September 3, 2003

Ms. Anita N. Doucette, Town Clerk
Town of Harwich
732 Main Street
Harwich, MA 02645

Dear Ms. Doucette:

I am responding on behalf of the U.S. Nuclear Regulatory Commission (NRC) to your letter dated June 5, 2003, regarding the Pilgrim Nuclear Power Station (Pilgrim). In your letter, you referenced a resolution adopted by the Town of Harwich, which requested that the NRC and the Massachusetts Emergency Management Agency (MEMA) provide emergency planning, including (1) immediate notification of any serious accident or abnormal occurrence at Pilgrim, (2) designated radiological safe shelters, and (3) written directives for each resident as to how to proceed in a radiological emergency. You also requested that the Massachusetts Department of Public Health (MDPH) provide potassium iodide (KI) to your town's Health Department. In addition, the resolution requested that the NRC direct Pilgrim to transfer their spent fuel rods to dry cask storage. As the basis for these requests, the resolution cited concerns about the safety of the people of Cape Cod in the event of an accident at Pilgrim and the vulnerability of the plant to a terrorist attack.

Our primary mission, as an independent regulatory agency, is to protect the public health and safety. This is our most important responsibility and we take our mission very seriously. As a regulator, we ensure that each nuclear power plant operates in accordance with the regulations and that safety issues, which could adversely impact public heath and safety, are resolved.

Federal oversight of radiological emergency planning and preparedness associated with commercial nuclear facilities involves both the Federal Emergency Management Agency (FEMA) and the NRC. While the NRC has overall responsibility, FEMA takes the lead in reviewing and assessing offsite planning and response and in assisting State and local governments. We review and assess our licensees' onsite planning and response capabilities. We also work closely with FEMA in support of its assessment of offsite emergency preparedness.

Federal regulations require nuclear power reactor licensees to prepare comprehensive emergency plans to ensure that prompt and effective actions can and will be taken to notify and protect citizens in the vicinity of a nuclear facility in the unlikely event of a radiological emergency. Emergency plans for nuclear power plants specify two concentric emergency planning zones (EPZs), centered around each plant, which represent areas for which detailed planning is needed. The first zone, called the plume exposure pathway EPZ, is an area with a radius of about 10 miles from the center of the plant. The major protective actions planned for the 10-mile EPZ are evacuation and sheltering. Outside of 10 miles, direct exposure is expected to be sufficiently low that evacuation or sheltering would not be necessary. The second zone, called the ingestion pathway EPZ, is an area with a radius of about 50 miles from the center of the plant. Within the 50-mile EPZ, precautionary actions such as putting livestock on stored feed and other protective actions may be employed to reduce exposure to the public from the ingestion of potentially contaminated food and water. These precautionary or

protective actions would only be necessary for the population within the segment or “slice” of the EPZ that is actually impacted by the path of the plume. For either EPZ, protective actions could be expanded, as necessary, depending on the conditions of a radiological emergency or changes in weather conditions.

Emergency planning is a dynamic process and, as a result, emergency response plans are periodically updated. The plans and their implementation are tested and reviewed by FEMA and the NRC to confirm the adequacy of protective measures. This includes the adequacy of plans to notify the public of an emergency, the evacuation and sheltering plans, and the ability to provide response instructions to the public. The combination of onsite and offsite emergency planning requirements that are routinely inspected and tested during drills provides assurance that the public will receive timely notification and instruction for either evacuation or sheltering in the unlikely event of a serious accident.

As you are aware, MEMA is responsible for comprehensive emergency planning within the Commonwealth of Massachusetts. We understand that MEMA has responded to your specific requests for emergency planning, and has included more detailed information on plans already in place. We consider that MEMA’s response adequately addresses concerns identified in the resolution about notification, sheltering, and written instructions. We also understand that a copy of MEMA’s response has been provided to FEMA and MDPH.

The resolution also expressed concerns about the vulnerability of Pilgrim to potential terrorist attacks. Our regulations set high standards for safety and security programs at nuclear power plants and other sensitive nuclear facilities. Since the NRC’s inception, we have required significant protection of licensed facilities against sabotage or attack. Security has been an important part of our regulatory activities, with defense-in-depth as the guiding design and operating principle. The regulations ensure that nuclear power plants are among the most hardened and secure industrial facilities in our Nation. The many layers of protection include robust plant design features, sophisticated surveillance equipment, physical security protective features, professional security forces, and access authorization requirements. Together, these layers of protection provide an effective deterrence against potential safety or security problems related to terrorist activities that could target equipment vital to nuclear safety.

Immediately after the terrorist attacks on September 11, 2001, we began a comprehensive review of the threat environment, as well as a review of our requirements for physical protection and security. We have approached these issues deliberately, in a manner consistent with the national approach to the current threat environment. In addition, we have coordinated our efforts with the intelligence community, Federal law enforcement, the Department of Defense, the Department of Homeland Security, the Department of Energy, and various State officials. These efforts continue to this day. With these actions, we continue to view nuclear facilities as among the most secure sites in the country.

Regarding the disposition of spent nuclear fuel rods, you requested that the NRC direct Pilgrim to transfer its spent fuel rods to dry cask storage. Previous studies, including some NRC or NRC-contractor studies, were conducted for the specific purpose of assessing spent fuel pools at decommissioning plants to ensure that licensees maintain an adequate level of insurance and emergency preparedness during decommissioning. The calculations were performed using simplified and highly conservative assumptions. These studies were intended as bounding

analyses to determine if current spent fuel pool requirements were adequate for decommissioning plants, and generally did not consider terrorist threats. Other assessments of possible spent fuel pool accidents stemming from potential terrorist attacks do not address these events in a realistic manner. In many cases, the authors rely on studies intended for other purposes that made overly conservative assumptions or were based on simplified and very conservative models. The use of these previous studies provides overly conservative and misleading results when assessing potential spent fuel pool vulnerabilities to terrorist events. Since the attacks of September 11, 2001, we have sponsored additional research into spent fuel pool vulnerabilities to terrorist attacks. The results of our research are undergoing internal NRC management review, and will be published in the near future. We believe that our recent research provides a more realistic basis for determining the acceptability of storing spent fuel in spent fuel pools. We believe the previous reports that have been cited provide an insufficient basis to conclude that it is preferable to relocate fuel to dry cask storage.

As part of these efforts, we are reevaluating the threat to spent fuel pools and measures to reduce that threat. In conjunction with the spent fuel pool assessment, we have been reexamining the predicted behavior of spent fuel during various accident scenarios. This reexamination includes the mechanisms associated with cooling, potential heat-up and degradation, fission product release, transport, and deposition, as well as possible offsite consequences. These analyses are being performed using updated, realistic methods. Insights from these more realistic analyses indicate that:

- the spent fuel stored in spent fuel pools is more easily cooled than predicted in earlier NRC studies;

- the consequences of such an accident would be much less severe than previously estimated;

- the radioactive release would be much smaller (by at least a factor of 10 for the scenarios analyzed), and the radioactive release would begin later than previously estimated, thereby:

    - providing more time for implementing effective protective measures (e.g., evacuation of the emergency planning zone),

    - resulting in reduced health effects, and

    - resulting in reduced land contamination.

The National Research Council, in its 2002 report, *Making the Nation Safer: The Role of Science and Technology in Countering Terrorism*, noted that, “[t]he threat of terrorist attacks on spent fuel storage facilities, like reactors, is highly dependent on design characteristics.” Differences in the design of spent fuel pools and dry cask storage facilities make it difficult to compare the relative safety of each method. We believe that spent fuel stored in both spent fuel pool and dry cask storage configurations is safe and measures are in place to adequately protect the public. As our ongoing efforts are completed, the staff will take appropriate regulatory actions, as needed, to further enhance the continued safe storage of spent fuel.

Regarding the vulnerability of Pilgrim's spent fuel pool design and storage configuration, the current spent fuel storage pool design at Pilgrim was reviewed and approved by the NRC. The spent fuel pool is a robust structure constructed of thick concrete walls with a stainless steel liner. The spent fuel rods are stored at the bottom of the pool and are covered by more than 20 feet of water. As long as the fuel rods are covered by water, there is sufficient cooling to keep them from melting or burning. The risk of uncovering the fuel is very low because several backup sources of water, some of which do not require offsite power, can be used to keep the fuel rods covered. We consider that the spent fuel at Pilgrim is safely stored in the spent fuel pool and the current spent fuel pool design is adequate for ensuring the protection of the public health and safety. Thus, additional storage requirements are not warranted.

You may find additional information regarding spent fuel storage on the NRC's public Web site at http://www.nrc.gov/waste/spent-fuel-storage.html. Thank you for your interest in these issues. I trust that you will find this information helpful and responsive to your concerns.

Sincerely,

/RA/

William D. Travers
Executive Director
for Operations

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