

## NUKE MATTERS: Radioactive waste storage at Pilgrim - why it is a concern

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**Wicked Local**

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PLYMOUTH — Nuclear energy's long-term legacy is well known: radioactive waste that needs to be safely stored for thousands of years. At Entergy's Pilgrim nuclear reactor in Plymouth, operating since 1972, spent nuclear fuel is being stored on site – a solution that is not what was intended when the reactor was built and that is potentially dangerous.

The core of Pilgrim's nuclear reactor was built to operate with a maximum of 880 fuel assemblies. After a period of time, fuel assemblies cannot generate enough energy and have to be replaced. The used fuel assemblies are irradiated waste fuel, a high level radioactive waste that is at least a million times more radioactive than fresh fuel. At Pilgrim, about one-third of the fuel assemblies in the core are unloaded every 18 months to two years. The used fuel assemblies are transferred, one assembly at a time, by a lifting hook and put into the spent fuel pool located in the upper level of the main reactor building, outside the primary containment building. Equipment failures and personnel errors during reactor refueling activities have resulted in a few hundred safety incidents in the U.S., including at Pilgrim, which, fortunately, were minor.

Pilgrim's irradiated fuel pool was originally designed to hold 880 fuel assemblies but now holds 3,279, about four times as much. The assemblies must be covered with water to prevent a fire that would release huge amounts of radioactivity – enough to contaminate an area more than 100 miles downwind, according to the National Academies of Sciences. Water loss in the pool can occur from mechanical failure, human error, acts of malice or the migration of a reactor accident to a pool accident. The Massachusetts attorney general's expert estimates a fuel pool fire at Pilgrim would result in \$488 billion dollars in damages and 24,000 latent human cancers.

Pilgrim was never meant to be a radioactive-waste storage site. The waste was to be sent to a deep geological repository off-site funded by a small charge to electricity consumers, and the storage would be the federal government's responsibility. The Yucca Mountain repository in Nevada was developed, but canceled in 2011.

Some believe that Yucca may be considered again, depending on politics, but this would not solve the waste storage issue at Pilgrim. The amount of high-level radioactive waste nation-wide already exceeds Yucca's maximum capacity, and reactor's operator can decide not to send the waste off-site for financial reasons.

Pilgrim's original operating license from the U.S. Nuclear Regulatory Commission limited the number of assemblies that could be stored in the spent fuel pool, but when it became clear no offsite repository would be available, the NRC increased the number. NRC has now extended Pilgrim's operating license for to 2032. Out of necessity, Entergy is planning to remove from the spent fuel pool only enough assemblies to make enough room for the next offload. This leaves too much fuel in the pool. Instead, Entergy should reduce number of fuel assemblies in the pool to 880, the original design capacity. Removing assemblies from the pool has many safety advantages, such as allowing air convection to help cooling, and with fewer assemblies in the pool there will be fewer offsite releases of radioactivity in the event of an accident. Implementing this safer option would cost Entergy about \$79 million (\$1.5 million per cask, each which holds about 62 assemblies, for 3,729 assemblies).

*Meg Sheehan is Plymouth native and environmental attorney. Mary Lampert is director of Pilgrim Watch. Cape Cod Bay Watch is dedicated to protecting and restoring water quality and marine life in Cape Cod Bay through public education, networking, and advocacy. Its current priority is addressing the harmful effects of the Pilgrim Nuclear Power Station – especially its destructive “once-through cooling” system – on water quality and marine life in the bay.*