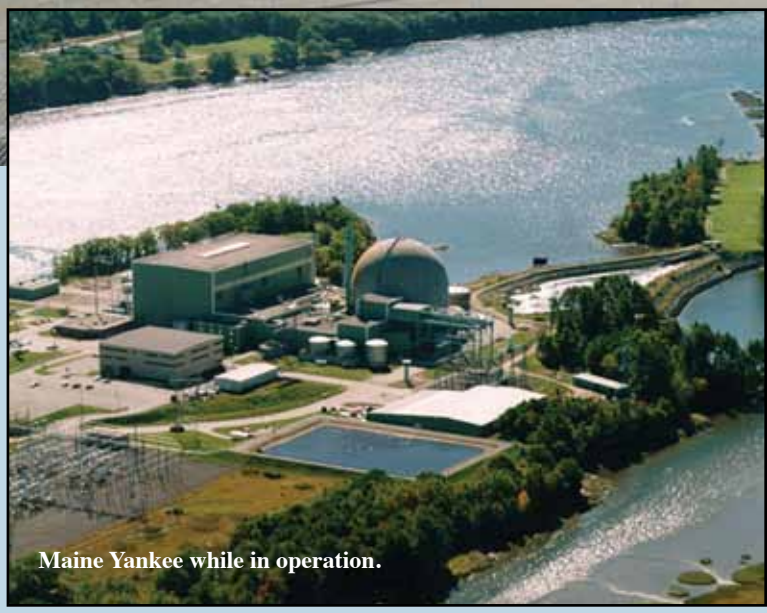
Maine Yankee

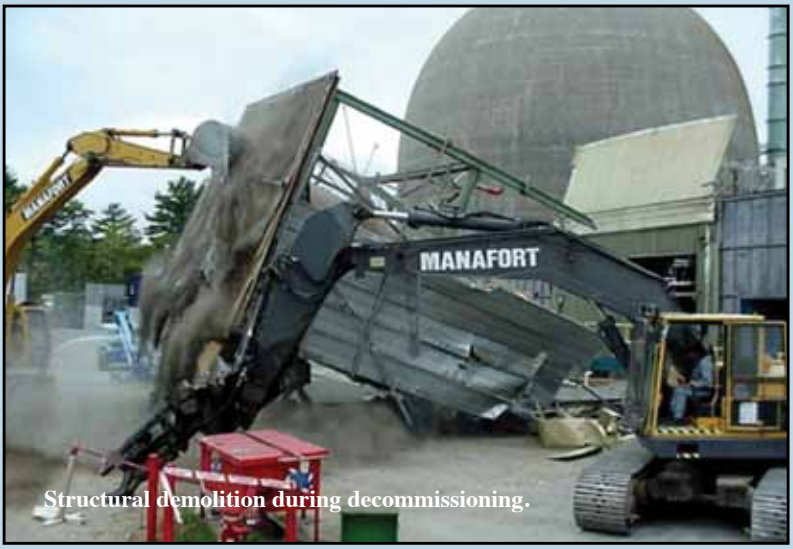
A brief history of operation, decommissioning, and the interim storage of spent nuclear fuel.

The Maine Yankee Independent Spent Fuel Storage Installation (ISFSI).

Maine Yankee was a 900 megawatt pressurized water reactor located on Bailey Point in Wiscasset. From 1972-1996 the plant generated about 119 billion kilowatts of electricity for the people of Maine and New England. The plant permanently shut down on August 6, 1997 for economic reasons. Decommissioning began immediately and was completed in the spring of 2005.



Maine Yankee while in operation.



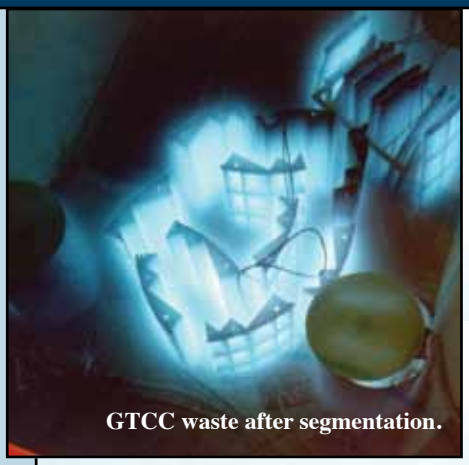
Structural demolition during decommissioning.

During decommissioning 430 acres of Maine Yankee land north of Bailey Point was sold to a developer in a first-of–its-kind transaction. An additional 200 acres west of Bailey Point known as the Eaton Farm was donated to the Chewonki Foundation for conservation, public access, and environmental education purposes as part of a FERC Settlement Agreement.

In October 2005 the U.S. Nuclear Regulatory Commission certified the successful completion of decommissioning when it amended Maine Yankee's Part 50 General License to reduce the 180 acre Bailey Point land under the license to the 12 acre Independent Spent Fuel Storage Installation site.

Maine Yankee after decommissioning.

All plant structures were removed to three feet below grade. Through agreement with stakeholders that became state statute, the site was restored to a radiological clean up standard of 10 mR above naturally occurring background radiation with a separate 4 mR standard for groundwater. This is more stringent than the NRC standard of 25 mR plus as low as reasonably achievable, or the EPA standard of 15 mR. Other than the ISFSI site, Bailey Point is now woods and fields.



GTCC waste after segmentation.

The reactor vessel was shipped by barge to the low level radioactive waste disposal facility in Barnwell South Carolina. Prior to the vessel's removal from the containment building, irradiated steel know as Greater than Class C (GTCC) waste was cut from the reactor vessel in a high tech underwater operation. Like the spent nuclear fuel, this irradiated steel is stored in canisters at the ISFSI. For disposal purposes it is treated as spent fuel.

The reactor pressure vessel leaving Maine Yankee by barge.

The containment dome before explosive demolition.

Maine Yankee was also the first decommissioning plant to use controlled explosive demolition to safely demolish plant structures such as the containment dome in September 2004.

Approximately 400 million pounds of waste was safely removed from the site by rail, truck and barge. Much of it was concrete and soil that was shipped by rail to the Envirocare facility in Utah.

The approximate gross cost of Maine Yankee's decommissioning was $568 million which includes all dismantlement and decontamination costs, as well as all spent fuel storage related costs through completion of the plant's decommissioning and final NRC license termination approval.

Waste loading for rail shipment.

ISFSI construction began in 1999. The loading of spent fuel into canisters in the fuel pool began in August 2002. Fuel transfer from the pool to the ISFSI was complete in February 2004. The project was the largest single fuel loading campaign.

Photos
Right: vertical concrete cask construction at the ISFSI.
Below: fuel loading in the spent fuel pool.
Below, right: transfer of loaded canister to the ISFSI and placement on pad.

The spent fuel pool was drained and demolished between March and August 2004.

Capital costs for the Maine Yankee ISFSI were approximately $75 million. This includes ISFSI construction, cask construction, canisters, fuel transfer, and other costs associated with establishing a stand-alone ISFSI.

Maine Yankee uses NAC International's UMS system to house its SNF and GTCC waste. NAC International, located in Atlanta, Georgia, is one of the world's leading fuel cycle experts. The NAC UMS system is licensed by the NRC for both storage and transport. The NAC UMS canisters are licensed until 2020 at which time, if necessary, there is an NRC process for license renewal for an additional 40 years. As the NRC license owner for the NAC UMS system relicensing the canisters is largely NAC's responsibility, although as a UMS system user Maine Yankee will be much involved in the process as it relates to our site.

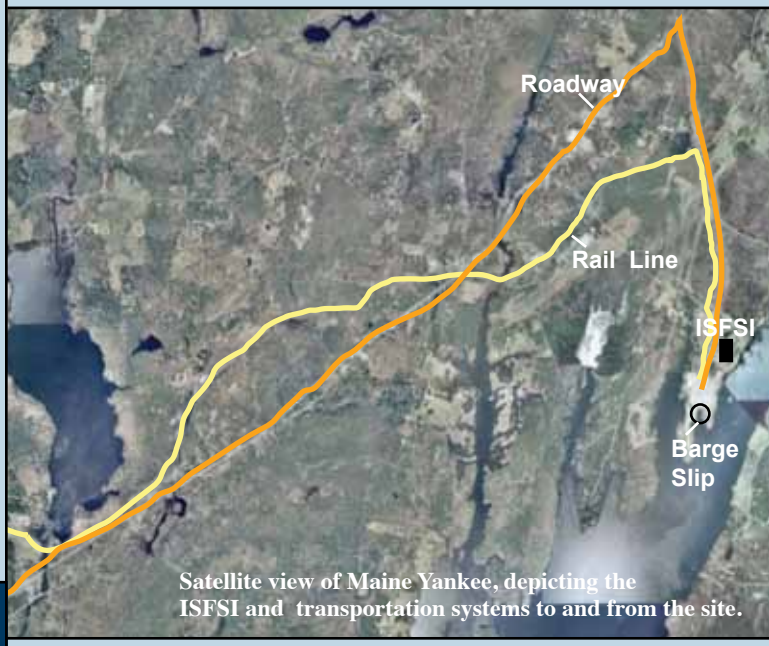
The spent nuclear fuel is stored in 60 dry cask storage containers at the ISFSI. Each canister holds 24 fuel assemblies. An additional four containers hold irradiated steel known as Greater than Class C waste (GTCC) that was removed from the reactor vessel. The 64 casks sit on 16 concrete pads.


The Maine Yankee ISFSI.

As the NRC licensee, it is Maine Yankee's responsibility to store the SNF in accordance with NRC regulations which include approved programs for security, emergency planning, radiological monitoring, and quality assurance. ISFSI security includes around the clock armed officers and a well rehearsed emergency plan involving local, state, and federal resources. The NRC conducts annual inspections of the ISFSI and issues reports that can be viewed on the Company's website at MaineYankee.com. Additionally, Maine Yankee's staff is in routine phone contact with the NRC and often provides condition reports and other information to keep inspectors informed of site activities.

State entities involved with Maine Yankee oversight are the Department of Health and Human Services' Radiation Control Program, the Health and Environmental Testing Lab, the Department of Environmental Protection, the State Police, and the Office of the Public Advocate. The annual fee for State of Maine oversight of Maine Yankee is $220,000 per year paid by Maine Yankee's ratepayers. The State oversight agencies and Maine Yankee meet a minimum of four times per year to review oversight activities for the following year and estimate the associated costs. An annual report of the oversight activities and estimated costs is provided to the Joint Standing Committee on Utilities and Energy which can make recommendations to the full legislature regarding the annual fee. To date the annual fee has been found sufficient to meet the State's oversight needs.

Maine Yankee's SNF and GTCC waste is safely stored and ready for transport from the site which is served by rail, road, and deep water access that accommodates barges. However, the U.S. Department of Energy has not yet built an overpack to transport the canisters from the site. There are no facilities any longer at Maine Yankee to repackage spent nuclear fuel. Maine Yankee and its stakeholders are eager to engage the DOE in a dialogue about the many details associated with the transportation of this material from Wiscasset.



Satellite view of Maine Yankee, depicting the ISFSI and transportation systems to and from the site.

The annual operating cost of the ISFSI is $6-$8 million per year.

As long as the spent nuclear fuel is stored at the Bailey Point ISFSI, this valuable piece of property is unavailable for productive reuse. Among other attributes Bailey Point has a rail line to the site, a barge slip with deep water access, a 345 and 115 Kv switchyard, transmission lines, and municipal water and sewer.

Maine Yankee's sister plants, Connecticut Yankee and Yankee Rowe in MA are also fully decommissioned with their own ISFSIs, similar dry cask storage systems, and similar transportation and delayed opportunity issues.