The first nuclear power plant containment building to be safely demolished with explosives.

Taking Down the Maine Yankee Containment Building

Text by Eric Howes
Photos courtesy Maine Yankee Atomic Power Co.

The Maine Yankee containment building was safely demolished with explosives on the morning of September 17, 2004, making it the first former nuclear power plant containment building to be demolished in this manner. (Explosives were previously used at Maine Yankee to safely demolish the turbine building in November 2000 and the overhead crane inside the containment in December 2002.) Maine Yankee has been undergoing decommissioning since 1997. Decommissioning is scheduled for completion in the spring of 2005.

Explosive demolition was deemed the safest, most efficient method of taking down the massive 150-foot-tall, steel-reinforced cylinder capped with a dome. The safe demolition of the containment building had been ongoing since 1999, beginning with interior demolition. The exterior of the containment was concrete reinforced with thousands of steel bars. The 75-ft-tall exterior walls were 4.5 ft thick, while the dome was 2.5 ft thick. This was backed by a 0.5-inch-thick steel liner. The containment had been designed to withstand a variety of adverse conditions, including a 360-mile-per-hour wind.

Areas where concrete and steel will be removed to create arches are outlined on the Maine Yankee containment building.

Because of the robust nature of the structure, it was necessary to weaken it substantially before final demolition was possible. Therefore, nine 75-ft-tall rectangular openings, or "arches," were cut through the exterior shell and liner using hoe rams and cutting torches (a specially manufactured long-reach boom helped reach up to the dome). This resulted in the removal of two-thirds of the shell concrete—about 13 million pounds of material. The weight of the structure after weakening was about 20 million lb. In addition, all of the 2.25-in.-diameter vertical reinforcing bars (approximately 1360 of them) were cut. The columns were then drilled laterally with almost a half mile of holes for the approximately 1100 lb of explosives used for the final demolition.

Prior to demolition, the columns were wrapped in chain-link fencing and fabric to minimize flying debris. The explosives were designed to col-

Pounding the concrete to create the arches.

Hoe rams and cutting torches were used to cut the arches in the containment building.

The containment with all arches cut out.

Eerily reminiscent of ancient temple ruins, the containment stands ready for the explosion, with the columns wrapped in fabric and chain-link fencing to minimize flying debris.

Inset: The Maine Yankee containment dome demolition explosion.
Above: After the dust settled, the dome was safely on the ground, ready for additional concrete cutting.
Right: The dome at the end of September 2004, with demolition nearly complete.

lapse the columns or "legs," causing the dome to drop intact. Once down, the resulting dome debris was about 75 ft high, within reach of the conventional excavators that continued to break up the concrete and steel and load it into railcars for shipment to and disposal at the Envirocare of Utah disposal facility.

Manafort Brothers Inc., of Connecticut, was the demolition contractor that prepared the containment for final demolition; Controlled Demolition Inc., of Maryland, was the explosive demolition contractor. ■

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