

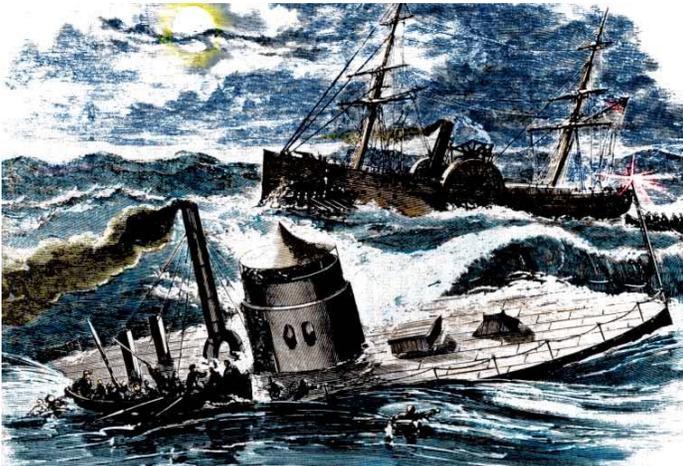


USS Monitor 2001 Project: Engine Recovery

01-126

Background:

The Civil War ironclad USS *Monitor* was one of the most remarkable and famous warships in history, and its design revolutionized warship technology around the world. The USS *Monitor* sank in a storm off Cape Hatteras, NC, on 31 December 1862 and was not discovered until 1973. In 1975, the site was designated as America's first National Marine Sanctuary. The *Monitor* has also been added to the National Register of Historic Places and declared a National Historic Landmark. During the early 1990s, the National Marine Sanctuary Program, National Oceanic and Atmospheric Administration (NOAA), determined that the *Monitor*'s remains were rapidly disintegrating. NOAA sought help from the U.S. Navy and other organizations for the recovery and preservation of significant components of the *Monitor*. The U.S. Navy partnered with NOAA's *Monitor* National Marine Sanctuary and The Mariners' Museum on a five-year program that began in 1998 and was completed in 2002. Legacy funds supported the major recovery expeditions during 2000-2002.



Courtesy National Archives

The USS *Monitor* sank off Cape Hatteras, NC, in 1862.

Objective:

The primary objectives for *Monitor* 2001 were: to prepare the *Monitor*'s unique steam engine for recovery; recover the steam engine; adjust the armor belt support; make significant progress towards uncovering the turret; and recover other artifacts in the immediate area as requested by the onsite NOAA representative. These objectives required U.S. Navy divers to work in heavy seas, strong currents, and deep water. The work required a stable surface platform and a considerable amount of bottom time.

Summary of Approach:

Legacy funding in 2001 was used to contract for a suitable support platform that met the mission requirements for heavy lift, berthing, deck space, multiple-point mooring capability and open ocean seaworthiness for the Cape Hatteras area. The barge supported 104 personnel who operated two separate Navy diving stations: one for Navy surface-supplied mixed-gas divers, the second a Navy saturation dive station using a leased civilian saturation system. Both stations conducted two 12-hour shifts a day to provide for 24-hour-a-day operation, seven days per week, weather permitting.



Courtesy US Navy, Combat Camera

Both saturation (left) and surface-supplied dive systems were utilized on the *Monitor* 2001 Project.

Benefit:

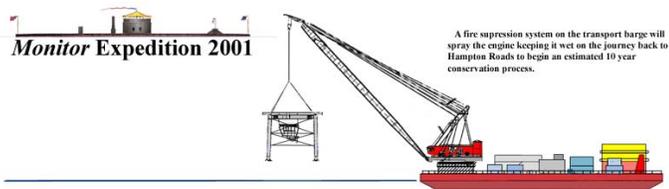
Monitor 2001, as with previous *Monitor* expeditions, provided significant benefits to the U.S. Navy. Previous *Monitor* expeditions had provided Navy divers with experience conducting realistic mixed-gas salvage operations that required real-time problem-solving and quick actions. The 2001 expedition added the complexity of the first large-scale saturation diving operation the Navy had conducted for decades. The overall project operation consisted of the two dive stations, plus a third station from which a remotely-operated vehicle (ROV) provided topside supervisors with the ability to view site operations from various locations and to record the operations on video. Well over 100 Navy divers from more than a dozen commands participated in the project. The overall benefits to Navy divers include dive training in surface-supplied and saturation diving, and an opportunity to participate in one of the most complex and delicate salvage operations ever conducted by the Navy. The project also resulted in the preservation of significant components of one of the Navy's most famous warships.

Accomplishments:

Phase One: prepare engine recovery system for use.

The USS *Grapple* (ARS 53) conducted *Monitor* recovery operations from 26 April to 12 May 2001. During this period 32 dives were accomplished, accumulating approximately 31 hours of bottom time. After laying a four-point moor, the *Grapple* concentrated on preparing the Engine Recovery System (ERS) that was positioned over the *Monitor*'s hull during the *Monitor* 2000 Expedition, for use during phase two. During the *Grapple*'s operation, inclement weather was encountered over several days which limited its ability to put divers in the water. Even with the marginal weather, the overall operation was very successful and contributed greatly to the success of phase two.

Phase Two, recover the engine. The supporting platform was the Manson Gulf derrick barge *Wotan* (299 x 90-foot barge with a 500-ton crane and 100 ton deck crawler). The barge supported 104 personnel, and was able to support two separate Navy diving stations 50 feet apart. One station consisted of Navy surface-supplied mixed-gas divers. The second was a Navy saturation dive station which used a leased civilian saturation system. Since the Navy did not possess a portable Saturation Diving System at that time, the project utilized the Global Industries 1504 system that allowed for a significant amount of bottom time. The saturation system allowed Navy divers to complete excursions of up to five hours at a time on the bottom. This compared to a maximum of 40 minutes a dive with the surface-supplied system. The saturation diving system accounted for 465 hours of bottom time during 2001. Total surface-supplied diving provided for over 200 hours of bottom time.



The ERS and the engine were lifted to the surface by the *D. B. Wotan*'s 500 ton lift capacity crane and placed on a separate barge for transport back to Virginia.



With the engine free from the wreck, the work of removing the deck and armor belt covering the *Monitor*'s revolving gun turret can begin.

Monitor Collection, NOAA

The *Monitor*'s engine was lifted using a steel Engineering Recovery System (ERS) to support the engine during rigging and recovery.

The ultimate achievements were recovery of the *Monitor*'s steam engine and numerous smaller artifacts, followed by additional stabilization of the hull. All recovered material was delivered to The Mariners' Museum in Newport News, Virginia for conservation and display.

In 2007, The Mariners' Museum officially opened a \$30 million new wing, the USS *Monitor* Center, which contains exhibits that tell the *Monitor*'s story, including the part played by the U.S. Navy in recovering the propeller, engine and (in 2002) the *Monitor*'s famous rotating, armored gun turret. The exhibit also features many of the recovered objects and allows visitors to look into the new conservation laboratory where the larger objects are still in treatment. A final report on the recovery expeditions is in preparation and is scheduled for publication in 2008.



Following recovery, the *Monitor*'s engine, still cradled within the ERS, was placed on a barge for transport to The Mariners' Museum for conservation and eventual display.

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