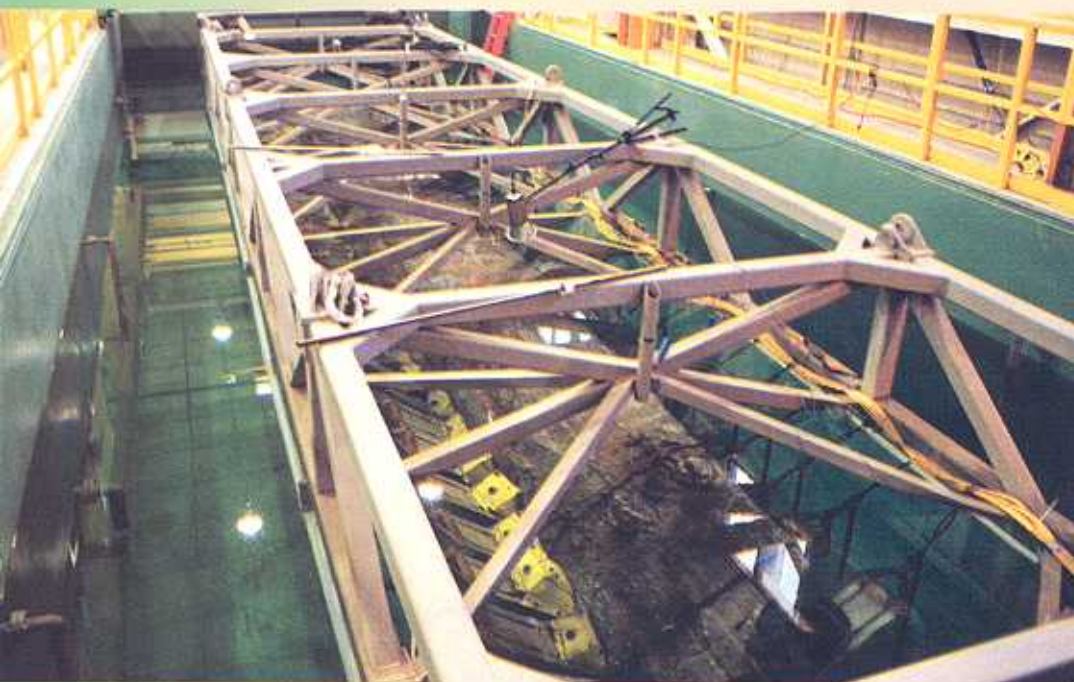




WATER & WASTES DIGEST

Sensors, Analyzers Instrumental in Preserving Civil War Sub

Recovered Submarine Requires Chloride Removal to Prevent Rust, Corrosion



The H.L. Hunley immersed in a large tank filled with an electrolyte solution of water and sodium hydroxide, which draws the chlorides out of the metal.

During the Civil War, in the year 1864, the first ship capable of maneuvering completely underwater sank off the coast of South Carolina while returning from its first mission. Now, after 137 years at the bottom of the Atlantic, one of the most sought after artifacts in the history of naval warfare has been brought home — the H.L. Hunley.

The organization Friends of the Hunley, Inc. has raised the submarine not only to preserve the relic, but to honor the crewmen aboard the fated vessel with a proper burial and to find some answers regarding its sinking all those years ago.

Emerson Process Management,

Rosemount Analytical, Liquid Division is playing a part in this monumental task as the company has been contracted to provide the sensors and analyzers used in the restoration and preservation of the H.L. Hunley.

Rosemount Analytical devices have been used during preservation processes to monitor the conductivity, pH/ORP and dissolved oxygen levels throughout the critical chloride removal. Without this process, the Hunley would immediately begin to oxidize, which would quickly lead to rust and deterioration.

Davis and Floyd and C.R. Hipp Construction Company Inc., a division of Encompass Services Corporation, in conjunction with the Friends of the Hunley, Inc., awarded the contract to Rosemount based on the ruggedness and durability of the Rosemount sensors and analyzers.

Built in 1863 for the Confederate Navy, the H.L. Hunley was plagued with disaster. The Hunley sank twice during testing with all hands aboard, and then returning from its mission, it sank a third time. It was finally discovered in 1995.

The submarine was raised August 8, 2000 and will be restored in preparation for display at the Charleston Museum. A major component of the restoration will involve drawing the chlorides out of the submarine's metal to prevent corrosion, rust and deterioration. One step of the chloride-removal project involves immersing the Hunley in a large tank filled with an elec-



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trolyte solution of water and sodium hydroxide, which draws the chlorides out of the metal.

The sub has now been in the tank for approximately seven months. The excavation team has already begun to remove some of the artifacts such as buttons and even skeletal remains. The restoration process was originally anticipated to take several years, but is now ahead of schedule and may be completed earlier.

During the restoration project, the analyzers are used to monitor pH/ORP, conductivity and dissolved oxygen in the sub's storage tank.

"The Rosemount products allow us to reliably monitor the electrolyte solution, which is critical to the success of the Hunley restoration," said Dr. Robert Neyland, Hunley project director and underwater archaeologist from the Naval Historical Center. "Without this sensor data, it would be impossible for us to maintain a proper environment for the chloride removal."

"The reliability and rugged design of the Rosemount sensors are critical to the project," stated Al Hitchcock, president, C.R. Hipp Construction Company Inc. "The durability of the Rosemount products make them well-suited for this type of critical operating environment."

The Rosemount sensors supplied for the Hunley project are housed in ruggedized cowlings to prevent damage to the electrodes. Additionally, Rosemount sensors offer a maximum life span.

Friends of the Hunley, Inc. was created by the South Carolina Hunley Commission as a 501(c)(3), non-profit organization to raise the funding needed for the recovery and conservation of the H.L. Hunley submarine.

Friends of the Hunley is dedicated to helping the Hunley complete its historic journey home. The organization's goals are to recover the remains of the brave men who gave their lives and honor them with the proper burial they earned; to solve the mystery of that first-ever successful submarine attack in 1864; and to conserve one of the greatest, most sought-after artifacts in the history of naval warfare.

More information on the H.L. Hunley can be found at www.hunley.org.

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