

Hull Bugs

by Capt. Bob Cerullo

Barnacles and sea growth on the hulls of boats of all sizes have been the sailor's nemesis for time in memoriam. In the days of wooden sailing ships, the ship would be beached and careened, allowed to roll to one side to facilitate cleaning the hull. Centuries later, barnacles and sea growth on the hull still slow the vessel and must be removed every year, generally by hauling the boat out of the water for the process of scrubbing the hull clean. Bottom paints have helped control marine life growth, but in the end the bottom has to be cleaned. New expensive bottom paints are cutting fuel consumption and marine growth, but their cost is prohibitive.

All those years of scrubbing the hull may soon come to an end with the use of a device called Hull Bug. A company headed by Mr. Dan Darling named Sear Robotics is working with the U.S. Navy's Office of Naval Research to develop a device that will actually roam along the bottom of a ship's hull cleaning off the marine growth as it goes. It has long been known that barnacles can reduce a ship's speed by as much as ten percent and increase fuel consumption by as much as forty percent. For the Navy the cost of removing the stuff and the extra cost for fuel when a dirty hull causes the ship to drag is roughly \$500 million a year.

The battery-powered Hull Bug is fitted with a suction device that allows it to stick to the hull and creep along the hull surface like a powerful vacuum cleaner. Watching a filmed demonstration, I was reminded of a pool cleaner that roams the bottom of a pool, cleaning as it goes. The amazing thing about the Hull Bug is that it attaches itself to a hull and moves along while holding itself to the hull.

The Hull Bug is equipped with a biofilm, the green gunk that grows on the hull, a detector that makes it able

to recognize and differentiate a clean section of hull from a hull that needs cleaning. When a dirty hull section is detected, water jets or brushes scrub away the accumulated growth of barnacles and marine growth. The Hull Bug attaches to the hull by means of a powerful pump at its base that creates a negative pressure pulling the device to the hull. In recent tests it was found the Hull Bug could scrap off biofuel and some barnacles, but as was expected, it was unable to scrap off barnacle bases. The scientists were very pleased with the job the Hull Bug did in cleaning the hull of the test vessel.

Developers predict that new hull coatings that are more resistant to marine growth used in combination with the Hull Bug could save the Navy millions of dollars per year in hull cleaning costs and fuel consumption. A full-scale demonstration of the Hull Bug's capability is planned for 2015, when two hull bugs will be assigned the task of cleaning the hull of a Navy ship. The cleaning experiment is expected to last about a month.

The plan is that the Hull Bug will be put to work on a ship while it is in port, roaming the hull and removing marine growth before it gets a chance to firmly attach itself to the hull. Experts agree the best way to stop barnacles from growing is to catch them before they begin to colonize.

A demonstration of the Hull Bug on the 55-foot sailing yacht *Adele* was recently conducted in Key West, Florida. It proved that the Hull Bug could successfully clean the bottom of a yacht while it was still in the water. There will have to be many more tests before the Hull Bug could be commercially available, but it has been proven to work and in the process save the yacht or ship owner lots of money.

The ramifications of the Hull Bug are startling. If it were used on all kinds of vessels, it has the potential of



The Hull Bug attaches to the hull of a vessel while still in the water and roams the surface of the hull looking for barnacles and marine growth to remove.

changing the way boats and ships are cared for during the course of a year. If the hull is free of barnacles and marine growth, then the need for taking the boat out of the water is greatly reduced. Cheaper bottom paints could be used if the hull were cleaned regularly. The Hull Bug could potentially be used once a month. Fuel consumption would be reduced, boats would move faster and the environment would be the better for it.

Dan Darling says, "Basically any boat over 45 feet, which is in the water all the time, can benefit from this kind of technology."

Ken Holippa, a Sea Robotics engineer, said, "Just like the Navy, the savings to the commercial shipping industry stand to be significant in terms of fuel efficiency and in reducing emissions associated with ship operation in our world's oceans."

The potential is tremendous, as are the benefits. Now all that stands in the way is consistent performance over the next few years. If the Hull Bug can literally stick to the hull and clean away the gunk, it could be an incredible breakthrough for the marine industry. The boat could be cleaned right at the dock with no need for hauling.



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