Topic: N161-044

Boston Engineering Corporation

OHIO Class External Hull Antifouling

Biofouling can increase fuel usage and the acoustic signatures of submarines and ships. Boston Engineering is developing a semi-autonomous system to kill biofouling life effectively, reduce skilled manpower requirements, and address environmental concerns. The Maritime UltraViolet Antifouling (MUVA) system uses an ultraviolet light (UV-C) module to eliminate fouling without physically touching – or damaging – coated underwater surfaces. Boston Engineering's modular design supports manual, semi-automated, and automated operation. Additionally, the MUVA also enables remote management. For more than 20 years, Boston Engineering has been developing game-changing products for its customers, and also leverages that expertise to commercialize its own capabilities for maritime environments. The company will apply its experience to address antifouling requirements across the U.S. Navy, DoD, Coast Guard, and commercial maritime organizations.

Technology Category Alignment:

Maintainability/Sustainability
Unmanned Ground and Sea Vehicles
Corrosion
Readiness
Structures and Protection

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SYSCOM: NAVSEA
Contract: N00178-17-C-8003
Corporate Brochure: https://navystp.com/vtm/open_file?type=brochure&id=N00178-17-C-8003

Department of the Navy SBIR/STTR Transition Program

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NAVSEA #2018-0558

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WHO

SYSCOM: NAVSEA

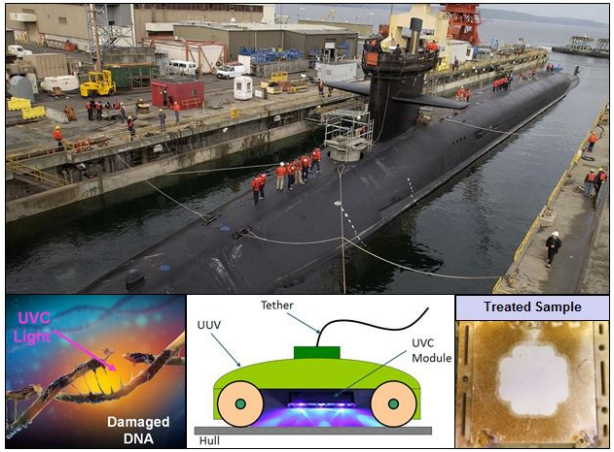
Sponsoring Program: NAVSEA05, Code 392HB

Transition Target: Columbia Class Submarine

TPOC:
(202)781-1262

Other transition opportunities: U.S. Navy Virginia Class and other submarine programs, NAVSEA Program Executive Office (PEO), Naval Supply Systems Command (NAVSUP), U.S. Army Runnymede-class large landing craft

Notes: Boston Engineering has the people and capability to develop fieldable UV-C modules and deployment systems if existing deployment systems are inadequate. Phoenix International is our teammate with experience and existing contracts supporting Navy maritime asset maintenance activities.



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WHAT

Operational Need and Improvement: Biofouling can reduce submarine propulsion efficiency and obstruct internal seawater systems. And it also creates similar barriers to Operational Availability for service ships.

Submarines in port for long durations require additional maintenance to address biofouling growth. This effort requires valuable manpower, safety processes to address radiological and other remediation applications, and compliance with environmental regulations.

Specifications Required: The technology will mitigate and/or control biological fouling on the external surfaces of the ship during in-port periods. This system must be rapidly installed and removed to support submarine arrivals and departures and require only minimal personnel demands to operate during maintenance periods. Importantly, the system must not alter the hull's hydrodynamic flow while at sea (change the hull form), and not impact the high integrity standards of submarine sea water systems or the hull.

Technology Developed: Boston Engineering's Maritime UltraViolet Antifouling (MUVA) system uses ultraviolet light (UV-C) packaged into a modular form to eliminate fouling without physically touching – or damaging – coated underwater surfaces. Boston Engineering's modular design supports manual, semi-automated, and automated operation. The product is also designed for rapid installation and removal on underwater hulls with little to no hull modifications or scaffolding.

Warfighter Value: The deployment of MUVA technology is significant because pervasive biofouling can negatively impact the U.S. Navy's 283 battle force ships and submarines when they are docked in a static state. The MUVA is designed for rapid deployment, automation, and can be augmented to address specific antifouling requirements. The MUVA's modular design can also support the requirement for increased commonality and interoperability between the U.S. Navy and the U.S. Coast Guard, as outlined in the National Fleet Plan.

WHEN

Contract Number: N00178-17-C-8003 **Ending on:** September 28, 2020

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Establish the initial operational limits of the application	Low	Determine weir height and speed for effective biofouling control	5	October 2018
Demonstrate effectiveness of multiple and varied locations	Low	Verify effectiveness in different environments with different organisms	5	August 2019
Establish product form operating at relevant depth	Med	Package a design that demonstrates usability and effectiveness	6	September 2019
Establish a means for deployment of the application	Med	Either select an existing deployment capability or develop one	6	May 2020
Demonstrate service use on the Columbia Submarine	High	Execute effectiveness in an operational environment	7	September 2020

HOW

Projected Business Model: Boston Engineering plans to advance the technology to the point of commercialization via the SBIR program. Then, Phase III funding will include internal R&D investment and participation in programs to accelerate product delivery to the US Navy -- such as the US Navy Rapid Innovation Fund (RIF). We will also use Phase III to work with potential strategic business partners. Boston Engineering will develop and provide the technology directly to the Navy and to associated prime contractors.

Company Objectives: Boston Engineering will focus on working with the US Navy to demonstrate an expanding range of operation for ships and submarines. Boston Engineering expects commercial success based on the ability to demonstrate added value to US Navy Logistics, Maintenance and Industrial Operations users. Boston Engineering's goal is to spin-off a company to develop and sell MUVA systems modified for commercial shipping, oil & gas exploration, and US Navy requirements.

Potential Commercial Applications: Boston Engineering's antifouling solution addresses industry's focus on controlling costs, increasing performance, and complying with environmental regulations. In 1981, the US Navy used 18 million barrels of fuel, with 3.3 million attributed to biofouling losses. Biofouling likely has a similar impact on the underwater hulls of commercial fleets. Additionally, biofouling prevention is associated with high maintenance costs and the potential to cause water pollution through the release of toxic substances.

In addition to commercial shipping opportunities, an Oil & Gas company has contacted us regarding specific antifouling targets for subsea structures within the thermocline.

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