

# Department of the Navy SBIR/STTR Transition Program

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ONR Approval #DCN# 43-10503-22

Topic # N09-T001

Autonomous Launch, Recovery and Turn-Around Systems for Small UAVs  
Boston Engineering Corporation

## WHO

**SYSCOM:** ONR

**Sponsoring Program:** NRL

**Transition Target:** PMS 555

**TPOC:** Corey Countryman  
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**Other Transition Opportunities:** Navy Research Lab  
TSN team (Emerging POR)

**Notes:** The Thermal Spray Robotic Vehicle (rendering shown) automatically prepares and coats ship decks with thermal spray non-skid. The URSALA2 system will enhance this capability by providing a self-contained QA/QC system that integrates multiple commercially available sensors to aide in coating prep and automation while also removing personnel from hazardous environments and increasing throughput by eliminating pauses in coating operations for inspection

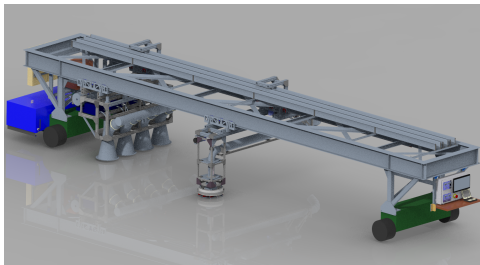


Image courtesy of Boston Engineering Corporation

## WHAT

**Operational Need and Improvement:** Vertical Take Off and Landing (VTOL) operations aboard amphibious ships have created an increased heat and pressure load that rapidly degrade the traditional epoxy non-skid on the deck. The Navy, specifically the Navy Research Laboratory's (NRL) Center for Corrosion Science and Engineering (CCSE) has identified a twin wire electric arc thermal spray coating system that sufficiently survives these increased heat and pressure loads. Boston Engineering has developed a system for automating the abrasive blasting at scale for Thermal Spray Non-skid (TSN), however requires operators to manually review blast quality. This disrupts the automation process does not provide real time feedback, and increases manpower requirements during coating

**Specifications Required:** Develop a self-contained data acquisition system (DAQ) robust enough for use with a broad range of sensors, data streams, and communication protocols associated with coating and coating-preparation applications, with a focus on TSN

**Technology Developed:** Boston Engineering's URSALA2 device is a self-contained QA/QC system that integrates multiple commercially available sensors to aide in coating prep and automation while also removing personnel from hazardous environments and increasing throughput by eliminating pauses in coating operations for inspection. The URSALA2 device uses modular, open-source software to leverage Boston Engineering's large portfolio of robotic platforms including hull and tank crawlers as well as large resurfacing robots used in shipyards.

**Warfighter Value:** Implementation and use of the URSALA2 system can provide a more rapid inspection capability to the shipyards potentially decreasing the amount of time needed for vessel remediation. This decreased inspection and remediation time can more rapidly return a vessel to the fleet, increasing the US Navy's warfighting posture.

## WHEN

**Contract Number:** N68335-21-C-0322

**Ending on:** May 30, 2023

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Initial Concept Development & Paper Study	Low	Mathematical model feasibility analysis	3	2nd QTR FY22
COTS Sensor Assessment and Selection	Medium	Surface test data from candidate sensors statistically aligns with current Navy sensing methods	4	3rd QTR FY22
URSALA2 Initial System Testing	Low	System is reporting test plate data in real time	5	1st QTR FY23
URSALA2 TSRV Integration & Demo	Medium	System is sending data to TSRV operator during mock coating operations	6	1st QTR FY23

## HOW

**Projected Business Model:** To refine the design and achieve a TRL 7/8 solution for the stated need, Boston Engineering is interested in exercising both the Phase II Option 1 and Option 2 components of the current contract. Acquisition beyond intermediate R&D funding would occur in alignment with emerging programs of record from PMS 555 or other Shipyard modernization efforts

**Company Objectives:** There are multiple paths forward for adoption once the URSALA2 system is demonstrated with the Navy. We expect the most direct customer is the Navy TSN application enterprise, whose core funding customer is PEO Ships. Broadly speaking the market size for the URSALA2 system, including the four potential TSRV's (estimated to require 2 URSALA2 systems each), and multiple support systems to execute independent testing on non-TSRV coated ship decks, is likely 10-20 systems. For the crawler based systems, we believe the core customers are the regional maintenance centers (RMC) that are run and staffed by the Navy. We will expect to sell systems directly to the regional and intermediate maintenance centers and facilities, for use by their inspectors and contractors for use in cleaning, inspecting, and maintaining tanks. The transition path will build upon what the Navy is doing now, in particular with regard to personnel and inspection procedures.

**Potential Commercial Applications:** Boston Engineering will also look to sell URSALA2 systems to the private sector including companies relevant to thermal spray (such as Thermion) and shipyards or their subcontractors. URSALA2 is focused on providing an easily integrated system architecture of disparate sensors for the specific task of assessing surface prep quality for Thermal Spray Nonskid. The premise however is to expand to support operations with other vehicle platforms for adjacent surface prep missions. As such, selection of a separate mission platform, separate end effector, etc. could be completed to support the alternative mission.

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