Department of the Navy SBIR/STTR Transition Program

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NAVSEA #2020-0479

Topic # NOAA141-842W

Above Surface/Below Surface Expendable Dropsondes (MASED)

Boston Engineering Corporation

WHO

SYSCOM: NAVSEA

Sponsoring Program: PEO USC

Transition Target: Littoral Combat Ship (LCS) Mine Countermeasures (MCM) Mission Package (MP)

TPOC:

Other transition opportunities: Ship deployed oceanographic missions that focus on specific SVP data (NOAA Hurricane Research Center, Navy METOC). Depending on final sensor configuration, NAVAIR (PMA-264 and PMA-290) may be interested in acoustic data during profiles.

Notes: The MASED variant "SVP Sonde" (likely to be renamed) is shown in operation (one of its multiple dive/surface/transmit profiles); with a physical demonstration unit (inset).

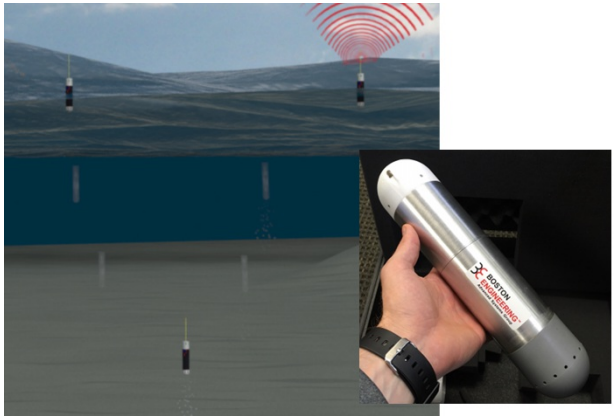

Image courtesy of Boston Engineering Corporation

WHAT

Operational Need and Improvement: Sound Velocity Profile (SVP) measurements are critical for providing high-quality sonar returns when conducting sonar mapping of the ocean floor or identifying the presence of moored items. Mine Countermeasure (MCM) teams adjust their equipment given the local changes within the ocean environment, and need information as close to the point of sonar collection as possible. SVP Sonde is a small, remotely-deployed sensor that collects multiple SVPs during a 12-24hr timeline, starting within the mine threat area (MTA).

Specifications Required: Execute multiple profiles (a cycle of downward motion followed by upward surfacing motion in the water column) originating within the MTA to a depth of at least 600ft during a 12-24hr period. Data will be collected a least once per meter during either the decent or ascent, identified spatially with GPS location data, and will be transmitted back to the host vessel over many miles.

Technology Developed: Low-cost, free floating, multi-profile sensor system that collects conductivity, depth, and temperature measurements, allowing for off-board calculation of SVP. The system's variable buoyancy provides the depth change capability, and satellite communications technology provides operation including deployments over the horizon (OTH).

Warfighter Value: Collecting SVP data where sonar measurement occurs increases the likelihood of high-quality data, and minimizes the risk of needing repeated measurements in the same location. Extending this system out to execute multiple profiles during the course of many hours provides a more continuous view of the underwater environment, allowing operators to note changes before the sonar data is collected, further minimizing risk of sub-optimal data.

WHEN

Contract Number: N68335-20-C-0354 **Ending on:** September 4, 2022

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Analysis of Alternatives Document	N/A	veraged by customer to weigh in on inclusion of additional capabilities	4	July 2020
Demonstration Units Shipped for PEO USC Testing	Low	Preliminary hardware demonstration, feedback from PEO USC	5	October 2020
Internal Device Testing	Low	Successful profiling, data collection, and transmission	6	June 2021
PEO USC Initial Prototype Testing	Med	Successful profiling, data collection, and transmission	6	July 2021
If Option Exercised, PEO USC Subsequent Prototype Testing	Med	Successful profiling, data collection, and transmission in relevant environment	7	September 2022

HOW

Projected Business Model: Boston Engineering Corporation is actively looking to commercialize this (and other) multi-profile maritime distributed sensor technology either directly to the DoD or with support of a prime associated with the MCM mission package. Boston Engineering has the capability to support manufacturing of small lots and has ongoing connections with contract manufacturers to support larger quantity requests. Boston Engineering expects to reach field-worthy prototypes within 12 months of the end of Phase II work, with particular focus on shelf life and device TRL maturity within a potential Phase II.5, and limited rate initial production six months after the start of Phase III. Full production should begin within 12 months after limited rate production begins, and we estimate the business will be profitable within 1 year of full production.

Company Objectives: Boston Engineering's objective is to transition SVP Sonde to support PEO USC and the LCS MCM Mission Package. More broadly, Boston Engineering's efforts with other maritime sensors, position the team to be an industry leader in low-cost, multiple profile, maritime data collection. This technology portfolio has received buy-in from Massachusetts commercialization grants and other DoD funding in this subject area. Boston Engineering continues to look for sponsors, teammates, testing, and other support to decrease transition risk and overall barriers for Navy adoption.

Potential Commercial Applications: SVP data is valuable to companies collecting high-quality sonar data, monitoring aquatic habitats, or executing high-quality acoustic measurements/transmissions. Low-cost oceanographic sensors are purchased and implemented by various commercial fishermen, aquaculture farms, seabed mapping companies, and organizations within the oil and gas sector. As these companies drive towards more remote or unmanned data collection, risk can increase related to deployed sensor calibration and systems that can help mitigate risks of poor data returns can become increasingly valuable. Boston Engineering welcomes commercial engagement to help increase the probability of transition within the US Navy.

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