

# Department of the Navy SBIR/STTR Transition Program

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NAVSEA #2021-0459

Topic # N191-024

CONEXUS: Comms and Operation Node for Expeditionary Underwater Systems  
Boston Engineering Corporation

## WHO

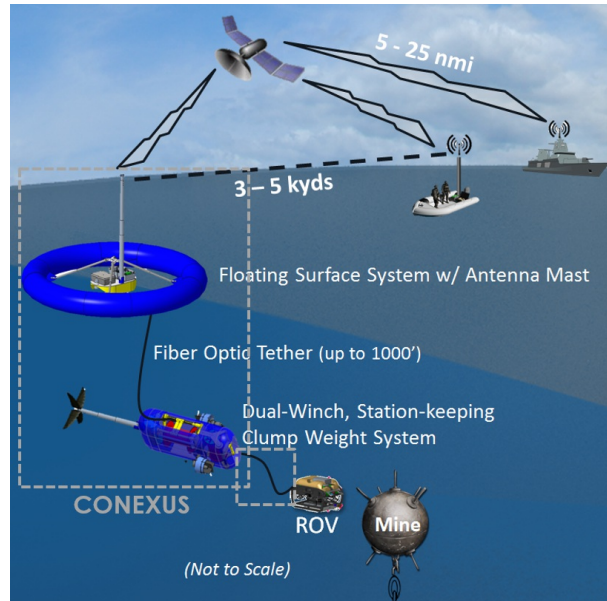
**SYSCOM:** NAVSEA

**Sponsoring Program:** PEO USC / PMS 408

**Transition Target:** PMS 408

**TPOC:**

**Other transition opportunities:**



## WHAT

**Operational Need and Improvement:** EOD operators need a fully integrated, expeditionary, autonomous tether management system to provide long range standoff operation of remotely operated vehicles (ROVs). Currently, operators that use ROVs need to remain relatively close for operations in maritime mine areas. A fully integrated intermediate system between operators and the ROV provides ROV operations at depth and supports safe separation of personnel.

**Specifications Required:** CONEXUS (Communication and Operation Node for Expeditionary Underwater System) must provide seamless command and control at standoff distances with sufficient communications quality and speed from operators to and from the ROV. This system must operate in a range of sea states and depths and must provide ROV operation without direct connection to an on site vessel (often an 11m RHIB). Overall, the system must be expeditionary and not inhibit operational tempo.

**Technology Developed:** CONEXUS is comprised of a "Clump ROV" (set of 2 winches with station keeping that connects to an EOD ROV, isolating it from tether forces) and a floating surface system that houses the antenna and mast to communicate with remote users. Tether management in challenging conditions, minimizing SWaP, and ROV localization are the main technical risks being addressed early in PH I and II.

**Warfighter Value:** CONEXUS supports the warfighter by extending surface lateral standoff range between EOD technicians and their ROVs to several thousand yards without compromising command and control capability. CONEXUS supports the warfighter by extending surface lateral standoff range between EOD technicians and their ROVs to several thousand yards without compromising command and control capability.

## WHEN

**Contract Number:** N68335-21-C-0153 **Ending on:** December 15, 2021

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Initial communications and surface float system tests	Low	Test tank stability and littoral test execution	4	December 2019
Surface system and winch in water testing	Low	Tether tension and wind confirmation, surface system stability to Sea State 3	5	December 2021
Combined system testing	Low	Field winching and communications testing	5	December 2022
Full communications and operations test	Med	Full system test with ROV and standoff	6	December 2023

## 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 PMS 408's 'Maritime Expeditionary Standoff Response System of Systems (MESR SoS)' Program of Record, possibly executed under a broader Phase III contract. Boston Engineering is expecting to produce the product itself, leveraging contract manufacturers as appropriate, and is targeting availability on FedMall (or similar) by 2023-2024.

**Company Objectives:** Boston Engineering's objective is to transition CONEXUS to support NAVSEA, PEO USC, PMS 408, and specific EOD units engaging with ROV operations. The current PH II SOW includes TTP and TTA development specifically working towards incorporating CONEXUS within the PMS408 'Maritime Expeditionary Standoff Response System of Systems (MESR SoS)' Program of Record with NIWC-PAC as Technical Design Agent (TDA). 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:** CONEXUS's standoff capability is especially valuable for EOD personnel, however, it is also valuable in other fields, such as pipeline inspection, underwater infrastructure inspection, and other related Renewable Energy and Oil & Gas needs. Extended standoff could support less intrusive inspection of underwater ecosystems where vessels are prohibited. Boston Engineering is actively assessing commercial applications for the CONEXUS system as a whole and for its subcomponents. The surface communications system could support various ocean surface gateway communication needs including oceanographic, research, government, and military operations.

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