

Department of the Navy SBIR/STTR Transition Program

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ONR Approval #

Topic # N151-066

Underwater Dual Manipulator Inflatable (UDMI)

RE2, Inc.

WHO

SYSCOM: ONR

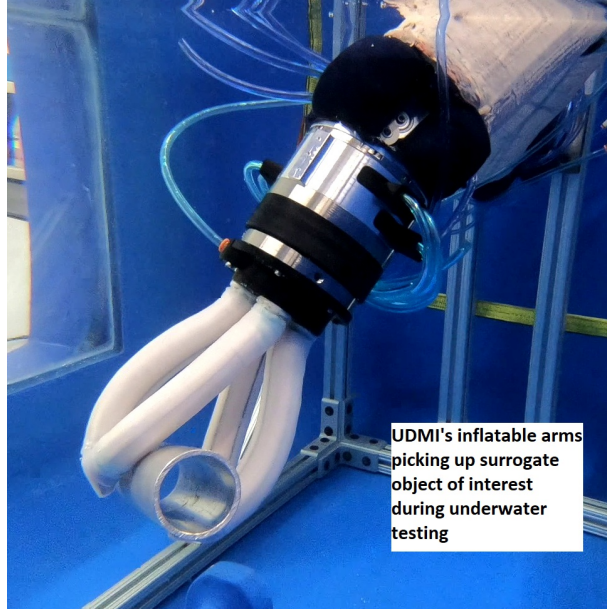
Sponsoring Program: PMS-408

Transition Target: Maritime Expeditionary Standoff Response (MESR) Program of Record

TPOC:

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Other transition opportunities: Low Observable / No Collateral Damage Neutralization of Underwater Mines and Waterborne Improvised Explosive Devices Future Naval Capability



WHAT

Operational Need and Improvement: Develop an inflatable underwater dexterous manipulation system that minimizes impact on energy needs and electromagnetic signature of Remotely Operated Vehicles (ROVs) to perform counter mine and Water-Borne Improvised Explosive Device (WBIED) missions.

Specifications Required: * Deployable/inflatable as needed

- * Lifts objects weighing up to 25 lbs
- * Lightweight
- * Precise wrist control positioning under tele-operation
- * 7 Degrees of Freedom (DOF)
- * Single or dual arm configuration

Technology Developed: * Inflatable arm, gripper, and actuators
* Environmental seawater inflates the structure and powers the hydraulics
* Pressurized membranes using compliant, elastomeric materials
* Fluidic peristaltic roll joint enabling continuous rotation and precision motion
* Torque: 8 ft-lbs; Joint speed 30 degrees/second
* Tele-operated control system

Warfighter Value: * Inflatable arms with natural compliance decrease possibility that contact with or near a suspicious device could cause a detonation.

- * Increases safety when working in close proximity to suspicious devices moving unpredictably in water columns.
- * Minimizes additional size, weight and power (SWAP) needs and reduces electromagnetic signature created by adding manipulators to ROVs.

WHEN

Contract Number: N68335-17-C-0046 **Ending on:** December 18, 2020

| Milestone | Risk Level | Measure of Success | Ending TRL | Date |
|---|------------|---|------------|--------------|
| Initial prototype build and underwater testing in lab | N/A | Successfully demonstrated proof-of-concept | 4 | 2nd QTR FY19 |
| Revised prototype build and underwater testing in lab | N/A | Passed initial underwater testing | 5 | 2nd QTR FY20 |
| Demonstrate underwater operations in lab | Low | Successful demonstration of UDMI capabilities | 6 | 1st QTR FY21 |

HOW

Projected Business Model: Develop and manufacture manipulators and payloads for Programs of Record, selling them either directly to the DoD or to Defense Prime Contractors.

Company Objectives: RE2, Inc. designs, develops, and integrates intelligent mobile manipulation systems and payloads with human-like performance for unstructured ground and underwater environments.

Potential Commercial Applications: * Oil and gas industry

- * Other underwater applications requiring highly dexterous manipulators integrated with smaller ROVs

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