

WHO

SYSCOM: NAVSEA

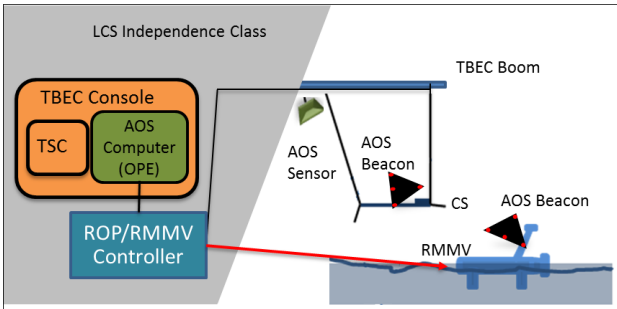
Sponsoring Program: NAVSEA
Project Management (PMS) 403

Transition Target: LCS
Independence Class

TPOC:
(401)832-3213

Other transition opportunities:
LCS Freedom class, Naval crane
operations, other military and
civilian crane operations

Notes: AVRS base technology is
successfully integrated in the sling
load mission of autonomous
rotorcraft deployed overseas. This SBIR program is adapting the technology to enhance the reliability
and speed of RMMV recovery.



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WHAT

Operational Need and Improvement: Increase the repeatability of a reliable RMMV launch and recovery efforts in various sea states. By automating and combining key operators' portions of the launch and recovery process to provide faster response times than human operators can achieve while compensating in real time for dynamic turbulent wake field conditions.

Specifications Required: Reduced recovery time, reduced damage inflicted during recovery to both and capture equipment, increased mission on-station time by adding automation to the RMMV recovery procedure.

Technology Developed: The AVRS solution uses demonstrated optical beacon technology from the Navy's unmanned cargo resupply program and adapts it for use in a maritime environment. Closed-loop intelligent control of the capture spine ensures a successful capture every time.

Warfighter Value:

- AVRS reduces the overall capture time of the RMMV from hours to minutes, increasing the total on-station time of the RMMV during mission and reducing fuel costs.
- AVRS reduces the likelihood of damage to the RMMV and capture spine.
- AVRS enhances the repeatability of L& R evolutions in all sea states.
- By taking the "man out of the loop," AVRS reduces the Navy's total cost of ownership for the RMMV and allows the Navy to use the limited contingent of Sailors on the LCS for the things that only humans can do on board a Navy vessel.

WHEN

Contract Number: N00024-15-C-4013 **Ending on:** November 14, 2016

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Demonstration prototype lab tested	Low	Hardware met all system requirements and passed performance testing	4.5	November 2015
Demonstration prototype tested in relevant environment	Med	Components integrated with larger system and tested in expected geometry with RMMV and CS	6	January 2016
Demonstration Prototype Tested Pier-Side on ship	Med	Prototype system integrated and tested on LCS, CS, and RMMV pier-side	6.5	September 2016
Demonstration Prototype Tested At-Sea during RMMV recovery	High	Hardware demonstrated during recovery exercise of RMMV	7	September 2016

HOW

Projected Business Model: During Phase II Option AOS will demonstrate autonomous capability and add specific requirements to POR for autonomous recovery. Phase III will include specific maritime ruggedization, qualification testing & documentation, and development of all training, doctrine, and ICDs. AOS can support direct Phase III funding or funding can flow through our partner, Maritime Applied Physics Corp. (MAPC), or Lockheed Martin for ultimately transitioning the technology to MAPC, LMCO, or another prime through license agreements or technology sales.

Company Objectives: Transition by either licensing or technology sales to the Lockheed Martin RMMV team (the prime for the RMMV and the ROP) and/or our SBIR teammate, Maritime Applied Physics Corporation (MAPC), the prime for the Twin Beam Extensible Crane (TBEC). We plan to work closely with Lockheed Martin, MAPC, and the Navy to identify integration challenges and to find funding to move the AVRS solution to TRL 9.

Potential Commercial Applications: Autonomous Crane Operations shipyards, oil rigs, depots. Sea explorers, other industries that involve launch and recovery of a remote operated vehicle (ROV).

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