Department of the Navy SBIR/STTR Transition Program

Statement A: Approved for Release. Distribution is unlimited.

Topic # N132-120

Advanced Littoral Combat Ship Common Mission Module Handling Device

Advanced Technology & Research Corp.

WHO

SYSCOM: NAVSEA

Sponsoring Program: PMS 501, Seaframe Construction

Transition Target: Littoral Combat Ship (LCS) Program Office

TPOC:
(301) 227-5975

Other transition opportunities: The Robotic Mission Module Handling System (RMMHS) provides a versatile lifting capability and significantly enhances the efficiency of transfer operations for shipping containers and flat racks. This functionality is well suited for the LCS sea frames and would also be well suited for other defense applications such as the Military Sealift Command (MSC) and Special Operations Command (SOCOM).

WHAT

Operational Need and Improvement: The Freedom and Independence seaframe variants of LCS currently use three types of equipment to move off-board sea vehicles and to reposition Mission Modules (MMs) shipboard. These technologies do not provide a Module handling system common to both seaframe variants and adaptable to handling a variety of MMs. In addition, each of these pieces of equipment has limitations in areas such as omni-directionality of movement, side and height clearances, and deck-point loading. The new system is to replace the existing handling equipment for MMs and address the limitations faced during current shipboard operations.

Specifications Required: The new shipboard module handling device should be compatible with a variety of MMs weighing up to 12,500 kg and common to all LCS configurations. It should be remotely controlled, lightweight, and affordable. It should be capable of omni-directional movement and spreading load across the deck while maintaining load security in sea states. It should operate within the constraints imposed by competing requirements for module clearances, deck load, maneuverability, size, weight, and manning.

Technology Developed: The RMMHS consists of a team of multiple robotic movers. The robotic movers are highly maneuverable, reconfigurable, and remotely controlled. They can maneuver around structural stanchions and under low overhead aboard the LCS seaframes. They work together to lift and transfer both shipping containers and flat racks in port and at sea.

Warfighter Value: The RMMHS eliminates the limitations of current MM handling devices and provides a cost-effective, safe, and MM handling device common to both LCS seaframes in sea conditions up to Sea State 4. It offers superior module positioning performance with a smaller on-deck equipment footprint and at lower lifetime costs.

WHEN

Contract Number: N00024-15-C-4038 **Ending on:** April 1, 2018

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Preliminary Design Review (PDR)	Low	TPOC approval	TRL 3	September 2015
Critical Design Review (CDR)	Med	TPOC approval	TRL 3	March 2016
Phase II Base Demonstration	Med	Complete Functional Demonstration in laboratory environment	TRL 4	March 2017
Phase II Option Demonstration	Med	Complete Prototype Demonstration in relevant environment	TRL 5	March 2018

HOW

Projected Business Model: Cargo handing gear is an equipment category not typically provided by a prime contractor. ATR anticipates to make the RMMHS and supply them in volume to the Navy. ATR has three decades of designing, prototyping, and manufacturing experience of material handling equipment for the US Postal Service (USPS). The company has been formally recognized as an ISO 9001-2000 compliant producer. ATR's manufacturing system is also designed to minimize working capital requirements: the company typically stages components deliveries to match its rapid assemble-test-and-ship production cycle and seldom requires large investments in inventory. ATR also plans to leverage its relationships with DoD prime contractors, such as GD-MS who is our subcontractor for this SBIR project, to most effectively augment and deliver the desired skill sets and production capabilities to its customers.

Company Objectives: We understand that the LCS Program Office is interested in using this new technology on both the Freedom and Independence seaframe variants of LCS. ATR anticipates that we could manufacture and supply the RMMHS in volume directly to the Navy. ATR would explore additional applications of the RMMHS to other military services. In addition, ATR would also pursue commercialization of the RMMHS.

Potential Commercial Applications: The RMMHS is compatible with ISO commercial standards and would also be well suited for the commercial shipping industry, warehouse operations and installation, or reconfiguring of heavy manufacturing equipment.

Contact: Dr. Tom Zhao, Principal Investigator
TZhao@ATRCorp.com (443) 766-7978