Department of the Navy SBIR/STTR Transition Program

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Topic # N161-023

Sinking Hose System for Amphibious Bulk Liquid Transfer System (ABLTS)

Materials Sciences Corporation

WHO

SYSCOM: NAVFAC

Sponsoring Program: Amphibious Bulk Liquid Transfer System (ABLTS)

Transition Target: Enhance Capablility of ABLTS / Replacement for Offshore Petroleum Distribution System (OPDS)

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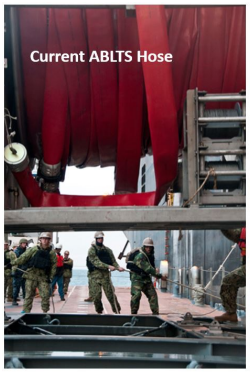
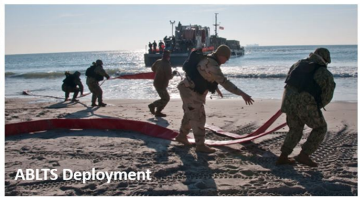
Other transition opportunities: This program was preceded by a program to develop a lightweight, high-pressure hose for the US Army. The Army is pursuing multiple platforms of fuel and water transport which may utilize some of the same technology used in this product..





http://seabeemagazine.navylive.dodlive.mil/2012/03/09;
http://www.msc.navy.mil/inventory/ships.asp?ship=234

Notes: The image depicts the current layflat, floating ABLTS hose as well as the non-collapsible, sinking OPDS hose. The goal of the program is to create a layflat hose that stores efficiently on a smaller reel that sinks to prevent interference with local traffic.

WHAT

Operational Need and Improvement: The US Naval Facilities Engineering Command (NAVFAC) is responsible to deliver fuel and water from ship to shore to support critical land operations using a rapidly deployable hose from the tanker to the beach.. The ABLTS system uses a lightweight, lay-flat hose deployed from lighterage vessels which floats on the surface, preventing passage of traffic in the area. The OPDS uses a non-collapsible, sinking hose which requires a large storage area and a dedicated transport ship, which may take days or weeks to reach the theater. The Navy seeks a sinking, yet-collapsible hose which can be stored on smaller reels that can be containerized and brought quickly to the battle.

Specifications Required: Hose must collapse, or "lay-flat" for deployment on 48" or smaller drums
Hose must sink in water when filled with buoyant fuel and remain stable on bottom even when subjected to lifting currents.
Hose must resist abrasion and damage when deployed and in contact with sea-floor
Working Pressure >500 psi at 6 inch inner diameter

Technology Developed: The Materials Sciences Corporation (MSC) has developed an all-new design and fabrication method for high-pressure lay-flat hoses which can incorporate heavy materials into a single wall. This technology uses a unique reinforcement architecture to achieve high burst pressure while maintaining flexibility. The design is enabled through a manufacturing method which can incorporate heavy particles while maintaining collapsibility.

Warfighter Value: Having a sinking hose will permit the ABLTS to share the seaway with mission-critical warfighter traffic. The higher working pressure will provide greater fuel and water supply for land operations. Because a dedicated transport and tanker will not be needed, supplies will be delivered to the fight sooner.

WHEN

Contract Number: N39430-18-C-2015 **Ending on:** December 12, 2019

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Target Design Completed	N/A	Collapsibility Demonstrated	4	September 2018
Prototype Hose Delivered to Navy	Low	Long Length Fabricated, Pressure Testing	5	July 2019
Hose performance demonstrated	Med	Deployment and Flow-Through Demonstrated	6	October 2019

HOW

Projected Business Model: MSC has developed this technology using our understanding of the mechanics and materials associated with building a high-pressure, collapsible hose while integrating heavy elements into the hose wall. Under the SBIR, MSC is building the capability of producing long lengths while ultimately planning to produce complete hose sections and end fittings to support the Navy's goal of fielding a Sinking ABLTS system.

Company Objectives: MSC's objective is to become the manufacturer and supplier of this unique product to the Navy to support future capabilities. The current target is delivering 2 miles of hose by the end of 2022.

Potential Commercial Applications: This product can also be used for providing fuel and water in disaster relief without inhibiting other rescue traffic. Both the sinking and non-sinking version of this hose have potential applications in rapidly deployable, high pressure pipelines on an offshore for the petrochemical industry.

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