

Topic: N151-037

METSS Corporation

Fat Line Tow Cable

When submarines deploy the TB-16/TB-34 towed array sonar system using the Lightweight Tow Cable (LWTC), it has a propensity to buckle rendering the towed array out of commission. METSS is developing a new outer jacket for the LWTC by designing a high density polyethylene (HDPE) resin system that will improve the LWTC axial compression strength, improve cut resistance to longline fishing lines, and improve the cut resistance of the submarine's torpedo guide wire. METSS is leveraging commercially available HDPE base resins and carbon black masterbatch materials to streamline technology transition process making them compatible with current manufacturing process.

Technology Category Alignment:

Materials & Manufacturing Processes

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SYSCOM: NAVSEA

Contract: N00024-16-C-4538

 Corporate Brochure: https://navystp.com/vtm/open_file?type=brochure&id=N00024-16-C-4538

Department of the Navy SBIR/STTR Transition Program

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WHO

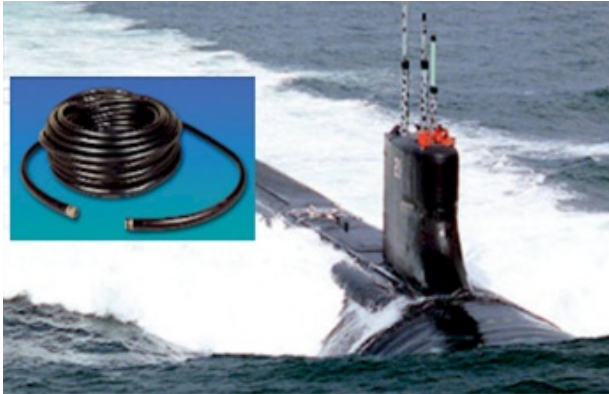
SYSCOM: NAVSEA

Sponsoring Program: PMS-401
Submarine Acoustic Systems
Program Office

Transition Target: Submarine fleet

TPOC:
(202)781-4058

Other transition opportunities:



NAVSEA Technology Transition Office

Notes:

METSS is developing three candidate high density polyethylene (HDPE) resins as a new protective cover for the current TB-16 Lightweight Tow Cable (LWTC). Under strict performance measures, the primary intent is that the Fat Line Towed Array does not buckle during deployment from the submarine and resists cuts caused by monofilament long fishing lines and hooks.

WHAT

Operational Need and Improvement:

Develop an outer jacket to improve the performance and eliminate potential deployment problems associated with submarine TB-16 (and TB-34) Fat Line Towed Arrays. A specific enhancement to the exiting TB-16 includes compressional ruggedness without modifying the array's coaxial core. A successful outcome will significantly maintain a submarine's operational mission profile.

Specifications Required:

- Towed array tow cable shall be capable of withstanding 220 pounds of axially applied energy
- Tow cable may have a 30% weight increase
- Outer jacket should have axial stiffness making the cable more cut-resistant
- Survive 150 reeling cycles on the OK-276 handler with the dynamic seal in place

Technology Developed:

- Leveraging commercially available high-density polyethylene (HDPE) base resins and carbon black masterbatch materials to streamline transition process using novel and consistent chemistry.
- Largest risk factor is achieving the flexural modulus (>180 ksi) and compatibility with established manufacturing processes

Warfighter Value:

- Eliminate Out of Commissions (OOCs) – eliminate "Fail-to-Sail" scenarios that interfere with submarine operations
- Improve the TB-16/34 outer jacket's axial compressive strength to eliminate cable buckling and subsequent deployment failure
- Improve the towed array's cut resistance, i.e., cuts/slices caused by fish hooks, high-test line monofilament fishing longlines, and torpedo guide wires

WHEN

Contract Number: N00024-16-C-4538 **Ending on:** September 7, 2018

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Validate HDPE resin systems in a laboratory environment	Low	Ensure resin systems are adaptable with South Bay Cables' extrusion processes	4	August 2017
Execute co-extrusion processes at South Bay Cable	Low	Meet established manufacturing requirements	4	September 2017
Conduct limited testing at L-3 Chesapeake	Low	Cable segments pass compression and push force evaluations	5	January 2018
Conduct reel-to-reel test at NUWC	Low	Meet static tension requirements	5	April 2018
Demonstrate performance at Lake Pend Oreille, Idaho	Low	Meet all Navy requirements	6	September 2018

HOW

Projected Business Model:

METSS will utilize the partnership established between South Bay Cable and L-3 Chesapeake Sciences Corporation (CSC) to streamline the technology transition. South Bay Cable currently applies the HDPE jacket material onto the LWTC's jacket.

Company Objectives:

METSS intends to become the materials supplier to South Bay Cable to co-extrude the new jacket material for the modified LWTC (achieve a direct materials replacement). The collaboration between METSS, L-3 CSC, and South Bay Cable under the proposed program offers the shortest path to technology transition, and significantly reduces the risks associated with transitioning the SBIR technology into the fleet.

Potential Commercial Applications:

Stronger and more robust cable jacket materials may improve commercial seismic receivers (geophones) used in the gas and oil business, as well as undersea and underground cables in a variety of geographic locations.

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