

Topic: N102-155

Physical Optics Corporation

Fishing Net Entanglement Avoidance System

The Fishing Net Entanglement Avoidance System (FiNEAS) is an underwater towed vehicle that is attached onto the front of a towed array. It is self-powered, locates obstacles such as fishing nets, and maneuvers the towed array around the obstacle to prevent entanglement and improve array survivability. The overall dimensions of the FiNEAS are $\approx 1.5\text{m} \times 0.9\text{m} \times 0.8\text{m}$; it weighs $\approx 150\text{lb}$ and can be easily assembled on the ship deck and attached onto the tow cable. It is easily retrievable from the water, free to pitch and roll, does not interfere with the towed array operation, and operates up to 2,500-ft depth. Open water testing of the reduced-function prototype showed that FiNEAS can move $>50\text{ft}$ to either side of the tow direction in $<30\text{s}$ while towing at 3-knots.

Technology Category Alignment:

None

None

None

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SYSCOM: NAVSEA

Contract: N00024-13-C-4055

 Corporate Brochure: https://navystp.com/vtm/open_file?type=brochure&id=N00024-13-C-4055

Department of the Navy SBIR/STTR Transition Program

Statement A: Approved for Release. Distribution is unlimited.

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WHO

SYSCOM: NAVSEA

Sponsoring Program: PMS 485

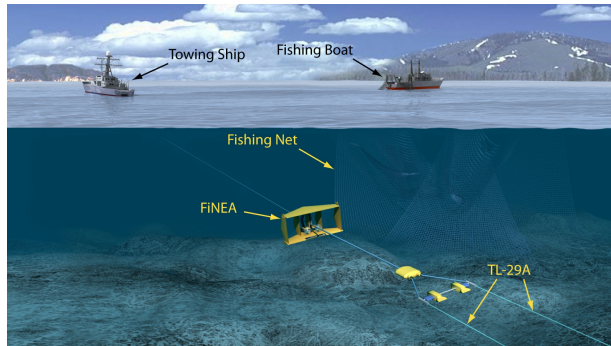
Transition Target: SURTASS

TPOC:

(858) 537-0164

Other transition opportunities:

Other Navy towed array platforms.



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WHAT

Operational Need and Improvement: The Navy needs an apparatus to avoid or mitigate towed array system damage from entanglement with obstacles such as fishing nets, seaweed, and other underwater obstacles that result in costly repairs and reduce mission readiness. These obstacles, especially fishing nets, plague antisubmarine warfare (ASW) by entangling Navy towed arrays such as the twin-lined array (TL-29A) used by the Surveillance Towed Array Sensor System (SURTASS), with little or no warning. Coupled with the constant tow of the vessel, the entanglement causes enormous stress on the towed array and cable, which can result in significant array repair or replacement costs, impacts to mission-critical operations, reduced Pacific Fleet ASW readiness, and temporarily halt operations with similar consequences.

Specifications Required: Stand-alone operation – FiNEAS's energy harvesting feature allows it to operate independently from the towing platform and can operate for unlimited duration. Compatible with SURTASS – FiNEAS uses phased array sonar to scan a large field of view without producing any mechanical noise. It operates at ~450 kHz to 900 kHz, which provides adequate resolution for detecting fishing nets at ~100 m and will not interfere with the SURTASS which operates at much lower frequencies.

Technology Developed: Fishing Net Entanglement Avoidance System (FiNEAS) can be attached onto any towed array cable at the fore of the towed array. It uses an innovative system design that combines the use of sonar imaging to locate the fishing nets (or other obstacles) and hydrodynamic force to physically maneuver the array to prevent its contact with the nets (or obstacles).

Warfighter Value: FiNEAS enables the SURTASS to detect quiet and harder-to-find foreign submarines at long range, thus providing U.S. forces with adequate time to react to, and defend against, potential submarine threats while remaining a safe distance beyond a submarine's effective weapons range.

WHEN

Contract Number: N00024-13-C-4055 **Ending on:** February 6, 2016

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Completion prototype fabrication	Low	A functional prototype in laboratory environment	4	March 2016
Openwater testing	Med	Prototype can function properly in openwater	5	May 2016
Demonstration of obstacle avoidance	Med	Can avoid underwater stationary obstacle	6	July 2016
System weight reduction	Med	Reduce system weight to <120 lb	6.5	July 2017

HOW

Projected Business Model: POC can adopt either in-house manufacturing of FiNEAS or license it to a company that specializes in unmanned underwater vehicle manufacturing.

Company Objectives: Identify other Navy programs that can benefit from FiNEAS or its related technology for protecting different types of naval underwater assets.

Potential Commercial Applications: The FiNEAS technology can be applied to any maritime market in which detailed information about underwater conditions is relevant. For example, underwater mining and oil exploratory studies often require the use of towed array sonar. Thus, this technology will protect the costly sonar systems that are used in exploratory research vessels, rescue and salvage vessels, and underwater construction efforts.

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