Department of the Navy SBIR/STTR Transition Program

Statement A: Approved for Release. Distribution is unlimited.
NAVSEA #2016-0607

Topic # N122-131
Automated Non-Destructive Foam Sense and Control Unit
Physical Optics Corporation

WHO

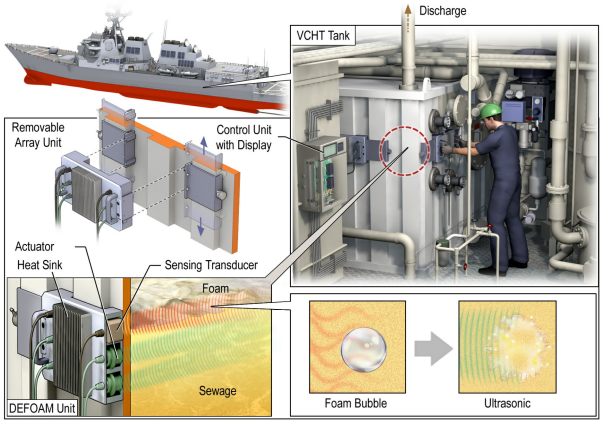
SYSCOM: NAVSEA

Sponsoring Program: PEO Ships, PMS 400D

Transition Target: DDG-51

TPOC:
(215)897-1074

Other transition opportunities:
PEO Team Ships



WHAT

Operational Need and Improvement: Foam overflows within the vacuum collection, holding, and transfer (VCHT) tanks onboard naval ships, causing sewage/foam spills onto the weather deck, resulting in serious safety, health and environmental impacts. To reduce shipboard crew labor and operational/maintenance costs required to clean up the foam build-up, PMS 400D intends to add a foam sensing/elimination capability to their DDG-51 Arleigh Burke-class Destroyer ships. This defoaming technology is applicable to other Navy military ships such as the LPD 17 Class, LCS-1 and LCS-3 VCHT systems, and in cruise liners and cargo ships.

Specifications Required: Current defoaming technology involves chemical agents that are not only hazardous but can be destructive. Additionally, pump based systems are available; however, they require in-line fitting, and modification to the tank. Thus, the Navy requires a compact, non-destructive, non-invasive system that is completely external and modular. Furthermore, the system must be low power, autonomous, and must pose no hazards to humas, animals and to the ship/submarine (acoustic signature) itself (especially during combat mode).

Technology Developed: POC is advancing the development of the Automated Non-Destructive Foam Sense and Control Unit (DEFOAM) system which leverages mature ultrasonic sensing methodology that allows non-invasive and non destructive sensing and elimination of foam in the VCHT tank. DEFOAM detects accumulation of foam by measuring changes in the acoustic impedance in the beam path that occur due to presence of foam. During mitigation, ultrasonic energy is coupled with an existing water spray system to rupture the foam layer.

Warfighter Value: The successful development of the DEFOAM technology will reduce shipboard crew labor and consequently operational/maintenance costs by decreasing the number of corrective maintenance procedures required to clean up the foam build-up. Its modular design employs commercial-off-the-shelf components; thereby allowing the cost of implementing DEFOAM onto DDG-51 ships or any other ship platform to be significantly more economical than approaches that require tank modification.

WHEN

Contract Number: N00024-16-C-4002 **Ending on:** November 9, 2017

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Optimize DEFOAM sensing/mitigation technology	Med	Ability to sense foam through 3/8	5	February 2017
Assemble Phae II prototype for evaluation	Low	Complete prototype assembled per Navy requirements	5	June 2017
Demonstrate DEFOAM technology in a relevant environment	Med	Prototype passed evaluation in lab based, simulated VCHT environment (at POC, or at Navy approved site)	6	November 2016

HOW

Projected Business Model: POC can adopt either in-house manufacturing of DEFOAM or license it to a company that specializes in foam control for industrial applications.

Company Objectives: Identify other Navy programs that can benefit from DEFOAM methodology or its related technology for foam sensing/elimination inside tanks

Potential Commercial Applications: DEFOAM has numerous potential commercial applications in many large travel vehicles that carry passengers. Cruise liners, cargo ships, and aircraft can all benefit from the DEFOAM system. In addition, recreational vehicles could use the DEFOAM system. Another application of DEFOAM is eliminating foam in food, specifically, sodas like cola and root beer. Manufacturing companies, sewage treatment plants, chemical industries, pesticide manufacturers, and others can use DEFOAM technology. Modification of the DEFOAM device will result in ultrasonic drying or washing, which the food and textile industries will find beneficial.

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