Department of the Navy SBIR/STTR Transition Program

DISTRIBUTION STATEMENT A. Approved for public release. Distribution is unlimited.

NAVAIR 2018-750

Topic # N132-093

Compact, Logistics Free Electrochemical Reduced Oxygen Breathing Device

Lynntech, Inc.

WHO

SYSCOM: NAVAIR

Sponsoring Program: Aviation Training Systems Program Office (PMA205)

Transition Target: Navy Medicine Operational Training Center (NMOTC) Naval Survival Training Institute (NSTI)

TPOC:
(407)380-4773

Other transition opportunities: Hypoxia training for the Army, Air Force, Marine Corps, or the civilian aviation sector; device for aviation physiology research.

WHAT

Operational Need and Improvement: Hypoxia training is essential for early recognition of hypoxic conditions, which is paramount to implementing corrective action to minimize the impact on the aircrew's cognitive function. Advanced mobile training devices that have smaller footprints, reduced logistical burdens, and prevent air starvation of the trainees via pressure-on-demand delivery, are needed to improve the quality of training.

Specifications Required: Portable, low maintenance, normobaric hypoxia training device to deliver pressure-on-demand oxygen depleted air via an oxygen mask (MBU-23/P series) to aircrew that undergo hypoxia training that can be powered using a regular 110 VAC, 15 amp wall outlet.

Technology Developed: Lynntech's On-Demand Hypoxia Trainer uses an electrochemical oxygen separation (EOS) device that is based on liquid water fed electrochemcial cells that utilize a highly efficient oxygen evolution reaction electrocatalyst in a membrane electrode assembly. The EOS separates the oxygen from the nitrogen present in the ambient air.

Warfighter Value: Lynntech's pressure-on-demand delivery eliminates the oxygen starvation risk of the current equipment and enhances the overall safety of training due to the pure oxygen delivery feature that can aid recovery in the event of a hypoxic episode. The hypoxia training device will also increase overall training flexibility with the ability to conduct training at various facilities across the country. Lynntech's On-Demand Hypoxia Trainer significantly increases the quality, efficiency and safety of aircrew hypoxia training.

WHEN

Contract Number: N68335-17-C-0293 **Ending on:** February 28, 2019

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Delivery of production prototypes	Low	On time delivery of prototype meeting Navy hypoxia training requirements	6	August 2018
Human machine interface (HMI) and usability testing at Naval Aviation Survival Training Centers	Med	Navy acceptance of HMI/usability of device and finalization of CONOPS	7	March 2019
3rd Party verification and validation testing	Med	Specifications/requirements met, unit offers improved training over current hypoxia traininer.	8	July 2019
Lifetime and life cycle cost finalization	Low	Determination of operational and life cycle cost over 10 year period	8	August 2019
Delivery of first procurement units	Low	On time delivery of On-Demand Hypoxia Trainer units	9	August 2019

HOW

Projected Business Model: Lynntech Inc. will manufacture the On-Demand Hypoxia Trainer units in-house and supply them to the Navy and other customers. NSTI currently uses about 40 devices for hypoxia training for the Navy while the Fleet uses about another 40 units. Lynntech currently plans to manufacture and supply these devices to the Navy without needing to interface with a prime contractor.

Company Objectives: Lynntech's objective for the On-Demand Hypoxia Trainer technology is to increase the quality, safety, and efficiency of hypoxia training of Naval aircrews. Lynntech Inc., a 2016 Tibbetts award winner, is a for-profit small business and believes that if the above objective is properly met, sales and profit will follow.

Potential Commercial Applications: In addition to being a hypoxia training device for commercial aviation, this technology had other related applications such as training for athletes, mountain climbers, and elevated personal exercise. This technology could also be transitioned into portable, compact oxygen concentrators for medical purposes.

Contact: Brian Hennings, V.P. Business Development
brian.hennings@lynntech.com 979.764.2234