

**WHO**

**SYSCOM:** MCSC

**Sponsoring Program:** Logistics Combat Element Systems (LCES), Supply & Maintenance Systems (SMS)

**Transition Target:** Forward Resuscitative Surgical System

**TPOC:** [sbir.admin@usmc.mil](mailto:sbir.admin@usmc.mil)

**Other Transition Opportunities:** U.S. Army Medical Units

The expeditionary portable oxygen generation system can be used in medical facilities of various sizes, emergency management agencies, disaster aid and humanitarian aid agencies, and municipal fire and rescue squads.

**Notes:** LPM: Liters Per Minute  
 PSIG: Pounds Per Square Inch Gauge  
 FRSS: Forward Resuscitative Surgical System  
 EPOGS: Expeditionary Portable Oxygen Generating System  
 SWaP: Size, Weight and Power



Photo provided courtesy USMC, VIRIN: 160801-MQM580-126

**WHAT**

**Operational Need and Improvement:** The objective is to develop a portable oxygen generation system that consumes less electrical power, has a compact cube/size, and reduced weight. This objective is in support of the expeditionary medical requirements of the Marine Corps. This will allow simplification of equipment deployment and use, while improving system reliability.

- Specifications Required:**
- Smaller, lighter, man-portable (2-4 personnel)
  - More energy efficient (requiring less electrical and mechanical power)
  - Can produce medical-grade oxygen (United States Pharmacopeia (USP) 93% oxygen)
  - Flow rate of 10-15 Liters Per Minute, produce 2200 PSIG
  - Total weight does not exceed 350 pounds, volume does not exceed 20 cubic feet
  - Maximum power should not exceed 1200 Watts
  - Ability to be transported in all tactical/medical vehicles including helicopters
  - Operate in all climates with no degradation at temperatures between -40°F and 125°F
  - Resistant to the effects of salt/water spray, and extreme sand and dust conditions

**Technology Developed:** The size and power reduction of the EPOGS are made possible through the incorporation of a more selective oxygen/nitrogen separation sorbent and by the implementation of innovative adsorption/regeneration cycling schemes.

- Warfighter Value:** SWaP improved thereby reducing logistical burden
- Reduced power requirements by 33% (from 1800 Watts to 1200 Watts)
  - Decreased size by 40% (from 34.5 cubic feet to 20 cubic feet)
  - Decreased weight by 61% (Goal from 644 lbs. to 250 lbs.)
- No longer requires 208-240VAC power source to produce O2 in the field

**WHEN**

**Contract Number:** M67854-21-C-6507

**Ending on:** Oct 20, 2022

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Evaluation of new O2 compressors	Low	Meet power and flow requirements	5	1st QTR FY22
Integration of new O2 compressors	Low	Integration complete, meet MIL-STD-810H testing	6	1st QTR FY22
Evaluation of integrated EPOGS	Low	Meet flow/purity/power requirements and successful testing against MIL-STD-810H	6	4th QTR FY22
Develop manufacturing plan	Low	Plan development	6	1st QTR FY23
Production-type prototypes fabricated & delivered	Low	Meet flow/purity/power requirements and successful testing against MIL-STD-810H	7	1st QTR FY23
Attain FDA approval	Low	FDA approval attained	8	1st QTR FY24
Begin manufacturing & sales	Low	All fabrication hurdles solved	8	2nd QTR FY24

**HOW**

**Projected Business Model:** TDA will contract a third party medical device manufacturer to produce the EPOGS which will be sold directly to the USMC.

**Company Objectives:** TDA Research, Inc. is a technology developer that uses various pathways to commercialization. Depending on the technology and manufacturing process, we will manufacture products in-house and sell directly to customers or we will license the technology to a third party.

**Potential Commercial Applications:** The potential for commercial application and dual use is high. The proposed system would be easily portable and well suited in areas where limited power is available. The expeditionary portable oxygen generation system can be used in medical facilities of various sizes, emergency management agencies, disaster aid and humanitarian aid agencies, and municipal fire and rescue squads.