Department of the Navy SBIR/STTR Transition Program

Topic # N10A-T001
Fuel Cell UAV Powerplant System Development
Northwest UAV

WHO

SYSCOM: NAVAIR
Sponsoring Program: PMA263
Transition Target: MEUAS
TPOC:
(301)342-0801
Other transition opportunities:
Portable power, range extenders
Notes: NWFC-1500 Hydrogen Fuel Cell

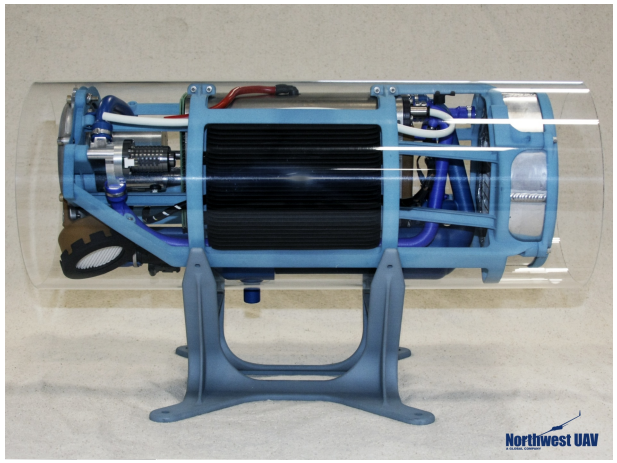

Image courtesy of Northwest UAV

WHAT

Operational Need and Improvement: Longer missions, more powerful payloads, less maintenance, and higher reliability.

Specifications Required: 300+watts/kilogram power density minimum. NWFC-1500 Specifications: Rated Power (Net): 1500 W; Rated Performance: 24V @ 50A; Number of Cells: 48; Hydrogen Consumption at Rated Power: 1.7 g/min (10.2 lpm) / 2.7 gpm; Hydrogen Consumption at Cruise Power (500 W): 0.5 g/min (2.9 lpm) / 0.8 gpm; Hydrogen Supply Pressure: 10-20 psi / 69-138 kPa; Weight (excludes fuel tank. Includes balance of plant and radiator, and in-flight cell voltage monitoring): 10 lbs / 4550 grams; System Dimensions (Diameter x Length): 6.8 x 16 in / 17.3 x 40.6 cm; Sound Rating (Max): 66 db; Power-to-Weight Ratio: 330 W/kg; System Efficiency at Cruise (500 W): 53%; Ambient Operating Temperature: 23°F to 113°F / -5° to 45°C; Time Between Overhaul: 500 hours; Service Life: 1500 hours.

Technology Developed: Integrated system packaging, Why use a Fuel Cell? Low maintenance, low operating cost, low audible signature, instant on – remote operation, clean power with a low thermal signature, more energy efficient compared to other energy sources.

Warfighter Value: Smaller system footprint for operations. Longer missions with more capable payloads. The Northwest UAV Hydrogen Fuel Cell is reliable and lightweight, small envelope (compact), quick start capability <1s, scalable to your power requirements, system layout is customizable to fit your physical space, long term storage capable in fueled condition (1+years).

WHEN

Contract Number: N68335-20-C-0821 **Ending on:** October 25, 2022

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Initial Configuration Characterization	Low	Meets specifications	5++	August 2021
Flight Configuration #1 Endurance Test	Low	Remains fully functional	6	October 2021
Flight Configuration #2 Flight Worthiness	Low	Meets Criteria for flight	7	November 2021

HOW

Projected Business Model: These units can be purchased as Direct Sales and furnished to OEM's as GFE. NWUAV can provide Service and Maintenance on-site and remotely. A Power-by-the-hour program is also possible where the customer pays for each hour of use plus a monthly fee per unit. The Northwest UAV Fuel Cell is ready for procurement and integration with end-use systems now.

Company Objectives: Northwest UAV will consistently provide products and services that meet the requirements and expectations of our customers—propelling our customers to new heights with on-time, high-quality, affordable goods and services.

Potential Commercial Applications: Propulsion systems for Commercial Drones, both VTOL and Fixed-wing. Range extenders for ground and surface vehicles. Air-Launched effects power systems. Loitering munitions. Backpack power systems.

Contact: Jeff Ratcliffe, CTO/Business Development
Jeff.Ratcliffe@nwuav.com 503-434-6845 x192