The need for a small tactical UAS heavy fuel engine still exists due to logistics and operational concerns in both maritime and land operations with gasoline. A production small heavy fuel engine will reduce the need for gasoline procurement and storage, allowing the troops to use fuels that are currently available in the logistics system. Heavy-fuels are defined as Diesel, JP-5, and JP-8.

The technology readiness level (TRL) of current state-of-the-art varies considerably from TRL 2 to 5. The Ultra Endurance Unmanned Aerial Vehicle (UE-UAV) Future Naval Capability (FNC) Product recently developed a true small 12 hp diesel engine. It can operate on a broad range of heavy fuels and has a relatively high power-to-weight ratio of 0.75 hp/lb. The time between overhauls is 250 hours, and the engine's life is 500 hours. The applicable Brake Specific Fuel Consumption (BSFC), a measure of its fuel economy, is 0.44 lb/hp-hr. If only achieved individually; power-to-weight ratio, durability, fuel efficiency, or the ability to run on different fuels; would be considered impressive accomplishments, especially considering the use of direct fuel injection within a cylinder bore measuring only ~2 inches. However, the true technical achievement and challenge is to realize all four in the same engine, which is the goal of UE-UAV. Technical areas being addressed include combustion, cycle analysis, and heat management; fuel delivery, atomization, and fuel-air mixing; intake and exhaust systems; power generation systems; mechanical systems; and lastly, controls and engine health management systems.

Efficient combustion with compression ignition in smaller chambers
Precise miniaturized fuel injection system components
Design and construction of strong and lightweight smaller engine components (e.g., crankshaft, crankcase)