

WHO

SYSKOM: ONR

Sponsoring Program: ONR SBIR Program

Transition Target: The Quiet Auxiliary Propulsion (QAP - electric marine thruster) system is being designed to be compatible with small combatant craft, such as the SOC-R, which has been the focus of the design and development efforts to this point. However, the system is being designed to be scalable as well as vessel agnostic. The mounting and stowage hardware can be readily modified to accommodate other vessel's specific requirements

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Other Transition Opportunities: As indicated in the solicitation, the 11m Rigid Hull Inflatable Boat (RHIB) is also a potential candidate, as are other smaller boats such as the Combat Rubber Raiding Craft (CRRC) and other variants of the Zodiac inflatable boats. Moreover, the technology is very suitable for Unmanned Underwater Vehicles (UUV) and Unmanned Surface Vehicles (USV), as well as other underwater systems such as the Diver Propulsion Vehicle (DPV) or Diver Propulsion Device (DPD), also known as the Swimmer Delivery Vehicle (SDV).

Notes: The electrically driven Quiet Auxiliary Propulsor system shown in the graphic above utilizes Candent's very low acoustic signature propulsor technology, and has been designed to drive the SOCR at hull speed (5.5 kts), and will provide reverse thrust to propel the boat at speeds up to 2 kts. Its low drag, modest size is made possible by the high power density electric motor and small, quiet gearless transmission propeller drive system.



Image courtesy of Candent Technologies, Inc.

WHAT

Operational Need and Improvement: Small Combatant craft such as the SOCR and 11m RHIB are propelled by waterjet propulsors, which are in turn driven by diesel engines via transmissions. The propulsors typically generate cavitation on the rotating blade tips and surfaces, which is a significant source of underwater acoustic noise. Moreover, the diesel powerplants (e.g. 470 hp Yanmar engines) are quite loud, with acoustic signatures reaching significant and highly detectable noise levels; hence, the need for a Quiet Auxiliary Propulsion system. The Candent system under development has very little cavitation or system noise, thus providing the silent operation mode that allows for continued operation at hull speed while the main (diesel) engines are shutdown, preventing detection due to engine and propulsor noise.

- Specifications Required:**
- The APU system shall provide a minimum thrust at varying speeds ranging from 113 lb at 3.5 kts, to 890 lb at 5.5 kts, and reverse speed of at least 2 kts
 - The propeller/impeller shall minimize underwater acoustic noise and eliminate cavitation
 - The thruster must be transom mounted with a quiet, automated deployment/retraction mechanism and must minimize installation envelope and weight, and must be capable of withstanding dynamic loads
 - The thruster steering system shall be provided by the contractor
 - The system must be designed for use in harsh marine environments: all seals and bearings must be capable of operating in bodies of water with high levels of turbidity, silt, and sand, without deleterious effects

Technology Developed: Candent has completed most of the final design, and material procurement has begun, with first deliveries expected early in Summer 2024 and continuing through the Fall, when the test phase of the program will begin.

Warfighter Value: Candent's Quiet Auxiliary Propulsion system technology provides the SOCR, and similar small combatant craft, with the capability to operate in silent mode (no diesels, no waterjets) when necessary, enabling the Special Operators to avoid detection due to propulsion system noise, thus providing more stealth capability to the CONOPS.

WHEN

Contract Number: N68335-24-C-0038

Ending on: Nov 10, 2025

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Phase I Concept and Preliminary Design Complete	Medium	CFD analyses results and mechanical design compliant with requirements	3	2nd QTR FY24
Phase II Final Design Complete	Low	Hydrodynamic, mechanical, and electrical designs meet rqmnts	3	4th QTR FY24
Phase II Hardware Procurement Complete	Medium	All required hardware on hand for prototype assembly process	4	4th QTR FY24
Prototype assembly completed	Low	Prototype systems successfully assembled, meet requirements	4	4th QTR FY24
Prototype water tank testing completed	Medium	Prototype system performance meets requirements	5	1st QTR FY25
Navy acoustic testing completed	Medium	Prototype system performance meets requirements	5	1st QTR FY25
Navy initial prototype operational testing complete	Medium	Prototype system performance meets requirements	6	4th QTR FY25

HOW

Projected Business Model: To minimize the required initial investment, as well as operating overhead costs, Candent plans to outsource manufacturing, through prototype, LRIP, and full production, to existing qualified, US based Aerospace & Defense suppliers. This approach will allow Candent to focus its activities on performing assembly and test of the final product. Alternative approaches are being considered to partner, license, or sell the technology to one of several major OEMs with whom we have been exploring use of our technology in their vehicle designs.

Company Objectives: The objective of the commercialization plan is to, in the end, obtain financing, secure a market position, and produce the hardware for dual use aerospace and defense applications

Potential Commercial Applications: The design of the electric thruster system is highly compatible with many commercial market applications, such as sport fishing, where the current trolling motors are not as rugged as the militarized QAP, or recreational and commercial vessels, which could benefit from the sea keeping capabilities of the system, as well as operations in restricted speed areas (such as found in harbor navigation), and also during docking, where the QAP system would greatly improve maneuverability of the vessels. The shrouded propulsor is also safer for marine life, particularly certain endangered species such as manatees and loggerhead turtles

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