

NAVY Transition Assistance Program

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NEED & CUSTOMER REQUIREMENT

Need: For high speed surface platforms, such as the Littoral Combat Ship (LCS), composite materials offer performance enhancements as well as cost and weight reductions. A need exists to translate these benefits to propulsors with performance optimization while maintaining comparable impact performance and cavitation erosion resistance to current metallic propulsors

Value to the Warfighter: US Navy propulsion systems comprising FRP materials would enable improvements in operational performance (i.e., high specific properties, high corrosion resistance, design tailor-ability, pitch adapting) of future US Navy vessels including system efficiency and reduced system weight and wear.

Operational Gap: Due to stiffness and strain-rate limitations, current state-of-the-art (SOTA) FRP materials do not possess the durability characteristics to provide impact performance and cavitation erosion resistance consistent with heritage blade materials (e.g., nickel-aluminum-bronze, stainless steel, etc.).

Customer Specifications: Highly toughened polymers that: 1) possess durability characteristics vastly superior to SOTA, 2) mechanical properties consistent with operational requirements, 3) processing characteristics consistent with manufacturing requirements and 4) material costs consistent with system acquisition requirements.

Technology Description: Fiber reinforced polymer (FRP) propeller blades for future US Navy propulsion systems that possess impact performance and cavitation erosion resistance consistent with current blades comprising heritage materials.

TECHNOLOGY DEVELOPMENT MILESTONES (SBIR/STTR)

Milestone	TRL	Risk	Measure of Success	TRL Date
Phase I - Material Formulation & Cavitation Erosion Resistance Feasibility	3	Moderate	>10x performance improvement over SOTA	12/2007
Phase I Option - Verification of Material Performance	3	Low	Fabrication demonstration of 3-ft span propulsor blades, verification of early results	9/2008
Phase II (1st Year) - Material Iteration for Improved Cavitation Erosion Resistance	4	High	>10x improvement in performance over Ph. I	9/2009
Phase II (2nd Year) - Performance Validation in Relevant Form & Environment	5	High	Construct prototype blades for water tunnel test at NSWCCD	10/2010

Open contract: N00014-08-C-0763 ending 12/31/2009

N07-088 - Composite Technology Development, Inc.

Propulsor Blade Advanced Composite Materials

SPONSORSHIP of original SBIR/STTR Topic

SYSCOM: ONR - SBIR

Transition Target: Broadly, current and/or future US Navy marine vessels. Specifically, TBD

Original Sponsoring Program: PMS 450, PMS 377

TPOC Phone Number: 703-696-4305



TECHNOLOGY TRANSITION OPPORTUNITIES (PHASE III)

Other Potential Applications:

- 1) Lift-fan and/or propulsion blades for air cushion vehicles
- 2) Durable FRP hull structures and topside structures
- 3) Lightweight, FRP structural armor
- 4) Open-cell foam pad systems for Advanced Combat Helmets for reduced mild traumatic brain injury
- 5) Tidal turbine blades for renewable energy systems for DOD installations

Business Model:

Technology license to strategic industry partners

Objective:

Acquisition Community Rep.: Identification of target platform
 Potential Prime: Guidance in large-scale manufacturing requirements
 1st/2nd Tier Supplier: Potential licensee