

# Department of the Navy SBIR/STTR Transition Program

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NAVSEA #2020-0411

Topic # N171-072

Light Weight Composite Components for Naval Systems

Pacific Engineering, Inc

## WHO

**SYSCOM:** NAVSEA

**Sponsoring Program:** PEO IWS 5.0 - Undersea Systems

**Transition Target:** FFG(X) guided missile frigate, Large Unmanned Surface Vessel (LUSV)

**TPOC:**  
(202)781-2002

**Other transition opportunities:** PEI shaft technology can be applied to many DoD and Department of Homeland Security (DHS) programs, such as: Department of the Army watercraft, DoN surface combatants (to include unmanned and small surface combatants), and DHS United States Coast Guard surface ships.

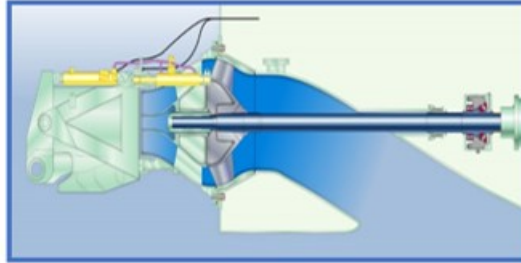
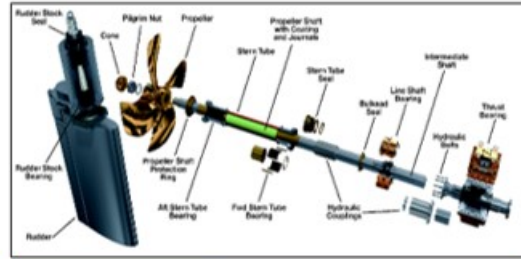


Image Courtesy of Wartsila Defense, Inc.

## WHAT

**Operational Need and Improvement:** The primary objective of this SBIR effort is to develop light weight composite main propulsion drive shafts and gear box housings for the guided missile frigate (FFG(x)), guided missile destroyer (DDG), and guided missile cruiser (CG) systems. Develop a composite shaft for the Large Unmanned Surface Vessel (LUSV).

**Specifications Required:** Reduce weight and maintenance life cycle costs.

**Technology Developed:** Filament-wound composite main propulsion system drive shafts and the metal-to-composite joint design needed to attach the required flanges.

**Warfighter Value:** Reduces weight by 50%, reduces the outside diameter of the shafts, and removes the need for preservation or removal due to the non-corrosive material.

## WHEN

**Contract Number:** N68335-19-C-0174 **Ending on:** November 30, 2020

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Selection of fabric and resin with incorporated nano materials	Med	Current seals weigh in excess of 500 lbs.; PEI composite units to be 40% lighter	6	November 2020
Alignment ring and seal housing composite configuration	Med	Main seal air leakage rate specification (5 PSIG/15 Min)	6	November 2020
Alignment ring and seal housing composite configuration	Med	Main seal water leakage past seal rate (1 Qt/Hour)	6	November 2020
Selection of fabric and resin with incorporated nano materials	Med	Reduce weight of existing shaft by 50%	6	November 2020

## HOW

**Projected Business Model:** PEI has the in-house capability to build light weight composite drive shafts and gear boxes and has the ability to transition products to the fleet. Wartsila and Gibbs and Cox will assist in designing of the propulsion systems interface.

**Company Objectives:** Develop shafting technology that reduces corrosion, weight, and the life cycle costs of ship main propulsion components.

**Potential Commercial Applications:** Boats, yachts, jet skis.

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