



TOPIC NUMBER: N112-142

SBIR INVESTMENT: \$1,649,934

PHASE III FUNDING: \$31,356,185

DEPARTMENT OF THE NAVY

NAVY SBIR/STTR SUCCESS STORY



ADVANCED STRUCTURAL DEVELOPMENT FOR NAVAL HOVERCRAFT RAMPS

Seemann Composites routinely delivers next-generation composite materials solutions to the fleet that reduce weight and increase payload capacity.

**Seemann Composites
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THE CHALLENGE

The Navy is interested in upgrading welded aluminum ramps on its Landing Craft Air Cushion (LCAC) hovercraft, which are prone to damage due to harsh marine environments and extreme load requirements. Improving durability, corrosion resistance and life cycle cost of the air cushioned vehicle (ACV) ramps at minimum weight is paramount to achieving operational goals of platforms such as the Ship-to-Shore Connector (SSC).

THE TECHNOLOGY

Materials Sciences Corporation (MSC), parent company Seemann Composites, utilized its extensive expertise in composite materials and design technology to offer a lightweight, advanced material solution and structural designs for typical ACV ramp configurations. Using fiber reinforced composite materials achieved the solution of reducing weight, while improving the durability and corrosion resistance of ACV ramps.

THE TRANSITION

Phase II saw the successful installation on a stern ramp, and that same design technology was leveraged for use on a bow ramp, which was recently installed on LCAC-43 at Assault Craft Unit 5 (ACU 5) in Camp Pendleton, California. Subsequently, Seemann Composites secured several other contracts stemming from its SBIR-funded technology. This includes a potential \$74.3M cost-plus-fixed-fee, cost-type, indefinite delivery/indefinite quantity contract (of which \$31M has been obligated) to help the U.S. Navy develop out-of-autoclave manufacturing practices and processes to build marine equipment components. Efforts under this contract, awarded by The Naval Surface Warfare Center, Carderock Division, will build on composite fabrication methods developed under the SBIR program.

THE NAVAL BENEFIT

Every pound saved in structural weight of the LCAC equals more payload the fleet can carry from ship to shore. The composite materials chosen not only achieved the goal of reducing structural weight while handling large loads up to 74.5 tons, but it increased the ruggedness and durability of the ramps with an expected improvement in Operational Availability. This, in turn, reduced life-cycle and maintenance costs while allowing for an increase in the payload lift capacity of the vessel. The results from this effort prove the applicability and future-use of composite materials across a wide range of platforms.

THE FUTURE

The Navy continues to work with Seemann Composites on ramping up manufacturing and applying this new technology to the SSC platform. In addition, a wide range of commercial applications exist since the benefit of improved, lightweight ramps can help a variety of vehicles such as commercial ferries and cargo ships that load and unload vehicles and heavy equipment on a regular basis. Trucks, especially those which use ramps for loading such as moving or delivery trucks, would also benefit from the durability and weight savings this dual-use technology can easily provide.

"MATERIALS SCIENCES CORPORATION, THROUGH THE SBIR PROGRAM, USED THEIR KNOWLEDGE IN COMPOSITE MATERIALS AND ESPECIALLY IN DESIGN EXPERTISE, TO SUCCESSFULLY DEMONSTRATE THE DURABILITY OF THE COMPOSITE MATERIALS SELECTED. THEY MET ALL THE PERFORMANCE REQUIREMENTS FOR THE END PRODUCT, WHICH IS NOW BEING USED BY THE FLEET."

Joseph Bray
ACV Systems TWH
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