

Casting Solution to Reduce Cost and Weight for Freedom-variant LCS Hull

Status: Pending Implementation

PROBLEM / OBJECTIVE

Oldenburg Group, Inc. (OGI), has designed and fabricated high-strength steel brackets for the launch, recovery and handling system (LRHS) crane on the Freedom-variant of the Littoral Combat Ship (LCS). The current fabricated bracket design requires precision fabrication, welding and machining and very stringent dimensional tolerances. With some changes to part geometry, these brackets can be cast at a significantly lower cost and lower weight than the current welded fabrication. This Navy Metalworking Center (NMC) Rapid Response project developed two alternative cast solutions that ensure high-quality, high-strength steel castings that reduce cost and weight.

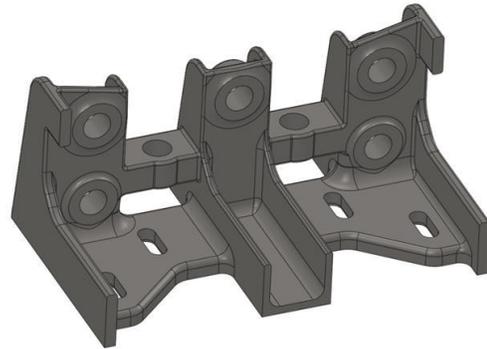
ACCOMPLISHMENTS / PAYOFF

Process Improvement:

Members of the project team created seven potential casting designs that would survive expected static and dynamic load conditions. Once the designs were established, the casting process was modeled to optimize the designs and processing conditions. The Integrated Project Team down selected two of the designs for further evaluation. These designs were provided to OGI for implementation.

Implementation and Technology Transfer:

OGI prepared a detailed statement of work, which meets all American Bureau of Shipping, Military Specification, and Naval Sea Systems Command Technical Publication requirements, to produce the castings. NMC provided OGI with detailed drawings, which had to be modified to accommodate the newly defined loading conditions and meet appropriate material standards. OGI worked with an ABS-approved foundry constructed tooling for the casting in the fall of 2015, and a proof casting is undergoing final certification with full-scale production expected to begin in 2016 as soon as shock qualification is finalized.



A less expensive, two-piece cast bracket will reduce weight and cost for the Freedom-variant LCS.
NMC image

Expected Benefits and Warfighter Impact:

Based on current OGI production experience with the legacy fabricated design and the estimated cost to implement the cast designs for a full ship set of 26 brackets, an estimated 77 percent reduction in cost is anticipated. In addition, the proof casting indicates an approximate total system weight savings of 120 kg. The cast design also uses fewer fasteners than the fabricated version.

TIME LINE / MILESTONE

Start Date:	September 2012
End Date:	June 2013

FUNDING

Navy ManTech Investment:	\$133K
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PARTICIPANTS

PMS 501
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Lockheed Martin Littoral Ships & Sensors
Navy Metalworking Center
ONR Navy ManTech

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