Fiber Reinforced Polymer (FRP) Composite Bulkhead Slot Filler Panel

Response Summary:

The Little Rock District of the US Army Corps of Engineers (CESWL) submitted a Dredging Operations Technical Support (DOTS) request for technical assistance in studying the feasibility of a bulkhead slot protection plate, also known as a filler panel, made from glass fiber reinforced polymer composites. ERDC researchers traveled for a site visit, assembled historical information, and conducted market research to determine the rough order of magnitude weight and cost for a feasible protection plate concept made from pultruded composite materials. The concept weighs approximately 4,300-lbs. and carries material costs of about $50,000.

Panels are included in the analysis found in the ERDC Special Report (ERDC SR-24-3, http://dx.doi.org/10.21079/11681/48755), “Composite Material Applications and Research Roadmap for US Army Corps of Engineers Civil Works,” though at low priority with a Normalized Combined Component Score in Table B-4 of only 0.67 out of 10. The subjective assessment on page 83 of the Research Roadmap does recommend consideration of composite materials for this application.

Period of Performance:

30 November 2023 to 06 September 2024

Benefits of the Response to the USACE Dredging/Navigation Program:

The Navigation program benefits from extended engagement and communication of composite material prototypes and conceptual designs in support of Engineering and Construction Bulletin 2024-08 (https://www.wbdg.org/FFC/ARMYCOE/COEECB/ecb_2024_8.pdf), “Design of Fiber Reinforced Polymer Hydraulic Composite Structures.” Composite structures bring the potential to avoid hundreds of millions of dollars of lifecycle maintenance costs across the enterprise when compared with in-kind steel replacements of failing components. Additional details are available in the Composite Material Research Roadmap.

Deliverable:

The ERDC compiled a Letter Report in order to disseminate existing specific information and expand applicability of the solution across the enterprise.

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