



Lock and Dam 25 Tow Simulation Study

ERDC Dredging Operations Technical Support Program (DOTS)

U.S. ARMY CORPS OF ENGINEERS

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Response Summary:

The ERDC Coastal and Hydraulics Laboratory (CHL) is assisting the U.S. Army Corps of Engineers, St. Louis District (MVS) in evaluating navigation approach conditions for a proposed 1,200-foot lock chamber and the viability of the existing 600-ft lock chamber at Lock and Dam 25. Lock and Dam 25 is located in Calhoun County, Illinois, and Lincoln County, Missouri in the Upper Mississippi River. This evaluation will be accomplished through a tow simulation study using the ERDC Ship/Tow Simulator (STS) in Vicksburg, MS. Local tow pilots will participate in testing the upstream and downstream approaches to the new and existing lock under varying environmental conditions. Design level simulations will be conducted with the objective of ensuring design adequacy and safety.



Figure 1. Proposed Lock Design

The DOTS program allowed for ERDC personnel to conduct a reconnaissance trip to the project site to meet with towing industry representatives along with MVS and observe navigation conditions. ERDC conducted interviews with tow captains and collected site information and photographs needed to develop the virtual environment within the STS. ERDC personnel rode a fifteen (5x3) barge tow with MVS and industry to observe the current and projected needs for the infrastructure. Further discussions with MVS and industry were held to determine the design vessel, environmental conditions, and construction scenarios to test within the simulator.

Period of Performance:

The reconnaissance trip was conducted from July 18th to 22nd 2022.

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

The tow simulation study will provide the results, recommendations and data necessary to inform the decision making of the MVS regarding the construction of the proposed lock for a safe and efficient upstream and downstream approach.

Deliverable:

The simulator databases and test scenarios for Lock and Dam 25 study will be developed using the information gathered during the reconnaissance trip. Additionally, a published technical report will be generated to provide the results of the study including expert elicitation from the participating tow pilots, description of the simulations conducted, data analysis, and recommendations for any navigation improvements.



Figure 2. Upstream approach to existing 600-ft long chamber



Providing environmental and engineering technical support to the U.S. Army Corps of Engineers
Operations and Maintenance navigation and dredging missions

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