

Revolutionary crane technology may be in Navy's future

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The Office of Naval Research (ONR) successfully completed multiphase testing of the Large Vessel Interface Lift On/Lift Off (LVI Lo/Lo) Crane technology demonstrator recently, marking a major milestone in at-sea, ship-to-ship cargo transfer capabilities.

In this final phase of at-sea testing in the Gulf of Mexico, 128 containers were safely transferred in May from one ship to another with waves of up to 1 meter in height. Operators picked up and placed down an unobstructed container, lifted a container obstructed on several sides, and lowered containers into obstructed "holes."

"I've been managing this project for about 4 1/2 years, from the idea phase to the implementation and test phase," said Dr. Paul Hess, program manager in ONR's Sea Warfare and Weapons Department. "It's been very rewarding to see the capabilities of this technology come to life and to track its future potential impact on Navy operations."

Hess said the crane performed as planned yet proved more capable than the ship's mooring configurations would allow.

If employed in the future fleet, the LVI Lo/Lo crane will facilitate the flow of "containerized" logistics through the sea base to the shore, eliminating the need for a secure deep water port. It will also enable the rapid and safe transfer of containers, Humvees and other heavy loads at sea.

"The safety factor is also a huge advantage that the commercial industry is taking an interest in," Hess said. "Offshore oil companies are particularly looking at this technology from a safety perspective. For military shipboard applications, a regular conventional crane requires up to a 10-person crew for offloading material to other ships. But with this crane design, only three crewmembers are needed--one in the crane house and one on each ship. This greatly reduces the potential for injury or mishap."

Numerical and scaled physical modeling set the stage for a crane quite different apart from other available lift technologies due to its ability to actively compensate for ship motions. This early work led to the construction of a large-scale crane to more fully evaluate the potential provided by advanced control of heavy payloads for ship-to-ship transfer.

In 2009, a demonstrator crane was installed and integrated aboard the SS Flickertail State (T-ACS-5) to support transfer of standard 20-foot containers. Earlier this month, the Flickertail State embarked to evaluate the crane's performance in transporting containers between two moving ships in an operational environment using commercial and oil industry at-sea mooring techniques.

ONR has been in talks with transition partners about the future of the Lo/Lo crane, but no immediate decisions have been made to provide a way forward for the technology. The demonstrator [crane](#) on Flickertail State is available for future testing and to support the U.S. government's humanitarian assistance and disaster response efforts.

Provided by Office of Naval Research

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