Department of the Navy SBIR/STTR Transition Program
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Topic # N201-021
Cargo Handling Software for Navy and Marine Aircraft
Stottler Henke Associates, Inc.

WHO

SYSCOM: NAVAIR

Sponsoring Program: PMA-261 CH-53E/K Heavy Lift Helicopters

Transition Target: NAVAIR PMAs

TPOC: (301) 342-5872

Other Transition Opportunities: The Cargo Loading app is designed to run on the Marine Air-Ground Tablet (MAGTAB) and initially supports the CH-53E/K Super/King Stallion, V-22 Osprey, and C-130J Super Hercules aircraft, with plans to expand to similar aircraft across the DoD.

Notes: "A U.S. Army Soldier with 1st Battalion, 1st Special Forces Group (Airborne), prepares to load a CH-53E Super Stallion."

U.S. Marine Corps photo by Lance Cpl. Ujian Gosun. https://media.defense.gov/2021/Apr/01/2002613049/-1/-1/0/210317-M-TU214-885.JPG

WHAT

Operational Need and Improvement: Develop innovative software to assist aircrew in loadmaster duties and generate cargo configurations that meets requirements specified in platform specific Cargo Loading Guides (CLGs) for Navy and Marine Corps aircraft.

Specifications Required: There are four primary requirements: First, enable the development of a 3D model of cargo placement and tie-down patterns. Second, evaluate the safety of the placement and tie-downs based on the information in the CLGs. Third, generate a complete solution, or finish a partial solution, to a specified problem. And fourth, run on an Android tablet and eventually transition to the MAGTAB.

Technology Developed: The Cargo Loading app runs on an Android tablet and enables aircrew to create 3D models of cargo placement and tie-down patterns on the CH-53E/K, V-22, and C-130J and then automatically verifies platform-specific safety guidelines are met. The app has been developed to easily transition into operational use for the Navy and Marine Corps on existing MAGTAB devices.

Warfighter Value: First, the Cargo Loading app automatically performs safety calculations on models of restrained cargo, ensuring cargo- and aircraft-specific constraints and issues are considered. Doing these calculations manually, and ensuring none are missed, is an error-prone and time-consuming task. Through automation, the app improves the safety of crewmembers and cargo along with expediting the cargo transportation process.

Second, the Cargo Loading app provides visual feedback and checklists that help the user correctly secure cargo. Insufficiently and/or incorrectly restrained cargo will remain unnoticed most of the time – which can propagate bad habits until an incident occurs. The app provides ongoing training through positive examples, improving the knowledge, skills, job performance, and safety of aircrew personnel.

Finally, as an app that runs on existing hardware, and is deployed as part of existing update cycles, these capabilities and benefits are made available in a cost-effective manner.

WHEN

Contract Number: N68335-22-C-0059   **Ending on:** Nov 27, 2023

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Phase I Option Evaluation Event	Medium	Hands-on evaluation of the Phase I prototype	4	4th QTR FY21
First Phase II Evaluation Event	Medium	Demonstrate progress and identify issues during hands-on evaluation of app on several Android tablets.	5	3rd QTR FY22
Sixth (Final) Phase II Evaluation Event	Medium	Verify that Cargo Loading app is ready to be deployed on the MAGTAB.	6	4th QTR FY23
If Option Exercised, Deploy app to MAGTAB	Medium	Passes verification and validation along with positive feedback from aircrew.	7	1st QTR FY25

HOW

Projected Business Model: The Phase II Option is focused on transitioning the Phase II minimum viable product onto the MAGTAB and then supporting the integration of the Cargo Loading app into the Navy and Marine Corps cargo handling process. If successful, our business plan from there focuses on software development consulting – applying our technological expertise to support the app and to continuously improve the software by extending its functionality, both in the depth of cargo loading rules for each supported platform & version and in the breadth of platforms & versions supported. There are no license fees for US government use.

Company Objectives: Stottler Henke specializes in artificial intelligence solutions, with a proven track record of delivering advanced software systems for the both the DoD and commercial companies.

Our primary goal is to transition the Cargo Loading app into operational use for the Navy and Marine Corps via the Marine Air-Ground Tablet (MAGTAB) upon successful completion of the Phase II Option. Given the initial aircraft supported, U.S. Navy PMA-261H-53 Heavy Lift Helicopters, PMA-275 V-22 Joint, and PMA-207 Tactical Airlift program offices would be possible transition advocates.

The app could be expanded to support similar aircraft used by the U.S. Army and Air Force for tactical cargo transport. The Army PEO Aviation (PEO AVN), Air Force Air Mobility Command (AMC) and Air Force Life Cycle Management Center (AFLCMC) would all be possible transition advocates.

Potential Commercial Applications: Airlines and air cargo freight companies ship massive amounts of cargo and any optimization that increases throughput would result in significant cost savings. While the challenges in commercial air cargo are not the same as tactical transport, with customization the Cargo Loading app could be applied to the optimization challenges in commercial air cargo.

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