Department of the Navy SBIR/STTR Transition Program

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Topic # N04-081

TECHNICAL PROPOSAL FOR THE SHIPBOARD LIGHTING SYSTEM (AVIATION LIGHTING SYSTEM-CONTROL PANEL SET (ALS-CPS)) SBIR N04-081 PHASE II

C3I, Inc.

WHO

SYSCOM: NAVSEA

Sponsoring Program: Team Ships, PMS 500

Transition Target: The Aviation Lighting System-Control Panel Set (ALS-CPS) incorporates controls for all Visual Landing Aid (VLA) systems on Navy/Coast Guard Air Capable ships.

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Other transition opportunities: Transition opportunities include LCS, LHA/LHD, DDG 51 Flight IIA class, LPD-26, JHSV-1, WMSL-752, MSC, OPC, NSC and CG-47 classes of Navy and Coast Guard ships. After successful Environmental qualifications and completion of NAVAIR's Technical Review process, C3I will be able to offer the ALS-CPS suite of hardware and software to international Navy and Coast Guard fleets.

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Notes: The attached photograph shows the C3I ALS-CPS Control Panel in the Helo Control Station with a view of the flight deck onboard USS SEA FIGHTER (FSF-1) during initial trials.

WHAT

Operational Need and Improvement: Current Navy/Coast Guard flight deck lighting and launch and recovery devices are a collection of complex operating systems requiring numerous personnel, stove-pipe controls, extensive cabling, maintenance and complicated communication procedures to link them together into a cohesive operational system. The ALS-CPS system integrates these legacy systems and NAVAIR's Next Generation Visual Landing Aids (NGVLA) into a fully-distributed, flexible and modular communication and control architecture that provides the operator with a multi-functional command capability utilizing Night Vision compatible touch screen Control Panels, Network Switches, Protocol Controllers and LED and legacy lighting drivers.

Specifications Required: The ALS-CPS system replaces system-specific remote Visual Landing Aid operator control panels with a common operator interface of the Next Generation Landing Aids including: Advanced Stabilized Glide Slope Indicator, Multi-Function Display, Deck Status Display, Advanced Flight Deck Lighting, and specific legacy lights. It interfaces with shipboard gyro inputs and replaces the legacy Flight Deck Status and Signaling System with an interface to the Rapid Aircraft Secure and Traverse system.

Technology Developed: The ALS-CPS is a hardware and software system based on IEEE 802.x/EIA TIA-485-A standards that provide control, communication, safety and equipment monitoring. The integrated software is easily re-configurable and the hardware is "plug-and-play" compatible with existing shipboard systems. The Night Vision Compatible Control Panels provide the operator interface and contain software that integrates the shipboard and VLA devices.

Warfighter Value: The ALS-CPS system provides for overall reduced VLA life-cycle costs with significant improvements in capability, reliability and functionality coupled with ease of maintenance. The system is designed to meet Cyber Security requirements and permits enhanced flight deck safety of operation through improved situational awareness for the Helo Control Station operator. It controls visible/night vision LED lighting and the Control Panel is Night Vision Device Compliant providing for enhancing operational capabilities during launch and recovery of air platforms from Air Capable ships.

WHEN

Contract Number: N00024-14-C-4059 **Ending on:** February 16, 2016

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Critical Design Review	Low	Exit Criteria met	TRL 5	November 2016
Test Readiness Review	Low	Exit Criteria met	TRL 6	May 2017
Production Readiness Review	Low	Exit Criteria met	TRL 7	January 2018

HOW

Projected Business Model: C3I's skilled engineering, software and manufacturing teams will finalize the design of the ALS-CPS hardware and software leading to Environmental Qualification and integration testing. After successful testing, C3I will manufacture the ALS-CPS units in our facility in Hampton, NH, install the software, integrate and test the system prior to delivery to our Government and commercial customers. Additionally, C3I is working with NAVAIR to define the logistics requirements, identify the configuration management process both for hardware and software, and manage the logistic sparing and training for delivered components.

Company Objectives: C3I's objective is to become one of NAVAIR NGVLA's premier contractors supporting all aspects of the ALS-CPS program and related technologies, through Engineering Design, Software development, integration testing, component manufacturing, and logistics support to the fleet.

C3I has also recently won an SBIR Contract Topic N152-086 Flight Deck Addressable Smart Control Modules, for the design of enhancements to C3I's Flex Driver Module to control flight deck lighting with reduced shipboard cabling and improved performance utilizing a standardized smart control module to recognize lighting packages through embedded firmware and software.

Potential Commercial Applications: C3I is leveraging technology developed under this SBIR contract to pursue opportunities to provide Non-Lethal Animal deterrent devices utilizing a variation of the ALS-CPS firmware and software to control LED lighting to warn animals of impending obstacles.

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