

HEROIC ACCS

THE ADVANCED COMMUNICATION AND CONTROL SYSTEM CREATES
POTENTIALLY LIFE-SAVING EFFICIENCIES

A U.S. Navy destroyer is operating in the Western Pacific at night when an urgent radio call is received in the Combat Information Center. A helicopter operating from a ship in the battle group has experienced an emergency and requires immediate recovery.

Traditionally, Navy ships would immediately set Flight Quarters, send a number of sailors to turn on flight deck lighting, ensure the horizon reference system, wave off system, and homing beacon were all activated, power the Advanced Stabilized Glide Slope Indicator, send officers to the Helicopter Control Station to direct the flight deck landing crew, ensure that the flight deck was prepared for the recovery, conduct Foreign Object Debris (FOD) walks on the flight deck to remove any potential items or debris that could cause damage to the helo, and man-up a damage control team.

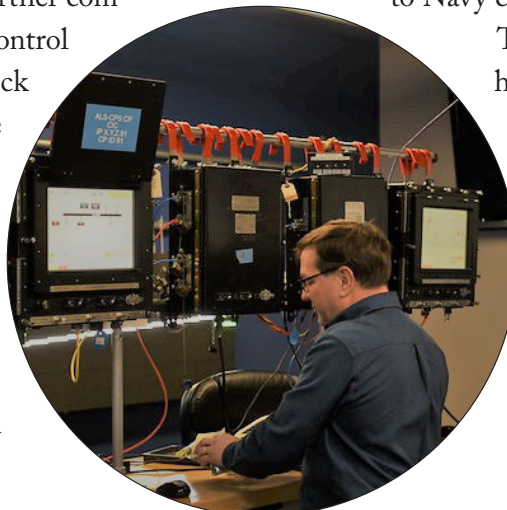
Many of these activities were largely stovepiped, meaning each required individual power switches and control devices, and were generally decentralized, requiring significant manpower. Further complicating matters, the individual control cabinets and much of the flight deck lighting and recovery devices were not designed to incorporate night vision capabilities, which has become important to night helicopter operations.

As can be imagined, this complex procedure required time to ensure the ship was ready. When

seconds could mean the difference between recovering the helicopter safely or losing it in the ocean, the Navy needed to find a solution to reduce the complexity of the process.

The answer required a centralized command and control system capable of reducing the time to get all systems on-line and reducing the need for large numbers of sailors managing the landing aids needed to support safe recovery operations. In 2004, the Navy awarded an SBIR contract to C3I, a small business founded in New Hampshire in 2000, to design and qualify a full suite of hardware and software that could communicate with and/or control the full complement of shipboard and flight deck lighting, as well as other NAVAIR Next Generation Visual Landing Aids. C3I, with the guidance of NAVAIR and NAVSEA technicians and Program Managers, along with the support of follow-on SBIR contracts, developed the system the Navy required. C3I was acquired in late 2021 by Triad Capital Management and continues to provide support to Navy customers.

The outcome of the SBIR contracts has been the Advanced Communication and Control System, or ACCS, which was selected by NAVSEA to control nine separate systems installed onboard the DDG 1000 Class, ranging from shipboard lighting to Next Generation



The systems integration lab at C3I

Visual Landing Aids (NGVLA), to telerobotic firefighting nozzles placed throughout the topside of the ship, all with the aim to centralize control and reduce response time and manpower requirements. C3I designed the full suite of hardware, delivered more than 90 pieces of individual equipment per DDG 1000, all operating with a robust yet easy to modify software system that integrates the nine individual systems into a full command and control system operated by one sailor at one user interface—the night vision compatible ACCS Control Panel. This centralized system permits one Navy sailor, for the first time, to control hundreds of individual lights, systems and landing aids with the push of a few buttons. The ACCS design also meant that controlling a ship’s flight deck response time could be dramatically reduced in the event of an emergency.

C3I designed ACCS to ensure future NGVLA and shipboard systems could be cost-effectively added to the software without the need to redesign the entire program. “We’ve been able to design ACCS as an agile and flexible system that does not require the redesign of the entire system to incorporate changes or add new hardware, providing significant benefits to the US Navy,” said Michael Curry, the former President of C3I. “Having one centralized system has improved safety and reduced the time frame to recover helicopters on Navy and Coast Guard ships.”

C3I continued to receive NAVAIR and NAVSEA SBIR contracts to further develop and improve the original ACCS technology into the Aviation Lighting System Control Panel Set (ALS-CPS), NAVAIR’s Program of Record for controlling NGVLA devices on all new Air Capable Ships. Similar to ACCS, the ALS-CPS system operates from a centralized hub and can control multiple systems including advanced flight deck lighting, Advanced Stabilized



Glide Slope Indicators, Deck Status Lights, Flight Deck Status and Signaling System and other NGVLA devices used in the launching and recovering of helicopters.

ACCS and ALS-CPS technologies have since been delivered to more than 75 Navy and Coast Guard ships, including the Littoral Combat Ship (LCS) Classes, the USS SEA FIGHTER (FSF-1, an experimental LCS), the DDG 1000 Class, the DDG 51 FLT IIA Class, the JHSV Class, the Large Deck Amphibious Ship Classes, USNS (USN non-commissioned) ships, and the U.S. Coast Guard’s National Security Cutter. ALS-CPS is scheduled for installation onboard DDG 51 FLT III, the Offshore Patrol Cutter,

the FFG 62 class and the Polar Security Cutter. Additionally, C3I has delivered its system to Eglin Air Force Base and other training fields for controlling LED and legacy lighting for the Joint Strike Fighter.

George Bray, a NAVAIR Esteemed Fellow and recently retired NAVAIR employee stated that, “the ALS-CPS system consolidated control

of shipboard Visual Landing Aid (VLA) systems and lights into a single user-friendly control panel. This consolidation of controls will reduce operator workload and errors through the use of single button settings of all VLA lights using preset conditions on the ALS Control Panels, a significant improvement over previous controls used on Navy ships.”

“C3I has been extremely fortunate to receive dozens of NAVAIR and NAVSEA SBIR contracts over the past 17 years to provide to the Navy the system they desired. Through these contracts, many of which were Phase III awards, the ALS-CPS system has been fully qualified to NAVAIR standards and the design and software have met their cybersecurity requirements.” Curry said. “It is clear that without these SBIR opportunities, the company would not exist as it is today.”

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Modernization Priority: FNC3 (Fully Networked Command, Control, and Communications)

SBIR Contracts: N00024-08-C-4133, N00024-14-C-4059 • Agency: Navy • Topic: N04-081 Shipboard Lighting System

SBIR Contract: N68335-17-C-0213 • Agency: Navy • Topic: N152-086 Flight Deck Lighting Addressable Smart Control Modules

National Defense Strategy Pillar: Force Readiness and Lethality; Business Reform