



STIC Note



Boat Crew Communication System Improvements

BACKGROUND/PROBLEM

The Boat Crew Communication System (BCCS) is a critical system used by small boat operators in the Coast Guard. It allows for boat crews to communicate with each other internal to the boat, as well as over all the many external radios on the boat. A functioning BCCS allows the entire boat crew to maintain situational awareness with each other, as well as the cutter, station, aircraft and/or, the target of interest. Keeping the BCCS functioning properly is extremely difficult and maintenance intensive; because of this, most BCCSs do not function properly, and therefore are not used by the boat crews. The BCCS installed on the two most prevalent boats in the CG's fleet, the RB-S II and the OTH IV (representing approximately 400 boats), are no longer supported by the manufacturer. Therefore, it was a priority for the C5I Service Center (C5ISC) to identify a new BCCS for use across all CG small boats.

METHODS

In January 2022 the C5ISC reached out to the Defense Innovation Unit (DIU) to find out if the Other Transaction Authority (OTA) used by DIU could work to solve the BCCS problem. An OTA is the authority to use Other Transactions (OTs) to engage in research and prototype activities outside of the typical Federal Acquisition

Regulations (FAR) based contracting processes. The Coast Guard was given the authority to use OTs in the 2021 authorization act, specifically: "prototype projects and follow-on production contracts or transactions...directly relevant to the Coast Guard's C5I initiatives." DIU determined that the BCCS challenge would be an excellent candidate for the CG's first use of OTs. DIU then reached out to the R&D Center's Science and Technology Innovation Center (STIC) to determine if it would be a project the STIC could support. Because of the STIC's inherent project and budget flexibility, it was quickly able to support and fund this high-impact project. The STIC provided \$260K toward the project, while DIU funded an additional \$200K.

EVALUATION

Following DIU's Commercial Solutions Opening process, an Area of Interest (AoI) was released to Industry in June of 2022. The AoI was left intentionally broad to encourage a large and diverse set of possible solutions to the BCCS problem. 17 vendors responded to this AoI. These 17 vendors were then down selected in a three-phase process. In Phase I, the 17 vendors were evaluated by a team consisting of members from the RDC, DIU, C5ISC, SFLC, and CG-731. This led to the selection of eight vendors to participate in Phase II. Phase II

STIC Note: Boat Crew Communication System Improvements

consisted of in-person pitches at DIU’s offices in Mountain View CA. The Phase II evaluation team consisted of the same team from Phase I, plus members from the CG operational and maintenance communities. These pitches consisted of presentations and hands-on demonstrations as applicable. The vendors were also provided an opportunity to physically walk-through an RB-S II, OTH IV, and a 32-foot Port Security Unit Boat (Figure 1), and to discuss the challenges of the current systems with the operators and maintainers.



Figure 1. Walking through boats during Phase 2 at DIU (Source: U.S. Coast Guard).

From the Phase II, three vendors were invited to Phase III (agreement negotiations) and were issued Prototype OT Agreements to develop and/or test their solutions on operational CG assets. During the Fall of 2022, these vendors worked directly with the Integrated Project Team (IPT) of RDC/DIU/C5ISC to develop prototype solutions and test these solutions at the C5ISC communications laboratory in Portsmouth VA (Figure 2).



Figure 2. Communications lab at C5ISC (Source: U.S. Coast Guard).

Once the prototype solutions were identified, the vendors tested their solutions on operational boats at Maritime Safety and Security Team San Francisco (MSST SF). The IPT testing that was completed over a two-week period in January of 2023, consisted of temporary installation of the systems on both an RB-S II and OTH IV, and then testing of the systems in both day and night training evolutions in both high-speed pursuit and tactics training. Operators provided feedback following each evolution.



Figure 3. Prototype BCCS testing on an RB-S II (Source: U.S. Coast Guard).



Figure 4. Prototype BCCS testing on a OTH IV (Source: U.S. Coast Guard).

After prototype testing, there was enough information for the team to select a preferred solution.

The C5ISC is now in the process of procuring five complete systems for installation of First Article Testing (FAT) as a part of their systems acquisition process. They are also requesting \$2M in FY24 to purchase approximately 40 systems for install.

CONCLUSIONS

The use of DIU and the OT process was instrumental in identifying a functioning and maintainable solution to the BCCS problem. Currently there are no other processes that would have allowed for such rapid identification and prototyping of candidate solutions. This process is easily transferable to other design and acquisition challenges faced by the CG, and while it currently is only authorized for C5I systems, that is likely to expand soon.

FUTURE WORK

The STIC will continue to work with DIU and the C5ISC to ensure this BCCS solution gets transitioned to the operational CG. The team is also continuing to work with the vendor to develop a wireless solution that will interface directly with the wired solution that has been identified.

The Science and Technology Innovation Center (STIC) is a DHS S&T and USCG collaboration.