

# BOARDING TEAM SUPPORT/ COMMUNICATIONS PROGRAM

U.S. DEPARTMENT OF  
HOMELAND SECURITY



UNITED STATES COAST GUARD RESEARCH & DEVELOPMENT CENTER

## Safe and Effective Maritime Security



A boarding team from the Coast Guard Cutter ADAK climbs aboard a cargo vessel in Iraq. Coast Guard photo.

As the lead Federal agency for maritime homeland security, the U.S. Coast Guard conducts vessel boardings and inspections, both at sea and at the pier.

These boardings hold challenges and dangers for Coast Guard boarding teams. Boarding team members may have difficulty communicating within commercial vessels, crew members may lack proper identification, fully inspecting large vessels is time consuming and wrought with missed

opportunities, and boarding team members must be constantly aware of the safety of all members.

New techniques and technologies provide Coast Guard boarding teams with the ability to perform these duties more effectively, efficiently, and safely.

The **USCG Research & Development Center** (R&D Center) launched the Boarding Team Support/Communications Program to:

- Support the development of technology that will increase the safety and effectiveness of boarding teams,
- Identify gaps in capabilities that affect accomplishment of boarding team missions, and
- Promote appropriate interagency coordination and ensure that research is not being duplicated.

### R&D Center Strengths:

- Wide breadth of scientific, engineering, and operational field expertise
- Modeling and Simulation (M&S)
- Human Systems Integration
- Operational Effectiveness Assessment
- Test & Evaluation (T&E)

### What Can the R&D Center Provide?

The R&D Center can provide a business strategy that will take your program from identifying a problem to acquiring the solution. We provide technical knowledge, Coast Guard operations experience, and contracting expertise. Working with other government agencies and vendors, the R&D Center devises workable Coast Guard solutions.

### How Can We Work Together?

The Boarding Team Support/Communications Program can:

- Define performance gaps,
- Translate user wants/needs into requirements,
- Identify emerging technologies,
- Provide an unbiased assessment of potential solutions,
- Leverage other government agency development efforts to benefit the Coast Guard,
- Plan development strategy, and
- Plan and execute T&E in support of acquisitions.



Container vessel awaits boarding. Coast Guard photo.

### Recent Reports

*User Evaluation of the Tactical Ballistic Survival System for the Enhanced Maritime Safety and Security Team* analyzed the efficacy of a load carriage/ballistic protection vest system that integrates emergency flotation, level 3 ballistic protection, and configurable load carriage.

*Performance Evaluation of the Pulsed Elemental Analysis with Neutron (PELAN) System* evaluated the performance of a technology that could detect contraband behind bulkheads and walls in vessels and shipping containers.

*Maritime Biometrics Identification at Sea Requirements Study* identified and documented Coast Guard biometric requirements for identifying individuals during vessel boardings or alien migrant interdiction operations.

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## SAMPLE OF CURRENT PROJECTS



*Today's vessels make communication difficult. Coast Guard illustration.*

### Boarding Team Connectivity

seeks to provide reliable, secure communications among boarding team members while dispersed throughout a large vessel.

The candidate technical solution uses Personal

Digital Assistants (PDA) as communication devices and smart wireless repeaters that are deployed throughout the vessel to form a secure, self-healing network in critical areas on a boarded vessel. This network can transmit voice, data, and video. The solution can also integrate with legacy handheld radios. Phase one development included a first generation engineering prototype that validated the proof of concept. The second phase development focused on size reduction, increased transmitter power, increased ruggedization, and human factors analysis of the design.



*Vessel inspection challenges. Coast Guard photo.*

**Vessel Compartment Inspection** is evaluating the Lobster Eye X-ray Inspection Device (LEXID). It is an x-ray imaging device that uses a low power, hard x-ray source. A focusing array

collects and focuses back-scattered x-rays onto a screen. The image is captured using a digital camera, enhanced using real-time image processing software, and displayed on a small flat-panel display. The low power makes it safe for users. The trade-off is its limited ability to penetrate sheet metal. Sponsored by Homeland Security Advanced Research Projects Agency (HSARPA), the initial evaluation is nearing completion. After which, the prototype will be lab tested and if successful, the R&D Center will conduct an independent user-field test to verify the prototype's performance in an operational environment. The goal is to determine the efficacy of this technology in searching for hidden contraband on vessels.



*Mobile biometrics identification system. Coast Guard photo.*

**Maritime Biometrics Identification at Sea** implements a proof of concept for a mobile biometrics identification system that is being used by 110-foot patrol boat crews for positive identification of illegal migrants interdicted in the Mona Passage between the Dominican Republic and Puerto Rico. In the proof of concept, a maritime system has been designed and built that collects fingerprint and digital facial images with handheld devices. This data is integrated with biographic data for search and enrollment in the Department of Homeland Security's (DHS) United States Visitor and Immigrant Status Indicator Technology program (US-VISIT). The first phase used an on-board database of 800,000 biometric templates on a laptop computer and the data searches were done onboard. The second phase leverages a newly deployed 110-foot patrol boat-based satellite communications system to send biometric data back to DHS for comparison with the full US-VISIT database of 80 million records.



*BT member evaluates lonscan swipe for drug detection. Coast Guard photo.*

**Multi-mode Detection** is evaluating four commercially available, enhanced trace narcotics and explosives detection systems. These systems have a simultaneous narcotics and explosives detection capability and will replace the aging lonscan 400B trace narcotics detector. The evaluation will consist of performance testing in a controlled laboratory environment and a controlled field environment.

If the candidate devices successfully pass testing in controlled environments, they will be evaluated in an operational field environment.

