Committee on Transportation and Infrastructure
U.S. House of Representatives
Washington, DC 20515

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July 26, 2013

SUMMARY OF SUBJECT MATTER

TO: Members, Subcommittee on Coast Guard and Maritime Transportation
FROM: Staff, Subcommittee on Coast Guard and Maritime Transportation
RE: Hearing on "How to Improve the Efficiency, Safety and Security of Maritime Transportation: Better Use and Integration of Maritime Domain Awareness Data."

PURPOSE

The Subcommittee on Coast Guard and Maritime Transportation will meet on Wednesday, July 31, 2013, at 10:00 a.m., in 2167 of the Rayburn House Office Building to review Coast Guard maritime domain awareness (MDA) programs and whether such programs are improving the efficiency, safety, and security of maritime transportation. The Subcommittee will hear from the United States Coast Guard, the Government Accountability Office (GAO), and MDA stakeholders in private industry and academia.

BACKGROUND

Maritime Domain Awareness

MDA is the federal government's effort to achieve an understanding of anything in the global maritime environment that can affect the security, safety, economy, or environment of the United States. The process of achieving MDA includes: (1) collection of information, (2) fusion of information from different sources, (3) analysis through the evaluation and interpretation of information, and (4) dissemination of information to decision makers. The goal is to identify risks and threats in a timely manner and provide actionable intelligence.

Information Collection

The Coast Guard uses the following systems to collect information on the maritime domain:

Automatic Identification System

Automatic Identification System (AIS) is a Very High Frequency (VHF)-based, short-range communication system that provides a means for vessels to electronically exchange data, including identification, position, course, and speed, with other nearby vessels and shore-based AIS receivers. Depending on signal strength, weather, geography, and receiver capability, AIS signals can generally be received up to 50 miles away.

Under amendments to the International Convention for the Safety of Life at Sea (SOLAS) adopted in December 2002, vessels over 300 gross tons are required to carry AIS. Section 70114 of title 46, United States Code, requires certain commercial vessels operating in U.S. waters to carry AIS. In October 2003, the Coast Guard issued a final rule (33 C.F.R. section 164.46) requiring AIS on commercial vessels greater than 300 gross tons, passenger vessels larger than 150 gross tons, towing vessels over 26 feet, and all other vessels over 65 feet with a few exceptions.

Nationwide Automatic Identification System

The Coast Guard collects AIS signal data through its Nationwide Automatic Identification System (NAIS). NAIS consists of approximately 200 VHF receiver sites located along the coasts and inland river systems of the United States. NAIS allows the Coast Guard to collect data from AIS-equipped vessels traveling in the vicinity of the Nation's 58 largest ports.

Long Range Identification and Tracking

Long Range Identification and Tracking (LRIT) is a worldwide, satellite-based automated tracking system for vessels subject to SOLAS regulation (vessels on international voyages with 12 or more passengers, or over 300 gross tons). Section 70115 of title 46, United States Code, required the Coast Guard to establish a long range tracking system. Amendments to SOLAS were adopted in May 2006 to require all SOLAS-regulated vessels to carry LRIT. The system became operational on December 31, 2008.

Unlike AIS, LRIT is a secure system in which vessel identity and position data is transmitted every six hours to data centers that distribute them to countries permitted to have the information. This system allows SOLAS Contracting Governments, such as the United States., access to flag, port, and coastal state LRIT information as necessary.

Notice of Arrival and Departure

Section 4(a)(5) of the Ports and Waterways Safety Act of 1972 (33 U.S.C. 1223) authorizes the Coast Guard to require vessels bound for U.S. ports to file notices of arrival before arriving. Prior to the terrorist attacks of September 11, 2001, vessels over 300 gross tons submitted notices of arrival directly to Coast Guard officials at the port of arrival 24 hours before arriving at port. On October 4, 2001, the Coast Guard issued a temporary final rule (33 C.F.R. Part 160) to increase the submission time to 96 hours; expand the notice of arrival to include

passenger, crew, and cargo manifest information; and require all data to be sent to a centralized Coast Guard data center.

Rescue 21

Rescue 21 is the Coast Guard's advanced distress call monitoring and response system built to replace the obsolete National Distress Response System. Rescue 21 provides direction finding capability for VHF distress calls, interoperability with first responders, and Digital Selective Calling (DSC). Rescue 21 is operational along the entire shoreline of the continental United States, as well as along the shores of the Great Lakes, Hawaii, Puerto Rico, the U.S. Virgin Islands, Guam, and the Northern Marianas Islands. Due to geographic and cost related issues, the Coast Guard no longer intends to install the Rescue 21 system in Alaska or along the Mississippi and Missouri River systems. Instead, both areas will receive upgrades to the legacy NDRS system that will improve reliability and provide DSC capability.

Other Collection Sources

The Coast Guard also collects and shares information on the maritime domain through its day-to-day operations, intelligence programs, open source information, and agreements with other federal agencies, state and local governments, and the private sector. For instance, the Coast Guard has an agreement with the National Oceanic and Atmospheric Administration (NOAA) to receive Vessel Monitoring System (VMS) data from certain commercial fishing vessels. VMS provides the position and identification of certain commercial fishing vessels through a satellite-based system the Coast Guard uses for fisheries enforcement activities and to respond to search and rescue cases. Also, new real-time integrated ocean observation and monitoring data concerning the physical ocean environment made available through the National Integrated Coastal and Ocean Observation System has been used to enhance the efficiency of Coast Guard search and rescue activities.

Fusion, Analysis, and Dissemination

Once MDA information is collected, it must be fused together and analyzed before being disseminated to decision makers for potential action. The Coast Guard uses the following programs and infrastructure to accomplish these tasks:

Common Operating Picture

A Common Operating Picture (COP) is a map-based information system that fuses together and displays MDA data collected through various sources. The Coast Guard operates several COPs that selectively display information concerning vessels, the threats they may pose, and the environment surrounding them on interactive digital maps. COP information is shared via computer networks throughout the Coast Guard to assist operational commanders with tactical decisions to deploy assets.

Intelligence Coordination Center

The Coast Guard Intelligence Coordination Center (ICC) coordinates and integrates the collection, analysis, production, and dissemination of Coast Guard intelligence. The ICC provides intelligence to Coast Guard leadership, as well as to other military and intelligence services, and civilian agencies. The ICC is collocated with the Navy and Marine Corps intelligence units at the National Maritime Intelligence Center in Suitland, Maryland.

Issues

Gaps in Collection

Most small commercial vessels are not currently required to carry AIS. This leaves the Coast Guard with little real-time information on their activities in the maritime domain. On December 16, 2008, the Coast Guard published a Notice of Proposed Rulemaking (NPRM) (RIN 1625-AA99) to amend the current AIS regulations to expand AIS carriage requirements to fishing vessels over 64 feet, passenger vessels carrying over 49 passengers, and vessels carrying certain dangerous cargo. The Coast Guard estimates the 10-year total cost of the proposed rule on vessel owners is between $181 million and $236 million, while the benefits in the form of reduced property damage could also total $236 million. The NPRM would more than double the number of vessels currently tracked by the Service. A final rule is still under development by the Coast Guard.

As part of its MDA activities, the Coast Guard tracks the location of most of its vessels and a few of its aircraft. This "blue-force tracking" capability improves the Service's situational awareness and enables it to more efficiently deploy and operate assets. Unfortunately, the Service has not yet developed a way to track all of its surface and air assets, nor integrate information regarding an asset's operational status.

Gaps in Fusion, Analysis, and Dissemination

The Coast Guard currently operates several COP systems available to users depending on the mission. For instance, the Service uses its Search and Rescue Optimal Planning System (SAROPS) to plan and execute search and rescue missions. It also operates several COP systems that display information on vessels and the threats they may pose. Operational commanders can use the Global Command and Control System to fuse, filter, and display information and intelligence on vessels in the maritime domain. Finally, the Service operates COP systems that enhance information available through its other COPs. For instance, operational commanders can use the Command and Control Personal Computer System to enhance the data available through SAROPS by overlaying information from AIS and other sources.

The GAO has reported that these disparate COP systems sometime do not function or integrate properly and consume so much computing capacity that command center computers often crash. The GAO also noted that Coast Guard personnel are not always properly trained on how to use the systems (GAO-13-321). To address the situation, the Coast Guard is developing a new COP system, Coast Guard One View (CG1V), to provide users with a single interface for all

COP functions. The Service expects to deploy CG1V in fiscal year 2014. However, the GAO recently faulted the Coast Guard for not following proper procedures for the development of the technology (GAO-13-321).

Section 70107A of title 46, United States Code, required the Department of Homeland Security to establish Interagency Operations Centers (IOCs) in high priority ports by October 2009. IOCs were intended to bring together federal, state, and local authorities into a single command center at each of the Nation's high priority ports. IOCs were intended to improve coordination of activities, reduce operating costs, and enhance information and intelligence sharing. However, budget constraints have left many IOC partner agencies unable to provide dedicated staffing. In response, and to avoid construction costs for "bricks and mortar" facilities, the Coast Guard developed "virtual IOCs" as a way to conduct information sharing.

To facilitate the "virtual IOC" concept, the Coast Guard spent $74 million to develop a software program called WatchKeeper. WatchKeeper was designed to gather data from sensors and port partner sources to provide comparable situational awareness among Coast Guard field personnel and IOC partner agencies. To date, the Coast Guard has activated the Watchkeeper software at 26 Coast Guard sectors. It expects to deploy Watchkeeper at the nine remaining sectors by 2014.

In February 2012, the GAO reported that WatchKeeper failed to meet port partners' needs and was being underutilized (GAO-12-202). GAO found that of the 233 port partners who had access to WatchKeeper, only 18 percent had ever logged onto the system and about 3 percent had logged on more than 5 times. The GAO faulted the Coast Guard for failing to follow established guidance to determine the needs of the system's users, define acquisition requirements, and manage the system's cost and schedule.

Command, Control, Communication, Computers, Intelligence, Surveillance and Reconnaissance

As part of the Coast Guard's ongoing 25 year, $29 billion recapitalization of its legacy fleet of cutters and aircraft, the Service is also upgrading the Command, Control, Communication, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) systems on these assets and at shore-based installations. The C4ISR program is comprised of a core software and hardware suite for each Coast Guard asset that integrates sensors, communications systems, and intelligence information into a COP. The program's goal is to deliver a C4ISR-equipped asset that can collect and process MDA information from a variety of inputs and integrate it onto a user-defined COP.

In July 2011, the GAO reported that not all recapitalized vessels and aircraft carried the same C4ISR system or operated at the same classification level, meaning the assets could not access all forms of data directly or share data with one another (GAO-11-743). The GAO also reported that the Service was shifting from full data-sharing capabilities to a system where each asset sent data to a shore-based command center for integration into a COP.

The President requests $35.2 million for C4ISR in fiscal year 2014, $3.3 million (or 9 percent) less than the fiscal year 2013 enacted level. The Coast Guard has budgeted $235 million

for C4ISR over the next five fiscal years in its Capital Improvement Plan. At this level of funding, the Service expects to be able to continue to deploy and maintain its current C4ISR systems on recapitalized air and surface assets, but not to develop and deploy new C4ISR systems to stay ahead of technological obsolescence.

WITNESSES

Panel I

Rear Admiral Mark E. Butt
Assistant Commandant for Capability
United States Coast Guard

Mr. Stephen Caldwell
Director, Homeland Security and Justice
United States Government Accountability Office

Panel II

Mr. Steve Morrow
President & CEO, Insitu
on behalf of the
Association for Unmanned Vehicle Systems International

Mr. Bill Vass
President & CEO
Liquid Robotics, Inc.

Ms. Lisa Hazard
Operations Manager, Coastal Observing Research and Development Center
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Dr. Newell Garfield, III
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