Coastal Battlefield Reconnaissance and Analysis (COBRA) System

Executive Summary

- The Coastal Battlefield Reconnaissance and Analysis (COBRA) Block I system completed the first of five periods of IOT&E using a DOT&E-approved test plan to evaluate the system's capability to detect and classify mine lines, minefields, and obstacles on the beach zone in daylight.
- COBRA Block I provides an operational capability for beach reconnaissance. The system did not meet the Block I Capability Production Document threshold requirements for one class of targets but provides marginal capability that is better than any existing beach reconnaissance capability.
- The Navy declared COBRA Block I Initial Operational Capability (IOC) in July 2017 based on IOT&E Period One and developmental testing.
- The Navy was not able to complete planned IOT&E periods in FY17 due to lack of an available Littoral Combat Ship (LCS) platform.

System

- The COBRA system is a mission payload on the MQ-8B Fire Scout unmanned air system (UAS), which can be embarked on an LCS or other air-capable ships. The COBRA system is a component of the mine countermeasures (MCM) mission package (MP) when employed from LCS.
- The COBRA program is using evolutionary acquisition and incremental development to meet overall mine and obstacle reconnaissance requirements.
  - Block I capability is intended to provide tactical reconnaissance for detection and location of unburied mine lines, minefields, and obstacles on the beach in daylight. The MQ-8B Fire Scout currently serves as the Block I sensor platform. The Navy declared Block I system IOC in July 2017.
  - Block II is intended to enhance the COBRA system sensor to provide daytime and nighttime detection and location of unburied mine lines, minefields, and obstacles in the beach and surf zones. The Navy expects Block II to reach IOC in FY22.
  - As currently envisioned, Block III will add the capability to detect buried mines in the beach and surf zones. The Block III IOC date has not yet been established.
- The COBRA Block I system consists of the COBRA Airborne Payload Subsystem (CAPS) and Post Mission Analysis (PMA) subsystem.
  - CAPS consists of a multi-spectral camera, installed on an MQ-8B Fire Scout as a modular payload. The system saves collected multi-spectral imagery of the target area to a Data Storage Unit (DSU) for post-mission analysis.

  - Upon aircraft recovery, the DSU is removed from CAPS and connected to the PMA subsystem. When the PMA operator has completed analysis of the data, the processed imagery is forwarded to the Mine Warfare (MIW) Environmental Decision Aids Library (MEDAL) for message formatting and further dissemination to the Mine Countermeasures Commander and other operational commanders via tactical data networks.
- The COBRA system is dependent on the UAS and shipboard systems to perform its mission.
  - Shipboard operators use the Tactical Common Data Link (TCDL) to communicate with CAPS from the MQ-8B Mission Control System (MCS) while the MQ-8B Fire Scout is in flight.
  - On LCS, MEDAL resides in the mission package application software (MPAS). The PMA subsystem and MPAS, in turn, reside on the mission package computing environment (MPCE), which provides operator control, computing, networking, and storage infrastructure.
- The COBRA system provides the sensing capability for Joint Direct Attack Munition (JDAM) Assault Breaching System (JABS), a component of the Assault Breaching System, which can be used to neutralize mines and obstacles on the beach prior to an amphibious assault. The COBRA system precision location capability supports JABS targeting or identification of clear lanes to bypass mines and obstacles.
- The COBRA system provides beach reconnaissance capability for the LCS Coastal Mine Reconnaissance Mission Module in the LCS MCM MP.

Mission

- The Joint Force Commander will use LCS units equipped with the COBRA Block I system as part of the MCM MP to conduct unmanned aerial tactical reconnaissance of potential landing sites for an amphibious assault.

- The Joint Force Commander will use LCS units equipped with the COBRA Block II system as part of the MCM MP to conduct daytime and nighttime unmanned aerial tactical reconnaissance of both beach and surf zones for potential landing sites for an amphibious assault.

Major Contractor
Areté Associates – Tucson, Arizona

Activity
- DOT&E approved a COBRA Block I Test and Evaluation Master Plan revision for IOT&E in May 2017.
- The COBRA Block I completed IOT&E Test Period One in accordance with a DOT&E-approved test plan. Fleet sailors operated the system from shore at NASA's test facility in Wallops Island, Virginia, in May 2017. The MQ-8B Fire Scout with the COBRA payload completed 21 missions to assess its performance against mine lines, mine fields, and obstacles emplaced on the nearby beach. After each flight, trained fleet operators completed post-mission analysis of the data.
- The Navy was unable to complete the remaining phases of IOT&E in FY17 as planned due to lack of an available LCS platform to complete testing.
- The Navy declared COBRA Block I IOC in July 2017 before completion of IOT&E based on the Navy's Operational Test and Evaluation Force (OPTEVFOR) quick look report on system performance during IOT&E Test Period One and the results of developmental testing.
- Depending on the availability of LCS platforms, the Navy plans to complete COBRA Block I IOT&E Test Period 2 by 2QFY18, which includes at-sea testing in Southern California. IOT&E Test Period 3 is a maintenance demonstration, which may be completed on LCS 2 after Test Period 2 if sufficient suitability data are not available from prior IOT&E periods. The Navy intends to complete IOT&E Test Period 4 in 4QFY18 and Test Period 5 in 1QFY19, which includes shore-based cybersecurity testing on LCS 2.

Assessment
- Test Period One of the COBRA Block I IOT&E provided the data to evaluate the search rate, percentage of targets (mine fields, mine lines, and obstacles) detected and classified, and the target location error rate.
- The Test Period One data were adequate to assess the effectiveness of the system to detect, classify, and localize mine lines, minefields, and obstacles on pure sand and on sand with beach vegetation.
- Test Period One data show that the COBRA Block I system performed reliably with relatively few operational mission failures of short duration. However, both MQ-8B Fire Scout test platforms were not operational for several days during this IOT&E period. MQ-8B troubleshooting and repairs required significant maintenance and technical support.
- Based on IOT&E Test Period One results, OPTEVFOR reported that the system is trending toward being operationally effective and suitable.
- COBRA Block I provides an operational capability for beach reconnaissance. The system did not meet the Block I Capability Production Document threshold requirements for one class of targets but provides marginal capability that is better than any existing beach reconnaissance capability.

Recommendations
- Status of Previous Recommendations. This is the first annual report for this program.
- FY17 Recommendations. The Navy should:
  1. Complete the remaining periods of IOT&E, including LCS-based testing, cybersecurity testing, and the maintenance demonstration, if necessary.
  2. Fund and integrate the COBRA Block I system on a more robust and reliable platform to mitigate risks caused by poor MQ-8B Fire Scout operational reliability and availability observed during testing.
  3. Fund and develop the COBRA Block II system to provide nighttime and surf zone reconnaissance capability.