

Global Command and Control System – Maritime (GCCS-M)

Executive Summary

- The Navy's Commander, Operational Test and Evaluation Force (COTF) conducted IOT&E of the Global Command and Control System – Maritime (GCCS-M) Release v4.1 Force Level variant onboard the USS *Boxer* (one of the Navy's Landing Helicopter Dock ships) from November 3-19, 2010, and from May 1-10, 2011. DOT&E determined that the Force Level variant of the GCCS-M v4.1 system is operationally effective and suitable with limitations. Following our determination, the program manager corrected identified limitations and COTF independently validated corrections on September 15, 2011.
- COTF conducted the IOT&E of GCCS-M v4.1 Unit Level variant onboard the USS *Carr* (one of the Navy's Guided Missile Frigates) from March 30 through April 6, 2011. The USS *Carr* was conducting Surface Warfare, Undersea Warfare, littoral, and counter-drug operation exercises in the Virginia Capes Operations Area. DOT&E determined that the Unit Level variant of the GCCS-M v4.1 system is operationally effective and suitable.
- The Navy Information Operations Command (NIOC) Red Team identified and attempted to penetrate and exploit system information assurance (IA) vulnerabilities during each IOT&E.

System

- GCCS-M is a command, control, communications, computers, and intelligence system consisting of software, procedures, standards, and interfaces that provide an integrated near-real-time picture of the battlespace used to conduct joint and multi-national maritime operations. The Navy's Tactical Networks Program Office, PMW 160, provides hardware and hosting services for the GCCS-M software system, to include either the Integrated Ship Network System (ISNS) infrastructure or the Common Computing Environment (CCE)/Consolidated Afloat Networks Enterprise Services infrastructure.
- The Navy is developing GCCS-M Increment 2 at the Force, Group, and Unit Levels. Force Level includes aircraft carrier (CVN), amphibious assault (LHA and/or LHD), and command ships (LCC). Group Level includes guided missile cruisers (CG), destroyers (DDG), and submarines. Unit Level includes guided missile frigates, dock landing ships, amphibious transport docks, and patrol coastal crafts.



- GCCS-M Increment 2 consists of two distinct types of software:
 - Aircraft carrier, amphibious command ship (LCC), and amphibious assault ship capability based on the GCCS-Joint (GCCS-J) software baseline.
 - Guided missile cruiser and below capability based on the eXtensible Common Operational Picture software baseline.
- The Navy intends to release the Group and Unit Level solution in a three configuration phased approach, starting with the patrol coastal ships, then the full Unit Level ships, and finally the Group Level ships.

Mission

- U.S. maritime commanders utilize GCCS-M to exercise command and control over forces in support of maritime operations.
- Commanders at all echelons use GCCS-M to:
 - Integrate scalable command and control, communications, and intelligence capabilities.
 - Support the decision-making process.
 - Process, correlate, and display geographic track information on friendly, hostile, and neutral land, sea, air, and space forces, integrated with available intelligence and environmental information.

Major Contractor

Northrop Grumman Mission Systems – San Diego, California

Activity

- COTF conducted the IOT&E of GCCS-M v4.1 Force Level variant onboard the USS *Boxer* from November 3-19, 2010, and from May 1-10, 2011. USS *Boxer* was underway conducting exercises in the Southern California Operations Area acting as Top Common Operational Picture (COP), Common Tactical Picture Manager, and Air Operations Center while Commander Third Fleet GCCS-J systems were unavailable.
- COTF conducted the IOT&E of GCCS-M v4.1 Unit Level variant onboard the USS *Carr* from March 30 through April 6, 2011. The USS *Carr* was conducting Surface Warfare, Undersea Warfare, littoral, and counter-drug operation exercises in the Virginia Capes Operations Area.
- Concurrently with IOT&E, a NIOC Red Team performed an IA assessment that included system scans, penetration testing, and malicious insider analysis.
- COTF performed all testing in accordance with the DOT&E-approved Test and Evaluation Master Plan and operational test plans.
- The COP Synchronization Tools (CST) function randomly switched from normal mode to maintenance mode daily during the IOT&E, for a total of 16 occurrences. The program manager corrected the deficiency and COTF confirmed that there were no further instances during the second test period. The GCCS-M v4.1 system met threshold reliability requirements when DOT&E excluded the CST random switching faults. COTF identified six minor IA deficiencies during testing that require correction.
- The Unit Level variant of the GCCS-M v4.1 system is operationally effective and suitable. The GCCS-M v4.1 system met or exceeded all threshold requirements and satisfied all tested Critical Operational Issues. The GCCS-M v4.1 system supported user tactical assessment and decision making by providing an integrated COP with near-real-time tracks, link tracks, and imagery; access to historical, current, and future positional data; and mission specific overlays and templates. NIOC provided IA test data showing that the system can preclude unauthorized access to information, although deficiencies attributed to surrounding network components could make the system vulnerable. The Navy should correct these deficiencies as soon as practical.

Assessment

- The Force Level variant of the GCCS-M v4.1 system is operationally effective and suitable with limitations. Overall, the GCCS-M v4.1 system demonstrated improved tactical decision aids, track capacity, and security. However, COTF identified a number of limitations during testing. Operators and system administrators were not properly trained to handle Air Tasking Orders and Airspace Control Orders, nor did the GCCS-M v4.1 online help function contain adequate details to guide operators through the Air Tasking Order/Air Control Order handling processes. The program manager corrected all portions of this deficiency and COTF independently validated this correction on September 15, 2011.

Recommendations

- Status of Previous Recommendations. The Navy addressed all previous recommendations.
- FY11 Recommendation.
 1. The program manager, in coordination with Navy Enterprise leadership, should correct the IA deficiencies identified during GCCS-M v4.1 Force Level and Unit Level operational testing.