

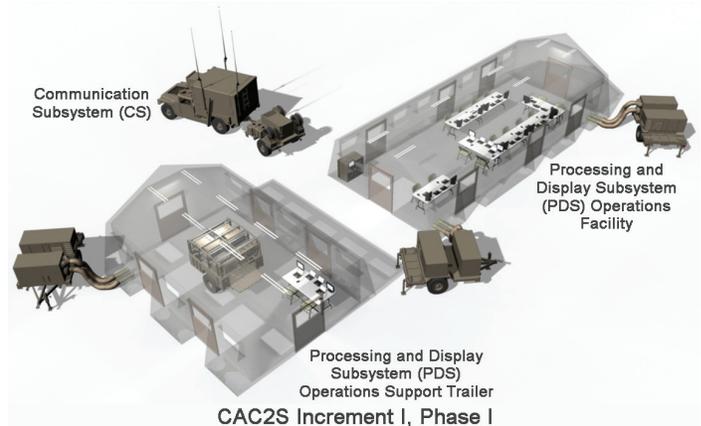
Common Aviation Command and Control System (CAC2S)

Executive Summary

- In September 2011, DOT&E assessed that the Common Aviation Command and Control System (CAC2S) Phase 1 IOT&E was not adequate due to test venue limitations and insufficient data collection. As a result, DOT&E could not determine CAC2S operational effectiveness and suitability.
- In September 2011, the Assistant Secretary of the Navy, Research, Development, and Acquisition, as the Milestone Decision Authority (MDA), led the Full Deployment Decision Review. The MDA subsequently approved Phase 1 full deployment of CAC2S and directed the CAC2S program manager to conduct additional testing to address recommendations by DOT&E and the Marine Corps Test and Evaluation Activity (MCOTEA) based on deficiencies identified during the IOT&E.
- In June 2012, the Marine Corps completed a Limited User Evaluation (LUE) for CAC2S Increment 1, Phase 1 that satisfactorily addressed previously identified key DOT&E and MCOTEA deficiencies.
- Based on data collected during the LUE combined with that from the IOT&E, DOT&E assessed CAC2S Increment 1, Phase 1 as operationally effective and operationally suitable in an October 2012 Major Automated Information System report for CAC2S Increment 1, Phase 1.

System

- CAC2S is designed to provide Marine Corps operators with the ability to share mission-critical voice, video, sensor, and command and control data and information in order to integrate aviation and ground combat planning and operations in support of the Marine Air-Ground Task Force (MAGTF).
- CAC2S consists of tactical shelters, software, and common hardware. The hardware components are expeditionary, common, modular, and scalable, and may be freestanding, mounted in transit cases, or rack-mounted in shelters and/or general purpose tents that are transported by organic tactical mobility assets.
- CAC2S Increment 1 is comprised of three functional subsystems to be delivered in two phases.
 - Phase 1:
 - Processing and Display Subsystem (PDS) – Provides the operational command post and functionality to support mission planning, decision making, and execution tools for all aspects of Marine Aviation.
 - Communication Subsystem (CS) – Provides the capability to interface with internal and external



communication assets and the means to control their operation.

- Phase 2:
 - Sensor Data Subsystem (SDS) – Provides an open-architecture interface capable of integrating emerging active and passive sensor technology for organic and non-organic sensors of the Marine Air Command and Control System (MACCS).
- CAC2S Phase 1 includes the PDS and CS to establish the baseline Direct Air Support Center (DASC) for the Marine Air Support Squadron and limited Tactical Air Operations Center (TAOC) mission functionality for the Marine Air Control Squadron. During Phase 2, SDS is intended to enhance the CAC2S and meet remaining MACCS aviation battle management command and control requirements to include fusion of real-time data.

Mission

- The MAGTF Commander will employ CAC2S to integrate Marine Corps aviation into joint and combined air/ground operations in support of Operational Maneuver from the Sea, Sustained Operations Ashore, and other expeditionary operations. The CAC2S will support the MAGTF command and control concept and will provide an expeditionary and common joint air command and control capability.
- The MAGTF Commander will execute command and control of assigned assets afloat and ashore in a joint, allied, or coalition operational environments by using CAC2S capabilities to:
 - Display a common, real and near real-time integrated tactical picture with the timeliness and accuracy

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necessary to facilitate the control of friendly assets and the engagement of threat aircraft and missiles

- Access theater and national intelligence sources from a single, multi-function command and control node
- Standardize Air Tasking Order (ATO) and Airspace Control Order generation, parsing, interchange, and dissemination throughout the MAGTF and theater forces by using the joint standard for ATO interoperability

Major Contractors

- Phase 1
 - Government Integrator: Naval Surface Warfare Center – Crane, Indiana
 - Component Contractor: Raytheon-Solipsys – Fulton, Maryland
 - Component Contractor: General Dynamics – Scottsdale, Arizona
- Phase 2: General Dynamics – Scottsdale, Arizona

Activity

- In September 2011, DOT&E assessed that the CAC2S Phase 1 IOT&E was not adequate due to test venue limitations and insufficient data collection. As a result, DOT&E could not determine CAC2S operational effectiveness and suitability.
- In September 2011, the Assistant Secretary of the Navy, Research, Development, and Acquisition, as the MDA, led the Full Deployment Decision Review. The MDA subsequently approved Phase 1 full deployment of CAC2S and directed the CAC2S program manager to conduct additional testing to address test inadequacies and deficiencies identified by DOT&E and MCOTEA during the IOT&E.
- The Marine Corps conducted an LUE in accordance with a DOT&E-approved test plan to address prior limitations in test adequacy and to test corrections for CAC2S deficiencies identified during the IOT&E. The test was divided into two phases. The Marine Corps conducted Phase 1 testing during the Weapons and Tactics Instructor's Course (WTI) exercise at Marine Corps Air Station Yuma, Arizona, in April 2012. The Marine Corps conducted Phase 2 testing at the Marine Corps Tactical Systems Support Activity in June 2012.
- The Marine Corps began test planning for Phase 2 of CAC2S in FY12. IOT&E is scheduled for FY15.

Assessment

- The primary objectives of LUE Phase 1 testing were to assess the TAOC mission in an operationally realistic environment and CAC2S's ability to support continuous operations during DASC displacement. The primary objectives of LUE Phase 2 testing were to assess accuracy and timeliness of the Common Tactical Picture, Joint Range Extension Application Protocol A/B connectivity, Global Command and Control System integration, Advanced Field Artillery Data System integration, and maximum track processing capability. Data collected during both phases of the LUE were used to assess system reliability, availability, and maintainability.
- The LUE satisfactorily addressed key deficiencies previously identified, and there were no major limitations to testing. The minor limitations of not having the Service-level preventative maintenance plan established, as well as not having a logistics spares and delivery structure in place, did not hinder the overall assessment. The WTI exercise, during which the LUE was conducted, did allow sufficient data collection to resolve TAOC effectiveness operations. The combination of both

- IOT&E and LUE testing provided adequate data to assess the operational effectiveness and suitability of CAC2S.
- The CAC2S is operationally effective in its primary mission to support the DASC and TAOC. DASC operators were able to use the CAC2S to support direct air support missions during both the IOT&E and LUE. The CAC2S Common Tactical Picture provided DASC operators with timely, accurate, and relevant information. Early Warning and Control TAOC operators were able to use the CAC2S communications capabilities to support airspace surveillance, air direction and control, coordination of air assets, and weapons systems integration during the LUE.
 - The CAC2S is operationally suitable. The combination of data from both the IOT&E and LUE are adequate to assess reliability, availability, and maintainability. DASC and TAOC operators were able to consistently employ the system in the operationally representative environment provided during WTI operations. The reliability of completing a 24-hour mission was 88 percent, and the estimated Mean Time Between Operational Mission Failure was 192 hours. The operational availability was calculated as 97.9 percent.

Recommendations

- Status of Previous Recommendations. The Marine Corps addressed all previous FY10 and FY11 recommendations.
- FY12 Recommendations. The Marine Corps should:
 1. Ensure that future test venues for Phase 2 IOT&E provide for a balanced use of air and ground combat forces along with a 24-hour operational window to ensure adequate system operating hours for assessment of system reliability. In order to reduce risk, an operational assessment should be conducted prior to IOT&E that assesses functionality, integration, and employment for all MACCS users.
 2. Develop and implement a data collection plan to aid in assessment of reliability, availability, and maintainability requirements of currently fielded systems and use the data to supplement the evaluations of Phase 2.
 3. Establish requirements for and develop a Service-level preventative maintenance plan.
 4. Conduct a supportability assessment to assess the availability of logistic support and spares for Phase 2.