Mounted Mission Command – Software (MMC-S)

The Army Test and Evaluation Command (ATEC) conducted the Mounted Mission Command – Software (MMC-S) Version 3.1 IOT&E in April 2023, at Fort Liberty, North Carolina in support of a full deployment decision in October 2023. In September 2023, DOT&E published the MMC-S IOT&E report that assessed the software as operationally effective, suitable, and survivable.

SYSTEM DESCRIPTION

MMC-S is the main software piece of the Mounted Computer Environment (MCE) which makes up part of the Army's Common Operating Environment (COE). MMC will leverage the existing Joint Battle Command – Platform (JBC-P) program of record and evolve utilizing a phased modernization approach with four lines of effort under the MMC Family of Systems:

- Software
- Network
- Transport Hardware
- Compute and Store

MMC-S is based on open standards that promote competition and enable the ability to incorporate new technology. As part of the MCE, MMC-S provides all the movement and maneuver apps but also supports the needs of the wider community and warfighting functions.

MMC-S will be deployed as a software-only upgrade to replace JBC-P software. MMC-S will evolve over time using existing MMC transport and hardware capability-maturation. MMC-S is intended to provide a common user experience that enables leaders to lead their formations from anywhere on the battlefield.

MISSION

MMC-S is part of the Army's concept to facilitate the seamless transfer of information across numerous platforms and provide critical situational awareness to commanders at all echelons. MMC-S contributes to the Army's doctrinal Operations Process by enhancing the commander's ability to coordinate the warfighting functions (Fires, Maneuver, etc.) through the Plan, Prepare, Execute, and Assess components of the Operations Process. MMC-S contributes to mission success through a variety of capabilities to include the Common Operating Picture, Mobile Command on the Move, collaboration tools, and a common look and feel and interoperability with legacy systems.

PROGRAM

The program conducted a materiel development decision in May 2020 entering MMC-S into the acquisition system as an ACAT II program at the limited deployment decision. However, the program adjusted in June 2022 to cancel the limited deployment decision and continue with developmental testing along with a planned IOT&E to support a full deployment decision in September 2023 on the 3.1 version of the software. DOT&E approved the Test and Evaluation Master Plan (TEMP) in January 2023.

DOT&E published the IOT&E report in September 2023, assessing the system as operationally effective, suitable, and survivable. The Army conducted a full deployment decision in October 2023. The program will pivot to an Agile approach for quarterly software releases. The program intends to incorporate this Agile approach in an updated TEMP.

» MAJOR CONTRACTORS

- Government Lead System Integrator – Aberdeen Proving Ground, Maryland
- Combat Capabilities Development Command, System Simulation, Software and Integration – Huntsville, Alabama

TEST ADEQUACY

The Army conducted an IOT&E of MMC-S in April 2023 with a complete cavalry squadron from the 2nd Brigade 82nd Airborne Division. DOT&E approved the test plan in March 2023 and observed the IOT&E. MMC-S IOT&E was adequate to assess operational effectiveness, suitability, and survivability. Operational testing was conducted in accordance with the DOT&E-approved test plan. MMC-S and JBC-P were the primary means of communication for the test unit during the test. The test unit provided a fully manned headquarters command post that included representation from all staff elements. In addition, the squadron was comprised of two complete reconnaissance troops equipped with vehicles integrated

with either MMC-S or JBC-P systems. The squadron also had a combat support troop present that contained a mix of MMC-S and JBC-P equipped vehicles as well as dismounted soldiers using the Nett Warrior system. This third troop provided combat support and service support such as refueling, medical evacuation, etc. to the squadron headquarters and two reconnaissance troops.

The Army conducted an adversarial assessment (AA) of MMC-S at Fort Liberty during the record test window in accordance with the DOT&E-approved test plan. U.S. Army Combat Capabilities Development Command Analysis Center provided data collectors and analyzed the prevent, mitigate, and recover data from the test site and the Network Operations Center. The U.S. Army Threat Systems Management Office supported the AA as the cyber threat stimulus. The purpose of the AA was to characterize how a cyber compromise might degrade the mission capability of MMC-S in the presence of representative defensive tools, personnel, training, and procedures.

The IOT&E uncovered shortcomings in the quality and quantity of delivered instrumented data, and a significant set of technical questions could not be assessed. Data reduction proved to be insufficient due to complexities in the reduction of the data. DOT&E leveraged Mission Event Logs produced by MMC-S to supplement its effectiveness evaluation to overcome instrumentation shortcomings.

PERFORMANCE

» EFFECTIVENESS

MMC-S is operationally effective. MMC-S was useful for all phases of the Operations Process and across all operational factors: time of day, set of cavalry missions, weather, and electronic warfare conditions. Unit leaders stated that MMC-S provided utility and flexibility. The messaging system, particularly chat and free messaging, allowed for quick, long-range communications. Overall, unit soldiers preferred MMC-S over the legacy JBC-P system and provided recommendations for improvement to better support their mission as MMC-S does not yet offer the complete set of messages that JBC-P supports, nor does it integrate with onboard sensor systems such as mounted vehicle optics.

The MMC-S common operational picture allowed operators to develop and maintain situational awareness of the battlespace and the messaging system, particularly chat and free text messaging, allowed for quick, long-range communications, to include disseminating orders, across all tactical echelons. The data DOT&E was able to use showed that messages arrived in a timely and accurate manner. Several anomalies were noted during the test; however, the lack of sufficient instrumentation data prevented any further analysis.

» SUITABILITY

MMC-S is operationally suitable. The system is rapidly recoverable by operators when problems occur, the user interface is intuitive and easy to use, and the provided training prepared soldiers to operate and maintain the system without field service representatives. Operators were able to resolve most failures without external support.

The system does need to improve in order to meet its reliability requirements. The MMC-S training was sufficient for the IOT&E, but did not emphasize troubleshooting, and the quick reference guides and training manuals were not easily available on the MMC-S interface. Unit leaders acknowledged the lack of collective training that teaches units how to use MMC-S to support the Operations Process.

» SURVIVABILITY

DOT&E found that the MMC-S, as configured, is cyber survivable to nascent actors from outsider threat postures. Details can be found in the classified annex of the IOT&E report.

RECOMMENDATIONS

The Army should:

1. Create collective training requirements and program for operating and managing the MMC-S.

2. Integrate vehicle systems and sensors to MMC-S (such as mounted vehicle optics).

3. Incorporate soldier feedback into technical manuals and quick reference guides that are easily accessible within MMC-S.

4. Continue refining the test activities required to support the Agile development and release of software and submit an updated TEMP to DOTE for approval.

5. Address the cyber recommendations in the classified annex of the IOT&E report.