Distributed Common Ground System – Army (DCGS-A)

Executive Summary
- The Army Test and Evaluation Command (ATEC) conducted a Developmental Test/Early User Test (DT/EUT) on the Distributed Common Ground System – Army (DCGS-A) Software Baseline 1.0 (DSB 1.0) from August through September 2011, to provide information for the Milestone C decision in February 2012.
- DOT&E published a DCGS-A DSB 1.0 Operational Assessment Report in January 2012. ATEC conducted the test in a non-operationally representative laboratory environment. Based on the DT/EUT data, DOT&E evaluated DSB 1.0 to be sufficiently mature to enter production in preparation for IOT&E, but recommended improvements to Tactics, Techniques, and Procedures (TTPs); individual and collective training; and system reliability.
- ATEC conducted the DSB 1.0 IOT&E from May through June 2012, utilizing an operationally representative field configuration.
- DOT&E published a DCGS-A DSB 1.0 IOT&E Report in October 2012 that evaluated DSB 1.0 to be not operationally effective, not operationally suitable, and not survivable based on the IOT&E data.
  - During IOT&E, the physical configuration of DSB 1.0 forced unnecessary foot traffic and data exchange through the security cross-domain guard since most of the data needed for the fusion is Secret, but the fusion capability was only in the Sensitive Compartmented Information (SCI) enclave. Physical barriers and security procedures between the SCI enclave and the remainder of the DSB 1.0 system inhibited exchange and fusion of data to the point where DOT&E assessed the DSB 1.0 system to be not operationally effective.
  - Additionally, software faults within the SCI enclave were a primary factor in the evaluation of the DSB 1.0 system as not operationally suitable.
- The Army reconfigured DSB 1.0 without the SCI enclave to mitigate the effectiveness and suitability shortfalls identified in the IOT&E report and demonstrated fixes to the critical Information Assurance (IA) shortfalls that led to the evaluation that the system was not survivable. The reconfigured package is called Release 1.
- DOT&E released a memorandum in November 2012 that stated Release 1 will provide users with capabilities at least as good as those provided by the current systems.

System
- DSB 1.0 establishes the architecture that will provide an organic net-centric Intelligence, Surveillance, and Reconnaissance (ISR) capability. DSB 1.0 integrates three

'Low Side' Components

DCGS-A Enabled Common Ground Station (DE-CGS)

V3.1.6 ISR Fusion Server (IFS)

DCGS-A Enabled Digital Topographic Support System – Light (DE DTSS-L)

'High Side' Components

Mobile Basic Enclave

major existing systems and provides new SCI components to brigade combat teams. The major components include the following:
  - V3.1.6 ISR Fusion Server is the same as the currently fielded DCGS-A v3.1.6 and organizes and processes raw intelligence reports into coherent information at the Secret classification level.
  - DCGS-A Enabled Common Ground Station provides multisensory imagery intelligence data processing and evaluation capability.
  - DCGS-A Enabled Digital Topographic Support System – Light provides geospatial analysis and production capability.
  - Mobile Basic Enclave contains new components designed to provide signal intelligence capability and intelligence fusion and analysis capability for Top Secret information and SCI.
- DCGS-A allows users to collect, process, fuse, and display intelligence on six types of enemy entities: individuals, units, equipment, facilities, events, and organizations.
- DCGS-A is the information- and intelligence-processing centerpiece of the Army ISR framework and is the enabler for all intelligence functions at the Division, Brigade Combat Team, Maneuver Battalion, and Company levels.

Mission
Army intelligence analysts use DSB 1.0 to support six Mission Command Capabilities:
- Display and share relevant information
- Provide a standard and shareable geospatial foundation
- Collaborate in voice, text, data, and video modes
- Execute running estimates of enemy force progress
- Provide mission rehearsal and training support
- Interoperate across the joint, interagency, intergovernmental, and multinational forces

Major Contractor
Northrop Grumman Electronic Systems – Linthicum, Maryland

Activity

- From August through September 2011, ATEC conducted the DT/EUT utilizing a non-operationally representative system configuration at the Intelligence Systems Integration Laboratory at Fort Huachuca, Arizona. In the laboratory configuration, the SCI enclave and the rest of the DSB 1.0 system were connected by a single secured door. Testing was conducted in accordance with a DOT&E-approved test plan.
- DOT&E published the DCGS-A DSB 1.0 Operational Assessment Report in January 2012 informing the Milestone Decision Authority on the test results of the DT/EUT.
- The Milestone Decision Authority signed the Acquisition Decision Memorandum in March 2012, approving limited deployment for IOT&E.
- From May through June 2012, ATEC conducted the IOT&E at Fort Stewart, Georgia, with the 4th Brigade Combat Team, 3rd Infantry Division operating the system in an operationally representative field configuration. In the fielded configuration, the SCI enclave and the rest of the DSB 1.0 system were separated physically and by security barriers (concertina wires and guarded entrances). Testing was conducted in accordance with a DOT&E-approved test plan.
- In October 2012, DOT&E provided an IOT&E report to the Milestone Decision Authority and Congress.
- The Army reconfigured the DSB 1.0 without the SCI enclave to mitigate the effectiveness and suitability shortfalls identified in the IOT&E report, and demonstrated fixes to the critical IA shortfalls. The reconfigured package is called Release 1.
- DOT&E released a memorandum in November 2012 that stated Release 1 will provide users with capabilities at least as good as those provided by the current systems.

Assessment

- The DT/EUT demonstrated that the DSB 1.0 system had shortfalls but was sufficiently mature to enter production in preparation for IOT&E.
  - During the DT/EUT, test data showed operators using DSB 1.0 could execute all key missions, although software limitations forced the users to manually fuse data on two of the six entity types. DSB 1.0 could perform fusion for unit, equipment, facility, and event entities, but not for individuals and organizations. The software modules to fuse data on each entity type are unique due to the different data sets associated with each entity.
  - DSB 1.0 was not reliable due to software problems. The Mean Time Between Essential Capability Failure (MTBECF) of 3.8 hours fell short of the 160-hour requirement. The primary cause for all reliability failures was software (44 of 49 for all failures, 15 of 16 for essential capability failures).
  - The TTPs and training were not mature and needed improvement prior to IOT&E. The TTP and training shortfalls during DT/EUT precluded comprehensive operational evaluation of the end-to-end mission sequence. These shortfalls channelized testers' attention and precluded identification of the non-trivial problems

(discovered later during IOT&E) that were associated with the physical separation of the SCI enclave and the rest of the DSB 1.0 system.
  - The Army did not evaluate DSB 1.0 survivability against cyber threats during DT/EUT.
- The change from a laboratory configuration to the fully fielded configuration in IOT&E significantly altered the test results from those seen during DT/EUT. The IOT&E results showed DSB 1.0 is not operationally effective, not operationally suitable, and not survivable.
  - The system is not effective because it inhibits effective workflows for the development of intelligence products to support operations. The system configuration, as tested, placed the intelligence fusion capability in the SCI (high) enclave even though most of the data to be fused are contained in the Secret (low) side. Additionally, collection management tools reside in the high side, but collection managers need to work closely with the brigade operations staff on the low side. Human intelligence tools are split between the high side and low side, but human intelligence analysts manage and interview their sources on the low side. The need for constant collaboration between high and low side personnel and the utilization of fusion capabilities contained only on the high side, in addition to physical separation and security procedures, inhibited access to capabilities and ultimately severely degraded the ability to generate a single, fused intelligence plot.
  - The system is not suitable because operators performing key mission tasks are interrupted with server reboots or reliability failures, on average, every 8 hours, and operators frequently need to recreate lost work as a result of computer resets. Training for the targeting and signal intelligence analysts using the new capabilities is inadequate.
  - The system is not survivable against cyber threats and does not provide adequate protection and detection against them.
- As reconfigured, Release 1 provides useful capability for the Army users, but does not fully satisfy the Key Performance Parameters (KPPs) for DSB 1.0.
  - Release 1 does not fully meet the Net-Ready KPP since the information exchange requirement that involves the SCI component is not satisfied.
  - Release 1 does not fully meet the Fusion KPP since the software that performs semi-automated fusion was hosted on the SCI enclave. However, Army users can perform fusion with manual assist.
  - Release 1 critical IA shortfalls have been corrected.

Recommendations

- Status of Previous Recommendations. This is the first annual report for this program.
- FY12 Recommendation.
  1. The Army should conduct operational testing of all releases of DCGS-A Increment 1 to be deployed for operational use.