CLOSE COMBAT TACTICAL TRAINER (CCTT)

SYSTEM DESCRIPTION & CONTRIBUTION TO JOINT VISION 2010

The Close Combat Tactical Trainer (CCTT), the first of a series of combined arms tactical training simulators, will assist armored and mechanized infantry units in preparing for combat. The use of Abrams Tank and the Bradley Fighting Vehicle simulators to train soldiers in maneuver and in command and control while operating in a combined arms environment is a central component of the dominant maneuver force.

The CCTT system consists of a group of fully interactive networked simulators and command, control, and communications workstations, replicating Abrams Tanks, Bradley Fighting Vehicles, scout vehicles, supporting artillery vehicles and other weapon systems and dismounted infantry of an armored or mechanized infantry maneuver company operating on a simulated real-time battlefield. CCTT is designed to support a primary maneuver training audience from individual crew through company/team level enabling focus on: battlefield synchronization between command and battle staffs; coordination between crews through company/team; hazardous battlefield conditions that cannot be duplicated outside
of actual combat; and the sustainment training of tactical skills. CCTT can also support limited training of selected battalion staff tasks. The system will exist in both fixed-site and mobile versions. The fixed-site version is capable of running five simultaneous exercises. The mobile version is road transportable within the USA to provide reserve forces platoon-level training.

The CCTT mission is to train active and reserve component armor and mechanized infantry crews, scouts, and leaders to perform critical battlefield tasks and skills. The CCTT will simulate, in real-time, the conduct of combat operations in a representative environment under varying conditions of visibility and weather with an appropriate and challenging opposing force that will require realistic individual, crew, and staff actions, placing stress on all participants. This simulation will permit soldiers to train with reduced real world restrictions caused by weapon effects, safety, and terrain limitations.

BACKGROUND INFORMATION

During May 1992 the Army authorized CCTT to proceed into the EMD phase of acquisition. During 1996 the Army conducted pre-production qualification testing. The mobile set of CCTT underwent pre-production testing during the first six months of 1997. A limited user test was conducted during April-June 1997, to assist the program by assessing software maturity, system reliability, and the training scenarios.

TEST & EVALUATION ACTIVITY

The DOT&E approved the first CCTT TEMP, since it was put on OSD oversight, in January 1997. The Milestone III TEMP was approved in December 1998. The initial operational test (IOT) was conducted during the December 1997–June 1998 time period. During this test, the baseline data were collected at the National Training Center (NTC) from three battalion taskforces that did not use CCTT in their training prior to deploying to the NTC. The baseline data consisted of platoon and company team task and sub-task performance data collected from each mission conducted at the NTC. CCTT suitability and performance data were collected over an 11-week period at the Ft. Hood fixed site using company-sized units. For two weeks of this period a Fort Hood battalion taskforce, called the treatment unit, used CCTT in their training prior to deploying to the NTC where company team task and sub-task performance data were collected for each mission. The results of the company team task and sub-task performance data for the baseline units and the unit that trained using CCTT were compared to determine if the performance differed. Tests were also conducted with the mobile configuration at select military sites in the southeastern United States. The systems were moved, set-up and torn-down on several occasions.

TEST & EVALUATION ASSESSMENT

The CCTT IOT was adequate with respect to all areas of interest including use of typical military users, preparatory training, production representative articles, tactics and doctrine, operational tempo, data collection, test conditions and test conduct. The units selected for the base line represented a cross-section of heavy forces from armor and mechanized infantry divisions. The training cycle for each of the test units was slightly different, but each was representative of training cycles of units preparing for the National Training Center at Fort Irwin, CA. The hardware was representative of the CCTT production systems, although some software capabilities have not been implemented.
The CCTT is operationally effective as tested. The criteria used to determine the effectiveness of CCTT are that units trained with CCTT perform as well as units trained without CCTT, and that the use of CCTT should not degrade individual skill performance or foster unsafe practices. At the National Training Center, the performance of the treatment companies exceeded the performance of the base line companies. The treatment platoons performed at least as well as the baseline platoons. Overall, there were no indication during the IOT that use of the CCTT degraded individual skill performance such as target acquisition, radio/telephone procedures, or reporting. The following unsafe areas were identified among CCTT trained units: tank crews did not use main gun safety guards, tank crew members stood behind the main gun, units failed to assign and maintain direct fire lanes, weapons safety was not enforced (e.g., firing over the heads of friendly troops), and driving too fast for existing conditions.

The CCTT is not operationally suitable as tested. With demonstrated mean time between essential function failure (MTBEFF) values between 30 hours and 153 hours, none of the manned modules (M1A1, M1A2, M2A2, dismounted infantry, HMMWV, M113, and FIST) met the reliability requirement of 200 hours MTBEFF. During the IOT, a total of 613 essential function failures occurred during a total of 23,742 hours of training time during the test. There were also a total of 1,601 nonessential function failures of which 888 were situationally dependent and would have been scored essential function failures had an exercise been in progress. Facility aborts occurred on 32 (58 percent) of the 55 test days. The system demonstrated a 48 percent (vice 90 percent requirement) probability that no more than 10 percent of each type of manned modules are simultaneously down for more than 30 minutes during the normal training day. The CCTT demonstrated that 89 percent of company exercises and 96 percent of platoon exercises were completed without an exercise or trainer abort, thus meeting the requirement to complete 90 percent of the training exercises without an exercise or trainer abort. There were frequent interruptions to training (1.4 per platoon exercise and 6.5 per company exercise) that were of short duration (less than 3 percent of the training time). Soldiers who trained on the CCTT indicated that this level of interruptions is unacceptable.

The CCTT configuration tested in the IOT had a mean time to repair of 0.46 hours, which is significantly less than the criterion of 1.11 hours. This maintenance was accomplished by the contractor logistics support personnel. However, because these maintainers were required to perform other tasks, actual daily workload was significantly higher than the time spent on conventional maintenance. When considering the total maintenance burden placed on the contractor logistics support maintainers, there is currently insufficient manpower authorized to operate CCTT at the projected operating tempo.

The ability to set-up and tear-down the mobile versions of CCTT was demonstrated to be an average of 3 hours and 4:50 hours, respectively; both values significantly less than the requirement of 8 hours.

**LESSONS LEARNED**

To maintain its effectiveness, the CCTT must be updated as changes are made to fielded systems. The Army's training and development communities must work together to ensure that new capabilities (e.g., digitization) are incorporated into the CCTT so that it remains a viable training tool.