

BATTLEFIELD COMBAT IDENTIFICATION SYSTEM (BCIS)



The Battlefield Combat Identification System (BCIS) is a point-to-point, question and answer system intended to reduce fratricide in the forward battle area. BCIS is an added tool that is intended to increase the gunner's situational awareness and survivability of friendly forces in the battlespace.

The potential for fratricide will continue to be a problem with the advent of new weapon technologies enabling target engagements beyond visual identification range. BCIS is intended to allow the platform gunner or commander to identify friendly BCIS equipped platforms on the battlefield.

Initial versions of the system will go on Abrams Tanks and Bradley Fighting Vehicles. Subsequent versions will equip all vehicles—shooters and non-shooters—in this area. Future versions of the system are under development for dismounted soldiers and for air-to-ground and ground-to-air applications.

BCIS employs a millimeter wave beam to interrogate a potential target prior to firing. The BCIS interrogator is bore-sighted with the weapons sights, and an interrogation is conducted at the gunner's station. When an interrogation is received at the target vehicle, a BCIS transponder automatically responds with a friendly identification message. BCIS correlates the responding signal with the intended target's position using azimuth and range calculations from the system's laser range finder. BCIS provides audio tones and visual signals to the gunner to identify potential targets as Friend, Friend-at-Range, or Unknown.

BACKGROUND INFORMATION

Army requirements for a combat identification system are documented in the Joint Mission Need Statement for Combat Identification, validated by JROC in March 1992. The Milestone I/II decision on July 25, 1993 approved the BCIS to enter into the engineering and manufacturing phase. Because of funding constraints, the system was returned to the technical base in 1995 and participated in several demonstrations and small tests.

A Limited User Test for BCIS was conducted in fall 1995 at Fort Hunter Liggett, CA. The results revealed that the number of fratricides with BCIS was substantially less than with the baseline

unit without BCIS. However, BCIS did not meet the system requirement of 90 percent correct identifications.

In 1997, BCIS was selected as one of the systems to be examined as part of the Joint Combat Identification Advanced Concept Technology Demonstration (ACTD). Systems showing promise during the ACTD were recommended for further development. In the ACTD final report of June 1999, BCIS was the only system recommended for entry into LRIP.

In June 1999, the Army approved a three-phased approach to field approximately 1,200 systems to the 4th Infantry Division at Fort Hood, TX. Phases I & II were initially funded for a total of 124 units. On February 20, 2001, the Army Acquisition Executive approved Phase III for production of the remaining LRIP units.

The current development strategy is to conduct two IOT&Es (IOT&E-1 and IOT&E-2 in FY01 and FY03, respectively), leading to an Milestone III in FY03. IOT&E-1 was a Table VIII gunnery exercise against pop-up targets on a gunnery firing range. IOT&E-2 is to be a force-on-force exercise employing company-sized units. Following IOT&E-2, the system is intended to enter full-rate production to produce approximately 16,000 units to equip all active Army armored units.

TEST AND EVALUATION ACTIVITY

The BCIS program manager conducted several tests to gain confidence that the system was ready to proceed to IOT&E-1. In the System Confidence Demonstration held in fall 2000, the BCIS-equipped M1A1 tanks and Bradley's met the system requirement of 90 percent correct identification. However, they performed no better than similar units not equipped with BCIS, as both baseline and BCIS equipped units had very low fratricide rates.

In the Virtual Integration Exercise conducted in fall 2000, BCIS was effective in reducing fratricide in night battles. However in day battles, more fratricides occurred than did at night. This phenomenon is believed to be the result of troops using BCIS at night when visibility is poor, but trusting their own vision in the day more than they trust BCIS responses.

BCIS participated in IOT&E-1 at Fort Hood in September 2001. Approximately 4,000 target silhouettes were engaged on a gunnery range. BCIS demonstrated the potential to improve target identification and reduce fratricide. However, units equipped with BCIS engaged significantly fewer friendly silhouette targets than non-BCIS units. While only a few hardware failures were reported, the low level of utilization (fewer than 500 total operating hours) resulted in a demonstrated mean time between failures significantly lower than the 1,200-hour requirement.

TEST AND EVALUATION ASSESSMENT

In operational testing, BCIS has yet to demonstrate conclusively that it will reduce fratricide. Under operational conditions, crew behavior has resulted in limited demonstrated operational effectiveness to date. In some of the early operationally oriented testing, crews with BCIS have performed no better than crews without it. In other testing, crews performed well with BCIS at night, but poorer with BCIS during the day.

During recent IOT&E, units equipped with BCIS engaged significantly fewer friendly silhouette targets than non-BCIS units. However, there were severe limitations with this gunnery exercise that preclude projecting these observations to operational environments. First, there was only one BCIS equipped vehicle on the range at a time. This prevented exploring C3I and situational awareness issues that contribute to fratricide. The LRIP system tested did not provide for interoperability or compatibility with situational awareness systems such as the Force XXI Battle Command, Brigade and Below, or other systems designated within the overall Combat Identification Architecture. Interoperability with these other systems requires Block II improvements to BCIS, which will be completed in the out years.

Secondly, the IOT&E-1 gunnery exercise did not provide confusing or stressful situations for the crews, which they would experience in force-on-force battles when an opponent is engaging the friendly force. Crews commented that IOT&E was not very stressful. An exercise, in which an opponent is attempting to engage the friendly force and involves multiple friendly players on the battlefield at once, is required to adequately address BCIS' contribution to fratricide reduction.

In technical testing to date, the BCIS system has high reliability in laboratory testing and contractor testing, as well as robustness in the presence of jamming. IOT&E-1 produced only a limited suitability assessment. The BCIS equipped vehicles were each on the firing range for only a total of 2-3 hours. This is clearly not adequate to produce a suitability assessment that normally requires a system to complete its prescribed operational mission profile.

A full operational assessment of BCIS to overcome these limitations is planned for IOT&E-2 in FY03. This is expected to be a company-level, force-on-force exercise. The test will explore issues of Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance created by having multiple vehicles in the battle simultaneously, and situations of stress and confusion created by employing a live opposing force. Additionally, vehicles will be subjected to a more realistic operational profile for the suitability assessment.

This Page Is Intentionally Left Blank