Small Diameter Bomb (SDB) Increment I

Executive Summary

- The Air Force conducted DOT&E-approved follow-on testing in early FY08.
- The release of Joint Munitions Effectiveness Manual Weaponeering Software (JWS) 1.2.1 corrected deficiencies in Small Diameter Bomb (SDB) lethality estimates. Additional improvements are expected in mid-FY09.
- The SDB Program Office conducted additional testing to determine optimal fuze settings when using aircraft target-designation. These different fuze settings resulted in greater lethality.
- Central Command (CENTCOM) led a Joint Capability Technology Demonstration (JCTD) on SDB Focused Lethality Munition (FLM) at White Sands Missile Range, New Mexico, in March 2008, in order to field 50 weapons in theater.

System

- The SDB is a 250-pound air launched weapon using deployable wings to achieve standoff range.
- SDB combines GPS and internal inertial navigation system guidance to achieve precise guidance accuracy.
- F-15E aircraft employ SDBs from the BRU-61/A four-weapon carriage assembly.
- The SDB warhead is a penetrator design with additional blast and fragmentation capability. Weapon impact initiates integral fuzing, with or without a specified function delay, or by reaching a preset height above the intended target.
- SDB provides reduced collateral damage while achieving kills across a broad range of target sets by precise accuracy, small warhead design, and focused warhead effects.
- SDB may receive support by the Talon NAMATH system. The system provides GPS differential corrections to the SDB through the F-15E data link prior to weapon release to increase SDB accuracy.

Mission

- Combatant commanders use SDB to attack fixed or relocatable targets that remain stationary from weapon release to impact. Units can engage both soft and hardened targets to include communications facilities, aircraft bunkers, industrial complexes, and lightly armored ground combat systems and vehicles.
- SDB-equipped units can achieve an increased weapons load out per aircraft compared to conventional air-to-ground munitions for employment against offensive counter-air, strategic attack, interdiction, and close air support targets in adverse weather.

Prime Contractor

- Boeing

Activity

- The Air Force completed a FOT&E, consisting of six live attacks, in early October 2007. The attack consisted of two live weapons against a ZSU-23-4 air defense system and four live attacks against a BM-21 multiple rocket launcher replica. The aircrew used aircraft target-designation with all six weapons set for impact fuzing.
- After reviewing the test results, the Program Office conducted additional flight tests in March 2008 against armored personnel carriers to compare SDB I lethality as a function of three different fuzing options. In August 2008, the Program Office repeated the FOT&E tests against the ZSU-23-4 and BM-21s with a different fuze setting.
- The Air Force conducted 17 live missions against a variety of targets to evaluate different targeting tactics.
- A major effort to improve JWS small warhead weaponeering accuracy is ongoing with large numbers of SDB I and II warheads and bare charge equivalents employed in static tests against realistic targets.
- The Air Force implemented hardware improvements in 4QFY07 and software improvements in January 2008 to improve BRU-61/A carriage reliability.
- The CENTCOM-led JCTD conducted SDB FLM testing throughout 2008. The Air Force supplemented the original six-weapon test program with 2 additional weapons and a

single weapon in 4QFY08. SDB FLM had a limited fielding of 50 weapons in theater.

Assessment

- As a result of the FOT&E and additional Program Office flight tests, the SDB program will release recommended fuze settings based on the targeting method employed. These additional tests demonstrated greater lethality than earlier tests. Apart from a fuze failure resulting in a dud, testing was largely successful, with target damage and collateral damage results in line with expectations.
- Release of JWS 1.2.1 reflected notable changes in SDB lethality numbers based on the new data and warhead test efforts. JWS 2.0 will emerge in mid-FY09 incorporating new data and major changes in methodology.
- The BRU-61A carriage reliability requirement is stated in terms of Mean Time Between Failure (MTBF). Before the improvement implementation, the MTBF stood at 327 hours, with the requirement being 500 hours by the end of Lot 2 deliveries. With these improvements addressing 70 percent of the flight failures, the re-calculated Lot 2 MTBF is 1,078 hours. The system now exceeds its operational requirement.
- The Program Office completed follow-on live fire testing using impact-fuzed SDBs to validate JWS improvements and to provide a more robust set of empirical data to better characterize the range of SDB capabilities against ground combat systems such as field artillery and lightly armored air defense systems in early FY08.

Recommendations

- Status of Previous Recommendations. The Air Force completed the FY07 recommendation and continues to make progress on the three FY06 recommendations.
- FY08 Recommendation.
  1. The Joint Munitions Effectiveness Manual office should continue efforts to collect small warhead test data to improve JWS 2.0 software and provide an update in FY09.