

Small Diameter Bomb (SDB)

Executive Summary

- The release of Joint Munitions Effectiveness Manual Weaponing Software (JWS) 2.0 corrected deficiencies in Small Diameter Bomb (SDB) lethality estimates.
- The SDB II program completed risk reduction testing activity during FY09.
- The Air Force started SDB I replacement fuze testing in September 2009.

System

- The SDB is a 250-pound air-launched weapon using deployable wings to achieve standoff range. F-15E aircraft employ SDBs from the BRU-61/A four-weapon carriage assembly.
- 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.
- SDB Increment I combines GPS and internal inertial navigation system guidance to achieve precise guidance accuracy.
- The SDB I warhead is a penetrator design with additional blast and fragmentation capability. The weapon can be set to initiate on impact or a preset height above the intended target. Fuze function delays can be pre-set to either of these two options.
- SDB Increment II combines Millimeter-Wave radar, infrared, and laser guidance sensors in a terminal seeker in addition to a GPS and inertial navigation system to achieve precise guidance accuracy in all weather.

Mission

- Combatant Commanders use SDB I 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.

- Combatant Commanders will use SDB II to attack moving targets in adverse weather at standoff ranges. SDB II can also be used against moving or stationary targets using its Normal Attack mode (radar/infrared sensors) or Semi-Active Laser mode and fixed targets with its Coordinated Attack mode.
- 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 Contractors

- SDB I: The Boeing Company, Integrated Defense Systems, St. Louis, Missouri
- SDB II: Source selection 3QFY10 between Raytheon Missile Systems, Tucson, Arizona, and The Boeing Company, Integrated Defense Systems, St. Louis, Missouri

Activity

- The Air Force is continuing a major effort to improve JWS small warhead weaponing accuracy, with over 200 SDB I and SDB II warheads and bare-charge equivalents employed in static tests against realistic targets since December 2006. JWS 2.0, released in March 2009, incorporated these results and will continue to evolve.
- Sled testing and live flight testing on a new fuze for SDB I is ongoing and will be complete in FY10. Objectives are to

demonstrate enhanced fuze reliability and retain previous levels of weapon performance.

- The Program Office completed SDB II risk reduction test activity in FY09 with final data reduction and analysis expected prior to Milestone B and entry into Engineering and Manufacturing Development. Contractors conducted developmental testing including free flight demonstration, captive carriage of All-Up-Rounds on F-15Es, and seeker

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testing from the component level. Each contractor's warhead also underwent lethality testing.

- The Air Force Operational Test and Evaluation Center conducted an Early Operational Assessment (EOA) to assess system progress toward operational effectiveness and suitability. An EOA report will support the Milestone B decision.
- With an approved Acquisition Strategy for SDB II, the Program Office plans to release a Request for Proposals in preparation for Milestone B. An active Integrated Test Team process resulted in notable progress toward producing a Test and Evaluation Master Plan (TEMP).

Assessment

- The release of JWS 2.0 notably improved SDB lethality based on warhead testing. JWS 2.0 incorporates both new data and major changes in methodology.

- The EOA will provide a basis for assessment of SDB II progress to date.
- Program funding and scope decisions are needed to allow completion of a Milestone B TEMP and progression past Milestone B. Efforts should continue to keep testing event driven.

Recommendations

- Status of Previous Recommendations. The Air Force completed the FY08 recommendation.
- FY09 Recommendations.
 1. The SDB I Program Office should complete ongoing fuze testing and report on the results.
 2. The SDB II Program Office should finalize the TEMP prior to Milestone B.