

Small Diameter Bomb (SDB) II

Executive Summary

- The Small Diameter Bomb II (SDB II) program has completed eight Guided Test Vehicle (GTV) shots and one live fire test shot as part of developmental testing in preparation for System Verification Review and Milestone C decision, which is expected in FY15. An updated Test and Evaluation Master Plan is being finalized in support of a Milestone C decision.
- The Integrated Test Team completed work to examine test resource and planning requirements for developmental, live fire, and operational testing, resulting in an adequate test program as SDB II proceeds through Engineering and Manufacturing Development (EMD).

System

- The SDB II is a 250-pound, air-launched, precision-glide weapon that uses deployable wings to achieve stand-off range. F-15E aircraft employ SDBs from the BRU-61/A four-weapon carriage assembly.
- SDB 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. The SDB II incorporates a multi-function (blast, fragmentation, and shaped charged jet) warhead, designed to defeat armored and non-armored targets. The weapon can be set to initiate on impact, at a preset height above the intended target, or in a delayed mode.
- SDB II provides increased weapons load per aircraft compared to legacy air-to-ground munitions employment against offensive counter-air, strategic attack, interdiction, and close-air support targets in adverse weather.

Activity

- Over the past two years, SDB II has flown 11 GTV and 2 live fire missions as part of developmental testing.
- The Program Office completed 11 rounds of seeker Captive Flight Test, resulting in over 1,000 target runs in a wide variety of terrain and environmental conditions providing terabytes of seeker performance data and over 400 hours of seeker operation without a single failure.
- Nearly 2,000 hours of reliability testing have been completed, and work on the Integrated Flight System has been done with verification and validation on track for completion prior to Milestone C.
- The Integrated Test Team fully examined test resource and planning requirements for developmental, live fire, and operational testing, resulting in an adequate test program as SDB II proceeds through EMD.



- 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.

Mission

- Combatant Commanders will use SDB II to attack stationary and moving targets in degraded weather conditions at standoff ranges. There are three principal attack modes: Normal Attack (NA), Semi-Active Laser (SAL) Attack, and Coordinate Attack (CA). SDB II can also be used against moving or stationary targets using its NA (radar/infrared sensors) or SAL modes, and fixed targets with its CA mode.
- An SDB II-equipped unit or Joint Terminal Attack Controller will use a weapon datalink network to provide in-flight target updates, in-flight retargeting, weapon in-flight tracking, and weapon abort.

Major Contractor

Raytheon Missile Systems – Tucson, Arizona

- The program is finalizing the Test and Evaluation Master Plan in support of Milestone C.

Assessment

- SDB II continues to progress through EMD with an adequately resourced test program and no major programmatic testing problems outstanding.
- Eight of the 11 GTV missions and 1 of 2 live fire missions were successful, leaving only 1 live fire mission remaining to meet the testing requirements to pass Milestone C. The failures were thoroughly investigated and corrective actions implemented before proceeding with additional tests. All corrective actions have been successful to date in preventing repeats of the observed failure modes.

- As SDB II has a small payload, degradation in weapon accuracy or warhead lethality can lead to a drop in weapon effectiveness. Seeker performance and the ability to properly assess that performance, as well as warhead lethality, are critical to program success. Flying test bed seeker results have been the predominant source of data on seeker performance during the first years of EMD. Modeling and simulation will provide tools to interpret that data and evaluate weapon performance throughout program development. Both are critical aspects of the EMD program.

Recommendations

- Status of Previous Recommendations. The Air Force completed all previous recommendations.
- FY14 Recommendation.
 1. The SDB II Program Office should pay particular attention to the lethality of the modified warhead and impact on weapon accuracy of end-to-end flight testing in more challenging environments and conditions when moving to the Government Confidence Test phase of the program.