UNITED STATES ARMY
SPACE AND MISSILE
DEFENSE COMMAND

SMD–TC
Space & Missile Defense
Technical Center

MKV

Multiple Kill Vehicles

Summary

- Effective and affordable solution to the emerging midcourse threat
- Destroys multiple credible objects – both lethal threats and decoys
- Dramatically reduces threat leakage
- Integrated with all Ballistic Missile Defense System assets
- Adaptable to multiple basing options

The next generation in midcourse missile defense.

Ballistic missile defense elements must have the ability to effectively negate re-entry vehicles in the midcourse portion of their trajectory to effectively support a layered missile defense architecture. The MKV System will provide a cost effective means for addressing countermeasures by intercepting all credible threat objects within a threat cluster with one or more kill vehicles. Practical use of low cost kill vehicles for these applications will require: 1) proper balance of functions between the carrier vehicle and the kill vehicles; and 2) substantial reduction of kill vehicle size, mass, and acquisition cost.

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Overview

The U. S. Army's Space and Missile Defense Technical Center (SMDTC), serving as the Missile Defense Agency's Executing Agent, is pursuing development of a revolutionary interceptor design that will accommodate the launch of multiple kill vehicles (MKV) on a single booster. The MKV program will provide a significant increase in the robustness of ballistic missile defense layered defenses that use complementary interceptors, sensors, and battle management systems to provide multiple engagement opportunities against threats in the boost, mid-course, and terminal phases of flight.

Benefits for Tomorrow's Defense

While the end of the Cold War signaled a reduction in the likelihood of global conflict, the threat from foreign ballistic missiles has grown steadily as sophisticated missile technology becomes available on a wider scale. The proliferation of weapons of mass destruction and the missiles that could deliver them, pose a direct and immediate threat to the security of the United States, its military forces and assets in overseas theaters of operation, as well as our allies and friends. At least 25 countries now possess, or are acquiring, nuclear, biological and chemical (NBC) weapons. Since 1980, ballistic missiles have been used in six regional conflicts. The MKV program is critical to ensure that threat targets are successfully engaged in all phases of flight.

Technical Concept

Ballistic missile defense systems must have a capability to negate re-entry vehicles during the mid-course portion of their trajectory in order to meet specified battlespace and probability of leakage goals supporting a layered missile defense architecture. A-priori knowledge of threat signatures will likely be inadequate for reliable discrimination even with good measurements, and countermeasures such as anti-simulation and encapsulated re-entry vehicles. These problems will be addressed by a MKV interceptor system. The MKV System will provide a cost effective means for addressing countermeasure suites by intercepting all credible threat objects within a threat cluster with one or more kill vehicles. Practical use of low cost kill vehicles for these applications will require: 1) proper balance of functions between the carrier vehicle and the kill vehicles; and 2) substantial reduction of kill vehicle size, mass, and acquisition cost.

The Space and Missile Defense Technical Center has been developing concepts for an MKV system and supporting technologies for over 10 years. The MKV program's primary effort began with the MKV System Concept Development Task following initial work executed by SMDTC under MDA's Innovative Science and Technology Program. The MKV System Concept Development task included three contractor teams engaged in designing system concepts with emphasis on the carrier vehicle (CV) and miniature kill vehicles. Following the System Concept Development effort, an MKV System Development effort was initiated to focus on advanced technology development, detailed designs, system integration and ground test, and Integrated Flight Tests to demonstrate all critical MKV system functions.

For more information, please contact:
U.S. Army Space and Missile Defense Command
Public Affairs Office
P.O. Box 1500
Huntsville, AL 35807-3801
Phone: 256-955-3887
Fax: 256-955-1214
Email: webmaster@smdc.army.mil

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