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Ballistic Missile Defense

President Reagan's keen desire to modernize U.S. strategic defense and efforts to define how to implement this modernization continued, in FY 83, to focus attention on the Army's ballistic missile defense (BMD) research and development effort conducted by the Army BMD Organization (BMDO). The Army BMDO, a field operating agency of the Chief of Staff, Army, was located in Huntsville, Alabama, with a BMD Program Office in the Washington, D.C., area.

A presidential commission established to review the strategic modernization program and to find an acceptable basing mode for the Air Force MX inter-continental ballistic missile (ICBM), which the president renamed Peacekeeper, recommended in March 1983 that the U.S. house Peacekeeper in existing Minuteman silos and continue vigorous research and development of BMD. Then, on 23 March, the president reaffirmed his desire for strategic modernization and directed completion of a comprehensive and intensive effort by October 1983 "to define a long-term research and development program to achieve our ultimate goal of eliminating the threat posed by strategic nuclear missiles." To conceptualize the program, which would be named the Strategic Defense Initiative (SDI) by year's end, the Secretary of Defense appointed a Defense Technologies Executive Committee consisting of a Defensive Technologies Study Team subgroup, and a Future Security Strategy Study subgroup. Both looked to the Army BMDO and its contractors for input and support. Several members from the organization served full time on the panels for these committees, while others briefed the panels on various aspects of the BMD effort.

Guided by the president's strategic initiatives, which were implemented by National Security Decision Directives 69 and 83, and which were taken into account the action of Congress in deleting deployment funding in FY 83, the Department of Defense (DOD), the Army Secretariat, and Army BMDO management restructured the BMD program. The restructured program de-emphasized work in support of a potential near-term deployment decision, but maintained a deployment hedge option and increased emphasis on improving technology that could support a full range of missions in the future. Funds, which resulted from the termination of the SENTRY interceptor development effort, along with increased funding of $57 million over that budgeted for FY 82, permitted the Army to expand its efforts in optical tracking, non-nuclear kill (NNK) techniques, exoatmospheric defense, and continued development of selected critical components of SENTRY system hardware and software.

The FY 83 efforts were manifested in two ongoing programs: the BMD Advanced Technology Center's (BMDATC) Advanced Technology Program, and the Ballistic

Missile Defense Systems Command's (BMDSCOM) Systems Technology Program. BMDSCOM continued to operate Kwajalein Missile Range in support of the above BMD programs, supported Air Force strategic offensive weapons testing, and collected data in support of the DOD intelligence community.

In the Advanced Technology Program, BMDATC performed research and development on technologies supporting improvement in near-term BMD and preventing technological surprise by an adversary. The center emphasized technology for advanced defensive systems in all operating regimes: boost phase, post-boost phase, the exoatmospheric/high endoatmospheric or midcourse phase, and the endoatmospheric or terminal phase.

The Army more than doubled the program budget for BMDATC's Endoatmospheric NNK program, permitting new initiatives and accomplishments in the areas of warheads, radomes, and controls. It successfully demonstrated destruction of full-scale, threat-type reentry vehicles through two hypersonic sled tests of a full-scale NNK focused warhead. Component tests of control thrusters demonstrated dramatic improvement in throttling capability and fast response times. It also started validation of flyable brass board controls. BMDATC initiated development on a cooled metallic radome concept and development of high density silicon nitride material for radomes. Plans and preparations began for subscale radome testing. A millimeter wave (MMW) instrumentation radar installed at the Kwajalein Missile Range obtained limited reentry vehicle signature data. BMDATC developed a breadboard model of conformal array MMW and made it ready for testing in 1984. BMDATC also initiated and completed preliminary design review of a Small Radar Homing Interceptor Technology flight experiment to demonstrate achievable small miss distance against both fixed and ballistic moving targets. In response to the president's SDI, BMD management began, late in FY 83, to realign the Endoatmospheric NNK program to shift emphasis from low endoatmospheric to high endoatmospheric defense.

In an electromagnetic accelerator program, BMDATC explored the application of electrical energy as an alternative to chemical-reaction powered guns and missiles to provide non-nuclear kinetic energy kill capability for BMD purposes. BMDATC initiated technology analysis and subsystem/component design and development efforts for several concepts and plans for a ground test-bed to validate applicable electromagnetic accelerator technologies. Besides the above, BMDATC continued to develop and extend the technology base for advanced BMD and made progress particularly in the development of distributed data processing technology.

In the Systems Technology Program, BMDSCOM continued research and development of BMD systems options. The restructuring of the BMD program to de-emphasize an early deployment capability provided opportunities to more efficiently integrate and validate maturing technologies into evolving system concepts that the Army could deploy should it deem a defensive system necessary.

BMDSCOM also continued development of SENTRY related technology other than that for the interceptor. These efforts produced a number of achievements in the development of a state-of-the-art radar, data processing hardware and software, and guidance and control systems and in the definition of deployment and command, control, communications, and intelligence (C3I) requirements for terminal defense application in a layered defense system. The signature measurement radar, at the Kwajalein Missile Range, and a shipborne Cobra Judy radar collected dedicated target data from mission twenty-two in the Systems Technology Reentry Experiment Program. BMDSCOM completed pitch and yaw engine test on the SENTRY Jet Interaction Control System, as well as initial propulsion test vehicle static firings, including a motor plume test. They also completed the radar antenna design and tested a prototype in a simulated nuclear environment.

BMDSCOM completed phase I of an Airborne Optical Adjunct (AOA) study that it had begun in 1982. The phase I effort identified the utility and need for an AOA system, defined system requirements for an aircraft-mounted optical sensor that the Army could use to augment other sensors in a BMD system in the search and acquisition of threatening missile warheads, established critical development issues, and completed an AOA demonstration program plan. BMDSCOM then modified the plan to incorporate suggestions from Army management, the Army Science Board (ASB), and experts from private organizations. In phase II, which began in March 1983, the command used the plan in formulating, specifying, and writing the scope of work and technical requirements for the Request for Proposal.

In another effort to define systems, BMDSCOM determined effective combinations of BMD and passive defense measures for use in the protection of urban industrial and military targets, and assessed the impact of the introduction of passive defense measures on BMD requirements. Systems definition also continued on BMD concepts for the 1990s with separate contract efforts relating to sea-launched BMD, high value target defense, and ICBM defense. Another contract, initiated in February 1983, involved incorporating results of previous BMD/90s concepts to update an existing baseline design into a defense system capable of defending a broad set of targets.

BMDSCOM's System Technology Project Office continued to determine and publish threat projections for BMD studies. A special effort involving research of Soviet countermeasures produced a five-year Countermeasure Plan. A Threat-Specific Program, which began in June 1982, provided continuity to consideration of non-conventional BMD concepts, ranked candidate Threat-Specific Systems, and proposed further development of concepts that demonstrate real potential for BMD application. An Attack Working Group, chartered to define realistic attacks on U.S. targets and to identify those which could be defended by various BMD systems, concentrated on Soviet attack capabilities on closely speed basing (CSB) deployments for Peacekeeper, attack laydowns, and AOA scenarios.

During the year, BMDSCOM initiated a BMD road map project to identify alternatives for the Systems Technology Program and to provide priorities for the alternatives. The effort involved top-level assessment of BMD missions, strategic threat, potential attack scenarios, technology maturity and availability, strategies environment, and political factors such as treaty considerations, public opinion, and allied concerns. BMDSCOM has provided data from this effort to the DOD for use in the Strategic Defense In-depth study. During the last six months of this fiscal year, the command performed studies identifying BMD technology applicable to antitactical missiles in support of an antitactical missile analyses effort being performed by the Army Missile Command.

In October 1982, the U.S. and the Republic of the Marshall Islands completed negotiation for a new Interim Use Agreement regarding present and future use of the Kwajalein Missile Range. The agreement allows for continued operation of the range through FY 85 or until the Compact of Free Association comes into effect ending the trusteeship the U.S. has exercised over Micronesia since 1947. In September 1983, the Republic of the Marshall Islands signed the compact, which both houses of Congress must approve. Throughout the year, the Kwajalein Missile Range provided technical and logistical support of on-site BMD research and development programs and continued operations supporting national strategic offensive and defensive weapons testing. The range participated in eighteen major U.S. launched missions, including that of the first Peacekeeper launched from Vandenberg Air Force Base in California. In addition, the range supported four National Air and Space Administration (NASA) Space Transportation System flights.