Ballistic Missile Defense: Historical Overview

Steven A. Hildreth
Specialist in Missile Defense

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Summary

For some time now, ballistic missile defense (BMD) has been a key national security priority, even though such interest has been ongoing since the end of World War II. Many current BMD technologies date their start to the 1980s, and even earlier. This effort has been challenging technically and politically controversial. For a 25-year review of the major BMD technology thrust, see CRS Report RL33240, *Kinetic Energy Kill for Ballistic Missile Defense: A Status Overview*, by (name redacted).

More than $120 billion has been spent on a range of BMD programs since the mid-1980s; Congress appropriated $9.4 billion for FY2007 and $9.9 billion for FY2008. This report provides a brief overview of U.S. BMD efforts to date. It may be updated periodically.

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Introduction

Since the mid-1980s, many decision makers and others have demonstrated serious interest in deploying ballistic missile defense (BMD) systems capable of defending the United States from ballistic missile attack. Events over the past two decades contributed to strengthen these views. The collapse of the Soviet Union in the early 1990s heightened concerns about the possibility of an accidental or unauthorized launch of ballistic missiles from the remnants of that nation. The Persian Gulf War in 1991, with Iraq's use of Scud missiles, proved to many that the growing threat posed by ballistic missiles had to be addressed. The proliferation of ballistic missile technologies, including sales from nations such as China, Russia, and North Korea to nations such as Iran, Syria, and Pakistan became more worrisome to many. Finally, many also argue that some U.S. adversaries, such as North Korea and Iran, are developing longer-range missiles that might reach the United States, or threaten U.S. military forces deployed abroad, as well as U.S. friends and allies.

But interest in missile defense stretches back much further than the 1980s. In fact, efforts to counter ballistic missiles have been underway since the dawn of the missile age at the close of World War II. Numerous programs were begun, and only a very few saw completion to deployment. Technical obstacles have proven to be tenacious, and systems integration challenges have been more the norm, rather than the exception. Since 1985, the United States has spent more than $120 billion on a range of BMD efforts. In 2004, the United States deployed a small-scale national-level missile defense, which is still being tested but considered by most military leaders to be operationally effective.

This short report provides a brief overview of the history of the BMD efforts undertaken to defend the United States. It begins with a brief summary of the provisions of the 1972 ABM Treaty, which shaped most of the history of the U.S. BMD effort, and includes a short review of U.S. programs leading to the current program.

The 1972 Anti-Ballistic Missile (ABM) Treaty

Negotiations with the Soviet Union on the Anti-ballistic Missile (ABM) Treaty began in November 1969. Early on the United States proposed that the treaty limit Russia to one deployment site around Moscow (which it was building) and permit the United States to deploy four sites around ICBM fields, which was the U.S. program at the time (construction had begun on a site near Grand Forks, ND). The Soviets rejected this proposal, insisting any agreement include equal limits on each nation. They had the same reaction when the United States proposed that the treaty permit either nation to deploy one site at its capital or two sites at ICBM fields. Eventually, the Nixon Administration agreed to accept parity in ABM deployments; each nation could deploy two sites, one around its capital and one around an ICBM field. This permitted the continued construction of each nation's existing ABM site.

Signed in May 1972, the Anti-Ballistic Missile (ABM) Treaty prohibited the deployment of ABM systems for the defense of the nations' entire territory. It permitted each side to deploy limited ABM systems at two locations, one centered on the nation's capital and one at a location around ICBM silo launchers. When it became clear that neither nation would complete a second site, the two sides agreed in a 1974 Protocol that each would have only one ABM site, located either at the nation's capital *or* around an ICBM deployment area. Each ABM site could contain no more than 100 ABM launchers and 100 ABM interceptor missiles. The Treaty also specified that in the

future any radars that provided early warning of strategic ballistic missile attack had to be located on the periphery of the national territory and oriented outward. The Treaty banned the development, testing, and deployment of sea-based, air-based, space-based, or mobile land-based ABM systems and ABM system components (these included interceptor missiles, launchers, and radars or other sensors that can substitute for radars). The Treaty placed no restrictions on the development, testing, or deployment of defenses against shorter range missiles. Although the United States withdrew from the ABM Treaty in 2002, the treaty profoundly shaped U.S. BMD efforts up to that point.

History of NMD in the United States

Sentinel and Safeguard Programs

The United States has pursued research and development in anti-ballistic missile (ABM) systems since the late 1940s. In the mid-1960s it developed the Nike-X system, which would have used ground-based, nuclear-armed interceptor missiles deployed around a number of major urban areas to protect against Soviet missile attack. Many analysts recognized that such protection would be limited, in part because the Soviet Union could probably saturate the system with offensive warheads and just a few warheads could achieve massive damage against a "soft" target like a city. In response, supporters argued that the system could provide a "thin" defense of U.S. cities against an attack by an anticipated Chinese intercontinental ballistic missile (ICBM) force. Consequently, in 1967 Defense Secretary McNamara announced the deployment of the Sentinel ABM system, based on the Nike-X system, as a defense against a future Chinese ICBM threat.

In 1969, the Nixon Administration renamed the system "Safeguard," and changed its focus to defend strategic offensive (i.e., nuclear-tipped ICBMs) missile fields, rather than cities, to ensure that these missiles could survive a first strike and ensure retaliation against the Soviet Union. Many in Congress objected to the program, citing its costs, technical uncertainties, and the risk of accelerating the arms race. Congress almost stopped the program's deployment in 1969, when the Senate voted 50-50 to approve an amendment halting construction. Safeguard continued, however, when Vice President Agnew broke the tie with a vote for the program. Nevertheless, sentiment against ABM deployments and in favor of negotiated limits on ABM systems was growing.

The United States completed its nuclear interceptor ABM site near Grand Forks, North Dakota. It operated from October 1975 to February 1976, then was shut down at the direction of Congress because it was viewed to be not cost-effective and had major technical problems. The facilities at that location, however, continued to count under the ABM Treaty because it had not been dismantled according to a classified post-Treaty agreement reached with the Soviet Union. Russia continues to this day to operate its ABM site around Moscow.

U.S. research and development into ABM systems, especially for ICBM protection, continued, albeit at lower budget levels through the late 1970s. By the time of the Carter Administration, however, spending on BMD programs had began to rise again, primarily as a means to defend the newest generation of U.S. ICBMs—the MX missile system.

The Strategic Defense Initiative (SDI)

The Reagan Administration continued to increase funding for defenses against ICBMs begun under the Carter Administration. But, in March 1983, President Reagan announced an expansive, new effort to develop non-nuclear BMD to protect the United States against a full-scale attack from the Soviet Union. Although the Strategic Defense Initiative (SDI) remained a research and development effort, with little testing and no immediate deployments, President Reagan and the program's supporters envisioned a global defensive system with thousands of land-, sea-, air-, and space-based sensors and interceptors. This defensive "shield" would employ both non-nuclear interceptor missiles and more exotic laser or x-ray devices in space designed to destroy incoming missiles. With these technologies, the United States would replace deterrence with defense in its effort to protect itself from Soviet attack. However, as cost estimates and technical challenges increased, the Reagan Administration scaled back its objectives for SDI. It announced that it would begin with a "Phase I" deployment of land-based and space-based sensors and interceptors. This system would not provide complete protection from Soviet attack, but would, instead, seek to disrupt the attack enough to call into question the attack's effectiveness. Phase I of SDI would, therefore, according to their arguments, enhance deterrence, while the United States continued to seek a way to replace deterrence with defense. Although Congress largely supported BMD research and development, it generally opposed plans for significant BMD deployments at that time.

The Reagan Administration and the program's supporters recognized that many of the technologies pursued under SDI would not be allowed by the ABM Treaty when they entered the testing or deployment phases. Therefore, the Reagan Administration outlined a new interpretation of the ABM Treaty that it hoped would allow for the testing of space-based and exotic missile defense technologies. Many in Congress at that time objected to this re-interpretation of the ABM Treaty, with Senator Sam Nunn mounting a particularly comprehensive defense of the traditional interpretation of the Treaty. Throughout this period, Congress tendered strong support for the ABM Treaty. The Reagan Administration also opened new negotiations with the Russians, known as the Defense and Space talks, in an effort to reach agreement on modifications to or a replacement for the ABM Treaty.

Global Protection Against Limited Strikes (GPALS)

The first Bush Administration responded to the costs and technical challenges of Phase I and the changing international political environment with a further contraction of the goals for SDI. Instead of seeking to protect the United States against a large-scale attack, the United States would seek to deploy a defensive system that could provide Global Protection Against Limited Strikes (GPALS); a more modest version of the original SDI vision. This new focus recognized that the demise of the Soviet Union had reduced the likelihood of a large-scale attack, but also the increased likelihood of a small accidental or unauthorized attack. In addition, this type of ballistic missile defense would have sought to protect the United States, its forces, and allies against an attack by other nations who had acquired relatively small numbers of ballistic missiles.

The Bush Administration envisioned a GPALS system that would have included up to 1,000 land-based interceptors and perhaps another 1,000 space-based interceptors, along with space-based sensors. The Administration recognized that this system would have exceeded the limits in the ABM Treaty. It therefore held negotiations with the Russian government in 1992 in an effort to identify a more cooperative and flexible regime to replace the ABM Treaty. The Clinton Administration suspended these negotiations in 1993, when it also scaled back U.S. objectives for

a national missile defense program. Meanwhile, some in Congress, notably Senator Nunn, had argued since the late 1980s for the deployment of a more limited NMD system, that would comply with the ABM Treaty, to protect against limited or accidental attacks.

National Missile Defense Technology Development

The Clinton Administration restructured BMD programs to reflect the results of the 1993 Bottom Up Review, a major DOD-wide review of U.S. military plans and programs. At the time, it decided to emphasize missile defense deployment geared toward short-range missile threats, and focus national level efforts on technology development. Secretary of Defense Aspin noted at the time that these program changes reflected an assessment that the regional ballistic missile threat already existed, while a ballistic missile threat to the United States *per se* might emerge only in the future. This raised questions about the need for an NMD system in the near- to mid-term, particularly as compared with the need for robust theater missile defense efforts. The Department of Defense also determined that these programs would still be conducted in compliance with the 1972 ABM Treaty.

Key legislation was passed during this time. The Missile Defense Act of 1995 (in P.L. 104-106—National Defense Authorization Act for Fiscal Year 1996) declared it the policy of the United States to: (1) develop as soon as possible affordable and operationally effective theater missile defenses; (2) develop for deployment a multiple-site national missile defense system that is affordable and operationally effective against limited, accidental, and unauthorized ballistic missile attacks on the United States, and which can be augmented over time as the threat changes to provide a layered defense against limited, accidental, or unauthorized ballistic missile threats; (3) initiate negotiations with Russia as necessary to provide for the national defense systems envisioned by the act; and (4) consider, if those negotiations fail, the option of withdrawing from the ABM Treaty.

The Clinton Administration adjusted its efforts and adopted a new NMD strategy. In 1996, the Clinton Administration adopted a 3+3 strategy, to guide development and potential deployment. Under this strategy, the United States would develop a national missile defense system to defend the United States against attacks from small numbers of long-range ballistic missiles launched by hostile nations, or, perhaps, from an accidental or unauthorized launch of Russian or Chinese missiles. The strategy envisioned continued development of NMD technologies during the first three years (1997-2000), followed by a deployment decision (in 2000) if the system were technologically feasible and warranted by prospective threats. If a decision to deploy an NMD system were made, the plan then was to deploy it within the second three year period (2000-2003). Development and deployment was to be conducted within the limits of the ABM Treaty. This approach was later modified to allow a longer lead time for possible deployment (possibly 2005), and according to the Pentagon at that time, to reduce the amount of program risk. Ultimately, in September 2000, President Clinton decided not to authorize deployment of an NMD system at that time. He stated that he could not conclude "that we have enough confidence in the technology, and the operational effectiveness of the entire NMD system, to move forward to deployment."

National Missile Defense Acquisition

President George W. Bush entered office prepared to advance long-range BMD deployment as a key national security objective. The Bush Administration substantially increased funding for

BMD programs and laid the foundation for withdrawal from the 1972 ABM Treaty, which was announced in June 2002. Much of the Bush Administration's argument centered around a different strategic environment from 1972: Soviet forces no longer threatened the United States and the greater threat came from the proliferation of ballistic missiles and weapons of mass destruction from other countries, especially rogue states, and terrorists. The Russian government gave little opposition to the Administration's decision to withdraw from the treaty, and potential allied criticism in Europe was notably muted.

Also in 2002, the President announced his decision to deploy a limited BMD capability against long-range missiles by the fall of 2004. A handful of ground-based interceptors was deployed in Alaska by this date. To most observers, on-going testing is demonstrating the capabilities of that deployed system. More than 20 interceptors are now deployed in Alaska and California. The Bush Administration wants to expand this capability to a third site in Europe to defend against Iranian ballistic missile threats, but Congress has put this effort on hold pending further testing of the interceptors and final agreement on deployment with Poland and the Czech Republic.[1] Russian opposition has been strong, and European support is mixed.

History of TMD in the United States

U.S. efforts to develop effective defenses against shorter range ballistic missile threats to U.S. forces deployed overseas grew out of the Army's formal requirement for a theater ABM system in 1949 and produced a succession of systems, including the development and maturity of the Patriot air defense system from the 1960s to the present. As Patriot developed further in the 1980s, some argued for its potential also as a theater missile defense (TMD) capability. Although the Pentagon, Army, and the SDI Organization initially were not supportive of the effort at first, Congress increasingly argued successfully for Patriot's development of an anti-tactical missile (ATM) defense. By the time of the 1991 Persian Gulf War, the Patriot ATM had experienced a remarkably successful test record.[2] Acquisition of Patriot missiles for Desert Storm was accelerated after Iraq invaded Kuwait. On the battlefield, however, Patriot's success, or lack of it in Desert Storm, remains a subject of controversy despite most public perceptions of unequivocal success.[3]

Nonetheless, Congress and the Department of Defense determined subsequently that the Patriot concept to defend against shorter range ballistic missile threats to U.S. forces overseas warranted further support. The Patriot system had been upgraded several times by the time of the recent war against Iraq. On the battlefield, Patriot was considered more successful than in 1991, but with mixed results.[4] Congress and the Pentagon continue to support development of other highly effective TMD systems, especially a maritime capability built around existing naval systems and infrastructure that have been deployed or in development for decades.[5] In terms of program and

[1] CRS Report RL34051, *Long-Range Ballistic Missile Defense in Europe*, by (name redacted) and (name redacted).

[2] CRS Report 91-456F, *The Patriot Air Defense System and the Search for an Antitactical Ballistic Missile Defense*, by (name redacted) and Paul C. Zinsmeister (available from author upon request).

[3] Hearings before the House Government Operations Sub-committee on Legislation and National Security, April 7, 1992, on Patriot Performance in Desert Storm.

[4] CRS Report RL31946, *Iraq War: Defense Program Implications for Congress*, by Ronald O'Rourke (section on Ballistic Missile Defense).

[5] CRS Report RL33745, *Sea-Based Ballistic Missile Defense—Background and Issues for Congress*, by Ronald O'Rourke.

testing success, most observers agree that the U.S. effort to develop and deploy effective BMD against short-range missiles has been more successful relative to the U.S. effort to develop and deploy effective BMD against long-range or strategic ballistic missiles.

Author Contact Information

(name redacted)
Specialist in Missile Defense
-redacted-@crs.loc.gov, 7-....