

# Missile Defense Systems

By Lois Requist

National missile defense (NMD) is any system built to protect a country against incoming missiles. The interception technology may be designed to intercept at the beginning, middle or end of the missiles trajectory and may be either a laser or another missile.

The most common use of the term U.S. National Missile Defense has referred to "the limited ground-based nationwide antimissile system in development since the 1990s. In 2002, this system was renamed [Ground-Based Midcourse Defense](#) (GMD), to differentiate it from other missile defense programs, such as space-based, sea-based, laser, or high-altitude intercept programs."<sup>1</sup>

## History

Beginning in World War II, the U.S. military realized the need for missile defense systems. Study and research began soon after the war and continues to this day. It was in the 1950s when an actual national missile defense system, the Nike-Zeus, was introduced. The 1957 launching of Sputnik, the world's first artificial satellite, heightened concerns "about American vulnerabilities to a Soviet ICBM attack and created a political environment more supportive of developing and fielding an ABM system." <sup>2</sup> The army stopped further development of Nike-Zeus in 1962, though it was 1966 when testing ended and the program was cancelled. <sup>2</sup>

It was followed by the Nike X program, later renamed Sentinel. A scaled-down version of the 1963 Sentinel Program, the Safeguard Program, was announced in 1967 and was intended to defend U.S. cities from a limited attack. Later, the intent was changed to safeguard our ICBM-silo areas, so we would have the ability to retaliate. <sup>3</sup>

The United States and the U.S.S.R. signed the Anti-Ballistic Missile (ABM) Treaty in 1972 and revised it in 1974. The treaty originally allowed each side two fixed missile defense sites. One site would defend national command authorities; the other would defend a missile field, with no more than 100 total interceptors for both sites. A 1974 protocol reduced the number of sites to one. Since the United States was protecting an ICBM field at Grand Forks Air Force Base in North Dakota, this was the only U.S. ABM site allowed until June 2002, when the United States withdrew from the ABM treaty. "Having served its purpose as a political bargaining chip, the Safeguard site at Grand Forks was only operational from October 1975 to February 1976" due to technical problems.<sup>4</sup>

Both U.S. President Ronald Reagan and Soviet Premier Mikhail Gorbachev publicly supported the total elimination of nuclear weapons worldwide. However, the trust level between the two countries "between them, they had (and have) most of the nuclear weapons" was low. The Soviets were afraid the United States would develop weapons in space; the Americans were afraid the Soviets would agree to things that they would not, in fact, carry out. There was evidence that the Soviets weren't in compliance with the ABM treaty.

In 1983, President Reagan announced plans for a new program, the Strategic Defense Initiative, nicknamed "Star Wars," which would protect the United States and its allies. It was believed that by providing the system to the Soviet Union, the threat of nuclear war would end.

"With the end of the Cold War, President George H.W. Bush ordered a review of the SDI program." The result was some changing of the program to "develop strategic defenses against limited attacks on the United States and theater defense against attacks by short-range ballistic missiles on overseas forces."<sup>5</sup>

Called Global Protection Against Limited Strikes (GPALS), the program included three components: a global, space-based system, ground and sea-based theater missile defenses, and a ground-based national missile defense element. These elements were broken up during the Clinton Administration and adherence to the ABM treaty was emphasized.<sup>6</sup>

President Bill Clinton signed the National Missile Defense Act of 1999 which made it "the policy of the United States to deploy as soon as is technologically possible an effective National Missile Defense system capable of defending the territory of the United States against limited ballistic missile attack (whether accidental, unauthorized or deliberate)."<sup>7</sup> That is the U.S. government's current policy.

President George W. Bush was committed to deploying missile defense. He notified Russia of the U.S. withdrawal from the ABM treaty. Five long-range Ground-based Midcourse Defense (GMD) interceptors were deployed in Greeley, Alaska.<sup>8</sup>

## **Recent Policy and Systems**

At the end of the last century and the beginning of this one, the stated goal of U.S. National Missile Defense has been to prevent an attack on the United States by a rogue state or from nuclear blackmail or nuclear terrorism. North Korea and Iran were identified as countries that might launch such an attack, so deployment has proceeded for defense against those possibilities.

During the George W. Bush administration, long-range missile defense capabilities were built in Alaska, where there are 21 ground-based interceptors, and at Vandenberg Air Force Base in California, where there are three, as well as sea-based radar in Hawaii. The sea-based radar is described by General James Cartwright, vice chairman of the Joint Chiefs of Staff, as "the best sensor our nation has at our disposal." The radar, he says, would activate the 24 interceptors in Alaska and California with a "ninety percent-plus" likelihood of successful intervention in the event of deployment of a missile from North Korea.<sup>9</sup>

In addition, the U.S. Missile Defense Agency (MDA) proposed a Ground-based Midcourse Defense (GMD) element of the larger Ballistic Missile Defense System (BMDS) in Europe to defend against an Iranian threat. It was intended to include ten interceptors in Poland and radar in the Czech Republic, and be positioned in a country closer to Iran. The intent was that the entire European system be operational by 2013, at a cost of several billion dollars.

In December 2002, President Bush signed National Security Presidential Directive 23, which outlined a plan to begin deployment of operational ballistic missile defense systems by 2004. Subsequently, the United States formally requested from the United Kingdom and Denmark use of facilities in Fylingdales, England, and Thule, Greenland, respectively, as a part of the NMD program. These bases are to be equipped with early warning radar systems.<sup>10</sup>

"MDA's proposed system is controversial," according to "Options for Deploying Missile Defenses in Europe," a study by the Congressional Budget Office (CBO).<sup>11</sup>

In addition to the Poland/Czech Republic plan, the CBO offered three other options:

- Interceptors located on U.S. Navy Aegis ballistic missile defense (BMD) ships operating at three locations around Europe, supported by two transportable forward-based radars (FBRs);
- Ground-based interceptors operating from mobile launchers at two existing U.S. bases (in Germany and Turkey), supported by two transportable forward-based radars; and
- Ground-based Kinetic Energy Interceptors (KEIs, a new high-acceleration interceptor MDA that is currently being developed and could be based either in silos or on mobile transporters), operating from mobile launchers located at two existing U.S. bases in Europe (in Germany and Turkey), and supported by two transportable forward-based radars.<sup>[12](#)</sup>

In addition, the United States has an Airborne Laser (ABL), a plane that is designed to "locate and track missiles in the boost phase of their flight, then accurately point and fire the high-energy laser, destroying enemy missiles near their launch areas."<sup>[13](#)</sup>

## Obama Administration

The White House website says, "To better protect our forces and those of our allies, we intend to field more of our most capable theater missile defense systems, including the Terminal High Altitude Area Defense System (THAAD) and Standard Missile 3 programs, and convert additional Aegis ships to increase ballistic missile defense capabilities." <sup>[14](#)</sup>

Plans for missile defense systems in Poland and the Czech Republic were cancelled by President Barack Obama in September 2009. Since the plan had been in the works for several years, cancellation was controversial. Some in Poland and the Czech Republic were disappointed and felt more vulnerable to Russia, though many citizens of the two countries had not wanted the bases positioned in their country. The agreement had not been ratified by the legislative body of either country.

Russia had been outspoken in its opposition to American missile defense systems in Poland and the Czech Republic, saying it would cause an escalation in the arms race, and that the defense bases would be a threat to their country. After the Obama announcement, the Russians said they would not deploy missiles near Poland.

## Testing

While limited testing of missile defense systems has taken place, the results are inconclusive and experts disagree as to their success. Only a few tests have been conducted, and not all have been successful.

According to the Congressional Research Service report, "Long-Range Ballistic Missile Defense in Europe," testing of the current Ground-based Midcourse defense (GMD) began in 2002. "This effort was built on several earlier long-range BMD programs with decidedly mixed results themselves since the early 1980s. Since 2002, a number of GMD intercept flight tests have taken place with mixed results."<sup>[15](#)</sup>

As a result, Congress, in June 2009, put certain restrictions on approved funding. Given withdrawal of planned deployments in Poland and the Czech Republic, the Secretary of Defense was directed to pursue

development, testing, procurement and deployment of an alternative integrated missile defense system to protect Europe from all types of ballistic missiles. This option is conditional on certification that it is consistent with NATO efforts and is cost-effective, technically reliable and operationally available in protecting Europe and the United States.

In May 2009, the East-West Institute, a joint U.S.-Russian research organization, released a report which concluded that (1) Iran likely would not be able to acquire both nuclear weapons and delivery systems within the next five years, and (2) the missile defense system proposed by the Bush Administration for deployment in central Europe would be ineffective against eventual Iranian missiles outfitted with decoy devices and other countermeasures. [16](#)

Questions remain as to the effectiveness of any missile defense system. The Union of Concerned Scientists and the Security Studies Program at the Massachusetts Institute of Technology concluded: "Any country capable of deploying a long-range missile would also be able to deploy countermeasures that would defeat the planned NMD system." Possible countermeasures suggested were bomblets containing biological or chemical agents, aluminized balloons to serve as decoys, and disguising of warheads or cooling of warheads, thus reducing the kill vehicle's ability to detect them. [17](#)

In *Weapons of Terror . . . Freeing the World of Nuclear, Biological and Chemical Arms*, in 2006, the Weapons of Mass Destruction Commission (WMDC), chaired by Dr. Hans Blix states that missile defense systems "are also not entirely defensive in orientation" radars, surveillance systems, and even interceptors can also be used for offensive military purposes." [18](#)

## Cost

"Congress appropriates about \$9-\$10 billion for all missile defense activities annually (in recent years) and the government has spent some \$150 billion on all missile defense programs since President Reagan's 'Star Wars' speech in 1983," according to Steve Hildreth, co-author of the Congressional Research Service Report. [19](#)

## Conclusion

The U.S. missile defense systems are a work in progress. They may provide some level of security; however a number of qualifications should be mentioned:

- Test results have been mixed and have taken place over the ocean or over sparsely populated areas. There is no certainty as to what happens to the debris from taking out a missile.
- A decision to launch must be made within minutes, and (if fully operational) must be ready 24/7, thus there is no opportunity for consultation between governments in case of a technical error.
- Terrorists and political enemies aren't a stable commodity, so the systems we build, even if effective, don't offer security from an area not identified, e.g., a South American or African country.
- The building of missile defense systems may influence negotiations on the various treaties meant to limit or eliminate the threat of weapons of mass destruction being used. Russian Prime Minister Vladimir Putin, on Dec. 29, 2009, said, "U.S. plans for a missile defense system were the main obstacle to reaching a new deal on reducing Cold War arsenals of nuclear weapons." [20](#)

- The cost of such systems should be weighed against other needs.

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