

Kinetic energy ASATs would disable their targets by force impact rather than through explosion. An ASAT system would consist of an interceptor that is launched into approximately the same orbit as the target satellite, maneuvers close to it, and then explodes, destroying the target with a blast of metal pellets. In another system, the interceptor would destroy the target by direct collision with it. Another type of kinetic energy weapon is called the electromagnetic railgun. This weapon involves the use of electromagnetic forces to accelerate a mass which impacts the target at a great speed.

Space mines and other uses of projectile satellites as ASATs are also being investigated.

Directed energy weapons use energy itself, traveling at the speed of light to destroy a target. Essentially three types of directed energy weapons are being investigated: particle beam weapons, high energy lasers, and radio frequency weapons. Directed energy weapons project are designed to engage small, discrete targets without causing collateral damage. They have "soft kill" capability whereby sensors are blinded or electronics are disrupted by the energy these weapons emit. They also possess "hard kill" capabilities accomplished when the directed-energy penetrates the surface of an object and then causes the objects' fuel to ignite or to detonate.

Ballistic Missile Defense (BMD) System

The question of defense against a nuclear attack took on a new dimension with the development of research in the possible deployment of a ballistic missile defense (BMD). In 1983, the US launched a major research program known as the Strategic defense Initiative (SDI). This program has since been revised and in 1999, President Clinton signed into law the National Missile Defense Act (NMD) of 1999.

It is the policy of the US to deploy as soon as is technologically possible an effective NMD capable of defending the US territory against limited missile attack. It is aimed at addressing the growing danger that rogue nations may develop and field long-range missiles capable of delivering weapons of mass destruction against the US.

Four factors are identified for consideration in determining whether to deploy a limited NMD:

- the status of the NMD's technological development and testing;
- the cost effectiveness of the system;
- the nature of the threat;
- the progress in achieving US arms control objectives, including negotiating necessary amendments to the ABM Treaty.

The NMD will consist of land-based, non-nuclear missiles with a space-based detection system. More specifically, it would be composed of three elements: ground-based interceptor missiles, a battle management, command, control, and communications element; and four types of long-range sensors. All elements would work together to defend the US against incoming ballistic missile.

Ballistic missile defense systems, particularly the US NMD system, are highly controversial and have been the subject of intense debate.

Russia currently opposes the US NMD system and negotiations are underway between the US and Russia, at American initiative, aimed at modifying the ABM Treaty to allow for the US system. Russian President Putin has proposed working with the US and Europe to develop a