

The Nuclear Triad

Introduction

The United States maintains thousands of nuclear weapons and a variety of ways to deliver warheads. Nuclear weapons are unique because of their destructive power; the explosive yield of U.S. warheads varies from .3 kilotons (300 tons of TNT) to 1.2 megatons (1,200,000 tons of TNT). To put this in perspective, all explosives dropped during the six years of World War II, including the two nuclear weapons, equaled three megatons.

How Many?

The U.S. arsenal currently holds approximately [7,100 nuclear weapons](#). Of these, 2,080 are deployed, 2,680 are in storage, and 2,340 have been retired and are awaiting dismantlement.

What is the Triad?

The U.S. nuclear arsenal is comprised of three legs, or methods of delivery. Warheads can be launched from the air via strategic bombers carrying gravity bombs or cruise missiles, from the sea by submarines holding ballistic missiles, or from underground silos also containing ballistic missiles. In theory, each leg is necessary to hedge against the failure of another.

U.S. nuclear weapons policy is generally in line with the policy of deterrence – the credible threat of retaliation if it or an ally is attacked. Thus the arsenal is designed to retain a second-strike capability, or the ability to survive devastating losses incurred during a nuclear attack, and to retaliate in kind.

Under current plans, all three legs of the triad will be modernized at the same time – a cost estimated at [up to \\$1 trillion](#).

Air

There are two distinct nuclear weapons systems delivered by plane – nuclear air-launched cruise missiles (ALCM), which are guided and highly accurate, and gravity bombs, which require a plane to deploy them near a desired target. Currently, certain B-52 bombers can carry gravity bombs and nuclear-tipped ALCMs, and B-2 stealth bombers contain gravity bomb capabilities. Largely due to the New Strategic Arms Reduction Treaty (START) with Russia, the U.S. is committed to reducing its nuclear-capable strategic bomber force to 60 planes (41 B-52s and 19 B-2s) by 2018. Each plane can carry multiple nuclear weapons.

Current nuclear modernization plans include continued production of a new gravity bomb (B61-12) and a new nuclear cruise missile, known as the Long Range Standoff Weapon (LRSO).

Many analysts, including former [Secretary of Defense William Perry](#), are concerned about the adverse effects of nuclear-tipped cruise missiles. ALCMs can carry both thermonuclear and conventional warheads, and this “dual-use” nature could be destabilizing, as an opposing force would be unable to determine an ALCM’s payload in mid-flight. For [this and other reasons](#), analysts have called for the cancellation of the new cruise missile.

Sea

The sea-leg of the nuclear triad currently consists of 14 Ohio-Class ballistic missile submarines (SSBNs). These submarines are capable of firing ballistic missiles from submerged positions into the air and above the atmosphere, following the curvature of the Earth, and ultimately descending back through the atmosphere to hit an intended target. The sea leg of the triad is often considered the most critical, since submarine whereabouts are difficult to track and destroy.

Current U.S. SSBNs can launch up to 24 nuclear-capable ballistic missiles with multiple warheads per missile. Largely due to New START, the number of launch tubes is being reduced to 20 by 2018.

Nuclear modernization plans call for Ohio-Class SSBNs to be replaced, with 12 scheduled submarines slotted for production. During the production phase, the U.S. will operate 10 nuclear submarines for a decade. The upcoming class, currently known as SSBN(X), will reduce its missile tubes to 16.

Ground

The current ground-based deterrent system is composed of 450 deployed Minuteman III intercontinental ballistic missiles (ICBMs). U.S. ICBMs are housed in underground silos in three active wings in Montana, Wyoming, and North Dakota. Largely due to New START, the number of deployed missiles will drop to 400 by 2018.

Similar to ballistic missiles launched from submarines, an ICBM is boosted above the Earth's atmosphere, where its trajectory follows the curvature of the Earth until it descends to reach an intended target.

ICBMs must fly over the Russian mainland to reach the majority of projected targets, and thus any unforeseen launch could be destabilizing. The anchored nature of ICBM silos also makes them vulnerable to attack. However, many experts believe that it would take multiple nuclear projectiles to ensure their destruction. Consequently, this leg of the Triad is often referred to as a nuclear sponge.

Nuclear modernization plans call for an update to the ICBM force known as the Ground Based Strategic Deterrent (GBSD), which will contain 400 new or refurbished deployed missiles.

Learn more about the US nuclear weapons complex by visiting www.armscontrolcenter.org