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# Defense Primer: Strategic Nuclear Forces

The United States is in the process of modernizing its strategic nuclear forces. This modernization effort includes numerous Department of Defense (DOD) major defense acquisition programs, some of which are annually assessed by the Government Accountability Office, and warhead modernization programs implemented by the National Nuclear Security Administration (NNSA), a semi-autonomous agency in the Department of Energy. In 2023, the Congressional Budget Office estimated that U.S. programs to operate and modernize nuclear forces would cost $756 billion over the next 10 years. The FY2025 DOD budget requests "$49.2 billion for the modernization, sustainment, and operations of all three legs of the nuclear triad." Members of Congress have shown strong interest in conducting oversight of U.S. nuclear modernization efforts.

## The Nuclear Triad

Since the early 1960s, the United States has maintained a "triad" of strategic nuclear delivery vehicles. These include long-range land-based intercontinental ballistic missiles (ICBMs), long-range submarine-launched ballistic missiles (SLBMs) on strategic nuclear submarines (SSBNs), and long-range heavy bombers. The U.S. nuclear warhead stockpile has decreased in number as the United States changed nuclear planning requirements after the Cold War and complied with arms control agreements.

U.S. strategic forces are currently limited by the 2011 U.S.-Russian New START treaty. **Table 1** displays U.S. nuclear forces, as of September 1, 2022, accountable under that treaty. The United States had 1,419 warheads deployed on 662 missiles and bombers as of March 1, 2023, according to a more recent State Department fact sheet. The State Department has stated that the United States "is prepared to adhere" to the treaty's central limits (1,550 deployed warheads on 700 deployed strategic launchers; 800 total strategic launchers) "as long as it assesses the Russian Federation is doing so."

**Table 1. U.S. Strategic Nuclear Forces in 2022**

| System | Total Launchers | Deployed Launchers | Warheads |
|---|---|---|---|
| Minuteman III ICBM | 454 | 396 | 396 |
| Trident (D-5) SLBM | 280 | 220 | 981 |
| B-52 bombers | 46 | 33 | 33[a] |
| B-2 bombers | 20 | 10 | 10[a] |
| Total | 800 | 659 | 1,420 |

**Source:** U.S. Department of State. New START Treaty Aggregate Numbers of Strategic Offensive Arms, September 1, 2022.

a. The treaty attributes one warhead to each deployed bomber, although each could carry up to 20 bombs or cruise missiles.

## Rationale for the Triad

Early in the Cold War, the United States developed three types of nuclear delivery vehicles, in large part because each of the military services wanted part of the U.S. nuclear arsenal. Eventually, DOD came to argue that different basing modes' complementary strengths could enhance nuclear deterrence. As the 2010 Nuclear Posture Review (NPR), a periodic assessment of U.S. nuclear policy, summarized the post-Cold War evolution of this thinking:

> [SSBNs] and the SLBMs they carry represent the most survivable leg of the U.S. nuclear Triad.… Single-warhead ICBMs contribute to stability, and like SLBMs are not vulnerable to air defenses. Unlike ICBMs and SLBMs, bombers can be visibly deployed forward, as a signal in crisis to strengthen deterrence of potential adversaries and assurance of allies and partners.

The U.S. government has reaffirmed the value of the nuclear triad and the importance of its modernization in a series of NPRs. The Obama Administration stated in the 2010 NPR that the unique characteristics of each leg of the triad were important to "maintain strategic stability at reasonable cost, while hedging against potential technical problems or vulnerabilities." The Trump Administration stated in the 2018 NPR that "the triad's synergy and overlapping attributes help ensure the enduring survivability of our deterrence capabilities against attack and our capacity to hold a range of adversary targets at risk throughout a crisis or conflict." The Biden Administration's 2022 NPR argued that "maintaining a modern triad possessing these attributes—effectiveness, responsiveness, survivability, flexibility, and visibility—ensures that the United States can withstand and respond to any strategic attack, tailor its deterrence strategies as needed, and assure Allies in support of our extended deterrence commitments."

## Current Forces and Modernization Plans

### ICBMs

Before implementing the New START Treaty, the United States deployed 450 Minuteman III ICBMs at Air Force bases in Wyoming, Montana, and North Dakota. Under New START, the number has declined to 400 deployed missiles, although the Air Force has retained all 450 silo launchers. While each Minuteman III missile originally carried three warheads, the United States deploys the missile with a single warhead in order to comply with New START levels. The Air Force has completed life extension programs (LEPs) to improve the accuracy and reliability of the Minuteman III.

The Air Force is also developing a new ICBM, the Sentinel, previously known as the Ground-based Strategic Deterrent

(GBSD), which will replace all Minuteman III ICBMs. The Air Force plans to acquire 659 missiles to support testing and the deployment of 400 missiles. The NNSA is developing a new W87-1 warhead to deploy on the Sentinel. For FY2025, the Biden Administration requested $3.7 billion for the Sentinel in the DOD budget and $1.1 billion for the W87-1 warhead in the NNSA budget. In 2024, DOD conducted a congressionally mandated review of the Sentinel program due to cost overruns and delays. (See CRS In Focus IF11681, *Defense Primer: LGM-35A Sentinel Intercontinental Ballistic Missile*.) Some analysts have argued that the ICBM leg of the triad may be too costly to recapitalize or even unnecessary.

### SLBMs

The United States currently has 14 Trident (Ohio-class) SSBNs. Under New START, each submarine carries only 20, rather than the original 24, missiles. Using treaty counting rules, the 14 submarines count as a total of 280 deployed and nondeployed launchers, with a maximum of 240 deployed launchers and around 1,000 warheads counting on 12 operational boats (assuming two submarines are in overhaul). The Navy operates SSBN bases in Washington and Georgia.

The Navy is procuring 12 new Columbia-class submarines that feature 16 SLBM tubes each. The lead boat was supposed to enter service in 2031, but the Navy recently stated that it is delayed by over a year. The Navy requested $9.9 billion for the Columbia-class submarine in its FY2025 budget submission. (See CRS Report R41129, *Navy Columbia (SSBN-826) Class Ballistic Missile Submarine Program: Background and Issues for Congress*.)

U.S. SSBNs carry the D-5 SLBMs. The Navy conducts Life Extension Programs (LEPs) so that the missile remains capable and reliable throughout the deployment of the new Columbia-class SSBN. The Navy's FY2025 budget request includes $2.5 billion for the D5LE and D5LE2 programs.

NNSA has conducted an LEP for the W76 warhead, which is carried by most Trident missiles, and provided a small number of low-yield warheads, known as the W76-2, to the Navy in FY2020. NNSA is also improving the safety and reliability of the W88 warhead, which is carried by a portion of the fleet, and has initiated work on the W93 warhead, which is to eventually deploy on D-5 missiles.

### Heavy Bombers

The Air Force has 20 B-2 bombers based in Missouri. The B-2 bomber can carry B61 and B83 nuclear gravity bombs, but it is not equipped to carry cruise missiles. The Air Force maintains 76 B-52H bombers at bases in Louisiana and North Dakota. The B-52 bomber, which first entered service in 1961, is equipped to carry nuclear air-launched cruise missiles (ALCMs). The B-2 and B-52 bombers can also carry conventional weapons and participate in U.S. conventional military operations. The Air Force also is acquiring a new B-21 Raider bomber for conventional and nuclear missions; the service plans to "procure a minimum of" 100 of the new bomber, which is currently in testing and initial production. The Air Force has included $5.3 billion for this new bomber in its FY2025 budget request.

According to unclassified nongovernmental estimates, the United States has around 488 B61 and B83 gravity bombs. NNSA is conducting an LEP on several variants of the B61 to produce a single variant, known as the B61-12, which began entry into the stockpile in 2022. DOD and NNSA have planned to retire the B83, the largest bomb remaining in the U.S. arsenal. The 2018 NPR supported retaining the B83, but the 2022 NPR announced retirement of the weapon. In 2023, DOD announced that NNSA would develop a new B61-13 bomb to give the President "additional options against certain harder and large-area military targets" as it "works to retire" the B83.

The Air Force is planning to replace the aging air-launched cruise missiles carried by B-52 bombers with a new advanced Long Range Standoff (LRSO) cruise missile. The Air Force plans to buy a total of 1,087 missiles and has included $834 million for the missile in its FY2025 budget request. NNSA is also conducting an LEP on the W80 warhead to provide a warhead for the LRSO.

### Nuclear Command, Control, and Communications

The United States is also modernizing its nuclear command, control, and communications (NC3) architecture. The FY2025 budget request includes $11 billion for NC3. (See CRS In Focus IF11697, *Defense Primer: Nuclear Command, Control, and Communications (NC3)*.)

## Employment Planning and Force Sizing

The U.S. President, the Secretary of Defense, the Chairman of the Joint Chiefs of Staff, and other stakeholders in the U.S. government and military participate in a process of planning for the potential employment of U.S. nuclear forces that, inter alia, contributes to determining an appropriate size and mix of U.S. strategic and nonstrategic nuclear forces to meet U.S. national security requirements.

The 2023 report of the Congressional Commission on the U.S. Strategic Posture argued that the current U.S. nuclear forces modernization plan (the so-called program of record, or POR) is "necessary, but not sufficient" because it does not account for an emerging environment where the United States will face two nuclear peers—Russia and the People's Republic of China (PRC). (See CRS In Focus IF12621, *Congressional Commission on the U.S. Strategic Posture*.)

The President also updated the U.S. nuclear employment guidance in 2024 to, inter alia, account for the PRC's expanding nuclear weapons program "and the need to deter Russia, the PRC, and North Korea simultaneously," according to Administration officials. The 2024 guidance states that the United States may need to "adapt current U.S. force capability, posture, composition, or size" and that DOD will "continuously evaluate" the need to make such adjustments.

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