

The U.S. Nuclear Arsenal: A Dangerous Vestige of the Cold War

Current status, plans for the future, and recommendations

HIGHLIGHTS

Twenty-five years after the end of the cold war, the United States still has thousands of nuclear weapons as well as the materials to construct thousands of additional weapons. These weapons and materials present a danger of theft and unauthorized or accidental use, and require great expense to maintain and guard.

The United States has taken important steps to reduce its nuclear arsenal and stockpile of nuclear materials, but its nuclear weapons policy is still based on cold war thinking. To enhance its security, the United States should commit to use nuclear weapons only in response to a nuclear attack, remove its missiles from high alert status (thereby reducing the risk of an accidental or unauthorized launch), reduce its arsenal to 1,000 weapons total, and declare more weapons material as excess to military needs and dispose of it as quickly as possible.

The United States faces a very different international security situation today than it did during the cold war. Our most pressing threat no longer comes from a single large rival similarly armed with thousands of nuclear weapons, but from instability and terrorism—threats that nuclear weapons are particularly unsuited to address. In recognition of the changing environment, the United States has reduced its nuclear arsenal substantially over the past 20 years—from 20,000 weapons to fewer than 5,000. While this is a welcome change, the United States still has far more nuclear weapons than it needs, and more excess nuclear material than it will ever need. Moreover, a large portion of U.S. nuclear-armed missiles are still ready to be launched on a moment's notice, just as they were during the cold war.

Maintaining this status quo is dangerous. Rather than an asset to national security, these weapons and materials, with their potential for theft and unauthorized or accidental use, have become a liability that requires great expense to maintain and guard. Even worse, maintaining a large arsenal and outdated “launch-on-warning” posture encourages Russia to follow suit, which puts the very survival of the United States at risk. Every president in the modern era has taken steps to address this danger, but none have ended it. In a speech early in his presidency, President Obama committed to “seek[ing] the peace and security of a world without nuclear weapons.” Since then, his administration has taken steps to reduce both the numbers and role of these weapons in United States security policy, but much more still needs to be done.



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At any given time, the United States deploys eight or nine of its 14 ballistic missile submarines. Warheads that could be launched from these submarines are expected to make up more than 1,000 of the 1,550 deployed strategic warheads permitted under the New START agreement.

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What Purpose Do U.S. Nuclear Weapons Serve?

The most commonly recognized official purpose of U.S. nuclear weapons is to deter a nuclear attack on the United States or its allies, but this has never been their only purpose. During the cold war, the United States deployed thousands of short-range nuclear weapons in Europe, arguing that they were needed to deter or respond to a conventional attack by the Soviet Union. Though this threat no longer exists, some 200 of these weapons remain in Europe where their role is now purely political—a demonstration of commitment to U.S. allies—even though several countries that host the weapons no longer want to do so.

In its 2010 Nuclear Posture Review (NPR), the Obama administration took some concrete steps to limit the role of U.S. nuclear weapons. The NPR states that the “fundamental” role of U.S. nuclear weapons is to deter a nuclear attack on the United States or its allies, but stops short of declaring this their “sole” purpose, as the Union of Concerned Scientists (UCS) and other expert groups had urged.

The NPR also amends past policy by removing a provision that allowed a nuclear attack on non-nuclear states allied with a nuclear-armed state. The new policy says simply that the United States will not use nuclear weapons against any country that does not have nuclear weapons and is abiding by the Nuclear Nonproliferation Treaty (NPT).^{*} It also adds the first clear U.S. commitment to not use nuclear weapons to prevent or respond to biological or chemical weapon attacks by such countries. While the NPR states that, “The United States will continue to reduce the role of nuclear weapons in deterring non-nuclear attacks,” it still reserves the right to strike first with nuclear weapons against China, Iran, North Korea, and Russia in “a narrow range of contingencies” (i.e., to deter or

^{*} *The NPT prohibits all but five states—China, France, Russia, the United Kingdom, and the United States—from possessing nuclear weapons. This formulation makes clear that the U.S. commitment does not apply to Iran or North Korea, which are in violation of or no longer a party to the NPT, respectively. In addition, India, Israel, and Pakistan possess nuclear weapons but are not signatories of the NPT.*

in response to attack). This is unnecessary given the fact that the United States can meet any non-nuclear threat with conventional weapons. It also undermines U.S. nonproliferation goals by implying that nuclear weapons are useful for addressing non-nuclear threats, thereby increasing their perceived value.

Maintaining High Alert Status

While the 2010 NPR is a step in the right direction, it does not go as far as it should have. Along with stopping short of adopting a “sole purpose” stance, the administration also shied away from another step that would have benefited U.S. security: removing U.S. nuclear weapons from high, or “hair-trigger,” alert status.

The United States keeps a large fraction of its nearly 500 U.S. land-based missiles on high alert so they can be launched upon detection of an incoming nuclear attack. But a surprise first strike by Russia is no longer a realistic threat (if it ever



The United States still has nearly 500 silo-based Minuteman III intercontinental ballistic missiles on “hair-trigger” alert, ready to launch within minutes. This increases the risk of accidental or unauthorized launch.

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was), and keeping large numbers of missiles on high alert to guard against an unrealistic threat increases the risk of accidental or unauthorized launch. The United States does not need to be able to launch a retaliatory strike immediately upon warning of an attack to maintain a credible deterrent; even in the unlikely event of an attack that destroys all U.S. land-based missiles, U.S. submarine-based nuclear weapons could provide a more than adequate response.

The NPR states that the “current alert posture of U.S. strategic forces . . . should be maintained for the present” but that “efforts should continue to diminish further the possibility of nuclear launches resulting from accidents, unauthorized actions, or misperceptions and to maximize the time available to the President to consider whether to authorize the use of nuclear weapons.” In recognizing the dangers inherent in making decisions about the use of nuclear weapons under time pressures, the NPR makes a good argument for taking this logic to the next step: removing the ability to launch these weapons within minutes. This is a simple measure for improving U.S. security that the president could take immediately.

The U.S. Nuclear Arsenal

The U.S. nuclear arsenal consists of long-range “strategic” and short-range “tactical” weapons. Strategic weapons comprise a triad, with each of the three legs using a different method of weapon delivery: land-based intercontinental ballistic missiles (ICBMs) carrying warheads, submarine-launched ballistic missiles (SLBMs) carrying warheads, and fighter planes or bombers carrying bombs or cruise missiles. Seven types of explosive devices are involved: four ballistic missile warheads, two for ICBMs (the W78 and W87) and two for SLBMs (the W76 and W88); two bombs (the B61, which has multiple versions, and the B83); and one air-launched cruise missile (ALCM, the W80).

In addition to these strategic nuclear weapons, the United States has about 500 tactical nuclear bombs. These are variants of the B61 bomb and can be delivered by U.S. and NATO aircraft; about 200 are deployed in Europe, at bases in five NATO countries.

The United States deploys about 2,100 nuclear warheads in all, and keeps another 2,500 as a reserve, or “hedge.” The rationale for the hedge force is that these weapons could be fielded relatively quickly if a problem were discovered in all warheads of a particular type or if a change in the world political situation required more deployed warheads—both highly unlikely scenarios. This gives a total of roughly 4,600 warheads that are deployed or could readily be. An additional 2,700 retired warheads are currently in storage and awaiting dismantlement.

The U.S. Nuclear Arsenal, 2013

Deployed Weapons	2,122
ICBM warheads	470
SLBM warheads	1,152
Bombs	Strategic: 100 Tactical: 200
ALCMs	200
Reserve	2,530
Retired, Awaiting Dismantlement	2,700
Total Inventory	7,352

Note: Numbers are approximate. ICBM= intercontinental ballistic missile; SLBM= submarine-launched ballistic missile; ALCM= air-launched cruise missile.

SOURCE: KRISTENSEN, H.M., AND R.S. NORRIS. 2014. *BULLETIN OF THE ATOMIC SCIENTISTS* 70:85-93.

Under the New START arms control agreement, which entered into force in 2011, the United States and Russia will each reduce their deployed strategic weapons to 1,550 by 2018. President Obama also indicated in a June 2013 speech that he plans to seek deeper reductions in conjunction with Russia, to between 1,000 and 1,100 deployed strategic weapons.

There is no reason for the United States to wait to reduce its arsenal to this level. Even a total arsenal of 1,000 weapons—including deployed and reserve, strategic and tactical—would provide a robust deterrent.

Weapons Materials

The United States currently retains large stocks of fissile materials that can be used to make nuclear weapons: plutonium and highly enriched uranium (HEU). Though previous administrations have taken the important step of designating some of this material as excess to military requirements, the excess material remains a safety and security risk because the government has been slow to dispose of it. And even after disposing of this excess, the United States will still retain enough plutonium for about 10,000 nuclear weapons and enough HEU for 10,000 to 16,000 nuclear weapons—far more than necessary for any conceivable military contingency. The United States should therefore declare all fissile material greater than the amount needed for the roughly 4,600 weapons already in its arsenal (deployed and reserve) as excess to military needs, and dispose of it as expeditiously as possible.

The United States can meet its security requirements while saving hundreds of billions of dollars over the next three decades.

Plans for the Future

Each year, the three federal facilities that designed and developed the nuclear weapons in the U.S. arsenal—the Lawrence Livermore, Los Alamos, and Sandia National Laboratories—certify that the weapons remain safe, reliable, and effective. The labs use information from inspections, tests, experiments, and computer simulations to detect and monitor changes in the weapons caused by aging or other factors, and to determine whether any observed changes will affect safety or reliability.

As weapons age, certain non-nuclear components deteriorate in predictable ways and must be replaced periodically; this has always been part of stockpile maintenance. While U.S. nuclear weapons do not have an expiration date, many have been in the arsenal for longer than originally anticipated. This has led to concerns that some components not included in the original maintenance plans may be aging in ways that could affect a weapon's safety or performance. In order to relieve these concerns, the United States plans for each weapon in the stockpile to undergo a life extension program that will maintain its usability for another 20 to 30 years. The W76 SLBM warhead is in the middle of such an update now, and one for the B61 bomb is in the works.

Potential life extension programs range from simply refurbishing the weapon to making significant changes to its nuclear

components. Since the United States no longer conducts full-scale (i.e., explosive) nuclear testing, it is not possible to directly verify that a significantly modified weapon will work as intended. Thus, the more ambitious approach to life extension programs, in which designers drift further from previously tested designs, increases the risk of reducing a weapon's reliability. Making significant changes to existing designs would also violate the spirit, if not the letter, of President Obama's pledge to not develop new nuclear weapons.

The W76 update made only modest changes to the warhead, an approach that UCS supports. More extensive changes are planned for the B61, and although these do not involve the nuclear components, the weapons laboratories have expressed interest in making changes to the nuclear components in future life extension programs. The administration should instead commit to simpler refurbishments.

In addition to modernizing its warheads, the United States plans to maintain all three legs of the nuclear triad, and to update the delivery systems for each leg—including the development of an entirely new generation of land-based missiles, nuclear-capable bombers, and ballistic missile submarines. A December 2013 report by the Congressional Budget Office (<http://www.cbo.gov/publication/44968>) estimated that it would cost \$355 billion to maintain and modernize the U.S. nuclear arsenal over the next 10 years, assuming no further reductions beyond those required by the New START agreement. A January 2014 report by experts at the James Martin Center for Nonproliferation Studies (http://cns.miis.edu/opapers/pdfs/140107_trillion_dollar_nuclear_triad.pdf) is even gloomier about the economic implications of these plans, estimating that the United States will have to spend \$1 trillion over the next 30 years.

Given the tightly constrained federal budget, an expenditure of this magnitude is unrealistic. Fortunately, much more modest plans can meet U.S. security requirements while saving hundreds of billions of dollars over the next three decades.

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