

# A Nuclear Posture for Today

*John Deutch*

## A THREAT TRANSFORMED

THE COLLAPSE of the Soviet Union was a dramatic geopolitical shift that should have led to major changes in the nuclear posture of the United States. The policy reviews undertaken by the Clinton administration in 1994 and the Bush administration in 2002, however, led to only minor alterations. As a result, the United States lacks a convincing rationale for its current nuclear force structure and for the policies that guide the management of its nuclear weapons enterprise.

The end of the Cold War did not mean that the United States could eliminate nuclear weapons altogether. Their existence is a reality, and the knowledge required to make them is widespread. But over the last decade, the nature of the nuclear threat has fundamentally changed, from large-scale attack to the use of one or a few devices by a rogue nation or subnational group against the United States or one of its allies. Countering the proliferation of nuclear weapons—by slowing the spread of nuclear capabilities among states, assuring that nuclear devices do not get into the hands of terrorist groups, and protecting existing stockpiles—has thus become as high a priority as deterring major nuclear attacks.

Unfortunately, the current U.S. nuclear posture does not reflect this shift. Washington still maintains a large nuclear arsenal designed for the Cold War, and it fails to take into account the current impact

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of its nuclear policies on those of other governments. In fact, with its overwhelming conventional military advantage, the United States does not need nuclear weapons for either war fighting or for deterring conventional war. It should therefore scale back its nuclear activity significantly. Policymakers should sharply decrease the number of warheads deployed with active military forces and make U.S. stockpile activities (of active and retired warheads and nuclear material) more transparent, setting a security standard for other nations. The United States should not, however, abandon effective nuclear forces, and it should even leave open the possibility of certain limited kinds of nuclear tests. A new U.S. nuclear posture, in short, should encourage international nonproliferation efforts without sacrificing the United States' ability to maintain a nuclear posture that deters attack.

#### DUAL PURPOSE

IN THE PAST, U.S. policymakers have considered many potential roles for nuclear weapons: massive retaliation, damage limitation in nuclear exchanges, or controlling escalation in more limited scenarios. Still, they have always understood that the purpose of nuclear weapons is to deter war, not to fight it. For deterrence to work, however, the threat of preemptive or retaliatory use must be credible. It follows that, regardless of the number or the mix of weapons in the nuclear arsenal, they must be maintained ready for use, not kept as "wooden cannon."

During the Cold War, a range of nuclear scenarios defined strategic deterrence of the Soviet Union. The number of weapons in the Single Integrated Operation Plan (SIOP), the nuclear-attack strategy drawn up by the military and approved by the president, depended on the number of attack options, the number of targets (military as well as urban and industrial), and the desired "expected damage" to each target. "Expected damage" depended on the "hardness" of the target, the probability of a weapon's reaching it, and the explosive yield and accuracy of the programmed weapon. It does not require much imagination to appreciate that such a calculation could justify acquiring several thousand strategic weapons, as was indeed the case. In the 1970s and 1980s, the United States and the Soviet Union also accumulated several thousand tactical nuclear weapons, smaller devices intended for regional or battlefield use.

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Although the nature of today's threats calls into question the usefulness of the United States' large nuclear arsenal, nuclear weapons continue to play a key role in U.S. security. After all, there is no guarantee that geopolitical circumstances will not change dramatically, and the emergence of a more militant China or Russia's return to totalitarianism might compel the United States to place greater reliance on its nuclear forces. Moreover, Washington's commanding nuclear posture still works to limit the nuclear ambitions of other countries. U.S. allies, most notably Germany and Japan, have forsworn establishing their own nuclear programs in exchange for protection under the U.S. security umbrella. Were the United States to give up its arsenal, other countries might be tempted to develop their own.

The possession of weapons by current nuclear powers does not directly influence the ambitions of states or terrorist groups that already want their own. They believe, rightly or wrongly, that acquiring a nuclear weapon will improve their security situation. A change in the U.S. nuclear posture would certainly not have dissuaded any of newest members of the nuclear club—Israel, India, and Pakistan—from seeking the bomb. North Korea and Iran, meanwhile, are vastly more concerned by the United States' conventional power than they are by its nuclear forces. They would probably seek nuclear weapons even if the United States had none, perhaps even with greater determination.

At the same time, the United States relies on the cooperation of many nations to achieve its nonproliferation objectives, and in this regard the U.S. nuclear posture has important consequences. An effective nonproliferation effort requires restricting the transfer of nuclear materials and technology, encouraging effective inspection by the International Atomic Energy Agency, and strengthening standards for the protection of nuclear materials and facilities. Cooperation is also essential for establishing an international norm that forbids the nuclear ambitions of non-nuclear states. (This goal, in fact, raises a basic hypocrisy on the part of nuclear powers: they retain their own arsenals while denying others the same right. This contradiction prompted Washington unwisely to commit under Article 6 of the Nonproliferation Treaty [NPT] “to pursue good-faith negotiations” toward complete disarmament, a goal it has no intention of pursuing.)

Ultimately, Washington must strike a balance between conflicting goals: maintaining a modern nuclear weapons posture, on the one hand, and curbing the spread of nuclear weapons, on the other. The Bush administration has not struck this balance well. Some officials have made unfortunate policy statements about pre-emption, implying that the U.S. government might even consider a first nuclear strike. The administration's 2002 nuclear posture review unwisely treats non-nuclear and nuclear strike capabilities as part of a single retaliatory continuum. Policymakers have invoked technical and geopolitical uncertainty as an argument for modernizing the weapons complex and maintaining robust testing and production capabilities. Most unfortunately, the Bush administration has proposed work on a new warhead—a low-yield “robust nuclear earth-penetrator.” Although it could argue that some conceptual work on generic warheads is needed to preserve the competence of weapons designers, the administration has instead justified this weapon on the basis of its military utility, hinting at the possibility of development and production in the future. The tone of this proposal ignores the indirect effect that new U.S. warhead research programs have on international attitudes toward nonproliferation.

HOW LOW CAN YOU GO?

TODAY, the U.S. nuclear arsenal should be managed with two purposes in mind: to deter a nuclear attack against the United States or its allies by retaining an overwhelming nuclear force with high “survivability,” and to respond flexibly and precisely to a broad range of contingencies, including chemical or biological attack. The goal is to force any nation or subnational group that contemplates use of a weapon of mass destruction for an act of catastrophic terrorism to consider the possibility of U.S. nuclear retaliation and the complete destruction of its interests or sanctuary.

These purposes are not so different from those of the past, but the new nature of the threat means that many fewer weapons are needed to achieve them. In May 2001, President George W. Bush said at the National Defense University, “I am committed to achieving a credible deterrent with the lowest-possible number of nuclear weapons consistent with our national security needs, including our obligations to our allies.” But just what is the “lowest possible number”?

The answer cannot be calculated using the classic *STOP* method: there are no suitable target lists analogous to those drawn during the Cold War. But even a crude estimate of numerical requirements gives a sense of how much smaller the U.S. nuclear arsenal could be.

A fleet of nine Trident ballistic-missile-equipped nuclear submarines—half the size of the current fleet of 18 boats, which is capable of carrying about 3,000 warheads—would constitute a retaliatory force with sufficient survivability. Three partially loaded submarines would be on continuous station, each carrying 16 D-5 missiles with 8 nuclear warheads (a combination of the W76 and the W88), for a total of 384 warheads on alert. Another three would be in transit (carrying an additional 384 warheads in strategic reserve), and still another three would be in overhaul (and thus unarmed) at any given time. (Because each Trident can carry 24 missiles, such a deployment would add up to 1,728 accountable warheads under the counting rules of the Strategic Arms Reduction Treaty, suggesting that these rules may no longer be relevant to either the United States or Russia.) Another 200 operational nuclear warheads would complement the fleet, providing for flexible response. These would be placed on other delivery systems, such as land-based intercontinental ballistic missiles and cruise missiles on sea and air platforms that permit easier command and control.

Such a deployment—less than 1,000 warheads in total—would be smaller than the reduced target proposed by Bush as part of the Strategic Offensive Reductions Treaty: between 1,700 and 2,200 deployed strategic warheads by 2012. But for the sake of deterrence and response, this smaller nuclear force would be enough. China, the nation most likely to try to match the U.S. nuclear capability, is thought to have a total inventory of 400 nuclear weapons, including a small but growing ballistic missile force capable of reaching the United States.

In the past, all nuclear force reductions took place within U.S.-Russian arms control agreements. Given today's geopolitical realities, it is not necessary to wait for formal agreements before moving toward lower numbers. To be sure, the pace of reduction should consider Russian force levels as well as political developments there. But Washington's concern with Moscow's nuclear stockpile has as much, if not more, to do with security and the threat of "loose nukes" than with the threat of Russian attack.

Alarm over the security of nuclear stockpiles also points to the need to change the way nuclear warheads are counted. In the past, Washington counted only operational military warheads and delivery vehicles, the weapons that posed the most immediate threat. Now, however, preventing proliferation requires focusing not only on a country's deployed nuclear capability, but also on the security of its nuclear material and the intentions of those who control it. Accordingly, all nuclear weapons and material—including deployed warheads, warheads undergoing maintenance or modification, decommissioned warheads, and all weapons-grade highly enriched uranium and separated plutonium—should be counted as part of a nation's nuclear inventory.

This revised accounting scheme would do away with the anachronistic distinction between long-range strategic and short-range tactical weapons; today, all nuclear weapons are of equal concern. It would also drive home the importance of securing a country's entire nuclear inventory, including decommissioned warheads and nuclear-related materials (such as spent fuel and low-enriched uranium). Removing a warhead from the active force would shift it to a different accounting category, not drop it from the inventory altogether, because the device and its nuclear material would still require secure supervision.

Meanwhile, the United States should make its own total nuclear inventory known to the public, reporting the number of warheads and the amount of material in each category as an example to other governments. During the Cold War, there was good reason to keep this information secret. Now, however, greater transparency, consistent with proliferation concerns, would enhance U.S. security by giving allies comfort and prospective proliferators pause. Nations resisting disclosure would be inviting increased international scrutiny of their capabilities and intentions.

#### LOW-PROFILE MANAGEMENT

RESPONSIBILITY for managing the United States' nuclear weapons complex falls to the National Nuclear Security Administration (NNSA) of the Department of Energy (DOE). The NNSA's budget request for fiscal year 2005 was \$6.6 billion, and this is expected to grow to \$7.5 billion by 2009. The agency, which has some 35,000 employees,

faces significant obstacles, including assuring the competence of its staff. The generation of scientists and engineers that developed, built, and tested nuclear weapons has long since retired. The current work force at the three main weapons laboratories—at Los Alamos, New Mexico; Livermore, California; and Sandia, New Mexico—has little direct experience designing or testing weapons. And the DOE's stringent response to recent unfortunate security lapses has hurt morale and clouded the atmosphere in the laboratories.

In 1992, the Exon-Hatfield-Mitchell amendment barred nuclear tests except those motivated by concern about the safety and reliability of weapons already in the stockpile. Since then there has been general agreement that there is no such need (affirmed by annual Defense Department reviews of nuclear safety and reliability), and the United States has observed a testing moratorium.

In the absence of a test program, the DOE has established a “stockpile stewardship program” designed to preserve the knowledge and technology required to extend the life of existing warheads. Advanced computing technology—bolstered by the DOE's impressive Accelerated Strategic Computing Initiative—has allowed modeling and simulations that can partially substitute for instrumented laboratory tests. The program also includes nuclear-weapons-related subcritical laboratory experimentation, conducted, for example, in the x-ray radiographic test facility at Los Alamos and the laser ignition facility at Livermore.

The premise behind the stockpile stewardship program is that computer simulation of the nuclear explosion sequence (beginning with chemical explosive detonation in the primary and ending with fission and thermonuclear burn in the secondary), confirmed with data from experimental facilities, can give technicians confidence in new or modified weapons. Scientists disagree, however, about whether this premise is correct. Some argue that the current program is enough to confirm the safety and reliability of existing weapons. The only way to prove the effectiveness of the strategy, however, is to demonstrate that computer codes can in fact predict the results of a nuclear explosion, as the program assumes. This suggests the need for a “scientific confirmation test,” meant not to ensure stockpile security or to develop new weapons but to prove that the practical physics underpinning the nuclear program still holds. Accordingly, scientific

confirmation should be added as an acceptable rationale for testing, in addition to the verification of the correction of a safety or reliability problem that cannot be verified by other means. Indeed, in the past, confidence in the stockpile came largely from development tests, rather than from tests specifically designed to confirm weapons reliability.

The NNSA program also includes several large and costly facilities intended to modernize the production infrastructure. These include a new tritium extraction facility at Los Alamos, a pit disassembly and conversion facility at the Savannah River Laboratory in South Carolina, and plans for a modern pit facility. Each individual project may be justified, but the quantity, size, and timing of such developments contribute to an impression that the U.S. weapons complex is growing and that the United States is not, in fact, reducing the role of nuclear weapons.

A more realistic U.S. nuclear posture would require a smaller but still high-quality weapons research and engineering program and a consolidated production complex. The existing stockpile stewardship program's approach is reasonable, but confirmation that physics knowledge remains adequate may require (and, from a technical point of view, ideally would require) occasional "scientific confirmation tests." Careful timing and management of such tests could mitigate the adverse international reaction they would inevitably cause. Meanwhile, conceptual work on the design of new warheads should not be precluded per se, but if it is proposed and performed there must be no ambiguity about future development. Greater transparency with regard to the activities of the NNSA would also help convince domestic and international audiences that Washington is striking the right balance in managing its nuclear weapons.

#### RETHINKING ARMS CONTROL

A NEW U.S. nuclear posture should include consideration of several current and prospective arms control measures. The most controversial is the Comprehensive Test Ban Treaty (CTBT), which would permanently ban all future nuclear tests, with no provision for withdrawal. The United States has not ratified the CTBT (nor have India, Iran, Israel, North Korea, and Pakistan), but 109 nations (including the United Kingdom, France, Russia, and China) have.



Proponents of the CTBT see its potential for strengthening international norms against nuclear weapons as vital to nonproliferation efforts. They argue that it is especially worthwhile because, with the stockpile stewardship program in place, the United States does not need testing to confirm stockpile safety or reliability. Opponents respond that the CTBT has verification problems, that testing has no direct effect on either the pace or the likelihood of success by determined proliferators such as North Korea and Iran, and that, given the uncertainty of future requirements for new weapons, forgoing forever the possibility of new tests is a mistake.

Both sides in this debate have strengths and weaknesses. Opponents of the CTBT are correct that testing should be allowed if the assurance of stockpile safety or reliability requires it. However, they exaggerate the treaty's verification problems: only very low-yield tests (or tests that insulate the explosion from the surrounding earth) have much of a chance of escaping detection. CTBT advocates, meanwhile, are correct that the treaty would bolster international nonproliferation norms, even if their assertion that no test will ever again be necessary to assure stockpile safety is dubious. (In fact, some CTBT advocates may oppose testing precisely because they believe that confidence in the reliability of nuclear weapons will erode without it—to the point that nuclear weapons will lose their deterrent value and become irrelevant.) Those who attempt to sidestep the issue by claiming that a future president could invoke the supreme national interest to renounce the treaty are implying that it is better to accept a treaty despite major reservations than to work to craft one that resolves difficult issues.

There is, fortunately, a sensible middle ground in this dispute: a CTBT of limited term. Former national security officials Brent Scowcroft and Arnold Kanter have proposed entering into the CTBT for a five-year term (since all agree that U.S. nuclear tests will not be necessary anytime soon), with possible five-year extensions, after ratification by the Senate. Such a compromise would have the advantage of strengthening nonproliferation efforts—and thus be preferable to having no CTBT—while leaving open the possibility of not extending the treaty if geopolitical circumstances or stockpile considerations change. A similar approach worked with the NPT, which was ratified

in 1969 for a 25-year period, with review conferences every five years, and then made permanent in 1995. Opponents argue that it would be difficult or impossible at this stage to change the terms of the internationally negotiated CTBT. But the CTBT does not enter into force until 44 countries, including the United States, have ratified it, so the choice is whether the United States prefers a renewable five-year CTBT to no CTBT at all.

A second still-unratified arms control treaty is the fissile material production cutoff treaty, originally proposed by President Bill Clinton at the United Nations in 1993; it would prohibit new production of separated plutonium or highly enriched uranium. This is an attractive measure, because the United States and other nuclear states have ample amounts of weapons-usable material. The ban would prohibit any state from undertaking new production, thus serving basic nonproliferation objectives, and would limit the total amount of material that must be kept secure.

The UN Conference on Disarmament has been deliberating the cutoff treaty for several years. On August 4, 2004, the U.S. ambassador to the UN, John Danforth, announced that the Bush administration, although supportive of the ban, does not believe that effective verification is feasible. This and earlier statements by the Bush administration imply that alleged verification shortcomings will be a barrier to an agreement. But with a new nuclear posture, opposition to this treaty would be inexplicable. No arms control treaty is perfectly verifiable; there is always a risk that a violation will go undetected. Verification could be enhanced if signatory countries agreed to inspections. Traditionally, the United States and other nuclear weapons states have not accepted such inspections, but there is now little reason for the United States to resist them. Here again, transparency is in the interest of the United States. A signatory violating the treaty would be stigmatized as a proliferator before the international community. And a state that refused to sign the treaty would be signaling its interest in acquiring material suitable for making a bomb.

Arms control advocates have proposed two other major changes to U.S. nuclear policy: pledging “no first use” and de-alerting nuclear

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forces. Even with a changed nuclear posture, however, the arguments for such reforms are not convincing.

Since 1978, Washington has committed to not using nuclear weapons against non-nuclear states that are signatories to the NPT, unless they attack the United States with the backing of a nuclear state. Successive U.S. administrations, however, have also maintained a policy of “strategic ambiguity,” refusing to rule out a nuclear response to a biological or chemical attack. Supporters of a stronger no-first-use policy argue that strategic ambiguity sends the wrong signal to other governments: even the United States, with its overwhelming conventional military advantage, sees value in leaving open the possibility of first use. And this impression, they argue, undermines nonproliferation. They underestimate, however, just how much “strategic ambiguity” aids deterrence by keeping potential adversaries uncertain about a U.S. response.

De-alerting nuclear forces would mean increasing the amount of time between the decision to launch a nuclear weapon and its actual launch, in order to prevent accidental or unauthorized attacks, avoid misunderstanding, and add time to negotiate in a crisis. During the Cold War, a prompt launch capability



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was necessary to assure the survivability of land-based forces. Those who support de-alerting U.S. nuclear forces correctly argue that such a concern is no longer relevant. But they underestimate the the practical obstacles to de-alerting submarine-launched warheads. If warheads were removed from the submarines, maintaining a continuous sea-based deployment would not be possible; the ships would need to be kept close to port, near the warheads, where they would be more vulnerable. Alternatively, communications to submarines on station could be managed to lengthen the time to launch, but it is hard to see how this could serve as a verifiable confidence-building measure. Such a step would be easily reversible anyway, making its usefulness quite limited.

Finally, the United States should make clear that any reduction is not a first step toward the abolition of the U.S. nuclear force. The U.S. nuclear posture should be consistent with foreseeable U.S. security interests. In the distant future, depending on the state of the world, a move to even lower—or potentially back to higher—levels might make sense.

Even with the Cold War over, nuclear weapons remain far more than empty symbols; they cannot simply be eliminated, despite the hopes of some arms-control advocates and the stated goals of the NPT. Nonetheless, the U.S. nuclear posture must change to meet a transformed nuclear threat. The U.S. nuclear force must be strong enough to deter and to survive attack even as it serves, as much as possible, to advance Washington's nonproliferation goals. Instead of treating nonproliferation and the maintenance of a nuclear deterrent as mutually exclusive, the United States must shape and manage its nuclear force in a way that does both. 🌐