



# TOWARD TRUE SECURITY

TEN STEPS THE NEXT PRESIDENT SHOULD TAKE  
TO TRANSFORM U.S. NUCLEAR WEAPONS POLICY

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## CHAPTER 1

### *The Proposal in Brief*

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Policy makers of both major parties recognize that the U.S. nuclear posture must change to reflect today's world and future challenges to national security. Congress has passed legislation calling for a reexamination of U.S. nuclear policy by 2009.<sup>1</sup>

Four of the most seasoned architects of U.S. national security policy—George Shultz, secretary of state under President Reagan; William Perry, secretary of defense under President Clinton; Henry Kissinger, secretary of state under Presidents Nixon and Ford; and Sam Nunn, former senator from Georgia—have forcefully articulated the need for a new policy. They argue that the United States should embrace the goal of a “world free of nuclear weapons” as a vital contribution to preventing more nations, and eventually terrorists, from acquiring nuclear weapons.<sup>2</sup>

In fact, over the past decade, several nations have crossed the nuclear threshold by testing nuclear weapons, or are now suspected of having nuclear weapons programs. Some of these states are politically unstable or have high levels of corruption, increasing the risks that they will use these weapons and that terrorists will acquire them.<sup>3</sup>

The world will stay on this course as long as the United States and the other original nuclear powers—Britain, China, France, and Russia—consider nuclear weapons essential to their security. To avoid a new and more dangerous nuclear era, these states must drastically reduce the role that nuclear weapons play in their security policies. If they do not do so, they will lack the legal and political legitimacy they need to induce other nations to refrain from acquiring or further developing their nuclear arsenals.

The United States can, and should, take the lead in this effort. Indeed, the United States can proactively shape the nuclear future, rather than anticipate the worst and prepare to hedge against it. In so doing the United States can begin to clear a path to a world free of nuclear weapons.

#### **Today's Nuclear World**

The greatest nuclear dangers to the United States today are a Russian accidental or unauthorized attack, the spread of nuclear weapons to more nations, particularly unstable states, and the acquisition of nuclear weapons or the materials needed to make them by terrorists. U.S. nuclear weapons

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<sup>1</sup> Congress sent the National Defense Authorization Act for FY2008 to the president for his signature on December 19, 2007. It requires a new nuclear posture review to be completed in 2009, and specifies that it include an assessment of: “(1) the role of nuclear forces in U.S. military strategy, planning, and programming; (2) the policy requirements and objectives for the United States to maintain a safe, reliable, and credible nuclear deterrence posture; (3) the relationship among U.S. nuclear deterrence policy, targeting strategy, and arms control objectives; (4) the role that missile defense capabilities and conventional strike forces play in determining the role and size of nuclear forces; (5) the levels and composition of the nuclear delivery systems that will be required for implementing the United States national and military strategy, including any plans for replacing or modifying existing systems; (6) the nuclear weapons complex that will be required for implementing the United States national and military strategy, including any plans to modernize or modify the complex; and (7) the active and inactive nuclear weapons stockpile that will be required for implementing the United States national and military strategy, including any plans for replacing or modifying warheads.” H.R. 1585 ENR, section 1070. While President Bush has vetoed the bill over an unrelated issue, Congress will pass a modified version that retains this language.

<sup>2</sup> George P. Shultz, William J. Perry, Henry A. Kissinger, and Sam Nunn, “Toward a nuclear-free world,” *Wall Street Journal*, January 15, 2008, p. A13, and “A world free of nuclear weapons,” *Wall Street Journal*, January 4, 2007, p. A15.

<sup>3</sup> India and Pakistan conducted multiple test explosions of nuclear weapons in 1998, and North Korea tested a small nuclear weapon in 2006. Iran is suspected of having a nuclear weapons program. It is building an enrichment facility to produce low-enriched uranium for nuclear reactor fuel, and this facility could also produce highly enriched uranium for nuclear weapons. Pakistan has an unstable government, and North Korea's government could become unstable in the future. Pakistan and Iran have very high levels of government corruption. See Transparency International, “Corruption perceptions index,” 2007. Online at [http://www.transparency.org/policy\\_research/surveys\\_indices/cpi/2007](http://www.transparency.org/policy_research/surveys_indices/cpi/2007).

policy stands in the way of addressing these dangers—and sometimes even worsens them.

The official doctrines of both the United States and Russia are still mired in cold war patterns of thought. Almost two decades after the fall of the Berlin wall, both countries still maintain massive nuclear arsenals ready for nearly instant use. Although U.S. nuclear war plans differ in size and detail from those drawn up during the cold war, their basic structure remains unchanged.

Both the United States and Russia deploy several thousand nuclear warheads, of which 1,300 to 1,400 remain on hair-trigger alert, ready for launch within minutes of a warning of an incoming attack. The United States deploys roughly 4,100 warheads, and has about 1,250 additional warheads stored for potential future use, for a total of roughly 5,350 warheads.<sup>4</sup> Russia deploys roughly 5,000 warheads and has about 10,000 warheads in storage, for a total of roughly 15,000 nuclear warheads.<sup>5</sup> (To put this in context, one U.S. or Russian warhead could destroy an entire city, resulting in millions of dead or injured people.<sup>6</sup>)

While the risk of a premeditated Russian attack is almost zero, a mistaken, accidental, or unauthorized attack remains a possibility. Russia could deliberately launch its weapons in response to a mistaken warning of a U.S. nuclear attack—perhaps because of an error in Russia's warning system. And a failure in Russia's command-and-control system could lead to an accidental or unauthorized attack.

The U.S. policy of maintaining large numbers of highly accurate nuclear weapons that can be launched promptly stands in the way of reducing this risk. So, too, would U.S. deployment of a missile defense system that Russia believes could intercept a significant number of its strategic missiles, thereby undermining its nuclear deterrent.<sup>7</sup>

In the longer term, the greatest danger to U.S., and indeed global, security stems from the weakening or even collapse of the international consensus to prevent proliferation. Article VI of the Non-Proliferation Treaty (NPT) requires the United States and the other four nuclear powers to take serious steps toward nuclear disarmament.

While the 2002 Treaty on Strategic Offensive Reductions (known as the Moscow Treaty) limits U.S. and Russian deployed strategic weapons to 1,700 to 2,200 as of December 31, 2012, it places no restrictions on stored weapons, or on deployed weapons that are nonstrategic. (Strategic weapons are those on long-range missiles or long-range bombers, whereas nonstrategic nuclear weapons are those on short-range missiles or short-range aircraft. Nonstrategic weapons are commonly referred to as tactical nuclear weapons, which are intended for use on the battlefield. However, nonstrategic nuclear weapons also include those used for missile and air defense.) Moreover, the Moscow Treaty expires on the same day that it takes effect.

The Bush administration announced in 2004 that the United States would reduce its nuclear arsenal “by nearly 50 percent” by 2012. The White

<sup>4</sup> In December 2007, the United States announced that it had reduced its total arsenal by retiring warheads it had originally planned to retire by 2012. These warheads currently remain at Department of Defense (DOD) sites, but the Department of Energy (DOE) has been given authority over them, and they are slated for eventual dismantlement. A transfer of authority from the DOD to the DOE is usually accompanied by a transfer of the weapons to DOE facilities, but the DOE does not have room to store these warheads at the Pantex facility, where it dismantles warheads.

The U.S. government does not make public the numbers of nuclear weapons in its arsenal. For an estimate of how these cuts affect the size of the U.S. arsenal, see Hans M. Kristensen, “White House announces (secret) nuclear weapons cuts,” Federation of American Scientists Strategic Security blog, December 18, 2007. Online at [http://www.fas.org/blog/ssp/2007/12/white\\_house\\_announces\\_secret\\_n.php](http://www.fas.org/blog/ssp/2007/12/white_house_announces_secret_n.php). See also White House, Office of the Press Secretary, “President Bush approves significant reduction in nuclear weapons stockpile,” December 18, 2007; U.S. Department of Energy, National Nuclear Security Administration, “NNSA releases draft plan to transform nuclear weapons complex,” December 18, 2007; and “US accelerates nuclear stockpile cuts: White House,” AFP, December 19, 2007, online at [http://www.spacedaily.com/reports/US\\_accelerates\\_nuclear\\_stockpile\\_cuts\\_White\\_House\\_999.html](http://www.spacedaily.com/reports/US_accelerates_nuclear_stockpile_cuts_White_House_999.html).

<sup>5</sup> For the Russian figures, see Federation of American Scientists/Natural Resources Defense Council, *Status of world nuclear forces 2007* (as of May 2007). Online at <http://www.nukestrat.com/nukestatus.htm>.

<sup>6</sup> The different types of U.S. warheads have an explosive power equivalent to that of 100 to 1,200 kilotons of TNT. The weapons in the Russian nuclear arsenal have comparable explosive yields. The weapons that destroyed Hiroshima and Nagasaki were much less powerful: they had an explosive power equivalent to 15 to 20 kilotons of TNT.

<sup>7</sup> Whether Russia believed that a specific U.S. missile defense could undermine its deterrent would depend on its assessment of how many of its strategic missiles would survive a U.S. first strike, and how many of those missiles the U.S. defense system might be able to intercept. It would also depend on Russia's assessment of U.S. confidence in its first-strike and defensive capabilities.

House announced in December 2007 that these reductions would be completed by the end of the year—five years earlier than originally planned. Prior to December 2007, the U.S. arsenal contained roughly 10,000 warheads, of which roughly 5,000 were deployed and 5,000 stored as a “hedge” (to permit a rapid increase in deployed weapons, or replace any deployed warhead types that develop technical problems). The recent cuts substantially reduce the hedge, bringing the total arsenal to roughly 5,400 warheads, with the balance of roughly 4,600 now slated for dismantlement. The White House also announced that the United States would reduce the arsenal by a further 15 percent by the end of 2012—bringing the total to roughly 4,600.<sup>8</sup> While this is a meaningful step, it falls far short of what is required by the NPT.

While countries will make their own decisions about acquiring nuclear weapons, U.S. nuclear weapons policy can have a substantial impact on future nuclear proliferation. For example, in the past, the United States and other nuclear weapons states have pledged not to use their nuclear weapons against nations without them, giving those nations an incentive to not acquire their own nuclear weapons. However, U.S. policy today explicitly includes the option of using nuclear weapons against countries without such weapons—to either preempt or respond to the use of biological or chemical weapons. This actually serves as an incentive for nations to acquire nuclear weapons, to deter the United States from launching a preemptive attack.

U.S. policy also emphasizes maintaining a large nuclear arsenal indefinitely, contradicting the U.S. commitment under the NPT to pursue good-faith negotiations with the other nuclear powers to eliminate nuclear weapons. In fact, under its Complex 2030 and Reliable Replacement Warhead programs, the Bush administration intends to revitalize the U.S. infrastructure for developing and

producing nuclear weapons, and replace the U.S. arsenal with four or more new types over the next two decades. This cycle of design, development, and production would continue indefinitely, to train new weapons designers and maintain the production complex in a ready state. These programs would also seriously undermine the nonproliferation regime and enhance the incentives for other countries to acquire nuclear weapons.

### Ten First Steps

Even under the best of circumstances, developing an international consensus and an institutional framework for a global prohibition on nuclear weapons would take several decades. And limits on verification technologies and a corresponding lack of political confidence may make it difficult—at least initially—to prohibit all nuclear weapons, rather than setting a very low limit on the size of arsenals. Nevertheless, establishing prohibition as the goal—and seriously pursuing it—is essential to preventing more nations and eventually terrorists from acquiring nuclear weapons. The United States can make a critical contribution to national and international security by working to establish the conditions needed to make progress toward this goal.

An essential first step is to declare that the sole purpose of U.S. nuclear weapons is to deter and, as a last resort, respond to the use of nuclear weapons by another country. Such a new nuclear policy would directly enhance U.S. national security and promote nonproliferation—regardless of whether or when nuclear prohibition is achieved.

The United States should also unilaterally reduce its nuclear arsenal to a total of no more than 1,000 nuclear warheads. There is no plausible threat that justifies maintaining more than a few hundred survivable nuclear weapons over the next decade or beyond, and no military reason to link the size of U.S. nuclear forces to those of other countries.

<sup>8</sup> See Hans M. Kristensen, “White House announces (secret) nuclear weapons cuts.” Under the Moscow Treaty’s restrictions on deployed strategic weapons, the United States must transfer all retired warheads from bases with operational delivery systems, so the warheads will not be counted as deployed. If the United States continues to adhere to these restrictions after 2012, these 4,600 weapons would likely constitute 2,200 deployed strategic warheads, 2,000 reserve strategic warheads the United States considers as a “hedge” against unforeseen political developments, and 400 nonstrategic bombs.

Nor does any plausible threat require the United States to retain the ability to launch nuclear weapons in a matter of minutes, or even hours. By increasing the amount of time required to launch these weapons, the United States would ease Russia's concerns about the potential vulnerability of its own nuclear deterrent. Russia would then have an incentive to adopt a safer nuclear posture for its own arsenal, greatly reducing the possibility of an accidental, unauthorized, or mistaken Russian attack.

Specifically, the next president should take 10 unilateral steps to bring U.S. nuclear weapons policy into line with today's political and strategic realities:

1. Declare that the sole purpose of U.S. nuclear weapons is to deter and, if necessary, respond to the use of nuclear weapons by another country.
2. Reject rapid-launch options by changing its deployment practices to allow the launch of nuclear forces in days rather than minutes.
3. Eliminate preset targeting plans, and replace them with the capability to promptly develop a response tailored to the situation if nuclear weapons are used against the United States, its armed forces, or its allies.
4. Promptly and unilaterally reduce the U.S. nuclear arsenal to no more than 1,000 warheads, including deployed and reserve warheads. The United States would declare all warheads above this level to be in excess of its military needs, move them into storage, begin dismantling them in a manner transparent to the international community, and begin disposing—under international safeguards—of all plutonium and highly enriched uranium beyond that required to maintain these 1,000 warheads. By making the end point of this dismantlement process dependent on Russia's response, the United States would encourage Russia to reciprocate.
5. Halt all programs for developing and deploying new nuclear weapons, including the proposed Reliable Replacement Warhead.
6. Promptly and unilaterally retire all U.S. non-strategic nuclear weapons, dismantling them in a transparent manner, and take steps to induce Russia to do the same.
7. Announce a U.S. commitment to reducing its number of nuclear weapons further, on a negotiated and verified bilateral or multilateral basis.
8. Commit to not resume nuclear testing, and work with the Senate to ratify the Comprehensive Test Ban Treaty.
9. Halt further deployment of the Ground-Based Missile Defense system, and drop any plans for space-based missile defense. The deployment of a U.S. missile defense system that Russia or China believed could intercept a significant portion of its survivable long-range missile forces would be an obstacle to deep nuclear cuts. A U.S. missile defense system could also trigger reactions by these nations that would result in a net decrease in U.S. security.
10. Reaffirm the U.S. commitment to pursue nuclear disarmament, and present a specific plan for moving toward that goal, in recognition of the fact that a universal and verifiable prohibition on nuclear weapons would enhance both national and international security.

## The Future

If the next president takes these steps, the United States will have greatly enhanced national and international security, while also setting the stage for negotiations to reduce the nuclear arsenals of other countries. Together with these nations, the United States can then tackle the challenges entailed in negotiating and implementing verifiable, multilateral reductions to levels well below 1,000 nuclear warheads—thereby laying the groundwork for an eventual worldwide prohibition on nuclear weapons.

## CHAPTER 2

### *The Problem*

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**T**he global security environment has changed profoundly since the end of the cold war. During that four-decade superpower standoff, U.S. policy makers were deeply concerned about the danger of a massive, deliberate Soviet conventional or nuclear attack on the United States or its allies. Today the danger of a deliberate attack is acknowledged to be virtually nonexistent. Other nuclear dangers to the United States do, however, remain, and new threats could emerge.

To safeguard its citizens, the U.S. government must reduce current dangers while preventing or minimizing future dangers. Thus any nuclear posture review must begin with a realistic assessment of these dangers to U.S. security, keeping in mind that any policy the United States adopts today will affect the dangers it faces in the future.

#### **Nuclear Dangers from Russia**

While Russia retains the ability to conduct a deliberate nuclear attack against the United States, it has no political incentive to do so, and would in any case be deterred by the certain U.S. capability to retaliate. Yet Russia's nuclear weapons remain the greatest security risk to the United States: although the probability of their use is low, the consequences would be enormous.

Rather than a deliberate attack, the danger today is that of a mistaken, unauthorized, or accidental

launch of nuclear weapons. Russia could deliberately launch some of its nuclear-armed missiles at the United States in response to a mistaken warning of an incoming U.S. attack. Such a mistaken retaliatory launch would likely involve a large number of nuclear warheads—perhaps thousands. Another possibility is that one or a few individuals could seize control of some weapons and launch them without authorization. An unauthorized launch would also likely be large, ranging from many tens to several hundreds of warheads.<sup>9</sup> Alternatively, equipment malfunction or operator error could result in the launch of anything from a single missile to a large portion of Russia's missile force.

Some 1,300 Russian nuclear weapons are deployed on missiles kept on high alert, and could be launched within a few minutes of a decision to do so. Russia maintains this capability so it can launch its nuclear-armed missiles promptly upon receiving a warning that the United States has launched—or is about to launch—a first strike. Such an immediate launch is intended to prevent its nuclear weapons from being destroyed, and to ensure the dissemination of launch orders before its command centers are destroyed.

Launch on warning is a risky posture: the decision-making window is so short that it leaves little time to rule out a mistaken warning. In Russia, the dangers of mistaken launch are exacerbated by a

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<sup>9</sup> One scenario for an unauthorized attack would be the launch of missiles from a single Russian submarine. The Delta IV submarines each carry 64 warheads, and the Delta III submarines carry 48. Another scenario would be the launch of land-based missiles under the control of a single commander. A Russian regiment of SS-18 land-based missiles is typically six missiles with 10 warheads each, for a total of 60 warheads. However, all Russian land-based missiles in a division are interconnected, and can be launched by any of the regimental launch control centers, or by division command posts and their alternates in the field. A regiment commander who devised a way to launch the six missiles under his or her control could also fire all the missiles in the interconnected regiments. Russia maintains four fields of SS-18 missiles. Each has 30 to 52 missiles and 300 to 520 warheads. Thus an unauthorized attack could involve 48 to 520 warheads.

deficient warning system: its satellite-borne sensors for detecting missile launches provide incomplete coverage.<sup>10</sup> As a result, Russia has little ability to cross-check the validity of attack indications from its radars with those from its satellites.

Moreover, nearly all Russia's deployed strategic nuclear weapons are on vulnerable missiles: land-based missiles in silos, mobile missiles in garrisons, and missiles on submarines kept in port. Because of this, Russia has an incentive to react quickly to a warning of a U.S. first strike, and therefore could be fooled by false alarms.

The United States is similarly prepared for a Russian "bolt-from-the-blue" attack. It maintains the capability to launch roughly 1,400 weapons within minutes of receiving coordinated signals from its network of radars and early-warning satellites indicating that an attack is in progress.

The United States could keep a more relaxed finger on its nuclear trigger, as its warning and communication systems are more reliable and provide redundant worldwide coverage. The United States also maintains more than 1,000 missile-launched nuclear weapons on submarines safely hidden at sea, and these would survive any Russian first strike.

The U.S. policy of maintaining the ability to launch its nuclear forces on warning is inherently dangerous because it also gives the United States the ability to launch its weapons quickly and without warning. Not only could this posture result in a mistaken U.S. launch, but—given the high accuracy and large number of deployed U.S. nuclear weapons—it also gives Russia an incentive to keep its forces on hair-trigger alert to protect its vulnerable nuclear missiles from a surprise U.S. attack. This, in turn, increases the very real risk of a mistaken, unauthorized, or accidental launch of Russian missiles.

This is not just a hypothetical problem. In 1995, Russia's early-warning system indicated a possible U.S. missile attack. Russia's radars

apparently could not rule out the possibility that a nearby rocket launch was a U.S. nuclear-armed missile fired from a submarine in the Norwegian Sea. This triggered Russia's emergency nuclear decision process, and the alarm traveled all the way up the chain of command to President Boris Yeltsin, activating his nuclear suitcase, which would be used to authorize nuclear retaliation. About eight minutes into the rocket launch, the operators of Russia's warning radars reported that the rocket did not threaten Russia, and the alarm was canceled. In fact, the launch was a scientific research rocket fired from Norway.

The safe outcome of this false alarm is scant consolation. The mere fact that a peaceful scientific rocket could trigger an emergency launch procedure in Russia points to a real danger. And Russia's command and early-warning systems have deteriorated since then: it now has only three early-warning satellites rather than nine. The next time Russia interprets a benign event as a potential nuclear attack, it is not clear that it will have enough information to decide that it can afford to wait. A false alarm involving a single rocket or a small number of incoming warheads presumably would not precipitate a Russian decision to launch. However, a false alarm (resulting from, for example, a computer malfunction) could also create the impression of a massive U.S. attack, in which case Russia may be less willing to wait before launching a counterattack.

Maintaining forces on high alert also increases the risk of unauthorized launches. An unauthorized attack is more likely if fewer steps are needed to implement it, as is the case if weapons are primed for rapid launch. With nuclear missiles armed, fueled, and ready to fire on receipt of a few short computer commands, the need for strict safeguards to prevent unauthorized launch is obvious.

But no safeguards are foolproof, as dramatically demonstrated in August 2007, when a U.S. bomber transported six nuclear-armed cruise

<sup>10</sup> One of Russia's early-warning radars was built on Latvian territory, and was dismantled following the breakup of the Soviet Union, leading to a gap in coverage by Russia's system of such radars. However, a new radar in Lekhtusi, Russia, was completed in 2006, thereby restoring full coverage. On the other hand, because of its economic difficulties, Russia has been unable to replace all its early-warning *satellites* as they age and stop functioning. In 1995, its fleet included nine functioning satellites; now there are only three. These satellites can detect launches of U.S. land-based missiles but not those of U.S. submarine-based missiles. Russia is apparently planning to begin deploying a new satellite-based early-warning system within a few years. Pavel Podvig, "Russian strategic nuclear forces," January 2008, online at <http://russianforces.org/sprn>.

missiles from North Dakota to Louisiana without the knowledge of the military. The flight was nominally a routine air shipment of disarmed cruise missiles from one base to another. The episode occurred because Air Force personnel did not comply with security measures. The military was unaware of the missing warheads for 36 hours.

### *Future Russian Dangers*

The 1991 Strategic Arms Reductions Treaty (START I), which limits each nation to 6,000 deployed strategic warheads, expires on December 5, 2009. Neither Russia nor the United States seems interested in extending the treaty, although they are having preliminary talks about retaining some verification measures. The loss of the treaty's verification and transparency measures would mean that the United States would have less information about Russia's arsenal in the future.

The START II agreement, signed in 1993, would have limited each country to 3,500 deployed strategic weapons, and requires the elimination of MIRVs (multiple independently targeted reentry vehicles), so missiles carry only one warhead each. This treaty did not enter into force because the Russian Duma ratified it with the requirement that the Anti-Ballistic Missile (ABM) Treaty remain in effect. The day after the United States withdrew from the ABM Treaty in June 2002, Russia declared that it was no longer bound by the terms of START II.

Because of economic constraints, Russia appears to want to continue to cut its deployed nuclear forces, aiming for some 1,500 to 2,000 strategic (that is, long-range) weapons a decade from now. This level is consistent with the terms of the Moscow Treaty, which limits the United States and Russia to 1,700 to 2,200 deployed strategic weapons as of December 31, 2012, which is also the date the treaty expires. Because the Moscow

Treaty places no limits on nondeployed strategic weapons or on nonstrategic weapons, Russia—like the United States—probably plans to keep several thousand more warheads in reserve.

With the demise of START II, Russia has announced that it will begin to equip its land-based single-warhead Topol-M missiles with multiple warheads “in a few years.” That decision could increase the concern of Russian leaders about the vulnerability of Russian forces to a U.S. first strike, as the same number of warheads would then be deployed on fewer missiles. This, in turn, could increase Russia's commitment to keeping its missiles on high alert. The danger that Russia's weapons pose to the United States and other countries will depend as much—if not more—on their operational status as on their numbers.

Because of NATO expansion and the deterioration of its conventional forces, Russia has expressed renewed interest in nonstrategic nuclear weapons. Because such weapons are small and dispersed, and usually under less secure control than strategic weapons, expanding their number could increase the risk of unauthorized or accidental use as well as theft.

Political changes in Russia could also worsen nuclear dangers. Russia's transition to democracy has been uneven at best. Growing tension between the United States and Russia could deepen Russia's commitment to nuclear weapons, and convince it to keep more of them on higher alert. Indeed, in August 2007 President Putin ordered Russian nuclear-armed aircraft to resume conducting long-range patrols “on a permanent basis,” as during the cold war, noting that other nations (i.e., the United States) continued such missions for some time after the cold war ended.<sup>11</sup> More recently, President Putin stated that Russia would modernize all three legs of its nuclear triad, calling the plans “grandiose” but “fully realistic.”<sup>12</sup>

<sup>11</sup> *International Herald Tribune* (Associated Press), “Putin says Russia will resume long-range bomber patrols,” August 17, 2007. Online at <http://www.ihf.com/articles/ap/2007/08/17/europe/EU-GEN-Russia-Putin-Bombers.php>.

<sup>12</sup> Dmitry Solovoy, “Russia plans new nuclear weapons,” Reuters, October 18, 2007. Online at <http://www.reuters.com/article/topNews/idUSL1828669020071018>.

### *Russian Response to U.S. Policy*

While Russia's deployed arsenal will likely shrink significantly in coming years, U.S. nuclear policy will affect the choices Russia makes regarding its nuclear weapons. For example, domestic political constraints will almost certainly keep it from reducing its deployed forces below 1,000 to 1,500 warheads unless the United States does so as well. Moreover, unless U.S.-Russian relations significantly improve, Russian planners will argue that Russia cannot go below a certain force level if it is to retain a credible nuclear deterrent, given that the United States could deploy a relatively large-scale ground-based missile defense system, as evidenced by its continued expansion of the system in Europe and elsewhere.

U.S. nuclear doctrine will also heavily influence Russian operational policy. In particular, whether Russia maintains a launch-on-warning posture will depend on whether the United States maintains the ability to promptly destroy hardened Russian missile silos, and whether the United States deploys missile defenses that Russia believes could intercept Russia's remaining missiles.

The U.S. State Department's talking points for negotiations with Russia in January 2000 on modifying the ABM Treaty to permit deployment of the Clinton administration's planned missile defense system clearly acknowledged this link. The talking points argued that the U.S. missile defense system would not threaten Russia's deterrent as long as Russia continued to deploy 1,000 or more nuclear warheads and maintained the ability to launch its forces promptly on warning of a U.S. attack.<sup>13</sup>

Russia has also warned that it would respond to the U.S. deployment of missile defense interceptors or radars in Europe by withdrawing from the 1988 Intermediate-Range Nuclear Forces (INF) Treaty, which prohibits the deployment of missiles

with ranges from 500 to 5,500 kilometers, and by targeting U.S. military bases in Europe, presumably those with missile defense components.<sup>14</sup> (Citing U.S. missile defense plans, President Putin announced in July 2007 that Russia would suspend its participation in the 1990 Conventional Forces in Europe Treaty, which limits the deployment of conventional armaments in Europe.<sup>15</sup>)

### **Nuclear Dangers from China**

China now deploys roughly 20 single-warhead, liquid-fueled DF-5 missiles, capable of reaching all of the United States. Because China apparently stores the warheads and fuel separately from the missiles, the probability of an accidental or unauthorized launch is low. Mistaken launch in response to false warning of a U.S. or Russian strategic attack is also unlikely, because China does not have a system of early-warning sensors that permit it to launch on detection of an incoming attack.

China could launch a deliberate attack against the United States, but it has no plausible reason for doing so. In any event, because China clearly does not have the capability to execute a disarming first strike, the United States would still be capable of massive retaliation after an attack. This knowledge would strongly deter any Chinese leaders contemplating such an attack.

### *Future Chinese Dangers*

During the 20 years since China first deployed nuclear-armed missiles with a range that could reach the United States, it has been slowly modernizing its nuclear forces. China is apparently developing two solid-fueled road-mobile missiles: the DF-31, with a range of about 8,000 kilometers, and the DF-31A, with a range of more than 11,000 kilometers. The DF-31 was first flight-tested in 1999 and, according to the U.S. Department of Defense (DOD),

<sup>13</sup> Steven Lee Myers and Jane Perlez, "Documents detail U.S. plan to alter '72 missile treaty," *New York Times*, April 28, 2000, online at <http://query.nytimes.com/gst/fullpage.html?res=9507E5D61F30F93BA15757C0A9669C8B63>; and "Proposal on ABM: 'Ready to work with Russia'," *New York Times*, April 28, 2000, online at <http://query.nytimes.com/gst/fullpage.html?res=9C06E6D91F30F93BA15757C0A9669C8B63>. See also William J. Broad, "U.S.-Russian talks revive old debates on nuclear warnings," *New York Times*, May 1, 2000. Online at <http://query.nytimes.com/gst/fullpage.html?res=9802EED81539F932A35756C0A9669C8B63>.

<sup>14</sup> Demetri Sevastopulo, Neil Buckley, Daniel Dombey, and Jan Cieski, "Russia threatens to quit arms treaty," *Financial Times*, February 15, 2007, online at [http://www.ft.com/cms/s/0/289ed728-bd26-11d8-b5bd-0000779e2340.html?ncklick\\_check=1](http://www.ft.com/cms/s/0/289ed728-bd26-11d8-b5bd-0000779e2340.html?ncklick_check=1); and Maria Danilova, "Russia warns U.S. on missile defense," Associated Press, June 3, 2007, online at <http://news.independent.co.uk/europe/article3055786.ece>.

<sup>15</sup> BBC News, "Russia suspends arms control pact," July 14, 2007. Online at <http://news.bbc.co.uk/2/hi/europe/6898690.stm>.

achieved “initial threat availability” in 2006. It is likely to be targeted against Russia and Asia, but could reach Alaska, Hawaii, and parts of the Northwest region of the continental United States. The DF-31A could become operational before the end of the decade, according to the DOD.

China is also developing a sea-based version of the DF-31 known as the Julang-2, to be deployed on new Jin-class nuclear-powered ballistic-missile submarines. China’s first attempt to deploy submarine-based ballistic missiles—on Xia-class submarines—was not successful. The submarines were plagued by technical problems and never conducted a patrol. However, China could acquire a small sea-based nuclear force within the next decade—if it can overcome the significant technical and operational challenges involved in building safe and reliable submarines, communicating with them when they are submerged, and protecting them with attack submarines.

The U.S. intelligence community believes China is building these mobile nuclear weapons systems because it feels that its fixed weapons are too vulnerable to a U.S. or Russian first strike. Whether the new missiles will be deployed with warheads is unknown, but doing so would significantly shorten China’s response time to an attack. Deployment with warheads would also increase the risk of an accidental or unauthorized launch, as could the more difficult command-and-control problems associated with mobile missiles. The risk of an unauthorized launch could also rise if serious political turmoil in China weakened its nuclear command and control.

There are speculations that China is trying to develop some form of early-warning system, which would give it the capability to launch on warning of an incoming attack. However, China’s incentive

to acquire such a capability would decline if it deploys more survivable mobile forces.

A military conflict over Taiwan is perhaps the most likely scenario in which a nuclear confrontation between the United States and China might occur. To prevent the United States from intervening on Taiwan’s behalf, China could—directly or indirectly—threaten to use nuclear weapons. In the words of some American commentators, China might force the United States to risk “trading Los Angeles for Taipei.”<sup>16</sup>

Of course, Chinese leaders could expect certain retaliation from a nuclear attack on the United States, effectively ending the Chinese government’s existence. Thus the question is more likely whether Chinese leaders would be willing to trade Beijing for Los Angeles. Such a “trade” would be a significant deterrent to a Chinese nuclear attack. China could also threaten to use nuclear weapons against U.S. military forces in the region, but Chinese leaders would have to assume that such use would prompt the United States to attack all remaining Chinese nuclear weapons.

### *Chinese Response to U.S. Policy*

The United States removed Chinese targets from its Single Integrated Operational Plan (SIOP) for nuclear weapons in 1980–81, following normalization of relations. However, the United States has included China in the SIOP since 1998, and it has evolved from a few limited attack options to a growing list of Chinese targets and new attack options.<sup>17</sup> Indeed, the 2002 U.S. Nuclear Posture Review explicitly listed China and a potential military confrontation over the status of Taiwan as an “immediate nuclear contingency” requiring inclusion in U.S. nuclear war plans.<sup>18</sup>

<sup>16</sup> During the 1996 Taiwan crisis, the U.S. press reported widely that a Chinese official had warned that China might threaten Los Angeles with nuclear attack to prevent the United States from intervening in a conflict over Taiwan. However, according to Ambassador Charles W. Freeman, Jr., these reports are based on a misquote of a Chinese military officer, Lt. General Xiong Guang Kai. In a discussion with Ambassador Freeman, Lt. Gen. Xiong noted that—unlike in the 1950s, when the United States threatened nuclear strikes on China during the Korean War—China now had the ability to retaliate, so the United States could no longer threaten to use its nuclear weapons against China. See Carnegie Endowment for International Peace, “Did China threaten to bomb Los Angeles?” Non-Proliferation Project Issue Brief 4,4 (March 22, 2001). Online at <http://www.ceip.org/files/publications/ProliferationBrief404>.

<sup>17</sup> In 2003 the name SIOP was changed to Operations Plan 8044.

<sup>18</sup> U.S. Nuclear Posture Review, January 8, 2002. Online at <http://www.globalsecurity.org/wmd/library/policy/dod/npr.htm>.

While U.S. nuclear policy is unlikely to affect the nature of China's modernization program, which is motivated by a desire for a more survivable basing mode, it could affect the number of nuclear weapons China decides to deploy.

In particular, the U.S. deployment of missile defenses that China believes could intercept a significant portion of its long-range missiles could well spur China to compensate by building more missiles—to both overwhelm the defenses and make this capability evident to the United States. And because China has only about 20 long-range nuclear-armed missiles, it would be concerned about a much smaller U.S. missile defense system than Russia. Although China's scientists would likely argue that China could rely on decoys and other “penetration aids” to thwart a missile defense system, the Chinese military would likely demand an increase in the country's nuclear arsenal. The eventual outcome of such a disagreement is impossible to predict.

Past predictions of China's responses to U.S. policy by U.S. intelligence agencies have proved to be inaccurate. The August 2000 National Intelligence Estimate reportedly predicted that China would build up to 200 long-range missiles in response to deployment of the limited national missile defense system being developed by the Clinton administration.<sup>19</sup> The Defense Intelligence Agency made a similar forecast in 1999, when it considered China's response to U.S. deployment of highly accurate Trident D-5 missiles and a limited missile defense system.<sup>20</sup> A 2001 Central Intelligence Agency report estimated that China would target 75 to 100 warheads primarily against the United States.<sup>21</sup>

## Nuclear Dangers from Other Countries

No other countries have the political motivation, the nuclear warheads, and the long-range delivery systems to pose a nuclear threat to the United States today.<sup>22</sup> However, a small number of countries that the U.S. government views as hostile may be seeking to acquire nuclear weapons and the means to deliver them to the United States. These emerging threats have had a disproportionate effect on U.S. nuclear policy and war planning, spurring a new emphasis on offensive and even preemptive nuclear capabilities. According to a declassified military planning document recently obtained by the Federation of American Scientists through a Freedom of Information Act request, the 2001 Nuclear Posture Review led to the creation of new nuclear strike plans against regional states that might be seeking to acquire nuclear, biological, or chemical weapons.<sup>23</sup>

The U.S. intelligence community estimates that North Korea may have produced enough plutonium for as many as 10 nuclear weapons. North Korea tested one low-yield nuclear device in 2006, but appears to be taking initial steps toward denuclearization. The country also has successfully tested a missile with a range of roughly 1,300 kilometers with a payload of 500 to 1,000 kilograms. However, while it has demonstrated the technology for the multiple staging required for a longer-range missile, it has not had a successful flight test of a multiple-stage missile.

Iran is building an enrichment facility to produce low-enriched uranium for nuclear reactor fuel, and this facility could also produce highly enriched uranium for nuclear weapons. An Iranian bomb would have direct implications for U.S.

<sup>19</sup> The August 2000 National Intelligence Estimate, “Foreign responses to U.S. national missile defense deployment,” is classified. However, several newspaper articles reported on its contents, including Steven Lee Myers, “U.S. missile plan could reportedly provoke China,” *New York Times*, August 10, 2000; and Roberto Suro, “Study sees possible China nuclear buildup,” *Washington Post*, August 10, 2000.

<sup>20</sup> Defense Intelligence Agency, *The decades ahead, 1999–2020: A primer on the future threat*, July 1999, p. 38.

<sup>21</sup> U.S. Central Intelligence Agency, *Foreign missile developments and the ballistic missile threat through 2015*, National Intelligence Council, December 2001, p. 8.

<sup>22</sup> However, the 1998 report of the Commission to Assess the Ballistic Missile Threat to the United States noted that states would not necessarily need long-range delivery systems to pose a threat to the United States. They could instead use short-range ballistic or cruise missiles launched from ships or aircraft near U.S. shores. Online at <http://www.fas.org/irp/threat/missile/rumsfeld>.

<sup>23</sup> Hans Kristensen, “White House guidance led to new nuclear strike plans against proliferators, document shows.” Online at [http://www.fas.org/blog/sp/2007/11/white\\_house\\_guidance\\_led\\_to\\_ne.php](http://www.fas.org/blog/sp/2007/11/white_house_guidance_led_to_ne.php).

nuclear policy and planning because of the United States' direct involvement in that region and its strong support for Israel. Iran has tested a missile with a range of roughly 1,300 kilometers with a payload of 500 to 1,000 kilograms—its version of the North Korean missile.

The United Nations eliminated Iraq's nuclear weapons program well before that country could develop a workable nuclear explosive device, and in 2003 Libya gave up its pursuit of nuclear weapons.

India and Pakistan openly crossed the nuclear threshold in 1998, when both conducted multiple test explosions of nuclear weapons. They have since begun a regional arms race to develop a range of offensive nuclear strike forces. While neither nation poses a direct threat to the United States, their nuclear weapons policies have implications for U.S. and global security. India has long rationalized its nuclear weapons program as a necessary response to China's nuclear arsenal, and is developing medium-range nuclear missiles for potential use against China. This, in turn, could affect China's nuclear decision making.

Israel has had an unacknowledged nuclear weapons program for decades, and is believed to possess roughly 80 nuclear weapons for delivery by aircraft or short- and medium-range missiles. Its nuclear arsenal was part of the impetus for Iraq's nuclear weapons program, and will be a factor in Iran's decision about whether to pursue such a program.

Several factors will determine whether Iran or other non-nuclear states pursue nuclear weapons, including their political motivations, their relationship with the United States, and their regional security concerns, as well as their access to the needed technology. The latter will depend in part on Russian and Chinese cooperation on restricting technology transfers, which, in turn, will be affected

by the U.S.-Russian and U.S.-Chinese relationships. However, other suppliers have come to light: A.Q. Khan, the scientist heading the Pakistani nuclear weapons program, transferred nuclear weapons technology to Libya, Iran, and North Korea for many years, and North Korea has transferred missile technology to Iran and Pakistan.

Even more critical than Russia's policy on technology transfers is its ability to prevent the unauthorized transfer of weapons, materials, and expertise to other countries. Nuclear security in Russia has improved dramatically since the mid-1990s, but serious risks remain. Russia has the world's largest stockpile of nuclear weapons and materials—an estimated 16,000 warheads, 180 metric tons of separated plutonium, and 1,000 metric tons of weapons-grade uranium.<sup>24</sup> As of the end of fiscal-year 2006, Russia had only completed security upgrades at roughly half of its warhead storage sites.<sup>25</sup> It is essential that U.S.-funded cooperative programs continue to ensure that the remaining sites undergo security upgrades, and that the United States and Russia resolve the outstanding political problems that have hampered progress at some sites.<sup>26</sup>

In the longer term, the greatest danger to U.S. and indeed global security stems from the weakening or even collapse of the international consensus to prevent proliferation. As noted, Article VI of the Non-Proliferation Treaty requires the United States, Russia, Britain, France, and China to take serious steps toward nuclear disarmament. If these five countries do not move more quickly toward fulfilling their NPT commitment to eliminate nuclear weapons, the nonproliferation regime could unravel. More states with the technical capability and financial resources to develop and deploy nuclear weapons could do so—including those that may lack the political stability and technical

<sup>24</sup> International Panel on Fissile Materials, *Global fissile material report 2007*. Online at [www.fissilematerials.org](http://www.fissilematerials.org).

<sup>25</sup> Matthew Bunn, *Securing the bomb 2007*, Cambridge, MA: Managing the Atom Project, Harvard University, and Washington, DC: Nuclear Threat Initiative, September 2007. Online at [http://www.nti.org/e\\_research/cnwm/overview/cnwm\\_home.asp](http://www.nti.org/e_research/cnwm/overview/cnwm_home.asp).

<sup>26</sup> No agreement has been reached on security upgrades for several sites in Russia's nuclear weapons complex. For details, see Matthew Bunn, *Securing the bomb 2007*, pp. 65–66.

infrastructure to maintain control of these weapons, or that have high levels of government corruption.

### Terrorists Armed with Nuclear Weapons

In the post-9/11 world, the possibility that terrorists could acquire nuclear weapons or the material to produce them has taken on new urgency. As former Defense Secretary William Perry recently testified before the House Armed Services Committee, “The greatest danger today is that a terror group will detonate a nuclear bomb in one of our cities.”<sup>27</sup>

To avoid this scenario, Russia must gain greater control over its nuclear arsenal and stockpiles of nuclear materials. Russian authorities have confirmed that terrorists have carried out reconnaissance at storage sites for nuclear warheads.<sup>28</sup> Both the United States and Russia must also increase the rate at which they are disposing of their excess tons of nuclear weapons materials.<sup>29</sup>

Pakistan’s nuclear weapons program is a potential terrorist source of weapons. Pakistan’s government is unstable, and its nuclear weapons are under de facto military—not civilian—control. In 2004 it was revealed that Pakistan’s A.Q. Khan had for some 20 years provided nuclear weapons technology and technical assistance to nations aspiring to acquire such weapons. The Pakistani government claimed that Dr. Khan had done so without

authorization, demonstrating an astonishing level of government corruption or incompetence. Moreover, some elements of its military reportedly are sympathetic to al Qaeda. In a time of civil unrest, Muslim extremists or terrorist groups hostile to the United States and its allies could gain access to Pakistan’s nuclear weapons.

Terrorist organizations could also obtain nuclear weapons materials from some types of nuclear power facilities. These include reprocessing facilities, which separate plutonium from the more radioactive elements<sup>30</sup> in spent reactor fuel, and fuel fabrication facilities that use plutonium to make reactor fuel. Nuclear power does not require reprocessing, so a worldwide prohibition on reprocessing could eliminate this avenue.

Global stockpiles of civil plutonium from past reprocessing programs totaled roughly 250 metric tons as of the end of 2005—enough for 40,000 nuclear weapons. The United Kingdom alone has more than 78 metric tons of its own separated civil plutonium, and no plans to use it. (The United Kingdom also stores 26 metric tons of foreign-owned separated plutonium.)<sup>31</sup> Such “civilian” material is generally poorly guarded compared with military stockpiles, and, as pointed out in a recent study by the British Royal Society, preventing terrorist access will require disposing of the material.<sup>32</sup>

<sup>27</sup> William J. Perry, testimony before the Strategic Forces Subcommittee, House Armed Services Committee, July 18, 2007. Online at [http://armedservices.house.gov/pdfs/Strat071807/Perry\\_Testimony071807.pdf](http://armedservices.house.gov/pdfs/Strat071807/Perry_Testimony071807.pdf).

<sup>28</sup> Matthew Bunn, *Securing the bomb 2007*.

<sup>29</sup> Russia has declared 500 metric tons of weapons-grade highly enriched uranium as excess to its military needs and, as of the end of 2006, had disposed of roughly 300 metric tons. The United States has declared 198 metric tons as excess and, as of the end of 2006, had disposed of roughly 50 metric tons. In 2000 the two countries agreed to each dispose of 34 metric tons of plutonium, but neither has begun to do so. International Panel on Fissile Materials, *Global fissile material report 2007*, Figure 2.2, p 26. Online at [http://www.fissilematerials.org/ipfml/site\\_down/gfmr07.pdf](http://www.fissilematerials.org/ipfml/site_down/gfmr07.pdf).

<sup>30</sup> The most radioactive elements in the spent fuel are “fission products,” which are created when some of the uranium in the reactor fuel fissions, producing new elements, which may again fission. These include strontium-90 and cesium-137.

<sup>31</sup> International Panel on Fissile Materials, *Global fissile material report 2007*, Table 1B.1, p. 21. Online at [http://www.fissilematerials.org/ipfml/site\\_down/gfmr07.pdf](http://www.fissilematerials.org/ipfml/site_down/gfmr07.pdf).

<sup>32</sup> Royal Society, *Strategy options for the UK’s separated plutonium*, 2007. Online at <http://www.royalsoc.ac.uk/document.asp?tip=0&id=7080>.

## CHAPTER 3

### *The Solution*

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In the absence of profound political transformations, the United States will continue over the next decade or longer to maintain the threat of nuclear retaliation to deter nuclear attack by other countries against its territory, its armed forces, or its allies. However, the United States should also exploit its unique position as the strongest power by taking unilateral steps to create a more secure strategic environment.

The United States can reduce the threats it faces now and in the future through both:

- military policy (governing the deployment, targeting, and conditions for using U.S. nuclear weapons) and
- diplomatic policy (governing existing and future international agreements on testing, deploying, and dismantling nuclear weapons, and testing and deploying missile defenses).

#### **A New U.S. Nuclear Posture**

U.S. security would substantially improve if the next president took 10 specific, unilateral steps to revamp U.S. nuclear policy:

- 1. The United States should declare that the sole purpose of U.S. nuclear weapons is to deter and, if necessary, respond to the use of nuclear weapons by another country.**

Current U.S. policy is to retain the option of using nuclear weapons for military purposes other

than deterring nuclear attack, including:

- Deterring, responding to, and even preempting conventional, chemical, or biological attacks
- Destroying chemical or biological agents
- Deterring or responding to other unspecified threats to U.S. vital interests

However, giving nuclear weapons roles beyond deterring nuclear attack is both unnecessary and counterproductive. Those roles add little or nothing to the deterrence of non-nuclear attacks provided by U.S. conventional forces or to the U.S. ability to counter or respond to such attacks.

Moreover, maintaining and strengthening the firebreak against the use and proliferation of nuclear weapons is paramount to U.S. security. If U.S. policy treats nuclear weapons as a multipurpose arsenal, then other states will be more inclined to seek nuclear weapons. If the United States, with its unquestioned conventional superiority, acts as if it must rely on nuclear weapons to protect and defend its vital interests, then weaker states—particularly those not covered by U.S. security guarantees—will perceive a far greater need for such weapons.

Indeed, implicit or explicit U.S. threats to use nuclear weapons may motivate nations to acquire nuclear weapons to deter the United States.<sup>33</sup> These added roles for U.S. nuclear weapons also negate the nonproliferation benefits of U.S. “negative security assurances” that the United States will not use nuclear weapons against non-nuclear signatories of the NPT.

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<sup>33</sup> A comprehensive policy to prevent proliferation will ultimately have to address the fact that U.S. conventional superiority may provide an incentive for states to acquire nuclear weapons to deter a U.S. conventional attack. This will require that the United States and other nations minimize their use of force, and use their conventional forces only as part of an international coalition, or if authorized by the United Nations.

Some believe that the consequences of attack from chemical and especially biological weapons could be so great that it is unwise to forgo the “sharp deterrence” provided by explicit threats to use nuclear weapons in response. Rather than promising never to use nuclear weapons first, these proponents advocate that the United States pledge not to initiate the use of “weapons of mass destruction,” by which they mean chemical, biological, and nuclear weapons.

However, chemical weapons do not belong in this category—their destructive capacity pales compared with that of nuclear weapons. Thus, it would be irresponsible for the United States to use nuclear weapons in response to an attack by chemical weapons. Biological weapons, in contrast, could, over time, kill as many people as nuclear weapons—if they are contagious and delivered effectively. However, the threat of a U.S. conventional response is likely to be as effective in deterring such attacks as an explicit U.S. nuclear threat. In any event, any marginal gain in deterrence against a biological attack would be offset by the incentive such a policy would provide hostile nations to acquire nuclear weapons.

Advocates of an explicit U.S. nuclear threat often claim that such a threat deterred Iraq’s use of chemical and biological weapons during the first Gulf War. However, President George H.W. Bush’s threat of “the strongest possible response” if Iraq used its chemical or biological weapons applied equally to the destruction of Kuwait’s oil fields, which Iraq did with impunity.<sup>34</sup>

U.S. officials threatened privately to escalate the war in ways that did not involve nuclear weapons if Iraq used chemical or biological weapons. Secretary of State James Baker warned the Iraqi foreign minister that the use of such weapons

would lead the United States to seek to topple the Hussein regime.<sup>35</sup> These threats were almost certainly an equally, if not more, potent deterrent compared with the nuclear threat. There is also evidence that U.S. air attacks impaired Iraq’s ability to deploy and use chemical and biological weapons. We do not know why Iraq did not use chemical or biological weapons in that war. However, the balance of evidence does not support the conclusion that veiled U.S. threats to use nuclear weapons were the determining factor.

Nuclear threats are also unnecessary to deter non-nuclear attacks because U.S. conventional military strength far exceeds that of all potential adversaries, and will do so for the foreseeable future. The United States and its allies can rely on their combined conventional military strength to counter any non-nuclear threat to their security.

Finally, practical political reasons preclude the use of nuclear weapons in response to non-nuclear attacks. Although one can imagine cases where domestic pressure for nuclear revenge might be strong, or where the use of nuclear weapons might reduce U.S. casualties and end a war more quickly, wise leaders would weigh these considerations against the grave damage that nuclear first use would do to U.S. security. In the short term, nuclear attacks could turn world opinion against the United States and render a collective response against an offender difficult or impossible. The long-term effects would be even more profound. Nuclear strikes would deal a fatal blow to U.S. leadership and alliances, wreck the nonproliferation regime, and spur other states to acquire nuclear weapons. While the United States has considered using nuclear weapons numerous times since the bombings of Hiroshima and Nagasaki, it has not done so, in part because of just such considerations.

<sup>34</sup> A letter from President George H.W. Bush to President Saddam Hussein, delivered by Secretary of State James Baker to Iraqi Foreign Minister Tariq Aziz on the eve of the Gulf War, stated in the final paragraph, “The United States will not tolerate the use of chemical or biological weapons, support of any terrorist actions, or the destruction of Kuwait’s oilfields and installations. The American people would demand the strongest possible response. You and your country will pay a terrible price if you order unconscionable action of this sort.” See “Confrontation in the gulf: Text of letter from Bush to Hussein,” *New York Times*, January 13, 1991.

<sup>35</sup> Secretary of State Baker verbally delivered the following threat to Tariq Aziz on the eve of the Gulf War: “If the conflict starts, God forbid, and chemical or biological weapons are used against our forces, the American people would demand revenge, and we have the means to implement this. This is not a threat, but a pledge that if there is any use of such weapons, our objective would not be only the liberation of Kuwait, but also the toppling of the present regime. Any person who is responsible for the use of these weapons would be held accountable in the future.” Lawrence Freedman and Efraim Karsh, *The gulf conflict: 1990–1991*, London: Faber and Faber, 1993, p. 257.

Threatening to use nuclear weapons in response to non-nuclear attacks could also increase the pressure on the United States to follow through, even if that would be counter to U.S. interests, for two reasons. First, if the United States retains its first-use option, the military will maintain detailed contingency plans and standard operating procedures for such use, which could dominate thinking about how to respond in a crisis. Second, once policy makers threaten a nuclear response, they might worry about undermining U.S. credibility and resolve if they did not follow through, even if they believed that doing so would be unnecessary or imprudent.

The bottom line is that the marginal value of explicit threats to use nuclear weapons to respond to non-nuclear attacks is small, the wisdom of carrying out such threats is dubious, and the potential long-term security costs of making such threats is great. The United States should make clear that the sole purpose of its nuclear weapons is to deter and, if necessary, respond to nuclear attacks.

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## **2. The United States should reject rapid-launch options (launch-on-warning and launch-under-attack) by changing its deployment practices to allow the launch of nuclear forces in days rather than minutes.**

By revamping its deployment practices so it could no longer launch its nuclear forces promptly, the United States would reduce Russia's incentive to maintain its launch-on-warning capability, thereby minimizing the risks of a mistaken, unauthorized, or accidental launch of Russian nuclear weapons. A reliable and credible U.S. nuclear deterrent does not require that the United States be able to retaliate within minutes, so long as no attack could disable the U.S. command-and-control system, and sufficient nuclear weapons would survive any attack.

In the longer term, the United States could further enhance its security by working with Russia to develop and negotiate verifiable measures to

ensure that neither country could launch its missiles in a massive surprise attack.

The only rationale for the United States to maintain its launch-on-warning and launch-under-attack options is a belief that doing so provides a more credible deterrent to a deliberate Russian attack, and therefore reduces the chance of a first strike against U.S. nuclear forces. Whether or not such a doctrine was valid during the cold war, it is not justified in the post-cold war security environment, where the probability of a mistaken, unauthorized, or accidental launch from Russia is far greater than that of a deliberate attack.

Moreover, there is no reason to believe that a rapid-launch posture is necessary to deter a first strike, should Russia ever contemplate such an action. Because nuclear weapons are enormously destructive, Russia would be equally deterred by the knowledge that enough U.S. nuclear weapons would survive any first strike to cause tremendous damage, and could be launched in retaliation. U.S. submarines at sea are undetectable and cannot be targeted, for example, so their nuclear-armed missiles would survive. And no attacker could assume that destroying key parts of the U.S. command system would prevent the United States from retaliating with its surviving nuclear weapons.

U.S. "detargeting" policy—in which U.S. missiles are not preloaded with specific targets—does not preclude rapid-launch options. This policy is purely cosmetic: the target information remains in the missiles' computer memory. Retargeting the land-based missile force would take just seconds, and retargeting the submarine-based missiles perhaps 10 minutes. If the target data were removed from the computer memory, and thus would have to be reentered before launch, retargeting 10 Minuteman land-based missiles would take about 30 minutes, and retargeting the entire force of 500 missiles a full day. (The Minuteman force is divided into 10 squadrons of 50 missiles each, and only one missile can be retargeted at a time per squadron because of software limitations.) If the supporting

documentation for emergency war orders had to be recreated and distributed, restoring large-scale preprogrammed options would take additional days.

The United States and Russia could modify deployment of their nuclear-armed missiles in several ways so they could not be launched rapidly and the other country could be confident of that fact. For example, a 1997 talking paper by the vice chair of the Joint Chiefs of Staff discusses the design of heavy objects that could be placed on the lids of U.S. and Russian missile silos and would take some time to remove. According to the paper, a combination of on-site inspectors and information from reconnaissance satellites could be used to verify that the object was actually large and heavy and would perform as expected, and that it remained in place. For Russian land-mobile missiles in garages, large heavy metal beams could be set up above the sliding roofs of the garages, and verified in a similar manner.<sup>36</sup>

The United States should take such steps unilaterally, so Russia can have enough confidence to relax its own nuclear posture. The two countries should jointly develop verifiable measures that would apply to both countries, but the unilateral steps by the United States would facilitate such measures.

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**3. The United States should eliminate preset targeting plans, and replace them with the capability to promptly develop a response tailored to the situation if nuclear weapons are used against the United States, its armed forces, or its allies.**

During the cold war, the United States developed a wide array of preset targeting plans for large-scale “counterforce” attacks against Soviet nuclear weapons and other targets, and against targets in China and other nations. These plans are still in place today, and could be modified only by

months of careful work. Such counterforce options are both unnecessary and dangerous. Moreover, the United States now needs far less time to plan small-scale retaliatory attacks.

Because a deliberate nuclear attack against the United States by another nation is implausible, and the circumstances under which the United States might seriously consider the use of nuclear weapons are unforeseeable, preplanned options make little sense. The United States should instead create a process for flexible targeting that would encourage deliberation and facilitate the development of options tailored to unanticipated situations. Such a shift would move nuclear weapons from the forefront of U.S. military planning to an option of last resort.

*Counterforce Targeting*

Today’s U.S. nuclear forces are highly accurate, and carry powerful warheads that give them the capability to destroy missiles in silos as well as hardened command-and-control centers. Under current U.S. nuclear doctrine, the United States maintains the ability to destroy more than 1,000 hardened Russian targets, with the nominal goal of limiting damage to the United States should deterrence fail or appear about to fail.

Although the 2001 Nuclear Posture Review removed Russia as an “immediate contingency” for nuclear planning (separate from actual targeting), it remains a potential contingency, and U.S. planners must maintain the strike plans and capabilities to hold the Russian nuclear target base at risk. Targets include hundreds of missiles in silos, launch-control centers, and mobile missile garrisons; dozens of bases for strategic bombers and submarines; and hundreds of air defense, nuclear weapons storage, command-and-control, and leadership targets.

Under such targeting, the United States must deploy enough nuclear weapons so it can launch enough warheads at each target—sometimes two

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<sup>36</sup> Vice chair of the Joint Chiefs of Staff, talking paper, 1997 (unpublished).

or more—to have a high probability of destroying it. Additional warheads must be kept in reserve for potential use against other nuclear powers, principally China, to ensure that the United States has a credible deterrent even after a nuclear war with Russia. These requirements call for a very large number of U.S. warheads. Counterforce targeting of Russian forces is the only rationale for a large U.S. arsenal.

Some U.S. defense officials are reluctant to endorse deep reductions in nuclear weapons largely because of their continued attachment to counterforce targeting. However, the harsh reality is that counterforce attacks against Russia could not limit damage to the United States to any meaningful extent. If Russia did launch a limited attack on the United States or its allies, the United States could launch its nuclear weapons at Russia's remaining nuclear forces and its command-and-control centers, in an attempt to limit further damage. Yet such a counterforce attack would likely prompt Russia to launch its remaining forces on warning of attack. Even if it did not do so, enough Russian nuclear forces to destroy many U.S. cities would almost certainly survive any U.S. attack, even if Russian forces were much smaller.<sup>37</sup>

A preemptive first strike by the United States against Russia would be even more reckless—even if deterrence appeared about to fail. A first strike could not succeed. It would instead prompt Russia to launch all the nuclear weapons it could on warning, thus ensuring that at least a few hundred would be launched rather than destroyed in their silos, which would be enough to destroy the United States.

Moreover, as noted, it is dangerous for the United States to maintain a large counterforce capability, as doing so encourages Russia to deploy its vulnerable forces so that they can be launched on warning. This, in turn, raises the risks of

mistaken, unauthorized, or accidental attacks. Today and for the foreseeable future, the greatest danger to the United States is from just such attacks.

The United States should renounce counterforce targeting. But what should replace it?

### *Other Targeting Options*

One option is to target cities. Such a “countervalue” doctrine clearly violates established international law, which requires that threats or the use of force not be directed at civilians. However, the claim that counterforce is superior in this regard rings hollow: counterforce attacks, which would involve a much larger number of nuclear detonations, and many attacks against targets in or near cities, would also kill millions to tens of millions of people.

Another option is to target conventional military forces and defense industries critical to a war effort. This so-called “counterpower” strategy might avoid the instabilities associated with counterforce—because neither side would fear for the safety of its nuclear force—while offering retaliatory options other than the destruction of cities. Targets might include major military bases and storage areas, and possibly energy infrastructure located away from major cities, such as refineries or transmission nodes for gas and electricity. Unlike counterforce, counterpower targeting would require at most 100 warheads—enough to hold the most valuable conventional military and energy targets located outside cities at risk.

However, because people live near where they work, even counterpower attacks using a small number of nuclear weapons would still produce large numbers of casualties. Another problem with counterpower targeting is that countries could misinterpret nuclear attacks against conventional military targets as an attempt to win a war, rather than an effort to retaliate against a nuclear attack

<sup>37</sup> The two reasons it is not feasible for the United States to use its nuclear weapons to limit damage from Russia—that Russia can launch its forces on warning of an incoming attack, and that it has enough nuclear weapons to ensure that a sufficient number would survive a U.S. counterforce attack—do not hold in the case of China or other countries that might acquire a small number of nuclear weapons in the future. If China or another small nuclear power did use nuclear weapons against the United States or its allies, the United States could seek to limit further damage by launching a counterforce second strike. However, the United States could not achieve its goal even in that situation. The potential for a counterforce second strike would almost certainly inspire countries without a launch-on-warning capability, such as China, to launch all their vulnerable forces in their first attack.

in ways that minimize the potential for further escalation and loss of life.

### *Flexible Targeting*

There is no easy answer to the question of how best—or even whether—to use nuclear weapons in retaliation should deterrence fail. Thus, rather than simply replacing one fixed plan with another, the United States should not rely on fixed nuclear war plans, known as operations plans (OPLANS). OPLANS are highly synchronized strike plans, with allocated forces maintained on various levels of alert as if anticipating nuclear war at any moment. (Although the nation’s strategic war plan was known as the SIOP for more than 40 years, in 2003 the name was changed to Operations Plan 8044, to reflect that a “family of plans” for use against a wider range of contingencies had replaced the “single” plan.) The new plan “provides more flexible options to assure allies, and dissuade, deter, and if necessary, defeat adversaries in a wider range of contingencies.”<sup>38</sup>

Nevertheless, this plan still implies an inappropriate degree of focus and preplanning. Why should the United States rely on detailed plans—which it updates and practices regularly—for massive attacks to destroy Russia on a few minutes’ notice? Such preprogrammed war plans are no longer necessary, as the technology exists to devise an attack and target missiles in a matter of hours.

Flexible targeting would not mean an end to war planning. Instead, the U.S. Strategic Command should rethink how nuclear weapons might be used within the confines of the limited role assigned to them, and how to subject the resulting concepts to periodic review by policy makers. These so-called concept plans (CONPLANs) could be brought up to OPLAN readiness levels if so ordered by the president. The military could regularly rehearse developing and executing more specific plans in response to hypothetical scenarios.

As noted, several principles should guide such exercises and contingency planning:

- The United States will not use nuclear weapons first.
- The United States will not use nuclear weapons in haste (no option to launch on warning or launch under attack).
- Any response to a nuclear attack will be tailored to the circumstances, and will be designed to minimize the risk of additional nuclear attacks, particularly against cities.

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4. **The United States should promptly and unilaterally reduce the U.S. nuclear arsenal to no more than 1,000 warheads, including deployed and reserve warheads. The United States would declare all warheads above this level to be in excess of its military needs, move them into storage, begin dismantling them in a manner transparent to the international community, and begin disposing—under international safeguards—of all plutonium and highly enriched uranium beyond that required to maintain these 1,000 warheads. By making the end point of this dismantlement process dependent on Russia’s response, the United States would encourage Russia to reciprocate.**

No current or conceivable future threat requires the United States to maintain more than a few hundred survivable warheads. By unilaterally reducing its arsenal to a total of 1,000 warheads, the United States would encourage Russia to similarly reduce its nuclear forces without waiting for arms control negotiations. To induce other nuclear weapons states to join in further reductions, U.S. cuts below this level should occur through multi-lateral negotiations.

These unilateral reductions should encompass both deployed warheads and those kept in reserve, which now total nearly 10,000. Such reductions would transform the post-cold war nuclear security environment, provide Russia with a strong

<sup>38</sup> General Richard B. Myers, chair of the Joint Chiefs of Staff, *Written posture statement to SAC-D*, April 27, 2005.

incentive to follow suit, and demonstrate U.S. intentions to fulfill its commitments under the Non-Proliferation Treaty.

### *Deterrence and Response*

There is no military reason to link the size of U.S. nuclear forces to that of other countries, as long as the United States has enough survivable and deliverable warheads to deter and, if necessary, respond to any plausible nuclear attack.<sup>39</sup> For example, even a 10,000-warhead force could not nullify a 100-warhead U.S. force based on submarines at sea.<sup>40</sup>

How many nuclear weapons does the United States need to deter or respond to the use of nuclear weapons?

Even if the United States rejects countervalue targeting, the capability to destroy an attacker's government and society is the core of deterrence. No sane adversary would believe that any political or military advantage would be worth risking the destruction of its own society. The delivery of 100 warheads would destroy the society and economy of any country, and tens of detonations could kill more people than have ever been killed in any previous war. Thus, 100 deliverable warheads should be more than enough to deter any rational leader from ordering a nuclear attack on the cities of the United States or its allies.

It would be suicidal for the United States to retaliate against Russian cities. If the United States suffered less than all-out nuclear attack and deemed a nuclear response necessary, the president should have options to use nuclear weapons on targets other than an opponent's cities, to minimize the probability of escalation. Again, 100 survivable warheads should be sufficient for such contingencies.

Against Russia, for example, 100 nuclear explosions would be enough to destroy all major air and naval bases, staging areas, command

centers, and logistics centers that might be used to support a conventional attack. Or 100 explosions could destroy all major energy and industrial targets located outside cities.<sup>41</sup> However, it is difficult to imagine that 100 nuclear weapons could be used against an opponent—even in a manner that avoided cities—without triggering an all-out response. Some 10 warheads are probably closer to the upper limit of what an adversary would interpret as a limited response.

Thus, a few hundred survivable and deliverable warheads should be sufficient for the United States to deter or respond to a nuclear attack while retaining enough nuclear weapons to continue to deter other countries from attacking.

Specifying in detail possible U.S. force postures is beyond the scope of this report. However, if, for example, the United States maintained two submarines at sea, each armed with 24 missiles carrying three warheads each, that should be enough to ensure survivability. This approach might require four submarines, of which two would be in port or undergoing retrofitting at any given time.

U.S. systems for formulating and communicating attack plans to the submarines must also be survivable if the United States is to tailor any response to the circumstances of an attack.<sup>42</sup> Although the United States might retain a dozen or so nuclear-capable bombers for special missions (such as to maintain presidential control until the last possible moment, to ensure that a bomber releases a weapon over its intended target, or to assess the results of an attack), there is no reason to maintain a full triad of forces. The high degree of redundancy in current forces is unnecessary for deterrence.

Given that 1,000 warheads is well beyond the few hundred survivable warheads needed to deter attack given the number of nuclear weapons in the world today, the United States might choose to

<sup>39</sup> Survivable warheads exclude those on silo-based missiles, pier-side submarine-based missiles, and bombers not on alert.

<sup>40</sup> There may be reason to link the size of the U.S. arsenal to the capabilities of missile defenses deployed by potential adversaries, but none of these countries are working on defense systems against long-range missiles.

<sup>41</sup> Roger D. Speed, "Potential CIS/Russian targets," UCRL-ID-111040, Livermore, CA: Lawrence Livermore National Laboratory, June 1992.

<sup>42</sup> As discussed in Kurt Gottfried and Bruce G. Blair, eds., *Crisis stability and nuclear war*, the United States could establish a secure "strategic mailbox" from which a submarine commander could pick up messages from the national command authority at any time. New York: Oxford University Press, 1988, p. 110.

deploy half of those 1,000 while retaining the rest as a reserve force.

### *Warhead Dismantlement*

Nuclear warheads kept in storage constitute a serious proliferation risk, especially under current conditions in Russia. To give Russia an incentive to reciprocate and reduce its nuclear arsenal, and to lay the groundwork for future reductions, the United States should continue dismantling its excess nuclear warheads in a manner transparent to Russia and the rest of the world.

The United States should also commit to storing and disposing of the resulting fissile material—and all other stocks of plutonium and highly enriched uranium beyond those needed to maintain 1,000 warheads—under international safeguards.<sup>43</sup> This would preclude the reuse of such stocks in nuclear weapons, and make clear that these reductions are irreversible.

The United States now has about:

- 3,600 active strategic warheads (those deployed on delivery systems and their spares)
- 500 operational nonstrategic warheads, of which some 350 are deployed in six European countries
- 1,250 inactive warheads (those maintained as a “hedge” to permit a rapid increase in deployed weapons, and those kept to replace active warheads if any develop reliability problems)

Thus the U.S. nuclear arsenal totals roughly 5,350 warheads. The United States also maintains some 15,000 plutonium “pits” from dismantled nuclear weapons at the Pantex plant near Amarillo, TX, of which roughly 5,000 are kept as a strategic reserve.<sup>44</sup>

In addition, as of December 2007, roughly 4,600 nuclear warheads have been retired and are

slated for dismantlement. According to the administration, that number will grow to 5,400 by 2012.

Under our proposal for unilateral cuts to a total of 1,000 warheads, the United States would not maintain any additional pits as a reserve. Thus, retaining 1,000 nuclear warheads would require the United States to dismantle some 4,400 additional nuclear weapons (for a total of roughly 10,000), and to dispose of the fissile material from some 25,000 plutonium pits.

Dismantlement began in 2005—without verification procedures. As of the end of 2007, perhaps 350 warheads have been dismantled. The last warhead is scheduled to be dismantled in 2023 or later, yielding an average rate of 250 warheads dismantled per year. During the 1990s, the average annual rate of dismantlement was almost 1,800. The pace is expected to be much slower partly because a large number of warheads are scheduled for life-extension programs, which require disassembly and reassembly, and these programs have priority at Pantex.

However, under our proposal for retaining no more than 1,000 warheads, the number in life-extension programs would decline significantly, so the dismantlement rate could accelerate. Under this scenario, 10,000 warheads could be dismantled in less than a decade. To make this activity transparent to Russia and the international community, the United States should allow verification, including on-site inspection, by a consortium of other nations. This could be done without revealing sensitive information on the design of nuclear weapons.<sup>45</sup>

Disposing of the fissile material is likely to take several decades.<sup>46</sup> To further encourage Russia to reciprocate, the United States could indicate that it will not complete its dismantlement and disposition process unless Russia also places its excess

<sup>43</sup> U.S. submarines are nuclear-powered, and are fueled with highly enriched uranium (HEU). The U.S. Navy has reserved a large stockpile of HEU for its future needs, but nuclear-powered submarines could instead be designed to be fueled with low-enriched uranium.

<sup>44</sup> A plutonium pit is the core of a thermonuclear weapon, used to initiate the nuclear explosion.

<sup>45</sup> The U.S. and Russian nuclear weapons laboratories have jointly developed verification measures that would not reveal sensitive information.

<sup>46</sup> The highly enriched uranium can be blended with depleted uranium to produce low-enriched uranium, which cannot be used for nuclear weapons but can be used to fuel nuclear power reactors. The plutonium can also be used to fuel reactors, but this approach would entail security risks, as all plutonium can be used to build nuclear weapons. Instead, plutonium should be disposed of by combining it with radioactive waste and encasing it in glass or ceramic cylinders, which would ultimately be placed in a geologic repository with other nuclear waste.

warheads in storage, and begins to dismantle them in a secure and verifiable manner.

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### 5. The United States should halt all programs for developing and deploying new nuclear weapons, including the proposed Reliable Replacement Warhead.

The U.S. Department of Energy (DOE) has proposed developing a new family of nuclear warheads. Over the next several decades, under the Reliable Replacement Warhead (RRW) program, the nuclear weapons laboratories would redesign and replace the entire U.S. nuclear arsenal with untested warhead designs that are intended to be more reliable. However, the RRW program is unnecessary; today's U.S. nuclear warheads are highly reliable and will remain so for many decades.

Concerns about reliability have focused on the plutonium pit at the core of U.S. hydrogen bombs, which serves as the trigger for the fusion reaction. Because plutonium does not occur in nature and the first plutonium was made in the 1940s (warheads were regularly manufactured until the late 1980s), little has been known about whether and how the properties of plutonium change as it ages beyond a few decades. Until recently, the DOE argued that new RRW designs were needed because self-radiation may damage the plutonium pits over time. However, these concerns were dispelled when the prestigious JASON panel of independent scientists reviewed the DOE's "accelerated-aging" experiments on plutonium pits. That review—released in December 2006 and later endorsed by the DOE—concluded that the plutonium pits in U.S. nuclear warheads have lifetimes of at least 85 years.<sup>47</sup>

Of the warheads that the United States plans to maintain as part of its "enduring stockpile," the

W-76 is the oldest (production began in 1978).<sup>48</sup> Thus, if we assume the lower limit of 85 years for the W-76's lifetime, the plutonium pits will remain reliable for at least another 56 years.

Moreover, the accelerated-aging experiments, which occurred over several years, will continue. Each year of the experiments provides information on 16 years of pit lifetimes.<sup>49</sup> Thus, in another 10 years, the United States will have information on the effects of aging on plutonium out to about 250 years.

The DOE has not dropped the RRW program in response to the JASON findings, partly because the agency says it needs the program to train new weapons designers. Under a related program, Complex 2030, the DOE will update the U.S. nuclear weapons production complex and design, develop, and produce a suite of new RRWs over the next two decades. Doing so would require the complex to produce warheads on a continuous basis.

The DOE maintains that this will create a "responsive infrastructure" that would allow the United States to rapidly build additional warheads in response to political developments, or to replace an entire class of warheads that have been found to be unreliable. Because the stated rationale for the U.S. reserve arsenal is to supply additional warheads quickly, the DOE maintains that Complex 2030 will permit reductions in the "hedge" of deployed nuclear warheads once this responsive infrastructure is in place—by 2030. However, this infrastructure will remain responsive only by continuously producing warheads.

The DOE maintains that new RRW warheads can be deployed without conducting nuclear explosive tests. However, the United States has never certified and deployed a modern nuclear warhead design without first conducting a series of full-scale nuclear explosive tests. Many weapons

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<sup>47</sup> JASON, *Pit lifetime*, JSR-06-335, Bedford, MA: MITRE Corp., January 11, 2007, online at <http://www.fas.org/irp/agency/dod/jason/pit.pdf>; letter to John Warner, chair, Senate Committee on Armed Services from Linton Brooks, administrator, National Nuclear Security Agency, U.S. Department of Energy, November 28, 2006, online at [http://www.nukewatch.org/facts/nwd/JASON\\_ReportPuAging.pdf](http://www.nukewatch.org/facts/nwd/JASON_ReportPuAging.pdf).

The JASON report originally concluded that the plutonium pits in most U.S. nuclear warheads have lifetimes of at least 100 years, and that clear steps are available to increase the minimum lifetimes of pits with shorter lifetimes to 100 years. The DOE later approved the review with the explicit statement that all U.S. warheads have a lifetime of at least 85 years.

<sup>48</sup> The W-62 warhead is older than the W-76, but the DOE is now retiring this warhead, a process that will be completed in 2009.

<sup>49</sup> Joseph C. Martz and Adam J. Schwartz, "Plutonium: Aging mechanisms and weapon pit lifetime assessment," *JOM*, September 2003. Online at <http://www.tms.org/pubs/journals/JOM/0309/Martz-0309.html>.

scientists are skeptical that a new RRW warhead could be certified with the same level of confidence as existing weapons without such tests. For example, a recent study by the JASON panel concluded that certification of the new design is as yet “not assured,” and that “additional experiments and analysis are needed that explore possible failure modes.”<sup>50</sup> In any event, there will be tremendous political pressure to test any new nuclear designs to reassure future U.S. politicians, the military, and our allies that the new warheads will be reliable.

The first RRW design has recently been chosen, and it is intended to replace the W-76 warheads deployed on Trident II submarine-launched ballistic missiles. Yet the W-76s are just beginning to undergo a refurbishment program that will extend the lifetime of their non-nuclear components for another 30 years. The nuclear components are expected to last much longer.

Initial production of this first RRW design was slated for 2012, but that was changed to 2014 when Congress eliminated all funding for work beyond Phase 2A (which entails defining the design and assessing the costs) in the FY08 defense appropriations bill.<sup>51</sup>

The RRW and Complex 2030 programs are not only unnecessary. They also undercut efforts to convince non-nuclear nations to forgo nuclear weapons, and to convince new weapons states such as India and Pakistan to refrain from developing additional warheads.

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**6. The United States should promptly and unilaterally retire all U.S. nonstrategic nuclear weapons, dismantling them in a transparent manner, and take steps to induce Russia to do the same.**

If the sole purpose of U.S. nuclear weapons is to deter and, if necessary, respond to the use of nuclear weapons by others, the United States has

no need for nonstrategic nuclear weapons that could not be fulfilled by strategic weapons. Because nonstrategic nuclear weapons are often stored and deployed under less secure conditions than strategic weapons, eliminating nonstrategic nuclear weapons would reduce the dangers of unauthorized use and theft, particularly if Russia reciprocates.

U.S. nonstrategic nuclear weapons were developed and deployed primarily to defend Western Europe from a potential Soviet conventional attack, and Taiwan and South Korea from potential Chinese and North Korean conventional attacks, respectively, at a time when the United States and its allies feared that their conventional forces were much inferior to those of their potential attackers. The Soviet Union and the Warsaw Pact no longer exist. Russia poses no conventional threat to Europe. U.S. conventional forces are now far superior to those of other nations, and there is no plausible future need for U.S. nonstrategic nuclear forces. In recognition of that fact, President George H.W. Bush unilaterally deactivated and began dismantling most U.S. nonstrategic nuclear weapons in 1991, and removed all such weapons from South Korea and U.S. naval ships and submarines.

Today the United States maintains some 1,280 nonstrategic nuclear warheads, of which roughly 500 are active. This total includes 400 bombs for delivery by aircraft, of which some 350 are deployed in six European countries. Another 100 active sea-launched cruise missiles are stored at naval bases in Georgia and Washington, but are not normally deployed at sea.<sup>52</sup>

The United States does not need nonstrategic nuclear weapons to continue to extend its nuclear umbrella over its allies in Europe or elsewhere. U.S. strategic nuclear forces would deter nuclear strikes against U.S. allies, and could be used to respond to such attacks if deterrence failed.

The United States should therefore promptly retire all nonstrategic nuclear weapons and

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<sup>50</sup> JASON, *Reliable Replacement Warhead executive summary*, JSR-07-336E, Bedford, MA: MITRE Corp., September 7, 2007. Online at <http://www.fas.org/irp/agency/dod/jason/rrw.pdf>.

<sup>51</sup> As mentioned previously, President George W. Bush vetoed the original bill, but the modified version will retain this provision.

<sup>52</sup> Robert S. Norris and Hans M. Kristensen, “The U.S. nuclear stockpile today and tomorrow,” *Bulletin of the Atomic Scientists*, September/October 2007, pp 60–62. Online at <http://thebulletin.metapress.com/content/3605g0m20b18877w/fulltext.pdf>.

dismantle them in a manner transparent to Russia and the international community, again allowing verification, including on-site inspection, by a consortium of other nations. Although the United States should make every attempt to encourage Russia to reciprocate, it should not make this effort contingent on Russian actions.

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**7. The United States should announce its commitment to reducing the number of nuclear weapons further, on a negotiated and verified bilateral or multilateral basis.**

Although the United States could meet its security needs with a few hundred survivable nuclear weapons, we recommend that it unilaterally reduce its nuclear arsenal to only 1,000 weapons at this point. If the United States reduces its total nuclear arsenal to 1,000 warheads, and Russia responds by taking comparable steps, the other nuclear nations—China, Britain, France, India, Israel, and Pakistan, which have from a handful to several hundred warheads—should join in the reduction process.

The desire for further reductions would be an important inducement for these states to join in multilateral negotiations to reduce their arsenals. Negotiated agreements would also make reductions more difficult to reverse. Such negotiations would therefore provide all nuclear weapons states with the predictability and transparency they need to move toward smaller nuclear forces and safer nuclear postures.

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**8. The United States should commit to not resume nuclear explosive testing, and should ratify the Comprehensive Test Ban Treaty.**

The indefinite extension of the Non-Proliferation Treaty in 1995 was predicated on support for the Comprehensive Test Ban Treaty

(CTBT) by the nuclear weapons states as the next major step toward fulfilling their commitments under Article VI of the NPT. President Clinton signed the CTBT in 1996, but in 1999 the Senate declined to ratify it.

Under the Clinton administration, at the 2000 NPT review conference, the United States joined the other nuclear weapons states in committing itself to secure the entry into force of the CTBT. However, while he has indicated that he intends to preserve the moratorium on nuclear testing, President Bush has stated that he does not intend to resubmit the treaty for Senate ratification.

The United States has a large and varied suite of fully tested nuclear weapons designs that can meet all credible future military requirements. It also has sophisticated facilities for maintaining a reliable nuclear stockpile without explosive testing. A U.S. resumption of testing would severely compromise the nonproliferation regime, whereas U.S. ratification of the CTBT would strengthen the regime.

As General John Shalikashvili noted in a January 2001 report, “An objective and thorough net assessment shows convincingly that U.S. interests, as well as those of friends and allies, will be served by the Treaty’s entry into force.”<sup>53</sup> That assessment was echoed by a 2002 National Academy of Sciences report.<sup>54</sup>

The United States has nothing to lose and much to gain by ratifying the CTBT. It would impose a significant barrier to developing many types of nuclear weapons on threshold nuclear weapons states—especially thermonuclear warheads that can meet the volume and weight constraints of missile delivery. If it does not ratify the CTBT, the United States will be unable to pressure other states to sign and ratify these provisions.

If the United States fails to ratify the CTBT and it consequently does not enter into force, the United States would be throwing away much of the moral authority and international goodwill

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<sup>53</sup> General John M. Shalikashvili (U.S. Air Force, ret.), “Findings and recommendations concerning the Comprehensive Nuclear Test Ban Treaty,” January 2001. Online at [http://www.state.gov/www/global/arms/ctbt/page/ctbt\\_report.html#report](http://www.state.gov/www/global/arms/ctbt/page/ctbt_report.html#report).

<sup>54</sup> Committee on International Security and Arms Control, *Technical issues related to ratification of the Comprehensive Nuclear Test Ban Treaty*, Washington, DC: National Academies Press, 2002. Online at [http://www.nap.edu/catalog.php?record\\_id=10471](http://www.nap.edu/catalog.php?record_id=10471).

that has allowed it to lead efforts to strengthen the global nonproliferation regime.

### *Testing Is Unnecessary*

As noted, the weapons in the current U.S. arsenal are highly reliable and will remain so for decades—or longer. Moreover, the United States has not relied on testing to assess reliability; almost all U.S. nuclear explosive testing has been devoted to developing new weapons. Of the some 350 underground tests the United States has conducted since 1972, only eight were “stockpile confidence tests.”<sup>55</sup> And these eight tests were conducted before the creation of the Stockpile Stewardship Program, under which the weapons laboratories have developed new experimental, diagnostic, and computational tools to maintain, modify, and certify the performance of nuclear weapons without nuclear testing.

CTBT opponents argue that an unanticipated security threat could emerge that would require a resumption of U.S. nuclear testing, and that this possibility—however small—means that the United States should stay out of the treaty. They also argue that the United States should not ratify the treaty because a serious technical problem could be discovered in a deployed warhead type, and testing might be needed to address it. However, U.S. nuclear weapons have been fully tested, and any small modification needed to address a potential problem would leave the modified weapon closer to its test pedigree than an RRW—which the DOE plans to deploy without nuclear testing.

Moreover, even if a problem were discovered with a warhead type, nuclear testing is unlikely to be required to fix it. The science-based stockpile stewardship facilities and technologies developed since 1993 have led to a more detailed understanding of how nuclear weapons work. Hydrodynamic tests now allow fully assembled nuclear weapons, with a surrogate for the fissile material core, to undergo implosions with no nuclear yield.

Finally, if an implausible situation were to develop in which the United States found it necessary to resume nuclear testing, it would have ample time to invoke the “supreme national interests” clause and withdraw from the treaty. Because the political price of withdrawal would be high, CTBT opponents question whether the United States would actually do so under such circumstances. However, the price of resuming testing is already high, and ratification of the CTBT would only marginally increase it. If the United States resumed testing, Russia and China would likely respond in kind, and other nations would not be far behind. Any nuclear testing would severely compromise the global nonproliferation regime and U.S. efforts to strengthen it.

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**9. The United States should halt further deployment of its Ground-Based Missile Defense system, and drop any plans for space-based missile defense. The deployment of a U.S. missile defense system that Russia or China believed could intercept a significant portion of its survivable long-range missile forces would be an obstacle to deep nuclear cuts. A U.S. missile defense system could also trigger reactions by these nations that would result in a net decrease in U.S. security.**

The national missile defense system now being deployed—the Ground-Based Missile Defense (GMD)—is likely incapable of defending against even a limited number of attacking missiles, whether aimed at Europe or the United States. Any nation with the expertise and material to develop a nuclear weapon and a medium- or long-range missile capable of carrying it could also develop effective countermeasures against the GMD.<sup>56</sup>

Moreover, further deployment of this system could result in significant security costs.

As long as the United States and Russia maintain nuclear-armed long-range missiles to deter

<sup>55</sup> See Kurt Gottfried, “Sowing nuclear misconceptions,” *Nature* 403(6766), January 13, 2000, pp. 131–133.

<sup>56</sup> Andrew Sessler et al., *Countermeasures: A technical evaluation of the operational effectiveness of the planned U.S. national missile defense system*, Cambridge, MA: Union of Concerned Scientists, April 2000, online at [http://www.ucsusa.org/global\\_security/missile\\_defense/countermeasures.html](http://www.ucsusa.org/global_security/missile_defense/countermeasures.html); and Lisbeth Gronlund, David C. Wright, George N. Lewis, and Philip E. Coyle III, *Technical realities: An analysis of the 2004 deployment of a U.S. national missile defense system*, Cambridge, MA: Union of Concerned Scientists, May 2004, online at [http://www.ucsusa.org/global\\_security/missile\\_defense/technical-realities-national-missile-defense-deployment-in-2004.html](http://www.ucsusa.org/global_security/missile_defense/technical-realities-national-missile-defense-deployment-in-2004.html).

attacks from each other, deployment of a U.S. missile defense system that Russia believes has—or may eventually have—the potential to intercept a significant portion of its survivable missiles will stand in the way of deep Russian reductions.<sup>57</sup> Deploying such U.S. missile defenses will also give Russia an incentive to maintain a launch-on-warning posture, because such defenses would work better against a small retaliatory strike after a first strike. Such deployment will further have a chilling effect on the cooperative U.S.-Russian programs that are helping to secure Russian nuclear weapons, materials, and expertise.<sup>58</sup> As noted in the previous chapter, Russia's recent hostile reaction to U.S. plans to deploy a limited missile defense system in Europe indicates that this dynamic is real.

U.S. plans for a national missile defense system could also increase the dangers from China. Because its long-range missile force is small, the U.S. intelligence community has repeatedly predicted that China will expand its long-range arsenal to ensure its effectiveness against a U.S. missile defense. China appears to have chosen instead to deploy countermeasures, and to wait to see what the scale of the deployed system will be. If China comes to view U.S. missile defense as capable of intercepting its missiles, it could expand its arsenal, thereby undercutting global efforts toward nuclear disarmament. Such an increase could also have negative regional consequences, such as spurring India to expand its arsenal.

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**10. The United States should reaffirm its commitment to pursue nuclear disarmament, and present a specific plan for moving toward that goal, in recognition of the fact that a universal and verifiable prohibition on nuclear weapons would be in its national security interest.**

Over the long term, the United States can accomplish its nonproliferation goals only if it

shows by its own actions that it has reached the firm conclusion that nuclear weapons bring greater dangers than security benefits, and that it intends to move expeditiously toward a non-nuclear world with the other nuclear weapons states. Accordingly, the United States should reaffirm its commitment to nuclear disarmament under Article VI of the Non-Proliferation Treaty.

To facilitate progress toward that end, the United States should substantially increase its research on the technologies and types of regimes needed to verify nuclear disarmament, and to respond to potential nuclear rearmament. The United States should also bolster its efforts to convince all nations that verifiable and enduring prohibition of nuclear weapons is important to their national security. One means of doing so is to accept a negotiating mandate allowing talks on nuclear disarmament to begin at the Conference on Disarmament, which was established by the international community in 1979 as the sole multilateral body for negotiating disarmament. The U.S. plan for pursuing nuclear disarmament should lay out the types of bilateral agreements it will seek with Russia, as well as multilateral agreements that would involve all nuclear weapons states. Such a plan should also specify the order in which these agreements or steps would logically proceed.

### Looking Ahead

By taking these 10 steps, the United States will bring its nuclear policy in line with post-cold war political realities. If Russia responds to a U.S. decision to cut its nuclear weapons to 1,000 and take them off hair-trigger alert by reducing its own alert levels and deployed forces, the United States will have significantly reduced the nuclear dangers it faces. By eliminating nonstrategic nuclear weapons, the United States will also encourage Russia to do the same, while reducing the risk that terrorists will acquire one of these weapons.

<sup>57</sup> Russia's belief may be based on a worst-case analysis, which is typical in military planning.

<sup>58</sup> The deployment of even a limited U.S. missile defense system could convince Russia that it no longer has the option of launching a limited attack with one or a few nuclear warheads on a selected target—an option that Russia likely views as an important part of its deterrent. However, in this case Russia would likely respond by deploying countermeasures to permit a small number of its nuclear warheads to penetrate a limited defense. While this would likely negate any military utility of the U.S. defense, it would not necessarily increase the dangers posed by Russia's nuclear arsenal. More problematic would be the U.S. response to a Russian tit-for-tat deployment of a limited nationwide defense.

By ratifying the CTBT and making clear its commitment to work toward fulfilling Article VI of the Non-Proliferation Treaty, the United States will also have strengthened the nonproliferation regime. And by increasing its research on how to verify nuclear disarmament and create regimes that prevent and, if necessary, respond to nuclear rearmament, the United States will help build the conditions for a worldwide prohibition on nuclear weapons.

By halting further deployment of its Ground-Based Missile Defense system, the United States will be able to forge a more cooperative relationship with Russia and China. This, in turn, will enable the three countries to work together to constrain proliferation.

By cutting its own nuclear arsenal to 1,000 warheads, the United States will also have set the stage for deeper, legally binding, verified nuclear reductions that include other nations. Negotiations with those nations will need to encompass both controls on the production of fissile material for weapons and the disposition of existing weapons-usable fissile material.

All these steps would have profound security benefits. They would also constitute key parts of a framework for a global prohibition on nuclear weapons, and help establish the conditions under which such a prohibition would become politically feasible.

## Authors

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