DRAFT

UNIVERSAL COMPLIANCE

A Strategy for Nuclear Security

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PREFACE

This draft strategy report offers a blueprint for U.S. leadership in rethinking the international nuclear nonproliferation regime. The proposed strategy synthesizes some innovative approaches of the George W. Bush administration, the benefits of the traditional treaty-based regime, and many new elements. It highlights both the necessity for strict enforcement of nonproliferation agreements and for global cooperation to forge those agreements.

The report is in two parts: The first details the core principles and policies of this new nuclear security strategy. The second section is an in-depth technical and political elaboration of the various elements of the strategy, including restructuring of the nuclear fuel cycle, a global threat assessment, and pathways to resolve regional proliferation crises.

Why is this a draft? This work builds on and incorporates the ideas of a great many experts in the field, but it is still a work in progress. Therefore, we are issuing it as a draft expressly in order to elicit additional detailed critiques from the United States and abroad. The authors will coordinate a five-month process of discussions, conferences, and publications to improve and expand the draft strategy and to develop an expert consensus on the necessary next steps.

We will assimilate the comments we receive through fall 2004, and then release a final version in December 2004 to help inform the next administration as it designs its policies.

Additional information and resources can be found on the Carnegie Endowment's web site in a special section devoted to this subject: **www.ceip.org/strategy**.

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SECTION ONE

The Strategy of Universal Compliance

PART ONE: WHY A NEW STRATEGY IS NECESSARY

We raced from threat to threat to threat….There was not a system in place to say, "You've got to go back and do this and this and this."…The moral of the story is, if you'd taken those measures systemically over the course of time…you might have had a better chance of succeeding.

—Director of Central Intelligence George Tenet
Before the National Commission on Terrorist
Attacks upon the United States, March 24, 2004

In 1995, when signatories to the Nuclear Non-Proliferation Treaty (NPT) agreed to make the treaty permanent, they politically committed themselves to a stringent bargain. One hundred and seventy-three states pledged to give up forever the option of acquiring nuclear weapons, in return for an explicitly reaffirmed commitment by China, France, Russia, the United Kingdom, and the United States to eventually eliminate their nuclear arsenals. All states did so with the understanding that the treaty was imperfect but nonetheless made them all safer—individually and collectively.

At the time, there was good reason for optimism. The Cold War was over. The number of states possessing nuclear weapons had declined, and the number of weapons was falling. But soon, the picture turned much darker. Trends suggested that the nonproliferation system built around the NPT was failing.

In May 1998, India announced that it had exploded five nuclear devices. Two weeks later, Pakistan boasted of six nuclear explosions of its own. Neither country had signed the NPT. Suddenly, the prospect loomed of a nuclear war in South Asia that could kill millions and irradiate a quarter of the globe. Neither the treaty nor the international community could stop two major countries from crossing the nuclear line.

The terrorist attacks on September 11, 2001, forced a recognition that shadowy movements, not under the control of any state, were able to commit sophisticated attacks of urban terror. If such groups were to come into possession of nuclear weapons, they would presumably be willing to use them. After September 11, what had been an important problem—the transfer and proliferation of nuclear technology—suddenly became an urgent one.

Then, in 2003, news emerged that a network of scientists, engineers, and middlemen from Pakistan, Switzerland, England, Germany, Sri Lanka, and Malaysia had for years sold nuclear bomb designs and equipment necessary to produce nuclear weapons. Buyers included North Korea, Iran, Libya, and perhaps other states. This development raised the specter of a "proliferation Wal-Mart."

These three events cast a shadow over all nuclear nonproliferation efforts. They showed that despite major nonproliferation successes, the spread and potential use of nuclear weapons remains all too real. These and other events showed that much more needs to be done to reduce the possibility of nuclear war. All nations—not only those willing to sign the NPT—need to be covered; and access to weapons fuel needs to be far more tightly limited everywhere.

Nonproliferation rules must be extended to individuals and corporations, too.

TODAY'S THREATS

The Non-Proliferation Treaty is the center of an interlocking network of agreements and organizations that have been used to effectively slow, but not stop, the spread of nuclear weapons. This nonproliferation regime was intended to encompass all the world's nations—those that had nuclear weapons and those that might want them some day. But the nations that created the regime could not force other countries to join the treaty. Nor have the regime members consistently adhered to their own commitments. Today serious problems exist that threaten both the use of nuclear weapons and the collapse of international restraints.

Most dangerous is the wide availability of highly enriched uranium (HEU) and plutonium, the fissile materials that form the cores of nuclear weapons.[1] These materials have become more accessible to terrorists because of the collapse of the Soviet Union and the poor security at nuclear stockpiles in the former Soviet republics and in dozens of other countries. There is also danger that new nations could acquire nuclear weapons by exploiting inadequacies in the NPT. As the treaty now stands, countries can acquire technologies that bring them to the brink of nuclear weapon capability without explicitly violating the agreement; they can then leave the treaty without penalty.

The spread and potential use of nuclear weapons remains all too real.

The treaty regime was designed for a world in which threats came from states. It was not built to deal with terrorist groups bent on mass destruction or nuclear black marketers with murky connections to governments. Many of the activities of the clandestine Pakistani network violated no existing laws. The fact that the network was based in Pakistan highlights the challenge of persuading India, Pakistan, and Israel to accept rigorous nonproliferation obligations to control technology even though they have not joined the NPT. These three countries broke no treaty in acquiring nuclear weapons, but in varying degrees their status beyond the boundaries of the NPT-based regime undermines efforts to prevent the spread or use of nuclear weapons.

There are other concerns. More than ten years after the end of the Cold War, the vast majority of countries feel that the five original nuclear-weapon states (China, France, Russia, the United Kingdom, and the United States) do not intend to fulfill their end of the NPT "bargain"—the pledge to eliminate nuclear weapons. Furthermore, these same five states, as the veto-wielding members of the United Nations Security Council, are divided on how to respond to today's challenges, raising widespread doubts about the Security Council's ability to enforce nonproliferation commitments.

Finally, there are rising doubts about the sustainability of the nonproliferation regime. This is most disturbing in nations that have the technological ability to develop nuclear weapons but have made a political decision not to. Some Brazilian and Japanese political leaders, for example, have openly suggested that their countries reconsider their nuclear weapon options.

Some of the failures to contain proliferation result from flaws in the nonproliferation regime itself; many others stem from the unwillingness of leaders around the world to enforce commitments and resolutions earnestly passed. The United States' share of these failures has involved both Democratic and Republican administrations and Congresses led by both parties.

THE GOOD NEWS

The news is not all bleak, however. There are positive trends to build upon. Since the signing of the Non-Proliferation Treaty in 1968, many more countries have given up nuclear weapon programs than have started them.[2] There are fewer nuclear weapons in the world and fewer nations with nuclear weapon programs than there were twenty years ago.[3] The U.S. and Russia continue to work cooperatively to dismantle

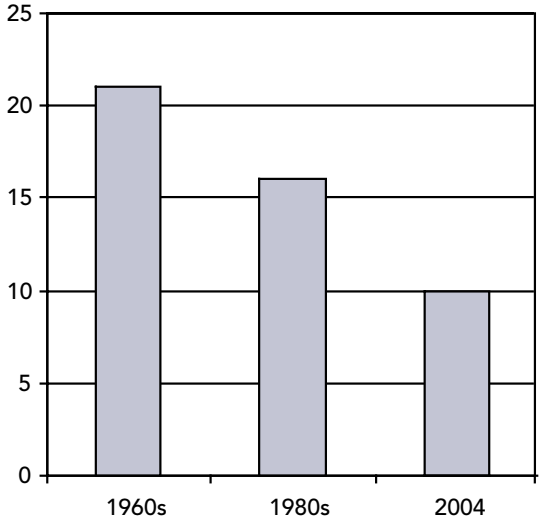
and secure nuclear weapons and materials left over from the Cold War.

Libya is an important success story and a model for other nations to follow as it verifiably dismantles its clandestine nuclear, chemical, and biological weapon capabilities. Iraq is a model of a different type, but it, too, no longer poses weapons of mass destruction (WMD) threats to its neighbors. The United States' use of force in Iraq to address a WMD threat (while mismanaged) has heightened international awareness of the dangers posed by proliferation. The results are particularly evident in the European Union (EU), which, forging a new resolve to combat proliferation, has intervened to curb programs in Libya and Iran and adopted a unified proliferation strategy that includes requirements for full compliance with nonproliferation norms in all its future trade and cooperation agreements. Adding to this effective use of "soft power," the EU now also asserts its willingness to use force against proliferation threats.

International cooperation has increased, with more than one dozen nations formally joining the U.S.-led Proliferation Security Initiative (PSI) to interdict illegal transfers of weapons and materials. The Security Council in April 2004 agreed on a resolution requiring states to increase security for weapons and materials and enact stricter export controls and laws to criminalize proliferation activities by individuals and corporations. President George W. Bush, International Atomic Energy Agency (IAEA) Director-General Mohamed ElBaradei, and other leaders have proposed new plans to restrict the acquisition of nuclear technology for the production of enriched uranium and separated plutonium.

Which trend will dominate—the positive or the negative? The world has arrived at a nuclear tipping point.[4] Policy decisions in the next few years will determine if the global cooperation that has slashed the arsenals of chemical, biological, and nuclear weapons and missile systems over the past two decades will continue, or if a dangerous new wave of proliferation will engulf the world.

Figure 1.1. Countries with Nuclear Weapons or Programs



Note:
1960s: Twenty-one countries had weapons or considered research programs: Argentina, Australia, Brazil, China, Egypt, France, Germany, India, Israel, Italy, Japan, Norway, South Africa, the Soviet Union, Spain, Sweden, Switzerland, Taiwan, the United Kingdom, the United States, and Yugoslavia.

1980s: Sixteen countries had weapons or programs: Argentina, Brazil, China, France, India, Iran, Iraq, Israel, Libya, North Korea, Pakistan, South Africa, the Soviet Union, Taiwan, the United Kingdom, and the United States.

2004: Eight states have nuclear weapons: China, France, India, Israel, Pakistan, Russia, the United Kingdom, and the United States. Iran and North Korea are suspected of having active nuclear weapon programs.

U.S. POLICY TODAY

The Bush administration arrived in office determined to combat nuclear, chemical, and biological weapons proliferation in fundamentally new ways. In two key documents, *The National Security Strategy of the United States of America* (September 2002) and the *National Strategy to Combat Weapons of Mass Destruction* (December 2002), the administration concluded:

- The threat of weapons of mass destruction is the highest priority for the United States and should be for other countries.
- The threat today is different from what it was during the Cold War, and greater.

- A small number of outlaw states exist that have no regard for international norms and are determined to acquire weapons of mass destruction.
- The proliferation threat is most dangerous at the nexus of these states, nuclear weapons and materials, and terrorists.[5]

The administration's assessment did not, at first, appear dramatically different from those of previous administrations, which also acknowledged growing dangers. However, previous presidents had treated the weapons themselves as the problem. As long as they existed, there was a great danger that they would be used. "The weapons of war must be abolished," President John F. Kennedy said, "before they abolish us." Thus, Presidents Kennedy, Lyndon B. Johnson, and Richard M. Nixon negotiated and implemented the NPT as a means of stopping the spread of and eliminating nuclear weapons.[6] President Nixon negotiated the Biological Weapons Convention banning biological weapons; President Ronald Reagan negotiated the Intermediate-Range Nuclear Forces Treaty (INF) banning intermediate-range missiles. President George H. W. Bush negotiated the Chemical Weapons Convention banning chemical weapons, and President Bill Clinton negotiated the Comprehensive Test Ban Treaty (CTBT). Each of these agreements codified a new global norm and provided the international legal framework for ending existing weapons programs and preventing the initiation of new ones.

By contrast, the Bush administration shifted the focus from eliminating weapons to eliminating regimes. Whereas President Clinton declared in 1994 an "unusual and extraordinary threat to the national security…of the United States posed by *the proliferation of nuclear, biological, and chemical weapons* and the means of delivering such weapons," President Bush, in his January 2003 State of the Union address, framed the issue differently: "the gravest danger facing America and the world, is *outlaw regimes that seek and possess nuclear, chemical, and biological weapons"* (emphasis added). In effect, the administration changed the focus from "what" to "who."

Following this targeted approach, the Bush administration highlighted "new methods of deterrence" to make clear that the United States "reserves the right to respond with overwhelming force—including through resort to all of our options—to the use of WMD against the United States, our forces abroad, and friends and allies."[7] Some officials advocated development of a new, more usable type of nuclear warhead for counterproliferation missions. The administration and Congress doubled the budgets for a national antimissile system. Most dramatically, the administration highlighted the necessity of regime change to remove threats posed by irredeemable governments seeking WMD, particularly the "Axis of Evil" states of Iraq, North Korea, and Iran. The Iraq War focused media and public attention on the tactic of preemptive war, but forcible regime change was the strategic innovation.

The Bush administration and supporting strategists deserve credit for highlighting the need to enforce and enhance the traditional nonproliferation regime. Too much attention had been paid historically to obtaining signatures on treaties, and not enough to achieving compliance with them. Too many dangerous activities are not encompassed by existing agreements, and are therefore tolerated. The absence of a collective political will to stop bad actors, by force if necessary, undermined deterrence. The United States itself had routinely made proliferation concerns secondary to other strategic and economic issues in relations with key states such as Pakistan, Israel, and Iraq. In contrast, the Bush administration's resolve helped motivate others to strengthen nonmilitary means of enforcement. The strong belief that some actors cannot be reformed helped sharpen international threat assessments and made governments in proliferant states think harder about whether to change their behavior, lest they be removed. However, the new administration strategy, like

the ones before it, proved insufficient to answer the new threats.

Accordingly, on February 11, 2004, the president proposed initiatives that, if implemented, would increase the ability of the United States and the international community to stem the spread of nuclear weapons. These initiatives included making all exports from the forty-member Nuclear Suppliers Group conditional on recipients adopting new, tougher inspections by the IAEA; expanding the Nunn-Lugar programs that finance the elimination of nuclear, chemical, and biological weapons in the former Soviet Union; and enhancing the IAEA's capability to detect cheating and respond to treaty violations.

The administration has not, however, put money or significant political effort behind these proposals. Its proposed budget for fiscal year 2005 cuts rather than increases funding for Nunn-Lugar programs and fails to provide any increase in the U.S. contribution to the IAEA—an agency whose responsibilities have greatly increased while its budget has stayed flat.

The core problem is that stopping the spread of nuclear weapons requires more international teamwork than the Bush administration recognizes, and more international resolve than previous administrations could muster. Nuclear weapons, material, and know-how are threats wherever they exist, not only in a handful of "evil" states.

The United States cannot defeat these threats alone, or even with small coalitions of the willing. It needs sustained cooperation from dozens of diverse nations to broaden, toughen, and enforce nonproliferation rules—including China, Russia, France, the United Kingdom, and leading states that have forsworn nuclear weapons, such as Argentina, Brazil, Germany, Japan, South Africa, and Sweden. These and other states must be persuaded to strengthen nonproliferation rules. In exchange, many states, especially those that have given up nuclear weapons, will want to know that burdensome new rules and costly enforcement will ultimately enhance their security. The nuclear weapon states must show that tougher nonproliferation rules not only benefit the powerful but constrain them as well. Nonproliferation is a set of bargains whose fairness must be self-evident if the majority of countries are going to support its enforcement.

The new challenges make it clear beyond denial that "racing from threat to threat" does not suffice. This is a time that demands systemic change: a new strategy to defeat old and new threats before they become catastrophes.

PART TWO: A NEW START

UNIVERSAL COMPLIANCE

The strategic aim of nonproliferation policy must now be to achieve *universal compliance* with the norms and terms of a deepened nuclear nonproliferation regime.

Compliance means more than signatures on treaties, or declarations of fine intent—it means actual performance. *Universal* means that all actors must comply with those norms and terms that apply to them. This includes states that have joined the NPT, and those that have not. It also includes nonstate actors—corporations and individuals. The burden of compliance extends not only to states seeking nuclear weapon capabilities through dual-use fuel cycle programs or those abetting proliferation through technology transfers; it also applies to nuclear weapon states that are not honoring pledges they have made.

Not all countries bear the same global responsibilities or face the same threats. It is unreasonable to expect all to be limited to the same capabilities. Police possess certain powers and capabilities that average citizens do not, but in healthy and just societies the use of these powers is constrained by law, and when abuses occur, citizens have recourse to correct them. The current nuclear order gives five states the right to possess nuclear weapons *and,* as veto-holding members of the Security Council, great influence in setting and enforcing nonproliferation rules. To sustain—much less strengthen—this order, the "advantaged" minority must ensure that the majority perceives that it is beneficial and fair. Universal compliance seeks to achieve this balance of obligations. It tries to correct the impression that the states with nuclear weapons are getting much more out of the nonproliferation regime than are others. The name of the strategy itself is both a reminder of the ultimate goal and a guide to ensure that each tactical step moves toward that goal.

The strategic aim must be to achieve universal compliance with the nonproliferation regime.

Progress toward universal compliance necessarily will be uneven. Attention and resources should be concentrated first and foremost on redressing the most pressing threats: those most likely to lead to nuclear use or to spreading waves of proliferation and instability.

Five obligations form the core of the universal compliance strategy. Their successful fulfillment will answer the most pressing proliferation problems. As sketched briefly here and detailed in later sections, each of these general objectives requires subsidiary national and international policies, resources, and institutional reforms. Some of the necessary steps require new international and national laws and voluntary codes of conduct, while others require only the will to live up to existing commitments.

1. **NO NEW NUCLEAR WEAPON STATES.** Non–nuclear weapon states must reaffirm commitments never to acquire nuclear weapons. This commitment must evolve to proscribe the further national acquisition of facilities that can produce materials directly usable in nuclear weapons (separated plutonium and HEU). The United States and other nations must, in turn, provide a guaranteed supply of the fuel and services necessary for nuclear energy.

Eight states possess nuclear weapons without having violated the NPT. Two states—North Korea and Iran—have acquired or seek to acquire nuclear weapon capabilities in violation of their commitments. The immediate challenge is to induce these two states to relinquish nuclear weapon capabilities, and, in the process, to strengthen nonproliferation rules to deter other actors from seeking nuclear weapons in the future.

To discourage countries from building up their capabilities to produce nuclear weapons and then leave the treaty, the Security Council should pass a new resolution requiring that a state that withdraws from the NPT remain responsible for violations committed while still a party to the treaty. The resolution should also bar states that withdraw from the treaty—whether in violation of its terms or not—from legally using nuclear materials, facilities, equipment, or technologies acquired internationally before their withdrawal.

To prevent nations from acquiring nuclear weapon capabilities, all states should agree to suspend nuclear cooperation with countries that the IAEA cannot certify are in full compliance with their nuclear nonproliferation obligations. (p. 30)

To remove dangerous ambiguity in interpretations of the NPT, leading technology suppliers, and eventually the IAEA, should establish that no new states should acquire the facilities to enrich uranium or separate plutonium. In return, states in compliance with all IAEA requirements should receive fuel for civilian nuclear applications on a guaranteed, cost-effective basis from existing sources.

Prior to the 2005 NPT Review Conference, to augment their collective will to enforce nonproliferation norms and terms, the heads of state of the U.S., China, France, Russia, and the United Kingdom should convene their first-ever summit focused exclusively on this subject. (p. 33)

2. **SECURE ALL NUCLEAR MATERIALS.** All states must maintain robust standards and mechanisms for securing, monitoring, and accounting for all fissile materials in any form. Such mechanisms are necessary both to prevent nuclear terrorism and to create the potential for secure nuclear disarmament.

Acquiring nuclear materials—whether by making, buying, or stealing them—is currently the single most difficult step for terrorists and states seeking nuclear weapons. Therefore, the security of stockpiles is absolutely important—as vital an element of defense as any weapons system. The United States should therefore encourage formation of a "Contact Group to Prevent Nuclear Terrorism." The Contact Group would involve special envoys appointed by and reporting directly to the heads of state of key nations that possess nuclear weapons or fissile material stocks—including China, France, Germany, India, Israel, Japan, Pakistan, Russia, South Africa, the United Kingdom, and the United States. The group's objective would be to establish the highest possible standards of security for nuclear weapons and materials. All members would be pressed to uphold these standards and arrange for assistance to those that need technical or financial help to achieve them. In addition, the United States should quickly identify, secure, and remove nuclear materials from all vulnerable sites—a "Global Cleanout." (p. 46)

3. STOP ILLEGAL TRANSFERS. Nations must establish enforceable prohibitions against individuals, corporations, and states assisting others in secretly acquiring the technology, material, and know-how needed for nuclear weapons.

Nonproliferation norms and rules must be universal—they must apply to all states and to all potential nonstate actors. The Security Council took a vital step in this direction by passing Resolution 1540 in April 2004 (p. 30). The resolution requires all states to establish and enforce national legislation to secure nuclear materials, strengthen export controls, and criminalize illicit trade. Because Resolution 1540's obligations are framed under Chapter VII of the United Nations Charter, they are obligatory and warrant all necessary means to ensure compliance.

To help enforce the laws adopted under the resolution, nations need to strengthen international mechanisms to guide exchanges of sensitive equipment, material, and know-how. Members of the Nuclear Suppliers Group have volunteered to share data with the IAEA, but they have not always done so. This kind of transparency arrangement should be expanded and made obligatory for transfers of all controlled items. Such a system would protect important commercial interests by establishing a legal basis for discriminating between legitimate commerce and illegitimate proliferation. Undeclared exchanges would be illegal on their face, while declared exchanges would be conducted under existing export control and customs regulations. Going further, more than a dozen states have committed themselves to the Proliferation Security Initiative. Its purpose is to detect and, if necessary, interdict proliferation activities within a nation's own jurisdiction. The initiative's scope should be widened to international waterways and airspaces, as is the case with piracy, hijacking, and slavery.

4. DEVALUE THE POLITICAL AND MILITARY CURRENCY OF NUCLEAR WEAPONS. All states must honor their obligations to end nuclear explosive testing, and must diminish the role of nuclear weapons in security policies and international politics. They must also identify and strive to create the conditions necessary to eliminate all nuclear arsenals verifiably.

To comply with commitments made in 1968 and explicitly reaffirmed in 1995 and 2000, the United States must disavow the development of any new types of nuclear weapons, reaffirm the current moratorium on nuclear weapon testing, and ratify the CTBT.[8] U.S. and North Atlantic Treaty Organization (NATO) doctrine should narrow rather than widen the role of nuclear weapons. To reduce the risks of inadvertent nuclear war or a renewed arms race, the U.S. and Russia should further increase the time decision makers would have before deciding to launch nuclear weapons, and should make irreversible and verifiable the nuclear reductions required under the 2002 Treaty of Moscow.

The core bargain of the NPT, and of global nonproliferation politics, can neither be ignored nor wished away. It buttresses the international security system and informs the political expectations of citizens and leaders around the world. On the other hand, it remains unclear whether thousands of nuclear weapons and uncounted thousands of tons of fissile materials can be verifiably decommissioned and secured in ways that would make the world safer and more stable. Only the United Kingdom has begun to analyze the steps necessary to achieve mutual and verifiable nuclear disarmament.[9] The United States should go further, and produce a detailed road map of the steps it would have to take to verifiably eliminate its nuclear arsenal. At the 2005 NPT Review Conference, the United States should encourage all states possessing weapon-usable fissile materials to follow suit.[10] By

defining the level of transparency and accounting accuracy necessary to verify elimination of all nuclear weapons, this process would begin to illuminate whether total disarmament is actually feasible, and if it is not, what alternative actions would enhance global security and fairness.

5. COMMIT TO CONFLICT RESOLUTION. States that possess nuclear weapons must use their leadership to resolve regional conflicts that compel or excuse some states' pursuit of security by means of nuclear, biological, or chemical weapons.

Because the use of nuclear weapons could result in staggering casualties and global disorder, states that possess these weapons—including India, Israel, Pakistan, and possibly North Korea—have a special obligation to ensure that they are not used and do not spread. To help these states reduce nuclear tensions and eventually disarm, China, France, Russia, the United Kingdom, and the United States must concentrate their diplomatic influence on defusing the conflicts in the Middle East, South Asia, and Northeast Asia that underlie the determination of some states to possess nuclear weapons. These conflicts are the triggers of potential nuclear use.

Separate sections of this report detail strategies for addressing nuclear threats in the Middle East, South Asia, and Northeast Asia. But preventing the use of nuclear weapons and reversing proliferation in these regions cannot be left to the specialized domain of the nuclear nonproliferation regime. Arms control experts, nonproliferation inspectors, and nuclear scientists cannot solve these problems; national leaders must devote their energies and resources to resolving key regional security dilemmas and supporting political reforms necessary to remove the perceived need for nuclear weapons. For example, averting a nuclear and missile arms race between India and Pakistan requires progress in normalizing these two states' overall relationship, particularly concerning Kashmir. Achieving a zone free of weapons of mass destruction in the Middle East will require normalization of relations between Israel and other regional states and entities, which in turn will require a cessation of terrorism and a just settlement of the Israeli-Palestinian conflict.

SOLVING THE THREE-STATE PROBLEM

The universal compliance strategy offers a constructive way to deal with the critical challenge posed by India, Pakistan, and Israel—the so-called three-state problem. Unlike North Korea and Iran, these three countries never signed the NPT and therefore have retained the "right" to possess nuclear weapons. India and Pakistan have demonstrated their possession of nuclear weapons and proclaim themselves to be nuclear weapon states. They now press supporters of the nonproliferation regime to remove technology embargoes applied to them. Israel does not confirm or deny its widely recognized possession of nuclear weapons, but its nuclear status causes turmoil within the nonproliferation regime. Each of these states has committed itself to preventing further proliferation.

Under the universal compliance strategy, the U.S. would stop demanding that India, Israel, and Pakistan give up their nuclear weapons and join the NPT as non–nuclear weapon states. Instead, the United States would lead a diplomatic initiative to persuade the three states to commit themselves politically to accepting the nonproliferation obligations accepted by China, France, Russia, the United Kingdom, and the United States.[11] For example, the three states would agree to prevent proliferation exports, to secure nuclear weapons and materials, to reduce the role of nuclear weapons in their national security policies, and to eschew nuclear testing. If these states failed to comply with their commitments, they would be subject to the same sorts of U.S. sanctions and political pressures China and Russia have faced over their past transgressions of nonproliferation rules. The goal of

Table 2.1. Countries That Have or Had Nuclear Weapons Programs

NPT NUCLEAR WEAPON STATES China France Russia United Kingdom United States	**RECENTLY TERMINATED PROGRAMS** Iraq Libya
NON-NPT NUCLEAR WEAPON STATES India Israel Pakistan	**PROGRAMS ENDED BETWEEN 1970–1980**[a] Australia Egypt Germany Italy Japan Norway Sweden
SUSPECTED PROGRAMS Iran North Korea	**PROGRAMS ENDED AFTER 1980** Argentina Brazil Romania South Africa South Korea Spain[b] Switzerland Taiwan Yugoslavia
SUSPECTED PROGRAM INTENTIONS—NO PROGRAM IDENTIFIED Algeria[c] Indonesia Nigeria[d] Saudi Arabia[e] Syria	**INHERITED WEAPONS—NOW NONNUCLEAR WEAPON PARTIES TO THE NPT** Belarus Kazakhstan Ukraine

Note: Thirty-six countries in total.

a Some political leaders in Germany, Italy, Japan, and Norway advocated nuclear weapons research, but the programs never became government policy.

b There is no evidence of a nuclear weapons program in Spain, although it is widely believed that a program existed.

c Joseph Cirincione, Jon Wolfsthal, and Miriam Rajkumar, *Deadly Arsenals: Tracking Weapons of Mass Destruction* (Washington, D.C.: Carnegie Endowment for International Peace, 2002), 299.

d Mentions of Indonesia and Nigeria are infrequent.

e Saudi Arabia is not believed to have an active nuclear weapon program. However, there is documented debate among the highest levels in Riyadh regarding the option to acquire a nuclear deterrent. See Ewen MacAskill and Ian Traynor, "Saudis Consider Nuclear Bomb," *Guardian,* September 18, 2003, available at www.guardian.co.uk/saudi/story/0,11599,1044402,00.html (accessed April 27, 2004).

persuading India, Israel, and Pakistan to abandon nuclear weapons would not be dropped; rather these three states would be expected to eliminate their nuclear arsenals as and when China, France, Russia, the United Kingdom, and the United States eliminate theirs.

Tolerating possession of nuclear weapons by India, Israel, and Pakistan does not mean rewarding these three states with nuclear reactors, as India, and more recently, Pakistan have sought. The United States and others would continue not to sell nuclear reactors to India, Israel, or Pakistan, pursuant to the Nuclear Suppliers Group agreement of 1992 barring such sales as long as the proposed recipient operates nuclear facilities that are not under international

● = full compliance with obligation
⦿ = partial or incomplete compliance
○ = no significant compliance
N/A = Not Applicable
blank = proposed obligation

Table 2.2. The Universal Compliance Matrix (Discussion Draft)

	NUCLEAR WEAPON STATES (NWS)					NON-NPT NWS			NON-NWS		
OBLIGATION	**U.S.**	**RUSSIA**	**CHINA**	**FRANCE**	**UK**	**INDIA**	**PAKISTAN**	**ISRAEL**	**IRAN**	**NORTH KOREA**	**OTHER**
No New Nuclear Weapon States											
• Reaffirm commitment to never acquire nuclear weapons	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	⦿	○	⦿
• Guarantee supply of the fuel and services necessary for nuclear energy									N/A	N/A	N/A
• Pass UN Resolution: states that withdraw from NPT remain responsible for violations											
• Pass UN Resolution: states that withdraw from NPT must forfeit imported nuclear technology											
• Suspend nuclear cooperation with countries not in full compliance with treaty obligations	●			●	●		○			○	
• Convene P-5 summit to strengthen nonproliferation mechanisms and laws						N/A	N/A	N/A	N/A	N/A	N/A
• Suspend national production of HEU and plutonium separation	●	⦿	⦿	⦿	⦿	○	○	○	○	○	
Secure All Nuclear Materials											
• Create Contact Group to establish highest possible nuclear weapon and material security standards											
• Support Global Cleanout of vulnerable nuclear materials	●	●	○	⦿	⦿	○	○	○	○	○	⦿
• Place all uranium enrichment under international control											
• Expand CTR beyond the FSU	●	⦿	○	●	●	○	○	○	○	○	⦿

Table 2.2. The Universal Compliance Matrix (Discussion Draft) (CONTINUED)

OBLIGATION	NUCLEAR WEAPON STATES (NWS)					NON-NPT NWS			NON-NWS		
	U.S.	RUSSIA	CHINA	FRANCE	UK	INDIA	PAKISTAN	ISRAEL	IRAN	NORTH KOREA	OTHER
Stop Illegal Transfers											
• Develop and implement universal international law to criminalize and help prosecute proliferation											
• Develop and enforce consistent national laws to criminalize and help prosecute proliferation	⦿	⦿	⦿	⦿	⦿	⦿	⦿	⦿	○	○	⦿
• Develop voluntary measures to criminalize and help prosecute proliferation											
• Expand the scope, mandate, and membership of the PSI and export control regimes	⦿	⦿	⦿	⦿	⦿	○	○	⦿	○	○	⦿
• Expand NSG transparency agreements and make them obligatory on all transfers of controlled items											
Devalue the Political and Military Currency of Nuclear Weapons											
• Ratify the CTBT	○	●	○	●	●	○	○	○	○	○	⦿
• Halt research and development of new nuclear weapons	○	○	○	○	⦿	○	○	○	⦿	○	?
• Develop security policies that explicitly diminish the role of nuclear weapons	⦿	○	⦿	○	⦿	○	○	⦿	⦿	○	⦿
• Make reduction agreements verifiable and irreversible	⦿	⦿	○	○	○	○	○	○	○	○	N/A
• Reform nuclear targeting and hair-trigger alerts	○	○	⦿	○	⦿	⦿	⦿	○	N/A	N/A	N/A
• Detail steps toward the elimination of their nuclear arsenals					⦿						
Commit to Conflict Resolution											
• Seek to reverse South Asia strategic competition and promote stable conventional force balances	⦿	○	○	⦿	⦿	⦿	⦿	○	N/A	○	⦿
• Create a WMD-free zone in the Middle East	⦿	○	○	⦿	⦿	○	○	○	○	○	⦿
• Use all available diplomatic means to persuade North Korea and Iran to eliminate their nuclear weapon programs	⦿	⦿	⦿	⦿	⦿	⦿	⦿	⦿	⦿	○	⦿

safeguards.[12] This restriction on nuclear commerce is necessary to uphold the incentives that reward other states for complying with their obligation not to acquire nuclear weapons. If non–nuclear weapon states want to ease restrictions on nuclear commerce with India, Pakistan, and Israel, they should propose alternative guidelines.

India, Pakistan, and Israel will not find it easy to embrace this arrangement, but each country's leadership has voiced strong support for the cause of nonproliferation. The approach here enables the three states to contribute constructively to international security without accepting obligations greater or less than those borne by China, France, Russia, the United Kingdom, and the United States. In return for explicitly shouldering the obligations of responsible international citizenship, India, Pakistan, and Israel would gain relief from unproductive, ritualistic hectoring or possible coercion to eliminate their nuclear arsenals before others do. India may want additional benefits, but this desire flows from an anachronistic belief that the world somehow owes something to states with nuclear weapons. Today, obligations flow the other way. States possessing nuclear weapons should be judged by their contribution to the global interest in preventing the spread and use of these devices.

SECTION TWO

The Elements of an Enforceable Regime

PART THREE: A GLOBAL THREAT ASSESSMENT

SUMMARY OF POLICY RECOMMENDATIONS

- Require the Director of Central Intelligence to prepare a comprehensive assessment of proliferation threats to present to allies. (p. 25)
- Persuade NATO leaders to produce a collective proliferation threat assessment by the 2006 NATO summit. (p. 25)

The U.S. National Security Strategy of 2002 declares that the United States must "coordinate closely with allies to form a common assessment of the most dangerous threats." So too, the Council of the European Union noted in June 2003, "An EU strategy against the proliferation of WMD needs to be based on a common assessment of global proliferation threats."[13] Indeed, the need for cooperation extends beyond the transatlantic community and must include other leading states. Russia and China are particularly important as permanent members of the Security Council and as sources of proliferation concern.

Thus, the first requirement of a new strategy is to develop greater international consensus on threats and the division of labor needed to diminish them. This will not be easy. Threat perceptions depend heavily on geographic position, alliance relations, economic interests, and historical experiences. Russia, China, and some allies may see proliferation as a threat more to the United States than to themselves. This puts a great onus on the United States to develop a threat assessment that is convincing to its allies, even if differences remain.

The process should begin immediately. The president should require the director of central intelligence to prepare a comprehensive assessment of proliferation threats that the United States could present to its allies. The logical starting point would be NATO, where the United States can share the classified supporting data for the assessment and compare insights with allied intelligence agencies. At the NATO summit in 2005, the allied heads of state should commit NATO to producing a collective proliferation threat assessment for the 2006 meeting. The commendable effort of the Council of the European Union to develop a joint European threat analysis should inform this effort. The assessment should also be discussed as a matter of first priority with key allies in Asia and the Middle East.

Below is a draft outline of such an assessment listing the most pressing threats. These are either threats to the people of the United States and their allies and friends, or threats to the stability of the nonproliferation regime, the collapse of which would greatly increase global security threats.

NUCLEAR TERRORISM IS THE MOST SERIOUS THREAT

While *states* can be deterred from using nuclear weapons by fear of retaliation, *terrorists* who have neither land, people, nor national futures to protect, may not be deterrable. Terrorist acquisition of nuclear weapons poses the greatest single threat to the United States.

Table 3.1. Proliferation Threats

NUCLEAR TERRORISM AND TRANSFERS	REGIONAL PROLIFERATION AND CONFLICT	BREAKDOWN OF NONPROLIFERATION REGIME
Terrorist acquisition of nuclear weapons or materials	North Korea as a new nuclear weapon state	Development of new nuclear weapons and doctrines for battlefield use, leading to new tests
Diversion of nuclear weapons or materials from national arsenals (other than by terrorists)	Iran as a new nuclear weapon state	Threats to use nuclear weapons against nonnuclear states
Nuclear black market and cooperative proliferation involving states (secondary proliferation)	Conflict between India and Pakistan leading to nuclear war	End of reductions in global nuclear stockpiles; toleration of new nuclear weapon states
Collapse of government control over nuclear arsenals in Pakistan or North Korea	Military conflict between China and Taiwan, drawing in the United States	Collapse of the Non-Proliferation Treaty and emergence of new nations armed with nuclear weapons

Note: This table presents the threats in order of urgency, with those near the top more urgent than those at the bottom. Those on the left are more urgent than those on the right. But even the least urgent threat—collapse of the nonproliferation regime—is extremely serious and cannot be ignored as action is taken to counter the present danger of terrorist use of a nuclear weapon.

The nexus of greatest danger comes at the intersection of terrorists and state stockpiles of nuclear weapons and fissile materials. It remains very difficult for a terrorist group to produce nuclear weapon material on its own. Therefore, the security and elimination of state stockpiles of weapons and weapon-usable materials must become the primary objective.[14] So-called outlaw states represent only one potential source of these weapons. An excessive focus on these states can divert attention from threats that are seemingly less frightening but, in fact, are more immediate.

The most likely targets for terrorists include nuclear sites in the former states of the Soviet Union and Pakistan, and weapon-usable fissile material kept at dozens of civilian sites around the world. The former Soviet states possess thousands of nuclear weapons and hundreds of tons of loose nuclear material that remain inadequately secured. International programs to eliminate and secure these stockpiles have had great success but bureaucratic obstacles and inadequate funding impair them (see Part 5, Securing the Global Nuclear Complex). Pakistan already has provided highly sensitive equipment and know-how to North Korea, Iran, and Libya. Pakistan also has terrorist organizations and radical fundamentalist groups operating within its borders. National instability or a radical change in government could lead to the collapse of state control over weapons and nuclear materials and to the migration of nuclear scientists to other nations or to the service of other groups. Until proven otherwise, Pakistan must be seen as a proliferation threat.

A similar risk of collapse is true for North Korea. If North Korea, Iran, or other nations in volatile regions develop nuclear weapons production capabilities, they might, willingly or unwillingly, share, sell, or otherwise transfer weapons, materials, or skills to terrorist groups.

There is also a substantial risk of terrorist theft or diversion to other countries from the

nuclear stockpiles in more than forty countries around the world. Many of these caches of materials consist of HEU that could be used in nuclear weapons, or further enriched to weapons grade. There are also significant stockpiles of plutonium that could also be used in a weapon, though with more difficulty. (See Part 5 for a more complete treatment.)

REGIONAL CONFLICTS THREATEN NUCLEAR USE

The focus on terrorism should not obscure the danger that regional wars could lead to nuclear catastrophe.

Though relations are currently warming between India and Pakistan, the decades-long conflict between the two has made South Asia for many years the region most likely to witness the first use of nuclear weapons since World War II. There is an active missile race under way between the two nations.

In Northeast Asia, North Korea's nuclear capabilities remain shrouded in uncertainty but presumably continue to advance. Miscalculation or misunderstanding could bring nuclear war to the Korean peninsula. Though unlikely, there is a risk that conflict could erupt between China and Taiwan, drawing in the United States and potentially escalating to nuclear weapon use across the Taiwan Straits.

In the Middle East, Iran's quest for nuclear weapons, together with Israel's nuclear arsenal and the chemical weapons of other Middle Eastern states, adds grave volatility to an already conflicted region. If Iran were to acquire nuclear weapons, Egypt, Saudi Arabia, or other nations might also initiate or revive nuclear weapon programs. Israel's nuclear weapons, while not an immediate security threat to these states, may be seen as such by some states and may politically impede efforts to persuade Middle East nations to abide by nonproliferation commitments.

THE RISK OF REGIME COLLAPSE

There are also dangers inherent in the maintenance of thousands of nuclear weapons by the United States and Russia and the hundreds of weapons held by China, France, India, Israel, Pakistan, and the United Kingdom. While each state regards its nuclear weapons as safe, secure, and essential to its security, each views other nations' arsenals with suspicion. The possibility of accidental or inadvertent use remains. A decade after the Cold War ended, thousands of warheads in Russia and the United States are on hair-trigger alert, ready to launch in fifteen minutes.

The centrality that each nuclear weapon state accords to its nuclear weapons raises the value other nations perceive in these weapons. Recent advocacy by some in the United States of new battlefield uses for nuclear weapons even in nonnuclear conflicts further expands the perceived utility and is matched by policies in Russia, France, Pakistan, and India.

The security and elimination of state stockpiles must become the primary objective.

The development of new warhead designs in the United States could lead to new nuclear tests. The five NPT nuclear weapon states have not tested since the signing of the CTBT in 1996, and no state has tested since India and Pakistan did in May 1998. New U.S. tests would trigger tests by other nations, collapsing the CTBT, which is widely seen as a pillar of the nonproliferation regime.

To the extent that the leaders of a given state are contemplating acceding to U.S. or international nonproliferation demands, these leaders may feel a strong need for equity so that they can show their publics that giving up nuclear aspirations and capabilities is fair. It is more difficult to demonstrate such equity when nuclear weapon states reassert the importance of nuclear weapons to their own security, develop new uses for nuclear weapons, resist progress toward disarmament, or make veiled nuclear threats.

If the number of states with nuclear weapons increases, the original nuclear-weapon states fail to comply with their disarmament obligations, and states such as India gain status for having nuclear weapons, it is possible that Japan, Brazil, or other nations will reconsider their nuclear

choices. Most nations will continue to eschew nuclear weapons, if only for technological and economic reasons, but others may decide that nuclear weapons are necessary to improving their security or status. The result would destabilize the international security and political system.

PART FOUR: STRENGTHENING ENFORCEMENT

Strengthened enforcement is a critical part of this nonproliferation strategy. The Bush administration deserves credit for its efforts to improve enforcement: It has both developed new mechanisms, such as the Proliferation Security Initiative to block illicit transfers, and refocused international attention on export enforcement mechanisms.

The flaw in the administration's enforcement approach is not one of enthusiasm but of emphasis. Narrow reliance on counterproliferation and preemptive force undercuts alternatives—such as strengthened inspections—that can resolve disputes without military confrontation. Selective enforcement against three "evil" states risks overlooking grave dangers in others, such as Pakistan.

A new strategy must retain coercive options but further strengthen a broad set of enforcement mechanisms to halt the spread of dangerous materials and prevent the use of nuclear weapons. This will require U.S. leadership to strengthen international and national laws, enhance the power of the Security Council, improve international inspection regimes, and effectively implement counterproliferation, including preemption if necessary.

New Laws for a More Secure Order

SUMMARY OF POLICY RECOMMENDATIONS

- Develop model national laws to criminalize, deter, and detect nuclear proliferation pursuant to Security Council Resolution 1540. (p. 30)
- Develop universal international law to criminalize nuclear weapon and material proliferation and facilitate prosecution of states and nonstate actors. (p. 30)
- Develop a declaration system or reporting requirement to distinguish between legal and illegal nuclear trade. (p. 30)
- Encourage the IAEA to adopt rules restricting nuclear assistance to states not in full compliance with NPT obligations. (p. 30)
- Adopt resolutions, through the Security Council, to hold states that withdraw from the NPT responsible for violations and prohibit their continued use of materials and facilities acquired while party to the treaty. (p. 31)
- Pursue voluntary governmental and nongovernmental activities or codes of conduct to discourage and prevent nuclear trafficking. (p. 31)

In many countries, stealing nuclear material is no more of a crime than stealing money. Given the consequences, every nation with nuclear warheads or weapon-usable materials needs to make theft of such items a serious offense. International laws need to go further, and deny violators safe havens. As Matthew Meselson and Julian Robinson have noted, "National criminal legislation, so far enacted by only a minority of states, is no substitute for international criminalization."[15]

Strengthened international law is needed, but will only help if combined with leadership by the most powerful countries to push for and enforce these measures. Many states resist establishing and enforcing international law for fear they might constrain their own options more than deter bad behavior by others. The most powerful countries, particularly the United States, at times calculate that they can use their unrivaled military force or economic leverage to coerce "bad guys" in the absence of international law. But an effective legal system cannot have it both ways—comprehensive against actions that alarm certain states; lax when it suits these states.

STRENGTHENING INTERNATIONAL LAW

A more ambitious international legal regime would strengthen deterrence against illicit activities, and also strengthen states' basis for prosecuting proliferation activities.

Security Council Resolution 1540, which was adopted unanimously on April 28, 2004, is a laudable step in this direction. Initiated by the United States and France, it reflects broad international agreement on the urgent need for international controls of nonstate proliferation activities.[16] The resolution calls on all states to establish domestic controls to prevent proliferation and adopt national legislative measures to that effect. It also provides international authorization for seizure of illegal material transfers by making them subject to Chapter VII of the UN Charter. (Chapter VII permits the Security Council to use sanctions or military force in response to threats to international peace and security.)

To facilitate compliance with the laws criminalizing proliferation behavior, the Security Council or relevant specialized institutions such as the IAEA need to develop a declaration system that will help distinguish between legitimate and illegitimate trade across state borders. In the field of nuclear transfers, members of the Nuclear Suppliers Group have agreed to provide transfer information to the IAEA, but reporting is inconsistent and voluntary. As a start, the Nuclear Suppliers Group should adopt a binding requirement that all states communicate each approved export of sensitive nuclear technology, material, or know-how to the IAEA on a timely basis. Pursuant to Resolution 1540, the Security Council should ask the IAEA to develop a model for universalizing such a reporting requirement. A transparent reporting requirement would establish a legal basis for discriminating between legitimate commerce and illegitimate proliferation. Undeclared exchanges (such as those by the A. Q. Khan network) would be illegal on their face, while declared exchanges would be conducted under existing export control and customs regulations.

Beyond Resolution 1540 and the adjunct measures suggested above, several additional steps are needed:

1. **The IAEA should adopt a rule proscribing foreign assistance to a state that the agency cannot certify to be in full compliance with transparency and safeguard obligations under the NPT.**

Proscribed assistance would encompass nuclear activities and facilities that have weapon applications, specifically reactors, uranium enrichment, plutonium separation, and isotope separation facilities. To prevent states from sidestepping these obligations, the rule should also specify that members of the IAEA adopt national legislation making it illegal for any entity on their territory to facilitate forbidden assistance to a state the IAEA

does not deem to be in full compliance with its transparency and safeguard obligations.

The United States, France, and other like-minded states should request that the 2005 NPT Review Conference urge the IAEA to adopt the central thrust of this rule. The rule would raise the costs and risks of cheating on transparency and safeguard rules, and extend the burden of compliance not just to recipients of technology and know-how but to providers as well.

In the event that a state ignored these prohibitions and continued a supply relationship with a noncompliant state (directly or by allowing entities on its territory to do so), the IAEA would be required to refer the matter to the Security Council for enforcement.[17]

2. **The Security Council, as the ultimate enforcement authority of the NPT, should adopt a resolution clarifying that a state that withdraws from the treaty remains responsible for violations committed while still a party to it.**

Like most treaties, the NPT has a withdrawal clause, Article X, which allows each party to withdraw if its "supreme interests" are threatened. However, from the standpoint of deterrence and enforcement, it is important to disabuse states of the idea that they can circumvent their NPT commitment, creep up to the nuclear weapons threshold, withdraw from the treaty, and quickly put together nuclear weapons without facing consequences.

3. **The Security Council should adopt a resolution that a state that withdraws from the NPT—whether having violated it or not—may no longer make use of nuclear materials, facilities, equipment, or technology acquired from another country before its withdrawal.**

This resolution should require further that such facilities, equipment, and nuclear material be dismantled, destroyed, or returned to the supplying state under international verification. If the withdrawing state proves unwilling or unable to comply, the Security Council or the technology-supplying states could, as a last resort, authorize destruction of the facilities, equipment, or material in question.

In support of this resolution (but not conditioned on it), the Nuclear Suppliers Group should agree to include clauses in technology assistance transfer agreements to the effect that sensitive or major transfers of nuclear materials, facilities, equipment, or technologies may not be used in the event that a receiving state withdraws from the NPT. Suppliers would then have greater leverage to persuade or compel recipients to comply with their nonproliferation obligations.

VOLUNTARY MEASURES

The United States should also encourage voluntary measures against the proliferation of nuclear, biological, and chemical weapons. In recent years, states and nonstate actors increasingly have used voluntary codes of conduct, without new regulation, to mitigate serious problems caused by socially harmful state or private actions. These measures would be state, corporate, or nongovernmental organization (NGO) policy, rather than a multilateral matter.

The corporate and banking worlds have become involved in an array of voluntary mechanisms in recent years to address concerns about environment and labor policy. For example, the Equator Principles, which originated with the World Bank, provide guidelines for lending to countries that have not historically shown a great deal of concern about maintaining environmental or social standards in large projects. The Equator Principles ask lenders to require that certain environmental and social standards be maintained in a project as a condition of lending. A growing number of banks subscribe to the principles in their lending practices, if only to escape the embarrassment of lending to a project that turns out to be environmentally unsound or harmful to local cultures. In a similar

vein, banks and corporations might also be convinced to make "nonproliferation soundness" a principle of their international activities.

A recent proliferation case illustrates how this principle might be applied. Libya evidently purchased centrifuge parts from a Malaysian company, through a front company in Dubai.[18] The Malaysian manufacturer apparently had to buy a great deal of equipment and retool a factory in order to produce the centrifuges. Although it has not been disclosed whether the company had to borrow money for that particular upgrade in its capacity, any viable firm must periodically raise capital. Therefore, banks might be asked to consider, as one condition for granting a loan, whether a company had a clean nonproliferation "bill of health." If a company has at any time contributed to nuclear proliferation, it should be just as embarrassing to the lender as poor environmental performance.

Not all lending, of course, comes from the big multinational commercial banks or international lenders such as the World Bank. In many countries, especially in Asia, lending takes place in "sweetheart deals," on highly beneficial bases, often with a significant amount of subsidy from the state banking system. Here it may be necessary to develop a kind of hybrid system, in which state banks, such as in China, are required by the national government to incorporate a nonproliferation standard into lending.

Tough Diplomacy: A Revived Security Council

SUMMARY OF POLICY RECOMMENDATIONS

- Orchestrate a P-5 summit to outline specific country commitments to strengthen nonproliferation mechanisms and laws. (p. 33)
- Consider establishing within the UN a nonproliferation rapporteur's office to collect and evaluate state reports documenting their implementation of nonproliferation laws, particularly Security Council Resolution 1540. (p. 33)

The Security Council is supposed to provide leadership in the resolute enforcement of nonproliferation rules to deter potential violators and reassure rule followers. This puts the onus on the five veto-wielding members of the Council: China, France, Russia, the United Kingdom, and the United States. These countries and their leaders—not an amorphous "UN"—will largely determine whether and how a rule-based international system can protect the world from proliferation dangers. If they fail to lead, they will not only undermine nonproliferation, they also will further weaken the UN system and their own power.

Security Council Resolution 1540, which significantly strengthens national obligations to enforce nonproliferation norms, is an important positive step. This comes after years of indecision and rancor among Security Council members over Iraq, North Korea, and, to some extent, Iran. Serious doubts remain whether the five key rule enforcers permanently ensconced in the Security Council can reconcile their often-competing interests sufficiently to present an impenetrable front against proliferation. Indeed, China and Russia have been at various times major sources of proliferation concern. The Security Council's credibility and disposition to enforce nonproliferation is gravely weakened when its members' hands are not clean.

No magic formula can bring China, France, Russia, the United Kingdom, and the United States into concert.[19] The first requirement is for U.S. leaders to want to invest the time, energy, and patience required to build mutual understanding, if not consensus, among the five regarding the nature of the nuclear threats and the priority of the policies needed to achieve

universal compliance with nonproliferation norms and laws. Again, consultations around Resolution 1540 are an important beginning.

A logical further step would be for the new U.S. administration to orchestrate a summit of the heads of state of China, France, Russia, and the United Kingdom prior to the April–May 2005 NPT Review Conference, to clarify specifically the commitments they are prepared to make to advance the prospect of universal compliance with nuclear nonproliferation norms and rules. Iran is a pressing case they should consider specifically. Although little time would be available to a new administration after the 2004 presidential election, such an unprecedented summit would highlight the importance these five key states attach to their role of protecting their citizens and the world from the unsurpassed danger of nuclear use. It would also increase the prospect that the NPT Review Conference would produce consensus, rather than discord, on the priority steps that states must take to strengthen global security against nuclear dangers.

The Security Council should strengthen its capacity to enforce nonproliferation on a more routine basis by further developing Resolution 1540's requirement that states file reports documenting their implementation of required laws. To manage this reporting, the Security Council should establish a nonproliferation rapporteur's office that would collect and evaluate state submissions. This rapporteur should also invite societal verification, by collecting and evaluating public-source analyses of states' compliance with the resolution's terms, and forwarding these to the Security Council.

Inspections That Work

SUMMARY OF POLICY RECOMMENDATIONS

- Urge the UN secretary-general to charter a review of the performance of its two Iraq-focused commissions, the UN Special Commission on Iraq (UNSCOM) and the UN Monitoring, Verification and Inspection Commission (UNMOVIC). (p. 33)
- If the findings of this review warrant, the Security Council should consider establishing a permanent, international nonproliferation inspection capability for chemical and biological weapons and delivery systems. (p. 33–34)
- Use all venues to advocate the adoption of the IAEA's Additional Protocol by all states. (p. 34)
- Work to provide international inspection regimes with a strong international mandate, sufficient budgets and resources, and international consensus on robust consequences in the event of noncompliance. (p. 34–35)

Robust international inspections are a key element of a layered defense against proliferation. International inspections add credibility and legitimacy to nonproliferation enforcement, as well as considerable skill and institutional memory. The United States has formidable resources that can supplement international inspections.

The United States should encourage the UN secretary-general to charter a review of the inspections performed by both UNSCOM and UNMOVIC in Iraq. It now appears that even under the most trying circumstances, these intrusive inspections had considerable success. In conjunction with military actions, sanctions, and export/import mechanisms, inspectors were ultimately able to discover and eliminate most, perhaps all, of Iraq's unconventional weapons and production facilities and destroy or monitor the destruction of most of its chemical and biological weapons agent.[20]

Based on that review, the Security Council should consider establishing under its authority a permanent, international nonproliferation inspection capability for chemical and biological

weapons and missile delivery systems. The IAEA already exists to inspect and monitor nuclear facilities, and the Organization for the Prevention of Chemical Weapons (OPCW) has a corps of inspectors responsible for monitoring compliance with the Chemical Weapons Convention. But there is no body established for the purpose of conducting the type of inspections and monitoring required in the past in Iraq and currently in Libya, and that might be needed in the future in North Korea, Iran, Iraq, or other nations. This new capability would work with the OPCW, and coordinate with the IAEA, which would continue to regulate and monitor nuclear facilities.

International inspections can be an effective response to proliferation.

One way to create this capability is to build on the experiences and skills of the inspection teams established for Iraq. The Security Council could revisit the UNMOVIC verification and monitoring mandate in Iraq and enlarge it to include other nations. UNMOVIC currently has fifty experts serving at UN headquarters and maintains a roster of 350 experts from fifty-five nations able and willing to undertake inspections. The UN inspectorate could be maintained with an active core staff, expanding when needed for each particular mission. Such a permanent inspection capability could provide institutional memory, international expertise, and valuable, readily deployable capabilities at low cost. This would not only ease the burden on the United States but would more effectively provide the long-term monitoring and verification that is a vital part of the inspections process.

Barbara Hatch Rosenberg of the State University of New York has developed a detailed outline of the possible functions, structure, and requirements of a new UN inspections agency.[21] Other useful studies include an analysis from Trevor Findlay, executive director of the Verification, Research, and Training Centre in London.[22]

It is already established U.S. policy to increase IAEA nuclear inspection capabilities, but to date the policy has been little more than words. At a minimum, the agency needs increased budgets and expanded powers. The IAEA suffered more than a decade of zero budget growth despite an increasing number of nuclear crises.

As both President Bush and Director-General ElBaradei have suggested, the Additional Protocol to the existing safeguards agreements should be mandatory for all states. Fewer than 20 percent of the 191 UN member states have approved this protocol allowing broader and more intrusive inspection of nuclear facilities (the United States has just recently ratified the protocol). The United States should use every opportunity to make implementation of the protocol mandatory, starting with consensus building on the matter at meetings of the Group of Eight (G-8), NATO, the Asia-Pacific Economic Cooperation Forum, and the Organization of American States.

ELEMENTS OF SUCCESSFUL INSPECTION REGIMES

Past experience suggests that international inspections are an effective response to proliferation when three factors are present:

1. A strong mandate

A united Security Council is key to any inspection regime. Security Council resolve will not be easy to maintain—especially over time, as the experience in Iraq suggests—but it is so critical to success that it is worth the effort. With it comes the legitimacy and independent verification that no unilateral inspections can match. Without it, sanctions and export-import controls, both of which require multilateral support, would likely collapse. Again, the credibility and effectiveness of the Security Council are at stake.

2. Sufficient inspection budgets and resources

Inspectorates require adequate capabilities and resources, including U-2 high-altitude spy aircraft and other surveillance equipment, helicopters, unfettered access to scientists and sites,[23] and shared intelligence from many nations. This final factor is absolutely critical to the suc-

cess of any inspection regime, because it allows inspectors to better identify suspect sites and individuals with access to valuable information. In addition, adequate funding is necessary to ensure the continued monitoring and destruction of existing weapons stockpiles around the world. But the OPCW, like the IAEA, has suffered repeated years of insufficient funding. To help protect against terrorist theft from weapons stockpiles and to increase the ability to verify that states are complying with nonproliferation commitments, the United States should lead efforts to increase the budgets and technical capabilities of international inspection agencies.

3. Consensus on robust consequences, including possible military force

Finally, any inspection effort must be backed by credible consequences in the event of noncompliance. After years of defiance, when the United States was poised to invade Iraq in 2003, Saddam Hussein complied with the inspections, even if that did not extend to full disclosure of past activities. Future solutions will undoubtedly require a modified approach, as a massive military buildup will not often be possible. Policy makers should consider alternatives, such as coercive inspections, that offer stronger and more intrusive inspections backed up by credible force in case of obstruction.[24]

In the event that inspections, sanctions, and other constraints do not succeed in the task of disarming an uncooperative nation, the UN or a credible coalition of nations should be prepared to authorize military force as an option of last resort. A Security Council inspectorate could make the use of force more likely, as the Security Council would have its credibility at stake.

The Use of Force: Counterproliferation and Preemption

SUMMARY OF POLICY RECOMMENDATIONS

- Broaden counterproliferation strategy beyond purely military responses to encompass the most likely capabilities to deter and defend against WMD use. (p. 35)
- Restructure missile defense research and subject all antimissile systems to realistic testing. (p. 36)
- Seek, through an international forum, to establish guidelines for preemptive military action in the absence of imminent threat. (p. 38)

Counterproliferation has a key role in nonproliferation policy and enforcement of antiproliferation laws and norms. In the *National Strategy to Combat Weapons of Mass Destruction,* it is highlighted as one of the three pillars—along with nonproliferation and consequence management—of deterrence and defense against nuclear, chemical, and biological weapon use. If diplomacy and deterrence fail, the United States must have active military forces ready to defeat attacks involving unconventional weapons. Currently however, strategy and budget substantially overemphasize military responses to proliferation at the expense of the other critical pillars. Terrorism, in addition, presents the new challenge of dispersed groups and facilities that are not suited to attack by traditional military means. A broader counterproliferation approach is necessary and essential.

A comprehensive nonproliferation strategy should emphasize specific aspects of counterproliferation that will best help deter and defend against nuclear, chemical, or biological use. Efforts to strengthen counterproliferation should focus on six areas in particular:

- The ability of U.S. forces to fight in a nuclear, chemical, or biological warfare environment. This includes research on and acquisition

of chemical and biological warning sensors, vaccines, protective coverings and sealed vehicles, and means of base protection.

- New conventional weapons for attacking suspected chemical or biological weapons.
- Better equipment and training for police, firefighters, and other service personnel most likely to be involved in terrorist pursuit and response in the homeland.
- Accurate, timely intelligence to detect illicit activity and potential threats.
- Surveillance systems to detect and track enemy operations.
- Air- and sea-based capabilities to strike at the source of the attacks wherever they emanate.

PROSPECTS FOR MISSILE DEFENSE

By far the bulk of the annual U.S. counterproliferation budget is devoted to ballistic missile defense, currently some $10 billion per year.[25] The resources spent on a national missile defense are disproportional to the threat from ballistic missiles and do little to defend against the most probable threats. U.S. intelligence assessments and military officials have said for years that the United States is most likely to be attacked with a nuclear weapon covertly delivered on a ship, plane, or truck.[26] Delivery by a long-range missile from a country other than China or Russia is highly unlikely. Only one hostile state, North Korea, has even the potential to hit part of the United States with a missile launched from its own territory. Delivery by short- or medium-range missile remains a possibility, if the device is launched by a ship along the U.S. coast.

Research on missile defense must be depoliticized and restructured.

Research on missile defense must be depoliticized and restructured. All systems must undergo thorough, realistic testing to ensure that U.S. troops and the nation get defenses that work. The president should ask the Joint Chiefs of Staff, absent political pressures, for their recommendations on the threats and budgets for missile defense. When the Joint Chiefs were asked in 1993, they recommended that research be funded at modest levels for a national missile defense system against long-range missiles and that the majority of the funds be spent on effective defenses against the short-range threat the troops and U.S. allies actually faced. Only modest changes in the threat have occurred since then.

Of the more than 190 nations in the world, thirty-four of them, including the United States, have ballistic missiles. Almost all these nations are friends of the United States, and most (that is, twenty-three) have only short-range missiles that threaten only their neighbors. Only China and Russia are able to attack the United States with nuclear warheads on long-range, land-based missiles. This has not changed since Russia and China deployed their first intercontinental ballistic missiles, in 1959 and 1981 respectively. The most significant proliferation threat today comes from the slow but steady increase in the number of states testing medium-range ballistic missiles. This development is often cited as evidence of a larger proliferation threat. Seven nations—China, India, Iran, Israel, Pakistan, North Korea, and Saudi Arabia—now have missiles in this range. Of these, three potentially could come into conflict with the United States—China, Iran, and North Korea.[27]

In short, the ballistic missile threat today is confined, limited, and changing relatively slowly. There is every reason to believe that it can be addressed through diplomacy and measured military preparedness. The following is a list of priorities for these efforts:

- Defenses against missile outside the atmosphere can be overwhelmed by lightweight decoys and other countermeasures available to any country capable of building a long-range missile.[28] For this and other reasons, the national missile defense system planned for Alaska is likely to be ineffective. A better

Table 4.1. The Thirty-Four Nations with Ballistic Missiles

TWENTY-THREE COUNTRIES POSSESS ONLY SHORT-RANGE BALLISTIC MISSILES (THAT IS, WITH RANGES OF LESS THAN 1,000 KILOMETERS)
Afghanistan, Argentina, Armenia, Azerbaijan, Bahrain, Belarus, Congo, Egypt, Georgia, Greece, Iraq, Kazakhstan, Libya, Slovak Republic, South Korea, Syria, Taiwan, Turkey, Turkmenistan, Ukraine, UAE, Vietnam, Yemen
SEVEN COUNTRIES POSSESS MEDIUM-RANGE BALLISTIC MISSILES (WITH RANGES OF 1,000–3,000 KILOMETERS)
China, India, Iran, Israel, North Korea, Pakistan, Saudi Arabia
ONE COUNTRY POSSESSES INTERMEDIATE-RANGE BALLISTIC MISSILES (WITH RANGES OF 3,000–5,000 KILOMETERS)
China
FIVE COUNTRIES POSSESS INTERCONTINENTAL BALLISTIC MISSILES (WITH RANGES OF 5,500+ KILOMETERS)
China, France, Russia, United Kingdom, United States

defense against a North Korean missile would be "preboost phase intercept" that would destroy the threatening missile on its launch pad.

- The Alaska system cannot intercept a short-range missile launched from a cargo ship off the U.S. coast. It is impractical to proliferate short-range missile defense systems (such as Patriot or Aegis ship-based systems) in the numbers needed to guard every incoming ship. The best defense would be to interdict the ship before missile launch.
- For ground-based attacks, systems capable of intercepting Scuds and Scud-derivatives, such as the North Korean 1,000-km-range *Nodong* and its cloned cousins the *Shahab* and *Ghauri,* should be developed. These missiles could threaten U.S. forces and allies. Few of the nations that have these missiles have nuclear warheads, but their acquisition of such warheads cannot be ruled out in the future.
- Research on adapting the antiaircraft system on Aegis ships to an anti–short-range missile capability should continue. Despite substantial funding, however, progress has been slow, and expectations about the military utility of this system should be modest.
- Experiences in South Asia and Cyprus (where the United States objected to the introduction of missile defense as a destabilizing move in this crisis region[29]) demonstrate that even short-range missile defenses can have the unintended consequence of stimulating new missile deployments. Greater efforts should be devoted to preventing the missile threat in the first place by, for example, reconsidering President Reagan's Reykjavik proposal to eliminate all ballistic missiles, or by making the U.S.-Russian ban on intermediate ballistic missiles a global treaty, or by ending the trade in short-range ballistic missiles.

PREEMPTION

The United States has the inherent right and a moral obligation to take preemptive military action against any imminent threat to its national security or that of its allies. Future proliferation threats, however, may not appear as

immediate dangers, complicating decisions on when to use military force.[30] In Iraq, the United States had trouble acquiring broad support because its actions were largely perceived as preventive—destroying a threat before it was imminent—rather than preemptive—destroying an imminent threat.

Leaders as diverse as former Secretary of State Henry Kissinger and UN Secretary-General Kofi Annan have called for an international initiative to establish guidelines for possible military action against grave but nonimminent threats.[31] Without such guidelines, Kissinger warns, the world could become increasingly chaotic, with numerous countries embarking on preventive military campaigns justified by a variety of individual standards. The best venue for negotiating such guidelines is the Security Council, though others, such as NATO, should be explored.

The process of negotiation itself will be valuable in clarifying vital issues even if ultimate agreement is not reached. Situations requiring an international recommendation for preemptive military action are likely to be rare, but because such action could entail very high costs, it is vital to try to ensure international support. If international actors are reluctant to support military intervention, they should alternatively feel compelled to strengthen international resolve, procedures, and instruments to prevent proliferation crises from emerging in the first place.

Recent experience suggests that the following steps should be considered in devising guidelines:[32]

- Clarify the standards and implications of imminence.
- Assess the deterrability of the threat.
- Build shared confidence in intelligence and threat assessments.
- Distinguish between actions to target weapons and to remove regimes.
- Establish military action as a last resort.
- Establish the prospect of success and cost/benefit ratio of military action.
- Clarify the authority under which military action should be taken.

Clarify the Standards and Implications of Imminence

Imminence of threat has been a key legal and customary criterion in determining the legitimacy of preemptive force or anticipatory self-defense. Before the Iraq War, imminence was generally understood as a credible, specific threat that was likely to be exercised in the immediate future.[33] However, terrorists' capacity to acquire chemical, biological, or nuclear weapons and attack without warning complicates this state-based standard. Thus, there is a genuine need to develop an internationally shared and valid definition of "sufficient imminence" to warrant the use of force.

The standard of imminence considered sufficient to warrant military action should vary with the magnitude of the threat. This requires a disaggregation of the WMD threat. The now ubiquitous phrase *weapons of mass destruction* conflates three very different categories of weapons whose use would pose distinctly different levels of threat, both physically and in terms of impact on international order.

- Nuclear threats, reliably ascertained, justify action with a lesser degree of certainty of imminence. Nuclear weapons are the only weapons that can immediately destroy entire cities and thus pose incomparably grave threats in terms of scale and damage to international order.
- The time scale for acting preemptively against biological threats could be adjusted according to assessments of the virulence and dispersability of the weapons in the case under consideration if intelligence allows.[34] Biological weapons can potentially kill millions and sow international disorder, but few potential

adversaries have the means to effectively disperse such weapons on a massively destructive scale.

- Action against chemical weapon threats, alone, would require still higher levels of evidence that use by an adversary is at hand. Chemical weapons are relatively easy to develop and deploy, but their scale of potential damage is significantly less than that of biological and nuclear weapons.

Thus, the threshold warranting military action should be inversely related to the magnitude of the damage threatened. Regarding biological weapons, the cost/benefit calculus of military force should take into account the likelihood that the possessor has both the biological agent and the means to disperse it on a broad scale.

Assess the Deterrability of the Threat

Decision makers must also assess rigorously whether the suspected possessor of a given category of weapons is deterrable. That is, the urgency of military action would be less against actors that are demonstrably deterrable than against those who appear unbowed by the threat of military retaliation. Ideally, the United States, with international backing, could simply destroy the offending nuclear capability and prove that proliferation does not pay. But such action is not risk free. Trade-offs must be weighed between the consequences of military action to destroy proliferant capabilities and the effects of falling back to a deterrence and containment strategy.

Reliance need not be placed on wholly subjective assessments. History is a guide, but must be evaluated carefully. In the case of Iraq, for example, many officials and pundits cited Saddam Hussein's use of chemical weapons against Iran and his own population in the 1980s as proof that Iraq was undeterrable. Yet, closer analysis indicated that Saddam used chemical weapons against these targets because they were weaker than Iraq and did not possess chemical defenses. After the 1991 war, Saddam was clearly subject to deterrence.

Build Shared Confidence in Intelligence and Threat Assessments

The 2002 U.S. *National Security Strategy* recognized that the legitimacy of "preemptive" force depended on outstanding intelligence capabilities and the close coordination "with allies to form a common assessment of the most dangerous threats." The lesson of Iraq, however, was not only that intelligence was poor, but that few states agreed with the U.S. assessment of the Iraqi threat, including the link to terrorists. If the intelligence review process becomes more sound and internationally vetted, as recommended earlier, it should be easier to generate shared confidence in intelligence and threat assessments made by the United States. Intelligence can provide the necessary leads for conducting cooperative inspection or verification of the violations, further building the unity needed for joint military action.

Two of the criteria for evaluating intelligence should be:

- If intelligence is not sufficiently exact as to the locations of nuclear, biological, or chemical weapons and their related infrastructure, then doubt should increase whether intelligence is sufficient to warrant military invasion of another state, if possession or acquisition of weapons of mass destruction is the justification for the invasion.
- If and when threat assessments are uncertain, policy makers should not delete caveats and uncertainties in advocating actions of last resort (use of force). Use of force may still be sound policy, but its soundness should be recognizable without diminishing intelligence uncertainties.

Distinguish Between Actions to Target Weapons and to Remove Regimes

In some instances, the threat posed by a regime can be removed by eliminating those capabilities that pose a threat. Military action to remove governments should be subject to the most rigorous criteria, while action to remove weapons and related infrastructure could be more readily

authorized. The costs and risks of targeting threatening weapons can be more readily contained than the costs and risks of removing governments.

- In 1998 the United States bombed a pharmaceutical plant in Khartoum, Sudan, which U.S. intelligence believed was being used to produce chemical weapons. Subsequent investigation determined that the intelligence informing the attack was mistaken. Although the incident was an embarrassing intelligence mistake, the physical damage was modest and partially remedied by payment to the factory's owner, pursuant to a lawsuit.
- By contrast, the consequences of the military invasion of Iraq to remove Saddam Hussein's regime are enormous and long-term. Whether or not the Iraq War proves salutary, the point is that distinctions should be made in considering whether the object of military force is specific weapon capabilities or the removal of a government (or both).

Establish Military Action as a Last Resort

War should continue to be an act of last resort, but its wisdom and legitimacy depend on whether other means to prevent or redress a threat have been truly exhausted. In many ways this is a subjective judgment—have the United States and other states exhausted all reasonable alternatives? The difficulty of such assessments when proliferation threats have become acute, as in North Korea, highlights the imperative of more resolute international enforcement of stronger nonproliferation rules *early* in the development of threats.

This subjectivity is one of the reasons for developing international guidelines for preemptive action in the first place. An international negotiation should establish a scale of preventive and enforcement actions that, where possible, should be pursued before resorting to force against threats that are not self-evidently imminent.[35] This prior standard would then provide a benchmark for a state, a coalition, or the Security Council to argue that no further recourse is left besides military action. Debate cannot be unlimited, however. A balance must be struck between taking joint action and taking action before time runs out.

Establish the Prospect of Success and Cost/Benefit Ratio of Military Action

Force should be undertaken only with confidence that it will be effective, and at a cost in lives and international order proportional to the threat.

International support for military action (absent clear self-defense or an imminent threat) is necessary to share the cost and risks of the operation and to enhance global order and security in the aftermath. This requires more rigorous and shared assessments not only of the prospects for immediate success of military action, but of likely subsequent developments. Guidelines should require rigorously vetted strategies for making the postwar environment significantly better than its antecedent, including the possibility that the military action might deter other actors from developing or acquiring similar threatening capabilities.

The converse also must be analyzed: that other actors will feel emboldened to strike preemptively against their adversaries. India and Pakistan, China and Taiwan, and Israel and Egypt or Syria are just some examples of adversaries that could follow such a precedent.

Clarify the Authority Under Which Military Action Should Be Taken

The Security Council is often regarded as the necessary authorizing agency of legitimate force, but the experiences of Kosovo and Iraq suggest that complementary or supplementary sources of legitimacy may be necessary.[36] Even a partial international consensus on guidelines for military force (short of self-defense and clearly imminent threat) would augment the moral and political legitimacy of a state or coalition that acted according to these guidelines. This is important,

especially for the United States, which is often seen, fairly or not, as projecting force for its own selfish interests and not on behalf of improved international security. The international negotiation of guidelines for military action against proliferation-related threats would necessarily clarify the means by which states could authorize urgent action, recognizing that the Security Council's traditional pattern and pace of deliberations may be insufficient.

PART FIVE: BLOCKING SUPPLY

Securing the Global Nuclear Complex

A well-organized and well-financed terrorist group could produce a basic nuclear weapon—but only if it could acquire enough weapon-usable nuclear material, the HEU and separated plutonium used for the core of a bomb.[37] The terrorist threat worsens the already acute threat presented by the large amounts of these inadequately secured materials in the world. *Securing weapon-usable fissile materials should be the single greatest nonproliferation priority.* As President Bush has said, "The nations of the world must do all we can to secure and eliminate nuclear…materials."[38]

Doing "all we can" means radically revising the management of the global nuclear complex. Piecemeal reform will not adequately protect fissile materials from theft or bridge gaps within the existing nonproliferation regime, which facilitates the accumulation of weapon-usable materials. The viability of the nuclear industry is also at stake: One bomb produced and detonated with material diverted from a "civilian" facility would turn the world against the nuclear industry with a vengeance.[39]

A strategy to prevent terrorists and additional states from acquiring nuclear weapons must:

- **Secure What Exists Now.** State-of-the art security must be applied to all stocks of nuclear weapons and weapon-usable materials, whether civilian or military, everywhere in the world. Where security is impossible, materials must be relocated or eliminated.
- **End Production.** Production and separation of all weapon-usable nuclear material should be halted.
- **End Use.** Civilian research, power, and naval reactors that use weapon-usable fuels should be converted to alternate fuels.
- **Eliminate Surplus Materials.** Large stockpiles of weapon-usable materials in countries around the world should be securely disposed of.

Each of these objectives is worth achieving alone; together they make up a comprehensive approach to nuclear materials. Many of these recommendations are controversial and will require significant work by many countries; leadership and cooperation among heads of state will be a prerequisite for success.

SUMMARY OF POLICY RECOMMENDATIONS

- Initiate a high-level Contact Group to lead efforts to improve security over all weapon-usable nuclear materials. (p. 44)
- Establish a high, unified standard of protection for all weapon-usable fissile materials and create international obligations to protect these materials. (p. 44)
- Establish a global fund for nuclear security assessments, upgrades, and relocation. (p. 46)

- Pursue a Global Cleanout of poorly guarded fissile material, with the goal of removing all vulnerable materials within two to four years. (p. 46)
- Form an international Nuclear Rapid Response Force of national dedicated resources to secure and remove at-risk fissile materials. (p. 46)
- Initiate a production "pause" to suspend enrichment of uranium and separation of plutonium. (p. 48)
- Develop fuel supply guarantees to states that do not possess and agree not to pursue domestic nuclear material production. (p. 48)
- Pursue a broader Fissile Material Cutoff Treaty (FMCT) that ends the production of HEU and separated plutonium for any purpose. (p. 50)
- End use of HEU for ship propulsion, reactor operation, research reactor fuel, and isotope production. Convert all HEU-fueled reactors to LEU or shut them down. (p.50–51)
- Prohibit the use of U.S.-origin HEU in any reactor able to convert to LEU fuels. (p. 51)
- Reevaluate the entire plutonium disposal program, with a renewed emphasis on securing plutonium under international monitoring. (p. 52)
- Develop a global nuclear accounting and transparency system. (p. 53)

UNIVERSALITY

The new standards and initiatives proposed here must be equally applicable to all states, whether or not they are signatories to the NPT or possess nuclear weapons. Civilian facilities in a nuclear weapon state (for example, a university-run research reactor or a privately run facility) should be required to meet the same standard as a civilian site in a non–nuclear weapon state. Similarly, materials in the defense sector of a state such as Brazil or India should meet the same standard as defense-related materials in Russia or the United States. Terrorists searching for such materials do not distinguish among sources—they will go where access is easiest. Ensuring political support for the broadest possible application of security standards requires avoiding the creation of new distinctions among states.

A terrorist group could build a nuclear bomb—but only if it had enough nuclear material.

SECURE WEAPON-USABLE NUCLEAR MATERIALS[40]

Because the most difficult part of making a nuclear bomb is acquiring the nuclear material, *all weapon-usable nuclear materials should be treated as if they were nuclear weapons, and the highest standards applied to weapons should become the global norm for all such materials regardless of use or location.*[41]

Currently, the IAEA publishes voluntary standards for nuclear material protection.[42] But states are not obliged to follow the guidelines.[43] Many states' security practices are demonstrably inadequate. Global standards should be established requiring that the security of nuclear stocks in *all* states be brought up to the standards of the most secure nuclear establishments. These standards should be informed by the best methods from various national approaches.

The United States and its allies should lead the international effort to set standards,[44] starting with the creation of a high-level "Contact Group to Prevent Nuclear Terrorism," including Brazil, China, France, India, Israel, Japan, Russia, the United Kingdom, the United States, and any other states that possess nuclear weapon fissile material and wish to join. States that have provided and exported weapon-usable materials (including China, Russia, and the United States) would have a significant responsibility for leadership within this contact group. By being open to all states that possess stockpiles of fissile

Table 5.1. Stocks of Weapon-Usable Plutonium (in Metric Tons)

STATE	SEPARATED CIVIL PLUTONIUM	MILITARY PLUTONIUM	WEAPON EQUIVALENTS[a]
Russia	37.2	130	41,800–83,600
United States	45.05	100	36,263–72,525
France	79.9	5	21,125–42,250
England	90.8	7.6	24,600–49,200
Germany	10.9	N/A	2,725–5,450
Japan	5.6	N/A	1,400–2,800
China	0	4	1,000–2,000
Belgium	3.4	N/A	850–1,700
India	.7	.31	275–550
Israel	.51	?	127–255
Switzerland	<.05	N/A	13–26
North Korea	N/A	.04	~8–10
Pakistan	.005	?	~1

Sources: U.S. Department of Energy, International Atomic Energy Agency, and Institute for Science and International Security.

a These calculations are based on official estimates that it would require 8kg of plutonium to produce a nuclear weapon (IAEA) and a similar estimate from the U.S. Department of Energy that a nuclear weapon could be produced with only 4kg of plutonium.

materials, a contact group would overcome the problem of India, Pakistan, and Israel not being members of the NPT. As an informal venue for solving urgent problems, a contact group would avoid the issue of conferring new juridical status on any state. Representation should be at a very high level—special envoys reporting directly to their heads of state—to convey the urgency that participating nations attach to their responsibilities as possessors of materials that could instantly destroy whole cities if they fell into the wrong hands.

A high-level contact group is also necessary to focus the spotlight of public and media attention on the nuclear security challenge and to break the bureaucratic ice now blocking progress.[45]

Once nuclear security standards are set, a new legal commitment by all states to implement them will be needed. UN Security Council Resolution 1540 is a good beginning.[46] Voluntary acceptance of the new standards is preferable, but it may not produce rapid or acceptable results. Countries should be required to demonstrate compliance (possibly through

Countries Known to Possess Weapon-Usable Uranium (46)

Argentina	India	Poland
Australia	Indonesia	Portugal
Austria	Iran	Romania
Belarus	Israel	Russia
Belgium	Italy	Serbia
Bulgaria	Jamaica	South Africa
Canada	Japan	South Korea
Chile	Kazakhstan	Syria
China	Libya	Taiwan
Czech Republic	Latvia	Turkey
Denmark	Mexico	United Kingdom
France	Netherlands	Ukraine
Germany	North Korea	United States
Ghana	Pakistan	Uzbekistan
Greece	Peru	Vietnam
Hungary		

acceptance of IAEA International Physical Protection Advisory Service inspections or similar procedures with these new standards) or accept international assistance to implement the new requirements. The wealthiest states should provide assistance for others, including financing for security upgrades and, where needed, relocation of materials from states that lack the capabilities to meet state-of-the-art standards.[47] This assistance should include sharing best practices on the protection of nuclear materials, personnel reliability, and physical protection assistance similar to that provided by the international community to states of the former Soviet Union.[48]

Stop making more bomb material.

As part of the nuclear terrorism prevention effort, the United States and its allies should immediately pursue a "Global Cleanout" of vulnerable nuclear materials. Several dozen countries possess weapon-usable materials (almost exclusively uranium) that are vulnerable to theft and should be relocated. Without a compelling rationale for their continued use, providing security in place for these materials does not make sense. The United States, working with Russia and other partners, could remove and secure the vast majority of these materials in four years at a cost of $50 million per year.[49] This should include rapid repatriation of fuel from former Soviet republics. In addition, the United States needs to recognize the special risks associated with vulnerable HEU in the former Soviet Union and prioritize efforts to secure this material given its attractiveness for possible use in a terrorist weapon.[50] Rapid security upgrades in Russian sites containing high-risk HEU could be completed within one year.

The United States and other states also should develop joint capabilities to respond to the theft or threatened use of nuclear materials or weapons. The U.S. Nuclear Emergency Search Teams offer a unique capability to respond to nuclear scenarios such as these. A number of other countries have units that also could be equipped to create an international capability. NATO countries are obvious potential contributors; Russia, China, India, and others could be engaged to work to develop a truly international nuclear rapid response force that could include dedicated transport and deployment capabilities, along with trained and cross-trained personnel.

Initiatives:

- Initiate a high-level contact group to lead efforts to improve security over all weapon-usable nuclear materials.
- Establish a high, unified standard of protection for all weapon-usable nuclear materials.
- Create international obligations to protect weapon-usable nuclear materials.
- Establish a global fund for nuclear security assessments, upgrades, and relocation.
- Pursue a Global Cleanout of unneeded and poorly guarded nuclear materials.
- Form an international nuclear rapid response force of national dedicated resources to secure and remove at-risk nuclear materials.

STOP PRODUCTION OF WEAPON-USABLE FISSILE MATERIALS

Enough weapon-usable material exists in the world to produce well over 100,000 nuclear weapons. Nonetheless, a number of countries continue to produce more of these materials.[51]

President Bush and others wisely have endorsed international efforts to assess the international fuel cycle and consider alternatives that would stem the acquisition of nuclear fuel cycle facilities. On February 11, 2004, the president said:

> The world must create a safe, orderly system to field civilian nuclear plants without adding to the danger of weapons proliferation. The world's leading nuclear exporters should ensure that states have reliable access at reasonable cost to fuel for civilian reactors, so long as those states renounce enrichment and reprocessing. Enrichment and reprocessing are not necessary for nations seeking to harness nuclear energy for peaceful purposes.[52]

While this statement recognizes the risks associated with the expansion of nuclear production capabilities into new states, it does not fully appreciate the dangers posed by the continued production of weapon-usable materials in states that already possess these facilities. Both should be addressed together as part of a new comprehensive initiative to end the further production of such materials.

The spread of nuclear fuel production facilities (uranium enrichment and plutonium extraction) to new states such as Iran threatens to undermine global confidence in the nonproliferation regime. What value is there in a system in which multiple non–nuclear weapon states can acquire the means to produce nuclear weapons in a matter of weeks? But the national production of weapon-usable nuclear materials in states that already have nuclear production facilities—even those for peaceful purposes—also increases the chances of terrorist theft. Efforts to block new actors from opening production facilities while allowing traditional producers to continue sharpens the sense of discrimination between states and reduces the perceived legitimacy of the NPT regime.

To meet this challenge, the United States and other countries should pursue new international fuel cycle arrangements and seek to end production of all weapon-usable nuclear materials. Achieving this goal will require benefits for states that forgo these capabilities and costs for those that do not. This goal will also likely require initiatives to manage the front and back ends of the nuclear fuel cycle. States will need legal and commercial mechanisms to codify their commitments not to acquire material production capabilities,[53] to provide fuel guarantees to countries that abstain from production, and, eventually, to verify commitments not to acquire enrichment and reprocessing capabilities. The proposed contact group is one venue for such deliberation. The parallel initiatives by the director-general of the IAEA on the internationalization of the fuel cycle and by President Bush on supply guarantees demonstrate the growing currency of these issues and provide a basis for moving forward. Without consensus on the strategy, however, any success is likely to be short-lived.

There is no peaceful need for HEU.

Nuclear Terrorism

Related to, yet distinct from, efforts to prevent terrorists from acquiring nuclear weapons is the urgent need to prevent other kinds of nuclear-related terror attacks, including the use of radiological dispersal devices (so-called dirty bombs) and attacks on nuclear facilities including power and research reactors. These efforts are beyond the scope of the present study, but are covered in extensive detail in a forthcoming publication by the Monterey Institute for International Studies entitled *The Four Faces of Nuclear Terrorism.* The Monterey Institute's work on the issue of terrorism and nuclear weapons has greatly informed the contents of this section.

A Production Pause

The United States and the other nuclear-capable states should as an initial step establish a production "pause" in which they suspend operation of all facilities that can produce HEU or weapon-usable plutonium (military and civilian). This would apply to all enrichment and reprocessing activities, including even the production of LEU on a temporary basis. The IAEA could verify such a pause if given sufficient resources and access. Verification under a total production pause would be easier than a partial measure, since all enrichment and reprocessing would be stopped. Formal verification measures should be discussed, but should not delay adoption of the production pause. National technical means of intelligence collection (recognizing its limits) from leading states should be used to build confidence that the pause is in effect.

There is no inherent reason this production pause should disrupt existing fuel supply arrangements. There are sufficient stocks of enriched uranium to fuel existing nuclear reactors for several years. To ensure the stability of the uranium market, countries should provide commitments that they will fulfill current supply arrangements, in the event of a crisis or major interruption of supply. Consultation with industry would be essential, but financial considerations should not be allowed to trump the broad international-security benefits associated with the goals outlined here.

For uranium, the length of the pause should be extended by using existing stocks of enriched material. Excess stocks from Russia should be purchased and blended down to LEU. The United States should tap into its large but protected stocks of defense HEU and blend it down for reactor fuel. A uranium enrichment pause should be feasible for at least three to five years, if not more.

Current stocks of separated material would allow a plutonium separation moratorium to remain in place for several decades. This would allow time to develop proliferation-resistant fuel cycles that might provide an attractive alternative to plutonium-producing fuels and to establish institutional conditions that might reduce the proliferation risks associated with plutonium use.

A second step to pursue in parallel with the pause would involve the president's initiative to provide fuel supply guarantees to states that do not possess or pursue domestic nuclear material production. Several potential approaches have been forwarded for crafting these guarantees politically and practically (see sidebar on page 49). Successful options will need to provide sufficient confidence to recipients that the supply arrangements will be inviolable. States that resist such proposals that are economically advantageous would deserve to be suspected of seeking nuclear weapon capabilities.

In the long run, the new arrangements will need to balance the need for the continued production of certain nuclear materials—especially LEU for nuclear power purposes—with the political-economic imperative to compensate states fairly for not adding new capacity that they might otherwise prefer to. While the plutonium fuel economy is not yet fully established, the demand for LEU fuel is established and will require resumed production after the recommended pause. New institutional arrangements over the future enrichment of LEU will be needed to deal with the lack of inherent technical barriers to the use of enrichment facilities for the production of weapon-usable material.

One approach that would establish high institutional barriers to such production would be for all uranium enrichment to be done in facilities under either international control (that is, by companies from more than one country), similar to those operated under the Treaty of Almelo (URENCO), or under multinational control by agencies such as the IAEA or the UN or national governments working jointly. The director-general of the IAEA has written that "sensitive parts of the nuclear fuel cycle—the production of new fuel, the processing of weapon-usable material, the disposal of spent fuel and radioactive waste—would be less vulnerable to proliferation if brought under multinational control."[54] These

Options for Providing Guaranteed Supplies of Nuclear Fuel

There are a number of possible arrangements for ensuring that states that abandon fuel cycle capabilities can obtain guaranteed access to fuel services. The goal in each case would be to undercut the economic argument for programs to develop enrichment capabilities.

A COMMERCIAL CONSORTIUM OF FUEL PROVIDERS. Government-backed collections of fuel producing states or companies could form supply groups to commercially outcompete domestic fuel production programs. Three or more fuel-providing entities could offer reinforcing contracts to prospective buyers (and if one company dropped out, another would be obligated to fulfill the contract). The fuel could be sold or leased (depending on the recipient states' ability to manage spent fuel). Such an initiative would require a new level of cooperation and coordination between companies that have fiercely guarded their commercial relationships and would require intense government/corporate interactions. All of the potentially affected companies, however, already have close (if not coordinate) relationships with their national governments, which could be used to ensure cooperation with the proposed new arrangements.

INTERNATIONALLY MANAGED STOCKS OF FUEL. The IAEA statute allows for states to donate nuclear materials to the control of the agency, which it can then use as directed by the Board of Governors. States could transfer the "flag" or ownership of fresh nuclear fuel that could then be transferred by the agency to states on an economically viable basis. Transfers could be made to the IAEA in lieu of or in addition to voluntary contributions to the IAEA, or seed money could be used to start a cost-neutral program of fuel transfers by the agency. In addition, the IAEA could take possession of stocks in smaller amounts to serve as a backup to commercial contracts. In the event that political, economic, or technical factors led to the end of a fuel supply arrangement, the IAEA could step in, backstopping and thereby guaranteeing continuous supply.

BLIND AUCTIONS OF FUEL. Fuel supply guarantees could be provided not to states but to the IAEA, which could then be empowered to conduct auctions among eligible states for the material. This would mean that states or companies would not be in a direct position to deny fuel services, since the fuel would be provided directly to and by the IAEA or some alternate body. Companies might commit themselves (or be persuaded to commit) to provide the agency with a certain amount of fuel per year. Providing states would then have to fulfill these commitments, thus increasing the resilience of the guarantees. A political commitment could also be envisioned under which all such sales were required to go through the IAEA as a form of control and transparency.

IAEA AS GUARANTOR. The IAEA could itself provide fuel guarantees to states that had abstained from acquiring fuel cycle capabilities. In turn, supplying companies or states would then be required to fulfill IAEA obligations for fuel supply. Leading supplying states could sign agreements with the IAEA to fulfill commitments made by the agency on their behalf.

arrangements could reduce the risk of direct and indirect proliferation from such civil facilities. For this reason, the concept deserves serious international attention. In either an international or multinational formulation, facilities would need to adopt stringent measures to control sensitive technologies and ensure the reliability of plant personnel.[55]

The goal of ending material production is consistent with and even more comprehensive than the U.S.-backed FMCT, which would ban the production of fissile materials for use

Table 5.2. HEU and Plutonium Production Activities

HEU AND PLUTONIUM ACTIVITY	PROPOSED STATUS
HEU production and plutonium separation for nuclear weapons	Terminated in all states
HEU production for ship propulsion	Ended, converted to alternative LEU fuels
HEU production and plutonium separation for reactor operation	Ended, converted to alternative LEU fuels
HEU production and use for research reactor fuel	Ended, converted to alternative LEU fuels
HEU production and use for isotope production	Ended, converted to alternative LEU fuels

in weapons. Instead of an FMCT that allows HEU and separated plutonium production for nonweapons applications, however, a broader FMCT should be pursued that would end the production of these materials for any purpose. This broader FMCT would provide an additional institutional barrier to the production of weapon-usable materials.

END USE OF WEAPON-USABLE MATERIAL

Because some reactors use HEU and plutonium, states and corporations continue to produce and transport these weapon-usable materials. These production activities and uses raise risks that terrorists will buy or steal nuclear weapon capabilities, and also give cover for states to develop nuclear weapons under the guise of peaceful programs. These risks are unnecessary, since there is no inherent technical or economic need for the use of HEU or separated plutonium in any peaceful application. The choice to use them is just that, a choice. The use of these materials is an exercise of national sovereignty, but it is one that directly affects the security of other states and should come increasingly under international surveillance.

The main nonweapons uses for HEU and separated plutonium are in research reactors, nuclear power reactors, and naval propulsion. But technology has progressed to a point where all of these uses are unnecessary.

Plutonium Use in Power Reactors

The debate over the use of plutonium-based fuels for energy production goes back decades. France, Japan, Russia, and India have made large investments in developing plutonium-based fuel cycles. Other countries, including the United States, have pursued a once-through fuel cycle that avoids the proliferation risks associated with the reprocessing of fuel and extraction of weapon-usable plutonium.

In the long term, it is not clear which system (closed versus open) will prove superior in the areas of cost, waste management, and, most important, security. It is clear, however, that under current circumstances, the use and transport of HEU and plutonium for the civilian fuel cycle increases the risk that terrorists or other states will acquire the means to produce nuclear weapons.

The United States and other states have the right to oppose actions that may threaten their security. The United States should adopt a simple policy statement to the effect that "the United States opposes the separation of plutonium for the civil production of energy and other purposes." Where the United States has legal commitments to others to allow use of U.S.-origin nuclear material for such plutonium-based activities, it should abide by those commitments when they do not directly threaten U.S. security. Washington should ensure that

where such facilities and materials are in use, the highest standards of nuclear security and accountability are maintained (see above). Moreover, it should oppose any further attempts by states to pursue reprocessing or plutonium-based activities and deny permission for states to utilize U.S.-origin nuclear materials or technology for such purposes.

Research Reactors

The United States has a long-standing policy opposing the civil use of HEU in research reactors. In February 2004, President Bush stated that the United States "will help nations end the use of weapon-grade uranium in research reactors. I urge more nations to contribute to these efforts." These efforts include accepting U.S.-origin research reactor fuel into the United States for disposal and helping Russia do the same with material it exported to reactors over the past several decades. The United States is also helping Russia develop LEU fuels to convert Soviet-era reactors, just as it has successfully developed fuels to convert the majority of the world's HEU-fueled research reactors of U.S. origin and design.

These efforts, however, are moving too slowly, and the United States has failed to use all of the tools and leverage at its disposal. The United States should pursue a more aggressive and comprehensive policy to end the use of HEU in research reactors and associated applications worldwide, including in the United States itself. Fifty of the 135 research reactors worldwide that continue to operate using HEU fuel are either in the United States, are of U.S. origin, or use U.S.-supplied fuel.[56] Suggested steps to curtail HEU use include:

- Increasing investments in the development and testing of new fuels to enable the last few existing reactors to convert to new, LEU fuels.
- Converting all HEU-fueled reactors in the United States to LEU or shutting them down.
- Financing the validation of medical isotope production using LEU and banning the importation of such isotopes produced with HEU after the LEU process has been licensed by the U.S. Food and Drug Administration.
- Prohibiting the use of U.S.-origin HEU in any reactor able to be converted to LEU fuels.
- Requiring the repatriation of all U.S.-origin HEU to the United States for disposal.
- Providing technical assistance and financing for reactors that are being shut down or converted to LEU fuels.
- Funding the large-scale return of HEU fuels of Russian or Soviet origin to Russia from Soviet-era reactors. This should also include financing for retraining and job creation for reactor operators displaced by reactor shutdown.

Submarine and Ship Propulsion

As with the other nonweapons uses, there is no technical need to use HEU on ships. The current generation of naval reactors could be modified to use specially developed high-density LEU fuels. Additional improvements in high-density LEU fuel can be applied to future generations of reactors. Some existing ships and submarines will be unable to convert, however. In such cases, safeguards on enriched uranium for naval uses and a stringent accounting system can be applied to fuel that is fabricated, used, and then removed from naval vessels. Multinational or international ownership should apply to these production facilities as well. Finally, fuel supply guarantees could be considered for naval propulsion, in much the same way as they might be offered for reactors.

ELIMINATE STOCKS

Final disposal of weapon-usable materials is the best way to guarantee that they will not be used in a nuclear device. Most HEU and plutonium exists in the United States and Russia, both of which have already declared considerable

amounts to be excess to their defense needs, but significant stocks of such material exist in a number of countries (see Table 5.1).

These materials—especially excess defense materials—have been recognized as a clear and immediate danger.[57] In the twelve years since the end of the Cold War, some limited progress on disposal has been made, but the pace and scope of efforts to eliminate weapon-usable uranium and especially plutonium have been unacceptably slow.

Of the two types of materials—HEU and plutonium—weapon-usable uranium is by far the more solvable and more pressing challenge. HEU is easier to use in nuclear weapons than plutonium, although both present an attractive target for terrorists. The United States has agreed to purchase 500 metric tons of weapon-grade uranium from Russia and use the downblended and diluted material for power reactor fuel in the form of LEU fuel. To date, some 200 metric tons—enough for 8,000 nuclear weapons—has been diluted in Russia and accepted into the United States. But some 300 metric tons of the original purchase target remain in weapon-usable form, to say nothing of the additional material—which may include an additional 500 metric tons. The security of this material remains a concern. Downblending efforts need to be accelerated and expanded to ensure the fastest possible elimination of this material. Russia and the United States should agree to double the pace of uranium downblending from 30 to 60 metric tons of HEU per year. The accelerated downblending and acquisition of material can be used to meet existing fuel requirements during the production pause referred to above.

The plutonium question is much more complex. Unlike uranium, plutonium cannot be easily mixed or mechanically diluted to adequately prevent its use in nuclear weapons. From the dozens of solutions evaluated by the United States and Russia over the past decade, two viable options emerged—irradiation and immobilization. The two countries negotiated a legal agreement that commits each to eliminate 34 metric tons of plutonium using one of the two methods. Russia has relied almost exclusively on irradiation, whereas the United States had—until recently—been pursuing a mixed approach. The results, despite hard work and considerable investment in time and money, have been disappointing. Almost no weapon-origin plutonium has been eliminated in the ten years since the United States began serious efforts to do so. The start of elimination activities in both Russia and the United States is still several years away. Moreover, the disposal of 34 metric tons of plutonium in each country, while worthwhile, will only provide a justifiable security benefit if it marks the start of a much larger process that could include the bulk of weapons plutonium in each country, about 100 metric tons in the United States and 150 in Russia.

U.S. officials should reevaluate the entire plutonium disposal program, with a renewed emphasis on securing plutonium under international monitoring as an intermediate step toward its eventual elimination. The time line for disposing of the first 68 metric tons of excess plutonium, even under optimistic estimates, stretches out for decades. The intervening period is too long not to require the highest standards possible for interim secure storage. The United States has assisted Russia in the construction of the Mayak Fissile Material Storage Facility, which is capable of holding 100 metric tons of plutonium under bilateral and multilateral verification. Russia currently plans to store 25 metric tons of surplus plutonium on site. Russia should be encouraged to place 200 metric tons of HEU at the facility pending downblending into LEU for peaceful uses. The United States should actively pursue expedited negotiations with Russia to store non-weaponized plutonium at Mayak under bilateral transparency measures. These actions would be an important intermediary step in the disposal process, but one that recognizes that disposal will take much longer than originally anticipated. The United States should also consider outright purchase of Russian excess plutonium for storage and elimination in the United States.

This could offer several significant security and schedule advantages.

In the interim, the United States and Russia should reengage in a discussion about alternatives to the bilateral, reciprocal approach to plutonium disposal. The United States must recognize that current approaches have failed to rapidly address the clear and present danger of these materials being reused in nuclear weapons. New and energetic attention to this issue is required as part of a comprehensive strategy to keep weapons out of the hands of terrorists.

GLOBAL NUCLEAR ACCOUNTING

No single international organization or government knows how much weapon-usable nuclear materials exists in the world. Some countries do not even have a sufficiently accurate inventory of their own direct-use material.

A reliable and accurate accounting system for nuclear materials is necessary for a truly effective effort to prevent terrorists from acquiring nuclear weapons or to seriously pursue a comprehensive nuclear disarmament agenda.

The United States should work to develop a global nuclear accounting and transparency system. All states that possess nuclear weapons should be pressed to join this effort in fulfillment of their shared obligations. All states with nuclear materials will have to cooperate; the burden lies not only on states that possess actual nuclear weapons. The goal of this long-term initiative would be to establish a global requirement for all states to maintain an accurate accounting of all nuclear holdings, and to develop a set of internationally recognized standards for accounting and transparency. All states would then be required to provide a declaration to a central organization or publicly state their holdings. The existing commitment by a handful of states (including the United States and European states) to make annual declarations of plutonium holdings through the IAEA provides a model that could later be extended with other forms of transparency.

Table 5.3. Global Plutonium Stockpiles (in Metric Tons)

PLUTONIUM TYPE	QUANTITY
Weapons plutonium	250
Civil plutonium in spent fuel	1,005
Separated civil plutonium	195

Such a registry would need to be carefully established to ensure that sensitive information—such as the exact location of specific amounts of materials—could remain protected for security reasons. In addition, the amount of nuclear material possessed by nuclear weapon states is considered highly sensitive in some countries. The United States has released a comprehensive plutonium inventory and has provided funding for Russia to develop its own accounting of civilian plutonium production. Neither the United States nor Russia has released comprehensive information about its HEU holdings. The benefits of establishing a global registry for nuclear materials should greatly outweigh existing institutional preferences for keeping the numbers classified.

A number of states will also need considerable training and assistance to ensure that their accounting practices are compatible with those of more advanced nuclear states. This assistance can easily be provided bilaterally or through the IAEA with the necessary investment and support from its members. The most daunting task will be to develop the most accurate inventories possible from nuclear states with extensive histories of producing nuclear materials.

Global Threat Reduction

SUMMARY OF POLICY RECOMMENDATIONS

- Fund threat reduction programs with Russia and the former Soviet republics at adequate levels. (p. 55)
- Develop a strategy to extend threat reduction cooperation to new countries and regions, building on experience in Russia and the former Soviet republics. (p. 54–55)
- Expand the number of target countries and partners participating in the G-8 Global Partnership program. (p. 54–55)
- Launch a fast-paced initiative to remove material with the potential to be used in nuclear weapons from the most vulnerable sites in Russia and elsewhere in the world. (p. 56)
- Establish a senior coordinator, or focused coordination team, within the White House that has the mandate to oversee, prioritize, and expedite threat reduction programs. (p. 56)

The "Nunn-Lugar" or cooperative threat reduction programs to dismantle and secure WMD in Russia and the former Soviet Union have been remarkably cost-effective investments in U.S. security. Hundreds of ballistic missiles have been dismantled, thousands of nuclear warheads have been retired, enough nuclear material for thousands of nuclear weapons has been eliminated, enough for thousands more has been secured, and thousands of nuclear, chemical, and biological weapon experts have received at least temporary grants to work on civilian projects.[58]

Although this discussion will focus on Russia, efforts are under way to expand the scope of cooperation to address proliferation problems in other arenas. Three strategic issues confront the programs. First, how can progress be accelerated with Russia and the other former Soviet republics? Second, how can more partners, including Russia, be effectively engaged? Third, how can the experience that has already been gained be extended to other countries and regions where WMD proliferation is a concern?

These issues are intertwined, and they have major implications for U.S. policy. For example, accelerating progress with Russia requires engaging more international partners in the work. However, to this point, the United States has been the top funder for the threat reduction programs, and therefore has not had to share management of the activities with other countries. Adding more countries, including Russia, to the decision-making mix might initially slow rather than accelerate progress.

Likewise, much work remains to be done in Russia, and extending such cooperation to other countries and regions threatens to drain resources away from this top priority. Therefore, although urgent requirements for tackling proliferation problems could emerge in countries such as Iran and North Korea, demands for new projects and funding in these countries must be carefully balanced with requirements of the continuing work in Russia.

A partial answer to these problems has been to establish an initiative within the G-8, the Global Partnership Against the Spread of Weapons and Materials of Mass Destruction. The G-8 leaders launched this effort at Kananaskis, Canada, in June 2002, to cooperate on nonproliferation, disarmament, counterterrorism, and nuclear safety issues.[59] The United States pledged $10 billion to the initiative over ten years, and the other G-8 partners pledged to match this amount.

Initially focused on Russia, the Global Partnership is considering expanding its work to new countries, including Ukraine, Uzbekistan, and Georgia. Additional partners such as Norway and Sweden had already joined and become actively involved in funding high-priority projects such as submarine dismantlement in Russia. Yet more partners such as New Zealand, Australia,

Belgium, and South Korea were also considering joining. This process should continue, to expand the number of countries open to threat reduction cooperation and partners willing to contribute to this work.

The hardest challenge, of course, is to convince states that are "proliferation problems" to engage. Their leaders tend to believe that their WMD programs are necessary to their national security, sometimes in a regional context, sometimes against a perceived adversary such as the United States, which possesses superior military forces. To succeed in this context, the threat reduction cooperation must be part of an effort to draw the country out of its isolation and into the international system, thus changing its perception of its national interests and how best to preserve its national security.

To extend the reach of threat reduction initiatives, a new strategy will be needed. The experience gained in the former Soviet Union should be used to tackle proliferation problems in new regions, but important differences must also be taken into account. Russia, for example, a nuclear weapon state under the Non-Proliferation Treaty, had a high degree of technical expertise that immediately enabled its scientists to engage on an equal footing in nonproliferation cooperation. From the earliest days of threat reduction work, Russian experts contributed their knowledge as well as hardware that they had created to implement projects in material protection, control and accounting, and other areas. A country such as Libya, by contrast, would find it more difficult to do so—thus creating, potentially, a longer-term assistance relationship than that foreseen in Russia.

Most important, to succeed in other settings, the programs will have to succeed in Russia. At the current pace, many of the stockpiles in Russia would remain insecure at the end of this decade, after almost twenty years of work.[60] Insecure stockpiles of nuclear weapons and related materials, technologies, and expertise in Russia pose urgent security risks, especially in a world in which Al Qaeda maintains that acquiring such weapons is a "religious duty." In March 2004, Director of Central Intelligence George Tenet told Congress again that "Russian WMD materials and technology remain vulnerable to theft or diversion."

Unfortunately, progress in joint U.S.-Russian threat reduction programs—led primarily by the Departments of Defense, Energy, and State—has been slow in recent years. Whether judged by the percentage of Russian nuclear warheads and weapon-usable materials secured, the amount of fissile material destroyed, the number of facilities converted to commercial production, or the number of new permanent jobs created for WMD scientists, *less than half of the overall threat reduction mission in Russia has been completed.*

The biggest impediments to progress are political.

The biggest impediments to progress are political, not technical or financial. In fact, key programs for securing nuclear warheads and weapon-usable nuclear materials have accumulated hundreds of millions of dollars in unexpended balances. If, however, there were sufficient sustained high-level U.S. and Russian intervention, including at a presidential level, to break through obstacles, then more money would be needed to implement an accelerated effort.

While approximately $1 billion per year is being made available for Russia and former Soviet republic threat reduction programs, a number of lower-profile threat reduction efforts should be accelerated in the near term by making additional funding available. These include programs for redirecting weapons scientists, purchasing additional quantities of downblended Russian HEU, repatriating additional quantities of Soviet-origin HEU fuels to Russia for secure storage, converting research reactors that use HEU, consolidating Russian nuclear material into fewer facilities, developing controls on exports, and investing in long-term sustainability strategies for security equipment that has already been installed.

Specific high-priority proposals for improving the pace of U.S.-Russian cooperation include:

- Establishing a senior coordinator, or focused coordination team, within the White House that has the mandate to oversee, prioritize, and expedite threat reduction programs. This person or group must be more powerful than the current interagency working groups and must have unfettered access to the president and his senior advisers.
- Creating a system of biannual, performance-focused meetings between high-level U.S. and Russian political officials to comprehensively evaluate threat reduction progress, receive reports from program managers on advances and impediments in each program, and negotiate solutions to implementation obstacles.
- Seeking an agreement at the presidential level that would (1) designate securing and eliminating WMD stockpiles as a top priority for both countries' national security, (2) set a target date of four years from the date of agreement for completing comprehensive security upgrades for all nuclear weapons and weapon-usable materials, (3) include specific measures to break through procedural logjams, and (4) include a Russian commitment to maintaining security systems over the long term after U.S. assistance has been phased out.
- Engaging directly and regularly at a presidential level to resolve specific policy stumbling blocks. These issues include U.S. access to Russian facilities where nonproliferation programs are to be implemented, disputes over liability in nonproliferation agreements, and visa policies and procedures for Russian and U.S. threat reduction personnel.
- Working with Congress to get permanent authority to waive the annual certifications required for cooperative threat reduction programs and the specific conditions on constructing a chemical weapons destruction plant in Russia.
- Launching a fast-paced initiative to remove material with the potential to be used in nuclear weapons from the most vulnerable sites in Russia and elsewhere in the world.
- Increasing funding for smaller but still-critical nonproliferation efforts: purchasing more downblended Russian highly enriched uranium, removing HEU from Soviet-supplied facilities around the world to secure storage facilities in Russia, consolidating Russia's nuclear warheads and material at a smaller number of sites, strengthening enforcement of Russia's export controls, and investing in strategies to sustain security at these sites for the long haul, after U.S. assistance has been phased out.
- Proposing that the United States and Russia immediately place thousands of nuclear warheads that are no longer needed (including any that remain that are not equipped with modern electronic locks or other measures to ensure that they could not be used if stolen) in secure, monitored facilities, and promise that they would be verifiably dismantled as soon as both countries had worked out procedures to do so without revealing classified information.
- Consulting with U.S. allies and friends to forge a new standard for securing nuclear material stockpiles, ensuring that they are protected against the increasing threats that terrorists and criminals have demonstrated they can pose.

Stopping Transfers: Export Controls and Interdiction

SUMMARY OF POLICY RECOMMENDATIONS

- Expand membership in and compliance with export control regimes to all states with relevant capabilities. (p. 57–58)
- Reform existing export control regime operations by requiring notices of all sensitive exports, moving away from consensus rule making, establishing cooperative reviews of export control implementation, and considering penalties within export control systems for noncompliance. (p. 58–59)
- Have the Nuclear Suppliers Group make the IAEA Additional Protocol a condition of all nuclear exports. (p. 59)
- Support the Proliferation Security Initiative of the Bush administration as a stop-gap measure to implement quick improvements in the enforcement regime. (p. 59)
- Expand the scope of the PSI to cover shipments through international waters and airspace. (p. 59–60)
- Ground the PSI in international law by means of a Security Council Resolution. (p. 60)

Effectively controlling sensitive exports will continue to be a critical part of any successful nonproliferation regime. As international trade and technology expand, export controls on sensitive nuclear-related materials must be strengthened and fully implemented. The Bush administration has made international enforcement of export controls a high priority and has identified several useful methods to encourage all states to tighten their national export control laws and policies.[61] These include proposals to make the export of sensitive nuclear technology contingent on acceptance of the IAEA's Additional Protocol and creating a special safeguards and verification mechanism within the IAEA Board of Governors to help assess compliance with nonproliferation norms. In addition, the Bush administration led efforts that resulted in the adoption of Security Council Resolution 1540, which requires all states to enact laws to criminalize proliferation, to establish effective export controls, and to secure all sensitive materials within their borders.

Working to improve the effectiveness of existing export control systems, however, requires more than creating new obligations. Steps must be taken to improve the reach and effectiveness of the existing regime and to improve coordination among the various overlapping export control systems.

EXPAND THE SCOPE OF EXPORT CONTROL REGIMES

The scope of the A. Q. Khan network demonstrates the need to draw new states into the international efforts to control sensitive nuclear technologies.[62] Many of the countries involved in providing or transshipping technology to Iran, Libya, and North Korea are not part of any of the existing export control systems. All states possessing nuclear technology should be brought under the umbrella of these regimes. States that can play even a small role in providing or transshipping key assets need to ensure they do not assist would-be nuclear proliferators. Several states with advanced nuclear capabilities, including Pakistan, India, North Korea, and Iran, are not members of the Nuclear Suppliers Group (NSG) and the Zangger Committee,[63] nor are they likely to all be invited to join.[64] The traditional policy of export control regimes has been to regulate the transfer of technology *to* these states rather than seek to stem the export of technology *from* them. But states can be brought into compliance with these systems, even if they do not formally join.

Security Council Resolution 1540 on nonproliferation requires all states to "establish, develop, review and maintain appropriate effective national and trans-shipment controls" and "border controls" to prevent the proliferation of

nuclear, chemical, and biological weapons and their means of delivery.[65] States must enact "appropriate laws and regulations to control export, transit, trans-shipment and re-export" of materials that would contribute to proliferation.[66] This resolution not only encompasses states with nuclear technology, it also places the burden of export control on nonnuclear states such as Dubai and Malaysia that serve as shipping ports and manufacturing sites for proliferation-related activities.

How will this new export control requirement be implemented? One approach would be to develop and promote a model law on export controls that would aid states in adopting the export systems required by the Security Council. The United States and Europe have pursued such an approach with varying success in the states of the former Soviet Union. Similarly, the IAEA provides such models for nations implementing nuclear safeguard agreements. A model law could be drafted to strengthen reporting requirements under existing export control regimes such as the Nuclear Suppliers Group that could be adopted even by nonmembers. To increase the chances of its universal adoption, the law could also be attached on a national basis to existing customs law and policy, under the guidance, for example, of the Unified Tariff Code of the World Customs Organization.

Yet adopting laws is not the same as effectively controlling exports. Pakistan was unable or unwilling to enforce its nuclear security laws against A. Q. Khan and his associates.[67] And even if this one network is disbanded, sustained international cooperation and observation, including the sharing of information on suspected violations, will be required if the full potential of Resolution 1540 is to be reached. Regular reviews of implementation of the resolution will be required.

IMPROVE EXISTING REGIMES AND MEMBER PERFORMANCE

Global export controls are currently governed by four different arrangements: the Nuclear Suppliers Group, the Missile Technology Control Regime, the Australia Group, and the Wassenaar Arrangement. Of these, the Nuclear Suppliers Group and the Wassenaar Arrangement have the most application to nuclear and dual-use issues. While all of these regimes have been useful in regulating trade in sensitive technologies, they have several shortcomings:

- These groups operate by consensus, which impedes the adoption of new measures and biases the groups toward the lowest common denominator. Expanded membership, including nonsuppliers or members with divergent security interests, exacerbates this problem. Also, member states lack transparency in their export control systems and decision making and are inefficient at information sharing. This problem is compounded by the fact that member states have not harmonized their individual policy responses to proliferation threats and are not keeping pace with growing proliferation problems. Members are failing to deal effectively with increased dual-use trade and technology transfers. Finally, the systems are hampered by their voluntary nature and lack of enforcement and penalization measures. If export control systems are to be effectively implemented in an expanded threat environment, states need to be open and to be held accountable for their export decisions. Moreover, the actions of a few resistant states should no longer be allowed to impede the capabilities of the entire system.

  Several options exist for dealing with these challenges, including moving the export control systems to majority or weighted voting systems to replace consensus rule. There is likely be considerable internal resistance within these voluntary systems, which needs to be recognized and overcome.[68] This, however, is clearly a case in which high-level leadership will be required if needed improvements are to be achieved.

- Regimes need to improve membership criteria and make commitments more binding,

with an emphasis on timely compliance.[69] The introduction of penalties and incentives for adoption and maintenance of high standards should be considered, but cooperative measures such as assistance and collaboration should be emphasized to maximize cooperation.[70] Also, current practice only calls for states to share decisions to deny export requests between member states. Sharing information on actual exports granted would help all states track what others are buying and might help identify strategic but dispersed purchases by suspect firms and states. To this end, a centralized database for information sharing should be established among participant states.[71]

To improve the conduct of expanded export controls, many participating states may need assistance and advice. Leading states, including the United States, should lead periodic reviews of export controls in other countries. Such reviews should be pursued cooperatively and the G-8 or individual countries should provide assistance as needed after reviews are completed.[72]

In addition, the Nuclear Suppliers Group should adopt two provisions its members are currently considering: making the IAEA Additional Protocol a condition of supply for nuclear exports and adding "catch-all" provisions in the Nuclear Suppliers Group dual-use guidelines. Under this provision, members must control the export of any item, regardless of whether it appears on the control lists, if there is a risk that the export could be diverted to an unauthorized recipient. This eliminates the need to maintain an exhaustive list of controlled items.[73]

The forum for reviewing these ideas needs to be at a sufficiently high level to enable action but expert enough to effectively evaluate proposed measures. One option is to ensure that the implementation of Resolution 1540 includes follow-up reporting on the requirements for export controls. The proposed Security Council rapporteur might be useful in this role and act as a reminder of the obligations the Security Council has moved to adopt for all states.

Experts at the University of Georgia Center for International Trade and Security have recommended that an ambitious effort be started to consolidate and simplify the major existing proliferation export control regimes.[74] They argue for the creation of a single regime, characterized by majority voting, stringent membership and expulsion criteria, and a separate dispute resolution committee.

ENHANCE INTERNATIONAL INTERDICTION EFFORTS

Efforts to block the transfer of weapons and technology have recently been enhanced through the creation of a broader forum for information sharing and interdiction under the U.S.-led Proliferation Security Initiative (PSI) (see sidebar on page 60 for more detail). The PSI has made significant progress in a brief period of time, and member states have recently seized valuable shipments of weapons equipment to several countries. The initiative, however, is limited in preventing transfers of WMD-related items. Moreover, while the PSI is a valuable extension of export control implementation, it is not and cannot be a silver bullet to prevent the transfer of dangerous materials to terrorists or states that would participate in WMD proliferation.

First, the PSI regime is voluntary. It encompasses only states that choose to abide by its provisions, meaning that states seeking banned equipment can circumvent restrictions by avoiding shipments from or through the territory of participating states. Moreover, the regime is limited only to the national territory, airspace, and waterways of participants. It does not apply directly to international waters. Countries under whose flag a ship is traveling can give permission for that ship to be stopped and searched, and the United States has worked out prior consent arrangements with the two countries most popular with shippers seeking flags of convenience, Liberia and Panama. Still missing, however, is a

Proliferation Security Initiative

Based on the informal and voluntary cooperation of the United States and more than a dozen other countries, the Proliferation Security Initiative (PSI) seeks to enhance the ability of national governments to prevent the transfer or transit of weapons-related materials and equipment through their national territories, waters, and airspace and to cooperate with other states in doing the same.

PSI-related activities fall into three main areas:

1. Enhancing national legislation in participating states to ensure that shipments of controlled items can be searched or seized under national authority.
2. Intelligence sharing and law enforcement cooperation to identify illicit transfers.
3. Interdiction training, exercises, and actual intercepts in nationally controlled areas (land, sea, and air).

Members include the Australia, Canada, France, Germany, Italy, Japan, the Netherlands, Norway, Poland, Portugal, Russia, Singapore, Spain, the United Kingdom, and United States. More than sixty states have pledged their support for this initiative.

system that can deal with a legally flagged vessel or aircraft carrying weapons-related material or technology to another country through international territory.

The question of extending PSI activities to suspect shipments in international waters or airspace raises complicated legal issues. The Law of the Sea Treaty (to which the United States is not a full party) permits what is known as innocent passage for ships through national waterways, a provision that would appear to apply to such commerce. This gap in the PSI is a glaring potential problem that apparently can only be remedied through an expansion of international law, by means of either a convention or a Security Council mandate. The international community, however, can be empowered to interdict certain types of shipments in international territory when specific activities are deemed unacceptable to the international community. The most often cited example is that of slavery. Yet this norm required decades to build. Moreover, at the time the interception of slave ships began, certain legal conventions such as the law of the sea were not yet extant.

How can the international community define what is and is not acceptable, with respect to technology or even weaponry? How can the international community differentiate between banned and permitted transfers? The most direct route would be for the PSI to build out from its current membership through the negotiation of a legal convention. The goal of building an international norm banning the clandestine transfers of nuclear materials and other WMD-related items is worth the investment in time and political capital that would be needed.

PART SIX: ABATING DEMAND

As Libya and approximately 180 other countries demonstrate, the key to nuclear nonproliferation is for states to conclude that they are better off without these weapons. The most effective way to stem demand for nuclear weapons is to ensure that states do not face threats that they feel require nuclear weapons to deter or defeat, to reduce the political attractiveness of nuclear weapons, and to increase the costs and dangers associated with seeking these weapons.

It is more difficult to create these demand-abating conditions in states that already have started nuclear weapon programs. In these cases, it is not enough simply to reverse the original causes of nuclear ambition. The effort to acquire nuclear weapon capability changes the bureaucratic and political conditions within states so that reversing nuclear programs is more complicated than simply rewinding the causal chain that got them started in the first place. Nazi Germany stimulated U.S. development of nuclear weapons in 1942, but the United States did not give up its nuclear weapon program once Germany was defeated. Whatever Iran's motivations were for acquiring nuclear capability in 1988, the factors that must be addressed today to persuade Iranian leaders to abandon this effort are more numerous and complicated as the issue has become highly politicized.

Lock in Successes

SUMMARY OF POLICY RECOMMENDATIONS

- ▶ Reaffirm states' decisions to forgo nuclear weapons with new nuclear bargains that offer states benefits to eschew nuclear weapon programs: (p. 62)
  - Offer formal and informal security assurances.
  - Reduce the political value associated with nuclear weapons.
  - Reward states that contribute to nonproliferation with economic, political, and other inducements.
  - Facilitate development and funding of substitute energy technologies and proliferation-resistant nuclear reactors.

A significant number of countries have eschewed or abandoned nuclear weapon programs, including Argentina, Australia, Brazil, Egypt, Germany, Japan, Kazakhstan, South Africa, South Korea, Sweden, Taiwan, Turkey, and Ukraine. These states have the financial and technical wherewithal to produce nuclear weapons and could construct rationales for doing so. Preventing these states from undertaking nuclear programs is pivotal to the success of nonproliferation. If they chose not to comply fully with nonproliferation norms and rules, and not to

cooperate in strengthening enforcement of these rules in tough cases, these states could create a global security crisis.

U.S. policy, therefore, must devote much greater attention and effort to reaffirming the wisdom and benefits of these states' decision to forgo nuclear weapons. The United States can do this in several ways.

- Provide states formal security assurances that the United States will use its political and military strength to protect them against blackmail or war, and that U.S. foreign and security policies will not undermine these states' security.
- Reassure Argentina, Brazil, South Africa, and other states that do not have specific formal U.S. security guarantees that the United States recognizes a special duty to prevent threats that could make them reasonably feel the need for nuclear weapons. Insofar as leaders must calculate whether ties to the United States and its policies help or hurt them politically, the style and methods of U.S. engagement with these states may be as politically important as the underlying security assurances.
- Devalue the security and political status associated with nuclear weapons globally so that political actors in these societies do not conclude that they or their state will gain international leverage or grandeur by seeking nuclear weapons.*
- Consider a state's contribution to the nonproliferation regime in prospective decisions to expand the permanent membership of the Security Council.
- Reward states that contribute energetically to nonproliferation when the United States determines state visits, political-economic favoritism, and other forms of positive U.S. engagement.
- Create international programs to facilitate development and funding of cutting-edge, environmentally friendly energy technologies such as hydrogen fuel cells, to deglamorize nuclear technology.
- Expand cooperative research with fully compliant non–nuclear weapon states to develop designs for safer and proliferation-resistant nuclear reactors.
- In Southwest and Northeast Asia, where Iranian or North Korean proliferation could prompt Saudi Arabia, Turkey, Japan, and South Korea to reconsider their nuclear status, the United States should engage in preventive high-level diplomacy and defense cooperation to reassure these states that their strategic interests can be met without nuclear weapons.

As former Defense and State Department officials Robert Einhorn and Kurt Campbell have written, "A world in which the goals of the NPT are being fulfilled—where existing nuclear arsenals are being reduced, parties are not pursuing clandestine nuclear programs, nuclear testing has been stopped, the taboo against the use of nuclear weapons is being strengthened, and in general, the salience of nuclear weapons in international affairs is diminishing—helps reinforce" the wisdom of societies and states that have gone without nuclear weapons.[75]

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* Helpful means to this end include reducing the role of nuclear weapons in national security doctrine, eschewing development of new nuclear weapons, breaking the current perfect correlation between permanent membership in the Security Council and possession of nuclear weapons, and refusing to extend new benefits, including sales of nuclear reactors, to India, Pakistan, and Israel.

Conflict Resolution and Regional Security

SUMMARY OF POLICY RECOMMENDATION

- Raise global political demands that states that possess nuclear weapons must exert greater leadership to moderate and resolve regional conflicts that drive proliferation and possible use of nuclear weapons. (Specific obligations of the United States, India, Israel, Pakistan, and other states with nuclear weapons are discussed in subsequent sections.) (p. 63)

Current acute proliferation threats arise in regions plagued with unresolved conflicts and troubled polities, particularly the Middle East, South Asia, and Northeast Asia. Proliferation threats in these regions will not be fundamentally redressed without progress in resolving underlying conflicts, which may in turn require internal political changes. To the extent that international leaders can promote necessary changes, the exertions must come from the highest level as priorities of overall foreign policies. Nonproliferation policy makers, technical experts, or specialized institutions such as the IAEA should not be expected to take the lead, though they can help.

Thus, India's and Pakistan's acquisition of nuclear weapons should not be seen as a failure of some autonomous nonproliferation regime. It was a result of high-level state decision making in these states, and equally high-level decisions by the United States, China, and other international actors not to alter the incentives that Indian and Pakistani leaders considered. Similarly, proliferation pressures in the Middle East will not be removed by diplomats at the NPT Review Conference; they will be removed when regional and global leaders at the highest level apply themselves to specifying and creating the conditions necessary for a zone free of weapons of mass destruction.

Acute proliferation threats arise in regions plagued with unresolved conflicts.

Regional conflict resolution presumably also will contribute to a reduction in possible terrorist demand for nuclear weapons, insofar as such interest can be redressed by any appeal to reason. The Israeli-Palestinian conflict is a case in point.

U.S. Nuclear Policy and the Role of Nuclear Reduction Agreements

SUMMARY OF POLICY RECOMMENDATIONS

- Nonproliferation objectives of preventing the spread and use of nuclear weapons should drive U.S. nuclear policy. (p. 64)
- While nuclear threats remain in the world, maintain a strong and effective nuclear deterrent. (p. 64)
- The role of nuclear weapons in national security policies should be de-emphasized and devalued, and the norm against using these weapons should be highlighted: (p. 64–69)
  - Halt research into and development of new nuclear weapons; continue constraints on testing.
  - Work with Russia and other countries to restore the momentum toward verifiably and irreversibly reducing the amounts of nuclear weapons and materials.
  - Continue to reform targeting and develop strategic conventional missions.
  - Develop new policies to reduce nuclear risks from hair-trigger postures, forward deployment of weapons, and preemptive strategies.

The top goal of U.S. nuclear policy should be to prevent new actors from seeking nuclear weapons and reduce toward zero the risk that those who have these weapons will use them. This nonproliferation imperative reflects major changes in the post–Cold War era.

During the Cold War, the most serious threat to the United States was a large-scale conflict with the Soviet Union that would trigger escalation to massive exchanges of nuclear weapons. Today, proliferation and asymmetric warfare threaten U.S. security more than the prospect of nuclear force exchanges. In these circumstances, the United States has a great incentive to ensure that all future conflicts and adversaries remain nonnuclear. Thus, nonproliferation objectives must drive rather than follow from nuclear policy.

This imperative does not remove other nuclear requirements, however. The U.S. nuclear deterrent is a key part of U.S. security guarantees, which protect important allies such as Japan, South Korea, and Germany. Relying on U.S. security guarantees lessens these countries' interest in acquiring nuclear weapons themselves. The possibility of U.S. nuclear retaliation also helps deter adversaries from challenging U.S. interests.

Thus, the United States must maintain an effective, reliable nuclear deterrent for as long as nuclear threats remain in the world. It also must pursue a vigorous nonproliferation strategy, preventing new actors from seeking nuclear weapons and reducing toward zero the risk that those who have these weapons will use them, including the United States. The question for U.S. policy makers is how best to pursue these critical goals. Two radically different approaches have been advanced: to acquire new nuclear weapons with more usable characteristics, thus to dissuade proliferators; and to de-emphasize and devalue nuclear weapons, thus to strengthen the norm against their acquisition and use and politically leverage U.S. enforcement of nonproliferation.

NUCLEAR WEAPONS SERVING NONPROLIFERATION

Today, elements within the U.S. policy making and defense science establishments urge development of new types of nuclear weapons in the service of nonproliferation. In March 2004, the Departments of State, Defense, and Energy urged Congress to fund research and development of a new "low-yield" nuclear weapon. A Defense Science Board report, also of March 2004, argued that if the United States builds and deploys such weapons, states and terror groups would be dissuaded from seeking and using weapons of mass destruction to challenge the United States. They would calculate that if they did so, the United States would have an increased ability to respond with nuclear weapons because low-yield nuclear weapons would reduce the likely damage to civilian populations and would thereby reduce inhibitions on using nuclear weapons. Thus, new nuclear weapons, by enhancing deterrence, would advance nonproliferation goals.

Those arguing this case have emphasized that the new nuclear weapons would only be used in extremis, and would not be reinserted into U.S. military doctrine or force posture as a major element. Quite the contrary—they have argued that U.S. conventional capabilities would continue to be strengthened. They have stressed, for example, that the U.S. Strategic Command has been converting its weapon systems for new long-range conventional missions.

Proponents have also asserted that the new nuclear weapons would be so uniquely dedicated to their missions—for example, to targeting deeply buried bunkers that might hold chemical or biological weapons—that other countries would recognize and accept this fact. Other countries would not conclude that the United States was placing new value on nuclear weapons to enhance its capacity to project force around the world—an effort that others might want to deter by pursuing their own nuclear capabilities.

Likewise, U.S. nonproliferation leadership would not be compromised, and these countries would continue to follow the United States in pursuing nonproliferation goals.

Opponents of this point of view question whether a new nuclear weapon would really enhance deterrence and reduce the risk of nuclear proliferation. They have suggested that if the United States pursues new types of nuclear weapons, then other nuclear weapon establishments—in Russia, China, India, and Pakistan, for example—would be more resistant to U.S. calls for them to forgo building up their own nuclear forces. They have also expressed concern that the non–nuclear weapon states would conclude that the nuclear weapon states were breaking their commitment, under Article VI of the NPT, to pursue the total elimination of nuclear arsenals. If the United States were seen to be breaking its nonproliferation commitments, other nations would be less likely to join with it to enforce nonproliferation norms against countries suspected of cheating against the regime.

In addition, analysts have questioned whether a U.S. president should break the taboo on using nuclear weapons for tactical missions. Recent experience suggests that the United States lacks sufficiently precise intelligence to make the tactical use of nuclear weapons a reliably wise option.[76] Examples include faulty intelligence in both Iraq wars, the mistaken bombings of the Chinese embassy in Belgrade, and the misidentified "chemical weapons" plant in Sudan. If bunkers can be located precisely, then other means than nuclear weapons can be found to stymie the threats they contain.

Several teams of independent physicists and former leading nuclear weapon designers have also demonstrated that the laws of physics make it impossible for small (low-yield) nuclear weapons to successfully destroy chemical or biological weapons underground.[77] To destroy such targets, the weapons would have to be as big as some of the weapons in the current arsenal and would produce much more radioactive fallout than proponents claim. In other words, if nuclear weapons are the only way to get at these targets, then the United States already has the weapons that it would take. It is a dangerous illusion to believe that there is a clean and tidy way to accomplish this mission.

NON-USE AND NONPROLIFERATION

The second approach being advanced to achieve nonproliferation goals is to strengthen *the norm against the use* of nuclear weapons. Secretary of Defense Donald Rumsfeld described the issue well in the run-up to the war in Iraq:

> Do we—does the department—have an obligation and have they in successive administrations of both political parties had procedures whereby we would conceivably use nuclear weapons? Yes…[but] it seems to me that if one looks at our record, we went through the Korean War, we went through the Vietnam War, we've gone through the war on terror and we've not used nuclear weapons. That ought to say something about the threshold with respect to nuclear weapons.[78]

To advance the norm against use, U.S. nuclear weapons policy has begun to move away from the Single Integrated Operational Plan or SIOP, which was largely designed for large-scale retaliatory attacks against Russian targets. Under the current Nuclear Posture Review, although Russia deploys more than 5,000 strategic nuclear weapons against the United States, it is not understood to be an "immediate contingency" against which nuclear forces are deployed. Although targeting will have to continue to take into account the need to respond in the unlikely case of a Russian attack, this is a major change from the Cold War years.

Likewise, as noted above, the U.S. Strategic Command has been tasked to develop more strategic conventional missions, and U.S. long-range bombers are being equipped and trained for conventional missions. These steps are being undertaken to create a "new triad," one devoted not wholly—as in the past—to nuclear weapons, but instead emphasizing equally strategic

conventional missions and highly capable command and control.

U.S. policy thus has been taking some steps to prevent the future use of nuclear weapons. This trend could be strengthened with new attention to several long-standing issues in nuclear policy. For example, U.S. and Russian strategic nuclear arsenals are still configured on hair-trigger alert, to be launched within minutes of warning of an attack. This seems unnecessarily risky when the accidental or unauthorized launch of nuclear weapons is more likely than a massed nuclear attack between the two nuclear powers. As former senator Sam Nunn has said, "Incredibly, eleven years after the so-called end of the Cold War, the decision time of our leaders has not changed appreciably from what it was during the peak of the tensions."[79]

The United States should work with Russia to *lengthen the fuse on both countries' nuclear weapons.* U.S. and Russian diplomats and military experts should more energetically implement focused and transparent measures to pull the two countries back from their Cold War hair-trigger deployments.

Forward deployment of nuclear weapons is a policy that should also be reformed. U.S. nuclear weapons already have been withdrawn from South Korea, and fewer than 200 remain in NATO Europe. They are little regarded in NATO planning, and seem largely a vestigial capability, given that NATO has extended to Russia's borders and Russia is emerging in the role of a NATO partner. In this context, U.S. nuclear weapons in Europe pose a greater risk of terrorist theft or diversion than they provide an asset to NATO's security.

Extending the role of nuclear weapons is counterproductive and unnecessary.

The United States is largely restructuring its presence in NATO Europe, ending traditional deployments at large fixed bases and undertaking a new system of so-called lily-pad basing. Many of the new, smaller bases will not be well structured for long-term storage and maintenance of nuclear weapons. Currently deployed weapons could be returned to the United States, with the proviso that should they ever be needed for a NATO operation, they could be returned promptly to Europe. To ensure that this option remains viable, nuclear weapon training and basing infrastructure will have to remain current in NATO facilities in Europe.

NATO's new members, many of whom are concerned about Russian nuclear weapon power, will want NATO to remain committed to a nuclear option. For that reason, reciprocal constraints on Russian nonstrategic nuclear weapons should also be pursued (see discussion below). Even original NATO members such as France and the United Kingdom, which are nuclear weapon states themselves, and Germany, which is not, would find reassurance in such constraints, as well as in maintaining nuclear training and infrastructure.

In regard to *chemical and biological weapons contingencies,* U.S. nuclear weapons policy has sustained an ambiguity over the years: If chemical or biological weapons were used against the United States or U.S. targets overseas, then the adversaries launching the attack should expect a proportionate response. They would have to assume that it could be nuclear. U.S. declaratory doctrine need not advertise this hard reality, but should continue to emphasize that U.S. nuclear weapons are available to retaliate for the use of nuclear weapons against the United States, its armed forces, or its allies.

Current U.S. policy trends, however, have left the impression that the United States would be willing to use nuclear weapons preemptively, to destroy chemical or biological weapon stockpiles, whether or not the adversary possessed nuclear weapons. This suggestion emanates from recent proposals to develop new nuclear weapons to strike deeply buried chemical and biological facilities.

Explicitly extending the role of nuclear weapons in this way is counterproductive and unnecessary. It could raise significantly the frequency and salience of nuclear weapon threats in ways that could undermine U.S. interests. Chemical

and biological weapons, after all, are often considered to be the "poor man's nuclear bomb," and may become increasingly available in regional settings. The United States, therefore, might find itself confronted with a frequent need to resort to nuclear threats in response.

Frequent invocation of threats, in turn, creates a commitment trap:[80] If you don't back up the threat and actually use nuclear weapons, people will no longer take you seriously. Given the gravity of breaking the nuclear taboo, and the U.S. interest in not having others emulate it in ways that might lead to regional nuclear crises, the United States should not put itself in a position where it may feel an increasing need to make such threats.

Of course, the United States must not allow adversaries to deter it from taking action when real chemical or biological weapon threats are present. Defense Department counterproliferation programs serve this purpose by preparing U.S. forces with vaccinations, equipment, and tactics to be able to fight and prevail in environments where chemical and biological weapons may be unleashed. Conventional weapons are also being improved to destroy chemical and biological storage facilities, and U.S. forces must be trained to use them to seize and hold such sites.

Certain elements of U.S. policy have already strengthened the norm against nuclear use. The recent move to adjust targeting away from Russia is one example; another is the new emphasis on conventional missions for the Strategic Command. This trend could be bolstered by further progress on the issues of hair-trigger alert posture and forward basing of nuclear weapons. Finally, although some ambiguity must remain with regard to the nuclear response against chemical and biological attacks, U.S. policy should emphasize Secretary Rumsfeld's message that the nuclear threshold is high and likely to remain so.

U.S. nuclear weapon policy should continue to focus on strengthening the norm against nuclear use, de-emphasizing nuclear weapons and building up strategic conventional capabilities. If the United States develops new nuclear weapons, it will likely invest such capabilities with new value in the eyes not only of states that have wanted to acquire nuclear weapons,

Table 6.1. Strategic Nuclear Warheads: United States, Russian Federation/Former Soviet Republics

	RUSSIAN FEDERATION/FSU				UNITED STATES			
YEAR	ICBM	SLBM	BOMBERS	TOTAL	ICBM	SLBM	BOMBERS	TOTAL
1964	201	74	548	821	952	605	6,471	8,028
1974	1,666	722	596	2,985	2,041	6,569	6,788	15,398
1984	7,135	2,140	756	10,031	2,231	5,611	6,118	13,960
1994	4,530	2,436	1,468	8,434	2,215	3,021	3,565	8,801
2003	2,922	1,732	632	5,286	1,600	2,880	1,660	5,340

Sources: Natural Resources Defense Council, "Table of USSR/Russian Nuclear Warheads," November 2002, available at www.nrdc.org/nuclear/nudb/datab10.asp (accessed May 11, 2004); "U.S. Nuclear Forces, 2003," *Bulletin of the Atomic Scientists* 59, no. 3 (May/June 2003): 73–76, available at www.thebulletin.org/issues/nukenotes/mj03nukenote.html (accessed May 11, 2004).

but of states that have wanted to remain nonnuclear. On balance, the policy impact and technical effectiveness of new nuclear weapons are so uncertain that the power of such weapons to dissuade proliferators is questionable.

THE ROLE OF NUCLEAR REDUCTION AGREEMENTS

The United States should also continue to reduce the numbers of its nuclear weapons while it maintains an effective, reliable nuclear deterrent. Through negotiated agreements, the United States and the Soviet Union have dramatically reduced their stockpiles of strategic nuclear weapons from the mountainous highs of the 1980s.

In 1984, before START I negotiations began, each deployed more than 10,000 strategic nuclear warheads (see Table 6.1). Thus began a process of legally bound nuclear arms reductions. These will continue through implementation of the 2002 Treaty of Moscow, under which the United States and Russia will each limit strategic nuclear weapons in operational deployment to 1,700 to 2,200.

This process of nuclear reductions has been impressive and demanding. However, it has focused on eliminating missiles and bombers—delivery systems—rather than warheads and the nuclear materials that go into them. START I did not address what to do with the warheads after they left deployment. Russia and the United States have each made unilateral commitments to eliminate warheads, but because of the sensitive nature of warhead design, cooperative monitoring of storage or elimination of warheads has been hampered. The lack of attention to warheads in the bilateral reduction process is one reason why many countries discount U.S.-Russian nuclear disarmament.

The 2002 Treaty of Moscow exacerbates this skepticism. Like the earlier START Treaty, the Treaty of Moscow calls for removing warheads from operational deployment, lowering the number from 6,000 to between 1,700 and 2,200 in deployment. It says nothing about warhead elimination. But unlike START I, the treaty contains no agreed-upon schedule for eliminating the launchers from which those warheads are removed. The two sides agreed to this less stringent approach to nuclear reductions, declaring it more in line with the new, more positive strategic environment.

However, the current U.S. national security strategy, made public in 2002, places equal weight on *increasing* deployments of strategic nuclear weapons, instead of emphasizing a downward trajectory in their numbers. This policy, coupled with the lack of agreed-upon measures for eliminating missiles and bombers, has led many, including influential Russians, to calculate that the United States might reverse course on the reductions of the Treaty of Moscow and reconstitute nuclear weapon systems.

Concerns have also emerged that Russia is not fulfilling its commitments under the so-called Presidential Nuclear Initiatives to reduce its holdings of nonstrategic or tactical weapons. In these unilateral statements made in 1991 and 1992, the United States and Russia simultaneously agreed to remove nonstrategic weapons from operational deployments and eliminate them over time. Although the Presidential Nuclear Initiatives (PNIs) were not treaty commitments but unilateral initiatives, they were to include some measures, such as data exchanges, to enhance confidence in their implementation. Russia has not provided this information in full, and the United States and its European allies are increasingly concerned that Moscow has not fulfilled its PNI commitments under the initiatives.

Thus, despite considerable efforts over the past thirty-five years to reduce their operational holdings of nuclear weapons, the United States and Russia receive little credit in the international community for being serious about their NPT Article VI obligation. Certainly, the other nuclear weapon states—the United Kingdom, France, and China—are unwilling to join in disarmament efforts until the United States and Russia restore the momentum toward reductions in their nuclear arsenals.

This problem could be dealt with in several ways. To start, Washington and Moscow should tell their story better. For example, in addition to eliminating weapon systems, they have closed and eliminated a considerable number of facilities for producing warheads. This process has been especially active in the United States, but also—increasingly, and with U.S. help—in the Russian Federation.

More important, however, would be bilateral steps to reduce the number of warheads. Such steps would have to address concerns about protecting sensitive warhead information. These concerns could be met by recent technical advances such as information barriers, which would permit monitoring of warheads without direct physical access to them by the inspectors. The United States and Russia could also take advantage of innovative transparency measures already in place for ongoing nonproliferation projects such as the Highly Enriched Uranium Purchase Agreement (HEU deal). They could also tap into new U.S.-Russian efforts to enhance the safety and security of warheads.

More bilateral attention to controlling warheads is thus a realistic goal that would underscore for the international community that the United States and Russia are serious about their commitments to reduce nuclear weapons. Better warhead controls would have the added benefit of improving protection against terrorist theft or other illicit acquisition of nuclear warheads and materials.

While the United States reduces the size of its nuclear arsenal, it must also maintain an effective, reliable nuclear deterrent. This will be necessary as long as nuclear threats remain in the world. Politically, reductions can only be accomplished against the backdrop of a strong national commitment to well-maintained nuclear forces. This raises a critical question: How can the United States best sustain the reliability of its nuclear arsenal without *nuclear testing?*

Since the moratorium on nuclear testing was established in the early 1990s, the United States has relied on science-based stewardship of the stockpile. U.S. laboratories have developed a number of activities to ensure that U.S. nuclear weapons are well maintained and will perform according to their specifications at any time and in any circumstances. This performance capability is certified on an annual basis.

However, some experts argue that testing is as important for assessing the reliability of weapons as it is for developing new ones. These experts argue that the stockpile stewardship program is not sufficient to sustain the human capital, the scientific expertise needed for a weapon program. They also argue that if the United States abandons its testing program, it will not devote the resources needed to maintain the testing infrastructure. In their view, the United States cannot remain committed to an effective, reliable nuclear deterrent if it does not test.

This is an example of the tension between the two imperatives of deterrence and reducing the global role of nuclear weapons. The size and diversity of the U.S. nuclear arsenal are so considerable that should the science-based stockpile stewardship program detect a flaw in one of the many deployed nuclear weapons, the availability of alternative assets to deter projected threats should be considered.

Furthermore, since the test ban is not a unilateral undertaking, other nuclear weapon states face similar or more difficult challenges, and the United States should be able to maintain its clear technical superiority. The United States also should be able to maintain the expertise and morale of its nuclear weapon specialists at least as well as other countries operating under the same constraints.

Thus, a strong burden of proof should be placed on those arguing that only renewed testing can serve U.S. security interests.

Disarmament

SUMMARY OF POLICY RECOMMENDATIONS

- The United States should work to comply with NPT commitments by: (p. 70)
  - Renouncing development of new types of nuclear weapons.
  - Reaffirming the ban on nuclear testing and pursuing ratification of the CTBT.
  - Diminishing the role of nuclear weapons in U.S. security policy.
  - Proceeding with verifiable, irreversible nuclear reductions.
- The United States should follow the United Kingdom's lead and order relevant government bodies to specify the procedures and technologies it would require in order to verifiably eliminate its nuclear arsenal, as it has committed to do under the NPT. (p. 70–71)
- The United States, United Kingdom, and other nuclear weapon states in the NPT should ask the IAEA to invite all states possessing nuclear weapons or stocks of fissile materials to submit white papers detailing how they could dismantle their nuclear arsenals or account for and securely store all their fissile materials in a verifiable manner as would be required in a world without nuclear weapons. (p. 71)

Article VI of the NPT obligates parties to "pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament." In 2000, this obligation was reaffirmed by an "unequivocal undertaking" of treaty members "to accomplish the total elimination of their nuclear arsenals."

Many officials in nuclear weapon states think this commitment should not be taken seriously today. Recognizing this, many states in the rest of the world hesitate to strengthen enforcement of nonproliferation because they believe that the nuclear weapon states are not committed to disarmament. States that have given up programs to produce nuclear weapons are particularly frustrated. Argentina, Brazil, Canada, Germany, Japan, South Africa, and Sweden are among the influential countries that demand clearer commitments to disarmament to ensure their continued cooperation in nonproliferation efforts. Not only could these states someday choose to resume their own nuclear weapon programs, they are vital participants in making and enforcing the rules on which effective nonproliferation depends.

Like it or not, the United States and the other nuclear weapon states must address the disarmament issue more directly than they have in the past. In the near term, the United States must take four steps to comply with commitments the nuclear weapon states made in 1995 when persuading the rest of the world to indefinitely extend the NPT:

- Disavow development of new types of nuclear weapons.
- Reaffirm the moratorium on nuclear weapon testing and devise stockpile stewardship innovations to allow ratification of the Comprehensive Test Ban Treaty.
- Narrow rather than widen the role of nuclear weapons in U.S. national security policy.
- Agree with Russia to make irreversible and verifiable the nuclear reductions required under the Treaty of Moscow.

By complying with political obligations it undertook as part of NPT bargaining, the United States would bring greater leverage to its efforts to convince others to accept and enforce tougher nonproliferation rules.

More fundamentally, the United States should move from a defensive to an offensive strategy

on the disarmament question. The United States should make proponents of disarmament go beyond high-minded slogans and wrestle with the immensely difficult technical and political security challenges that must be overcome in order to eliminate nuclear arsenals.

To start this process, the nuclear weapon states that attend the 2005 NPT Review Conference should urge the IAEA to request that *all* states possessing nuclear weapons or stocks of fissile materials produce white papers addressing several questions:

- For states with nuclear weapons, what technical facilities, capabilities, and procedures would be required to verifiably eliminate each nation's nuclear arsenal and securely dispose of the fissile materials contained in them? Physically, how long would a phased dismantlement-disposition process take?
- What technologies and procedures would be necessary to allow international verification of nuclear disarmament while protecting sensitive weapon design or other information from being "proliferated"?
- For all states possessing nuclear weapon materials (including Israel), what is the national capacity to account for all fissile materials produced?[81] Given that most of the acknowledged nuclear weapon states do not have accurate records of their production of nuclear weapon materials in the distant past, what procedures or policies do states recommend to provide high confidence that no state is secreting away material or weapons while claiming to have eliminated its nuclear arsenal or to have never possessed one in the first place?[82]
- For all states with unsafeguarded fissile materials, what level of confidence would the state require in disarmament verification before it could verifiably dismantle the last nuclear weapon or put the last kilogram of fissile material under IAEA safeguards?
- Would the production of fuel for nuclear reactors, including plutonium separation, be feasible in a world without nuclear weapons where sensitivity to proliferation risk would be even greater than today? Would such production need to be managed differently? If so, why and how? What would be the cost implications for nuclear power generation?

Asking and answering these questions is a minimal way for nuclear weapon states (and others) to demonstrate that they take their disarmament obligation seriously. Variations of these questions would have to be answered by individual states, the international community, and the IAEA if and when the total elimination of nuclear arsenals were actually on states' agendas. The white papers could be directed for submission to the IAEA Board of Governors (or an appropriate UN body); India, Israel, and Pakistan, as members of these organizations, should be expected to produce such papers. Public versions of these papers should then be made available for analysis and debate by concerned citizens, nongovernmental organizations, and intergovernmental bodies that have an interest in these topics. The United Kingdom has set an important precedent for beginning such work.[83]

The international debate of these papers would raise appreciation of the challenge of implementing nuclear disarmament. Not only states with nuclear weapons, but all states that possess nuclear materials and related infrastructure, would have to achieve greater transparency. Gaps in accounting for nuclear weapon materials would be inevitable, raising international security questions that are off the radar screen today. In short, expectations regarding the challenge and benefits of complete nuclear disarmament would receive the serious scrutiny they deserve.

The U.S. cofounders of the nonproliferation regime recognized, with other global leaders, that a dichotomous order of nuclear "haves" and "have nots" would be unstable over time. The obligations to pursue nuclear disarmament sprang from this understanding. If, upon examination, the challenge of eliminating the absolute last nuclear weapon is too fraught with uncertainty,

too technically daunting, and too politically and economically demanding for the international community—and not just the states with nuclear weapons—then an alternative basis must be found for stabilizing the nuclear order. This will require shared understanding that expectations need to be adjusted. All of this can be done within the framework of the universal rules and mechanisms outlined in this strategy report building on the NPT foundation.

PART SEVEN: APPLYING THE STRATEGY TO REGIONAL CRISES

South Asia

SUMMARY OF POLICY RECOMMENDATIONS

- Lead an initiative to ensure that Pakistan and India employ state-of-the-art practices and technologies to secure nuclear weapons, material, and know-how. (p. 73)
- Expand the scope of threat reduction programs. (p. 74)
- Encourage Pakistan and India to implement nuclear risk reduction practices. (p. 74)
- Encourage India and Pakistan to shape and join a global pause on all fissile material production. (p. 74–75)
- Encourage India and Pakistan to resolve the Kashmir dispute. (p. 75)
- Strengthen civilian political parties and institutions in Pakistan. (p. 75–76)
- Promote stable conventional force balances. (p. 76)
- Resist Indian demands to waive or amend nonproliferation prohibitions against nuclear technology commerce. (p. 76)

The nuclear proliferation problem in South Asia has many dimensions. From the standpoint of potential nuclear weapon use, two threats stand out:

- Potential military conflict between India and Pakistan and the possibility of escalation to nuclear use
- The possibility that Pakistanis will transfer nuclear weapons, material, and know-how to undeterrable actors.

Nonproliferation policies to protect nuclear materials from being diverted to terrorists and to strengthen export control practices are now mandatory under UN Security Council Resolution 1540; they can and should be implemented today unilaterally by Pakistan and India. But deep reductions in the threat of nuclear war in South Asia and real prospects for elimination of nuclear weapons will require breakthroughs in Indian-Pakistani relations and Sino-Indian relations, and domestic reform in Pakistan. India and Pakistan will not eliminate their nuclear arsenals outside of a process of reciprocal global nuclear disarmament whose mechanisms have not yet been sketched out by China, France, Russia, the United Kingdom, and the United States.

SECURE NUCLEAR CAPABILITIES AGAINST TERRORIST ACQUISITION

To help prevent terrorists from acquiring nuclear weapon capabilities, the United States should lead an initiative to ensure that Pakistan and India employ state-of-the-art practices and technologies to secure nuclear weapons, material, and know-how. This is consistent with each state's obligation under Resolution 1540. (Pursuant to the NPT, assistance should be provided to secure and safeguard nuclear materials, weapons, and

know-how, while assistance should be refused that enhances the operability of nuclear weapons themselves.)

The United States, in concert with others, or alone if necessary, should:[84]

- Expand the scope of threat reduction programs to fund as a priority measure the protection of radiological materials in Pakistan and India.
- Provide technologies and procedures to improve the reliability of personnel in organizations responsible for producing, storing, transporting, and managing nuclear materials and weapons. These improvements also may be implemented through discussions of best practices in other countries.
- Provide assistance to border control and customs agencies in Pakistan and India, in order to improve the detection of nuclear and radiological materials at border crossings.
- Develop programs to engage Pakistani and Indian scientists, engineers, and technical experts in cooperative work on threat reduction projects such as monitoring and detection systems for border crossings and nuclear material stockpiles.
- Provide physical protection, material control, accounting training, equipment for Indian and Pakistani facility operators and regulators.

India and Pakistan, unlike North Korea and Iran, are not barred under international treaty from having nuclear weapons. States proffering the assistance recommended here should not expect to gain physical access to sensitive Pakistani or Indian nuclear facilities; rather, they can provide recommendations, descriptions of best practices, and security technologies that Indians and Pakistanis would then apply to their facilities.

IMPLEMENT NUCLEAR RISK REDUCTION MEASURES

India and Pakistan should be strongly encouraged to implement nuclear risk reduction practices. The two countries have outlined possible measures, but Pakistan has held them hostage to resolution of the Kashmir dispute. In the wake of its recent egregious violations of nonproliferation norms and practices, Pakistan should be strongly encouraged to take these steps with India as a sign that it can be a responsible steward of nuclear weapons. The United States has protected certain interests of Pakistani leaders and the Pakistani army in not publicly disclosing all that it has known over the years about nuclear proliferation from Pakistan; disclosure should be considered if Pakistani leaders do not act urgently with India to build confidence in their nuclear stewardship. The United States also should assess Indian-Pakistani risk reduction efforts in determining the quantity and quality of military trade with both countries.

Priority measures include:[85]

- Establishment of national risk reduction centers in both countries to administer agreed-upon confidence-building measures.
- A commitment not to develop, produce, and use "tactical" nuclear weapons.
- Agreement not to flight-test missiles in the direction of the other country.
- Agreement to flight-test missiles only from designated test ranges.
- Provision of advance notification of the movement of missiles for training purposes.

PHASE OUT NATIONAL FISSILE MATERIAL PRODUCTION

The single most effective way for Pakistan and India to limit the potential cost and risks of a nuclear arms race, and to contain the pool of material that could potentially be diverted to

terrorists, would be to end the production of fissile materials. Strong security and economic arguments can be made that both states would benefit from such a move today. They have sufficient material for nuclear arsenals large enough to meet their deterrence needs, as long as China ceases producing more fissile materials for its arsenal. Pakistan would not need further production to fuel its small LEU-based nuclear energy program, and India's plutonium breeder program, if it ever proved feasible, could rely on stocks on hand or imports from Russia's vast surplus stockpile. Russian exports to India should be endorsed by the Nuclear Suppliers Group in the event that India agrees to cease the further separation of plutonium. Indeed, were India and Pakistan to dismantle their uranium enrichment and plutonium separation facilities and place all their nuclear reactors under international safeguards, a strong case could be made for international agreement to open commerce with them in nuclear power reactors and fuel services.

Nevertheless, Indian and Pakistani leaders will not stop all production of fissile material unilaterally or even bilaterally. They could only be expected to participate in a process of nuclear regulation and agreement that included China and linked them to the global arena.

RESOLVE THE KASHMIR DISPUTE

The single most likely cause of deterrence failure in South Asia, and therefore the most likely cause of nuclear use, would be an attempt by Pakistan or India to forcibly change the territorial status quo in Kashmir. India appears to recognize that it cannot gain sovereignty over the part of Kashmir that Pakistan now controls. Thus, the primary challenge is to persuade Pakistan and other possible instigators of organized violence to accept that they cannot forcibly gain sovereignty over the part of Kashmir that India controls. All of Pakistan's interlocutors should communicate to Islamabad that Pakistan cannot hope to change the territorial status quo in Kashmir.

Creative and courageous political and diplomatic work will be required to stabilize Kashmir. This will entail not only Indian-Pakistani diplomacy, but also much greater attention by all parties to the needs and aspirations of the Kashmiri people. Indian, Pakistani, and international authors have offered numerous constructive policy prescriptions relating to Kashmir.[86] The task now is for the United States and other influential actors to encourage Indian and Pakistani leaders to pursue these prescriptions. This is a long-term challenge, but it is unrealistic to expect substantial progress toward eliminating nuclear weapons in South Asia before it is met.

SUPPORT POLITICAL REFORM IN PAKISTAN

Some governments inspire more confidence as stewards of nuclear weapon capabilities than others. Pakistan's transfer of nuclear weapon designs, centrifuges, and related weapon capabilities to North Korea, Iran, Libya, and perhaps other destinations raises understandable questions about whether the Pakistani government can be trusted. The absence of real checks and balances in Pakistan limits confidence that dangerous actors and inadequate policies and procedures will be identified and replaced.

The army's dominant role in Pakistan must be recognized as a systemic problem. While the army often claims, with some reason, that it is the only institution that can guide the state, and that elected civilian leaders chronically misgovern, Pakistan cannot be stable over the long term under military rule. The army, including its intelligence arm, intensified the Islamization of Pakistani politics, nurtured the Taliban, and opened the political space for extremist parties. To correct these dangerous developments, the army and outside supporters of Pakistan must seek to strengthen civilian institutions so that effective political and economic authority can be transferred to them. Among other things, this is necessary to make the army accountable to some institution other than itself, in nuclear

policy in addition to other areas. Because the Pakistani army, including its powerful intelligence arm, bases its claim to political power and economic resources on the threat that India is said to pose to Kashmiri Muslims and Pakistan itself, the army lacks motivation to find ways to resolve the Kashmir issue. This in turn justifies Pakistan's nuclear weapon requirements.

For Pakistan's long-term internal stability, and for the sake of Indian-Pakistani rapprochement, the capacity of civilian political parties and institutions must be strengthened so that they can become effective governors of the polity and the economy. Ultimately, this is a key to an effective nonproliferation strategy in South Asia.

PROMOTE STABLE CONVENTIONAL FORCE BALANCES

India is in the midst of major modernization of its conventional forces. It plans to procure advanced aircraft, airborne early warning and command and control systems, and possibly missile defenses from Russia, Israel, and the United States. These acquisitions could appear to threaten Pakistan's nuclear deterrent. Were that to occur, Pakistan, in the absence of a fundamentally transformed relationship with India, would react by increasing the quantity and operability of its nuclear force, along with means to penetrate Indian defenses. All of this could raise the risks of escalation in crisis and accelerate the nuclear arms race in South Asia.

Efforts to constrain both a conventional and a nuclear arms race in South Asia are complicated by the fact that India seeks simultaneously to deter and defend against Pakistan *and* China. A triangular security dilemma results, wherein capabilities India acquires to balance China are perceived as threatening by Pakistan, prompting Pakistan to seek greater capabilities, which in turn add to the threats India perceives.

There are no easy solutions to either the Indian-Pakistani or the triangular Sino-Pakistani security dilemma. India and China are making progress toward resolving their border dispute and improving their relationship; were India and Pakistan to make similar progress, conditions could be created for negotiated measures to regulate conventional and nuclear capabilities on a triangular basis. But hard realities will remain: China will continue to modernize its military capability, which will prompt India to do the same, which will in turn alarm Pakistan, whose wherewithal is significantly inferior. To go further and consider eliminating nuclear arsenals, Pakistan would look for India to make initiatives, and India would react to China's lead. But China's willingness to cut back and eliminate its nuclear arsenal is linked to its nuclear security relationships with the United States and Russia, which is why the disarmament challenge in South Asia is now embedded in the global disarmament process.

A U.S. POLICY ON NUCLEAR COMMERCE

The United States needs a clear policy on doing nuclear business with India. Indian officials emphatically urge their counterparts from the United States, France, and elsewhere to waive or amend nonproliferation prohibitions against nuclear technology commerce (often subsidized) to India. India will not put all of its nuclear facilities under safeguards, but it wants nuclear suppliers to change existing rules and sell it nuclear reactors anyway.

The United States should not accede to the Indian demand as long as doing so would undermine non–nuclear weapon states' commitments to strengthening the nonproliferation regime. Many parties to the NPT chose to forswear nuclear weapons and join the treaty as non–nuclear weapon states, on an understanding that the benefits of nuclear commerce would accrue only to states that eschewed nuclear weapons. Argentina, Australia, Brazil, Japan, Germany, Sweden, and South Africa are among such states. They argue that recognizing India as a nuclear weapon state and providing unrestricted nuclear commerce to India would reward proliferation and thereby devalue their own nuclear abstinence. Combined with a

deteriorating security situation, such a message could lead some of these countries to reconsider nuclear abstinence.

Thus, the long-term costs of according India nuclear weapon status and opening nuclear reactor commerce to India outweigh the benefits. The burden should not be on the United States to amend global nonproliferation norms and rules for the sake of India; rather it is up to India to persuade the non–nuclear weapon states that the rules should be changed. Even as Washington recognizes that India developed nuclear weapons for its own national interests, and was not precluded by treaty obligations from doing so, the United States must support states that uphold the nonproliferation regime by not acquiring nuclear weapons.

Iran

SUMMARY OF POLICY RECOMMENDATIONS

- Encourage European leaders to precisely define what Iran must do to suspend its fuel cycle activities and eventually dismantle its facilities. (p. 78)
- Encourage the EU to clarify the benefits Iran would gain in exchange for forswearing acquisition and operation of all fuel production capabilities. (p. 78)
- Encourage the EU to offer specific economic benefits if Tehran meets at least the EU's nuclear nonproliferation demands. (p. 78)
- Communicate to the current Iranian government that the United States will desist from regime-change efforts if Tehran verifiably forswears acquisition of capabilities to produce materials that can be used in nuclear weapons. (p. 78)
- Pursue nuclear negotiations while concurrently championing reform. (p. 79)
- Welcome and participate in a security dialogue among Persian Gulf states, including representatives of Iran and Iraq. (p. 79)
- Seek British, French, Russian, and Chinese cooperation to *privately* warn Iran that they are prepared to vote for sanctions if Iran refuses to implement a complete suspension and eventual elimination of fuel cycle capabilities and the matter comes to the Security Council. (p. 79)
- Clarify through the IAEA and the NPT Review Process that all states should suspend nuclear cooperation with any state for which the IAEA cannot provide sufficient assurances regarding the peaceful nature of that state's nuclear program. (p. 79)
- Introduce a Security Council resolution to make clear that any state that withdraws from the NPT remains responsible for violations committed while still a party to the treaty. (p. 79)
- Introduce a Security Council resolution that a state that withdraws from the treaty—whether or not it has violated it—may no longer make use of nuclear materials, facilities, equipment, or technology acquired from another country before its withdrawal. (p. 79)
- Negotiate bilateral nuclear technology transfer agreements, particularly involving the Nuclear Suppliers Group, that disallow the use or major transfers of nuclear materials, facilities, equipment, or technologies, in the event that the receiving state withdraws from the NPT. (p. 79)

Iran has been caught breaking its obligations under the NPT, and is now being investigated by the IAEA and the Security Council. France, Germany, and the United Kingdom, on behalf of the EU, have taken the lead in trying to reverse Iran's threatening course. If Iran gets away with acquiring nuclear weapons in these circumstances, it would make a mockery of the nonproliferation regime. The Middle East would become even more dangerous. In short, Iran may be the proliferation tipping point.

Iran's unacceptably narrow interpretation of its October 2003 agreement with France, Germany, and the United Kingdom to suspend fuel cycle activities, and its continued obfuscation of the nature of its nuclear activities, indicate that the Iranian leadership wants to keep Tehran's nuclear weapon option open, even as Iran seeks to avoid becoming an international pariah. The United States, Europe, and Russia should devise a combination of costs and incentives to convince Iran's leaders to make a strategic choice not to acquire nuclear weapons.

DEFINE SUSPENSION AND CESSATION OF FUEL CYCLE ACTIVITIES

Iran's clear violations of its safeguards obligations and its continuing deceptions suggest that in the future Tehran must not be permitted the means to produce weapon-usable uranium or plutonium. Otherwise, such assets would give Iran the ability to leave the NPT and deploy nuclear weapons, a risk indicated by Tehran's track record.

First, the leaders of France, Germany, and the United Kingdom should precisely define what Iran should do to suspend and shut down fuel cycle activities and dismantle its facilities. In 2003, the three EU states tasked the IAEA with the responsibility to negotiate the exact terms of suspension, but this process is not working. The three EU states should reclaim the initiative. Suspension should include uranium enrichment and the fabrication and operation of centrifuge assemblies, procurement of enrichment-related technology, operation of uranium conversion facilities, and construction of capabilities related to plutonium production and separation. These demands would represent a new, restrictive interpretation of the Article IV entitlements of NPT non–nuclear weapon. But Iran's long pattern of noncompliance and deception warrants this action, as Iran has raised serious doubts about its compliance with Articles II and III of the treaty.

CLARIFY BENEFITS

The EU, backed by the United States and other states represented on the IAEA Board of Governors, should clarify the benefits Iran would gain in exchange for forswearing acquisition and operation of all fuel production capabilities. In particular, Iran should be guaranteed a commercially viable supply of LEU for its nuclear reactors and for the removal and disposal of spent fuel. Russia and Iran already have negotiated such arrangements, and the United States should endorse them under the terms outlined above.

Developing such a plan would have several benefits. First, it would undercut the economic and energy security argument used by Iran to justify acquiring these weapon production capabilities. If Iran rejected a viable plan along these lines, it would then lay bare its underlying ambitions to acquire nuclear weapon capabilities, allowing the international community to pursue alternative enforcement measures.

Iran should also receive increased favorable access to exports and imports to and from the EU. The EU has suspended negotiations on the EU-Iran Trade and Cooperation Agreement, in protest of Iran's violation of its nonproliferation obligations, its support of terrorist organizations, and human rights violations. The EU should specify what benefits Iran would receive if Tehran met at least the EU's nuclear nonproliferation demands.

The United States must communicate to the current Iranian government that it will desist from regime-change efforts if Tehran verifiably forswears acquisition of all capabilities related to nuclear weapons. It is highly unlikely that either the United States or the Iranian people will be

able to replace the current government before it would have time to acquire nuclear weapons. Therefore, the United States must deal with the current Iranian government, which will probably not abandon its budding nuclear weapon capabilities if it feels an existential threat from the United States. The United States should not disavow political support for democratic reformers in Iran; rather it should do as it did with the Soviet Union: pursue nuclear negotiations while concurrently championing reform.

Finally, to improve regional security, the United States should welcome and participate in a security dialogue among Persian Gulf states, including representatives of Iran and Iraq.

RAISE COSTS

The United States, France, and the United Kingdom should seek Russian and Chinese cooperation to *privately* warn Iran that they are prepared to vote for sanctions in the Security Council if Iran refuses to implement a complete suspension and eventual elimination of fuel cycle capabilities. These five permanent members of the Security Council (the P-5) should emphasize that they respect Iran's desire to resist isolation, and prefer to keep the matter out of the Security Council, but that if Iran rejects a positive course the P-5 are determined to enforce compliance with the nonproliferation regime. For maximum credibility and effect, prospective sanctions should focus on international investment in Iran's energy sector and on grants and loans from international financial institutions.

Participants in the Proliferation Security Initiative should also convey privately to Iran that they will redouble their efforts to physically prevent Iran from receiving or exporting nuclear technology and material.

STRENGTHEN UNIVERSAL STANDARDS

To buttress Iran-specific initiatives, an effective nonproliferation strategy should also include:

- Clarifying through the IAEA and the NPT Review Process that all states should suspend nuclear cooperation with any state for which the IAEA cannot provide sufficient assurances regarding the peaceful nature of its nuclear program. The IAEA Board of Governors could call for a suspension when its director-general reports that a state is in "serious breach" or "noncompliance," or when an "unacceptable risk of diversion" exists or the agency cannot carry out its mission.
- Introducing a Security Council resolution to make clear that if a state withdraws from the NPT, it remains responsible for violations committed while still a party to the treaty.
- Introducing a Security Council resolution that if a state withdraws from the treaty—whether or not it has violated it—it may no longer make use of nuclear materials, facilities, equipment, or technology that it acquired from another country before its withdrawal. Such facilities, equipment, and nuclear material should be returned to the supplying state, frozen or dismantled under international verification. (A state's failure to comply with these obligations would strengthen the legitimacy of military action to dismantle the relevant facilities and equipment.)

The United States must deal with the current Iranian government.

- Negotiating bilateral nuclear technology transfer agreements, particularly involving the Nuclear Suppliers Group, so that if a state withdraws from the NPT, it cannot use or transfer nuclear materials, facilities, equipment, or technologies.
- Establishing through relevant international bodies, as discussed earlier in this document, a general rule that no new uranium enrichment and plutonium separation facilities should be established on a national basis in non–nuclear weapon states. This rule must be established and applied immediately in Iran, but it should become a universal standard.
- Finally, the United States, the EU, and others must not ignore Iran's location in a volatile region, where one of its adversaries, Israel,

possesses nuclear weapons. This does not absolve Iran of its obligation to reassure its neighbors and the world that it will not seek nuclear weapons, but it makes it incumbent upon the P-5 to intensify efforts to create a zone free of WMD in the Middle East, as discussed in the next section.

Middle East

SUMMARY OF POLICY RECOMMENDATIONS

- Proactively call for a regional dialogue to negotiate and implement the conditions necessary to achieve a WMD-free zone. (p. 81)
- Establish threshold conditions for serious progress. All states and parties must recognize Israel's right to security and the right of Palestinians to a secure state. Dialogue must include all states in the region. (p. 81–82)
- Encourage friendly states and NGOs to conduct studies and dialogues exploring key conditions that would have to be met for a zone free of weapons of mass destruction to be implemented. (p. 82)
- Design the verification procedures and practices that would have to be implemented in the region. (p. 82)
- Provide the opportunity for outside powers to offer independent intelligence to help verify that parties are fulfilling their pledges. (p. 82)
- Push for high levels of transparency in national policies, budgets, and facilities. (p. 82)
- Encourage Israel to reaffirm its commitment not to be the first to introduce nuclear weapons into the Middle East. (p. 82)
- Encourage Israel to ratify the Chemical Weapons Convention and join the Biological Weapons Convention. (p. 82)
- Encourage Israel to declare that it has adopted an indefinite moratorium on producing plutonium and ceased the separation of plutonium from spent fuel. (p. 82)
- Encourage Israel to communicate to the 2005 NPT Review Conference that if and when a regional zone free of weapons of mass destruction is verifiably implemented and proved durable, Israel would be prepared to join the NPT as a non–nuclear weapon state. (p. 82)

LOCK IN REGIONAL DISARMAMENT

Libya shows that nuclear, biological, and chemical weapon programs can be eliminated in a major country in the Middle East without that step being conditioned on disarmament everywhere in the region. Iraq does also, though the cost has been high. The United States and other interested parties must ensure that both countries gain significant improvements in security, political standing, and international integration as a result of their relinquishing these weapons. The Libyan case is more straightforward, and the United States, the United Kingdom, and others already are implementing a course of political and economic engagement with Libya. Iraq is immensely more difficult. In addition to the formidable problems of reconstructing the Iraqi state, the United States, the EU, and the UN must ensure that Iraq is sufficiently protected from external threats so that a future government is not tempted to restart unconventional weapons programs.

To solidify Libyan and Iraqi disarmament, and to generate momentum from it, the United States and other major players must develop a strategy for regional security and disarmament.

The most pressing challenges are to prevent Iran from acquiring nuclear weapons and to persuade Israel to take immediate steps that will enhance the prospect of creating a zone free of weapons of mass destruction in the Middle East. Arab states fear each other and Iran, while they variously detest or rely on the United States' military presence in the region. Iran fears Iraq and, related to it, the overweening U.S. presence in the region. This knot of real and exaggerated security threats and status seeking is pulled tighter still by Israel's undeclared possession of nuclear weapons and by its continuing conflict with the Palestinians and with neighboring Arab states.

Israel's military strategy is motivated by defensive imperatives, not aggressive intent. Nor does Israel seek to gain political prestige from its nuclear arsenal, whose existence it continues to deny. Nevertheless, Israel's nuclear arsenal provides a popular *political* pretext for potential Arab proliferation efforts. More pertinently, Israel's nuclear status undermines support by Egypt and other Arab states of a nonproliferation regime that has failed to compel Israel to relinquish nuclear weapons. Jordan, the United Arab Emirates, and other Arab states are key transit points for suspect exports and imports. The A. Q. Khan proliferation network, for example, operated through the United Arab Emirates, and the full extent of its "clientele" in the region is not publicly known. The Arab states and Pakistan are less likely to devote resources and leadership to strengthen export and customs controls and intelligence cooperation with key NPT states and institutions such as the IAEA if they feel that champions of the nonproliferation regime are not treating Israel on par with Muslim states.[87]

A ZONE FREE OF WEAPONS OF MASS DESTRUCTION

Thus, even as the United States and others should press nonproliferation objectives one state at a time, nonproliferation leaders also must act on an ambitious regional initiative. Key parties in the Middle East, including Israel, already have endorsed the objective of creating a zone free of weapons of mass destruction. This objective was reiterated in the 1995 decision by parties to the NPT to extend the treaty indefinitely, and in UN Security Council Resolution 687, which created UNSCOM to oversee the disarmament of Iraq after the 1991 war. At the 2000 NPT Review Conference, the U.S. representative offered that: "Israel has stated that it is prepared to surrender its nuclear weapons option in the context of a just, stable, and enduring Middle East peace…. The U.S. is making every effort we can to bring about such a peace, and we believe that once that is achieved, that Israel can and should join the NPT as a non–nuclear weapons state."[88] Instead of defensively trying to ignore Israel's nuclear status, the United States and Israel should proactively call for regional dialogue to specify, negotiate, and then implement the conditions necessary to achieve a WMD-free zone.

The United States and other major players must develop a strategy for regional security and disarmament.

Many profound changes must be effected to achieve this goal, given the existence of chemical, biological, and nuclear weapons programs and arsenals in the region. Yet, not long ago few imagined that in 2004 Iraq and Libya would be verifiably disarmed of weapons of mass destruction. To pursue a zone free of weapons of mass destruction in the Middle East, leading parties in the Security Council and the NPT Review Process should offer their good offices and commitments to provide economic and security assurances as necessary to facilitate the process. They should clarify certain threshold conditions for a serious process:

- All regional states and parties must recognize the existence and right to security of all other regional states and parties. This means that all the Arab states, Iran, and various armed substate groups must avowedly recognize Israel's right to exist, and Israel must recognize the right of existence, the statehood, and the security requirements of the Palestinians.[89]

- Negotiations can occur only among parties who recognize each other's legitimacy; negotiations to create a region-wide zone free of weapons of mass destruction must necessarily include all constituent parts of the region.

As a precursor to negotiations, friendly states and NGOs should conduct studies and dialogues exploring key material conditions that would have to be met for a treaty to be implemented. The following conditions appear indispensable:

- To persuade all parties that relinquishing all of their strategic weapons would not undermine their security, each must be highly confident that the others are fulfilling their commitments. This in turn requires robust verification procedures and practices (as indicated in the call for white papers; see Part 6, Disarmament). Technical expertise is necessary to design such procedures and practices. Nonofficial dialogues or joint projects by regional and international verification experts could be initiated to design verification mechanisms and to educate regional governments about undertakings they would eventually have to make in this regard. This would be an extremely difficult process given the complexities and sensitivities involved. Anyone serious about the objective should commit human and diplomatic resources now to begin designing verification mechanisms.
- Sufficient verification, in turn, will require high levels of transparency in national policies, budgets, and facilities. Informal dialogues on security issues among well-briefed officials and nonofficials from the region could build confidence that requisite transparency can be effected.
- Regional actors may gain confidence if major outside powers provide independent intelligence to help verify that parties are fulfilling their pledges. Current and former officials from the P-5 could be encouraged to meet with regional actors to establish technical groups that could work in parallel as and when official negotiations on a zone free of weapons of mass destruction begin.

To impart momentum to this process, Israel, as the only state in the region with nuclear weapon capability, should take several initiatives:

- Israel should reaffirm its commitment not to be the first to introduce nuclear weapons into the Middle East.[90]
- To augment disarmament momentum generated in Iraq and Libya, Israel should ratify the Chemical Weapons Convention it signed earlier, and should join the Biological Weapons Convention.
- As confidence grows that Iran will permanently forgo acquisition of capabilities to enrich uranium and separate plutonium, and that new norms and rules are in place preventing other states from acquiring bomb-fuel production capabilities, Israel should declare that it has adopted an indefinite moratorium on producing plutonium and ceased separation of plutonium from spent fuel and is prepared to make this permanent. The means to verify such a moratorium should be explored through the expert dialogue suggested above.

To help buttress the NPT, Israel should be encouraged to communicate to the 2005 NPT Review Conference that if and when a regional zone free of weapons of mass destruction is verifiably implemented and proved durable, Israel would be prepared to join the treaty as a non–nuclear weapon state.

Many of these steps outlined above will take considerable time. What should not be delayed is public acknowledgment by the United States that Israel's nuclear status is a central problem that must be addressed.

Table 7.1. Suspected Weapons or Programs in the Middle East

COUNTRY	NUCLEAR	BIOLOGICAL	CHEMICAL	MISSILE DELIVERY SYSTEMS
Israel	~ 100 suspected weapons[a]	Suspected program	Suspected weapons[b]	Nuclear-capable SRBMs and MRBMs
Iran	Suspected program	Suspected program	Suspected weapons[c]	SRBMs (Scud-B and -C, CSS-8), and a MRBMs
Syria	Status unknown	Suspected program	Suspected weapons[d]	SRBMs (Scud-B, -C, and -D, SS-21)
Egypt	—	Suspected program	Suspected weapons	SRBMs (Scud-B and -C)
Saudi Arabia	—	—	—	Chinese MRBMs (CSS-2)
Iraq	Dismantled program	Dismantled program	Dismantled program	Dismantled program
Libya	Renounced program	Renounced program	Renounced program	SRBMs
All others[e]	—	—	—	SRBMs

a Israel is the only nation in the Middle East with nuclear weapons. David Albright and Kevin O'Neill, eds., *The Challenges of Fissile Material Control* (Washington, D.C.: Institute for Science and International Security, 1999), available at www.isis-online.org/mapproject/israel.html (accessed May 3, 2004).

b See Avner Cohen, "Israel and CBW: History, Deterrence, and Arms Control, *Nonproliferation Review* (Fall/Winter 2001): 27–53, available at www.bsos.umd.edu/pgsd/people/staffpubs/Avner-CBWart.pdf (accessed May 6, 2004).

c See Director of Central Intelligence, *Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions 1 January Through 30 June 2003,* November 2003, available at www.cia.gov/cia/reports/721_reports/jan_jun2003.htm (accessed May 3, 2004) (hereafter referred to as January–June 2003 CIA WMD report).

d January–June 2003 CIA WMD report.

e Includes Bahrain, Jordan, Lebanon, Oman, Qatar, Sudan, the United Arab Emirates, and Yemen.

North Korea and Northeast Asia

SUMMARY OF POLICY RECOMMENDATIONS

- Determine whether and under what conditions North Korea is willing to relinquish its nuclear capabilities. (p. 84)
- Develop an international consensus through the Security Council that North Korea's actions are a threat to international peace and security and that North Korea's attempt to withdraw from an agreement it has violated is unacceptable. (p. 85)
- Fully test the will of North Korea to verifiably implement the irreversible dismantlement of all nuclear weapon capabilities in exchange for a fundamentally different relationship with the United States, including diplomatic relations and peaceful reconstruction assistance. (p. 85)
- Further enhance U.S. alliances with South Korea and Japan to broaden support for U.S. security objectives in the region, including the absence of nuclear weapons. (p. 85)
- Pursue rapid and ongoing negotiations with North Korea through a presidentially appointed envoy. This person must be fully committed to the negotiations, prepared and empowered to make serious progress, and meet with North Korean counterparts of sufficient rank to make progress. (p. 85)
- Prepare for the possibility that North Korea is unwilling to abandon its nuclear capabilities by reinforcing the diplomatic and military capabilities in the region to enhance deterrence and stability on the Korean peninsula and reduce incentives for other countries to follow North Korea's nuclear lead. (p. 85)
- Make clear that any attempt by North Korea to export nuclear materials or weapons will be considered an act of war against the United States resulting in the end to the Korean War cease-fire. (p. 85)

North Korea has an active nuclear weapons program and may now possess several nuclear weapons. U.S. troops, allies in the region, and strategic interests are directly threatened by North Korea's growing nuclear capability, which has been pursued in violation of Pyongyang's commitments under the Non-Proliferation Treaty and other agreements. Given North Korea's economic strains, it is conceivable that for a high price Pyongyang might sell nuclear materials or weapons to other states or even terrorist groups, taking a regional threat to a global level. Such a scenario is so grave that U.S. policy makers could soon face a truly appalling choice between acquiescing in North Korea's transfer of its weapons technology and fighting a full-fledged war on the Korean peninsula.

Short of war, a failure to resolve the North Korean nuclear threat would badly undermine the cause of nuclear nonproliferation and would increase incentives for regional states, including South Korea and Japan, to consider their own nuclear options. It would pose an unprecedented regional and global security risk.

The United States and its partners in dialogue with North Korea must determine whether and under what conditions North Korea is willing to relinquish its nuclear capabilities. Finding Pyongyang's bottom line will either allow the United States and its allies to negotiate a verifiable end to North Korea's nuclear program or improve the prospects for building a consensus to respond to the threat posed by North Korea's suspected nuclear weapons.

The creation of a regional six-party negotiating mechanism has enabled the United States to more closely tie China to the issue of North Korea's nuclear future, but it remains unclear how far Beijing can or is willing to go in pressuring North Korea to abandon its program. China may not have an interest in a nuclear North Korea on its border, but it is also averse

to regime collapse or a war between the United States and North Korea that could result in U.S. troops being placed on the Chinese border. All in all, China may find the status quo tolerable, and the United States cannot assume that China will be able or willing to deliver North Korea's consent or compliance with a denuclearization agreement.

North Korea's apparent willingness to create crises in order to extract maximum negotiating leverage cannot be discounted. In comparison to military conflict or unchecked proliferation, many negotiated settlements become attractive.

If a negotiated solution that eliminates North Korea's nuclear program is possible, now is the time for a determined, comprehensive effort. At the same time, the United States and its allies must prepare for the possibility that Pyongyang will not abandon its nuclear program, forcing them to take appropriate steps to reinforce deterrence and the norm of nonproliferation in the region.

To test whether North Korea is prepared to eliminate its program under effective verification, the United States needs to:

- Develop an international consensus through the Security Council that North Korea's actions are a threat to international peace and security and that North Korea's attempt to withdraw from an agreement it has violated is unacceptable.
- Test the will of North Korea to fully, verifiably, and irreversibly dismantle all its nuclear weapon capabilities in exchange for a fundamentally different relationship with the United States, including diplomatic relations and peaceful reconstruction assistance.
- Further enhance U.S. alliances with South Korea and Japan to broaden support for U.S. security objectives in the region, including the absence of nuclear weapons.
- Pursue rapid and ongoing negotiations with North Korea with a presidentially appointed envoy. This person must be fully committed to the negotiations, prepared and empowered to make serious progress, and meet with North Korean counterparts of sufficient rank to make progress.
- Prepare for the possibility that North Korea will not abandon its nuclear capabilities by reinforcing diplomatic and military capabilities in the region to enhance deterrence and stability on the Korean peninsula and reduce incentives for other countries to follow North Korea's nuclear lead.
- Make clear that any attempt by North Korea to export nuclear materials or weapons will be considered an act of war against the United States resulting in the end to the Korean War cease-fire.

The regional security consequences of an ongoing North Korean nuclear weapon capability are dire. So too are the implications of allowing North Korea's violations of the international treaty regime to go unpunished. By violating and then attempting to withdraw from the NPT, North Korea has undermined the fundamental premise of the regime—that the international community is prepared to hold countries to their commitments. The Security Council presidential statement of January 1992 found the proliferation of nuclear weapons a threat to international peace and security. Thus, Security Council members have a responsibility to respond to North Korea's actions. Yet even now, the Security Council has yet to respond to North Korea's violations and withdrawal. If, after a determined good-faith effort, the United States and the other partners fail to achieve a negotiated agreement, then the United States must convince the Security Council that North Korea's violations are a threat to international peace and security and that its withdrawal from the NPT was invalid. The United States must then prepare for the consequences.

Now is the time for a determined, comprehensive effort.

NOTES

1 This report uses the phrase "weapon-usable fissile material" to refer to highly enriched uranium and plutonium. There are other nuclear materials used in weapons, such as beryllium, that are not fissile (capable of sustaining a chain reaction), and other fissile materials, such as low-enriched uranium, that are not usable in a weapon.

2 More than a dozen nations abandoned nuclear weapon programs under way or under consideration in the 1960s, including Sweden, Italy, Australia, and Switzerland. Since the late 1970s, Argentina, Belarus, Brazil, Iraq, Kazakhstan, Libya, South Africa, South Korea, Taiwan, and Ukraine have abandoned nuclear weapon programs or nuclear weapons (or both) on their territory. North Korea and Iran are the only two states that began acquiring nuclear weapon capabilities in this later period and have not ceased the effort.

3 In 1970, the year the NPT entered into force, there were about 38,000 nuclear weapons in global arsenals, most in the stockpiles of the United States and the Soviet Union; by 1986, the number of weapons had increased to a peak of 65,000 worldwide; in 2004, there are approximately 27,000.

4 For more on this concept, see Kurt M. Campbell, Robert Einhorn, and Mitchell Reiss, eds., *The Nuclear Tipping Point: Global Prospects for Revisiting Nuclear Renunciation* (Washington, D.C.: Brookings Institution Press, June 2004) (hereafter referred to as Campbell, et al., *The Nuclear Tipping Point).*

5 National Security Council, *The National Security Strategy of the United States of America,* September 2002, available at www.whitehouse.gov/nsc/nss.pdf (accessed May 11, 2004); National Security Council, *National Strategy to Combat Weapons of Mass Destruction,* December 2002, available at www.whitehouse.gov/news/releases/2002/12/WMDStrategy.pdf (accessed April 27, 2004), 1 (hereafter referred to as *National Strategy to Combat Weapons of Mass Destruction*).

6 The final document of the 2000 NPT Review Conference, agreed upon by all the states parties, says, "The Conference reaffirms that the total elimination of nuclear weapons is the only absolute guarantee against the use or threat of use of nuclear weapons."

7 *National Strategy to Combat Weapons of Mass Destruction,* 3.

8 See John Shalikashvili, "Address to Carnegie International Non-Proliferation Conference," Remarks in Washington, D.C., March 16, 2000, available at www.ceip.org/files/events/ShaliAddress2000.asp?p=8 (accessed April 22, 2004); see also John Shalikashvili, "Findings and Recommendations Concerning the Comprehensive Nuclear Test Ban Treaty," January 2001, available at www.state.gov/www/global/arms/ctbtpage/ctbt_report.html#report (accessed April 22, 2004).

9 See United Kingdom Ministry of Defence, *A Summary Report by the Ministry of Defence on the Role of Historical Accounting for Fissile Material in the Nuclear Disarmament Process, and on Plutonium for the United Kingdom's Defence Nuclear Programme,* September 2003, available at www.mod.uk/publications/nuclear_weapons/accounting.htm (accessed April 27, 2004) (hereafter referred to as the UK *Summary Report*).

10 This would include, among others, Israel, India, Pakistan, and North Korea. The willingness of the five acknowledged nuclear-weapon states to meet this assignment would make it politically risky for others to refuse.

11 India already has moved in this direction, as in 2000 its Minister on External Affairs declared to parliament that "Though not a party to the NPT, India's policies have been consistent with the key provisions of NPT that apply to nuclear weapon states. These provisions are contained in Articles I, III and VI…India has been a responsible member of the international nuclear non-proliferation regime and will continue to take initiatives and work with like-minded countries to bring about stable, genuine and lasting non-proliferation, thus leading to a nuclear-weapon-free-world." Jaswant Singh, "Statement on the 6th NPT Review Conference," Remarks in Parliament, New Delhi, May 9, 2000. Israel could make this commitment without publicly acknowledging possession of nuclear weapons; it would commit simply to do as the other named states do.

12 Were these states to dismantle uranium enrichment and plutonium reprocessing facilities, and place all nuclear reactors under international safeguards, international cooperation in supplying power reactors and fuel cycle services would make sense from a global security standpoint.

13 Council of the European Union, *Basic Principles for an EU Strategy against Proliferation of Weapons of Mass Destruction,* June 24, 2003, available at http://europa-eu-un.org/article.asp?id=2478 (accessed June 1, 2004).

14 Former senator Sam Nunn notes that "acquiring weapons and materials is the hardest step for the terrorists to take and the easiest for us to stop." Sam Nunn, "Address to Carnegie International Non-Proliferation Conference," Remarks in Washington, D.C., November 14, 2002, available at www.ceip.org/files/projects/npp/pdf/conference/speeches/nunntranscript.pdf (accessed April 27, 2004) (hereafter referred to as Nunn remarks).

15 Matthew Meselson and Julian Robinson, "A Draft Convention to Prohibit Biological and Chemical Weapons Under International Law," *Fletcher Forum of World Affairs* 28, no. 1 (Winter 2004): 58, available at http://fletcher.tufts.edu/forum/28-1pdfs/Meselson.pdf (accessed April 21, 2004).

16 Apart from the five permanent members of the UN Security Council, nonpermanent representatives from Algeria, Brazil, Chile, Germany, Pakistan, the Philippines, Romania, and Spain voted in favor of the resolution.

17 Hypothetically, Russia could veto a Security Council action to sanction it for continuing to supply a noncompliant Iran with nuclear assistance. Presumably, the public exposure of such self-interested action contrary to fiduciary responsibilities for international security would have a chastening effect.

18 See the press release of the Malaysian police authorities on the A. Q. Khan affair, "Investigation on the Alleged Production of Components for Libya's Uranium Enrichment Programme," February 20, 2004, available at www.rmp.gov.my/rmp03/040220scomi_eng.htm (accessed April 27, 2004).

19 Brad Roberts of the Institute for Defense Analyses has insightfully explored how the United States could induce the other major powers to accept greater responsibility for effecting a secure nuclear order. Brad Roberts, *American Primacy and Major Power Concert: A Critique of the 2002 National Security Strategy,* IDA Paper P-3751 (Washington, D.C.: Institute for Defense Analyses, December 2002), available at www.ida.org/IDAnew/Tasks/AmericanPrimacyFinal.pdf (accessed April 27, 2004).

20 See Joseph Cirincione, Jessica Mathews, and George Perkovich, *WMD in Iraq: Evidence and Implications* (Washington, D.C.: Carnegie Endowment for International Peace, January 2004), available at www.ceip.org/Iraq (accessed April 27, 2004).

21 See Barbara Hatch Rosenberg, "Enforcing WMD Treaties: Consolidating a UN Role," *Disarmament Diplomacy* no. 75 (January/February 2004), available at www.acronym.org.uk/dd/dd75/75bhr.htm (accessed April 27, 2004).

22 Trevor Findlay, "Preserving UNMOVIC: The Institutional Possibilities," *Disarmament Diplomacy* no. 76 (March/April 2004), available at www.acronym.org.uk/dd/dd76/76tf.htm (accessed April 28, 2004).

23 State cooperation is helpful, but recent experiences suggest that it is often unlikely to occur and not in itself critical to the success of an inspection regime.

24 See *Iraq: A New Approach* (Washington, D.C.: Carnegie Endowment for International Peace, August 2002), available at www.ceip.org/Iraq (accessed April 27, 2004).

25 For the purposes of this report, we do not consider the cost of the war in Iraq. The war is funded outside the annual budget.

26 See, for example, National Intelligence Council, *Foreign Missile Developments and the Ballistic Missile Threat to the United States Through 2015,* December 2001, p. 8 (hereafter referred to as NIC, *Foreign Missile Developments*): "U.S. territory is more likely to be attacked with [chemical, biological, radiological and nuclear] materials from nonmissile delivery means—most likely from terrorists—than by missiles, primarily because nonmissile delivery means are less costly, easier to acquire, and more reliable and accurate. They can also be used without attribution."

27 For a more detailed description see Joseph Cirincione, "A Much Less Explosive Trend," *Washington Post,* March 10, 2002, sec. B, p. 3, available at www.ceip.org/files/Publications/2002-03-10-cirincione-post.asp (accessed May 6, 2004).

28 Intelligence estimates have concluded for several years that such technology is easily available. "We assess that countries developing ballistic missiles would also develop various responses to U.S. theater and national defenses. Russia and China each have developed numerous countermeasures and probably are willing to sell the requisite technologies. Many countries, such as North Korea, Iran, and Iraq probably would rely initially on readily available technology—including separating RVs [reentry vehicles], spin-stabilized RVs, RV reorientation, radar absorbing material (RAM), booster fragmentation, low-power jammers, chaff, and simple (balloon) decoys—to develop penetration aids and countermeasures. These countries could develop countermeasures based on these technologies by the time they flight-test their missiles." NIC, *Foreign Missile Developments.*

29 State Department spokesman Nicholas Burns said on January 6, 1997, "The government of Cyprus signed a contract January 4 to purchase the Russian S-300 antiaircraft missile system. The United States regrets this step.… Lasting security and peace for the people on the island can only be achieved at the bargaining table, with all sides committed to finding a solution. The past has shown that importing weapons has brought only arms increases from the other side. This new missile system is even more troubling as it threatens to take the arms buildup on Cyprus to a new qualitative level." Department of State Press Statement, "Cyprus Missile Contract," January 6, 1997, available at http://dosfan.lib.uic.edu/ERC/briefing/press_statements/9701/970106ps1.html (accessed April 27, 2004).

30 High-level U.S. officials insist that in the run-up to the 2003 Iraq war they did not call Iraq or consider it to pose an "imminent" threat. See, for example, director of central intelligence George J. Tenet, "Iraq and Weapons of Mass Destruction," Remarks at Georgetown University in Washington, D.C., February 5, 2004, available at www.cia.gov/cia/public_affairs/speeches/2004/tenet_georgetownspeech_02052004.html (accessed April 27, 2004); see also Donald Rumsfeld, Interview on *Face the Nation,* CBS, March 14, 2004, available at www.defenselink.mil/transcripts/2004/tr20040314-secdef0542.html (accessed April 27, 2004).

31 Kissinger couches his call in a realpolitik viewpoint: "As the most powerful nation in the world, the United States has a special unilateral capacity to implement its convictions. But it also has a special obligation to justify its actions by principles that transcend the assertions of preponderant power. It cannot be in either the American national interest or the world's interest to develop principles that grant every nation an unfettered right of preemption against its own definition of threats to its security." Secretary-General Annan strikes a similar chord: "We must not shy away from questions about the adequacy and effectiveness of the rules and instruments at our disposal….[Security Council] members may need to begin a discussion on the criteria for an early authorization of coercive measures to address certain types of threats; for instance, terrorist groups armed with weapons of mass destruction." Henry Kissinger, "Consult and Control: Bywords for Battling the New Enemy," *Washington Post,* September 16, 2002, sec. A, p. 19; Kofi Annan, "Address to UN General Assembly," Remarks in New York, New York, September 23, 2003, available at www.un.org/News/Press/docs/2003/ga10156.p2.doc.htm (accessed April 27, 2004).

32 For an outstanding treatment of this issue see Brad Roberts, "NBC-Armed Rogues: Is There a Moral Case for Preemption?" in *Close Calls: Intervention, Terrorism, Missile Defense and 'Just War' Today,* ed. Elliott Abrams and James Turner Johnson (Washington, D.C.: Ethics and Public Policy Center, 1998).

33 See for example, Neta C. Crawford, "The Slippery Slope to Prevent War," *Ethics & International Affairs* 17, no. 1, (Spring 2003): 30, available at www.cceia.org/viewMedia.php/prmTemplateID/8/prmID/868 (accessed April 27, 2004); Miriam Sapiro, "The Shifting Sands of Preemptive Self-Defense," *American Journal of International Law* 97, no. 3 (July 2003): 599-606.

34 If intelligence cannot identify the type of biological weapon threat, the reliability of this intelligence should be doubted.

35 Again, states remain free to act in self-defense, including on an anticipatory basis, where threats are clearly imminent.

36 European leaders bypassed the UN Security Council in taking military action against Serbia over Kosovo.

37 All nuclear reactors produce plutonium that can be used for nuclear weapon production only after extraction from spent fuel. As such, "separated plutonium" refers to plutonium that has been separated and is usable in a nuclear weapon.

38 George W. Bush, "Address on Weapons of Mass Destruction Proliferation," Remarks at the National Defense University in Washington, D.C., February 11, 2004, available at www.whitehouse.gov/news/releases/2004/02/20040211-4.html (accessed April 27, 2004) (hereafter referred to as Bush, "Weapons of Mass Destruction Proliferation").

39 For a full discussion, see *The Future of Nuclear Power: An Interdisciplinary Study* (Boston: MIT, 2003), available at http://web.mit.edu/nuclearpower (accessed April 27, 2004).

40 The Belfer Center at Harvard University, under the direction of John Holdren and Matthew Bunn, has done several major studies on the issue of nuclear security, with the support of the Nuclear Threat Initiative. Many of the ideas from the center are reflected in this section. For their latest report, see Matthew Bunn and Anthony Weir, *Securing the Bomb: An Agenda for Action,* available at www.nti.org/e_research/analysis_crnwupdate_052404.pdf (accessed June 1, 2004) (hereafter referred to as Bunn and Weir, *Securing the Bomb*).

41 The National Academy of Sciences has recommended that the "highest standards of security and accounting applied to the storage of intact nuclear weapons should be maintained" for all nuclear materials in the disposal process. See *Management and Disposition of Excess Weapons Plutonium* (Washington, D.C.: National Academy of Sciences, 1994) (hereafter referred to as *Management and Disposition of Excess Weapons Plutonium*).

42 These are published as the IAEA's information circular or INFCIRC 225.

43 Some countries—such as the United States—require acceptance of certain conditions over their national origin material. These are bilateral agreements, however, and are not subject to international legal enforcement mechanisms.

44 This was another recommendation of the 1994 National Academy of Sciences study. It suggested that "the United States pursue new international arrangements to improve safeguards and physical security over all forms of plutonium and HEU worldwide." *Management and Disposition of Excess Weapons Plutonium.*

45 Efforts to strengthen the Convention on the Protection of Nuclear Materials and the routine process involved in revising the IAEA's nonbinding standards on physical protection for nuclear materials have been hampered by various obstacles. These include a desire by states to protect their national authority, resistance to opening their nuclear activities to international scrutiny, and industrial, financial, and bureaucratic imperatives.

46 Security Council Resolution 1540 states: "Acting under Chapter VII of the Charter of the United Nations…[the Security Council] decides also that all States shall take and enforce effective measures to establish domestic controls to prevent the proliferation of nuclear…weapons, including by establishing controls over related materials and to this end shall (a) develop and maintain appropriate effective measures to account for and secure such items in production, use, storage and transport; (b) develop and maintain appropriate physical protection measures…"

47 Such assistance is noted in the EU Strategy on Non-Proliferation, the G-8 Global Partnership, and UN Security Council Resolution 1540.

48 Clear red lines, however, will need to be drawn to avoid assisting Israel, India and Pakistan in ways that might assist them in controlling their nuclear arsenals in violation of NPT commitments.

49 See Bunn and Weir, *Securing the Bomb*.

50 Both HEU and plutonium can be used to produce a nuclear weapon, and terrorist groups with money and resources can produce a weapon with either. It is technically simpler, however, to produce a weapon using HEU.

51 Of the nine states known or believed to possess nuclear weapons, the United States, Russia, France, the United Kingdom, and China have ceased production of HEU or plutonium for weapons production. Russia continues to produce 1.5 metric tons of plutonium annually from former production reactors, but the material is not used for weapons, under bilateral agreement with the United States. It is believed that Israel, India, Pakistan, and North Korea all continue to produce material for nuclear weapons.

52 Bush, "Weapons of Mass Destruction Proliferation."

53 Amending the NPT to achieve this result is considered both impractical and ill advised, as reopening the agreement for one purpose would likely lead to its ultimate demise.

54 Mohamed ElBaradei, "Saving Ourselves from Self-Destruction," *New York Times,* February 12, 2004, sec. A, p. 27, available at www.iaea.org/NewsCenter/Statements/2004/ebNYT20040212.html (accessed April 26, 2004) (hereafter referred to as ElBaradei, "Saving Ourselves from Self-Destruction").

55 Observers note that Pakistan's enrichment capability was stolen from URENCO and question the wisdom of adopting the URENCO model. There was nothing inherent in the international nature of URENCO's ownership that allowed A. Q. Khan to steal the information needed to advance Pakistan's nuclear ambitions. Appropriate personnel reliability and technology controls can reduce risks to an acceptable level.

56 Union of Concerned Scientists, "Fact Sheet: Research Reactors Fueled by Highly Enriched Uranium," April 2004, available at www.ucsusa.org/global_security/nuclear_terrorism/page.cfm?pageID=1379 (accessed May 11, 2004).

57 See *Management and Disposition of Excess Weapons Plutonium.*

58 As of December 31, 2003, the Nunn-Lugar program had deactivated 6,252 nuclear warheads and destroyed 527 ballistic missiles, 455 ballistic missile silos, 8 ballistic missile launchers, 124 bombers, 668 nuclear air-to-surface missiles, 460 submarine-launched missiles, 408 submarine missile launchers, and 27 strategic missile submarines. It had sealed 194 nuclear test tunnels, employed more than 22,000 former weapons scientists in cooperative, peaceful endeavors, and removed all of the nuclear weapons from Ukraine, Kazakhstan, and Belarus. The program has also secured thousands of kilograms of nuclear material.

59 See "Statement by G8 Leaders: The G8 Global Partnership Against the Spread of Weapons and Materials of Mass Destruction," June 27, 2002, at www.g8.gc.ca/2002Kananaskis/globpart-en.asp (accessed May 6, 2004).

60 The analysis and discussion that follow are provided by William Hoehn of the Russian-American Nuclear Security Advisory Council and Matthew Bunn of Harvard University. Their work is gratefully acknowledged.

61 Bush, "Weapons of Mass Destruction Proliferation."

62 IAEA director Mohamed ElBaradei: "The current system relies on a gentleman's agreement that is not only non-binding, but also limited in its membership: it does not include many countries with growing industrial capacity. And some members fail to control the exports of companies unaffiliated with the government enterprise." ElBaradei, "Saving Ourselves From Self-Destruction."

63 The Zangger Committee is a body established to help implement the NPT by determining what items will require the application of IAEA safeguards.

64 China is the exception, having recently express interest in joining the Nuclear Suppliers Group.

65 United Nations Security Council, "Non-Proliferation of Weapons of Mass Destruction," United Nations Security Council Resolution 1540, April 28, 2004, available at http://ods-dds-ny.un.org/doc/UNDOC/GEN/N04/328/43/PDF/N0432843.pdf?OpenElement (accessed May 7, 2004) (hereafter referred to as UNSC Resolution 1540).

66 UNSC Resolution 1540.

67 The laws themselves are riddled with loopholes, for example, allowing the Ministry of Defense to exempt itself from export restrictions. See Anupam Srivastava and Seema Gahlaut, "Curbing Proliferation from Emerging Suppliers: Export Controls in India and Pakistan," *Arms Control Today* (September 2003): 12-16, available at www.armscontrol.org/act/2003_09/AnupamandGahlaut.asp (accessed May 6, 2004).

68 Michael Beck, Cassady Craft, Seema Gahlaut, and Scott Jones, *Strengthening Multilateral Export Controls: A Nonproliferation Priority* (Athens, Ga.: Center for International Trade and Security, University of Georgia, September 2002) available at www.uga.edu/cits/documents/pdf/regime_report.pdf (accessed April 16, 2004) (hereafter referred to as Beck, et al., *Strengthening Multilateral Export Controls: A Nonproliferation Priority*).

69 Beck, et al., *Strengthening Multilateral Export Controls: A Nonproliferation Priority.*

70 "Nuclear Non-Proliferation: An Agenda for the Future," Roundtable Conference cosponsored by United Nations Foundation, Belfer Center for Science and International Affairs and the Nuclear Threat Initiative in Cambridge, Mass. April 5, 2004.

71 Beck, et al., *Strengthening Multilateral Export Controls: A Nonproliferation Priority.*

72 Tamer Gabelnick and Rachel Stohl, "Developing Sound Export Control Reforms for Today's Security Environment," in *Challenging Conventional Wisdom: Debunking the Myths and Exposing the Risks of Arms Export Reform,* ed. Tamer Gabelnick and Rachel Stohl (Washington D.C.: Center for Defense Information and Federation of American Scientists, June 2003).

73 "NSG Seeks Agreement on Tightening Export Controls," *NIS Export Control Observer,* February 2004, available at http://cns.miis.edu/pubs/nisexcon/pdfs/ob_0402e.pdf (accessed April 27, 2004); "Developments in International Supplier Regimes," *NIS Export Control Observer,* January 2004, available at http://cns.miis.edu/pubs/nisexcon/pdfs/ob_0401e.pdf (accessed April 27, 2004).

74 Beck, et al., *Strengthening Multilateral Export Controls: A Nonproliferation Priority.*

75 Campbell, et al., *The Nuclear Tipping Point.*

76 See Charles V. Peña, "The Iraq War Makes the Case Against Mini-Nukes," December 10, 2003, CATO Daily Commentary, available at www.cato.org/dailys/12-10-03.html (accessed April 28, 2004); Tod Lindbergh, "Deterrence and Prevention," *Weekly Standard* 8, no. 20 (February 3, 2003), available at www.weeklystandard.com/Content/Public/Articles/000/000/002/162kkofc.asp?pg=1 (accessed April 28, 2004).

77 See, for example, Michael M. May and Zachary Haldeman, *Effectiveness of Nuclear Weapons Against Buried Biological Agents* (Stanford, Cal.: Center for International Security and Cooperation, Stanford University, June 2003), available at http://iis-db.stanford.edu/pubs/20216/MayHaldeman0104.pdf (accessed April 28, 2004); Robert W. Nelson, "Nuclear Bunker Busters, Mini-Nukes, and the U.S. Nuclear Stockpile," *Physics Today* 56, no. 11 (November 2003): 32, available at www.aip.org/pt/vol-56/iss-11/p32.html (accessed May 6, 2004); Michael E. Levi, "Effects of Nuclear-Earth Penetrating Weapons and Other Weapons," Remarks before National Academy of Sciences in Washington, D.C., April 27, 2004, available at www.brook.edu/views/testimony/fellows/levi20040427.pdf (accessed May 6, 2004); William Matthews, "Scientists: Bunker-Busting Nukes Are Unreliable," *Defense News,* May 4, 2004, available at www.nuclearpolicy.org/NewsArticle.cfm?NewsID=1557 (accessed May 6, 2004).

78 Donald Rumsfeld, "Defense Department Budget for Fiscal Year 2004 and Posture of the U.S. Armed Forces," Testimony to the Senate Armed Services Committee, February 13, 2003.

79 Nunn remarks; see also Valery E. Yarynich, "The Ultimate Terrorism," *Washington Post,* April 30, 2004, sec. A, p. 29.

80 Scott D. Sagan, "The Commitment Trap," *International Security* 24, no. 4 (Spring 2000): 85–116.

81 As Israel does not admit having nuclear weapons, it would comply with its obligation to contribute to nonproliferation by explaining how it could secure and account for its fissile materials.

82 The United Kingdom admirably has taken the commitment to nuclear disarmament seriously enough to commission official assessments of how it might be accomplished. According to an official report by the UK Ministry of Defence, "the Government does not believe that it will ever be possible for any of the relevant States to be able to account with absolute accuracy and without possibility of error or doubt for all the fissile material they have produced for national security purposes." This conclusion appears plausible not only for the United Kingdom, and raises questions that must be addressed to assess the meaning and feasibility of securely and verifiably eliminating all nuclear arsenals. UK *Summary Report.*

83 *Verification of Nuclear Disarmament: First Interim Report on Studies into the Verification of Nuclear Warheads and Their Components,* Working Paper submitted by the United Kingdom of Great Britain and Northern Ireland to the Preparatory Committee for the 2005 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, April 23, 2003, available at www.awe.co.uk/Images/n0333117_tcm6-1769.pdf (accessed April 27, 2004).

84 For a detailed analysis and policy agenda in this area, see Rose Gottemoeller with Rebecca Longsworth, *Enhancing Nuclear Security in the Counter-Terrorism Struggle: India and Pakistan as a New Region for Cooperation,* Carnegie Working Paper no. 29 (Washington, D.C.: Carnegie Endowment for International Peace, August 2002), available at www.ceip.org/files/pdf/wp29.pdf (accessed May 11, 2004).

85 For outstanding recommendations on nuclear risk reduction, see Michael Krepon, *Moving from MAD to Cooperative Threat Reduction,* Stimson Report no. 41 (Washington, D.C.: Henry L. Stimson Center, December 2001), available at www.stimson.org/southasia/pdf/MADtoCTR.pdf (accessed April 27, 2004).

86 See, for example, Michael Krepon and Ziad Haider, eds., *Reducing Nuclear Dangers in South Asia,* Stimson Report no. 50 (Washington, D.C.: Henry L. Stimson Center, February 2004), available at www.stimson.org/southasia/pubs.cfm?ID=92 (accessed April 28, 2004); see also reports by the Kashmir Study Group, available at www.kashmirstudygroup.com (accessed April 28, 2004) and the International Crisis Group, available at www.crisisweb.org/home/index.cfm?id=1268&l=2 (accessed April 28, 2004).

87 For example, one of the grievances cited by Al Qaeda's strategist, Ayman Al-Zawahiri, is that "the Americans and the Jews" have weakened Egypt and other Muslim states "through signing peace agreements and *treaties that ban weapons of mass destruction for us only,* disarming Sinai, and allowing direct U.S. occupation of our land and holding joint military exercises" (emphasis added). Ayman Al-Zawahiri, *Knights Under the Prophet's Banner* (Al-Sharq Al-Awsat: London, 2001), available at www.fas.org/irp/world/para/ayman_bk.html (accessed May 11, 2004).

88 Norman Wulf, Interview with Ralph Dannheisser, April 21, 2000, available at http://hongkong.usconsulate.gov/uscn/wh/2000/042101.htm (accessed April 27, 2004). In speaking of Israel's "nuclear weapons option," this U.S. statement acknowledged this capability more starkly than Israel ever has. Secretary of State Colin Powell reaffirmed at a press briefing that "it has always been U.S. policy that we would like to see that whole region free of weapons of mass destruction." Colin Powell, "Foreign Press Center Briefing," Remarks in Washington, D.C., April 15, 2003, available at www.state.gov/secretary/rm/2003/19662.htm (accessed May 6, 2004).

89 The chemical and biological weapon conventions conclude that there is no legitimate basis for possessing these weapons. The greatest and perhaps only legitimate ground for possessing nuclear weapons is to deter threats to the existence of the possessing state or its allies. It is not surprising, then, that a state facing adversaries that reject its right to exist would perceive an existential threat and not sign or implement agreements requiring it to forgo acquisition of the sort of strategic deterrence that nuclear weapons may provide. Even if such a deterrent is not militarily necessary, relinquishing such a deterrent may be politically impossible in the face of existential threats.

90 Israel apparently means that it would not be the first to use nuclear weapons in the region.

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