SECTION TWO

The Elements of an Enforceable Regime

CHAPTER THREE: STRENGTHENING ENFORCEMENT

Strengthened enforcement is a critical part of a nonproliferation strategy of universal compliance. The administration of President George W. Bush has significantly improved enforcement: It has both developed new mechanisms, such as the Proliferation Security Initiative, which blocks illicit transfers, and refocused international attention on export control mechanisms.

The flaw in the Bush administration's enforcement approach is its narrow reliance on counterproliferation and preemptive force. This emphasis 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 the coercive options but further strengthen a broad set of voluntary and mandatory enforcement mechanisms on both the national and international levels.

New International Law

In many countries, stealing nuclear material is no more of a crime than stealing a car. 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."[14]

Strengthened international law 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 be both: 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. UN 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.[15] 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 mandatory declaration system that will help distinguish between legitimate and illegitimate trade. 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 notify the IAEA of each approved export of sensitive nuclear technology or material on a timely basis. Pursuant to Resolution 1540, the UN 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.

Furthermore, 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 proscription on assistance. The

rule would raise the costs and risks of cheating on transparency and safeguard requirements, 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.

The UN 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.

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 it acquired from another country before that withdrawal. This resolution should require further that such facilities, equipment, and nuclear material should 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 ACTION

While an enforced legal regime related to nuclear proliferation is taking shape, companies, banks, and even nongovernmental organizations should join forces to ensure that international trade and lending practices also address the problem. *Voluntary measures* are a way to do so quickly. In recent years, such measures have been pursued as a means for states and nonstate actors alike to avoid new regulation or mitigate serious problems, in the absence of or pending the passage of new laws.

Voluntary measures would be no substitute for seeking an international regime to criminalize proliferation. Indeed, such negotiations should be expedited. At the same time, voluntary measures would permit key players, especially in the commercial arena, to take early action. International consensus on the need for such measures would add moral force to the measures themselves, and strong impetus to the negotiations to establish the legal regime.

For example, countries might volunteer to pursue a code of conduct that would prohibit aiding and abetting proliferation of nuclear components and technologies. The international code of conduct regarding proliferation of missile components is an example of such an approach. The Missile Technology Control

Regime (MTCR) is already in place, and has long operated as a mechanism to control exports from producers of missile-related technologies. The missile technology code of conduct has come into existence just in the past five years, as a way to reinforce the MTCR. The code draws additional countries, not members of the MTCR, into an international consensus on the need to control exports related to missile technology. Thus, it is a voluntary mechanism that reinforces an existing regime and seeks to expand the circle of countries that hold to its principles.

Banking and Lending Institutions

The banking industry has already become involved in an array of voluntary mechanisms in recent years, such as those that address concerns about environment and labor policy. The "Equator Principles," which originated with the World Bank, provide guidelines for lending to countries that historically have not shown much concern about maintaining environmental or social standards in large projects. The Equator Principles ask lenders to require that such standards be maintained in a project as a condition of lending. An increasingly wide array of banks subscribe to the principles in their lending practices, if only to avoid the embarrassment of lending to a project that turns out to be environmentally unsound or harmful to local cultures.[16]

Banks could also embrace "nonproliferation soundness" as a principle of their international lending. The damage caused by nuclear proliferation could be as destructive as the long-term effects of environmental or social damage, with more immediate and devastating effects on the global economy. Some have calculated that a single nuclear bomb, detonating in lower Manhattan, would cost the world economy three trillion U.S. dollars within

one year.[17] Preventing such an event is thus, for banks, sound business practice.

An example of how such a voluntary approach might work in international lending is provided by the case of the company in Malaysia that was producing centrifuges for Libya on contract to a front company in Dubai. 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 Malaysian firm had to borrow money for this upgrade in its capacity, any viable company has to seek loans from time to time.

Therefore, banks might consider, as one condition for granting a loan, whether a company has a clean nonproliferation "bill of health." This nonproliferation standard might be added to an existing mechanism, such as the Equator Principles. Alternatively, a wholly new code of conduct might be drawn up to highlight the particular problems associated with nuclear proliferation. If a company contributed to the building of an illicit nuclear bomb somewhere, and that bomb fell into the hands of terrorists, the damage to the international community would be profound.

Not all lending comes from the big multinational commercial banks or international lenders such as the World Bank. In many countries, especially in Asia, private and state banks are tightly connected. Here it may be necessary to develop a hybrid system that is not strictly voluntary, but involves instruction from the state. For example, the Chinese government could require banks to incorporate a nonproliferation standard into lending. This would be an extension of the increasingly developed Chinese export control system.

Investment Houses

Companies not only borrow, they also raise capital by seeking investors. Increasingly, large investment managers and equity funds are pushing companies to comply with best practices as a prior condition of investment. Their concern is the reputational damage to their portfolios that could result if companies in which they are investing commit human rights violations or other abuses.

The approach of F&C Asset Management, a leading European investment manager with £118.2 billion under management, is an example. F&C "engages in dialogue with the companies in which it invests, in order to assess how they manage risks related to governance, social, environmental and ethical factors. They do this to encourage good business practices that would enhance the value of the company for shareholders."[18] Examples of good practice would include developing specific policies to target the risks, establishing special review committees, defining accountability and reporting procedures, and training staff. Again, including nuclear proliferation on the list of risk factors should be attractive to investment firms concerned about damage to their reputations.

Manufacture and Service Industries

Large industries and manufacturing firms, including multinationals, could adopt their own codes of conduct to combat proliferation problems. Like the lending and investment institutions, at least one industry group has already developed a voluntary program to address a significant international issue. The De Beers Group, the world's leading diamond producer, worked together with governments and nongovernmental organizations (NGOs)

to develop the Kimberley Process, a mechanism to halt the trade in conflict diamonds.

Kimberley includes both an agreed-upon international system for certifying diamond shipments, and additional recommendations for diamond mining, exports and imports, and standardized statistics on the diamond trade. It was a complex but ultimately successful process that engaged industry, government, the NGO community, and the UN. An important factor in its success was the media spotlight that NGOs were able to shine on the impact that trade in conflict diamonds was having.[19]

Given the dire consequences of a potential nuclear, chemical, or biological attack, media and public attention should also be a factor in influencing companies to take voluntary measures to control trade in weapon components. However, because—mercifully—such attacks have not yet occurred on a large scale, the media and public have been notoriously immune to the dangers. Pictures of the Aum Shinrikyo sarin attack in the Tokyo subway, or of the Kurds gassed by Saddam Hussein, have had some impact, but it has been ephemeral. Lack of media and public attention remains a serious constraint on development of such measures in the nonproliferation arena.

Another issue is the dual-use nature of many components that could be used in weapon programs. The Malaysian company implicated in the sale of centrifuges to Libya for uranium enrichment pleaded that it was only manufacturing certain components, and it had no idea what their exact end use was to be. This problem occurs particularly in the chemical and biological spheres, where every fertilizer plant could be turned to the production of chemical weapons, and every pharmaceutical plant to the production of biological weapons.

ADAPTING EXISTING TECHNOLOGY AND PROCEDURES

Despite the diverse nature of trade in weapon components, technology as well as procedures could be put to work in solving the complicated problems of tracking and certifying end use. Such measures could be fairly intensive, such as marking individual pieces in shipments with a bar code, fiber-optic chip, or some other indelible identifying and tracking device. These technologies are already widely in use for business purposes such as inventory control. Nonproliferation assurance in this case would be an add-on to well-established procedures.

Other technologies and procedures, already existing in other sectors, might be used to track the transfer or shipment itself. For example, satellite monitoring of ships at sea is already established for certain purposes, such as tracking illegal fishing. Alternatively, procedures established to ensure proper labor or environmental practices for ships in port might be developed to provide nonproliferation assurance.

The North Koreans, for example, have complained that strict Japanese implementation of International Maritime Organization (IMO) regulations on environmental practices, including shipboard inspections, have slowed their seagoing trade with Japan to a virtual standstill. Since international concern has grown about North Korean trade in weapon materials or components, such well-established measures might also play some role in nonproliferation.

Indeed, it is high time to undertake a comprehensive review of how existing maritime and customs control measures could contribute to new, tougher enforcement activities under the Proliferation Security Initiative (PSI). Already-existing technologies and procedures, not only in the IMO system but also under

international agreements to ban trade in endangered species or to preserve natural resources such as fisheries, could provide good ideas or even the prototype for a layered approach to defeating trade in weapon components.[20]

While important international measures can occasionally be achieved quickly—as Security Council Resolution 1540 was—national and international laws and regulations generally take much longer. In the meantime, voluntary measures, which have not so far played a major role in nonproliferation policy, should be developed to tighten proliferation controls and effective enforcement.

SUMMARY OF POLICY RECOMMENDATIONS

- Develop model national laws to criminalize, deter, and detect nuclear proliferation pursuant to UN Security Council Resolution 1540. (p. 53)
- Develop universal international law to criminalize nuclear weapon and material proliferation and facilitate prosecution of states and nonstate actors. (p. 54)
- Develop a declaration system or reporting requirement to distinguish between legal and illegal nuclear trade. (p. 55)
- Encourage the IAEA to adopt rules restricting nuclear assistance to states not in full compliance with NPT obligations. (p. 55)
- Adopt resolutions through the UN Security Council to hold states that withdraw from the NPT responsible for violations of the treaty, and prohibit their continued use of materials and facilities acquired while party to it. (p. 56)

- Pursue voluntary codes of conduct and related measures with investment, banking, and manufacturing firms to discourage and prevent nuclear trafficking. (p. 57)
- Undertake a comprehensive review of how existing maritime and customs control measures could contribute to new, tougher enforcement activities under the PSI. (p. 62)

Tough Diplomacy: A Revived UN Security Council

The five veto-wielding members of the Security Council—the United States, China, France, Russia, and the United Kingdom, and their leaders—not an amorphous "UN," will largely determine whether a rule-based international system can succeed. If they fail to lead, they will not only undermine nonproliferation, they will further weaken the UN system and their own power.

Security Council Resolution 1540 was a welcome positive step after years of indecision and rancor among Security Council members over Iraq, North Korea, and, to some extent, Iran. Serious doubts remain, however, whether the five key rule enforcers permanently ensconced in the Security Council can reconcile their often-competing interests sufficiently to present a united front against proliferation. Indeed, China and Russia have been at various times major sources of proliferation concern. They, and occasionally the other permanent members of the council, including the United States, too often eschew council action for fear of setting enforcement precedents that could complicate their own freedom of action. The Security Council's credibility and its disposition to enforce nonproliferation are gravely weakened when its members' hands are not clean.

No magic formula can bring the United States, Russia, China, France, and the United Kingdom into concert.[21] 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 nuclear threats and the priority of the policies needed to achieve universal compliance with nonproliferation norms and laws.

A logical next step after Resolution 1540 would be for the U.S. administration to orchestrate a summit of the heads of state of China, France, Russia, and the United Kingdom as soon as possible after the 2005 NPT Review Conference, to clarify the commitments they will make to advance universal compliance with nuclear nonproliferation norms and rules. 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. Announcing the summit before the NPT Review Conference would also increase the prospect that the conference would produce consensus, rather than discord.

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 council should strengthen the monitoring committee established to collect and evaluate state submissions. The committee should be modeled on the successful example of the Counter-Terrorism Committee, which monitors Resolution 1373 and which is now being bolstered with an executive director and a staff directorate. Given the importance of Resolution 1540, a similar approach is warranted. The committee 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.

SUMMARY OF POLICY RECOMMENDATIONS

- Convene a P-5 summit to specify national commitments needed to strengthen nonproliferation mechanisms and laws. (p. 65)
- Strengthen the monitoring committee established for UN Security Council Resolution 1540 to collect and evaluate state reports documenting implementation of nonproliferation laws. (p. 65)

Inspections That Work

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.

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 an increased budget and expanded powers. The IAEA suffered more than a decade of zero budget growth despite a growing number of responsibilities.

As President Bush, IAEA Director General ElBaradei, and the UN's report of the Secretary-General's High-Level Panel on Threats, Challenges and Change have suggested, the Additional Protocol to the existing safeguards agreements should be mandatory for all states. Fewer than a third of the 191 UN member states have brought into force this protocol allowing broader and

more intrusive inspection of nuclear facilities. (The United States ratified the protocol in early 2004.) 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), the NPT Review Conferences, the North Atlantic Treaty Organization (NATO), the Asia-Pacific Economic Cooperation Forum, and the Organization of American States. As discussed in chapter 4 of the present report, "Stopping Transfers: Export Controls and Interdiction" (p. 116), nuclear transfers by members of the Nuclear Suppliers Groups should be made conditional on ratification.

The United States should encourage the UN secretary-general to charter a review of the inspections performed by both the UN Special Commission on Iraq (UNSCOM) and the UN Monitoring and Verification Commission (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, the inspection process ultimately led to the discovery and elimination of all of Iraq's unconventional weapons and production facilities; inspectors were also able to destroy or monitor the destruction of chemical and biological weapons agents.[22]

Based on that inspections review, the UN Security Council should consider establishing under its authority a permanent international nonproliferation inspection capability. Other inspections capacities exist: the IAEA for nuclear programs, and the Organization for the Prevention of Chemical Weapons (OPCW) for chemical materials and facilities. However, there is currently no inspection authority able to carry out special inspections, to cover states that do not participate in the relevant treaties, or to address

the potential presence of biological weapons and missiles. This new capability would fill these gaping holes while providing for close coordination with the IAEA and the OPCW.

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 expand it to other nations as needed. 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.

Dr. 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.[23] Other useful studies include an analysis by Trevor Findlay of the Verification Research, Training, and Information Centre in London.[24]

ELEMENTS OF SUCCESSFUL INSPECTION REGIMES

Past experience suggests that international inspections are an effective response to proliferation when three factors are present: a strong mandate, sufficient inspection budgets and resources, and consensus on robust consequences, including the possible use of military force.

A Strong Mandate

A united UN 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 permanent members of the Security Council are at stake. Their failure to act when the IAEA sent the North Korean case to it in 2002, and the council's apparent reluctance to have the Iran case referred to it, make clear that achieving political resolve is a major challenge.

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,[25] and shared intelligence from many nations. This final factor is absolutely critical to the success 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. 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.

Consensus on Robust Consequences, Including the Possible Use of 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 compliance 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 cases of obstruction.[26]

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. The involvement of a UN Security Council inspectorate could make the Security Council more likely to use force, as it would have its credibility at stake.

SUMMARY OF POLICY RECOMMENDATIONS

- Urge the UN secretary-general to charter a review of the performance of its two Iraq-focused commissions, UNSCOM and UNMOVIC. (p. 67)
- If the findings of this review warrant, urge the UN Security Council to consider establishing a permanent international nonproliferation inspection capability for chemical and biological weapons and delivery systems. (p. 67)
- Use all venues to advocate adoption of the IAEA's Additional Protocol by all states. (p. 66)

- 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. 69)

The Use of Force: Counterproliferation and Preemption

Counterproliferation has a key role in nonproliferation policy. In *National Strategy to Combat Weapons of Mass Destruction* (December 2002), 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 military forces ready to defeat attacks involving unconventional weapons. Currently, however, U.S. strategy and budgeting substantially overemphasize military responses to proliferation at the expense of the other two critical pillars. Terrorism, in addition, presents the new challenge of dispersed groups and facilities that are difficult to attack with traditional military means. A broader counterproliferation approach is necessary.

Efforts to strengthen counterproliferation should focus on four areas, the first being the ability of U.S. forces to fight in a nuclear, chemical, or biological warfare environment. Activities to enhance U.S. capacity in this area would include research on and acquisition of chemical and biological warning sensors, vaccines, protective coverings and sealed vehicles, and means of base protection. Second, new conventional weapons for attacking chemical or biological arms must also be pursued. Third, better equipment and training for police, firefighters, and other service personnel

most likely to be involved in terrorist pursuit and response within the United States must be developed and made available. Fourth, accurate, timely intelligence to detect illicit activity and potential threats is a critical element that must be continuously reviewed and improved.

PROSPECTS OF COUNTERING MISSILE ATTACKS

The bulk of the U.S. counterproliferation defense budget is devoted to antimissile weapons—currently some $11 billion per year, out of a total of roughly $13 billion—and most of this is spent on a national system to counter long-range missiles.[27] This allocation is greatly disproportionate to the threat from ballistic missiles and does little to defend against the most probable threats. The U.S. intelligence community and military officials have concluded for years that the United States is most likely to be attacked with a nuclear weapon covertly delivered on a ship, plane, or truck.[28]

Of the more than 190 nations in the world, 30 have ballistic missiles. Most of these are friends of the United States, and most (i.e., 19) have only short-range missiles. Only China and Russia currently are able to attack the United States with nuclear warheads on long-range, land-based missiles.[29] Only one hostile state, North Korea, has the potential to hit even part of the United States with a missile launched from its own territory. The most significant missile threat today comes from the slow but steady increase in the number of states testing medium-range ballistic missiles. Seven nations—China, India, Iran, Israel, Pakistan, North Korea, and Saudi Arabia—now have such missiles. In sum, the ballistic missile threat today is limited and changing relatively slowly.[30]

Research on antimissile systems should be depoliticized and

restructured. All systems should undergo thorough, realistic testing to ensure that the United States and its armed forces get weapons that work. The president should ask the Joint Chiefs of Staff, absent political pressures, for their assessments of the missile threat and their budget recommendations for defensive systems. When the Joint Chiefs were asked in 1993, they recommended that research be funded at modest levels for a national system to counter long-range missiles and that the majority of the funds be spent on effective interceptors for the short-range threat U.S. troops and U.S. allies actually faced. Only modest changes in the threat have occurred since then.

There are several practical means of addressing the missile threat. Efforts to intercept missiles while they are outside the atmosphere can be easily thwarted by lightweight decoys and other countermeasures available to any country capable of building a long-range missile. The Alaska-based antimissile system has not proved capable of defeating these countermeasures and has experienced substantial schedule and testing delays, budget overruns, and technical problems. Military planners cannot and do not count on it to provide an effective defense. A better defense against a North Korean missile would be a "pre-boost-phase intercept" that would destroy any threatening missile on its launch pad.

Also, the Alaska system could not intercept a short-range missile launched from a cargo ship off the U.S. coast. It is impractical to proliferate short-range anti-missile 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, Iran's Shahab and Pakistan's Ghauri, should be developed. These missiles could threaten U.S. forces in the field and U.S. allies. It is not clear whether any of the nations that have these weapons also have nuclear warheads suitable for missiles, but their acquisition of such warheads cannot be ruled out in the future. In other areas, research on adapting the antiaircraft system on Aegis ships to counter short-range missiles should continue. Despite substantial funding, however, progress has been slow, and expectations about the military utility of the Aegis system should be modest.

Experiences in South Asia and Cyprus (where the United States objected to the introduction of anti-missile systems as a destabilizing move in this tense region) demonstrate that even short-range anti-missile systems 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 moral obligation to take preemptive military action against imminent threats to its national security or that of its allies. Future proliferation threats, however, may not appear as immediate dangers.[31] The United States had trouble acquiring broad support for the invasion of Iraq because U.S. actions were largely perceived as preventive—destroying a threat before it was imminent—rather than preemptive—destroying an imminent threat.

Table 3.1. The Thirty Nations with Ballistic Missiles

NINETEEN COUNTRIES POSSESS ONLY SHORT-RANGE BALLISTIC MISSILES (RANGE UNDER 1,000 KILOMETERS).			
Afghanistan	Greece	South Korea	Ukraine
Armenia	Iraq	Syria	United Arab Emirates
Bahrain	Kazakhstan	Taiwan	Vietnam
Belarus	Libya	Turkey	Yemen
Egypt	Slovak Republic	Turkmenistan	
SEVEN COUNTRIES POSSESS MEDIUM-RANGE BALLISTIC MISSILES (RANGE OF 1,000–3,000 KILOMETERS).			
China	Iran	North Korea	Saudi Arabia
India	Israel	Pakistan	
ONE COUNTRY POSSESSES INTERMEDIATE-RANGE BALLISTIC MISSILES (RANGE OF 3,000–5,500 KILOMETERS).			
China			
FIVE COUNTRIES POSSESS INTERCONTINENTAL BALLISTIC MISSILES (WITH RANGES OF 5,500+ KILOMETERS)			
China	Russia	United States	
France	United Kingdom		

Leaders as diverse as former Secretary of State Henry Kissinger and UN Secretary-General Kofi Annan have called for an initiative to establish international guidelines for possible military action against grave but nonimminent threats.[32] The UN High-Level Panel has recommended criteria for the Security Council to use in considering whether to authorize the use of force.[33] 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 UN 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 criteria should be considered in devising guidelines: the standards of imminence; deterrability of the threat; confidence in intelligence assessments; clarity of purpose; cost-benefit ratio of military action; and breadth of political authority.[34]

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.[35] 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 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 the impact on international order.

Nuclear weapons pose incomparably grave threats in scale and potential damage to international order. Biological weapons can theoretically kill huge numbers of people and sow international disorder, but few potential adversaries have the combination of biological agent and dispersal mechanism to wreak such damage. Chemical weapons are relatively easy to develop and deploy, but the scale of potential impact is far less than for either nuclear or biological weapons. The threshold warranting military action—that is, the degree of imminence required—should vary inversely with this risk. That is, among the three, action against a nuclear threat should require the lowest degree of certainty and imminence. 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 were demonstrably deterrable than against those who appeared unbowed by the threat of military retaliation. Ideally, the United States, with international backing, could simply destroy the offending nuclear capability with little military or political consequences. But rarely are such conditions encountered. Trade-offs must be weighed

between the consequences of military action 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 only used chemical weapons against targets that were militarily weak and did not possess chemical defenses. After the 1991 war, faced with a determined international military coalition, Saddam was clearly deterrable.

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 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 U.S intelligence assessments are improved and internationally vetted, it should be easier to generate shared confidence. Intelligence can provide the necessary leads for conducting cooperative inspection or verification of violations, further building the unity needed for joint military action.

Two elements should be considered in evaluating intelligence. First, 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 invasion of another state, if these weapons are the

justification for the invasion. Second, if and when threat assessments are uncertain, policy makers should not delete caveats and uncertainties in advocating actions of last resort (i.e., the use of force). Use of force may still be sound policy, but decision makers should be able to demonstrate its soundness without downplaying intelligence uncertainties.

Distinguish between Actions to Target Weapons and Actions to Remove Regimes

The costs and risks of targeting threatening weapons can be more readily contained than the costs and risks of removing governments. Military action to remove governments, therefore, should be subject to the most rigorous criteria, while action to remove weapons and related infrastructure could be justified more readily.

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.

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. The difficulty of making such assessments in the middle of a crisis 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 prevention and enforcement actions that, where possible, should be pursued before a resort to force against threats that are not self-evidently imminent.[36] This prior standard would provide a benchmark for a state, a coalition, or the UN Security Council to use in arguing that no further recourse is left but 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 Prospects for Success and the Cost-Benefit Ratio of Military Action

Force should be applied 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 a clear need for 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 preventively 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 UN 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.[37] Even a partial international consensus on guidelines for preventive use of military force 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. Because the Security Council's pace of deliberation is generally too slow to begin in the midst of a crisis, international negotiation of guidelines for military action in advance increases the likelihood of an effective international response.

SUMMARY OF POLICY RECOMMENDATIONS

- Enhance and broaden counterproliferation strategy beyond purely military responses to encompass the capabilities most likely to deter and defend against the use of nuclear, biological, and chemical weapons. (p. 71)
- Restructure missile defense research and subject all antimissile systems to realistic testing. (p. 72)

- Develop international guidelines for preventive military action in the absence of imminent threat. (p. 75)

CHAPTER FOUR: BLOCKING SUPPLY

Securing the Nuclear Complex

A well-organized and financed terrorist group could produce a basic nuclear weapon—but only if it first could acquire enough HEU or separated plutonium to fuel a bomb.[38] The terrorist threat worsens the already acute risk of theft or diversion by states from the inadequately secured stockpiles of these materials around the world. *Securing weapon-usable fissile materials is, therefore, the single greatest nonproliferation priority.* As President George W. Bush has said, "The nations of the world must do all we can to secure and eliminate nuclear…materials."[39]

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 existing gaps. While economic and political compromises will have to be made in order to meet the security imperative, a tightened regime can be compatible with full use of nuclear energy and should be undertaken in cooperation with the nuclear industry. It is important to recognize that the viability of the nuclear industry is at stake: The violent use of stolen fissile material or the collapse of the nonproliferation regime would set back the use of nuclear power generation worldwide.[40]

A strategy to prevent terrorists and additional states from acquiring nuclear weapons must include these four objectives:

- **SECURE WHAT EXISTS NOW.** State-of-the art security must be applied to all nuclear weapons and weapon-usable materials, whether civilian or military, everywhere. Where effective security is impossible, materials must be relocated or eliminated as quickly as possible.
- **END PRODUCTION OF WEAPON-USABLE MATERIALS.** The production of highly enriched uranium should be permanently ended and separation of weapon-usable plutonium should be suspended until current stocks are drawn down. No new countries should build or operate enrichment or reprocessing facilities. Rather, states without such facilities should have internationally guaranteed access to fuel services from existing fuel producers. All states—nuclear weapon and nonweapon alike—should place existing fuel cycle facilities under new institutional controls.
- **END USE.** Civilian research, power, and naval reactors that run on weapon-usable fuels should be converted to alternate fuels or shut down. Conversion or shutdown of civilian research reactors, including those in the United States, should be accelerated and the fuel returned to the states of origin. Permission for convertible reactors to use U.S.-origin HEU fuels should be rescinded, and material returned to the United States for disposal. The G-8 should use money from its Global Partnership against the Spread of Weapons of Mass Destruction for these purposes.
- **ELIMINATE SURPLUS MATERIALS.** Large stockpiles of weapon-usable materials in countries around the world should be securely eliminated. The U.S.-Russian plutonium disposition program should be rethought, and must include a greater focus on securing materials pending their disposition and the reinvigoration of disposition projects.

Each of these objectives is worthwhile on its own; together, they make up a comprehensive and aggressive yet realistic approach to nuclear material security. However, many of the needed steps will require significant adjustments by, and contributions from, numerous countries, and will therefore be controversial. Leadership, cooperation, and sustained political support at the head-of-state level will be a prerequisite for success.

The new standards and initiatives proposed here must apply equally to all states with nuclear materials and facilities, 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 security standard and operational guidelines 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 highest standards that exist for defense-related materials in the United States or France. Terrorists searching for such materials will not distinguish among sources—they will go where access is easiest.

SECURE WHAT EXISTS NOW[41]

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.*[42]

Currently, the IAEA publishes voluntary standards for nuclear material protection.[43] These standards do not adequately protect all direct-use nuclear materials against current threats, yet many states' security practices do not meet even these minimum

Table 4.1. Global Stocks of Fissile Material[a]
(in Metric Tons)

GLOBAL STOCKS			
CATEGORY	**PLUTONIUM**	**HEU**	**TOTAL**
Civil Stocks (rounded)	**1,700**	**175**	**1,875**
Power and Research Reactor Programs	1,595[b]	50	
Declared Excess[c]	107	125 (U.S. only)	
Military Stocks	**155**	**1,725**	**1,880**
Primary	155	1,250	
Naval and Other	–	175	
Russian HEU Declared Excess	–	300	
Total	**1,855**	**1,900**	**3,755**

Note: HEU, highly enriched uranium.
Source: David Albright and Kimberly Kramer, "Fissile Material: Stockpiles Still Growing," *Bulletin of the Atomic Scientists,* 60, no. 6 (November/December 2004): p. 14; see also www.isis-online.org/global_stocks/summary_tables.html#table1.

a End of 2003.
b This figure includes 230 tons of separated unirradiated plutonium.
c Russia, the United Kingdom, and the United States have declared this amount of their military plutonium in excess of their defense needs. It will be consumed for civilian uses.

Table 4.2. The Forty-Six Countries Known to Possess Weapon-Usable Uranium

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

guidelines. A new, enhanced global standard should be established requiring that the security of nuclear stocks in *all* states be brought up to the highest standards technically possible.

The United States and its allies should lead this international effort,[44] starting with the creation of a high-level "Contact Group to Prevent Nuclear Terrorism," including the United States, Russia, the United Kingdom, France, China, India, Israel, Pakistan, Japan, Germany, Brazil, and any other states that possess weapon-usable material and wish to join. States that have produced and exported weapon-usable materials (including the United States, Russia, and China) would have particular responsibilities within this group, whose goal would be to develop a new, single, enhanced standard for nuclear material and weapons security. By opening participation to all states that possess stockpiles of fissile materials, a contact group would overcome the problem

of India, Pakistan, and Israel not being members of the NPT. (As an informal venue, a contact group would not confer 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. Industry and technical communities should be actively involved. The high level of the contact group would spotlight public and media attention on the nuclear security challenge and help to overcome the many bureaucratic and institutional barriers to progress.[45]

UN Security Council Resolution 1540's requirement that all states must "develop and maintain appropriate effective physical protection measures" could provide an already approved basis for adopting the new standard as a legal commitment for all countries once the requirements have been set by the contact group.[46] Previous efforts to improve nuclear security, including through the Convention on the Physical Protection of Nuclear Materials, will provide valuable lessons, but difficulties encountered in these attempts should not be allowed to deter this more ambitious effort from being pursued, this time with greater political support. It merits repeating, however, that serious and sustained political leadership will be necessary to break through the political and financial barriers to improved nuclear material security.

Once the new standards and obligations to implement them are established, countries should be offered several ways to comply. For civilian sites, this compliance could be demonstrated through acceptance of IAEA International Physical Protection Advisory Service inspections. The security of military facilities is more complex, but additional transparency and information sharing between states possessing weapon-usable materials would be a

useful mode of confidence building. The wealthiest states should also provide assistance to other countries to ensure they can meet these new standards, including financing for security upgrades and relocation of materials from states that cannot meet state-of-the-art standards.[47] This assistance can be provided in large part by the G-8 Global Partnership against the Spread of Weapons of Mass Destruction, which has allocated $20 billion over 10 years for this effort, although additional funds and a broadened scope beyond the former Soviet Union will be necessary. Assistance should include sharing best practices on personnel reliability and physical protection similar to those provided by the international community to states of the former Soviet Union.[48] The costs of such assistance are minuscule compared to the economic, political, and strategic costs of a terrorist attack committed with nuclear materials obtained from poorly secured stocks.

To further reduce the threat from nuclear terrorism, the United States and its allies should also reorient and more aggressively pursue the Global Threat Reduction Initiative (GTRI), which was launched in 2004 by the United States. The GTRI seeks to perform a global cleanout of nuclear materials from vulnerable research facilities and to either convert or shut down research reactors that operate on weapons-grade uranium. Current plans call for implementing GTRI goals within ten years. The major obstacles to faster implementation of the program are inadequate staffing and financing, and a disproportionate emphasis on conversion—rather than shutdown—of older, unnecessary facilities. More creative approaches, including a larger number of international partners, innovative contracting, and undertaking multiple operations simultaneously, are needed. With the necessary resources and emphasis, the ten-year goal can—and should—be met in four years.

Because civilian facilities are among the most vulnerable sources of nuclear materials worldwide, securing and eliminating these stocks of material should be given relative priority. Several dozen countries possess vulnerable weapon-usable materials (almost exclusively uranium) for use in research reactors. Absent a compelling rationale for their continued use, these materials should be removed. The United States, working with Russia and other partners, should accelerate efforts to relocate the vast majority of these materials in four years, with funding levels of at least $50 million per year.[49] Money should not be allowed to constrain this vital national security undertaking—dollar for dollar, the benefit will be huge. The United States needs to recognize the special risks associated with vulnerable HEU in the states of the former Soviet Union and prioritize efforts to secure this material, including its rapid repatriation to Russia, or even its relocation to the United States, as was done in Project Sapphire in 1994.[50] Rapid security upgrades of Russian sites containing high-risk HEU could be completed within one year.

NUCLEAR TERRORISM

Related but 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 devises (RDDs, also known as dirty bombs) and attacks on nuclear facilities, including power and research reactors. These efforts are beyond the scope of this study, but are covered in extensive detail in Charles Ferguson et al., *The Four Faces of Nuclear Terrorism* (Monterey, Calif.: Monterey Institute for International Studies, 2004).

END PRODUCTION OF WEAPON-USABLE MATERIALS

Enough civil and military weapon-usable materials exist globally to produce well over 100,000 nuclear weapons. As Table 4.1 shows, 300 metric tons of military material has been designated as excess: It is unneeded. The entire 3,755 metric tons of HEU and plutonium are difficult and expensive to protect. Effective means of disposing of large amounts of plutonium do not yet exist. For these reasons, in 1994 the U.S. National Academy of Sciences called surplus stockpiles "a clear and present danger" to international security.[51] Yet established producers continue to make more of these materials, and several other countries are considering or actively seeking to acquire their own facilities to add to the excess.[52] The continuing production of HEU and separation of plutonium are a global anomaly: acutely dangerous, expensive, and wholly unnecessary. The two halves of the threat are intimately linked: Neither can be addressed alone. Establishing a new fuel cycle system will require creating benefits for states that forgo enrichment and reprocessing; imposing costs on those that do not; and, for current producers, accepting steps of equal consequence. Specifically, successful fuel cycle reform has three necessary elements: providing internationally guaranteed fuel services to states that do not enrich and reprocess; banning further production of HEU; and implementing a plutonium production pause.

No New Facilities/Guaranteed Fuel Services

President Bush, the director general of the IAEA, the UN secretary-general's High-Level Panel, and others have endorsed radical fuel cycle reform. On February 11, 2004, President Bush 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.[53]

Unfortunately, while it recognized the risks associated with the expansion of nuclear production capabilities into new states, the statement failed to take account of the dangers posed by the continued production of weapon-usable materials in states where they already exist. Little progress in furthering the president's proposed reform has yet been made, in part due to a lack of U.S. follow-up, and in part to wide resistance to the needed changes. There are concerns among developing nations that a supplier cartel would unduly restrict their access to nuclear technology and a broader reluctance among non–nuclear weapon states to accept more stringent nonproliferation obligations when nuclear weapon states are seen as failing in their commitments to disarmament.

Article IV of the Non-Proliferation Treaty states:

> 1. Nothing in this Treaty shall be interpreted as affecting the inalienable right of all the Parties to the Treaty to develop research, production and use of nuclear energy for peaceful purposes without discrimination and in conformity with articles I and II of this Treaty.
>
> 2. All the Parties to the Treaty undertake to facilitate, and have the right to participate in, the fullest possible exchange of

> equipment, materials and scientific and technological information for the peaceful uses of nuclear energy. Parties to the Treaty in a position to do so shall also cooperate in contributing alone or together with other States or international organizations to the further development of the applications of nuclear energy for peaceful purposes, especially in the territories of non–nuclear-weapon States Party to the Treaty, with due consideration for the needs of the developing areas of the world.

There is a growing debate, however, whether the existence of facilities capable of producing weapon-usable materials can be considered consistent with this "peaceful uses" clause, or with the obligation of non–nuclear weapon states under Article II of the Treaty not to pursue nuclear weapons. In its 2004 report, the UN High-Level Panel recognized the problem but straddled the issue in stating that "the mounting tension between the goals of achieving a more effective nonproliferation regime and the right of all signatories of the [NPT] to develop civilian nuclear industries needs to be addressed." The majority of member countries interpret Article IV to allow nuclear material production, but *there is nothing inherent in the right to enjoy the benefits of peaceful nuclear technology that explicitly guarantees or requires possession of enrichment or reprocessing facilities.* However, reinterpreting the NPT to restrict the ability of states to develop or possess such facilities and materials will be exceedingly difficult. States seeking this new definition, especially nuclear weapon states, will be confronted by an openly skeptical group of states unwilling to cede any ground on their access to nuclear technology as long as other existing nonproliferation obligations, including those associated with disarmament, are perceived as going unimplemented. To obtain a legal endorsement of some new standard, advocating

states will need—and should be willing—to give more in order to get more.

The first step is a new international fuel cycle arrangement that would guarantee fuel cycle services to states that do not possess domestic fuel cycle capabilities. Such a mechanism would have to provide a credible international guarantee of fresh reactor fuel and removal of spent fuel at prices that offer an economic incentive. Such an arrangement would reduce, if not eliminate, the economic or energy security justification for states to pursue their own fuel cycle facilities, and in so doing would test states' commitment to a nonweapons path. States that turn down economically attractive alternatives to costly new production facilities would engender suspicion of their intentions, inviting sanctions and other international pressures.

The Expert Group on multinational options for managing the nuclear fuel cycle, impaneled by IAEA Director General ElBaradei is evaluating different options, and the incentives that would be needed to adopt them. The Contact Group on nuclear terrorism proposed in the present chapter could advance the IAEA Expert Group's work. Several potential mechanisms for guaranteeing the supply of fresh fuel have been put forward (see "Options for Providing Guaranteed Supplies of Nuclear Fuel," page 95). Successful options will need to assure recipients that the supply arrangements will be inviolable, and the most effective will include redundant systems to provide fuel if primary sources fail.

Attempting to stem nuclear proliferation crisis by crisis—from Iraq, to North Korea, to Iran, etcetera—ultimately invites defeat. As each deal is cut, it sets a new expectation for the next proliferator. Regime change by force in country after country is neither right nor realistic. The United States would bankrupt and isolate

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 (if one company dropped out, another would be obligated to fulfill the contract). The fuel could be sold or leased (depending on 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 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 IAEA Board of Governors. States could transfer the "flag" or ownership of fresh nuclear fuel that could then be transferred by the agency to

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OPTIONS FOR PROVIDING GUARANTEED SUPPLIES OF NUCLEAR FUEL (continued)

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 (or be persuaded to commit) to provide the IAEA with a certain amount of fuel per year. Providing states would then have to fulfill these commitments, 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

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OPTIONS FOR PROVIDING GUARANTEED SUPPLIES OF NUCLEAR FUEL (continued)

capabilities. In turn, supplying companies or states (or both) 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.

itself, all the while convincing additional countries that nuclear weapons would be their only protection. A more systematic approach that prevents states within the NPT from acquiring the nuclear infrastructure needed to produce nuclear weapons is the only real sustainable option. Obtaining global acceptance of this new norm will be unlikely, however, even with incentives, so long as existing facilities continue to pursue business as usual.

STOPPING CURRENT PRODUCTION

The United States should work with other countries committed to nonproliferation to end the production of HEU, and to adopt a temporary "pause" in the separation of plutonium.

Under an HEU production ban, uranium enrichment needed for the supply of low-enriched reactor fuel would continue.[54] Institutional measures should be adopted to improve the transparency of operations, and therefore improve confidence that facilities continue to be dedicated only to this purpose. These steps should include application of integrated safeguards, remote detection equipment, and real-time monitoring equipment to detect alterations. Annual national declarations of HEU holdings and production should also be required, as described in the section "Global Nuclear Accounting" below.

Plutonium is more complicated. There is a massive global oversupply of weapon-usable plutonium for both civil and defense purposes. Enough separated plutonium exists to fuel the reactors that need it for several decades. Freezing production would permit the steady drawdown of these dangerous stockpiles.

The pause would require several countries, including the United Kingdom, France, Russia, and Japan, to cease operation at large industrial reprocessing facilities, and would entail significant financial, technical, and political hurdles. It is possible that some of these states, and other key actors such as India, would reject the goal of a moratorium out of hand. Many in the technical community would oppose it, arguing that plutonium use is an efficient energy strategy. Notwithstanding these difficulties, the accumulation of plutonium constitutes such a large global threat in today's circumstances that the security imperative should override other considerations and be vigorously pursued.

The proposed pause would last only until current stocks were sufficiently reduced to allow for resumed production on a just-in-time basis (perhaps twenty to thirty years). States that currently use plutonium-based reactor fuel (known as mixed oxide, or MOX, fuel) would continue to do so, drawing on existing stocks. If they did not have sufficient stocks, they could exchange plutonium-bearing spent fuel for equivalent amounts of plutonium-bearing fresh fuel from states such as France, Russia, or the United States. They could also make use of excess weapons plutonium in Russia and the United States (see below).

In addition to shrinking the global burden of fissile material, a plutonium production pause would facilitate the negotiation of a "Fissile Material Cutoff Treaty" (FMCT)—a verifiable ban on enrichment and reprocessing outside international safeguards.

The pause would ease the establishment of the broader global norm against the domestic acquisition of fuel cycle facilities (see "The Fissile Material Cutoff Treaty and Nuclear Material Recommendations" below). Finally, a pause should be used by states, including the United States and key technical partners, to aggressively pursue technical development of more proliferation-resistant fuel cycles that eliminate the need for plutonium separation. As a further incentive, states that agreed to participate in the pause and other proposed new fuel cycle arrangements could be invited to participate in these research and development programs.

THE FISSILE MATERIAL CUTOFF TREATY AND NUCLEAR MATERIAL RECOMMENDATIONS

Establishing a ban on the production of fissile materials outside safeguards has been a long-time international goal. The general outlines of such an agreement, as previously laid out by the Conference on Disarmament, would still allow the production and accumulation of HEU and the separation of plutonium, albeit under international inspections. The proposed treaty, therefore, would be more permissive than the recommendations contained in the present report. Internationally monitoring the production of weapon-usable materials may be preferable to unaccounted production, but does not reduce the direct risk of nuclear theft or weapons use as much as an HEU ban and plutonium moratorium.

The IAEA could verify such a plutonium production pause if given sufficient resources and access. National technical means of intelligence collection could also be used to build confidence that the pause was in effect. A plutonium production pause is clearly an ambitious goal, as evidenced by the difficulties in negotiating even a ban on non-safeguarded production in the UN-based Conference on Disarmament. The security gain, however, is so great that it justifies the political effort that will be required. It should be emphasized, however, that the goal can only be achieved through a heightened political commitment led by the United States that would make the pause a top security priority.

Table 4.3. HEU and Plutonium Production Activities

HEU AND PLUTONIUM ACTIVITY	PROPOSED STATUS
HEU and separated plutonium for nuclear weapons	Terminate in all states
HEU production for ship propulsion	End; convert to alternative LEU fuels
HEU and separated plutonium for reactor operation	End; convert to alternative LEU fuels
HEU production and use for research reactor fuel	End; convert to alternative LEU fuels
HEU production and use for isotope production	End; convert to alternative LEU fuels

Note: HEU, highly enriched uranium. LEU, low-enriched uranium.

Until an HEU ban and plutonium production pause are in effect, steps should be taken to erect high institutional barriers to the misuse of civilian facilities for nonpeaceful purposes. Any state seeking to use peaceful facilities for weapons purposes should be forced to violate numerous legal, political, and economic commitments, raising the costs of such actions. Multinational corporate ownership or various forms of multilateral control would be useful steps in this direction. All types of management would need to adopt stringent measures to control sensitive technologies and ensure the reliability of plant personnel.[55]

END THE USE OF FISSILE MATERIAL

Civil use of HEU and plutonium drives the production and transport of these materials, increasing the risks of diversion by terrorists and giving cover for clandestine nuclear weapon programs by states. *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 one that directly affects the security of other states and should therefore increasingly come under international scrutiny.

The main nonweapon uses for HEU and separated plutonium are in research reactors, nuclear power reactors, and naval propulsion. 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 (known as closed fuel cycles).[56] Other countries, including the United States, have pursued a once-through fuel cycle (known as an open fuel cycle) in which spent fuel is stored and ultimately disposed of rather than reprocessed, thereby avoiding the proliferation risks of separated plutonium.

It is not clear which system (closed vs. open) will prove superior over the very long term with respect to cost, waste management, and security. However, it is beyond question that for the foreseeable future the use and transport of separated plutonium for the civilian fuel cycle greatly increases the risk that terrorists or additional states will acquire the means to produce nuclear weapons.

States clearly have the right to oppose actions that threaten their security. If progress is not made on international fuel cycle management, the United States should consider adopting a simple policy statement to the effect that it opposes the separation of plutonium for civil purposes. The United States should abide by its present commitments to others to allow use of U.S.-origin nuclear material for plutonium-based activities, but should refuse any new commitments.

Comments received on the draft of the present report noted that past U.S. opposition to plutonium use had not produced a global consensus against reprocessing, and that renewed opposition would be unlikely to succeed. Those who made these comments therefore advocated that the United States should endorse and even engage in plutonium use so that it could shape improved international safeguards and security standards related to such use: an "if you can't beat 'em, join 'em" strategy. These commentators suggested that the United States invest heavily in advanced nuclear reactor research to develop alternatives to the once-through use of nuclear fuel, including reactor concepts

that might involve plutonium separation, as well as research into non–nuclear energy applications. It is not clear, however, how endorsing or engaging in plutonium use could improve America's security. To the contrary, the limited U.S. decision to dispose of excess military plutonium by irradiating it in power reactors has already been used by other countries as justification for their much broader plutonium use. Further active support by the United States would only lead to more, not less, plutonium use, with commensurate risks of theft and diversion. Advanced reactor research would be beneficial if—but only if—it were directed to technologies that did not depend on plutonium separation.

Research Reactors

For more than twenty-five years, the United States has sought to end the civilian use of HEU. Research reactors are the main civil users of this material. On February 11, 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 over the past several decades. The United States is also helping Russia develop low-enriched uranium (LEU) fuels to convert Soviet-era research 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 much too slowly, and the United States has failed to use all of the tools and leverage at its disposal. Fifty of the 135 research reactors worldwide that continue to use HEU fuel either are in the United States, are of

U.S. origin, or use U.S.-supplied fuel. The United States should pursue a more aggressive and comprehensive policy to end the use of HEU in research reactors worldwide, including in the United States itself. Washington should increase the amount of money spent on developing and testing of new LEU fuels to enable the last few reactors that cannot now convert to do so, and provide technical assistance and financing for reactors that are being shut down or converted to LEU fuels.

The United States should also finance the validation of medical isotope production using LEU. Once this is complete, the U.S. Food and Drug Administration should ban the importation of such isotopes produced with HEU. More broadly, the United States should explicitly prohibit the use of U.S.-origin HEU in any reactor able to be converted to LEU fuel, and once all operating reactors can convert, require the repatriation of all U.S.-origin HEU for disposal. In the meantime, the U.S. Department of Energy should establish the legal authority to bring non-U.S. material to the United States if this is deemed essential for its protection. This can be a time consuming process and should be conducted in advance of any potential operation.

Finally, the United States—working with the G-8—should fund the large-scale return of HEU fuels of Russian or Soviet origin to Russia. This should also include financing of retraining and job creation for reactor operators displaced by reactor shutdowns.

Submarine and Ship Propulsion

As with the other nonweapon uses, there is no technical need to use HEU on ships. The current generation of naval propulsion reactors could be modified to use specially developed high-

density LEU fuels. Some ships and submarines will be unable to convert at an acceptable cost, however. In those cases, safeguards on the HEU and a stringent accounting system could be applied. Multilateral ownership could apply to fuel management facilities as well. Finally, in the limited cases in which a country could not convert its naval reactors but was willing to close its enrichment plant, an internationally guaranteed fuel supply should be considered, in much the same way as it might be for power reactors.

ELIMINATE STOCKS

Final disposal of weapon-usable materials is the only way to guarantee that they will never be used in a nuclear device. Most of the world's HEU and plutonium is in the United States and Russia, although much smaller but significant amounts of such material exist in a number of other countries as well (see tables 4.2 and 4.4). In the fifteen years since the end of the Cold War, some limited progress on disposal has been made, but the pace of efforts to eliminate weapon-usable uranium and especially plutonium has been unacceptably slow, and their scope unacceptably narrow.

Of the two types of materials—HEU and plutonium—weapon-usable uranium is by far the more solvable, and the 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 weapons-grade uranium from Russia and use the blended down LEU as fuel in power reactors. To date, some 200 metric tons—enough for 8,000 nuclear weapons—has been diluted in Russia and transferred to the United States. But some 300 metric tons of the original purchase target remain in weapon-usable form, to say nothing of the remaining Russian stockpile—which may

Table 4.4. Stocks of Weapon-Usable Plutonium
(in Metric Tons)

STATE	SEPARATED CIVIL PLUTONIUM	MILITARY PLUTONIUM	WEAPON EQUIVALENTS[a]
Russia	38.2+	95*	16,650–33,300
United States	45.05+	49.95#	11,875–23,750
France	47.95+	5*	6,619–13,238
England	70.8*	3.2*	9,250–18,500
Germany	25.6*	N/A	3,200–6,400
Japan	38.6+	N/A	4,825–9,650
China	0+	4.8*	600–1,200
Belgium	1.8*	N/A	225–450
India	1.0*	.36*	170–340
Israel	0	.56*	70–140
Switzerland	2*	N/A	250–500
North Korea	0	<.04	~5–10
Pakistan	0	.04*	5–10

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

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.

\+ International Atomic Energy Agency
* Institute for Science and International Security
\# U.S. Department of Energy

amount to an additional 500 metric tons under uncertain security. Downblending needs to be accelerated to ensure the fastest possible elimination of this material. Russia and the United States should agree to double the pace from 30 to 60 metric tons of HEU per year.

The plutonium question is much more complex. Unlike uranium, plutonium cannot be easily mixed or mechanically blended down to prevent its use in nuclear weapons. From the dozens of solutions evaluated by the United States and Russia over the past decade, two seemingly viable options emerged—irradiation and immobilization. In 2000, the two countries negotiated an agreement committing 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—until recently—pursued a mixed approach. Despite years of hard work and considerable investment, however, the results have been almost nil. Almost no weapon-origin plutonium has been eliminated in the ten years since the United States began a serious effort to do so. Indeed, the start of actual elimination in both Russia and the United States is still several years away. Moreover, the disposal of 68 metric tons of plutonium, while worthwhile, will only provide a significant security benefit if it marks the start of a much larger process that would include the bulk of weapon-origin plutonium in each country: about 100 metric tons in the United States and 150 in Russia.

It is past time to acknowledge the need to begin again. Fresh and energetic attention needs to be given to plutonium disposal if nuclear weapons are to be kept out of terrorist hands. The United States should reevaluate its entire plutonium disposal program, with a renewed emphasis on securing plutonium under

international monitoring as an intermediate step to 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.

In Russia, the United States has helped to construct a highly secure facility at Mayak originally intended for storing military-origin fissile material. Russia currently plans to store only 25 metric tons of surplus plutonium there. It should be urged to use the facility's full capacity by storing 200 metric tons of HEU at the facility, pending its downblending to LEU. Washington should drop its objections to storing nonmilitary plutonium, in recognition that disposal is going to take much longer than originally expected. The United States should also consider outright purchase of Russian excess plutonium for storage and elimination in the United States.

GLOBAL NUCLEAR ACCOUNTING

No single international organization or government knows how much weapon-usable nuclear material exists in the world. Some countries do not even have an accurate inventory of their own material. Without an accurate accounting system for nuclear materials, there can be no effective prevention of nuclear terrorism or serious pursuit of nuclear disarmament.

The United States should work to develop a global nuclear accounting and transparency system. While the primary focus should be on weapon-usable material, all states possessing nuclear materials would eventually have to cooperate. The long-term goal would be for all states to maintain an accurate, validated accounting of all nuclear holdings, under international standards

for accounting and transparency. All states would 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 several 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.

Such a registry would have to be carefully established so that sensitive information—such as the exact location of specific amounts of materials—could remain protected for security reasons, yet declared holdings could be verified. This would be no easy task, since even the amount of nuclear material within their borders is considered highly sensitive information by some countries. The United States has released a comprehensive plutonium inventory and has provided funding for Russia to develop its own accounting of civil plutonium production. However, neither country has declared its HEU holdings. Still, the benefits of establishing a global registry for nuclear materials should prevail over institutional preferences for keeping the numbers classified.

A number of states will 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—if the agency is given the necessary resources.

SUMMARY OF POLICY RECOMMENDATIONS

- Create a high-level "Contact Group to Prevent Nuclear Terrorism" to lead efforts to improve the security of all weapon-usable nuclear materials. (p. 87)

- Establish an effective global standard of protection for all weapon-usable fissile materials and create international obligations to protect these materials. (p. 88)
- Expand and enhance the G-8 Global Partnership program to improve nuclear security assessments, upgrades, and material relocation. (p. 89)
- Accelerate and increase funding for the Global Threat Reduction Initiative to secure and relocate vulnerable nuclear materials worldwide within four years. (p. 89)
- Seek an internationally endorsed ban on production of HEU and a decades-long moratorium on the separation of additional weapon-usable plutonium. Aggressively pursue proliferation-resistant fuel cycle concepts that avoid plutonium separation. (p. 91)
- Provide guaranteed, economically attractive fuel services to states that do not enrich uranium or reprocess plutonium, and consider ways to place existing facilities under new institutional controls. (p. 94)
- Reevaluate and re-prioritize the U.S.-Russian plutonium disposal program, with a renewed emphasis on securing plutonium under international monitoring. (p. 107)
- Develop a global nuclear accounting and transparency system. (p. 108)

Threat Reduction

The Nunn-Lugar Cooperative Threat Reduction Program, to dismantle and secure nuclear, chemical, and biological weapons in Russia and the former Soviet Union, has been a remarkably cost-effective investment 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, and enough for thousands more has been secured. In addition, thousands of nuclear, chemical, and biological weapons experts have received the means to begin transforming their careers from military to civilian work.[57]

Although the discussion here will focus on Russia, efforts are under way to expand the scope of this type of cooperation to proliferation problems in other regions. 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 proliferation of nuclear and biological weapons 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 of 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 an urgent need for new threat reduction programs 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.[58] 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 have already joined and become actively involved in funding high-priority projects such as submarine dismantlement in Russia. More partners such as Finland, the Netherlands, Poland, Switzerland, Australia, Belgium, the Czech Republic, Denmark, Ireland, South Korea, and New Zealand joined in 2003 and 2004.[59] This process should continue to expand the number of countries open to threat reduction cooperation and the number of 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 nuclear 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, 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 with their U.S. counterparts. From the earliest days of threat reduction work, Russian experts contributed their knowledge as well as hardware 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 more one-sided assistance relationship than that which developed with Russia.

Most important, to succeed in other settings, threat reduction 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."[61]

Unfortunately, progress in joint U.S.-Russian threat reduction programs—led primarily by the U.S. Departments of Defense, Energy, and State—has been slow in recent years. Whether one judges 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 weapon scientists, *it is evident that less than half of the overall threat reduction mission in Russia has been completed.*[62]

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 high-level U.S. and Russian commitments, including at the 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,[63] converting research reactors that use HEU, consolidating Russian nuclear material in fewer facilities, developing controls on exports, and investing in long-term sustainability strategies for security equipment that has already been installed.

Other high-priority proposals for improving the pace of U.S.-Russian cooperation include, first, 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.

The United States and Russia could also create a system of performance-focused meetings between high-level U.S. and Russian political officials to evaluate threat reduction progress, receive reports from program managers on advances and problems in each program, and negotiate solutions to such problems.

Moreover, both the Russian and American presidents should agree to (1) designate securing and eliminating nuclear, chemical, and biological weapon stockpiles as a top priority for both countries' national security and (2) set a target date of 2008 for completing comprehensive security upgrades of all nuclear weapons and weapon-usable material in Russia.[64] The two presidents would further agree to undertake specific measures to break through procedural logjams, and the Russian side would commit to maintaining security systems after U.S. assistance has been phased out.

The specific stumbling blocks that require presidential attention are disputes over U.S. access to sensitive Russian facilities, liability in nonproliferation agreements, and visa policies and procedures for Russian and U.S. threat reduction personnel.

The U.S. executive branch should also work 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.[65]

SUMMARY OF POLICY RECOMMENDATIONS

- Develop a strategy to extend threat reduction cooperation to new countries and regions, building on experience in Russia and the former Soviet republics. (pp. 112–113)
- Expand the number of target countries and partners participating in the G-8 Global Partnership program. (p. 112)
- Engage President Bush and his Russian counterpart, Vladimir Putin, to establish cooperation as a top policy priority and resolve stumbling blocks to implementation. (p. 114)

- Launch a fast-paced initiative, in partnership with Russia, to fully protect Russian nuclear weapon–usable material by 2008. (p. 115)
- Establish a senior coordinator, or focused coordination team, within the White House with a mandate to oversee, prioritize, and expedite threat reduction programs. (p. 114)

Stopping Transfers: Export Controls and Interdiction

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.[66] These include a proposal to make the export of sensitive nuclear technology contingent on acceptance of the IAEA's Additional Protocol. 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 and to establish effective export controls.

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 international efforts to control sensitive nuclear

technologies.[67] 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 arrangements. All states possessing nuclear-relevant 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 or the Zangger Committee;[68] nor are they all likely to be invited to join.[69] 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.[70] States must enact "appropriate laws and regulations to control export, transit, trans-shipment and re-export" of materials that would contribute to proliferation.[71] This resolution not only encompasses states with nuclear technology, it also places the burden of export control on non-nuclear states such as Dubai and Malaysia that may 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 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.[72] 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

Proliferation-related 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.

First, 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 a majority or weighted voting system to replace consensus rule. There is likely be considerable internal resistance within these voluntary systems, which needs to be recognized and overcome.[73] This is clearly a case in which high-level leadership will be required to achieve results.

In addition, the regimes need to improve membership criteria and make commitments more binding, with an emphasis on timely compliance.[74] 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.[75]

Also, current practice only calls for states to share decisions to deny requests for exports between member states. Sharing information on export approvals would help 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.[76]

To improve the conduct of expanded export controls, many participating states may need assistance and advice. Leading states, including the United States, should head 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.[77] (See "Strengthening International Law" in chapter 3.)

In addition, the Nuclear Suppliers Group should adopt two policy changes its members are currently considering: making the IAEA Additional Protocol a condition of supply for nuclear exports and adding "catch-all" provisions to the Nuclear Suppliers Group dual-use guidelines. Under this latter condition, members would have to control the export of any item, regardless of whether it appeared on the control lists, if there were a risk that the export could contribute to proliferation. This would eliminate the need to maintain an exhaustive list of controlled items.[78]

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. A strengthened Security Council monitoring committee for Resolution 1540 might be useful in this role.

This report has also been greatly influenced with regard to export control reforms by the work done by experts at the University of Georgia Center for International Trade and Security. They have developed a set of recommendations to reform and improve current technology controls.

The University of Georgia experts recommend adopting a new and strengthened Export Administration Act (EAA). The EAA expired years ago, and Congress has failed to renew it because of concerns over how to balance the interests of industry with national security imperatives. The lack of an export control law limits the ability to penalize companies that violate U.S. export controls. In addition, University of Georgia experts call for the expansion of export control assistance to emerging supplier states and key transit states. This should be done in conjunction with broader assistance to states in meeting obligations of Security Council Resolution 1540 by establishing minimum international export control standards.

Furthermore, negotiations are needed among member countries to establish a unified and strengthened nuclear, chemical, and biological weapons and ballistic missile export control regime with more binding and precise commitments, including enhanced information sharing, and more robust export enforcement authorities. The current multilateral control regimes are ill equipped to deal with growing global trade in dangerous technologies and to respond to proliferators that are becoming more sophisticated in their acquisition patterns.

The experts at the University of Georgia also note the need to promote greater corporate compliance with nonproliferation norms and export controls by establishing an international code of compliance for exporters of sensitive materials and technologies.

Companies that trade nuclear and dual-use technologies represent the first line of defense in efforts to stem proliferation. Responsible companies have internal compliance programs to ensure that they are screening end users and observing export control regulations. But because many firms remain ignorant of national export control requirements, violations and transfers result that raise proliferation concerns.

Finally, the need to assist the IAEA in implementing the export and import reporting requirements of the Additional Protocol is also noted by the experts at the University of Georgia as an important step in improving export control implementation.

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 PSI (see "Proliferation Security Initiative," page 123 for more detail). The PSI has resulted in significant progress in a brief period of time, with member states recently seizing valuable shipments of weapons equipment to several countries. However, it has significant limits. While the initiative is a valuable extension of export control implementation, it is not and cannot be a silver bullet to prevent proliferation to terrorists or states.

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 territorial waters of participants. It does not apply directly to international waters. Countries under whose flag a ship is traveling

PROLIFERATION SECURITY INITIATIVE

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

Initiative-related activities fall into three main areas:

(1) enhancement of national legislation in participating states to ensure that shipments of controlled items can be searched or seized (or both) 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 United Kingdom, France, Germany, Italy, Spain, the Netherlands, Poland, Portugal, Australia, Japan, the United States, Canada, Norway, and Singapore. More than sixty states have pledged their support for the Proliferation Security Initiative.

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 system that can deal with a legally flagged vessel or aircraft carrying weapons-related material or technology through international territory from nonparticipating countries.

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—such as slavery—are deemed unacceptable.

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 clandestine transfers of materials relevant to nuclear proliferation is worth the investment in time and political capital that would be needed.

SUMMARY OF POLICY RECOMMENDATIONS

- Expand membership in and compliance with export control regimes to all states with relevant capabilities. (p. 117)
- Expand export control assistance to emerging supplier states and key transit states. (p. 121)

- 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. (pp. 119–120)
- Make the IAEA Additional Protocol a condition of supply for all Nuclear Suppliers Group transfers. (p. 120)
- Pass a new and strengthened U.S. Export Administration Act. (p. 121)
- Establish an international code of compliance for exporters of sensitive materials and technologies. (p. 121)
- Expand the scope of the PSI to cover shipments through international waters and airspace. (p. 124)
- Ground the PSI in international law by means of a UN Security Council Resolution. (p. 124)

CHAPTER FIVE: 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 nuclear weapons. The most effective way to stem demand for such 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 starting to acquire nuclear capability, the factors that must be addressed today to persuade Iranian leaders to abandon uranium enrichment and plutonium separation are more numerous and complicated because the issue has become highly politicized.

Lock in Successes

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. More pertinently, these states must advocate, or at least not resist, new rules to stop the spread of nuclear weapon production capabilities and strengthen the nuclear safeguards and inspections mandate of the IAEA. Their support is needed to give the UN Security Council greater resolve to prevent or reverse proliferation challenges. The states that could have been possessors of nuclear weapons bring special credibility to the political process of strengthening the global nonproliferation regime.

The United States and other nuclear weapon states must do more to earn the ongoing support of a strong nonproliferation system among the most technically capable states that have abjured the possession or pursuit of nuclear arms.

Washington's first maxim should be Hippocratic: "Do no harm" to states that could readily produce nuclear weapons but have chosen not to. U.S. policy and rhetoric should never be dictatorial or arrogant in ways that would make officials in countries such as Japan, South Korea, or Turkey—to pick random examples—conclude that Washington would be more respectful of their interests if they had their own nuclear weapons. On the

contrary, the United States should reassure these countries and others, such as Argentina, Brazil, and South Africa, that do not have alliance security guarantees, that the United States recognizes a special duty to prevent threats that could make them reasonably feel the need for nuclear weapons. In Southwest and Northeast Asia, where Iranian and North Korean proliferation could tempt Egypt, 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.

The United States (and other nuclear weapon states) should focus more on rewarding states that actively strengthen the nonproliferation regime. Decisions on how to expand the permanent membership of the UN Security Council should take into special consideration candidates' contributions to nonproliferation. Decisions on where to conduct state visits and which countries should host major international conclaves should reward states that contribute heavily to the global security imperative of stopping nuclear proliferation.

It is also important to deglamorize nuclear technology as a symbol of modernity, even while encouraging the design of new generations of safer, proliferation-resistant nuclear reactors. For the latter purpose, international nuclear research and development projects should be made available only to states whose nuclear establishments demonstrate an unwavering commitment to nonproliferation. More broadly, international programs to develop cutting-edge, environmentally friendly energy technologies such as hydrogen fuel cells should be expanded. This promotion of non-nuclear energy sources does not reflect judgment on

the benefits and costs of nuclear power, economic or otherwise, but rather the political reality that nuclear establishments become mythologized in many societies to the point that curtailing any of their activities becomes seen as a rejection of modernity and progress, regardless of the economic, technical, or security merits of the activity being curtailed.

Finally, the United States and other nuclear weapon states must devalue the security and political status associated with nuclear weapons so that political actors in other highly capable societies do not conclude that they will gain international leverage or status by seeking these weapons. The role of nuclear weapons in national security doctrine should be clearly reduced, not increased. Development of new nuclear weapons should be rejected, not embraced. The correlation between nuclear weapon possession and veto power in the UN Security Council should be broken. Sales of new nuclear reactors should not be extended to states that do not live up to the same nonproliferation standards as the non-nuclear weapons states.

As former U.S. State Department official Robert Einhorn and former Defense Department official Kurt Campbell have observed, the wisdom of societies and states that have gone without nuclear weapons is reinforced by "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."[79]

SUMMARY OF POLICY RECOMMENDATIONS

- Reward states that contribute to nonproliferation with economic, political, and other inducements. (p. 129)
- Facilitate development and funding of substitute energy technologies and proliferation-resistant nuclear reactors. (p. 129)
- Devalue the security and political status associated with nuclear weapons by, among other things, breaking the correlation between nuclear weapon possession and veto power in the UN Security Council. (p. 130)

Conflict Resolution

Current acute proliferation threats in regions plagued with trouble—particularly the Middle East, South Asia, and Northeast Asia—will not be fundamentally redressed without progress in resolving underlying conflicts, which may in turn require internal political changes. To the extent that international leadership can promote necessary changes, the effort must come from the highest level as a priority of overall foreign policy. Nonproliferation policy makers, technical experts, or specialized institutions such as the IAEA should not be expected to lead such high-level exertions, though they can help.

Thus, the acquisition of nuclear weapons by India and Pakistan should not be seen as a failure of an autonomous nonproliferation regime. It was a result of high-level state decision making in these countries, and equally high-level decisions by the United States, China, and other international actors not to alter the incentives that were considered by Indian and Pakistani leaders. 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 nuclear, biological, and chemical weapons.

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

This analysis is obvious enough, yet officials in some states, including the United States, often speak and act as if countries such as Iran and North Korea will abandon efforts to acquire nuclear weapon capabilities without improvements in their broader security relationships. Similarly, officials in some non–nuclear weapon states demand that states permitted to possess nuclear weapons disarm, without recognizing the valid political and security problems that must be resolved in order to make disarmament augment global security.

SUMMARY OF POLICY RECOMMENDATIONS

- 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, Israel, India, Pakistan, and other states with nuclear weapons are discussed throughout this report, particularly in chapter 2, under obligation 6, and in chapter 6.) (p. 132)

U.S. Nuclear Policy and Arms Reduction

The twin goals of U.S. nuclear policy should be to prevent new actors from acquiring nuclear weapons and to reduce toward zero the risk that those who have these weapons will use them. This nonproliferation imperative reflects a major change from the Cold War.

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 non-nuclear. Thus, nonproliferation objectives should henceforth drive nuclear policy.

This imperative does not remove other nuclear requirements, however. The U.S. nuclear deterrent backs up U.S. security guarantees to 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 threat 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, even as it pursues a vigorous nonproliferation strategy.[80] The question for U.S. policy makers is how best to pursue these two critical goals that are in some eyes in tension. 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.

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 nuclear, biological, or chemical weapons to challenge the United States.[81] 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, thereby reducing inhibitions on using nuclear weapons. By appearing more usable, new nuclear weapons would enhance deterrence and thereby advance nonproliferation goals.

Those arguing this case have emphasized that the new nuclear weapons would only be used in extremis, and would not be made a major element of U.S. military doctrine or force posture. Quite the contrary—they have argued that U.S. conventional capabilities would continue to be strengthened. They have stressed that the U.S. Strategic Command has been converting its weapon systems for new long-range conventional missions, or non-nuclear strike 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. So, proponents conclude, U.S. nonproliferation leadership would not be compromised, and others would continue to follow the United States in pursuing nonproliferation goals.

All these arguments are questionable, particularly whether it is true that U.S. nuclear weapons policy has little effect on other countries. Unavoidably, U.S. actions do influence others' choices about whether to seek nuclear weapons, strengthen existing arsenals, or support nonproliferation.

Those who argue that modernization of U.S. nuclear forces does not affect other countries are ignoring the core of deterrence: For a nuclear deterrent to be effective, other countries must see and understand its effectiveness. One cannot, however, have it both ways: arguing for the necessity of a strong nuclear deterrent, and at the same time denying the impact that U.S. nuclear choices have on the security decisions of other countries. If the United States places more reliance on its nuclear deterrent, other countries will notice. If they did not, there would be no such thing as deterrence.

Other states may react by acceding to U.S. power, or they may choose asymetrical means to deter the United States. These decisions will not be driven entirely by U.S. actions; regional dynamics and threats also have an effect. But the United States cannot pretend that other countries will interpret its actions in the same benign light in which it perceives them.[82]

Of course, in some circumstances, U.S. *conventional* power serves as the primary impetus to nuclear policy in other countries. Russia, for example, has claimed in recent years that U.S. conventional superiority creates a threat to its weakened military capacity—a threat that can only be overcome through

continued dependence on nuclear weapons. Russian strategists place emphasis on the notion that Russia's nuclear weapons undermine U.S. conventional superiority in potential theaters of war surrounding the Russian Federation.[83] General K. Sundarji, former Indian Army chief of staff, commented in a similar vein when he stated the lesson he had learned from the 1991 Gulf War: "Make sure you have your own atomic bomb—before you challenge the United States."[84]

Moreover, if the United States pursues new types of nuclear weapons, then others—Russia, China, India, and Pakistan, for example—are likely to do the same, to the extent they can. At the very least, they will be less supportive of nonproliferation and more resistant to U.S. calls for them to forgo building up their own nuclear forces. Non–nuclear weapon states will conclude that the nuclear weapon states are breaking their commitment, under Article VI of the NPT, to pursue the total elimination of nuclear arsenals.

Both the Nuclear Posture Review and the National Security Strategy imply that a U.S. president should be less constrained by the taboo on using nuclear weapons for tactical missions.[85] These policy documents suggest that nuclear weapons might be used preemptively to attack possible chemical and biological weapons facilities or other high-value targets. However, recent experience demonstrates that the United States generally lacks sufficiently precise intelligence to make tactical use of nuclear weapons either a wise or likely option.[86] Examples include faulty intelligence in both Iraq wars and the mistaken bombings of the Chinese embassy in Belgrade and the misidentified "chemical weapons" plant in Sudan.

Essentially, if enough intelligence is available to reliably locate chemical or biological weapons bunkers, then other means, such as conventional weapons or special forces, can be used to attack them. If accurate intelligence is not available, then a nuclear attack would risk creating damage and loss of life highly disproportionate to the actual threat. No president is likely to do this. The United States would face immense international consequences if it used nuclear weapons other than in response to a nuclear attack on the United States or its forces or allies.[87]

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 destroy chemical or biological weapons deep underground.[88] 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 would be necessary. It is a dangerous illusion to believe that there is a clean and tidy nuclear way to accomplish this mission.

NONUSE 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.[89]

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 designed primarily 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, Russia 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 already noted in the present chapter under "Nuclear Weapons Serving Nonproliferation," the U.S. Strategic Command has been tasked to develop more non-nuclear strike missions. U.S. long-range bombers are being equipped and trained for such missions, and four Trident submarines are being converted to carry non-nuclear cruise missiles. 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 non-nuclear missions and highly capable command and control.[90]

U.S. policy makers thus have been taking 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 is 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 U.S. 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."[91]

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. Detailed proposals have been advanced in several forums, including studies by the RAND Corporation and the Institute of the USA and Canada in Moscow, both of which have made practical recommendations on how to achieve this important goal.[92]

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 a few hundred 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. Although the relationship with Moscow has not been easy, Russia is emerging in fits and starts into 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 any support they provide to NATO's security.

The United States is largely restructuring its presence in NATO Europe, shifting forces from large fixed bases and into a new system of so-called lily pad basing. However, many of the

new, smaller bases will not be well structured for storage and maintenance of nuclear weapons. Currently deployed weapons could be moved back 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 keep this option viable, some nuclear weapon training and basing infrastructure would have to remain in current NATO Europe facilities.

NATO's new members, many of whom are concerned about Russian nuclear weapons, will want NATO to remain committed to a nuclear option. For that reason, the United States should pursue reciprocal constraints on Russian nonstrategic nuclear weapons (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.

While the United States continues to de-emphasize forward deployment of nuclear weapons, it should also restore the consistency of its security guarantees and assurances. Historically, the United States' willingness to put its own security on the line in defense of its NATO and Asian allies in the face of a nuclear threat has been key to preventing allied countries in these regions from developing their own nuclear weapons. As the United States withdraws nuclear weapons from forward deployment, it will have to state a clear and solid commitment to continued defense of its allies. The United States should emphasize that the credibility of its defense commitments is greater than ever thanks to the potency of U.S. conventional weapons.

Of course, there is a certain tension between the notion that the United States is willing to defend its allies with nuclear weapons

and its emphasis on stopping other countries from acquiring nuclear weapons. This tension ultimately would be resolved by the total elimination of nuclear weapons, as agreed in the NPT. But as long as conditions are not ripe for total elimination, nonproliferation objectives are served by a U.S. nuclear umbrella over America's allies.

The United States also will have to maintain a serious and consistent attitude toward the positive and negative security assurances that it has offered in conjunction with its NPT commitments. In essence, these assurances have conveyed that the United States will not attack with nuclear weapons a non-nuclear country, unless that country is allied with a nuclear country and engaged in warfare against the United States. Although such assurances do not imply collective defense arrangements such as those guaranteed under the NATO Treaty, they have nevertheless helped persuade countries to agree to establish nuclear weapon–free zones in several key regions, including Latin America, Africa, and Central Asia.

Statements by U.S. officials in recent years implying that these assurances are little more than pieces of paper have raised widespread doubts about their value. In order to counteract this effect, the United States should consider restating the positive and negative security assurances first officially extended by Secretary of State Cyrus Vance in 1978. Secretary Vance stated that the United States would

> not use nuclear weapons against any non-nuclear weapon state party to the NPT or any comparable internationally binding commitment not to acquire nuclear explosive devices, except in the case of an attack on the United States, its territories or armed forces, or its allies, by any state allied to a nuclear weapon

> state or associated with a nuclear weapon state in carrying out or sustaining the attack.[93]

Restoring confidence in the U.S. commitment to such assurances will be vital to enabling the denuclearization of NATO Europe. It would also be a key to negotiating other nuclear weapon–free zones. For example, it would be a basic condition for such a zone in the Middle East.

In regard to chemical and biological weapons contingencies, U.S. nuclear weapons policy has long been ambiguous: If chemical or biological weapons are used against the United States or U.S. targets overseas, then the adversaries launching the attack should expect a proportionate response. They will have to assume that it could be nuclear. U.S. declaratory doctrine need not advertise this hard reality, but it 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 in part from the 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." If these weapons become increasingly available,

the United States could find itself confronted with an increasing need to resort to nuclear threat.

However, frequent threats create a commitment trap:[94] If you don't back them up, people will no longer take you seriously. Given the gravity of breaking the nuclear taboo, the United States should not put itself in a position where it would feel an increasing need to take nuclear action.

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 help prevent this from happening by preparing U.S. forces with vaccinations, equipment, and tactics that will enable them 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 are being trained to use these weapons to take 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. Further progress in relaxing the hair-trigger alert posture and ending the forward basing of nuclear weapons would augment the devaluation of nuclear weapons worldwide. Finally, although some ambiguity will 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 conventional capabilities. If the United States develops new nuclear weapons, it cannot avoid investing all nuclear weapons with added value in the eyes both of states that have wanted to acquire them and of those that have wanted to remain non-nuclear. On balance, the policy and technical problems associated with new nuclear weapons immensely outweigh any benefit to the United States.

THE ROLE OF NUCLEAR REDUCTION AGREEMENTS

The United States should also continue to reduce the number 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 the START I negotiations began, each deployed more than 10,000 strategic nuclear weapons (see table 5.1). Then unfolded a process of legally bound nuclear arms reductions. If the 2002 Treaty of Moscow is fully implemented, then the United States and Russia will each limit strategic nuclear weapons in operational deployment to between 1,700 and 2,200.

This process of nuclear reductions has been important 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

Table 5.1. Strategic Nuclear Warheads: United States, Russian Federation/Former Soviet Union

	RUSSIAN FEDERATION/ FORMER SOVIET UNION				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
2004	2,478	1,072	872	4,422	1,150	2,016	1,050	4,216

Notes: ICBM, intercontinental ballistic missiles. SLBM, submarine-launched ballistic missiles.

Sources: Robert S. Norris and Hans M. Kristensen, "Russian Nuclear Forces, 2004," *Bulletin of the Atomic Scientists,* 60, no. 4 (July/August 2004): pp. 72–74, available at www.thebulletin.org/article_nn.php?art_ofn=ja04norris (accessed January 6, 2005); Norris and Kristensen, "U.S. Nuclear Forces, 2005," *Bulletin of the Atomic Scientists,* 61, no. 1 (January/February 2005): pp. 73–75, available at www.thebulletin.org/article_nn.php?art_ofn=jf05norris (accessed January 6, 2005).

reduction process is one reason why many countries discount U.S.-Russian nuclear disarmament.

The 2002 Treaty of Moscow exacerbates this skepticism, because unlike the earlier START treaties, it contains no agreed-upon schedule for eliminating the launchers from which those warheads are removed. Although it calls for removing warheads from operational deployment, like START I, it says nothing about warhead elimination. Thus, there is a dual problem with the Moscow Treaty: it is silent on warhead elimination, and appears to backtrack on launcher elimination.

The Bush administration has made it clear that warhead elimination will occur, but as a consequence of unilateral U.S. policy, not a reduction agreed with Moscow. In May 2004, the president

approved a stockpile plan, whose details have not been made public, that will reportedly cut the U.S. nuclear stockpile almost in half by 2012.[95] In this way, the administration will maintain maximum flexibility in the process, but it is unclear how the United States will encourage or impel Russia to undertake similar warhead reductions.

Moreover, the current U.S. nuclear posture review, made public in 2002, states that, depending on events, *increased* deployments of strategic nuclear weapons are just as likely as a continued downward trajectory.[96] Coupled with the lack of agreed-upon measures for eliminating missiles and bombers, this has led many, including influential Russians, to calculate that the United States might reverse course on the reductions in the Treaty of Moscow.

Concerns have also emerged that Russia is not fulfilling its commitments under the so-called Presidential Nuclear Initiatives (PNIs) to reduce its holdings of nonstrategic or tactical weapons. In these statements, made in 1991 and 1992, the United States and Russia independently but simultaneously indicated that they would remove nonstrategic weapons from operational deployments and eliminate them over time. Although the PNIs were not treaty commitments, they were to include 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.

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 own nuclear arsenals.

This problem could be dealt with in several ways. To start, Washington and Moscow should tell their story better. For instance, 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 be taken without compromising the security of sensitive warhead information. This concern could be met by recent technical advances such as information barriers, which 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 take advantage of recent 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 bilateral controls, even if they did not immediately involve monitoring the elimination of warheads, 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 under any circumstances. This performance capability is certified on an annual basis.

Some experts nonetheless argue that weapons reliability cannot be maintained without testing. They emphasize that the stockpile stewardship program cannot 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 physical testing infrastructure.

However, it will be impossible to urge the rest of the world to accept a stronger nonproliferation regime if the United States is testing nuclear weapons. Nor is there a need to. The U.S. nuclear arsenal is so considerable that should the science-based stockpile stewardship program detect a flaw in one of the many deployed nuclear weapons, alternative nuclear assets would be available. Furthermore, since the test ban is not a unilateral undertaking, other nuclear weapon states face similar or more difficult

challenges, which means that 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.

On balance, overall U.S. security would be best served by a ratification of the Comprehensive Test Ban Treaty and, until that happens, by continuation of the indefinite moratorium on testing.

SUMMARY OF POLICY RECOMMENDATIONS

- The objectives of preventing the spread and use of nuclear weapons should now drive U.S. nuclear policy. (p. 133)
- While nuclear threats remain in the world, the United States must maintain an effective nuclear deterrent. (p. 133)
- The role of nuclear weapons in national security policy should be de-emphasized, and the norm against the use of these weapons should be strengthened. (p. 137)
- The United States should halt research into and development of new nuclear weapons, pursue ratification of the Comprehensive Test Ban Treaty and continue a moratorium on testing in the meantime, and continue to develop non-nuclear strike assets. (pp. 134–137)
- The United States and Russia should reduce nuclear risks by standing down from hair-trigger postures and by ending preemptive strategies and the forward deployment of nuclear weapons. (p. 139)
- The United States should work with Russia and other countries to restore the momentum toward verifiably and irreversibly reducing nuclear weapons and materials. (p. 147)

Disarmament

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."[97]

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 in order to ensure their continued cooperation in nonproliferation efforts. These states' commitments to abjure nuclear weapons must not be taken for granted; in some cases it is conceivable that decisions could be made to hedge nuclear weapon options. More immediately, these states are vital to the making and enforcing of 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 P-5 must comply with commitments made in 1995 when persuading the rest of the world to indefinitely extend the NPT and the thirteen steps adopted at the 2000 NPT Review Conference (see "The Thirteen Steps," page 151).

THE THIRTEEN STEPS

The 2000 NPT Review Conference, the first since the Non-Proliferation Treaty was indefinitely extended in 1995, was highly contentious. The United States focused on threats posed by North Korea, Iran and Iraq, while the non–nuclear weapon states expressed frustration over the pace of the weapon states' compliance with their disarmament obligation.

To maintain the regime in this divisive environment, the parties agreed to establish clearer benchmarks for effecting and measuring the weapon states' commitment to fulfill Article VI. Parties stated their commitment to an "unequivocal undertaking…to accomplish the total elimination of their nuclear arsenals," and backed it up by specifying thirteen steps they would take:

- early entry into force of the Comprehensive Test Ban Treaty
- a moratorium on all types of nuclear explosions, pending entry into force of the treaty
- conclusion within five years of a verifiable fissile material cutoff treaty
- establishment within the Conference on Disarmament of a subsidiary body to work solely on nuclear disarmament
- application of the principle of irreversibility to all nuclear arms control
- an unequivocal commitment by the nuclear weapon states to full nuclear disarmament

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THE THIRTEEN STEPS (continued)

- early entry into force of START II, the conclusion of START III negotiations, and the preservation of the Anti-Ballistic Missile Treaty
- completion of the Trilateral Initiative among the United States, Russia, and the IAEA
- steps by all the nuclear weapon states toward nuclear disarmament, including a unilateral reduction in nuclear arsenals, increased transparency, the reduction of the number of tactical nuclear weapons, a reduction in the operational status of nuclear weapon systems, and a diminished role for nuclear weapons in security policy
- a commitment by the nuclear weapon states to allow the inspection and disposition for peaceful purposes of all excess fissile material
- reaffirmation of the goal of complete disarmament under effective international control
- regular reports by all states on the implementation of Article VI of the Non-Proliferation Treaty
- improved verification capabilities

Agreement on these specific benchmarks signified an important and often overlooked evolution. Whereas many non–nuclear weapon states had in the past simply insisted on the need for complete disarmament, now they accepted a more realistic, incremental approach. Thus, the Thirteen Steps entailed a major political compromise: a fallback from the absolute language of Article VI.

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THE THIRTEEN STEPS (continued)

Failure to take the Thirteen Steps seriously would therefore have serious political consequences. It would inspire even greater resistance by the non–nuclear weapon states to new measures to strengthen the nonproliferation regime, and could undermine willingness to maintain the regime at all. Unfortunately, little progress has been achieved to date.

To make matters worse, the Bush administration has suggested that it may repudiate the commitment entirely. In May 2004, then Assistant Secretary of State John Wolf stated, "The world moves on and the discussion ought not to be locked in 2000. . . .We could return to 2000 and pretend that the next five years did not exist, but we would rather start in 2005."[a] Adaptability to changing circumstances is wise, but the United States has proposed nothing to replace the obligations it would be unilaterally disavowing (perhaps to the relief of Russia, China, France, and the United Kingdom). Why then should other governments not feel free to renege on the political obligations their predecessors negotiated?

It is difficult to imagine a more damaging approach to the creation of a rule-based international security system, which every U.S. leader since Dwight Eisenhower has sought in order to manage nuclear technology. If "might makes right" is to guide the nuclear weapon states' approach to the nonproliferation bargain, the world should not be surprised when other states begin to view development or acquisition of nuclear weapons as a natural move by the weak to neutralize the advantage of the strong.

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THE THIRTEEN STEPS (continued)

Note

a Wade Boese and Miles Pomper, "The Bush Administration's Nonproliferation Policy: An Interview with Assistant Secretary of State for Nonproliferation John Wolf" May 13, 2004. Available at www.armscontrol.org/interviews/Wolf.asp (accessed December 7, 2004).

To further demonstrate their commitment to this process, the nuclear weapon states should use the occasion of the 2005 NPT Review Conference to urge the UN Security Council to request that *all* states possessing nuclear weapons or stocks of fissile materials publish white papers addressing the series of questions listed below. In this way, the United States and other nuclear weapon states could move from a defensive to an offensive strategy on the disarmament question. In addition, the nuclear weapon 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.

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 and disposition process take? What technologies and procedures would be necessary to allow international verification of nuclear disarmament while protecting sensitive weapon design information or other knowledge from being "proliferated"?

For all states possessing nuclear weapon materials (including Israel), what is the national capacity to account for all fissile materials produced?[98] 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?[99] 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 the nuclear weapon states (and others with stocks of fissile material) to demonstrate that they take their disarmament obligation seriously. In the world of government, a policy for which no bureaucratic tasking has been made simply does not exist. The assignment of agencies and individuals to prepare the white papers would display some seriousness of purpose, create some internal governmental focus on disarmament, and, most important, provide a means of detailing some of the extremely challenging problems that must be overcome to create a world without nuclear arsenals.

The published white papers should be addressed by an international forum, with the Conference on Disarmament or the IAEA the most obvious extant possibilities. 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, NGOs, and intergovernmental bodies that have an interest in these topics. The United Kingdom has set an important precedent for beginning such work.[100]

International debate on these papers would force an appreciation of the challenge of 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 of nuclear weapon materials would be inevitable, raising international security questions that are off the radar screen today. In short, expectations regarding the challenges and benefits of complete nuclear disarmament would receive the serious scrutiny they deserve.

The United States and other cofounders of the nonproliferation regime recognized that the imbalance between nuclear "haves" and "have nots" would be unstable over time. The obligation 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 and too technically, politically, and economically demanding, an alternative basis must be found for stabilizing the nuclear order. This will require a 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 the present strategy report, building on the NPT foundation.

SUMMARY OF POLICY RECOMMENDATIONS

- Reaffirm and act to implement the thirteen steps agreed to in 2000, or negotiate and implement similar disarmament steps. (p. 150)
- To demonstrate commitment to disarmament, the nuclear weapon states and states with stocks of fissile materials should publish 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. These papers should be discussed and debated in an appropriate international forum. (p. 154)

CHAPTER SIX: APPLYING THE STRATEGY TO REGIONAL CRISES

Pakistan-India-China

Nuclear proliferation in South Asia has many dimensions, some of which were addressed in obligation 6 (chapter 1) and in "Implementing the Three-State Solution," page 45. Numerous new obligations that both India and Pakistan need to shoulder are spelled out there. More specific policies must be undertaken to reduce the potential for military conflict between the two countries, particularly the possibility of escalation to nuclear use, as well as the possibility that Pakistanis will transfer nuclear weapons, material, and know-how to undeterrable actors.

It is not reasonable to think that India and Pakistan will choose to reduce these threats simply by eliminating their nuclear arsenals, no matter how much rhetoric and diplomatic pressure the international community exerts to this end. However, UN Security Council Resolution 1540 clarifies the trajectory these two states should follow. Resolution 1540 mandates all states to protect all nuclear materials from theft and to strengthen export controls. India and Pakistan can and should set a positive example for others by immediately and unconditionally bringing their export control laws and practices up to the most stringent international standards and establishing databases and border controls to prevent scientists and engineers from proliferating nuclear know-how. The requirements of the MTCR provide benchmarks that could guide the nonproliferation law and practice of India and Pakistan. But avoiding nuclear war in South Asia will require political breakthroughs in Indian-Pakistani relations and Sino-

Indian relations, and domestic reform in Pakistan. Nor will India and Pakistan eliminate their nuclear arsenals outside of a process of reciprocal global nuclear disarmament whose mechanisms have not yet been sketched out by the United States, China, France, Russia, and the United Kingdom.

SECURE NUCLEAR CAPABILITIES AGAINST TERRORIST ACQUISITION

To help prevent terrorists from acquiring nuclear weapon capabilities, the United States should work quietly with Pakistan and India to ensure that they employ state-of-the-art practices and technologies to secure nuclear facilities, material, and know-how. This is consistent with each state's obligation under Resolution 1540. Lawyers hold diverse views on whether the NPT bars any cooperation with the nuclear weapon establishments of India, Pakistan, and Israel, but Resolution 1540 creates a clear basis for cooperation that would strengthen protections against export, transit, and transshipment of sensitive nuclear materials.

The United States, in concert with others, or alone if necessary, should offer, and India and Pakistan should welcome, an expansion of threat reduction programs to make the protection of fissile materials in Pakistan and India a top-priority measure.[101] Under such programs, outside states would provide both India and Pakistan with technologies and procedures to improve the reliability of personnel in organizations responsible for nuclear materials and weapons, and training and equipment for facility operators and regulators to improve physical protection and control and accounting of nuclear materials. These improvements also could be implemented through discussions of best practices in other countries. In addition, the states should pursue joint development of technical equipment for border control and customs agencies in order to improve the detection of nuclear and radiological

materials at border crossings, as well as research partnerships with nuclear experts to strengthen their role in the peaceful application of nuclear technologies.

India and Pakistan, unlike North Korea and Iran, are not barred under international treaty from having nuclear weapons. States proffering the assistance recommended in the present chapter 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 own facilities.

NEGOTIATE AND PROPERLY 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 have been slow to formalize and implement them. 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 weigh Indian-Pakistani risk reduction efforts in determining the quantity and quality of military trade with both countries.

Priority measures to achieve these goals include having the two sides establish national risk reduction centers in their respective countries to administer agreed-upon confidence-building

measures; negotiate and implement an agreement not to flight-test missiles in the direction of the other country and to flight-test missiles only from designated test ranges; exchange planned schedules of missile tests on an annual basis to supplement the current practice of twenty-four-hour advance notification; provide advance notice of the movement of missiles for training purposes; and avoid operational deployment of nuclear warheads mated to delivery systems.

PHASE OUT NATIONAL FISSILE MATERIAL PRODUCTION

The single most effective way for Pakistan and India to limit 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 material. Strong security and economic arguments can be made that both states would benefit from such a move today. Each has sufficient material for nuclear arsenals large enough to meet its deterrence needs. 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 states with surplus stocks. Indeed, were India and Pakistan to dismantle their uranium enrichment and plutonium reprocessing facilities and place all their nuclear reactors under international safeguards, a strong case could be made for the Nuclear Suppliers Group to seek non–nuclear weapon states' endorsement of the initiation of commerce with them in nuclear power reactors and fuel services.

In all likelihood, however, Indian and Pakistani leaders will not stop all production of fissile material unilaterally or even bilaterally. They should, however, accept with all states a global ban on HEU production and a moratorium on plutonium separation, and

join in negotiating an FMCT—an international treaty banning the unsafeguarded production of fissile materials.

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, more difficult, jihadi organizations active in Kashmir, to accept that violence will not create a favorable outcome in 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. At the same time, the international community should emphasize its willingness to help improve the status and well-being of Muslims in all of 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.[102] 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. The most important immediate step is to make permanent the current cease-fire along the Line of Control between India and Pakistan.

SUPPORT POLITICAL REFORM IN PAKISTAN

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

The army's dominant role in Pakistan is 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. Over the years, the army and its intelligence services have 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. The army must be made accountable to some institution other than itself. Because the Pakistani army, including its powerful intelligence arm, bases its claim to political power and economic resources in large part 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. The unresolved status of Kashmir significantly exacerbates regional instability, which in turn intensifies Pakistan's perceived need for nuclear weapons.

For the sake of Pakistan's long-term internal stability and 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. Paradoxically, the long-term future of Pakistan depends on the army voluntarily nurturing independent civilian institutions and leaders to displace it from many positions it now occupies. Perhaps the greatest challenge, for the army leadership as well as civilians, will be to impose control from top to bottom over the ubiquitous intelligence services, some of whose personnel operate autonomously. The United States' will and capacity to encourage restructuring and reform of the intelligence services is undermined by the Central Intelligence Agency's dependence on these services in combating the Taliban, al Qaeda, and other terrorist actors and sponsors. Ultimately, though, such reform is key to an effective nonproliferation strategy as well as to stability in South Asia.

PROMOTE STABLE CONVENTIONAL FORCE BALANCES

India is in the midst of a 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. The effects of ballistic missile defenses on strategic stability, in particular, need to be thought through much more fully in India—and among potential suppliers—than they have been to date.[103] Were Pakistan to find its deterrent deeply undermined, in the absence of a fundamentally transformed relationship with India, it would react by increasing the quantity and survivability of its nuclear force, along with the means to penetrate Indian defenses. In part out of concern about the erosion of its strategic position relative to India, Pakistan seeks and may acquire new F-16 fighter-bomber aircraft from the United States that are capable of performing

multiple roles, including delivery of nuclear weapons. All of these developments could increase the risk of escalation during a crisis and accelerate the nuclear arms race in South Asia. The United States should exercise strategic restraint and avoid sales of weapons such as antimissile systems and F-16s that could directly unsettle the state of nuclear deterrence between India and Pakistan. If and when the two countries stabilize their relationship, it should then be possible to provide new strategic capabilities that, under agreed-upon confidence-building regulations, would be seen to serve defensive, not offensive, purposes.

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 counter China are perceived as threatening by Pakistan, prompting Pakistan to seek greater capabilities, which in turn add to the threats India perceives. China's vital assistance to Pakistan's nuclear and missile programs has intensified and complicated the regional security dynamic, implicating China more fully in it than many international officials recognize.

There are no easy solutions to either the Indian-Pakistani or the triangular Sino-Indian-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 or 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 the United States, France, and other states to waive or amend nonproliferation prohibitions against nuclear commerce (which is often subsidized) with India. India has not put all of its nuclear facilities under safeguards, or even all of its civilian facilities, but it wants nuclear suppliers to change existing rules and sell it nuclear reactors anyway.

The United States should encourage agreement among nuclear suppliers to allow assistance to enhance the safety of old, safeguarded nuclear facilities in India, Israel, and Pakistan. However, the United States and other nuclear technology suppliers should not accede to the Indian demand to end restrictions on sales of technology for new reactors as long as doing so would undermine non–nuclear weapon states' commitments to strengthening the nonproliferation regime. Many parties to the NPT chose to 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.

Thus, the long-term costs of according nuclear weapon status to India and opening it (and Pakistan and Israel) to nuclear reactor commerce 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.

SUMMARY OF POLICY RECOMMENDATIONS

- Lead an initiative to ensure that Pakistan and India employ state-of-the-art practices and technologies to secure nuclear facilities, material, and know-how. (p. 160)
- Encourage Pakistan and India to negotiate and properly implement nuclear risk reduction practices. (p. 161)
- Encourage India and Pakistan to cease uranium enrichment and plutonium separation, in return for ending international restrictions on nuclear technology and fuel service cooperation. (p. 162)
- Encourage India and Pakistan to accept a permanent cease-fire across the Line of Control between India and Pakistan. (p. 163)
- Strengthen civilian political parties and institutions in Pakistan. (p. 164)
- Promote stable conventional force balances and security relationships among Pakistan, India, and China. Do not provide U.S. weaponry

capable of delivering nuclear weapons, such as fighter-bomber aircraft, or of destabilizing the strategic balance, such as ballistic missile defenses, unless and until India and Pakistan have stabilized their relationship so that new strategic capabilities would only be seen to serve defensive, not offensive, purposes. (pp. 165–166)

- Extend international cooperation to India and Pakistan (and Israel) to upgrade the safety of reparable existing nuclear plants, if and when all civilian nuclear facilities are placed under safeguards. (p. 167)
- Resist Indian demands to waive or amend nonproliferation prohibitions against nuclear technology commerce for new reactors, in the absence of support from key non-nuclear weapon states. (p. 167)

Iran

A nuclear-armed Iran would sharply exacerbate regional security and almost certainly give rise to similar programs in other Middle Eastern states, reversing the trend set in Iraq and Libya. The nonproliferation regime would not likely survive such a breakout, while the Middle East would become even more dangerous. In short, Iran may be the key proliferation tipping point.

The thirty-five member states of the IAEA Board of Governors concluded in November 2004 that Iran has committed "many breaches of its obligations to comply" with its nuclear safeguards agreement under the NPT, and that inspectors were still unable "to conclude that there are no undeclared nuclear materials or activities in Iran." France, Germany, and the United Kingdom, on behalf of the EU, have taken the lead in trying to reverse Iran's dangerous course.

It is reasonable to conclude from Iran's behavior that Iranian decision makers have not made a strategic decision to forgo the

capability to acquire nuclear weapons. Rather, Tehran appears to be making tactical decisions to balance its desire not to become an international pariah with its concern that security and status interests may argue for preserving a nuclear weapon option. If Iran's overriding interest is to guarantee fulfillment of its "right" to a secure supply of electricity from nuclear technology, then that "right" can be met fully and cost-effectively through international cooperation. France, Germany, and the United Kingdom (the EU-3), backed by Russia, the United States, and China, should assure Iran that its nuclear reactor program can proceed without interference. If, however, Iranian leaders also want to obtain the materials necessary to produce nuclear weapons, they have no right to do so, under Article II of the NPT, and the EU-3 and the UN Security Council should act to prevent Iran from obtaining such materials. The challenge before the international community today is to clarify Iran's intentions and give it every incentive—positive and negative—to meet its energy, political, and security needs without technologies that pose inherent threats of nuclear weapon proliferation.

Iran's clear violations of its safeguards obligations, its extensive pattern of deception, and lingering unanswered questions regarding its work on uranium enrichment technologies and its experimentation with polonium, which can be used in nuclear weapon triggers, raise unavoidable doubts about its commitment to use nuclear technology and materials exclusively for peaceful purposes, as required under Article II of the NPT. While Iran should not be denied the "right" to nuclear energy, Tehran's record has made it unsafe for the international community to permit Iran to produce weapon-usable uranium or plutonium. Iran should rely on guaranteed, cost-effective international supplies of fuel services to meet its energy needs.

CLARIFY BENEFITS

Pursuant to their November 2004 agreement, the EU and Iran began negotiations over the benefits the latter would gain in exchange for "objective guarantees that Iran's nuclear program is exclusively for peaceful purposes." Iran will argue that permanent international monitoring of its declared uranium enrichment operations (and hoped-for future heavy water and plutonium production facilities) would objectively guarantee the peacefulness of these activities. The EU, backed by the rest of the world, must make clear that the only way to objectively guarantee non–weapon-related applications is for Iran to forgo possession and operation of technologies to enrich uranium or separate plutonium.

EU negotiators recognize that Iran must receive positive incentives to accept this interpretation of "objective guarantees." Thus, the EU-Iran negotiations include working groups on "political and security issues, technology and cooperation, and nuclear issues." The EU also committed to negotiate with Iran on a trade and cooperation agreement and to support opening Iranian accession negotiations at the World Trade Organization. The November 2004 EU-Iran agreement also commits both sides to combating terrorism and to supporting the political process in Iraq "aimed at establishing a constitutionally elected Government." These negotiations have the potential to lead Iran to terminate its nuclear ambitions, but will be fitful and crisis prone.

The United States and all other states should actively support these negotiations by reinforcing the positive and negative incentives for Iran to forgo acquisition of capabilities to produce materials directly usable in nuclear weapons. While a host of motives are behind Iran's long-standing interest in a nuclear option—not the least of which being regional status and, formerly, the threat

from Saddam Hussein's Iraq—the United States should at least recognize the threats Iran perceives from the United States and communicate to the current Iranian government that it will not pursue regime change through overt or covert military action if Tehran verifiably forswears acquisition of all capabilities related to nuclear weapons and ends its support of groups that commit terrorism. It is highly unlikely that either the United States or the Iranian people would 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 cannot be expected to abandon its budding nuclear weapon capabilities if it faces the U.S. threat of forced regime change. 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.

Though some in Washington resist a strategy of positive engagement with Iran, they have failed to offer an alternative to the EU strategy that would alter Iranian decision making or destroy its nuclear capabilities for a suitably long period of time. If, with active U.S. support, the EU strategy failed, Washington would be no worse off than it is today.

Finally, the international community, especially the United States, must act on the reality that Iran's size, resource base, history, and mobilized population will always make it a major power in the Persian Gulf region and the broader Middle East. Stability in Iraq and the broader region therefore requires cooperation, or at least shared rules of the road, among Iran, Iraq, the Gulf Cooperation Council states, more distant neighbors, and, of course, the United States. If there is to be an easing of pressures

toward proliferation of nuclear (and chemical and biological) weapons in this region, progress must be made in constructing a regional security system. Iran should know that the more its smaller neighbors fear it, the more they will seek protection from the United States. Similarly, the United States and Iran's neighbors should communicate that Iran need not fear interference in its affairs if it eschews capabilities and activities that threaten others. A regional security dialogue should be convened to facilitate this process of communication and regional rule making.

RAISE COSTS

The prospects for persuading all of the powerful factions in Iran to eschew options to acquire nuclear weapons would be greater if those factions perceived that the international community could physically prevent them from acquiring such weapons. Diplomacy also would be augmented by the realistic possibility of economic sanctions on investment in Iran imposed by all countries, not just a few. Unfortunately, Iranian leaders seem to discount the prospect that the United States or another country could destroy all of Iran's nuclear assets. The most militant Iranian factions believe that a U.S. or Israeli military attack, without UN authorization, would rally the Iranian people to their government in dedicated defiance of the attackers. And there is little danger of comprehensively imposed economic sanctions so long as Iran does not incontrovertibly break its nonproliferation obligations and openly seek nuclear weapons. China's unwillingness to support economic sanctions to enforce international rules is intensified by its growing dependence on Iranian oil.

Thus, the options for raising the costs of Iranian nuclear defiance are rather limited. The best way to improve these options is

to pursue the negotiating course charted by the EU, maintaining an uncompromising bottom line on nuclear terms and offering reasonably generous incentives to Iran to accept it. If Iran rejected such incentives, it could be held to account for creating a crisis that left the international community no recourse but to pursue a more coercive approach. The United States and other countries should continue to seek intelligence on Iranian nuclear facilities, to increase the effectiveness of military action in case no other options are left. Participants in the PSI should also convey privately to Iran that they will redouble their efforts to physically prevent Iran from receiving or exporting nuclear technology and material.

SEEK A SECURITY COUNCIL GUARANTEE OF A DEAL

The UN Security Council is the ultimate enforcement body of the NPT, and the UN is the clearest source of international legitimacy. The importance, difficulty, and global implications of the issues surrounding Iran's nuclear activities warrant the Security Council's taking up the matter, but not yet in the punitive way that the United States seeks and Iran fears. Rather, at the hoped for culmination of the EU-Iran dialogue, the Security Council should be asked to consider a resolution positively endorsing the terms arrived at by the EU and Iran to objectively guarantee the world that Iran is conducting no nuclear activities that are not exclusively peaceful and that Iran's security, technical, and economic needs are met. Among these terms are likely to be a commitment by the EU and the international community, particularly Russia, to provide an uninterrupted, cost-effective supply of nuclear fuel to Iran, and to return spent fuel to its source. Security Council endorsement could help reassure Iran that neither the United States nor other states could interfere with its fuel

supply. In short, a positive Security Council resolution would significantly improve the durability of a deal between Iran and the international community.

STRENGTHEN UNIVERSAL STANDARDS

To buttress Iran-specific initiatives, an effective nonproliferation strategy should also include steps urged elsewhere in the present report. Specifically, states should work to clarify through the IAEA and the NPT review process that nuclear cooperation with any state for which the IAEA cannot provide sufficient assurances regarding the peaceful nature of its nuclear program should be suspended. The IAEA Board of Governors should 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. The UN Security Council should adopt a new rule making clear that if a state withdraws from the NPT, it remains responsible for violations committed while still a party to the treaty. The Security Council should also establish 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.)

Furthermore, the Nuclear Suppliers Group should establish a rule that all purveyors of nuclear technology require contracts that specify that if a state receiving such technology withdraws

from the NPT, the provided nuclear supplies may not be used or transferred.

More broadly, the Nuclear Suppliers Group should be establishing through relevant international bodies 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 of a zone free of nuclear, chemical, and biological weapons in the Middle East.

SUMMARY OF POLICY RECOMMENDATIONS

- Actively support France, Germany, and the United Kingdom in their efforts to negotiate long-term arrangements with Iran that objectively guarantee that its nuclear program is exclusively for peaceful purposes. (p. 170)
- Communicate to the current Iranian government that the United States will not pursue regime change through military action if Tehran verifiably forswears acquisition of capabilities to produce materials that can be used in nuclear weapons and ends its support of groups that conduct terrorism. (p. 172)
- Support nuclear negotiations, including positive incentives to the Iranian government and people, while concurrently championing political reform in Iran. (p. 172)

- Establish a security dialogue among Persian Gulf states, including representatives of Iran and Iraq. (p. 173)
- Strengthen intelligence efforts to identify all Iranian nuclear activities and facilities and to work through the PSI to interdict illicit transfers of technology, material, or know-how. (p. 174)
- Urge the UN Security Council to consider a positive resolution endorsing the terms of a deal worked out by the EU and Iran that objectively guarantees that Iran's nuclear program is exclusively for peaceful purposes. (p. 174)
- 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. 175)
- Move a UN Security Council resolution to make clear that any state that withdraws from the NPT remains responsible for violations committed while it was still a party to the treaty. (p. 175)
- Move a UN 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. 175)
- Establish a Nuclear Suppliers Group rule that all purveyors of nuclear technology must require contracts that specify that if a state receiving such technology withdraws from the NPT, the provided nuclear supplies may not be used or transferred. (pp. 175–176)

Middle East

LOCK IN REGIONAL DISARMAMENT

Libya shows that nuclear, biological, and chemical weapons programs can be at least temporarily eliminated in a major country in the Middle East without that step being conditioned on disarmament everywhere in the region. The case of Iraq makes the same point, though the cost has been very high. To solidify Libyan and Iraqi disarmament, and broaden the benefits internationally, the United States and other major players must develop a strategy for regional security and disarmament. This process must involve states in the region with past and current chemical, biological or nuclear weapon programs or arsenals[104] and influential outside actors, including at least the United States and Russia. Chemical and biological weapons must be addressed along with nuclear weapons because in the Middle East the threats posed by all three are inseparable, insofar as use of any of these types of weapons can threaten the existence of large segments of the smaller states' populations.

Insecurity has many forms and sources in the Middle East, including governments with tenuous legitimacy, territorial disputes, the unsettled fate of the Palestinians, Sunni-Shiite tensions, intra-Arab rivalry, and a mix of chemical, biological, and nuclear weapons programs and arsenals that raise the stakes of any potential conflict. Arab states fear each other and Iran, while they variously detest or rely on (sometimes simultaneously) the U.S. military presence in the region. Iran fears Iraq and, related to it, the imposing U.S. military posture. 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 that do not recognize its existence. The highest priorities are to prevent Iran from acquiring nuclear weapons, to end the use of force by states and nonstate actors against noncombatants, and to persuade Israel, Egypt and Syria to take immediate steps to enhance the prospect of creating a zone free of nuclear, chemical, and biological weapons.

Israel's possession of nuclear weapons must be recognized as central to the problem of improving regional security, but it is equally important to recognize that there is no reason to believe that the Arab states, Iran, and all terrorist organizations would completely and verifiably give up their chemical, biological, and nuclear capabilities and ambitions if Israel simply disarmed. Israel's military strategy is motivated by defensive imperatives, not aggressive intent to challenge the existence or territorial integrity of any other state. Nor does Israel seek to gain political prestige from its nuclear arsenal, whose existence it continues to deny. Some assert that Israel's nuclear arsenal has enabled it to occupy Palestinian territory and expand settlements on it, and therefore serves an aggressive strategy. This assertion is belied by the fact that Israel's control over Palestinian (and Egyptian and Syrian) territory resulted from the 1967 Six-Day War, which others initiated, and that Israel did not invoke its nuclear capability in this war. This does not excuse Israel's building of settlements on occupied territory, but the ongoing conflict over settlements should not be allowed to impede efforts to prevent the spread of nuclear, biological, and chemical weapons, especially as use of these weapons against Israel would put the Palestinian population at enormous risk.

Nevertheless, Israel's nuclear arsenal provides a popular *political* pretext for potential Arab proliferation. Many Arab states cite

the double standard reflected in Israel's nuclear status as an excuse not to support international efforts to enforce nonproliferation rules. 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 strengthening 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.[105] As a leader of nonproliferation enforcement, the United States must, in the words of the public opinion researcher Daniel Yankelovich, "present a new vision of America to the Muslim world by positioning U.S. foreign policy on the side of justice, because the present perception is that the United States is always to be found on the side of injustice."[106]

A ZONE FREE OF NUCLEAR, CHEMICAL, AND BIOLOGICAL WEAPONS

Thus, even as nonproliferation issues are tackled one by one, an ambitious regional initiative is also necessary. Key parties in the Middle East, including Israel, already have endorsed the objective of creating a zone free of nuclear, chemical, and biological weapons. This objective was reiterated and made a factor 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 Gulf 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.[107]

Instead of defensively trying to ignore Israel's nuclear status, the United States and Israel should proactively call for regional dialogue to specify the conditions necessary to achieve a zone free of nuclear, chemical, and biological weapons.

Many profound changes would have to occur to achieve the necessary conditions, given the existence of chemical, biological, and nuclear weapons programs and arsenals in the region. Israel will not implement all necessary arms control and disarmament measures before a real peace is achieved and threats to its existence disappear. Egypt, Iran, and Syria—the main holdouts—demand changes in Israel's nuclear status and policies toward the Palestinians before they will undertake far-reaching disarmament. This may seem unattainable, but not long ago Iraq and Libya were two major proliferation concerns; today they are not. To pursue a zone free of nuclear, chemical, and biological weapons in the Middle East, leading parties in the UN 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. The IAEA and the strengthened Resolution 1540 monitoring committee recommended earlier also could provide information that would build confidence.

Certain threshold conditions must be met for any progress to be made. All regional states and parties must recognize the existence and right to security of all other regional states and parties, and act accordingly. This means that all the Arab states, Iran, and

various armed substate groups must avowedly recognize Israel's right to exist, and Israel must meaningfully recognize the right of existence, the statehood, and the security requirements of the Palestinians.[108] Negotiations must include all states in the region that possess relevant weapons programs and technical capabilities. Terrorism must also be on the table, since support for terrorism or other forms of violence challenging the existence of others is an existential threat, making it unlikely that threatened actors or their protectors will relinquish means of deterring such threats.

Preliminary to negotiations, friendly states and NGOs should conduct studies and dialogues exploring key material conditions that would have to be met to establish a zone verifiably free from nuclear, chemical, and biological weapons. To accomplish this, the steps described below appear indispensable.

First, 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 chapter 5, under "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 nongovernmental experts from the region could build confidence that the required transparency can be effected.

Regional actors may also gain additional 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 nuclear, chemical, and biological weapons begin.

To impart momentum to this process, Israel, as the only state in the region with nuclear weapon capability, should offer several sequential initiatives. First and foremost, Israel must continue its declaratory policies that de-emphasize nuclear weapons in national politics and international diplomacy, and reinforce the goal of creating a zone free of nuclear, chemical, and biological weapons in the Middle East. Yet to augment disarmament momentum generated in Iraq and Libya, Israel should ratify the Chemical Weapons Convention it signed earlier and join the Biological Weapons Convention. Israel should also make its neighbors, particularly Syria and Egypt, aware that were they to sign and implement these two conventions, and were Iran to permanently forgo acquisition of capabilities to enrich uranium and separate plutonium, Israel would undertake an indefinite moratorium on producing plutonium and cease separation of plutonium from spent fuel. The means to verify such a moratorium should be explored through the expert dialogue suggested above.

The United States, Egypt, Jordan, Israel, and other key states should begin to explore how all or some of the proposals made here could be used to reinforce forward movement in a revived

Table 6.1. 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), probable MRBM capability
Syria	—	Suspected program	Suspected weapons[d]	SRBMs (Scud-B and C, SS-21)
Egypt	—	Suspected program	Suspected weapons	SRBMs
Saudi Arabia	—	—	—	MRBMs, 30 Chinese IRBMs (CSS-2s)
Iraq	Dismantled program	Dismantled program	Dismantled program	SRBMs
Libya	Renounced program	—	—	SRBMs (Scud-B)
All others[e]	—	—	—	SRBMs

Notes: SRBM, short-range ballistic missile. MRBM, medium-range ballistic missile. IRBM, intermediate-range ballistic missile.

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): pp. 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#iran (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.

Palestinian-Arab-Israeli peace process. What should not be delayed is public acknowledgment by the United States that Israel's nuclear status is a central issue that must be addressed, within the context of a revived regional security initiative.

SUMMARY OF POLICY RECOMMENDATIONS

- Muster greater U.S. involvement in the Middle East peace process. (p. 178)
- Proactively call for a regional dialogue to specify conditions necessary to achieve a zone free of nuclear, chemical, and biological weapons. (p. 181)
- 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. (p. 181)
- Provide external leadership by outside actors to facilitate and complement direct negotiation of confidence-building and arms control measures by regional actors:
  - Encourage friendly states and NGOs to conduct studies and dialogues exploring key conditions that would have to be met for a zone free of nuclear, chemical, and biological weapons to be implemented. (p. 182)
  - Design the verification procedures and practices that would have to be implemented to achieve a zone free of nuclear, chemical, and biological weapons in the Middle East. (p. 182)
  - Provide independent intelligence from outside states and international agencies to help verify that parties are fulfilling their pledges. (p. 183)

- Push for high levels of transparency in national policies, budgets, and facilities. (p. 182)

▶ Encourage Israel to sign and ratify both the Chemical Weapons Convention and the Biological Weapons Convention, Egypt and Syria to sign and ratify the Chemical Weapons Convention and ratify the Biological Weapons Convention, Iraq and Lebanon to sign and ratify the Chemical Weapons Convention, and the United Arab Emirates to ratify the Biological Weapons Convention. (p. 183)

▶ Encourage Israel to declare that it has adopted an indefinite moratorium on producing plutonium and ceased the separation of plutonium from spent fuel. (p. 183)

North Korea and Northeast Asia

North Korea (formally, the Democratic People's Republic of Korea, or DPRK) has an active nuclear weapons program and likely possesses enough nuclear material for up to nine nuclear weapons. U.S. troops, allies in the region, and strategic interests are directly threatened by North Korea's growing nuclear capability, pursued in violation of Pyongyang's commitments under the Non-Proliferation Treaty and other agreements. Acceptance of a North Korean nuclear weapons capability is inconsistent with vital U.S. national security interests. Given North Korea's economic strains, it is conceivable that Pyongyang might sell nuclear materials or weapons to other states or terrorist groups, taking a regional threat to the global level. In such a scenario, U.S. policy makers could face the truly appalling choice between acquiescing in North Korea's transfer of its weapons technology or fighting a full-fledged war on the Korean peninsula.

Even if North Korea does not make nuclear exports, its nuclear status is untenable. A failure to resolve the North Korean nuclear threat would undermine the cause of nuclear nonproliferation and make it far more likely that South Korea and Japan would reconsider their own nuclear status.

The United States and its partners in dialogue with North Korea must move more aggressively to determine whether and under what conditions North Korea is willing to relinquish its nuclear capabilities. Finding Pyongyang's bottom line will allow the United States and its allies either to negotiate a verifiable end to North Korea's nuclear program or to build a consensus on responding to the threat posed by North Korea's suspected nuclear weapons. The status quo is rapidly becoming a permanent crisis that threatens to undermine U.S. influence in the region and weaken the regional commitment to nonproliferation.

The creation of a six-party negotiating mechanism in 2003 was a positive development, but it has not yet produced tangible results. While the talks have enabled the United States to more closely engage China on the issue of North Korea's nuclear future, 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. Moreover, some in China may prefer keeping the North Korean nuclear issue—a threat to U.S. interests—alive as a counterweight to U.S. interests in Taiwan, an overriding Chinese concern.

A U.S. policy designed to achieve positive results in East Asia must follow a new course. First, it is essential that the United States and its allies develop an international consensus through the UN 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. Once this is done, it may prove more feasible for the United States to 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. This will involve real negotiations with North Korea, although these could take place in the broad context of the six-party talks.

Regardless of the forum, the United States should pursue rapid and ongoing negotiations with North Korea led by 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. However, for any talks—bilateral or six-party—to succeed, the United States must also work steadily to enhance its alliances with South Korea and Japan so as to broaden support for U.S. security objectives in the region, including the absence of nuclear weapons.

At the same time, the United States must prepare itself and its closest allies for the possibility that North Korea will not abandon its nuclear capabilities. Preparations can best be made 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. A key part of avoiding a crisis during this period, however, is for the United States to lay down clear "red lines" and make clear *at a minimum* that any attempt by North Korea to export nuclear materials or weapons will be considered a threat to international peace and security.

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. In keeping with the UN Security Council's presidential statement of January 1992, which declared the proliferation of nuclear weapons a threat to international peace and security, 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 as reported to the council by the IAEA. If a negotiated settlement cannot be reached after a determined good-faith effort, then the United States must work with its allies to obtain a Security Council resolution 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, including the possibility of sanctions, an embargo, and even military conflict.

SUMMARY OF POLICY RECOMMENDATIONS

- Determine whether and under what conditions North Korea is willing to relinquish its nuclear capabilities. (p. 187)

- Develop an international consensus through the UN 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. 188)
- 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 and other countries, including diplomatic relations and reconstruction assistance. (p. 188)
- 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. 188)
- End the state of permanent crisis by pursuing rapid and ongoing negotiations with North Korea led by a presidentially appointed envoy. This person must be fully authorized to negotiate, prepared and empowered to make serious progress, and in a position to meet with North Korean counterparts of sufficient rank to conduct substantive negotiations. (p. 188)
- Prepare for the possibility that North Korea is unwilling to abandon its nuclear capabilities by reinforcing the diplomatic and military capabilities in the region with a view to enhancing deterrence and stability on the Korean peninsula and reducing incentives for other countries to follow North Korea's nuclear lead. (p. 188)
- Make clear that any attempt by North Korea to export weapon-usable nuclear materials or weapons will be considered a threat to international peace and security as defined by the UN Charter. (p. 189)