# Nuclear Proliferation and Terrorism

> Every senior leader, when you're asked what keeps you awake at night, it's the thought of a terrorist ending up with a weapon of mass destruction, especially nuclear.
>
> —Secretary of Defense Robert Gates

On October 28, 2008, Dr. Mohamed ElBaradei, Director General of the International Atomic Energy Agency (IAEA), stood at the rostrum of the United Nations General Assembly and warned the world about nuclear terror.

"The possibility of terrorists obtaining nuclear or other radioactive material remains a grave threat," said Dr. ElBaradei. A soft-spoken man, he let the power of his message make his case loudly and unmistakably—and it produced major news stories around the world. "The number of incidents reported to the Agency involving the theft or loss of nuclear or radioactive material is disturbingly high . . . ," he said. "Equally troubling is the fact that much of this material is not subsequently recovered. Sometimes material is found which had not been reported missing."

We live in a time of increasing nuclear peril. The number of states armed with nuclear weapons or seeking to acquire them is increasing. Terrorist organizations are intent on acquiring nuclear weapons or the material, technology, and expertise needed to build them. Trafficking in nuclear technology is a serious, persistent, and multidimensional problem. The worldwide expansion of nuclear power increases the danger of proliferation.

The challenges for the United States and the world remain clear. Today, anyone with access to the Internet can easily obtain designs for building a nuclear bomb, but the hardest part for those bent on nuclear terror has always been acquiring the weapons-grade uranium or

plutonium required to make the bomb. Our crucial task is to secure that material before the terrorists can steal it or buy it on the black market. And we must stop and reverse the proliferation of nuclear weapons while we can.

Since the beginning of the nuclear age, the United States has made halting but steady progress toward establishing universal norms for the possession and use of nuclear weapons and toward securing nuclear materials and technology. U.S. strategies include building international regimes based on the Nuclear Nonproliferation Treaty (NPT) that came into force in 1970 and on the system of international safeguards that support its implementation. Those include counterproliferation initiatives undertaken to strengthen the nuclear security regime and cooperative programs between the United States and partner countries intended to strengthen the international response to nuclear security threats.

The United States, as a preeminent nuclear power, has an obligation to lead the world in advancing these efforts. Few other nations have the ability to exemplify best practices for the rest of the world. Few other nations can marshal the resources, expertise, and talent necessary to extend long-term bilateral and multilateral help on nuclear security issues. Our efforts must adapt to meet the rapidly evolving nuclear security challenges we confront today. After examining several tiers of U.S. efforts, the Commission offers the following findings and recommendations.

## The Nonproliferation Regime

The Nuclear Nonproliferation Treaty (NPT) has been ratified by 188 nations. It established an international norm against the proliferation of nuclear weapons and an elaborate system of nuclear safeguards to monitor compliance. The NPT defines a *nuclear-weapon state* as any country that manufactured and exploded a nuclear weapon prior to January 1, 1967. This definition limits the number of "official" nuclear-weapon states to five: the United States, Russia, China, France, and the United Kingdom. At the heart of the NPT is a bargain: in return for a pledge by the non-nuclear-weapon states to forswear nuclear weapons in perpetuity, the five declared nuclear-weapon states agree to provide assistance for peaceful uses of nuclear technology and negotiate in good faith on effective measures relating to nuclear disarmament.

To demonstrate compliance with their NPT obligations, the nonnuclear-weapon states must negotiate a safeguards agreement with the International Atomic Energy Agency that permits inspections of civilian nuclear plants in order to detect the diversion of nuclear material from those plants to make nuclear bombs.

The revelation during the 1990s that Iraq and North Korea were violating their NPT obligations led the IAEA to adopt a system of strengthened safeguards in 1997. States were urged to conclude an Additional Protocol with the IAEA that greatly expanded and strengthened its monitoring rights. As of October 2008, 118 states have signed the Additional Protocol and 88 have ratified it.

Today, however, the nonproliferation regime faces major challenges. The nuclear programs of Iran and North Korea pose the most urgent and immediate threat. But the growing nuclear arsenals of India, Pakistan, and China raise serious concerns that the international community must address. The recently concluded U.S.–India Civil Nuclear Cooperation Agreement may significantly affect Asian security, and the next President will have to manage the actions that states may take in response to the agreement. The President should begin by conducting a comprehensive, all-source assessment of the agreement's impact on nuclear weapons programs in the region.

The IAEA is constrained in serving as the world's nuclear watchdog because its staff is aging and its budget has increased little over the past decade. The IAEA has been forced to rely on extrabudgetary contributions from member countries, including the United States. Because of this, the IAEA now faces uncertainties about its long-term ability to perform its fundamental mission—detecting the illicit diversion of nuclear materials and discovering clandestine activities associated with weapons programs.

Perhaps the most important challenge facing the IAEA is the expected expansion of civil nuclear programs throughout the world. New nuclear facilities will have to be carefully monitored to ensure that no nation uses peaceful activities as a cover for a secret nuclear weapons program or for diverting weapons-usable material to a weapons program. Such monitoring will increase the strain on the IAEA's already limited resources. As a first step, the United States and the IAEA should ensure that civilian nuclear facilities are designed and built with safeguards in mind.

Among the other tests facing the IAEA is the inherent difficulty of reliably detecting dangerous illicit nuclear activities in a timely fashion. Some of these difficulties—such as detecting military diversions from nuclear fuel cycle activities—are not likely to be remedied no matter how much the IAEA's resources are increased. In the past 20 years, while the amount of safeguarded nuclear material usable for weapons (highly enriched uranium and separated plutonium) has increased by a factor of 6 to 10, the budget for safeguards has not kept pace and there are actually fewer inspections per safeguarded facility than before.

In addition to limited resources, the IAEA lacks clear authority to secure nuclear material and install near-real-time surveillance at the sites it inspects, or to conduct the "wide-area surveillance" needed to monitor activities under the Additional Protocol. Dysfunctional and nontransparent national accounting practices and national procedures for inventorying nuclear materials further limit the IAEA's effectiveness, especially when coupled with the agency's increasing inability to meet its "timely detection" goals.

More fundamentally, no review has been conducted recently to determine whether the IAEA needs to update definitions—such as how much material is needed to make a bomb and how much time is required to divert this material and to convert it into bombs—that are critical to the IAEA's fulfilling its mission. Finally, two structural factors have significantly undermined the IAEA's ability to act credibly against noncompliant states. First, consensus is typically sought within the IAEA Board of Governors and the UN Security Council prior to any compliance-related actions. Second, there are no automatic, default penalties for states that cannot be found to be in full compliance with their safeguards or other NPT obligations.

While the NPT and the IAEA are at the heart of the nonproliferation regime, it is important to note that they are bolstered by national export controls that help states impede the transit of technologies that could contribute to nuclear weapons programs across their borders, and groups of countries such as the Zangger Committee and the Nuclear Suppliers Group that set international export control standards.

**RECOMMENDATION 3: The United States should work internationally toward strengthening the nonproliferation regime, reaffirming the vision of a world free of nuclear**

**weapons by (1) imposing a range of penalties for NPT violations and withdrawal from the NPT that shift the burden of proof to the state under review for noncompliance; (2) ensuring access to nuclear fuel, at market prices to the extent possible, for nonnuclear states that agree not to develop sensitive fuel cycle capabilities and are in full compliance with international obligations; (3) strengthening the International Atomic Energy Agency, to include identifying the limitations to its safeguarding capabilities, and providing the agency with the resources and authorities needed to meet its current and expanding mandate; (4) promoting the further development and effective implementation of counterproliferation initiatives such as the Proliferation Security Initiative and the Global Initiative to Combat Nuclear Terrorism; (5) orchestrating consensus that there will be no new states, including Iran and North Korea, possessing uranium enrichment or plutonium-reprocessing capability; (6) working in concert with others to do everything possible to promote and maintain a moratorium on nuclear testing; (7) working toward a global agreement on the definition of "appropriate" and "effective" nuclear security and accounting systems as legally obligated under United Nations Security Council Resolution 1540; and (8) discouraging, to the extent possible, the use of financial incentives in the promotion of civil nuclear power.**

The Commission believes there are a number of specific actions that the United States should undertake to implement this recommendation.

**ACTION: The United States should lead efforts to establish, as a principle of international law, penalties for states that commit serious, sustained violations of the NPT or withdraw from the treaty.**

Any state that commits serious and sustained violations of its IAEA safeguards commitments or withdraws from the NPT should be required to forfeit all benefits gained from membership in the regime. The burden of proof should be on that state to prove that it is in compliance with its treaty obligations. This principle could be established either by agreement among the NPT's member states or, if that is not

achievable, by a UN Security Council resolution adopted under Article VII of the UN Charter.

Such a resolution should require any state declaring its intention to withdraw from the NPT to be automatically subject to intrusive measures. These should include inspections to determine whether the state is in violation of its safeguards commitments. During this process, the state would be obligated to demonstrate its compliance with its obligations.

A country discovered—either through the intrusive measures following its declaration that it intends to withdraw from the treaty or through other means—to be in noncompliance with its safeguards obligations would be subject to stringent additional monitoring measures to determine the extent of the noncompliance. These additional measures would include (1) broad mandatory inspections; (2) access without delay to persons and original documents, with the right to record interviews and copy documents; and (3) expanded access to information. A noncompliant state would forfeit the right to further nuclear assistance. Finally, all nuclear materials, technology, and equipment a state received while a party to the NPT would be removed from that country as a condition of withdrawal from the treaty.

**ACTION: The United States should lead an international effort to establish a nuclear fuel bank.**

An international fuel bank would guarantee countries a supply of nuclear reactor fuel. It would also provide complying countries with storage for spent fuel; these countries, in turn, would commit not to exercise any right to establish enrichment and reprocessing facilities. Progress has been made in creating a fuel bank through the IAEA, but the IAEA Board of Governors has taken no action to address the difficult questions of how the fuel bank will be administered and the conditions for its use. Meanwhile, Russia has taken initial steps to establish itself as a regional supplier of nuclear fuel.

The idea of a nuclear fuel bank has found widespread support—its backers include President George W. Bush and IAEA Director General ElBaradei, who endorsed the idea in his October 2008 UN address: "The ideal scenario, in my opinion, would be to start with a nuclear fuel bank under IAEA auspices." By then, U.S. Energy Secretary Samuel W. Bodman had already transferred $50 million to the

IAEA for this purpose, saying, "The United States fully endorses the establishment of an IAEA fuel bank . . ."

The United States should also work to build international support for the negotiation of a treaty halting the production of fissile materials for military purposes. This would be part of an overall effort to show that Washington is moving on all fronts to strengthen the nonproliferation regime. Since, for more than a decade, the international community has been unable to conclude a Fissile Material Cut-Off Treaty, alternative approaches should be explored. A possible start could be a joint declaration by the five NPT-designated nuclear-weapon states to halt their production of fissile material for weapons.

**ACTION: The United States should lead an international effort to update and improve IAEA capabilities.**

The most urgent element of such an effort should be to make sure the International Atomic Energy Agency has the resources and authorities needed to meet its current and expanding mandate. The UN High-Level Panel on Threats, Challenges, and Change described the IAEA aptly: "As an institutionalized embodiment of the Treaty on the Nonproliferation of Nuclear Weapons and of considerable long-term success in preventing widespread proliferation of nuclear weapons, the International Atomic Energy Agency . . . stands out as an extraordinary bargain."

The United States should work with the IAEA Director General to secure the resources (funding, personnel, safeguard technologies, etc.) needed to meet an increasing IAEA safeguards workload. This could include establishing a safeguards "user fee," whereby countries with inspected facilities would be assessed a fee to help defer the costs.

The United States and other interested parties should take additional actions to strengthen the IAEA and improve its management. They should routinely (at least every two years) assess whether the IAEA can meet its own inspection goals; whether those goals afford "timely warning" of an ability to account for a bomb's worth of nuclear material, as required by U.S. law; and what corrective actions, if any, might help the IAEA to achieve its inspection goals. This assessment should also clarify those instances in which achieving the goals is not possible.

The United States must continue to push for universal adherence to the IAEA Additional Protocol, which provides the IAEA with

additional rights to monitor civilian nuclear programs. According to the IAEA, there are now 439 nuclear power reactors in 30 countries—and 36 more plants are under construction. The U.S. government should also work to make adherence to the Additional Protocol a precondition of civil nuclear assistance under the provisions of UN Security Council Resolution (UNSCR) 1540, the rules of the Nuclear Supplier Group, and the laws of the United States.

The IAEA currently is hampered by the lack of near-real-time surveillance equipment at a number of sites where nuclear fuel rods are located and where such equipment must be installed so that the agency can establish the inspection continuity of the fresh and spent fuel rods. In addition, to promote much-needed transparency at suspect sites—and to help deter transfers of nuclear fuel and nuclear weapons technology—the IAEA member states should consider maintaining a registry of all foreign visitors at safeguarded sites. This registry should be made available to other IAEA members upon request.

To enhance the effectiveness of its safeguards program, the agency should establish a complete country-by-country inventory of nuclear materials that could be used to make nuclear bombs. The information should be shared, as appropriate, with individual IAEA member states and the public to ensure that it can be used effectively in developing the plan for IAEA safeguards. The IAEA should update the database regularly. Current IAEA databases are incomplete, and the agency's confidentiality rules make it difficult to construct a comprehensive country-by-country inventory.

The United States should accelerate the Department of Energy–led efforts to build a global database of nuclear material. To the extent possible, the United States should give the IAEA access to this data, thereby enhancing the agency's ability to carry out its mission.

The United States should also work with other IAEA members to agree that only IAEA inspectors from nuclear-weapon states (who already have access to sensitive weapons-related knowledge) should be authorized to look for indicators that weapons work is taking place at an inspected nuclear facility. Such a requirement would enhance the ability of inspectors to detect possible illegal activity at inspection sites, while minimizing the risk of spreading sensitive information.

In addition to the international efforts discussed above, the United States should improve its domestic nonproliferation efforts and set a

positive example for other nations to follow. The U.S. government should (1) declare a date certain for ending the civilian use and export of highly enriched uranium (HEU) and declare a moratorium on commercial reprocessing; (2) implement Title V of the Nuclear Nonproliferation Act of 1978, which requires energy assessments for developing states; (3) secure civilian nuclear facilities in the United States that store or handle nuclear weapons–usable materials to the same standards used for securing military facilities; and (4) accelerate efforts, such as the Next Generation Safeguards Initiative of the Department of Energy (DOE), to develop advanced safeguards techniques and capabilities that will improve the global application of safeguards.

**ACTION: The United States should expand counterproliferation initiatives and improve their implementation.**

The counterproliferation initiatives developed by the United States and other like-minded nations complement the NPT in combating the spread of nuclear weapons. Through diplomacy, the United States must reinforce the conviction that nuclear proliferation and terrorism are concerns not of a few states but of all members of the international community.

The Global Initiative to Combat Nuclear Terrorism (GICNT) is a multilateral initiative that was announced by the United States and Russia in 2006 and now includes 75 members. Under the initiative, the United States works with Russia and other nations to promote a global sense of urgency and commitment to securing nuclear materials, developing a security culture in states where nuclear materials are stored, and preventing nuclear materials and technology from falling into terrorists' hands. These goals are to be pursued through regular joint threat briefings, nuclear terrorism exercises, and nuclear security reviews. The U.S. government should also work to enhance GICNT in key areas, such as (1) eliminating the civilian storage and use of HEU, (2) securing the weapons-usable material of participating states in the shortest possible time frame, (3) aiding participating nations in carrying out the obligations contained in UNSCR 1540, and (4) building international capacity in critical areas, such as nuclear forensics.

The United States should intensify its use of UNSCR 1540, a 2004 resolution that established binding obligations on all UN member

states to take and enforce measures against WMD proliferation, to help countries develop the laws and regulations they need to criminalize proliferation, to improve physical protection and safeguards at nuclear facilities, to strengthen export controls, to improve cooperation on interdiction, and to tighten border security. The United States should also use UNSCR 1540 to work with states to develop a robust security culture focused on reducing the risk of theft or diversion of nuclear materials or technology. In particular, it should urge the adoption of "best practices" and national legislation.

The United States should also seek to strengthen the Proliferation Security Initiative (PSI), a global effort aimed at stopping the trafficking of WMD, their delivery systems, and related material. The initiative can be further improved by increasing the number of participants, enhancing efforts to interdict shipments of WMD (as well as their delivery systems and related materials), and heightening efforts to disrupt black market networks and the financing of proliferation. More importantly, the United States should also work with other states to extend the international laws that prohibit piracy, hijacking, and slavery to cover all transfers of WMD, delivery systems, and related materials in international waters and airspace.

Moreover, the United States should seek to establish as a binding requirement of international law the provision that all transfers of items on the Nuclear Suppliers Group dual-use and trigger lists must be reported in advance to the IAEA or to another international authority. Washington should assist in developing a system to process and analyze the information gathered. Any item transferred in violation of this requirement would be considered an illegal shipment—subject to seizure while in transit and to dismantlement, destruction, or return should it reach its destination. Such a requirement could be established pursuant to a UN Security Council resolution adopted under Article VII of the UN Charter.

Finally, the United States should strengthen and broaden efforts to detect and disrupt proliferation financing. Improved cooperation between the International Financial Action Task Force and countries participating in the PSI is a step in the right direction. The United States should continue to encourage other states to adopt legislation that strengthens national and international measures to combat the financing of proliferation and terrorist networks.

**ACTION: The United States should orchestrate an international consensus to block additional countries from obtaining enrichment and reprocessing capabilities.**

The Commission believes that one of the principal means of halting nuclear proliferation is to prevent the spread of uranium enrichment and plutonium reprocessing technologies and facilities to additional countries. It is important that the United States work to orchestrate an international consensus to block additional countries from obtaining these capabilities. The international nuclear fuel bank discussed above would be a significant step toward gaining this consensus, because it would ensure that nations without these capabilities have a reliable supply of nuclear fuel at market prices.

Many variations on the idea that no new nations should acquire enrichment and reprocessing capabilities have already been put forward. The Bush administration, for example, has proposed that the 45 members of the Nuclear Suppliers Group—the nations of the world with the most advanced nuclear technologies—refuse to sell them to any state that does not already possess full-scale, functioning reprocessing and enrichment capabilities. This proposal would effectively cap the number of states with such capabilities at current levels. Although some states have regarded this proposal as discriminatory, others, such as the United Arab Emirates, have agreed to forgo fuel cycle activities in exchange for assistance in developing civil nuclear power. Dr. ElBaradei has also weighed in, proposing that any new production-scale enrichment or reprocessing facility be under multinational control.

Both of these proposals have merit, but neither has been fully embraced by NPT non-nuclear-weapon states. Additional efforts are needed to find the right set of incentives and disincentives to gain widespread adherence.

**ACTION: The United States should work with others to promote and maintain a moratorium on nuclear testing.**

It is essential that current moratoria on nuclear testing, observed independently by each of the five nuclear-weapon states under the NPT, be maintained. The next President may wish to undertake diplomatic

efforts to formalize such a commitment among the NPT nuclear-weapon states and should encourage non-NPT nuclear-weapon states to adopt moratoria of their own.

The Commission recognizes that the issue of a Comprehensive Nuclear Test Ban Treaty (CTBT) is likely to be reconsidered by the next administration. In 1999, the Senate decided not to provide its consent to ratification of the CTBT. The 51 senators who opposed the treaty had a variety of concerns, including (1) the potential need for the United States to resume nuclear testing under certain circumstances in order to maintain the safety or reliability of the U.S. nuclear stockpile, (2) the fact that the treaty's zero nuclear yield threshold cannot be verified, and (3) whether other parties to the treaty were in compliance with its provisions. The 48 senators who supported it argued that it would make an important contribution to strengthening the international norm against proliferation and could impede states that are considering the modernization or procurement of nuclear arsenals. They also argued that the Department of Energy's "stockpile stewardship" program would help to ensure the long-term viability of the nuclear stockpile. And they maintained that an assurance of 100 percent verifiability of the provision on zero nuclear yield was not a realistic objective.

The Commission supports the review currently being conducted by the bipartisan Congressional Commission on the Strategic Posture of the United States. That review includes consideration of the long-term reliability, safety, and effectiveness of the U.S. nuclear arsenal. The review also covers the effectiveness of the international monitoring system that is designed to identify and locate underground nuclear tests in order to evaluate the potential reconsideration of the CTBT. Out of deference to the Commission on the Strategic Posture, we have not taken a position on the CTBT in this report.

**ACTION: The United States should work to gain international agreement on specific, stringent standards for securing nuclear materials.**

States have a principal obligation under UNSCR 1540 to adopt and enforce "effective" measures to establish domestic control of nuclear, chemical, and biological weapons and their means of delivery. States also must establish "appropriate" controls over the related materials.

Because the resolution does not define "effective" or "appropriate" measures for nuclear security and accounting systems, there is a need to establish standards for precisely what UNSCR 1540 requires states to do. These definitions must be formulated at the highest levels to ensure that internationally agreed-on standards will be implemented by all nations. Undersecured nuclear material and facilities pose a threat not just to the host nations but to all nations. A baseline approach to establishing what measures are effective and appropriate for nuclear security and accounting standards is the best way to safeguard the world from nuclear tragedy.

The Commission recognizes the urgent need to establish global nuclear security standards to which all states can adhere. We believe that the Convention on the Physical Protection of Nuclear Material and the IAEA's Information Circular (INFCIRC) 225, *The Physical Protection of Nuclear Material,* are the building blocks for obtaining an international consensus on measures that are needed to ensure adequate nuclear security and protection. But tighter standards need to be defined. The goal of the United States should be to ensure that international standards for securing nuclear materials are as stringent as those currently defined for U.S. military facilities. It is important that ongoing negotiations to amend INFCIRC 225 seek the highest standards possible.

The Convention on the Physical Protection of Nuclear Material establishes measures on the prevention, detection, and punishment of offenses relating to nuclear material. The Commission recognizes the positive steps taken in July 2005 when the convention was amended to bind parties to protect nuclear facilities and material in peaceful domestic use, storage, and transport. Nevertheless, the amended convention does not define specific standards for a physical protection "regime." It will not enter into force until two-thirds of state parties have ratified it, an event that is unlikely to occur until well into the future.

**ACTION: The United States should discourage, to the extent possible, the use of financial incentives in the promotion of civil nuclear power.**

The spread of nuclear technology and nuclear material heightens concern that non-nuclear-weapon states might decide to develop nuclear weapons, building on their civilian nuclear industry. It also increases the

possibility that terrorists might be able to steal—or buy from an insider—the materials or technical knowledge needed to construct a nuclear weapon. We should discourage, to the extent possible, the subsidizing of nuclear energy in ways that would cause states to choose it over other energy sources, without fully accounting for this risk.

## Cooperative Nuclear Security Programs

The breakup of the Soviet Union in 1991 led to international concerns that Soviet nuclear weapons and nuclear material deployed in Belarus, Kazakhstan, Ukraine, and Russia would no longer be under the control of a strong central government. In response, the United States led a coalition of nations to persuade Belarus, Kazakhstan, and Ukraine to become parties to the NPT as non-nuclear-weapon states.

Around the same time, Congress passed the Nunn-Lugar Amendment, which established assistance programs in the former Soviet Union (FSU) to ensure the safe and secure dismantlement and transportation of nuclear weapons and the secure storage and consolidation of dangerous nuclear materials. The amendment authorized $400 million for cooperative threat reduction (CTR) programs, and appropriations have remained relatively stable over the past 17 years. These programs helped return Soviet nuclear warheads from Kazakhstan, Ukraine, and Belarus to Russia for dismantlement; led to the dismantlement and disposal of strategic missiles in Russia and other former Soviet states; and greatly improved security at Russian warhead storage facilities. Other CTR accomplishments included securing nuclear weapons and materials at vulnerable sites and enhancing the security of nuclear weapons and materials in transit.

The United States has also worked with Russia on a number of efforts to secure, reduce, and eliminate nuclear materials in Russia and to stem the illicit flow of technologies and expertise from Russia (and other FSU states) to terrorists and covert weapons programs. The Material Protection, Control, and Accounting (MPC&A) program, implemented by the Department of Energy in 1997, provides security upgrades for nuclear materials at hundreds of facilities in the FSU, including improved security systems, strict control and accounting systems for materials, and security training for Russian nuclear specialists. In 2003, Congress passed legislation requiring the Department of

Energy to complete its work by 2013, so that Russia would assume sole responsibility for sustaining security upgrades after that time. Secretary Bodman told the Commission in September 2008 that the United States and Russia are on track to meet the deadline.

The two countries have also worked to reduce the amount of material—highly enriched uranium and weapons-grade plutonium—that might be stolen and used as fuel in illicit nuclear weapons. The Department of Energy is working with its Russian counterpart to "blend down," or process into a less-enriched form, 500 metric tons of Russia's HEU, which is then shipped to the United States for use as reactor fuel. So far, this partnership has blended down almost 350 metric tons of HEU.

At the same time, Washington and Moscow have also taken steps to (1) dispose of at least 68 metric tons of U.S. and Russian weapons-grade plutonium by converting it into fuel for commercial reactors; (2) shut down Russia's three remaining plutonium-producing reactors, two of which have now been closed; (3) secure Russia's borders to prevent the illicit trafficking of nuclear materials; and (4) ensure that thousands of former weapons scientists, technicians, and engineers throughout the former Soviet Union are engaged in civilian pursuits, to prevent the flow of this expertise to countries of proliferation concern and to terrorist organizations. (The pace and scope of the DOE programs were the subject of a 2001 report titled *A Report Card on the Department of Energy's Nonproliferation Programs with Russia,* which laid out specific criteria and objectives for the programs. That study, widely known as the "Baker-Cutler Report," is discussed in detail in an appendix below.)

After the terrorist attacks of September 11, 2001, growing concerns about nuclear and radiological terrorism spurred increased cooperative efforts to secure fissile materials and combat nuclear smuggling worldwide. One outcome was the Bratislava Nuclear Security Initiative, signed by Presidents George W. Bush and Vladimir Putin in 2005, which expanded and accelerated security upgrades at nuclear sites in Russia and led to a plan for Moscow to take charge of security at its own nuclear facilities. A senior U.S.-Russia group, co-chaired by the U.S. Secretary of Energy and the Director of the Russian Ministry of Atomic Energy, oversees this work and provides progress reports every six months to the U.S. and Russian Presidents.

Increasingly, threat reduction programs are being pursued internationally, not only bilaterally with Russia. The DOE's Second Line of

Defense program seeks to prevent illicit trafficking in nuclear and radiological materials by installing radiation detectors at international land borders, seaports, and airports. Another program, the Global Threat Reduction Initiative, is a worldwide effort to reduce and protect vulnerable nuclear and radiological materials located at civilian sites; it also seeks to convert civilian research reactors worldwide from the use of WMD-usable fuel to that which can be used only in reactors. In the past several years, programs to engage nuclear scientists in civilian pursuits have been expanded to areas outside the former Soviet Union. Additionally, the Department of Homeland Security's Container Security Initiative (CSI), which now operates at 58 ports around the world, is designed to prevent dangerous nuclear materials and technologies from entering the United States. This program scans high-risk cargo before it is loaded on U.S.-bound container ships. CSI has been criticized for its reliance on shipper-provided information to determine which containers are "high-risk"; the program is supplemented by the additional scanning of containers once they arrive in U.S. ports.

**RECOMMENDATION 4: The new President should undertake a comprehensive review of cooperative nuclear security programs, and should develop a global strategy that accounts for the worldwide expansion of the threat and the restructuring of our relationship with Russia from that of donor and recipient to a cooperative partnership.**

When cooperative nuclear security programs started well over 15 years ago, they focused on "loose nukes" and undersecured nuclear materials in the former Soviet Union. More work remains in securing Russia's nuclear arsenal, which is spread over its 11 time zones. As former Senator Sam Nunn suggested in 2004, "We should offer to help Russia consolidate their nuclear weapons in a few areas, and then guard the heck out of them."

But cooperative nuclear security programs have evolved to address global threats as well. Terrorists seeking nuclear material will look wherever that material may be poorly secured—in Russia or elsewhere. There are currently well over 100 nuclear research reactors around the world that use HEU for fuel, and many of them lack adequate security. The November 2007 break-in by armed intruders at the Pelindaba

nuclear research facility in South Africa illustrates the international challenge.

Even as nuclear security programs have expanded into important new areas, no strategic plan has been formulated to ensure maximum effectiveness and coordination across different government agencies. A new strategy is needed that takes into account developments since September 11, 2001, including the fundamental changes in Russia's economy and in U.S. relations with Russia. Equally important, the strategy should establish a basis for strengthening the international consensus on working cooperatively to address nuclear proliferation and terrorism.

The strategic review should examine every U.S. government program and activity, then recommend new, strengthened, or restructured programs where warranted; programs that are less effective should be eliminated or reduced. The review should identify where existing programs have helped stem the flow of potentially dangerous materials and technology, as well as gaps in coverage. Finally, the review should assess prospects for cooperative nuclear threat reduction activities in specific countries where concerns or opportunities may exist, such as Pakistan, India, North Korea, and China.

Washington should continue to work with Moscow to fulfill the goals of current nuclear security programs in Russia and should extend such programs to all vulnerable facilities. The Commission is concerned that Russia is not paying attention to developing an effective nuclear security culture at all Russian facilities where nuclear material is stored. The United States should propose to Russia an expansion of nuclear security commitments that would secure nuclear materials at all Russian facilities, including those storing nuclear weapons.

The United States should also press Russia to accelerate the blend-down of HEU from dismantled nuclear weapons and explore ways to expand its commitment beyond the 500 metric tons already agreed on. Moreover, the process of converting civilian Russian research reactors from using HEU to using low-enriched uranium (LEU) should be intensified.

The Commission supports the efforts by the United States and Russia to close Russia's plutonium-producing reactors and calls on both countries to finalize an agreement on disposing of plutonium in excess of defense requirements.

Finally, the Commission recommends that efforts to engage former nuclear weapons scientists in peaceful research ventures in Russia and the former Soviet republics continue and be guided by newly articulated priorities, such as focusing on nuclear institutes that are struggling financially and could be vulnerable to recruitment efforts by terrorist cells or proliferant states. The next administration should also assess the potential of these programs to work not only with nuclear weapons scientists and engineers, but with individuals at nuclear facilities who may have access to nuclear material. Although Russia's economic revival has helped mute some concerns regarding Russia's nuclear institutes, the fact remains that not all of these have benefited from this revival and some require our continued attention.

Russia no longer wishes to be seen as a recipient of U.S. or international largesse. Moscow can now afford to allocate more resources to cooperative security programs, to develop long-term plans, and to fund those plans. Whenever possible, the two countries should work to move nuclear security programs in Russia to a cost-sharing basis, a process that is already under way for some programs. Also, when possible, the United States should work with Russia as a partner to advance the objectives of threat reduction worldwide. Many U.S. threat reduction programs involving Russia are currently being implemented as partnerships. For example, the Global Threat Reduction Initiative includes trilateral programs—involving the United States, Russia, and the IAEA—to convert research reactors worldwide from HEU to LEU and repatriate the fuel back to Russia.

At the same time, U.S. cooperation with Russia should not be a prerequisite for international efforts to strengthen nuclear security. The United States should continue to work with international partners through existing vehicles to strengthen their ability to counter nuclear proliferation and combat nuclear terrorism.

The next administration must also think creatively about how to maximize the contributions of agencies other than the Departments of Defense, Energy, and State to promote cooperative nuclear security objectives. Such steps should include greater utilization of Department of Homeland Security and intelligence community assets. Also, greater coordination between the Departments of Energy and Homeland Security to improve radiation scanning devices at U.S. and international borders—and an acceleration of Homeland Security efforts to build a global nuclear detec-

tion network—would enhance the ability of the United States to track nuclear materials and prevent their movement across borders.

### Country-Specific Challenges: Iran and North Korea

The Nuclear Nonproliferation Treaty is facing the prospect of an unraveling that could be its permanent undoing. Iran and North Korea have pursued nuclear weapons–related programs that the world cannot permit to succeed.

Iran's apparent efforts to acquire a nuclear weapons capability in defiance of its NPT obligations and UN Security Council resolutions and the uncertainty over whether North Korea will ultimately eliminate its nuclear weapons program constitute threats to international peace and security. Failure to resolve these crises could lead some countries to revisit their earlier decisions to renounce nuclear weapons, potentially leading to a cascade of new nuclear-weapon states. Such a wave of nuclear proliferation would seriously jeopardize the current world order, creating profound new risks and increasing instability.

Iran maintains that it does not want to acquire nuclear weapons and is merely pursuing "peaceful" nuclear activities as allowed under the NPT. Although the National Intelligence Estimate on Iran issued in November 2007 came to the controversial conclusion that Iran had ended its nuclear weapons design and weaponization work in the fall of 2003, it made clear that Iran had engaged in such weaponization work until then and continues to develop a range of technical capabilities, including a civilian uranium enrichment program, that could be used to produce nuclear weapons. If Iran should test a nuclear device or declare it possesses a nuclear weapon, or if additional evidence should come to light that conclusively revealed that Iran was making a nuclear weapon, it would be the third time since 1991 that an NPT member evaded international nuclear inspectors, using the cover of peaceful nuclear activities to either obtain, or come close to obtaining, a nuclear weapon.

If Iran should acquire a nuclear weapon in violation of its pledges without suffering severe penalties, other countries might view it as a model to follow—leading to a "cascade of proliferation," as a UN panel has warned. Several other countries, including Egypt, Algeria, Turkey, Brazil, Argentina, Saudi Arabia, Libya, South Korea, and Taiwan, have, to varying degrees and at different times, expressed interest in acquiring

nuclear weapons and are now planning on expanding their peaceful nuclear energy programs.

The Commission decided that because of the dynamic international environment, it would not address the precise tactics that should be employed by the next administration to achieve the strategic objective of stopping the nuclear weapons programs of Iran and North Korea. Developing those tactical initiatives will clearly be one of its urgent priorities.

But on the central finding, the Commission was unanimous in concluding that the nuclear aspirations of Iran and North Korea pose immediate and urgent threats to the Nuclear Nonproliferation Treaty. Successful nuclear programs in both countries could trigger a cascade of proliferation and lead to the unraveling of the NPT.

### Iran

For almost a decade, the United States has been concerned that Iran is pursuing a nuclear weapons program through clandestine activities as well as under the guise of peaceful enrichment for civilian nuclear power. In 2002, a London-based Iranian opposition group—the National Council of Resistance of Iran—added to such concerns by disclosing details about a secret heavy-water production plant at Arak and an underground enrichment facility at Natanz. Later that year, the United States denounced Iranian violations of the NPT and IAEA Safeguards agreement, accusing Iran of across-the-board pursuit of weapons of mass destruction.

Three years later, the IAEA Board of Governors expressed an "absence of confidence that Iran's nuclear program is exclusively for peaceful purposes." In early 2006, the board voted to refer Iran as a possible NPT violator to the UN Security Council; in December 2006, the UN Security Council ordered Iran to suspend its enrichment effort and adopted the first of three resolutions imposing sanctions to punish Iran for continued defiance of the Security Council order. Tehran insists that its enrichment program is intended only to provide fuel for nuclear power reactors essential for meeting the nation's peaceful energy needs.

As the United States was leading the effort in the UN Security Council to end Iran's enrichment efforts, the European Union (EU) established a dual-track approach, supporting UN sanctions against Iran while also offering Iran economic incentives to end its enrichment

activities. The United States has not engaged in direct negotiation with Tehran, but has worked closely with the EU regarding its incentives effort. Britain, China, France, Germany, Russia, and the United States have held out the possibility of a package of political and economic benefits if Tehran suspends its enrichment of uranium. To date, these efforts to find a diplomatic solution have failed.

Most recently, on September 29, 2008, IAEA Director General ElBaradei told his agency's board of governors that Iran's continued enrichment activities are "still a cause for concern for the international community in the absence of full clarity about Iran's past and present nuclear program."

Just how much time does the world have to seek this "full clarity" and decide what to do? Experts such as David Albright, of the Institute for Science and International Security, have underscored that the timeline for Iran's acquisition of sufficient HEU to build a nuclear bomb is ominously short—it ranges from only six months to two years.

### North Korea

Serious concerns over North Korea's efforts to possess nuclear weapons have played a major role in U.S. foreign policy for more than 15 years. In 1985, North Korea obtained a nuclear reactor from the Soviet Union and signed the Treaty on the Nonproliferation of Nuclear Weapons. Seven years later the International Atomic Energy Agency and North Korea finally reached agreement on a safeguards agreement (required of all NPT non-nuclear-weapon states). As a result of inspections in late 1992, the IAEA identified significant discrepancies in North Korea's declaration and demanded that "special inspections" be conducted at the Yongbyon nuclear complex. In response, Pyongyang threatened to withdraw from the NPT, prompting the United States to intervene to negotiate a resolution to the crisis. In 1994, the United States and North Korea signed the Agreed Framework under which Pyongyang agreed to a denuclearized Korean peninsula in return for political and economic concessions, including the construction of two light-water nuclear power reactors.

In 2002, after having frozen North Korea's existing plutonium-based nuclear program, the Agreed Framework completely unraveled after the United States confronted North Korean officials with information that their country was conducting a clandestine uranium-based

nuclear weapons program in violation of the agreement. In an effort to resolve the crisis, a Six-Party Talks forum was formed involving China, Japan, North Korea, Russia, South Korea, and the United States. Despite a September 2005 declaration of agreement to denuclearize the Korean peninsula, this Six-Party effort failed to prevent North Korea from testing a nuclear weapon in October 2006—and declaring itself a nuclear-weapons state. Nonetheless, renewed diplomatic efforts, including direct talks between the United States and North Korea, led to the Six-Party "Initial Actions" agreement with Pyongyang in February 2007 on an overall road map for denuclearization.

The implementation of this agreement has been stop-and-go. But in mid-October 2008, some progress was made on the verification issue; the United States reciprocated by removing North Korea from its state sponsors of terrorism list. Future discussion will focus on the completeness of North Korea's declaration and the conclusion of a verification protocol.

**RECOMMENDATION 5: As a top priority, the next administration must stop the Iranian and North Korean nuclear weapons programs. In the case of Iran, this requires the permanent cessation of all of Iran's nuclear weapons–related efforts. In the case of North Korea, this requires the complete abandonment and dismantlement of all nuclear weapons and existing nuclear programs. If, as appears likely, the next administration seeks to stop these programs through direct diplomatic engagement with the Iranian and North Korean governments, it must do so from a position of strength, emphasizing both the benefits to them of abandoning their nuclear weapons programs and the enormous costs of failing to do so. Such engagement must be backed by the credible threat of direct action in the event that diplomacy fails.**

In 2004, the UN High-Level Panel on Threats, Challenges, and Change issued a blunt warning: "We are approaching a point at which the erosion of the non-proliferation regime could become irreversible and result in a cascade of proliferation." In the past four years Iran and North Korea have made progress in their nuclear programs, and today the situation is even more urgent. We cannot, through global inaction, allow that cascade of proliferation. It could doom populations the world over.