

Stronger Measures Needed to Prevent Proliferation

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Fifty years ago, U.S. President Dwight Eisenhower unveiled the Atoms for Peace program. In a widely noted speech to the United Nations (UN), he called on the United States and other nations to "make joint contributions from stockpiles of normal uranium and fissionable materials to an international atomic energy agency" that likely would operate under the aegis of the UN. This agency would be responsible for securing and protecting the accumulated materials. But more important, the materials "would be allocated to serve the peaceful pursuits of mankind. Experts would be mobilized to apply atomic energy to the needs of agriculture, medicine, and other peaceful activities. A special purpose would be to provide abundant electrical energy in the power-starved areas of the world. Thus contributing powers would be dedicating some of their strength to serve the needs rather than the fears of mankind." The United States, Eisenhower declared, "would be more than willing-it would be proud-to take up with others 'principally involved' the development of plans whereby such peaceful use of atomic energy would be expedited."

Much of this vision has been realized; and, most people would say, to the benefit of humankind. The Atoms for Peace program helped foster the early use of civilian nuclear technologies. The program also kept the United States in the center of efforts aimed at safeguarding such technologies. Today, most of the civilian nuclear material in the world requires U.S. permission to be exported. There has been no known diversion of nuclear material from safeguarded nuclear power plants. The International Atomic Energy Agency (IAEA) continues to be an essential tool for monitoring civilian activities. The Iraq and North Korean experiences also show the IAEA to be effective at detecting nuclear weapons-related activities (or, in the recent case of Iraq, the apparent lack of such activities), especially if the agency is backed up by aerial or space-based intelligence activities telling it where to look. These developments were not foregone conclusions at the time of Eisenhower's speech in 1953 and, to that extent, much of the original vision has come to fruition.

Nevertheless, much of the vision remains to be realized, and what remains to be done leads to the heart of today's problems in the nuclear world. Early on, Atoms for Peace activities unwittingly assisted nuclear weapons programs in India and Israel (although these programs would have succeeded eventually in any case). More recently, Pakistan, North Korea, Iran, Libya, and perhaps other countries have formed a clandestine network for the exchange of nuclear and missile technologies.

There now exist worldwide thousands of nuclear weapons' worth of nuclear material in the form of separated plutonium and highly enriched uranium (HEU) that can easily be used in the construction of other nuclear weapons. Much of this material does not come from civilian programs and is not under international safeguards. Indeed, it is not under very good security of any kind. Some governments have connections with terrorists or are unable to prevent terrorist activities. To make matters more urgent, given the predicted two- to fourfold expansion of electrical power production over the next 50 years, nuclear power may well continue to expand in less developed countries, whether the United States approves or not. Providing security under these circumstances is at the heart of what an updated Atoms for Peace program must do this century. The director general of the IAEA, Mohamed ElBaradei, recently noted that the "margin of security" under the world's current nonproliferation regime "is becoming too slim for comfort." he could equally well have said the same of the margin of security against nuclear terrorism. The thinness of the barriers to prevent terrorists from acquiring or making a nuclear weapon has frightened nearly everyone who has looked at them. The main obstacle to improving the margin of security is not a lack of ideas or proposed programs. Rather, the obstacle is the insufficient priority given by the governments that are "principally involved," to use Eisenhower's phrase, to implementing a worldwide program with the thrust and durability of the original Atoms for Peace program. Such a program would of necessity cover dangerous materials whatever their provenance-civilian or military, including dual-use facilities-and would provide a sustainable means to deal with governments that, wittingly or not, may aid terrorists.

Plans for improvement

The components of an updated security-conscious Atoms for Peace program fall into three general categories: materials control and facilities monitoring, effective international governance, and reduction of the demand for nuclear weapons. In some areas, there already may be sufficient agreement for governments to act jointly and give the programs the priority they need. In other areas, there is not. In still others, given the international situation, an effective solution remains elusive and only partial steps can now be attempted.

In the first category, seven measures would greatly increase effective control of the most dangerous nuclear materials: separated plutonium and HEU. Most of these measures have been widely discussed in the past decades. The first four measures are relatively specific, and some of them are under way:

Fulfill the pledges of the Group of Eight. At the group's 2002 summit, seven of its member nations pledged to provide Russia (the remaining member) with \$20 billion over 10 years to help prevent terrorists from obtaining weapons of mass destruction. The United States pledged to provide \$10 billion of the total. Surplus nuclear weapons materials (several hundred tons of plutonium and HEU, mainly

but not solely in the former Soviet Union and the United States) are probably the most urgent problem. This program has moved very slowly. "Only a tiny fraction has been spent or even allocated," according to a recent report from the Nuclear Threat Initiative, a private group that monitors various global threats. No general mechanism has yet been developed for either the distribution or receipt of the money pledged. Individual countries now work out their own bilateral programs. The main program, that of the United States, currently is mired in a dispute regarding the extent to which U.S. corporations and scientists will be shielded from liability in the case of accidents occurring as a result of the program in Russia. According to Sam Nunn, a former U.S. senator from Georgia and one of the program's earliest leaders, at the present rate of progress it will be 20 years before these materials are adequately secured.

Phase out the use of HEU in research reactors. Worldwide, 650 research reactors are known to have been built. Of these, 283 remain operational in 58 countries (with 85 operating in 40 developing countries), 258 are shut down, and 109 have been decommissioned. Approximately 135 of the operating reactors (in 40 countries) use HEU, which is defined as uranium that has been enriched so that at least 20 percent of its composition is U235, the isotopic form of uranium that can be induced to fission and hence is suited not only for use in nuclear reactors but as a material in nuclear weapons. Of the reactors that use HEU, about 60 either obtained their uranium from the United States or had their fuel enriched in the United States. For a number of years, the United States has been conducting a program to convert the U.S.-supplied reactors to low-enriched uranium (LEU), which cannot be used to make weapons. Through this Reduced Enrichment for Research and Test Reactors (RERTR) program, about half of the reactors have been so converted, with the United States generally taking back the HEU. To speed up progress, the RERTR program needs higher priority. In addition, other countries, such as Russia and France, have not been so diligent to date, and some countries where the reactors are located have not been as cooperative as others.

Implement a protocol to improve the physical security of weapons-usable material. There are no IAEA safeguards standards in force for the physical protection of nuclear materials. George Bunn, former general counsel of the U.S. Arms Control and Disarmament Agency and now a consulting professor at Stanford University, notes that "IAEA safeguards deter the country where the material is located from diverting it because the diversion will be discovered by accounting and inspection, but they are only marginally relevant to thieves or terrorists. The relevant treaty, the Convention on Physical Protection of Nuclear Material, applies to such material only in international transport, not to its use or storage in the territory of its home country." Attempts to amend this treaty to make it more effective have been under way since 1998, with partial agreement being reached in 2003 on substantial portions of text. "However, the draft does not establish specific standards for protection because the negotiators are afraid to make the standards known to terrorists and because the negotiators don't

want a treaty" to govern internal security measures, Bunn says. "The pertinent IAEA standards are only recommendations adopted in 1999-before September 11." Lack of progress in this area is due, in large measure, to different approaches to implementing physical security in different countries. For example, armed guards are routinely used in some countries, including the United States, but are banned in other countries; and advanced electronic barriers are not available everywhere. Physical security is a sensitive area in most countries, so that the protocol will not move forward rapidly without (and perhaps even with) effective U.S. leadership.

Make implementing the Additional Protocol of the IAEA a high priority and allow sensitive exports only to states complying with it. This protocol provides for more rigorous monitoring of facilities. It has been worked out among the state members of the IAEA over the past decade or more, and it is being implemented on a trial basis in a few of these states. Most recently, Iran has agreed to its implementation. But implementation remains far from ideal. Still, there is considerable backing for the protocol, and it may be that with U.S. leadership, most countries will agree to implementation, though perhaps slowly, at best. Although not the last word in facilities monitoring, the protocol nevertheless represents a significant improvement over past practices. In particular, it provides for two key measures. One measure gives the IAEA a right to request complementary access, on two hours' notice, to additional facilities not originally included in routine inspections. The other permits environmental monitoring near an inspection site and, with the permission of the country involved, anywhere else. This latter provision makes it easier for IAEA inspectors to justify asking for environmental inspections anywhere and puts pressure on the inspected country to justify any refusal. These provisions would make concealment of a clandestine nuclear program much harder to maintain. Proving a negative is always difficult, however. As David Donohue of the IAEA Safeguards Analytical Laboratory has noted, "Solving the problem of verifying the absence of undeclared nuclear facilities requires tools that can give high evidence of detecting the presence of such facilities." These tools would include sensors, such as cameras and radiochemical detectors, both on and off site; secure communication of sensor data in real time; and prompt no-notice inspections. Such tools would be in addition to measures that theoretically could be taken under the present protocols but have not been fully developed or installed, such as the use of portal monitors, emission sensors to provide facility data from operating reactors, electrical power monitors, and specialized monitors to indicate reactor performance between inspections. The technical requirements are thus quite high, and significant ongoing investments are needed by reactor operators and by the IAEA.

The three additional measures for increasing control of the most dangerous nuclear materials represent departures from the present system. These measures would require major investments, both economic and political, and are much more controversial:

Minimize accumulation of weapons-usable material, if necessary by using a new fuel cycle. Several tons of separated plutonium from the civilian fuel cycle now exist in Japan, Russia, and Western Europe, and hundreds of tons of excess plutonium and highly enriched uranium have been generated as part of the production of nuclear weapons. Reducing the HEU is technically straightforward: HEU can be "blended down" into LEU and the product then used as fuel in operating nuclear power plants. In practice, however, this effort has been held up several times by disagreements among the U.S. Enrichment Corporation (USEC), which is responsible for the job, the U.S. Department of Energy, Congress, and private interests, and has been proceeding slowly. The root causes are that the demand for nuclear fuel is limited, and the USEC, as a supplier to U.S. users, has an interest in minimizing the flow of foreign uranium into the United States.

Reducing the stock of plutonium is more complex. Plutonium can be partially burned by combining it with uranium and introducing the mixed uraniumplutonium oxide (MOX) fuel into existing reactors. The leftover plutonium, now changed chemically and mixed in with highly radioactive spent fuel, is less available and desirable for weapons use. This method already is used in France, and a preliminary MOX program is under way in the United States. Plutonium could be burned more completely in a new generation of fast neutron spectrum reactors, but this approach would take longer and cost more, given the development, licensing, and construction time needed to install such reactors. Indeed, both of these methods entail higher costs than the present methods of fueling nuclear reactors, and therefore they will have to be subsidized by the government. Still another method for disposing of plutonium is to immobilize it in a stable matrix and then bury that material underground. Work on this approach is under way, but again it is going slowly because of costs, perceived environmental problems, and questions about the procedure's effectiveness in providing a barrier against later plutonium separation. The actual degree of security that this method provides and the economic consequences of moving to production-scale activities remain significant unknowns. Answering such questions may take decades. In addition, permanent disposal is unattractive to some individuals and governments, particularly in Russia, who see excess plutonium as a resource for the future.

If nuclear reactors and fuel-cycle activities spread more broadly in the world, then a fuel cycle that minimizes the accumulation of weapons-usable material will increasingly be viewed as necessary for security. This effort is held hostage to the debate, almost theological in nature, between adherents of the once-through cycle and those of reprocessing. Each side quotes economic and environmental arguments. In fact, the economic differences are well within the uncertainties of the estimates, as are the environmental differences. Thus, a clear choice remains elusive. It is clear, however, that secure fuel cycles, with and without

reprocessing, need to be developed. Preliminary work has been done on such cycles, notably by Argonne National Laboratory.

Establish internationally available storage sites for nuclear materials. Since Eisenhower's initial proposal, many suggestions have been made for putting nuclear materials not actually being used, whatever the source and composition, under international monitoring or control. The proposals have variously been driven by security, safety, and environmental considerations, and they have floundered owing to economic, political, and siting concerns. Such recommendations may now receive more attention, for security as well as political reasons. In several countries, the storage of spent fuel at utility sites (probably not the most secure form of storage) cannot be increased without incurring costs that utilities are unwilling to bear. Recently, the IAEA's director general said, "We should consider multinational approaches to the management and disposal of spent fuel and radioactive waste . . . Considerable advantages-in cost, safety, security, and nonproliferation-would be gained from international cooperation in these stages of the fuel cycle." This message has been expanded by a member of Japan's Nuclear Safety Commission and professor of nuclear engineering at the University of Tokyo, Atsuyuki Suzuki, who said, "What I believe is more acceptable globally is to establish a multinational system where spent fuel is managed with more centralized and intensive international safeguards ... It would generate a tremendous amount of benefits for many nations which intend to use nuclear energy for peaceful purposes only, because it would provide the most economical and flexible option for managing spent fuel not merely in terms of direct cost but also taking into account indirect cost associated with such externalities as security and environmental concern."

Place enrichment and separation facilities under international authority. This proposal, made most recently along with other measures along the lines suggested in this paper, by IAEA Director General Mohammed ElBaradei in the fall of 2003 and again in 2004, is the most controversial, and arguably the most important. It also is the one on which the least progress has been made. Enrichment and separation facilities already exist in at least a dozen countries. They involve both commercial and military secrets. Vested interests, including the owners of these facilities and the managers of other facilities who want assured fuel supplies at market prices, are considerable and not reconciled. The recent disagreement between Iran and the United States and other nations about Iran's need for enrichment facilities is a case in point. The problem must be tackled, because these are the most sensitive facilities in the nuclear enterprise, aside from storage sites for weapons-usable materials. Control over enrichment facilities or plutonium separation facilities gives a state a capability to take the most time-consuming step toward nuclear weapons, yet remain within their Non-Proliferation Treaty (NPT) rights under Article IV of the NPT.

A host of possibilities can be envisioned for dealing with this problem as nuclear power expands worldwide. Among the suggestions to date are international

monitoring of national facilities or some form of international authority over these facilities (perhaps including international ownership). The latter obviously brings up governance questions that are far from settled.

In a February 12, 2004, speech at the National Defense University, President Bush proposed several initiatives along the lines discussed here and in general accordance with measures also proposed by ElBaradei. A major difference was that President Bush proposed that, "Enrichment and reprocessing are not necessary for nations seeking to harness nuclear energy for peaceful purposes. The 40 nations of the Nuclear Suppliers Group should refuse to sell enrichment and reprocessing equipment and technologies to any state that does not already possess full-scale, functioning enrichment and reprocessing plants." The Bush plan would create an international cartel, albeit the president also said: "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." The plan nevertheless would almost surely be considered by some, perhaps most, NPT parties to violate Article IV of the NPT. On the other hand, it would bypass the need for international agreement and enforcement and could be put into practice progressively as supplier states agreed. Possibly a combination of the Bush and the ElBaradei proposals could evolve if most states agreed to the substance of the two, but considerable negotiation would be required.

The current difficulties over Iran's and North Korea's capabilities and the proliferation network centered on Pakistan are only an early indication of what may come to pass as nuclear-related capabilities and demand for electricity worldwide increase. The leaders of the primary countries with nuclear capabilities should establish an international working group charged with developing a technical, administrative, and legal framework that will lay the groundwork for resolving the questions noted (and others like them) in a way that puts security first while safeguarding commercial and military interests. Technically, this is feasible. Politically, it is another matter. President Bush, in his February speech, took a step in that direction by proposing "the creation of a special committee of the IAEA Board which will focus intensively on safeguards and verification" and that "No state under investigation for proliferation violations should be allowed to serve on the IAEA Board of Governors-or on the new special committee."

Toward improved governance

The various steps for improving materials control and facilities monitoring are necessary but not sufficient to ensure a secure nuclear future. There inevitably will be disputes, and probably even outright cheating, on the measures agreed to. Thus, the governments involved must agree on how these measures will be governed and enforced if they are to be effective. Some machinery for governance and enforcement does exist, principally through the IAEA and the UN security Council. Opinions differ on how effective this machinery has been.

There is general agreement, however, that the world's governance and enforcement machinery, along with the technical and organizational measures, must be updated and strengthened if it is to be equal to the challenges posed by much wider diffusion of nuclear technologies worldwide and the existence of sophisticated international terrorist organizations. Such updating would at least entail the following:

Improved definition of what constitutes a violation of the NPT and what justifies inspections. The NPT is not a solution to all nuclear ills, but it remains the only widely accepted basis for evaluating international programs of cooperation in nuclear matters, whether involving assistance with civilian technologies or security against misuse of these technologies. An essential step in making the treaty adequate to a world in which nuclear weapons technologies are more widely available is to agree on a definition of what constitutes a violation. Today, countries that want an option to produce nuclear weapons can build facilities to make the necessary materials and come right up to the design and testing of the actual weapons, all without violating the NPT. Placing enrichment and separation facilities under international authority, in conjunction with tightening physical protection and improving accounting and inspection practices, would go a long way toward remedying that situation. If such authority is in place, then a refusal to abide by the authority's standards or an attempt to evade its oversight should be defined as a violation of the NPT. That will not be agreed to easily. But important leverage can be provided if the countries that have or readily could have nuclear power can reach broad agreement that nuclear terrorism must be prevented.

Agreement within the UN security Council and other key organizations, including the so-called PS group of nations, on the steps to be taken after a violation. This is a necessary adjunct to the need for defining violations more precisely and effectively, but it will be far harder to achieve. Indeed, the recent dispute in the UN over the legitimacy of the invasion of Iraq demonstrates just how difficult it will be to reach such agreement. The other recommended steps can begin to be tackled by high-level commissions, if the political will is present, because they lie in areas where there is some commonality of purpose. In this case, however, there are very difficult gaps to bridge. One of the widest gaps now seems to exist between the United States and much of the rest of the world. On one side is a U.S. administration that sees the problem of terrorism as justifying strong unilateral action to make over the areas where international terrorism has some of its roots. On the other side are the countries, including many democratic allies of the United States, that maintain that the UN and its institutions, including the agreement not to make war unilaterally, lie at the very root of international security. Bridging this gap can only come as a process of gradual agreement in the course of dealing with problems of proliferation and terrorism as they arise. The case of Libya, in which that nation has taken steps toward peace and has been welcomed back into the community of nations, may be indicative of early success in combining diplomacy with the threat of enforcement. The cases of

Iran and North Korea are more difficult and should be looked at as opportunities to build an effective and agreed-upon approach to enforcement. Whether that will be the case or not remains to be seen.

Appointment in the United States of a highlevel presidential representative to push needed initiatives and coordinate relevant programs. The menu of needed steps will not go forward with sufficient speed (in fact, it may not go forward at all) without active leadership from the U.S. government. That leadership, in turn, will not be available unless the president backs the effort himself and names a personal representative at a suitably high level who is known to have his ear. The recent appointment of former secretary of State James Baker to forgive or reschedule Iraq's debts to other states is an example of the kind of representation needed. Accomplishing the full slate of needed tasks will take longer to carry out than a single presidential term. A presidential initiative of the sort envisaged, with backing from Congress, could give it enough momentum to last through several administrations, just as the nonproliferation initiatives of the past did.

Reducing demand for nuclear weapons

One of the major forces fueling the nuclear juggernaut, of course, is the demand for such weapons. Here too, solutions may be possible, but hard to achieve. Among proposed needs and actions:

Recognize that the supply of nuclear materials and weapons cannot be completely controlled without cooperation from some of the very regimes that today cause concern. This point has become obvious with the recent revelations about Pakistani weapons and centrifuge technology trade with North Korea, Iran, and Libya. But it has been clear for some time that with the greater ease of making key nuclear weapons materials, supply could not be interdicted by actions from the traditional suppliers alone, even under the unlikely assumption that those suppliers could police all of their citizens and visitors. As a result, cooperation is needed from the very regimes that may come to the conclusion (on the basis of perceived security concerns or domestic politics, or both) that they need nuclear weapons. Yet, perceptions of security and the domestic politics with which these perceptions are intertwined are hard to alter from the outside. The United States and like-minded states cannot guarantee (or, with the occasional exception, even afford to improve significantly) the security of these regimes against foreign or domestic opponents. Nor can they much affect perceptions in states that seek nuclear weapons for prestige. As a result, universal adherence to nuclear nonproliferation must remain a long-term goal. Current trends in the perception of security and in domestic politics in states of concern, so far as they can be ascertained, are not favorable: Iran, Iraq, North Korea, and Pakistan are only current or recent examples. How Indonesia, Saudi Arabia, and others will evolve in these respects is unclear as well.

Place the highest priority on breaking any links between nuclear weapons capabilities and terrorist groups. Given the huge long-term nature of the task of controlling either proliferation or terrorism, some criterion for assigning priority must be established. The most obvious priority is to break any link that exists between a state possessing nuclear materials or capabilities and any terrorist group that has the intent and capability to harm either the United States or its allies or clients. However, placing an overriding priority on combating all terrorism could lead the United States into a much larger, more difficult, and infinitely more contentious endeavor. From a practical point of view, the first level of priority should be to break any links between states and state holdings of nuclear weapons and nuclear weapons materials and any subnational group. It is also important to break any such linkages related to certain kinds of advanced biological weapons capability.

Extend and clarify security assurances and the basis for extending them. The NPT, it can be argued, has been successful because of two factors: the past technological difficulty of making nuclear weapons and the discipline imposed by the Cold War on most nuclear-capable states. Both factors are now gone. With respect to nuclear proliferation, the bipolar order is gone and a unipolar order has not been established; indeed, the idea of a unipolar order is opposed by many of the states that would be natural partners in restoring effective nuclear nonproliferation measures. These measures on the demand side include security assurances and economic benefits for the states that adhere to the NPT, and enforcement threats (political, economic, and, if necessary, military) against those that do not. The assurances given by the nuclear weapons states to the effect that they will not attack the nonnuclear weapons states with nuclear weapons are clearly insufficient: states such as Iran, Pakistan, and Saudi Arabia are concerned not just about U.S. actions but also about the possible actions of their neighbors. The assurances thus must be broad-based, contingent on good international behavior, and, in essence, parallel to those of the UN Charter, under which the UN Security Council will consider action in case of attack by one state against another. Such broad assurances now exist only on paper, and the record does not support confidence in them. It will be extremely difficult to bring such confidence about. The obstacles standing in the way of bringing about such an international order have their roots both in the states that would provide the assurances and the states that need them. Coherent, consistent actions by the major powers may bring about some progress over the long term.

Exercise U.S. leadership in reducing both nuclear weapons and reliance on them. Although most of the current and previous U.S. strategies and policies place high priority on limiting or ending the proliferation of nuclear weapons and preventing nuclear terrorism, one aspect of policy now goes in the opposite direction: the new emphasis on nuclear weapons spelled out by the U.S. Department of Defense in its recent Nuclear Posture Review (NPR). According to the NPR, "U.S. nuclear forces still require the capability to hold at risk a wide range of target types. This capability is key to the role of nuclear forces in

supporting an effective deterrence strategy relative to a broad spectrum of potential opponents under a variety of contingencies. Nuclear attack options that vary in scale, scope, and purpose will complement other military capabilities." The NPR further states that new nuclear capabilities "must be developed to defeat emerging threats such as hard and deeply buried targets, to find and attack mobile and relocatable targets, to defeat chemical or biological agents, and to improve accuracy and limit collateral damage. Development of these capabilities, to include extensive research and timely fielding of new systems to address these challenges, is imperative." However, a number of countries, including some key U.S. allies, maintain that these developments would violate U.S. obligations under the NPT, as well as the nation's obligations undertaken in connection with the 2000 NPT Review Conference. Representatives of these countries, along with many people within and outside of the United States, such as the IAEA's ElBaradei, believe that the nuclear weapons states must adhere to their obligations under the NPT if the treaty is to remain effective. The development of new nuclear weapons capabilities by current nuclear states can provide incentives for the development of nuclear weapons by other states and make the attainment of a unified and effective international stance against nuclear proliferation even more difficult.

Eyes on the prize

Although the challenges ahead are many, there are at least signs of progress. After the attacks of September 11, 2001, the Bush administration took an important step in the direction of breaking any link between nuclear capability and terrorist groups when it announced that countries that hosted or tolerated terrorists would be held responsible for the terrorists' acts. In February 2004, President Bush proposed a seven-point plan to make it more difficult to sell nuclear equipment on the black market. The plan would place limits on the shipment of such equipment "to any state that does not already possess full-scale, functioning enrichment and reprocessing plants." The president also proposed expanding his program to share intelligence on proliferation, and he called for the UN security Council to require all states to criminalize nuclear weapons proliferation. Coupled with some of the practical measures advanced under various international protocols, these are all steps in the direction of greater security.

The comprehensive, sustained, internationally agreed-on program outlined here would go much further, and it is needed if the nuclear danger is to be avoided, given the direction of current technological and political conditions. Coherent and consistent leadership from the United States and other states is essential if the programs needed are to go forward with adequate speed. Only with such leadership and agreement among the affected countries can efforts at comprehensive security for the peaceful atom eventually be successful and a worldwide program with the thrust and durability of President Eisenhower's Atoms for Peace program be implemented.

An updated Atoms for Peace program is needed to help solve problems of national and international security brought about by increased civilian use of nuclear energy.

Coherent and consistent leadership from the United States and other states is essential if the programs needed are to go forward with adequate speed.

The world's governance and enforcement machinery must be updated and strengthened if it is to be equal to the challenges.

Important leverage can be provided if the countries that have or readily could have nuclear power can reach broad agreement that nuclear terrorism must be prevented.

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