

Nuclear Nonproliferation Treaty: Proposals for Strengthening¹

I. The Issue.

Model Additional Protocol

After the 1991 Gulf War revealed that Iraq had been able to conceal its nuclear-weapons efforts from International Atomic Energy Agency (IAEA) inspectors, the IAEA developed the Model Additional Protocol² for the purpose of expanding and strengthening its authority to verify a state's compliance with its Nuclear Nonproliferation Treaty (NPT) commitments and to detect clandestine nuclear weapons activities. Also known as simply the "Additional Protocol," this instrument helps the IAEA obtain a more comprehensive picture of a state's nuclear activities, both by requiring the state to disclose more information and by giving IAEA inspectors access to additional sites, including places where inspectors wish to do environmental sampling to detect undeclared materials.³

The NPT does not require its parties to agree to Additional Protocols. Nevertheless, as of December 18, 2003, 79 states had signed Additional Protocols, 38 of which had entered into force.⁴ Also, Additional Protocols for 13 states in the European Union that have fulfilled their internal requirements for entry-into-force will take effect when the IAEA receives written notice from the States and EURATOM that these requirements have been met.

Iran's recent agreement to sign the Additional Protocol played a significant role in the apparent defusing of the crisis over Iran's apparent effort to produce nuclear weapons in secret. The IAEA Board of Governors adopted a November 26, 2003 resolution welcoming Iran's intention to sign the Additional Protocol and, pending the protocol's entry-into-force, to comply with its provisions, as well as Iran's declared suspension of its activities that could produce weapons-grade materials—the enrichment of uranium and the reprocessing of spent reactor fuel to extract plutonium.⁵ However, ambiguity regarding Iran's promise to "suspend enrichment activities" has resulted in a dispute as to whether Iran's renewed production and assembly of centrifuges that can be used to produce weapons-grade highly enriched uranium (HEU) violates that promise. Also problematic are the IAEA's detection of traces of HEU on Iran's centrifuges, which had been imported from Pakistan and, as Iran claims, might have been contaminated before arriving in Iran, and Iran's failure to have reported other activities that could have been weapons related.⁶ Ultimately, the issues relating to Iran's possible plans and programs to develop nuclear weapons may be referred to the UN Security Council.⁷

The United States signed the Additional Protocol in June 1998; President Bush submitted it to the Senate on May 9, 2002.⁸ On March 31, 2004, the Senate gave its advice and consent to ratification, subject to certain conditions. These included requirements that,

before depositing the instrument of ratification, the President must certify that, within 180 days after depositing the instrument, regulations regarding the national-security exclusion of IAEA inspectors from certain facilities will be promulgated and certain “site vulnerability assessments” will be completed.

Also, on November 21, 2003, following pressure by the Foreign Relations Committee’s Ranking Member, Senator Joseph Biden, the White House reportedly transmitted the implementing legislation, which is a precondition of the U.S.’s protocol entering into force.⁹ Senate Foreign Relations Committee Chair Richard Lugar introduced the legislation (S. 1987) on December 9, 2003, but no action has yet been taken on it.

Although the United States is permitted to possess nuclear weapons, its ratification of the Additional Protocol and the enactment of the implementing legislation will demonstrate American leadership in the push for wider agreement to the Additional Protocol, especially by non-nuclear-weapons states (non-NWS).

Current Challenges and Proposed Solutions

A major loophole in the nonproliferation regime is that under the NPT, non-NWSs may operate a complete reactor fuel cycle as part of their peaceful nuclear power programs. This can enable them to develop the capability to produce nuclear weapons-grade materials—highly enriched uranium (HEU) and separated plutonium—neither of which occurs in nature.

With respect to HEU, the NPT does not prohibit the operation of a uranium enrichment program because many reactors use low enriched uranium (LEU) or HEU as fuel. Effective safeguards can reduce the risk of clandestine activity at a safeguarded facility by ensuring that all activity there is fully accounted for and that there are no hidden input or output sources. However, proliferation can occur if either the enrichment process is secretly used for the production of HEU or some uranium is siphoned off without detection and sent to a secret facility to be enriched to higher, weapons-grade levels.

Plutonium is created only in the burning of uranium fuel in a reactor. Through a chemical procedure known as reprocessing, plutonium is separated from the spent fuel. The plutonium can then be used for either fuel in a reactor or raw material for nuclear weapons. Here again, rigorous IAEA inspections are necessary to preclude the possibility of plutonium being secretly diverted to a weapons program.

The NPT safeguard agreements require non-NWSs to account to the IAEA for their LEU, HEU, and plutonium and to keep their stocks of these materials and their reactors and related facilities open to IAEA inspection. However, a non-NWS that wishes to produce nuclear weapons can either attempt to conceal activities and materials from the IAEA or withdraw from the NPT. Iran and North Korea are two cases in which activities for the production of weapons materials were concealed from the IAEA for prolonged periods. As noted above, Iran remains in the NPT and may have reversed course by signing the Additional Protocol¹⁰ and claiming that it will not develop nuclear weapons—although its failures to report various activities that could be weapons related and the discovery of traces of HEU at its nuclear facilities are very troubling. North Korea withdrew from the treaty in January 2003 and might or might not dismantle its nuclear weapons program as a result of the current negotiations.

Most recently, Brazil has refused to permit IAEA access to certain parts of a new uranium-enrichment facility, claiming a right to protect proprietary information regarding the equipment there.¹¹ Brazil, which asserts that its enrichment program is for civilian use only, has very sizable uranium deposits and may be planning to produce LEU for its own reactors and for export.¹² Thus it may fear that if its advanced enrichment technology were compromised, it would lose a competitive advantage in bringing LEU to the international market. Nevertheless, Brazil has indicated that it is open to a negotiated solution.

A major challenge before the world is to prevent future instances in which non-NWSs go right up to the line between peaceful and military applications and then either secretly cross that line or quit the NPT and cross it. There are no proposals for amending the NPT for this purpose.¹³ Rather there are proposals—some traceable to a 1981 essay by Dr. Lawrence Scheinman¹⁴—to strengthen and supplement the treaty.

The IAEA Director General, Dr. Mohammed ElBaradei, in October 2003, put forth a three-part approach:

1. Require that the processing of weapon-usable material (separated plutonium and HEU) and the production of new such materials through reprocessing and enrichment be conducted only in facilities under multinational control.
2. Convert to nuclear-energy systems that, by design, avoid or preclude the use of plutonium and HEU.
3. Use multinational approaches for the management and disposal of spent fuel and radioactive waste—in light of more than 50 countries having spent fuel in temporary storage sites.

This combination of steps is designed—in addition to putting control of nuclear material in multinational hands—to “turn off the tap” for all countries of their own individual production or control of new weapon-usable nuclear materials.¹⁵ In a subsequent interview, Dr. ElBaradei suggested that a further protocol to the NPT might be the way to achieve this goal.¹⁶

The Carnegie Endowment for International Peace has put forth a market-based approach that could supplement Dr. ElBaradei’s recommendations. Carnegie’s proposal is to “create viable commercial and political alternatives to national fuel-cycle facilities.”¹⁷ One way to do this would be for a multinational group to provide guaranteed supplies of fresh-fuel and the management of spent fuel at prices below what it would cost any one nation to produce those supplies and provide those management services on its own. In exchange, the recipient country would be required to dismantle its enrichment and reprocessing facilities, if any, and commit not to acquire any such capability.

A market-driven strategy plus new requirements for separation and enrichment activities to be under the control of combinations of countries that have clear incentives to prevent proliferation would be valuable additions to the nonproliferation regime. However, the full development and implementation of such approaches, as urgent as they may be, will require considerable effort in the coming months and years. Obviously, strong U.S. leadership would be most beneficial.

Four former high-ranking U.S. officials—Secretary of Defense William Perry and Assistant Secretary of Defense Ashton Carter from the Clinton administration and National Security Adviser Brent Scowcroft and Under Secretary of State Arnold Kanter from the first Bush administration—have also set forth a proposed solution.¹⁸ They recommend supplementing the NPT with “additional inducements and penalties.” Thus they propose that “countries seeking to develop nuclear power [for] electricity ... agree not to manufacture, store or reprocess nuclear fuel. They would also agree to submit to inspections (probably by the [IAEA]) to verify their compliance.” Countries that sell peaceful nuclear technology would promise both (1) “not to provide technology, equipment or fuel for nuclear reactors ... to any country that will not renounce its right to enrich and reprocess nuclear fuel,” and (2) “not to sell or transfer any equipment or technology designed for the enrichment or reprocessing of nuclear fuel.”

In addition, a new Swedish-sponsored Weapons of Mass Destruction Commission—to be headed by former chief UN weapons inspector Hans Blix, with a charge to “provide new impetus to the international efforts involved in disarmament and non-proliferation of weapons of mass destruction and missiles”¹⁹—may contribute further constructive thinking.

The Bush Administration also has acknowledged the proliferation problem that non-NWSs’ unrestricted access to the fuel cycle raises. The State Department’s director of policy planning stated December 9, 2003, “We must seriously limit enrichment and reprocessing capabilities while allowing access to appropriate reactor fuels.”²⁰ Also, unnamed officials are reported to have said that such a U.S. proposal “may be formally advanced” at the next G-8 meeting, which will be held in the United States in June 2004.²¹

Most recently, in a February 11, 2004, address at the National Defense University, President Bush proposed that the “world’s leading nuclear exporters . . . ensure that states have reliable access at reasonable cost to fuel for civilian reactors, so long as those states renounce enrichment and reprocessing” and that the “40 nations of the Nuclear Suppliers Group [NSG] . . . refuse to sell enrichment and reprocessing equipment and technologies to any state that does not already possess full-scale functioning enrichment and reprocessing plants.” Thus, the President would allow non-NWSs that already operate enrichment or reprocessing plants to acquire additional equipment to expand their capacity. Convincing the 30 NSG states to endorse and implement a program discriminating between states having and not having such “full-scale functioning” plants is likely to be a difficult and complex task.

Over the longer term, there is a need to develop even broader, lasting solutions, to bring the four non-NPT states—India, Israel, North Korea,²² and Pakistan—to the table, and to establish mechanisms that respond to the security concerns that make the development of nuclear weapons attractive to some countries. However, the Administration’s pursuit of new nuclear weapons and its opposition to ratification of the Comprehensive Test Ban Treaty could diminish our moral authority in seeking to dissuade non-NWSs from pursuing the nuclear option.²³

II. Recent Legislation

- Section 9001 of the Department of Defense Appropriations Act, 2000 (Public Law 106-79) gives the President authority to waive the application of sanctions to India

and Pakistan that were imposed by virtue of their possession and detonation of nuclear weapons. This waiver authority (and any waiver granted pursuant to it) will terminate with respect either country whenever it detonates another nuclear weapon.

III. Obstacles

- Concerns about security lead some nations to believe that the deployment of nuclear weapons provides them with an essential deterrent to an attack by a current or potential adversary. This is the case with respect to Israel, who fears an attack from its Arab neighbors, and India and Pakistan, who are each concerned about an attack by the other—and in India’s case, an attack by China.
- North Korea may be using a self-proclaimed nuclear capacity as a means of preventing an attack by the United States; or it may be using its nuclear weapons program as a bargaining chip.
- Until the international community can deal satisfactorily with the security concerns of countries that perceive a threat of a possibly overwhelming attack from another state, such countries will have a strong incentive to acquire a nuclear deterrent.
- Some countries also see nuclear weapons as a matter of national pride and are reinforced in that belief by the fact that all five veto-empowered, permanent members of the Security Council are nuclear powers.
- The United States leadership on the issue of nuclear disarmament, never particularly strong, seems especially weak at this point. Although possessing over 10,000 strategic, non-strategic, spare, and reserve nuclear warheads,²⁴ the U.S., with the repeal of the 1993 law barring research leading to the development of nuclear weapons of less than 5 kilotons,²⁵ has embarked on two programs that research new nuclear weapons designs: the Robust Nuclear Earth Penetrator and Advanced Concepts programs. Noting the above-mentioned repeal in a December 5, 2003 memorandum to the heads of the national laboratories, the Administrator of National Nuclear Security urged them to “explore a range of technical options that could strengthen our ability to deter, or respond to new or emerging threats” and to pursue research of “advanced concepts,” particularly in the areas of “agent defeat and reduced collateral damage.”²⁶

IV. Q & A

Q: What is the relationship between the obligation of non-NWSs under article II of the NPT not to acquire nuclear weapons and the obligation of all NPT parties under article VI to pursue negotiations leading to nuclear disarmament?

A: One of the major understandings in the formulation of the NPT was that the non-NWSs—which obviously include a large number of countries with the kinds of industrial and scientific bases that could support nuclear weapons programs—would forego such programs and would temporarily, not permanently, allow the NWSs the military advantage of having nuclear weapons. To the extent that the NWSs are perceived as considering their nuclear-power status permanent and as feeling free to build out that advantage in new ways, military leaders in the non-NWSs may believe, conversely, that their countries should consider freeing themselves from their obligation to refrain from developing any nuclear weapons.

As one writer put it, “If collective action to confront a proliferator and otherwise roll back or otherwise neutralize its program is to be successful, the most powerful nations must come to the table with clean hands.”²⁷

Q: In light of the acquisition of nuclear weapons by three non-NPT states—Israel, India, and Pakistan—shouldn’t the NPT be considered a failure?

A: In the 1960s, there were predictions of 25 to 30 NWSs by 1980. Those fears did not materialize. Instead, nearly 34 years after the NPT took effect, only three nations, Israel, India, and Pakistan²⁸ and possibly a fourth, North Korea, have joined the five NPT-recognized NWSs as nuclear powers. Thus, the NPT has to a very great degree succeeded in helping prevent a large-scale proliferation of nuclear weapons states. For the NPT to remain successful, the parties must stem any further proliferation, deal with the security concerns that can impel a state to seek or retain a nuclear-weapons capability, and undertake serious efforts to bring about nuclear disarmament.

Q: What can be done to reduce the chances of a non-NWS cheating on its NPT commitment and diverting nuclear materials and technology to a weapons program?

A: The IAEA’s Additional Protocol gives that agency significantly greater ability to detect the diversion of nuclear materials to weapons programs. So, the greater the numbers of nations that are convinced to agree to it, the more effective it will be. The United States, other nuclear powers, and the non-NWSs that have accepted the Additional Protocol should use their influence to encourage those who have not yet done so to agree to sign and ratify it.

With respect to the non-NWSs’ option to leave the NPT and use the nuclear materials that they have developed through peaceful activities to initiate a weapons program, additional measures are needed to safeguard the nuclear fuel cycle against the diversion of materials to military purposes. This could include the “multinationalization” of the fuel cycle along the lines recommended by IAEA director-general ElBaradei and former defense secretary Perry and others and the Carnegie Endowment’s market-based proposal.²⁹

Q: What can be done at this point to prevent and rollback the proliferation of nuclear weapons?

A: Preventing further proliferation will likely require three kinds of action:

- Enhanced NPT safeguard activities, including—
 - wide acceptance of the Additional Protocol and its vigorous implementation;
 - increased funding for IAEA safeguard inspections; and
 - negotiation of a fissile materials cut-off treaty.
- Broad international agreement on actions to restrict or avoid non-NWSs’ access to or operation of the nuclear fuel cycle (so as to prevent their production of weapons-grade materials, *i.e.*, HEU and plutonium), including the accomplishment of the objective through market mechanisms and the guarantee of a supply of fresh nuclear fuel for strictly peaceful uses.

- Multinational, possibly UN, efforts to satisfy the security concerns that impel some nations to seek a nuclear weapons capability.

Rolling back proliferation in Israel, India, and Pakistan will involve, first and foremost, the very difficult task of trying to meet the security concerns that caused these states to become nuclear powers in the first place and to convince them that, in the long run, the security of their citizens will be better served by progress toward nuclear disarmament than it is by the possession of nuclear weapons.

V. Talking Points

- The NPT has served the nations of the world quite well. Fears in the 1960's that there would be over 20 nuclear powers by the 1980's have never materialized. Nevertheless, three countries that did not sign the NPT—Israel, India, and Pakistan—have nuclear weapons and one state that has withdrawn from the treaty, North Korea, may also have such weapons.
- The international community needs to stop any further proliferation as it strives to roll back the proliferation that has occurred and work for the goal to which the United States and other countries are committed—nuclear disarmament.
- There are ideas for preventing further proliferation—such as restricting individual non-nuclear weapon states' access to the nuclear fuel cycle and creating market incentives for nations not to operate the fuel cycle by themselves—but refining and implementing these concepts will require strong U.S. leadership.
- America's ability to lead nonproliferation efforts is impaired by current U.S. efforts that are at odds with—or at least very difficult to square with—our commitments under the NPT to work with other nations toward nuclear disarmament. The activities of ours that diminish our moral authority to lead others in the international community away from nuclear capabilities include:
 - moving ahead on research on new nuclear weapons, including those that the head of the National Nuclear Security Administration has described as being not just for purposes of deterrence but for use against new threats;
 - declining to move toward ratification of the Comprehensive Test Ban Treaty;
 - accelerating our ability to renew the testing of nuclear weapons; and
 - failing to incorporate in the Treaty of Moscow the principles of irreversibility and verifiability in any ensuing reductions under that treaty.

VI. Factoids

- More countries have joined the NPT, 188, than any other arms control or disarmament agreement.
- The IAEA carries out its NPT safeguard inspections on a budget of less than \$100 million a year—about half a million dollars per NPT member. That is also less than \$10,000 for each ton of nuclear material known to be under its jurisdiction.

VII. Applicable Treaties, Legislation, and Other International Agreements

- Treaty on the Non-Proliferation of Nuclear Weapons (NPT)³⁰
- Comprehensive Test Ban Treaty (The CTBT has been signed by 170 states and ratified by 108, but will not enter into force until all 44 states considered to have substantial nuclear energy activities have ratified it. As of December 2003, 41 of the 44 have signed and 32 have ratified the CTBT. North Korea, India, and Pakistan are the three who have not signed. Among those who have not yet ratified are China, the U.S., Israel, and Egypt.)³¹
- Atomic Energy Act of 1954 (Public Law 83-703), as amended (42 U.S. Code §2011 *et seq.*), in which restrictions were placed on the export of nuclear materials and on information relating to the design, manufacture, and use of nuclear weapons (42 U.S. Code §2161 *et seq.*)
- Energy Reorganization Act of 1974 (Public Law 93-348), as amended (U.S. Code §5801 *et seq.*), divided the Atomic Energy Commission's authorities between two newly created entities—the Department of Energy (development and production of nuclear weapons and the promotion of nuclear power) and the Nuclear Regulatory Commission (regulation of nuclear energy, not including defense facilities).
- Nuclear Proliferation Prevention Act of 1994 (Public Law 103-236), as amended (U.S. Code §6301) requires sanctions (*e.g.*, termination of assistance and opposition to loans from international institutions) against countries taking specified actions contributing to proliferation.
- Congress has enacted various other laws authorizing or imposing sanctions on nations based on conduct relating to the proliferation of nuclear, biological, and chemical weapons and missiles. For an in-depth discussion and listing of such laws, see Richard H. Speier, Brian G. Chow, and S. Rae Starr, *Nonproliferation Sanctions* (RAND 2001).³²

APPENDIX



Department of Energy
National Nuclear Security Administration
Washington, DC 20585

DEC 5 2003

OFFICE OF THE ADMINISTRATOR

MEMORANDUM FOR PETE NANOS, DIRECTOR
 LOS ALAMOS NATIONAL LABORATORY
 MICHAEL ANASTASIO, DIRECTOR
 LAWRENCE LIVERMORE NATIONAL LABORATORY
 C PAUL ROBINSON, PRESIDENT
 SANDIA NATIONAL LABORATORY

FROM LINTON F BROOKS, ADMINISTRATOR *LFB*

SUBJECT FY 2004 National Defense Authorization Act

On November 24, 2003, President Bush signed the National Defense Authorization Act for FY2004. Section 3116 of this law repealed the 1994 law prohibiting the Secretary of Energy from conducting research and development that could lead to the production of a new, low-yield nuclear weapon (i.e., Section 3136 of Public Law 103-160—the so-called PLYWD restriction). The administration had sought to remove this restriction because of the chilling effect it has had on nuclear weapons research and development.

On behalf of the administration, I would like to thank you and your staff for helping to support this important effort. Now free to explore a range of technical options that could strengthen our ability to deter, or respond to new or emerging threats without any concern that some ideas could inadvertently violate a vague and arbitrary limitation (Of course, testing, acquisition or deployment of any nuclear weapon—low-yield or otherwise—or commencement of weapons engineering development or subsequent phases, requires authorization by Congress.)

Along these lines, I expect your design teams to engage fully with the Department of Defense to examine advanced concepts that could contribute to our nation's security. Potentially important areas of such research include agent defeat and reduced collateral damage.

In addition, we must take advantage of this opportunity to ensure that we close any gaps that may have opened this past decade in our understanding of the possible military applications of atomic energy—no novel nuclear weapons concept developed by any other nation should ever come as a technical surprise to us.

Repeal of the PLYWD restriction on nuclear weapons research and development represents, in part, an endorsement by Congress of our efforts to begin to address the nuclear weapons stockpile in accordance with the recommendations of the administration's Nuclear Posture Review to meet the security needs of the 21st century. We should not fail to take advantage of this opportunity. //



Printed with soy ink on recycled paper

(Emphasis in the original.)

¹ For information regarding the background of the treaty and its provisions, see the paper in this volume entitled "Nuclear Nonproliferation Treaty: Achievements and Challenges."

² “Model Additional Protocol to the Agreement(s) Between the State(s) and the International Atomic Energy Agency for the Application of Safeguards,” IAEA (September 1997), accessed at: <http://www.iaea.org/Publications/Documents/Infcirc/1998/infcirc540corrected.pdf>.

³ Jan Priest and Laura Lockwood, “Protocols for Strengthened Safeguards: Progress & Prospects,” *IAEA Bulletin*, vol.41, no. 4 (1999), accessed at <http://www.iaea.org/Publications/Magazines/Bulletin/Bull414/article4.pdf>.

⁴ IAEA website, “Safeguards and Verification; Strengthened Safeguards System: Status of Additional Protocols,” accessed at: http://www.iaea.org/OurWork/SV/Safeguards/sg_protocol.html. On June 12, 1998, the United States signed an Additional Protocol; and on May 9, 2002, the President submitted it the Senate for ratification. Department of State, Bureau of Nonproliferation, “Fact Sheet: U.S.-IAEA Additional Protocol,” May 14, 2002, accessed at: <http://www.state.gov/t/np/rls/fs/2002/10316pf.htm>.

⁵ IAEA Staff Report, “Iran Signs Additional Protocol on Nuclear Safeguards,” IAEA website, News Center (December 18, 2003), accessed at: <http://www.iaea.org/NewsCenter/News/2003/iranap20031218.html>.

⁶ Paul Kerr, “The IAEA’s Report on Iran: An Analysis,” *Arms Control Today* (December 2003), accessed at: http://www.armscontrol.org/act/2003_12/IAEAreport.asp.

⁷ “Continuing Iranian Centrifuge Production Causes Increasing Concern,” *Global Security Newswire*, January 21, 2004, accessed at: http://www.nti.org/d_newswire/issues/2004_1_21.html#C2719968.

⁸ The President’s May 9, 2002, letter submitting the Additional Protocol to the Senate, accessed at <http://www.whitehouse.gov/news/releases/2002/05/20020510-4.html>.

⁹ David Ruppe, “White House Advances Nuclear Safeguards Protocol After Receiving Senate Pressure,” *Global Security Newswire* (November 25, 2003), accessed at http://www.nti.org/d_newswire/issues/2003_11_25.html#01CEBEC8.

¹⁰ See note 5.

¹¹ Peter Slevin, “Brazil Shielding Uranium Facility: Nation Seeks to Keep Its Proprietary Data From U.N. Inspectors,” *Washington Post* (April 4, 2004), p. A1.

¹² *Ibid.*

¹³ In fact, two experts in the field contend that “[a]mending the NPT would be impractical and inadvisable.” Joseph Cirincione and Jon B. Wolfsthal, “North Korea and Iran: Test Cases for an Improved Nonproliferation Regime?” *Arms Control Today* (December 2003), accessed at: http://www.armscontrol.org/act/2003_12/CirincioneandWolfsthal.asp.

¹⁴ The essay is reprinted as “The Nuclear Fuel Cycle: A Challenge for Nonproliferation,” *Disarmament Diplomacy* (March/April 2004), accessed at: <http://www.acronym.org.uk/dd/dd76/76ls.htm>.

¹⁵ Mohamed ElBaradei, “Towards a Safer World,” Op-Ed. in *The Economist* (October 16, 2003), accessed at: <http://www.iaea.org/NewsCenter/Statements/2003/ebTE20031016.shtml>.

¹⁶ “Curbing Nuclear Proliferation: An Interview with Mohamed ElBaradei,” *Arms Control Today* (November 2003).

¹⁷ Joseph Cirincione and Jon B. Wolfsthal, *op. cit.*, note 14.

¹⁸ Ashton B. Carter, Arnold Kanter, William J. Perry, and Brent Scowcroft, “Good Nukes, Bad Nukes,” Op-Ed, *New York Times* (December 22, 2003), accessed at: http://www.ksg.harvard.edu/news/opeds/2003/carter_nukes_nyt_122203.htm.

¹⁹ “Hans Blix Presented Weapons of Mass Destruction Commission,” Permanent Mission of Sweden to the UN, December 18, 2003, accessed at: http://www.swedenabroad.com/pages/news___15376.asp.

²⁰ Mitchell B. Reiss, Director of Policy Planning, “Atoms for Peace: A Future After Fifty Years?” remarks to the conference hosted by Los Alamos National Laboratory, the Woodrow Wilson International Center for Scholars, and the College of William & Mary, Washington, DC, December 9, 2003, accessed at <http://www.state.gov/s/p/rem/2003/27035.htm>.

²¹ “United States Seeking Reforms of Nuclear Nonproliferation Treaty Regime,” *Global Security Newswire*, January 26, 2004, accessed at: http://www.nti.org/d_newswire/issues/2004_1_26.html.

²² It is hoped, of course, that the current six-party talks regarding North Korea’s nuclear weapons program(s) will succeed in the verifiable dismantlement of that program or programs.

²³ As noted in the paper in this volume entitled “Nuclear Nonproliferation Treaty: Achievements and Shortcomings,” the United States has embarked on a program of research of new nuclear weapons and the modification of existing ones for new purposes, such as the Robust Nuclear Earth Penetrator, and the acceleration of the U.S. capability to conduct weapons testing. These actions have raised concerns about the sparking of a new nuclear arms race and the creation of an incentive for nations who feel threatened by the United States to develop their own nuclear weapons. Thus, several non-NWSs have expressed impatience with the pace at which the nuclear powers are moving toward nuclear disarmament under article VI. For example, on September 23, 2003, the foreign ministers of Egypt, Ireland, Mexico, New Zealand, South Africa, Sweden, and Brazil “expressed their deep concern at the lack of progress to date in the

implementation of the thirteen steps on nuclear disarmament to which all States parties to the Treaty on the Non-Proliferation of Nuclear Weapons agreed at the 2000 NPT Review Conference. ... [and] reiterated their deep concern at emerging approaches to the broader role of nuclear weapons as part of security strategies, including rationalizations for the use of, and the development of new types of nuclear weapons. *Declaration issued by the Foreign Ministers of the New Agenda Coalition (NAC), United Nations Headquarters*, accessed at: <http://www.acronym.org.uk/docs/0309/doc20.htm>. Also, see Douglas Frantz, *op. cit.*, note 30, quoting the Malaysian ambassador to the IAEA, who heads a group of 13 unaligned countries on the IAEA board, as follows: “The U.S. follows a double standard that allows it to develop and threaten to use nuclear weapons while denying them to smaller countries. We do not know whether the [NPT] can survive with these U.S. policies.”

²⁴ “NRDC Nuclear Notebook: U.S. Nuclear Forces, 2003,” *Bulletin of the Atomic Scientists* (May/June 2003), pp. 73-76, accessed at: <http://www.thebulletin.org/issues/nukenotes/mj03nukenote.html>.

²⁵ Section 3116 of the National Defense Authorization Act for Fiscal Year 2004 (Public Law 108-136).

²⁶ The memorandum is in the appendix.

²⁷ Leonard Weiss, “Nuclear Weapon States and the Grand Bargain,” *Arms Control Today* (December 2003) p. 21, accessed at: http://www.armscontrol.org/act/2003_12/Weiss.asp.

²⁸ For a discussion of the issues involved in seeking to bring the non-NPT nuclear-weapons states into the non-proliferation regime, see Marvin Miller and Lawrence Scheinman, “Israel, India, and Pakistan: Engaging the Non-NPT States in the Nonproliferation Regime,” *Arms Control Today* (December 2003), accessed at: http://armscontrol.org/act/2003_12/MillerandScheinman.asp.

²⁹ See notes 17-19 and accompanying text.

³⁰ The treaty can be accessed at: <http://disarmament.un.org:8080/TreatyStatus.nsf>.

³¹ For detailed information on the CTBT, see the website of the Preparatory Commission for the Comprehensive Test Ban Treaty Organization: <http://pws.ctbto.org/>.

³² This publication can be accessed at: <http://www.rand.org/publications/MR/MR1285/index.html>.

“Iran Signs Additional Protocol on Nuclear Safeguards,” IAEA website, News Center (December 18, 2003), accessed at: <http://www.iaea.org/NewsCenter/News/Safeguards-Verification/iranap20031218.html>.