

Chapter 1

A Nuclear Energy Renaissance and the Nuclear Non-proliferation Regime

In recent years, as global warming has emerged as a serious environmental problem, nuclear power generation is being reevaluated in Europe and the United States, as one method for dealing with it. Amidst this emerging renaissance in nuclear energy, a number of countries in Asia, notably Indonesia, Vietnam, Malaysia, Bangladesh, and Thailand, have begun to show an interest in nuclear power generation. China has also publicly made clear its intention to become a major user of nuclear power and to build around 30 nuclear power plants capable of producing one million kilowatts each by 2020.

Asia will thus likely see a significant surge in countries launching nuclear power projects in the years ahead. Heightened demand for nuclear power, however, also increases the possibility that technologies for uranium enrichment and the reprocessing of spent fuel will proliferate. Although Article IV of the Nuclear Non-proliferation Treaty (NPT) gives countries the right to obtain or develop their own enrichment and reprocessing technologies, these capabilities have the unintended effect of enabling the same countries to manufacture weapons-grade fissile material. Equally important, Article X of the NPT allows a nation to leave the treaty, but there is a strong probability that a country seeking to withdraw from the NPT is aiming to manufacture nuclear weapons. Unlike withdrawal from other treaties, therefore, withdrawal from the NPT has major negative implications for international security. Moreover, today's international community must deal with the problem of nuclear proliferation to terrorist groups and other non-state actors given the potential use of radio active materials and nuclear weapons by such organizations in terrorist attacks. Unless the international community can devise effective responses to these problems, growing reliance on nuclear power could increase the risk of nuclear weapons proliferation and the threat of the use of nuclear materials and other radioactive substances by terrorists.

In recent years, there have been growing moves in the international community to cooperate in the field of nuclear power with India, a country that is not only a non-signatory of the NPT but also possesses nuclear weapons. This trend was touched off by the resumption of cooperation between the United States and India on civilian nuclear energy. Citing India's detonation of a nuclear explosive device in May 1974, the United States had for many years suspended all cooperation with India on nuclear energy. Factors prompting the change in US policy were the growing geopolitical importance of India, whose national power is expanding under a market economy; increasing demand for energy; and the problem of

global warming. However, this major policy shift by the United States could undermine the basic principle of the NPT, which is to reward non-nuclear weapons states with cooperation in the peaceful uses of atomic energy in exchange for their renouncing the development and possession of nuclear weapons. By providing India with the same level of cooperation, the international community is placing India, which not only continues to turn its back on the NPT but has also developed nuclear weapons, on an equal footing with non-nuclear weapon states that have met their non-proliferation obligations under the NPT. Thus, even if the international community agrees to provide nuclear cooperation to India as an exception in view of its growing importance politically, economically, and in security terms, it must also, at the same time, make every effort to contain any adverse impact of this cooperation on the non-proliferation regime.

1. Addressing Inherent Problems of NPT Article IV

Article IV of the NPT acknowledges that the parties to the treaty have an inalienable right to pursue the use of nuclear energy for peaceful purposes, such as nuclear power generation, provided they comply with the provisions of Articles I and II concerning the obligations of nuclear-weapon states and non-nuclear-weapon states party to the treaty. To confirm that nuclear material is not diverted for military use by non-nuclear-weapon states pursuing the use of nuclear energy for peaceful purposes, such countries must accept comprehensive safeguards set forth in treaties concluded with the International Atomic Energy Agency (IAEA) and accept inspections by the IAEA. According to Article III-1 of the NPT, the safeguards “shall be applied to all source or special fissionable material in all peaceful nuclear activities within the territory of such State, under its jurisdiction, or carried out under its control anywhere.” The aim of such comprehensive safeguards is to detect in a timely manner whether significant quantities of nuclear material are being diverted from civil nuclear activities to the manufacture of nuclear weapons and other nuclear explosive devices and to utilize this detection capability as a deterrent to prevent such diversion to military use.

The intention of the comprehensive safeguards is to require the parties to the safeguard treaties to report the existence of all nuclear materials, without concealment, inside their borders, but it is not inconceivable that a non-nuclear-weapon state might secretly divert nuclear material to military uses while engaged in nuclear-energy activities. In fact, these concerns were realized in the early

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1990s when Iraq and North Korea were suspected of developing nuclear weapons. To deal with such problems, the IAEA has proposed ways to strengthen the safeguards in order to improve its ability to detect undeclared nuclear materials and nuclear activities. The new measures aimed at strengthening the safeguards are embodied in a protocol to be added to comprehensive safeguard treaties, and the IAEA has called on non-nuclear-weapon states that are party to the NPT to sign and ratify this IAEA Additional Protocol. The Additional Protocol strengthens the IAEA's right to confirm the non-existence of secret nuclear activities by broadening the range of information regarding nuclear activities to be submitted to the IAEA and the targets of verification and also by giving IAEA inspectors access to more locations. As a result, there has been substantial improvement in the IAEA's ability to detect undeclared nuclear material and nuclear activities, making it extremely difficult for states to pursue secret nuclear weapons development programs when subject to the various verification procedures set forth in the Additional Protocol. However, as of the end of December 2008, only 88 countries had put the Additional Protocol into effect. Universalization of the Additional Protocol is essential to ensure the objectives of nuclear non-proliferation, but the decision on whether or not to sign the Additional Protocol is left to each NPT signatory state.

That said, even with universalization of the Additional Protocol, the problems inherent in Article IV of the NPT will not be resolved. As stated above, NPT Article IV encourages the use of nuclear energy for peaceful purposes by treaty signatories. Some countries pursuing peaceful uses of nuclear energy, such as nuclear-power generation, are interested not merely in operating nuclear-power facilities, but also in acquiring the ability to enrich uranium and to reprocess spent nuclear fuel in order to secure their own supplies of fuel. Given the growing use of nuclear power, the number of such countries is likely to be going forward. However, acquisition of the ability to enrich uranium and reprocess spent fuel means, *ipso facto*, acquisition of the ability to produce weapons-grade fissile materials that form the core of nuclear weapons. Thus, as the ability to enrich and reprocess becomes more widespread, so does the potential ability to manufacture nuclear weapons. It is conceivable, therefore, that an NPT non-nuclear-weapon state might withdraw from the NPT once it had accumulated the know-how to enrich and reprocess through nuclear activities ostensibly carried out for peaceful purposes and had made sufficient preparation to manufacture nuclear weapons.

Improving verification capabilities via the Additional Protocol will not resolve this problem. Even if the IAEA's verification process detects undeclared nuclear activities, there is no way to stop such activities without firm evidence that they are not for peaceful purposes.

Because of the growing risk of nuclear proliferation as an increasing number of non-nuclear-weapon states build facilities to enrich uranium and reprocess fuel, there has recently been a revival of moves that originated in the 1970s to place additional restrictions on the spread of sensitive technology related to uranium enrichment and reprocessing and the construction of facilities for such purposes on condition that it does not interfere with the peaceful use of nuclear energy. For example, a group of international experts studying ways of placing uranium enrichment and reprocessing activities under multilateral control at the behest of IAEA Director-General Mohamed ElBaradei released a report in February 2005 outlining the following five approaches: (a) strengthening current market mechanisms relating to nuclear fuel; (b) providing international assurances of nuclear fuel supply with IAEA participation; (c) voluntary placement of existing nuclear energy facilities under multinational control; (d) placement of any new nuclear energy facilities under multilateral or regional control; and (e) development of the nuclear fuel cycle under a broad collaborative structure by region or by continent, with IAEA involvement.

Various countries have since put forward concrete proposals based on some of these ideas. A specific example is the January 2006 proposal of then Russian President Vladimir Putin to set up an international center that would utilize his country's nuclear energy facilities to provide enrichment and reprocessing services, with IAEA involvement, to non-nuclear-weapon states that have decided not to acquire their own enrichment and reprocessing technology. In February of the same year, the United States proposed the Initiative on Global Nuclear Energy Partnership (GNEP) aimed at establishing a multinational framework to ensure reliable supplies of nuclear fuel as an alternative to each non-nuclear-weapon state acquiring its own enrichment and reprocessing technology. In June, six countries—the United States, the United Kingdom, France, Russia, Germany, and the Netherlands—proposed the concept of setting up a “nuclear fuel bank” as a nuclear fuel market safety net, and in September, Japan proposed an “IAEA Standby Arrangements System for the Assurance of Nuclear Fuel Supply.” Japan's proposal aims to secure stable supplies of nuclear fuel by having countries register their

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supply capabilities with the IAEA with respect not only to uranium enrichment, but all aspects of the supply of nuclear fuel, including uranium ore, conversion, fuel processing, and uranium stocks, to enable a large number of countries to participate in and contribute to the international nuclear fuel supply framework while reflecting the various circumstances of participating countries. The Japanese proposal aims to enhance participation in and complement the details of the earlier six-nation concept and holds the promise of complementary benefits. In June 2007, IAEA Director-General Mohamed ElBaradei listed the nearly 10 different proposals put forward until that point in a report entitled *Possible New Framework for the Utilization of Nuclear Energy* and submitted it to a meeting of the IAEA Board of Governors with a request for the Board to review it.

Unquestionably, these approaches, which aim to place uranium enrichment and reprocessing activities under multinational control, would help to prevent nuclear proliferation by involving the international community in some way in enrichment and reprocessing, in contrast to the situation in which non-nuclear-weapon states handle their own enrichment and reprocessing. However, as with the IAEA Additional Protocol, whether or not to forego acquisition of enrichment and reprocessing technology, and in particular, whether to participate in a nuclear fuel supply assurance program, is a political decision for each country to take. There is no way to force countries interested in establishing their own nuclear fuel cycle to participate. Thus, it will be necessary to devise ways to encourage participation in such a nuclear fuel supply assurance program. In the first place, there would have to be a guarantee that supplies of nuclear fuel will not be intentionally cut off for political reasons. This will entail defining certain conditions in advance and enabling countries that fulfill these conditions to receive supplies of nuclear fuel. One conceivable condition would be fulfillment of nuclear non-proliferation obligations, such as non-violation of the safeguard treaty, but there would have to be agreement on how to deal with countries that have committed violations in the past and whether to make acceptance of the IAEA Additional Protocol a precondition. However, caution must be exercised to avoid making the conditions too strict, as this is likely to cause more countries to think twice about participating in the nuclear fuel supply assurance program, limiting its value as a means of achieving nuclear non-proliferation.

Moreover, it would be essential to supply nuclear fuel at a price lower than the cost that the individual non-nuclear-weapon states would bear for nuclear fuel if

they were to handle the enrichment and reprocessing themselves. However, while setting the price of nuclear fuel supplies at a lower level than the cost of fuel obtained domestically would be a necessary condition for encouraging states to forego enrichment and reprocessing technology and facilities, it would not be a sufficient condition for them to do so. This is because of the ever-growing desire among states to achieve energy security, even if they have to pay slightly more, because of surging demand for energy. Moreover, given the provisions of Article IV of the NPT, it is questionable whether states would agree to forego entirely enrichment and reprocessing technology and facilities, including small-scale research facilities.

The concept of placing uranium enrichment and reprocessing under multinational control was already debated during the 1970s and 1980s, but nothing came of it because of the issues referred to above. Whether or not the various proposals now under consideration will end up being shelved, as happened in the 70s and 80s, will largely depend on the stance adopted by the IAEA Board of Directors vis-à-vis the report submitted by ElBaradei.

2. Problem of Withdrawal from NPT

In March 1993 and again in January 2003, North Korea declared that it was withdrawing from the NPT. Any party to the NPT can withdraw from the treaty “if it decides that extraordinary events, related to the subject matter of this Treaty, have jeopardized the supreme interests of its country” by giving three months’ notice to the United Nations Security Council (UNSC) and all other parties to the NPT with an explanation of the “extraordinary events.” However, as the North Korean example shows, it is fair to assume that any country invoking the withdrawal provisions of Article X of the NPT is almost certainly interested in developing nuclear weapons. Withdrawal from the NPT, therefore, has much more serious implications for international peace and security than withdrawal from other treaties. These concerns have sharply raised awareness of the need to impose some kind of restriction on withdrawal from the NPT, in particular, withdrawal by a state that has violated NPT-related treaties, such as the nuclear safeguard agreement.

For example, IAEA Director-General Mohamed ElBaradei, speaking at the Carnegie International Non-Proliferation Conference in June 2004, suggested that when a state notifies its intention to withdraw from the NPT, there should be a mechanism whereby such notification prompts an automatic review by the

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UNSC. Various other suggestions emerged at the 2004 NPT Preparatory Conference ahead of the 2005 NPT Review Conference, such as the need for UNSC approval of any withdrawal (Republic of Korea; ROK), defining the interpretation of “extraordinary events” referred to in Article X of the NPT and stripping NPT violators of the right to withdraw (Germany), and rendering unusable any nuclear material and nuclear facilities acquired from overseas prior to withdrawal (France).

Various suggestions were also put forward at the 2008 NPT Preparatory Conference leading up to the 2010 NPT Review Conference. The ROK proposed that when notification is received from a state intending to withdraw from the NPT, not only should the UNSC promptly review the matter, but at the request of the NPT depository states (United States, United Kingdom, and Russia) and at least one-third of the parties to the NPT, an emergency meeting of NPT signatories should be held within 30 days of receipt of the notification to respond to it. The proposal includes requiring the state that has notified its intention to withdraw to explain the reasons for its withdrawal and for the emergency meeting to review procedures for having the withdrawing state return nuclear materials and facilities imported from abroad and also review procedures for placing nuclear-related material, equipment and facilities obtained from overseas under the control of the IAEA until they are returned.

Australia also has proposed that if an NPT signatory state notifies its intention to withdraw, the UNSC should automatically and promptly deliberate on the impact to international peace and security of the withdrawal and at the same time should consider necessary responsive action and, furthermore, should have the ability to verify the withdrawing state’s compliance with the NPT. Canada has proposed three principles to deal with the withdrawal issue. The first principle is that no withdrawal be allowed that enables the withdrawing state to continue to enjoy the benefits obtained during the period that it was a party to the NPT; the second is that the withdrawing state not violate any of the obligations specified in the NPT; the third is that the withdrawing state take responsibility for any treaty violations committed during the period that it was a party to the NPT. Canada, like the ROK, wants an emergency meeting of NPT signatories to be held when notification of a state’s intention to withdraw is received.

As outlined above, various proposals have been put forward concerning the problem of withdrawal from the NPT. The arguments contained in these proposals

can be summarized in five points. First, as stated in Article 70 of the Vienna Convention on the Law of Treaties (VCLT), a withdrawing state cannot evade responsibility for treaty violations committed during the period it was a party to the treaty. Second, a withdrawing state cannot use nuclear-related material, equipment and technology obtained from overseas during the period it was a party to the treaty once it has withdrawn from the treaty. In order to ensure compliance with this rule, there is a need to consider measures to enable application of the IAEA's safeguards to the withdrawing state even after it has withdrawn. Third, states that have provided nuclear-related materials, equipment and technology must take steps to secure the return of such items from the withdrawing state or prevent them from being used. Fourth, when a state issues notification of withdrawal, there should be an international response, notably, immediate deliberation and review by the UNSC of the proposal to withdraw along with confirmation of whether there has been any treaty violation. Fifth, discussions should be held with the state intending to withdraw for the purpose of having that state reconsider its decision to withdraw. In addition to confirming the above summation of opinions, Japan has drawn attention to the importance of stressing the benefits of remaining a party to the NPT when addressing the problem of withdrawal.

Thus, in dealing with the issue of withdrawal from the NPT, various proposals have been put forward to apply constraints that would make it difficult to withdraw. These proposals have been submitted with the intent of placing them on the agenda of the NPT Review Conference scheduled for 2010 in the hope of achieving some kind of agreement following deliberation and review. However, if the agreement is outside the legal interpretation of Article X of the NPT, inevitably it will have no more than politically binding power.

3. Preventing Proliferation to Terrorists and Other Non-state Actors

(1) Risk of Nuclear Terrorism

Over the years, the international community has endured damage from terrorist activities targeting human lives and property, but the globalization driven by the spread of science and technology as well as the dramatic growth in the flow of funds and goods has raised the risk of terrorist organizations obtaining nuclear and radioactive material, to produce weapons of mass destruction (WMD) and to

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use them to carry out acts of terrorism. Reports that al-Qaeda, the top international terrorist organization, is planning and preparing acts of nuclear terrorism are, in fact, frequent. The IAEA has listed four potential modes of nuclear terrorism: (a) carrying out or threatening to carry out a nuclear attack through illicit acquisition of nuclear weapons; (b) use of a nuclear explosive device manufactured using illicitly obtained weapons-grade fissile materials; (c) use of a so-called dirty bomb made from radioactive materials; and (d) acts of sabotage against nuclear power facilities or vehicles transporting nuclear materials.

Even if terrorists did not use nuclear weapons or other nuclear explosive devices, there is still a considerable risk of wreaking havoc with a dirty bomb capable of causing radioactive contamination that would paralyze economic activity. Moreover, the human and property damage resulting from sabotage of nuclear power stations and other nuclear facilities could be enormous depending on the nature of the sabotage.

Compared to the threat from other conceivable types of nuclear terrorism, the

Enriched Uranium

Enrichment refers to the process of increasing the ratio of one isotope in material comprising two or more different isotopes. In the case of uranium, the uranium element separated from uranium ore contains roughly 0.7 percent uranium 235, the isotope that undergoes fission by absorbing neutrons. Uranium enrichment refers to the process of increasing the concentration of uranium 235 so that the amount of uranium 235 within the total is greater than that found in natural uranium.

With natural uranium that contains only 0.7 percent uranium 235, it is hard to start the chain reaction necessary for fission. Thus, for example, in order to initiate fission with sufficient efficiency to enable nuclear fuel to be used in a light water reactor for nuclear power generation, it is necessary to increase the ratio of uranium 235 to 3–5 percent. Uranium in which the ratio has been increased up to 20 percent is referred to as low-enriched uranium.

Highly enriched uranium has a uranium 235 concentration of more than 20 percent and is used in research reactors and in the manufacturer of nuclear weapons. The ratio of uranium 235 in highly enriched uranium used to make nuclear weapons is normally said to be at least 90 percent, but it has also been theorized that it would be possible to manufacture nuclear weapons with an enrichment level of around 70 percent.

Source: *Genshiryoku no Subete* Editorial Committee, ed., *Genshiryoku no Subete* [All about Atomic Energy (author's translation)] (National Printing Bureau, 2003) and other publications.

probability of terrorists illicitly acquiring nuclear weapons is relatively low. Normally nuclear bombs and warheads are fitted with a device called a permissive action link (PAL), which would prevent terrorists from detonating a nuclear bomb or warhead even if they managed to lay their hands on one. However, not all existing nuclear weapons are equipped with such a device. Therefore, all nuclear-weapon states should give priority to reducing and dismantling nuclear weapons not fitted with a PAL while doing their utmost to account for and secure such weapons.

Reductions in the amount of highly enriched uranium and plutonium, capable of being turned into weapons, along with measures to account for and secure these materials, are important to prevent terrorist organizations from making rudimentary nuclear explosive devices. This is because large-scale facilities are required for the enrichment and reprocessing, and production of such fissile materials involves the most difficult technology among the processes for producing nuclear weapons. It is hard to imagine terrorist organizations, therefore, being able to manufacture them relying solely on their own resources.

At the international level, however, measures to safeguard highly enriched uranium and other fissile materials leave something to be desired, as discussed below. Fissile materials that form the core of nuclear explosive devices, such as uranium 235 and plutonium 239, are dispersed in some 350 of so facilities in roughly 60 countries around the world, and the total amount of these materials is estimated at around 3,700 tons. Highly enriched uranium, produced by concentrating uranium 235, and plutonium are indispensable for producing a nuclear explosive device. However, an implosion-type explosive device made with plutonium is harder to manufacture than one made with uranium, so terrorists are more likely to try to obtain highly enriched uranium than plutonium. The total amount of highly enriched uranium in the world, including that for military purposes, is estimated at around 1,700 tons, but measures to safeguard highly enriched uranium for civilian uses are not as robust as those for enriched uranium for military use, supposedly making the former an easier target for terrorists. The US Department of Energy has calculated that there are 128 facilities throughout the world holding at least 20 kilograms of highly enriched uranium for civilian purposes and warns of problems with the way such material is secured at many of these facilities.

A dirty bomb, on the other hand, consists of a conventional bomb stuffed with radioactive materials obtained from nuclear power stations, nuclear fuel

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manufacturing facilities or facilities for producing nuclear weapons. Explosion of the bomb causes radioactive contamination. The human suffering and physical damage caused by a dirty bomb is assumed to be much less than the suffering and damage caused by a nuclear explosive device, but the impact on society as well as the financial cost of removing the contamination would be considerable. In order to prevent terrorist organizations from making dirty bombs, therefore, it is essential to ensure radioactive waste and other radioactive materials are properly accounted for and secured. However, radioactive materials for civilian purposes are widely used in medicine, industry and in agriculture, and measures to account for and secure such materials are said to be less stringent than those for military-use nuclear materials.

(2) Measures to Combat Nuclear Terrorism

Growing awareness of the threat of nuclear terrorism has focused attention on the importance of strengthening measures to account for and secure nuclear and radioactive materials and also to protect nuclear power stations and other nuclear facilities. Furthermore, various measures are being taken under the name of “nuclear security” to protect nuclear and radioactive materials as well as nuclear energy facilities from terrorist organizations.

Following is a description of efforts designed to establish the proper legal infrastructure for promoting nuclear security. The international community has adopted 13 anti terrorism treaties, but those focused primarily on preventing nuclear terrorism are the Convention on the Physical Protection of Nuclear Material (CPPNM), which came into force in February 1987, and the International Convention for the Suppression of Acts of Nuclear Terrorism (ICSANT), which came into force in July 2007.

There are 130 parties to the CPPNM, including Japan. This convention is aimed primarily at preventing the illicit acquisition and use of nuclear materials. The convention places an obligation on the parties to provide a certain level of protection for nuclear materials during international transportation, including supervision by security officers, and requires countries not to approve the export of nuclear materials without evidence that such protection has been provided. The convention also defines certain activities involving nuclear materials, including illicit acquisition of nuclear materials, as crimes and obligates treaty parties to establish jurisdiction to prevent suspects from evading criminal prosecution and

also to treat crimes under the terms of the convention as extraditable crimes. The CPPNM was revised in July 2005 to include protection of nuclear materials and nuclear facilities for civilian purposes that are used, stored or transported within the territory of treaty parties in addition to internationally transported nuclear materials. However, the revised convention leaves it to treaty parties to determine the level of protection to be provided based on the perceived threat. This creates the potential for differences among treaty parties in the level and scope of protection provided depending on the perceived level of threat against civilian nuclear materials facilities within their borders. The CPPNM mandates protection for nuclear materials, but not for radioactive materials. Moreover, the revised CPPNM has not come into force and will not take effect until two thirds of the parties to the CPPNM ratify it.

In addition to requiring protection for radioactive materials in general, including nuclear materials, the ICSANT defines as crimes such acts as possession or use of radioactive materials and nuclear explosive devices aimed at inflicting serious bodily injury or substantial damage to property, and, as with the CPPNM, requires signatories to punish criminals and cooperate with the extradition of criminals. As of October 2007, there were 29 parties to the ICSANT, including Japan. This is much smaller than the number of parties to the CPPNM, but the fact that 115 countries have signed the treaty holds promise that the number of treaty parties will increase. Like the CPPNM, the ICSANT facilitates the establishment of an international framework for punishing criminals, which is significant from the perspective of preventing nuclear terrorism.

The UNSC has adopted two resolutions concerning the establishment of the legal infrastructure to combat nuclear terrorism. UNSC Resolution 1373, adopted in September 2001, requires UN member countries to take comprehensive measures within their territories, including financial measures to fight terrorism such as banning the provision of funds or financial assets for use in terrorist acts, the designation of such acts as crimes, and the freezing of terrorist assets, as part of a set of countermeasures against funding for terrorist acts, including nuclear terrorism. In April 2004, UNSC Resolution 1540 was adopted unanimously. In order to prevent terrorist organizations or non-state actors from acquiring, using or causing the proliferation of WMD, including nuclear weapons, or the means of delivering such weapons, this resolution requires UN member countries (a) not to provide support to non-state actors that attempt to develop, acquire, transfer or use

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WMD; (b) establish and enforce domestic laws aimed at preventing non-state actors from developing, acquiring, transferring or using WMD; (c) take measures within their territories to account for and secure, physically protect, and control the exportation of WMD, including materials and equipment.

At the same time, the IAEA is involved in various activities intended to support member countries in their efforts to combat nuclear terrorism. For example, since 1975, the IAEA has formulated recommendations (INFCIRC/225) to develop international standards for protecting nuclear materials and urged member states to implement them. The INFCIRC/225/Rev.4 (Corrected) currently invoked by countries spells out clearly the separate roles of the state and operators. Specifically, it recommends that when devising a system to protect nuclear material, the state should draw up the “Design Basis Threat,” which spells out the nature of the threat to nuclear materials. The operator should establish and implement the protection measures, with the state assessing their effectiveness. The document also refers to the requirements for protecting nuclear facilities from sabotage. These international standards for protection of nuclear materials drawn up by the IAEA should serve as valuable references when the above-mentioned revised CPPNM comes into force. Japan has already revised the Law for the Regulation of Nuclear Source Materials, Nuclear Fuel Materials and Reactors in 2005 and has strengthened measures to protect nuclear materials in accordance with the INFCIRC/225/Rev.4 (Corrected) recommended by the IAEA.

Measures to account for and secure radioactive materials that could be used to manufacture a dirty bomb have even greater urgency because radioactive materials are easier to acquire than nuclear materials. In 2000, the IAEA formulated a Code of Conduct on the Safety and Security of Radioactive Sources (Code of Conduct), but following the 9/11 terrorist attacks, it revised the Code of Conduct to strengthen the security-related aspects by requesting IAEA member states to upgrade their legal systems to enable implementation of effective

restrictions on radioactive sources. This revised Code of Conduct was approved by the IAEA Board of Governors in September 2003. Because the Code of Conduct lays out specific measures for the protection of radioactive materials, it should be helpful when implementing the above-mentioned ICSANT. Furthermore, in September 2004, the IAEA Board of Governors approved Guidance on the Import and Export of Radioactive Sources, which calls for formalizing the system of notification and approval regarding exports and imports of radioactive sources. Japan revised its Export Trade Control Order and has implemented the Guidance since January 2006.

The United States and Russia, which have been targeted in several terrorist attacks, have started to take coordinated action aimed at preventing nuclear terrorism. An example is the initiation of the Global Initiative (GI) to Combat Nuclear Terrorism announced in the form of a joint declaration following bilateral talks between US President George W. Bush and Russian President Vladimir Putin at the Summit of the Group of Eight leading industrialized nations (G8) held in St. Petersburg in July 2006. Recognizing that it is essential to cooperate in combating terrorism with like-minded countries in order to establish an effective anti terrorism regime, the two leaders called on countries participating in the initiative to improve their ability to combat terrorism by implementing the following seven actions: (a) improve accounting and physical protection of nuclear material and other radioactive substances, as well as security of nuclear facilities; (b) detect and suppress illicit trafficking or other illicit activities involving such materials, especially measures to prevent their acquisition and use by terrorists; (c) respond to and mitigate the consequences of acts of nuclear terrorism; (d) cooperate in the development of technical means to combat nuclear terrorism; (e) ensure that law enforcement takes all possible measures to deny safe haven to terrorists seeking to acquire or use nuclear materials; (f) strengthen national legal frameworks to ensure the effective prosecution of, and the certainty of punishment for, terrorists and those who facilitate such acts, and enforce the ICSANT, revised CPPNM, Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation and UNSC Resolutions 1373 and 1540; and (g) multinational exercises, expert-level meetings and the provision of assistance.

The first meeting of participating countries was held in Rabat, Morocco, at the end of October 2006, three months after the joint declaration of the US and Russian presidents. The meeting adopted a “Statement of Principles,” which

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included a commitment to implement measures to combat nuclear terrorism on a voluntary basis. The “Statement of Principles” contains eight principles, but these are essentially the same activities aimed at combating nuclear terrorism as those outlined by the US and Russian heads of government in July 2006. A total of 13 countries participated in the first meeting, including China and Australia in addition to the G8 countries. Subsequently, the number of countries supporting the “Global Initiative to Combat Nuclear Terrorism” by endorsing the “Statement of Principles” and other actions has risen to 73, and 56 countries participated in the fourth meeting held in Madrid in mid-July 2008.

The nuclear facilities, nuclear materials and other radioactive substances envisaged in the Global Initiative are limited to those for civilian use. Nuclear facilities, materials and radioactive substances for military use held by nuclear-weapon states under the NPT are not covered. The eighth paragraph of the US-Russian joint declaration issued in July 2006 states that issues related to safeguarding nuclear weapons and other nuclear facilities, installations and materials used for military purposes remain strictly the “national prerogative” of the nuclear weapons state parties to the NPT, for which they bear special responsibility. The fact that there is no similar language in the Statement of Principles probably reflects political considerations intended to encourage participation in the initiative.

Another measure aimed at combating nuclear terrorism is the Global Threat Reduction Initiative (GTRI) launched by the United States in May 2004. The mission of the GTRI is to strengthen the safeguarding of nuclear and radioactive materials around the world and to remove certain nuclear materials. During the Cold War, the United States and former Soviet Union provided highly enriched uranium for civilian use to allied and friendly countries for use in research reactors. As part of the effort against nuclear terrorism, the GTRI envisages recovering highly enriched uranium and spent fuel from these facilities while recommending the replacement of highly enriched uranium with low-enriched uranium. During the three years following the start of the GTRI, the amount of highly enriched uranium that had been recovered was equivalent to the amount contained in 30 nuclear warheads, and measures to safeguard 575 facilities used to store radioactive substances have been strengthened.

Other initiatives with the potential to play a role in combating nuclear terrorism are the “Cooperative Threat Reduction (CTR) Program” based on the Nunn-Lugar

Act enacted by the US Congress in November 1991, the Global Partnership against the Spread of Weapons and Materials of Mass Destruction hammered out at the June 2002 G8 Summit in Kananaskis, Canada, and the Proliferation Security Initiative (PSI) proposed in May 2003 by President Bush with the aim of interdicting on land, at sea and in the air the transport and transfer of materials and equipment utilized to produce nuclear weapons and other WMD.

4. Resumption of United States-India Nuclear Cooperation

(1) Background to Deepening United States-India Ties and Agreement on Nuclear Energy for Civilian Uses

The United States has provided substantial cooperation and assistance to India since the mid-1950s with regard to peaceful uses of nuclear energy. It has supplied low-enriched uranium and heavy water, and has also furnished Indian scientists with the opportunity to conduct research at US nuclear facilities. However, when India conducted a nuclear test for purportedly peaceful purposes in May 1974, four years after the NPT came into effect, and it was revealed that India had used nuclear material and equipment supplied for civilian purposes by the United States and Canada in the development of a nuclear explosive device, the United States decided to review its assistance policy. Under the Carter administration, which took office in January 1977, the Atomic Energy Act of 1954 was revised to limit the provision of nuclear equipment, material and technology for civilian purposes solely to non-nuclear-weapon states that had accepted the IAEA's comprehensive safeguards and also to discontinue cooperation with non-nuclear-weapon states that had conducted nuclear tests. Apart from this, in January 1976, the international community, at the instigation of the United States, formed the London Group, the forerunner of the Nuclear Suppliers Group (NSG), which initiated a system of export controls on nuclear equipment, material and technology. In April 1992, the NSG added nuclear-related dual-use equipment, material and technology to the list of items subject to export controls and developed a policy of limiting the export of civilian nuclear material and equipment to non-nuclear-weapon states that had accepted the IAEA's comprehensive safeguards. These various developments meant India was no longer able to obtain cooperation or assistance on matters related to civilian use of nuclear energy from NSG members, including the United States.

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Following the underground nuclear tests carried out by India and Pakistan in May 1998, the Clinton administration in the United States imposed economic sanctions on both countries, but at the same time, the United States began to recognize that it was in its interests to strengthen relations with India in view of that rapidly developing country's political and strategic weight. President Clinton visited India in March 2000, less than two years after the 1998 nuclear test, and, together with Prime Minister Atal Bihari Vajpayee, announced "US-India Relations: A Vision for the 21st Century", the first step in a process to strengthen US-India ties.

From the outset, the Bush administration recognized the importance of strengthening political, economic and security relations with India. The Bush administration saw India as a partner sharing many of the United States' policy concerns, such as the fight against terrorism, preventing proliferation of WMD, and the promotion of democracy, and it recognized that India would eventually be one of the leading countries in Asia. This prompted the Bush administration to intensify political and security cooperation with India as a way of bolstering bilateral links, but to do this, the United States had to rethink its nuclear policies towards India. This is because it recognized that there were limits to how much it could hope to strengthen political and security cooperation with India while having nothing to do with India in the areas of nuclear cooperation and nuclear non-proliferation.

After India's underground nuclear test in May 1998, doubts were expressed in the United States about the feasibility and appropriateness of the policy of pursuing the denuclearization of India. One of the conditions India may have for abandoning nuclear weapons is that China give up its nuclear program, but China will not abandon its nuclear weapons unless the United States and Russia give up theirs. It was therefore realized that unless the United States and Russia move to scrap their nuclear weapons, there was almost no possibility of persuading India to relinquish its weapons. This reality coupled with the desire to strengthen the political and security partnership with India prompted the Bush administration to push for realistic and pragmatic nuclear policies towards India predicated on the assumption that India will keep its nuclear weapons.

India, for its part, has been striving to liberalize its economy and to establish a market economy since the breakup of the Soviet Union. Strengthening political and economic ties with the United States has been essential to the pursuit of this

Nuclear Suppliers Group (NSG)

The NSG was set up after India's nuclear test in May 1974. As of the end of 2008, a total of 45 countries were NSG members. The chair is rotated among member countries once a year. Germany began serving an approximately one-year term as the chair in May 2008.

The NSG controls exports through a set of guidelines, referred to as the "NSG Guidelines," which countries exporting nuclear equipment and material are expected to comply with (this is a so-called gentleman's agreement rather than a legally binding document). The guidelines are divided into two sections: NSG Guidelines Part I (Trigger List) dealing with the transfer of materials and technology designed specifically for nuclear use, and NSG Guidelines Part II, dealing with nuclear-related dual-use items, meaning items with legitimate civilian applications that can also be used to pursue nuclear explosive activities.

As a rule, the transfer to a non-nuclear-weapon state of the items and related technologies listed in Part I can only take place if the government of the non-nuclear-weapon state (the recipient) has a comprehensive safeguards agreement with the IAEA. When transferring materials and technology, the NSG member must confirm fulfillment of the following four conditions by the recipient: (a) entered into a comprehensive safeguards agreement with the IAEA; (b) will not use the transferred material and equipment to produce nuclear explosive devices; (c) will thoroughly protect the transferred material and equipment; and (d) when the recipient transfers the material and equipment to a third country, the recipient shall obtain the same guarantees from the third country that the recipient gave to the original exporter.

Concerning transfers of the items and related technologies listed in Part II, there should be export licensing procedures requiring the supplier to obtain the following before the export is authorized: (a) a statement from the end-user specifying the uses and end-use locations of the proposed transfers; and (b) an assurance explicitly stating that the proposed transfer or any replica thereof will not be used in any nuclear explosive activity or unsafeguarded nuclear fuel-cycle activity.

The NSG members are Argentina, Australia, Austria, Belarus, Belgium, Brazil, Bulgaria, Canada, China, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Kazakhstan, the ROK, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, New Zealand, Norway, Poland, Portugal, Rumania, Russia, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and the United States.

India, Pakistan, and Israel, which are not parties to the NPT, are not members of the NSG.

Sources: Ministry of Foreign Affairs Web site, *Genshiryoku Kyokyukoku Group (NSG) no Gaiyo* [Outline of Nuclear Suppliers Group (NSG) (author's translation)] (September 2008) and other publications.

A Nuclear Energy Renaissance and the Nuclear Non-proliferation Regime policy. India viewed resumption of civil nuclear cooperation as a key requirement to move towards establishing new cooperative ties with the United States. For example, in the United States-India Joint Statement on Next Steps in Strategic Partnership announced in January 2004, the two countries agreed to deepen and expand cooperation in civil nuclear energy in addition to expanding cooperation in the area of civilian space technology and trade in high-tech products.

(2) Outline of US-India Nuclear Deal

Following talks in Washington between visiting Indian Prime Minister Manmohan Singh and President Bush in July 2005, the two leaders issued a joint statement. In the statement, they noted their shared perception of the global growth in demand for energy and clarified the framework for future bilateral civil nuclear cooperation. President Bush said that in order to resume civil nuclear cooperation with India, he intended to call on Congress to revise US domestic laws and to adjust the relevant international export control regimes together with America's allies and friends.

Indian Prime Minister Singh, for his part, committed India to: (a) identify and separate civilian and military nuclear facilities and programs and file a declaration on civilian nuclear facilities to the IAEA; (b) voluntarily place its civilian nuclear facilities under IAEA safeguards; (c) sign and adhere to the IAEA Additional Protocol with respect to civilian nuclear facilities; (d) continue India's moratorium on nuclear testing; (e) work with the United States for the conclusion of a multilateral Fissile Material Cut-off Treaty (FMCT); (f) refrain from transfer of enrichment and reprocessing technologies to states that do not have them; and (g) ensure that the necessary steps be taken to secure nuclear materials and technology through comprehensive export control legislation and through harmonization and adherence to Missile Technology Control Regime (MTCR) and NSG guidelines.

During President Bush's visit to India in March 2006, India indicated its intention to implement the following with respect to the separation of civilian and military nuclear facilities and with respect to nuclear facilities to be placed under IAEA safeguards, based on the July 2005 US-India Joint Statement: (a) of the 22 nuclear reactors that India currently operates or has under construction, it will identify and offer for safeguards 14 reactors between 2006 and 2014; (b) India's existing prototype and experimental fast breeder reactors will not be placed under safeguards; (c) India will place under safeguards all future civilian nuclear reactors

and civilian fast breeder reactors, but the Indian Government retains the sole right to determine which reactors are civilian; (d) the safeguards shall be permanent; and (e) India will negotiate an India-specific safeguards agreement with the IAEA. The United States, for its part, promised to pursue amendment of its domestic laws in order to provide full cooperation with India's civilian nuclear program and to continue efforts to obtain the agreement of NSG members to enable adjustment of the export guidelines.

The governments of the United States and India perceived the significance of the nuclear agreement as follows. First, the Bush administration characterized the US-India nuclear agreement as indispensable for bolstering bilateral political and security ties and also saw it as beneficial for nuclear non-proliferation, the global environment and for the US nuclear energy industry. Concerning nuclear non-proliferation, the administration took the view that implementation of the US-India nuclear agreement would make it possible to commit India, which is not party to the NPT, to the nuclear non-proliferation regime, thereby strengthening the regime. The reasons given to support this view were India's promise to observe the NSG and MTCR export control guidelines and to make efforts to negotiate and sign the FMCT, the expectation that India's ongoing moratorium on nuclear tests would ease the nuclear arms race in South Asia, and India's promise not to export or transfer the enriching and reprocessing technology that is indispensable for manufacturing weapons-grade fissile materials. The Bush administration also stated that strengthening US-India bilateral ties through nuclear cooperation would contribute to peace and stability in Asia. The Bush administration did not spell out how the strengthening of US-India ties would contribute to peace and stability in Asia, but looking at the Senate debate concerning enactment of the domestic laws necessary to implement US-India nuclear cooperation, it appears the administration was thinking in the context of the United States' policy towards China.

India's Singh government, on the other hand, made the point that if US-India nuclear cooperation resumed, other major countries would be likely to follow this example, facilitating the acquisition of uranium fuel and high-grade nuclear equipment and technology from overseas. It also claimed that resumption of such nuclear cooperation would assist the development of India's nuclear power generation program, contributing to economic development while improving India's energy security. Despite generous government protection and nurturing, India's nuclear power program had not progressed as planned. One reason for this

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was a chronic shortage of nuclear fuel for power generation, stemming partly from the fact that overseas procurement routes were blocked.

While Prime Minister Singh acknowledged that the July 2005 US-India agreement does not treat India as a “nuclear-weapon state,” he stated that it essentially acknowledges India’s possession of nuclear weapons while placing no limitations on India’s plans to upgrade its nuclear weapons, indicating that he viewed the agreement as putting India essentially on par with the “nuclear-weapon states” defined in the NPT.

(3) From Hyde Act to US-India Nuclear Cooperation Agreement

The US Congress, acting on the wishes of the Bush administration, had started preparing the legislation for enabling US-India civilian nuclear energy cooperation. In December 2006, a joint committee of both houses of Congress passed the Henry J. Hyde US-India Peaceful Atomic Energy Cooperation Act of 2006 (Hyde Act). President Bush signed the act, which narrowed the contents of the nuclear cooperation program agreed between President Bush and Prime Minister Singh.

First, the Hyde Act bans in principle supplying materials and equipment to India for use in enrichment and reprocessing and for production of heavy water. It also bans India from enriching and reprocessing nuclear materials supplied by the United States for civilian use without the consent of the United States. Second, the act requires the United States to terminate nuclear energy cooperation, including the export of nuclear material and equipment, and for India to return previously supplied material and equipment, including nuclear fuel and nuclear reactors, in the event that India carries out a nuclear test. Third, the act obligates the US government to verify that India is not using nuclear material, equipment and technology exported from the United States for purposes other than peaceful purposes. Fourth, the act requires the US government to submit a report to Congress every year with information on India’s development of nuclear weapons and India’s cooperation in dealing with the problem of Iran’s suspected development of nuclear weapons.

The passing of the Hyde Act containing the above provisions prompted expressions of dissatisfaction in some quarters of India. There was dissatisfaction with the fact that the Hyde Act attached new conditions while banning certain forms of nuclear cooperation, despite the United States’ commitment to provide “full civil nuclear energy cooperation” in the July 2005 US-India agreement.

Prime Minister Singh's view was that the Hyde Act presented problems that would have to be resolved before the signing of the US-India nuclear agreement as it included issues and matters extraneous to the agreement based on the US-India nuclear deal.

First, India reacted strongly to the ban on enrichment and reprocessing of nuclear materials supplied by the United States for civilian use without the consent of the United States. India asserted that the July 2005 US-India agreement promised India "full civil nuclear energy cooperation" in exchange for agreeing to accept international nuclear non-proliferation obligations and that "full civil nuclear energy cooperation" included allowing India to reprocess spent fuel resulting from the processing of nuclear fuel supplied by the United States in the same way that the United States allowed Japan and the countries of the European Atomic Energy Community to reprocess spent fuel.

For India, the inability to reprocess US supplied nuclear fuel would create serious problems because it meant India would have to ask the United States to take back the spent fuel or, failing that, would have to dispose of the spent fuel within its own borders. India also had policy-related needs for reprocessing spent fuel to extract plutonium. Part of India's nuclear energy program includes establishment of the so-called thorium cycle. For this purpose, utilization of plutonium obtained from reprocessing spent fuel is indispensable. However, given the circumstances that led to India's May 1974 nuclear test, in order to allow such reprocessing, it would be necessary to establish a systematic framework to ensure India's reprocessing of spent fuel originating in the United States was carried out under IAEA safeguards and enable verification that India is using the extracted plutonium solely for civilian purposes. Such demands were only natural in view of the fact that India had not voluntarily ceased production of weapons-grade fissile materials, unlike the five NPT nuclear-weapon states.

India's second major objection to the Hyde Act was the provision to terminate nuclear cooperation and the demand that India return materials and equipment, including nuclear fuel and nuclear reactors, previously supplied by the United States in the event that India resumed nuclear testing. Section 123(a)(4) of the Atomic Energy Act of 1954 requires the United States to demand the return of nuclear material and equipment supplied to any non-nuclear-weapon state that conducts a nuclear test and the US Congress applied this provision to India. India asserted that its moratorium on nuclear testing was no more than a voluntary one

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and that it would not accept further constraints on what was a voluntary decision. It also argued that the idea of terminating nuclear cooperation in the event that India conducted a nuclear test in the future was tantamount to having India sign the Comprehensive Nuclear Test Ban Treaty (CTBT).

Negotiations between the United States and India on civil nuclear cooperation concluded at the end of July 2007, seven months after the passage of the Hyde Act, and the text of the agreement was released on August 3. In the resulting “Agreement for Cooperation Between the Government of the United States of America and the Government of India Concerning Peaceful Uses of Nuclear Energy” (hereafter, “US-India Nuclear Cooperation Agreement”), the United States made concessions to India’s assertions. This can also be inferred from Indian government statements welcoming the agreement immediately after the conclusion of the negotiations, including a statement by Minister of External Affairs Pranab Mukherjee that “all concerns of India have been reflected and have been adequately addressed.”

First, the US-India Nuclear Cooperation Agreement allows India to reprocess spent fuel originally supplied by the United States provided India builds new reprocessing facilities and accepts IAEA safeguards at the facilities. The specific procedures to be employed in the reprocessing are to be negotiated separately between the United States and India. The agreement was also interpreted as meaning that any reprocessing of spent fuel originally supplied by a country other than the United States would also be carried out at these facilities.

As indicated above, the Hyde Act includes a provision that the United States will cease all nuclear cooperation with India in the event that India conducts a nuclear test, but there is no such stipulation in the US-India Nuclear Cooperation Agreement. In fact, the agreement reached by the two countries contains no reference to nuclear testing. Many nuclear cooperation agreements between the United States and other countries state clearly that the United States will terminate its nuclear cooperation and demand the return of nuclear material and equipment if the other country carries out a nuclear test. However, Article 14 of the US-India Nuclear Cooperation Agreement merely cites a violation of the agreement or violation of the IAEA safeguards as examples of potential reasons for terminating the cooperation, stating that either party may demand the return of nuclear material and equipment following cessation of cooperation. After the signing of the US-India Nuclear Cooperation Agreement, the Indian government stated that the

agreement does not prevent India from carrying out further nuclear tests.

By contrast, there is an emphasis on assuring supplies of nuclear fuel to India. For example, Article 5(6) of the US-India Nuclear Cooperation Agreement refers to US support for India's efforts to develop a strategic reserve of nuclear fuel, stating that the United States will cooperate with other countries to resolve obstacles to India having access to supplies of nuclear fuel for any reason not of India's making. Although the US-India Nuclear Cooperation Agreement is described as a framework treaty that, as with nuclear cooperation agreements entered into by the United States and other states, is not legally binding, the US commitment to assure supplies of nuclear fuel to India is not found in other nuclear cooperation agreements to which the United States is a party.

Despite concluding the Nuclear Cooperation Agreement, the governments of the United States and India had to overcome several hurdles before nuclear cooperation could become a reality. India had to conclude a safeguards agreement with the IAEA and obtain approval from the IAEA Board of Governors. The United States had to obtain the consent of all NSG members to remove India from the list of states subject to the NSG's controls on the export of nuclear material and equipment and also obtain Congress's approval of the US-India Nuclear Cooperation Agreement.

(4) Stance of the NSG and US Congress concerning US-India Nuclear Cooperation Agreement

Following an extraordinary meeting of the IAEA Board of Governors to approve the India-IAEA safeguards agreement on August 1, 2008, the Bush administration initiated the task of convincing NSG members to agree to the "Statement on Civil Nuclear Cooperation with India" (NSG Statement), which requires the exemption of India from the NSG's export controls. On August 21, 2008, the NSG held an extraordinary plenary meeting to consider the matter of exempting India from the controls. Because the minutes of the meeting have not been made public, details of what transpired are unavailable. It is understood, however, that France and Russia, which are keen to secure business for their nuclear-energy industries, supported the US proposal, but that some 20 countries put forward more than 50 opinions and revisions. These included requests to add a condition terminating India's exemption in the event India conducted a nuclear test and restricting exports of material, equipment and technology related to enrichment and

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reprocessing. Out of consideration for India, which had refused to accept additional conditions, the United States expressed reservations about these demands. The extraordinary plenary meeting failed to reach a conclusion but agreed to hold another plenary meeting September 4–5.

At the extraordinary plenary meeting held on September 4, the United States presented a revised proposal that would require an extraordinary meeting of the NSG if, in the process of implementing civil nuclear cooperation with India, there were developments that necessitated deliberation, but as it did not expressly incorporate the revisions proposed by other members at the extraordinary plenary meeting held the previous August, there was some doubt about the prospects of securing approval at the outset of the plenary meeting. However, by September 6, after extending the meeting by another day, countries such as Austria, Ireland, and New Zealand, which had continued to express reservations about exempting India, showed signs of compromise and, in the end, the NSG adopted by consensus the NSG Statement incorporating the United States' revised proposals, thereby approving the lifting of the ban on exports to India.

In addition to a diplomatic offensive by the United States, one likely reason for the change of attitudes on the part of countries such as Austria, which had expressed reservations about exempting India, was a statement by Minister of External Affairs Pranab Mukherjee on September 5 reiterating India's commitment to nuclear non-proliferation, specifically: (a) ongoing commitment to the moratorium on nuclear tests; (b) India's refusal to subscribe to the nuclear arms race; (c) no-first-use of nuclear weapons; (d) commitment to work towards the conclusion of an FMCT; (e) implementation of strict export controls, including adherence to the NSG guidelines; and (f) application of IAEA safeguards to civilian nuclear facilities and commitment to negotiate and conclude an Additional Protocol to the Safeguards Agreement. The NSG Statement adopted by consensus states clearly that the exemption of India is based on that country's commitment to nuclear non-proliferation. Another factor was the revelation two days before the extraordinary plenary meeting that the Bush administration had sent a letter to the United States Congress in January, 2008, stating that the United States reserved the right to terminate nuclear cooperation immediately if India conducted a nuclear test. The publication of this letter was probably seen as a guarantee that the United States would apply certain checks to its nuclear cooperation with India.

Japan was part of the consensus adopting the NSG Statement resubmitted by

the Bush administration. Factors behind this were the above-mentioned reaffirmation by India's External Affairs Minister on September 5 of India's ongoing commitment to nuclear non-proliferation by maintaining its moratorium on nuclear testing and the conclusion that this commitment would facilitate encouragement of India in its nuclear non-proliferation efforts while strengthening the nuclear non-proliferation regime vis-à-vis India and increasing the visibility of that country's nuclear energy activities. When the statement was adopted, however, Japan expressed its view that the exemption of India should lapse or be terminated by the NSG and that NSG members should cease nuclear cooperation with India if India conducted a nuclear test.

With the NSG's approval of the US-India Nuclear Cooperation Agreement, the only remaining barrier was approval by the US Congress, but once NSG approval had been secured, it was considered unlikely that Congress would derail the agreement. In fact, the House of Representatives of the US Congress approved the United States-India Nuclear Cooperation Approval and Non-proliferation Enhancement Act with a vote of 298 to 117 on September 28, followed by the Senate's overwhelming 86-13 vote of approval on October 2. Reasons for the bipartisan support of Republicans and Democrats were a clear statement by President Bush in his September 10 letter to the Congress seeking approval of the US-India Nuclear Cooperation Agreement that there would be no exports to India of material, equipment or technology for uranium enrichment or reprocessing and a message by Secretary of State Condoleezza Rice to Howard Berman, Chairman of the House Foreign Affairs Committee on September 27, the day before the House of Representatives was due to vote on the bill, that she would do her utmost at the scheduled November 2008 NSG plenary meeting to secure agreement that states not party to the NPT, such as India, would not be supplied with materials, equipment or technology for enrichment and reprocessing.

The day before the United States Congress approved the US-India Nuclear Cooperation Agreement, France and India signed a nuclear cooperation agreement. Because the France-India Nuclear Cooperation Agreement required no parliamentary approval, it came into effect at the moment of signing. In December, Russia also concluded a nuclear cooperation agreement with India.

(5) Resumption of Nuclear Cooperation with India and the Nuclear Non-proliferation Regime

Concerning the vague sections of the US-India Nuclear Cooperation Agreement, notably the United States' response in the event India conducted a nuclear test, it is fair to assume from the Hyde Act and from the Bush administration's January 2008 letter to Congress that the United States would, in all likelihood, terminate its nuclear cooperation with India. Moreover, in view of the fact that the NSG Statement, adopted by the NSG after debating the issue of India's exemption, states that in the event of any matter requiring deliberation, NSG members will hold an emergency meeting to address it, plus the fact that Japan and some other countries had issued statements calling for termination of nuclear cooperation if India conducts a nuclear test, it can be assumed that any decision by India to conduct a nuclear test would incur a substantial political and economic cost. Based on the exchanges between the Bush administration and Congress over US-India nuclear cooperation and the debate at the NSG, it would be fair to conclude that it has become much harder for India to go ahead with any future nuclear test.

Nevertheless, granting India practically the same benefits of nuclear cooperation as other NPT non-nuclear-weapon states, despite the fact that India is not a party to the NPT and has developed and possesses nuclear weapons, still leaves questions about the credibility and stability of the nuclear non-proliferation regime. First, there is a risk that resuming nuclear cooperation with India will threaten the basic principles on which the NPT stands. Under the NPT, nuclear-weapon states are limited to the five countries—the United States, Russia, China, the United Kingdom, and France—that conducted nuclear explosion tests prior to January 1, 1967. India is defined as a non-nuclear-weapon state. Allowing India, in spite of this, to separate its nuclear facilities into those for civilian use and military use is tantamount to the international community acknowledging that India has nuclear

facilities for military use, i.e., that India is *de facto if not de jure* a nuclear-weapon state. Moreover, while part of the rationale for the NPT is to enable non-nuclear-weapon states to receive cooperation and assistance with the development of nuclear energy for civilian purposes in lieu of pursuing development of nuclear weapons, providing the benefits of nuclear cooperation for peaceful purposes, as envisaged in Article IV of the NPT, to a country like India that is not only a non-signatory of the NPT, but also possesses nuclear weapons, could threaten the very foundations on which the nuclear non-proliferation regime stands.

There is also a risk that the resumption of nuclear cooperation with India by a nuclear-weapon state such as the United States might violate Article I of the NPT, which says that nuclear-weapon states shall not provide assistance in any way to non-nuclear-weapon states for the manufacture of nuclear weapons. As India had not accepted the IAEA's comprehensive safeguards, it was prevented, in principle, from procuring nuclear fuel from an NSG participant. This is why it was necessary for India to allocate domestically produced uranium separately for civilian uses, primarily nuclear power, and for production of nuclear weapons. However, resumption of nuclear cooperation with India means India will be able to acquire nuclear fuel for use in nuclear-power facilities from the United States, France, Russia, and other countries, which would make it possible for India to free up domestically produced uranium for the production of weapons-grade fissile materials. Thus, depending on the level of India's existing stockpile of weapons-grade fissile materials, it could amount to assisting India with nuclear weapons development. The opinion has been voiced in some quarters that India has no shortage of uranium for nuclear weapons development and that its stockpile of weapons-grade plutonium is sufficient to enable India to increase its nuclear weapons arsenal without nuclear cooperation from overseas. However, India has not disclosed how much weapons-grade plutonium it has. Moreover, if India was to expand rapidly the use of nuclear energy for peaceful purposes, it would likely have difficulty sustaining both its peaceful-use nuclear energy program and the production of nuclear weapons. The only way to dispel doubts that nuclear cooperation with India might lead to increased production of that country's weapons-grade fissile material would be for India to accept a moratorium on the production of weapons-grade fissile material. During the negotiations on the US-India Nuclear Cooperation Agreement, however, India rejected demands to cease production of weapons-grade fissile material, saying that insisting on this would

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be a deal breaker. Consequently, the Bush administration did not press India to cease production of weapons-grade fissile materials.

India is a democracy with a population of more than one billion people. Its economy has grown rapidly in recent years and it is forecast to become one of the world's top five economic powers by 2025. Along with Japan and China, it has the potential to have a major influence on the direction of economic development, peace and stability in the Asian region. For the United States and other leading countries, strengthening political and security ties with India is a matter of no small significance. For example, geopolitically, India's proximity to southwest and central Asia, an area troubled by problems with terrorists and the spread of WMD, means cooperative ties with India in the political and security arena will be extremely important in addressing these challenges. While it might be an exaggeration to say that civil nuclear cooperation with India is *sine qua non* for deepening such political and security ties, there are obviously limits to how far it would be possible to strengthen political and security ties while ignoring India in the area of nuclear cooperation and the nuclear non-proliferation regime. Furthermore, as stated above, there is no possibility of India relinquishing its nuclear arms as long as NPT nuclear-weapon states, such as the United States, Russia, and China, continue to maintain stockpiles of nuclear weapons, ruling out the possibility of India becoming party to the NPT. To continue ignoring such a country without bringing it into the nuclear non-proliferation regime would also not be desirable from the perspective of maintaining the stability of the nuclear non-proliferation regime.

The issue of global environmental protection is growing in importance and it would be meaningful to pursue nuclear cooperation with India from that perspective also. Given India's shortage of uranium resources, continuing to isolate India in the field of nuclear energy rather than cooperating with India's nuclear energy program could increase India's dependence on fossil fuels in order to meet its growing demand for energy. India is already the world's fourth largest energy consumer and with its energy consumption set to increase in step with rapid economic growth, continuing to isolate India in the field of nuclear energy is also problematic from the perspective of global environmental protection. If it is possible to establish an infrastructure base that reduces dependence on fossil fuels by making use of nuclear power facilities while also improving the efficiency of energy consumption and utilizing reusable energy sources, efforts to boost the weight of nuclear energy

over the long term could play a role in protecting the earth's environment, even if the initial impact is only minor. Taking into account geopolitical considerations and such other issues as energy demand and global warming, a convincing argument can be made for providing civil nuclear assistance to India in exchange for committing India to the nuclear non-proliferation regime.

However, because India is an NPT non-signatory state that possesses nuclear weapons, it is hard to strike the right balance in these types of deals. The reality is that the commitments India has made to the nuclear non-proliferation regime so far in exchange for nuclear cooperation are of a nature inadequate and are of such a nature that it will be necessary to monitor India's actions going forward, including continuation of its moratorium on nuclear testing, in order to assess them. The international community, therefore, has to take further steps to encourage India's involvement with the nuclear non-proliferation regime.

In his address to the Indian parliament following the July 2005 US-India Agreement, Prime Minister Manmohan Singh said that India would assume the same obligations as NPT nuclear-weapon states. He indicated that under the right conditions, India might be prepared to sign the CTBT and also stop production of weapons-grade fissile materials like the five nuclear-weapon states. If this is so, it behooves the international community to foster the kind of political and security environment that would facilitate India's signature of the CTBT and cessation of production of weapons-grade fissile materials.

The United States and China hold the keys to fostering such a political and security environment. For example, regarding the CTBT, three NPT nuclear-weapon states—United Kingdom, France, and Russia—have signed and ratified the treaty, but while the United States and China have signed it, they have not yet ratified it. One of the likely conditions for India to sign the CTBT will be China's ratification of the CTBT, but ratification by the United States will likely be the precondition for China to make such a move. Moreover, while the five NPT nuclear-weapon states have all reportedly ceased production of weapons-grade fissile materials, China is the only country that has not yet officially declared a moratorium on such production. Given the fact that India started developing nuclear weapons in response to China's nuclear weapons development, a precondition for urging India to cease production of weapons-grade fissile materials will probably be the declaration by China of a moratorium on the production of weapons-grade fissile materials similar to that given by the United

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States, the United Kingdom, France, and Russia. This is why actions by the United States and China are key to securing a firm commitment by India to the nuclear non-proliferation regime. In order to maintain the credibility and stability of the nuclear non-proliferation regime, it will be critical for India, now that it has become a recipient of nuclear cooperation from the international community, to sign the CTBT and agree to a moratorium on the production of weapons-grade fissile materials.