

12. Nuclear arms control and non-proliferation

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I. Introduction

In 2006 two long-running challenges to the nuclear non-proliferation regime moved again to centre stage at the United Nations Security Council. The first involves the nuclear weapon ambitions of the Democratic People's Republic of Korea (DPRK, or North Korea), which in October 2006 carried out a nuclear test explosion using technology and material that had been imported for peaceful purposes. The second involves the efforts of the International Atomic Energy Agency (IAEA) to clarify unresolved questions about the scope and nature of Iran's uranium enrichment and other sensitive nuclear fuel cycle activities. During the year the Security Council imposed sanctions on Iran and North Korea that targeted their activities of proliferation concern. Elsewhere, controversy continued over the Indian-US Civil Nuclear Cooperation Initiative (CNCI) and its proposed exemption for India from nuclear supplier restrictions. In Geneva, renewed but ultimately fruitless efforts were made at the Conference on Disarmament (CD) to open the long-delayed negotiations on a global fissile material cut-off treaty (FMCT). Russian President Vladimir Putin's proposal for a new strategic arms reduction treaty with the United States to succeed the 1991 Treaty on the Reduction and Limitation of Strategic Offensive Arms (START I Treaty)¹ drew a cautious response from the USA and a promise of further discussion. There was one modest bright note for nuclear non-proliferation efforts in 2006, when leaders from five Central Asian states signed a treaty creating a nuclear weapon-free zone in the region.²

This chapter reviews the main developments in nuclear arms control and non-proliferation in 2006. Section II describes the circumstances surrounding North Korea's nuclear test explosion and examines the Security Council's decisions to impose sanctions on North Korea. Section III summarizes developments in the confrontation between Iran and the Security Council over the latter's demand that Iran halt its uranium enrichment programme. Section IV examines the controversy over the Indian-US nuclear deal, focusing on the obstacles to its implementation. Section V summarizes international initiatives aimed at enhancing the safety and custodial security of nuclear

¹ The Treaty on the Reduction and Limitation of Strategic Offensive Arms (START I Treaty) was signed on 31 July 1991 by the Soviet Union and the USA and entered into force for Belarus, Kazakhstan, Russia, Ukraine and the USA on 5 Dec. 1994. For a brief summary of the treaty see annex A in this volume.

² The Central Asian Nuclear Weapon-Free Zone Treaty was signed on 8 Sep. 2006 by Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. For a brief description of the treaty see annex A in this volume.

materials and facilities and preventing nuclear terrorism. Section VI describes the efforts at the CD to resolve the impasse that has blocked the opening of negotiations on an FMCT, while section VII presents the conclusions.

Appendix 12A provides tables of data on the nuclear forces of the United States, Russia, the United Kingdom, France, China, India, Pakistan, Israel and North Korea. Appendix 12B provides data on North Korea's nuclear test explosion and information about all previous nuclear tests known to have been conducted by other states. Appendix 12C provides an overview of global inventories of fissile material and efforts to dispose safely of the large quantities of material deemed to be in excess of national security requirements.

II. North Korea's nuclear programme and the Six-Party Talks

The international confrontation over North Korea's nuclear programme intensified in 2006. The dispute had entered its current phase in 2002, when a series of tit-for-tat moves by North Korea and the USA resulted in the collapse of the 1994 Agreed Framework and the expulsion of IAEA monitors from North Korea.³ This was followed in April 2003 by North Korea's formal withdrawal from the 1968 Treaty on the Non-Proliferation of Nuclear Weapons (Non-Proliferation Treaty, NPT).⁴ In February 2005 North Korea further raised the stakes in the crisis by declaring that it had developed nuclear weapons.⁵

The year 2006 opened against the background of a North Korean boycott of the Six-Party Talks—involving China, Japan, North Korea, South Korea, Russia and the USA—which aim at resolving the diplomatic impasse over North Korea's nuclear programme.⁶ The talks had achieved an apparent breakthrough the previous year when, on 19 September 2005, the parties issued a Joint Statement on principles guiding future talks aimed at the 'verifiable denuclearization of the Korean Peninsula in a peaceful manner'.⁷ Immediately after the Joint Statement was issued, however, the two main antagonists—North Korea and the USA—presented conflicting versions of what had

³ International Atomic Energy Agency (IAEA), Agreed Framework between the United States of America and the Democratic People's Republic of Korea, 21 Oct. 1994, INFCIRC/457, 2 Nov. 1994. On the breakdown of the Agreed Framework see Kile, S. N., 'Nuclear arms control, non-proliferation and missile defence', *SIPRI Yearbook 2003: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 2003), pp. 578–92.

⁴ The Treaty on the Non-Proliferation of Nuclear Weapons was opened for signature on 1 July 1968 and entered into force on 5 Mar. 1970. According to the NPT, only states that manufactured and exploded a nuclear device prior to 1 Jan. 1967 are legally recognized as nuclear weapon states. By this definition, China, France, Russia, the UK and the USA are the nuclear weapon states parties to the NPT. For a brief description of the NPT and a list of the signatories and parties to the treaty see annex A in this volume. North Korea acceded to the NPT as a non-nuclear weapon state party on 12 Dec. 1985. Its withdrawal from the treaty took effect on 10 Apr. 2003. North Korea's comprehensive safeguards agreement with the IAEA (INFCIRC/403) was considered also to have lapsed on that date.

⁵ For an assessment of North Korea's nuclear weapon capabilities see appendix 12A.

⁶ Prior to 2006, there had been 5 rounds of the Six-Party Talks: 27–29 Aug. 2003; 25–28 Feb. 2004; 23–26 June 2004; 26 July–7 Aug. and 13–19 Sep. 2005; and 9–11 Nov. 2005.

⁷ US Department of State, 'Joint Statement of the fourth round of the Six-Party Talks', 19 Sep. 2005, Washington, DC, URL <<http://www.state.gov/r/pa/prs/ps/2005/53490.htm>>.

actually been agreed, especially with regard to the sequencing of a possible deal on dismantling North Korea's nuclear infrastructure.⁸

The prospects for resolving the disagreement were complicated by the USA's imposition, on 15 September 2005, of new restrictions on North Korea's trading and financial activities. According to the USA, the measures had been imposed in response to North Korea's suspected involvement in a number of illegal activities, including money laundering and currency counterfeiting.⁹ The North Korean Government was reportedly hit especially hard by the Chinese-approved freezing of the accounts at a bank in Macao used by North Korean trading companies and individuals in the leadership.¹⁰ North Korea denounced the measures as a US tactic to derail progress at the Six-Party Talks, pointing out that the announcement of the measures had coincided with that of the Joint Statement.¹¹ In December 2005 North Korea declared that it would not return to the talks until the USA lifted the banking and other financial sanctions against it.¹² During the first half of 2006 North Korean officials continued to blame the US sanctions for the breakdown of the Six-Party Talks.¹³

North Korea heightened international concern about its strategic aims when it announced on 20 June that it would no longer observe its self-imposed moratorium, dating from 1999, on the flight-testing of long-range missiles.¹⁴ On 5 July 2006 the North Korean Army test-launched seven ballistic missiles. North Korea described the tests as 'routine military exercises' that fell under its sovereign right to self-defence and emphasized that they did not violate any treaty commitment or other international legal constraint.¹⁵ The flight tests involved several types of missile. Six short- and medium-range Hwasŏng-6 (Scud Mod-C) and Nodong missiles were successfully launched from the test facility at Musudan-ri into the Sea of Japan.¹⁶ The seventh missile tested was a multi-stage Taepodong-2. This missile, to which some sources have attributed

⁸ For a description of the Joint Statement see Kile, S. N., 'Nuclear arms control and non-proliferation', *SIPRI Yearbook 2006: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 2006), pp. 632–33.

⁹ US Department of State, Bureau of International Information Programs (USINFO), 'U.S. cites Banco Delta Asia for money laundering, other crimes', Current Issues, 15 Sep. 2005, URL <<http://usinfo.state.gov/usinfo/products/washfile.html>>.

¹⁰ Lague, D. and Greenlees, D., 'Squeeze on Banco Delta Asia hit North Korea where it hurt', *International Herald Tribune*, 18 Jan. 2007.

¹¹ Korea Central News Agency, 'DPRK Foreign Ministry's spokesman urges U.S. to lift financial sanctions against DPRK', Pyongyang, 9 Jan. 2006, URL <<http://www.kcna.co.jp/item/2006/200601/news01/10.htm>>; and Korea Central News Agency, 'KCNA blasts U.S. gimmick to evade responsibility for deadlocked talks', Pyongyang, 11 Feb. 2006, URL <<http://www.kcna.co.jp/item/2006/200602/news02/13.htm>>.

¹² Korea Central News Agency, 'U.S. perfidy under fire', Pyongyang, 6 Dec. 2005, URL <<http://www.kcna.co.jp/item/2005/200512/news12/07.htm>>.

¹³ Korea Central News Agency, 'DPRK Foreign Ministry: DPRK's stand on Six-Party Talks clarified', Pyongyang, 1 June 2006, URL <<http://www.kcna.co.jp/item/2006/200606/news06/02.htm>>.

¹⁴ Cooper, H. and Gordon, M., 'North Korea disavows its moratorium on testing of long-range missiles', *New York Times*, 21 June 2006.

¹⁵ Korea Central News Agency, 'DPRK Foreign Ministry spokesman on its missile launches', Pyongyang, 6 July 2006, URL <<http://www.kcna.co.jp/item/2006/200607/news07/07.htm>>.

¹⁶ Priest, D. and Faiola, A., 'North Korea tests long-range missile', *Washington Post*, 6 July 2006.

a range in excess of 3500 kilometres, had not previously been flight-tested.¹⁷ It crashed into the sea after its first-stage booster apparently failed less than one minute after launch. The long range of Taepodong-2 has made it of particular concern to the USA, which reportedly activated parts of its national missile defence system in anticipation of the test.¹⁸ Some non-governmental analysts pointed out that, the highly publicized failure of the Taepodong aside, North Korea's older short- and medium-range ballistic missiles seemed to perform well. This underscored the threat that North Korea's conventionally armed missile force poses to its neighbours and served to enhance the country's reputation as a missile technology supplier.¹⁹

The missile tests provoked widespread condemnation. In July 2006 the United Nations Security Council unanimously adopted Resolution 1695, which demanded that North Korea immediately suspend its ballistic missile activities and re-establish its flight-testing moratorium.²⁰ The resolution also required all states to undertake to 'prevent missile and missile-related items, materials, goods and technology' from being transferred to North Korea's missile or weapons of mass destruction (WMD) programmes. In addition, Japan moved to tighten its restrictions on travel and remittances to North Korea, while indicating that it could consider taking pre-emptive military action against North Korean missile bases if these were deemed to pose an imminent threat to Japan.²¹ South Korea suspended regular deliveries of rice and fertilizer to North Korea but warned that overreacting to the missile tests would needlessly heighten tensions in the region.²²

North Korea's nuclear test explosion

On 9 October 2006 North Korea announced that its army had 'successfully conducted an underground nuclear test under secure conditions'.²³ The explosion was detected by seismic sensors around the world, but the small yield of the blast raised questions about whether it was nuclear in origin. On 16 October, US intelligence officials announced that air samples had detected telltale radioactive debris that confirmed that North Korea had detonated a plutonium-fuelled nuclear explosive device.²⁴

¹⁷ See US Air Force, National Air and Space Intelligence Center (NASIC), *Ballistic and Cruise Missile Threat*, NAIC-1031-0985-03 (NASIC: Wright-Patterson Air Force Base, Ohio, Aug. 2003), URL <<http://www.nukestrat.com/us/afn/NAIC2003rev.pdf>>, p. 17.

¹⁸ Gertz, B., 'N. Korean threat activates shield', *Washington Times*, 20 June 2006.

¹⁹ Sterngold, J., 'Missile failure masks success', *San Francisco Chronicle*, 6 July 2006.

²⁰ UN Security Council Resolution 1695, 15 July 2006. UN Security Council resolutions can be accessed at URL <<http://www.un.org/documents/scres.htm>>.

²¹ 'Seoul slams Japan for pondering strikes on N. Korea', *Chosun Ilbo*, 11 July 2006; and Yamaguchi, M., Associated Press, 'Japan mulling action over N. Korea missiles', CBS News, 10 July 2006, URL <<http://www.cbsnews.com/stories/2006/07/10/ap/world/mainD8IP0DU00.shtml>>.

²² Onishi, N., 'Missile tests divide Seoul from Tokyo', *New York Times*, 11 July 2006.

²³ Korea Central News Agency, 'DPRK successfully conducts underground nuclear test', Pyongyang, 9 Oct. 2006, URL <<http://www.kcna.co.jp/item/2006/200610/news10/10.htm>>.

²⁴ Office of the Director of National Intelligence, 'Statement by the Office of the Director of National Intelligence on the North Korea nuclear test', News release, 16 Oct. 2006, URL <<http://www.dni.gov/>

The North Korean test was not unexpected outside the country. There had been media speculation, based on reports of conversations between North Korean leader Kim Jong Il and foreign diplomats, that North Korea might be planning to carry out a nuclear test.²⁵ There had also been indications from US intelligence sources during the summer of 2006 that North Korea was preparing an underground nuclear test site.²⁶ In addition, on 3 October 2006 North Korea had announced that it would conduct a nuclear test, although it did not say when this would occur.²⁷

North Korea's official explanations for carrying out the test emphasized its defensive purpose. According to Kim Yong-nam, president of the Presidium of the North Korean Supreme People's Assembly, the test was a 'historic event'; it enhanced the credibility of North Korea's nuclear deterrent in the face of US threats and thereby contributed to stability in North-East Asia.²⁸ A North Korean Foreign Ministry statement offered a similar rationale, stating that the country had been 'compelled to substantially prove its possession of nukes to protect its sovereignty and right to existence from the daily increasing danger of war from the US'.²⁹ These statements suggested that the test was intended in part to dispel any doubt in the USA or elsewhere that North Korea had mastered the engineering and design skills needed to build a first-generation nuclear weapon.³⁰ However, the unexpectedly low yield of the explosion, which led many foreign experts to believe that it had been a fizzle (an inefficient detonation releasing less explosive energy than expected), served to reinforce doubt that North Korea could manufacture a reliable nuclear weapon.³¹

In the view of many foreign analysts, North Korea probably had a parallel political rationale for carrying out the test: to signal displeasure with the sanctions imposed against it, and to gain diplomatic leverage for wresting concessions from the USA and its allies. Kim Yong-nam appeared partly to confirm the latter view when he warned that North Korea would carry out further nuclear tests if the USA did not abandon its efforts to isolate and sanction it.³²

announcements/20061016_release.pdf>. For further detail about the test and the methods used to determine whether a nuclear explosion had occurred see appendix 12B.

²⁵ Song-wu, P., 'Diplomats in N. Korea believe underground nuke test highly probable', *Korea Times*, 10 Sep. 2006, URL <<http://times.hankooki.com/lpage/200609/kt2006091017222510440.htm>>; and Fifield, A., 'Pyongyang "likely to test nuclear bomb"', *Financial Times*, 26 Sep. 2006.

²⁶ Karl, J., 'N. Korea appears to be preparing for nuclear test', ABC News, 17 Aug. 2006, URL <<http://abcnews.go.com/International/print?id=2326083>>.

²⁷ Korea Central News Agency, 'DPRK Foreign Ministry clarifies stand on new measure to bolster war deterrent', Pyongyang, 3 Oct. 2006, URL <<http://www.kcna.co.jp/item/2006/200610/news10/04.htm>>.

²⁸ Yonhap News, 'Additional nuke tests hinge on U.S. said by Kim Young Nam', *Daily NK*, 11 Oct. 2006, URL <<http://www.dailynk.com/english/read.php?cataId=nk09000&num=1203>>.

²⁹ Korea Central News Agency, 'DPRK Foreign Ministry spokesman on U.S. moves concerning its nuclear test', Pyongyang, 12 Oct. 2006, URL <<http://www.kcna.co.jp/item/2006/200610/news10/12.htm>>.

³⁰ Reuters, 'US not certain North Korea has nuclear weapons', ABC News, 1 Mar. 2006, URL <<http://abcnews.go.com/International/print?id=1671969>>.

³¹ Sanger, D. and Broad, W., 'Small blast, or "big deal"? U.S. experts look for clues', *New York Times*, 11 Oct. 2006.

³² Yonhap News (note 28).

Some analysts speculated that the decision to carry out the test may have been pushed through by hard-line elements in the North Korean military, who believed that the USA would be compelled to deal with the regime on an equal basis once it had unequivocally demonstrated its status as a de facto nuclear weapon state.³³

In response to North Korea's claim to have carried out a nuclear test, the UN Security Council convened in emergency session. The USA, backed by non-permanent member Japan, proposed a tough draft resolution that would among other things have prohibited all trade in military goods and equipment with North Korea. China and Russia demurred, proposing instead less stringent measures. They also insisted that any resolution be adopted under Article 41 of Chapter VII of the UN Charter, which permits economic and other measures to 'give effect' to Security Council decisions but precludes the use of military force.³⁴

On 14 October Resolution 1718 was unanimously approved by the Security Council. Invoking Article 41, the resolution 'expressed the gravest concern' about North Korea's nuclear test. It declared that North Korea should 'abandon all nuclear weapons and existing nuclear programs' as well as 'all other existing weapon of mass destruction and ballistic missile programs' in a 'complete, verifiable and irreversible manner'. It also called on North Korea to 'return immediately to the Six-Party Talks without preconditions'. The resolution required all UN member states to take a variety of measures to restrict certain conventional weapon systems and dual-use goods and materials from entering North Korea.³⁵ Member states were also asked to take action, 'in accordance with their national authorities and legislation, and consistent with international law', to prevent the transfer of prohibited items to North Korea by inspecting cargo en route to and from the country. This requirement sparked controversy in South Korea, where the government of President Roo Moo-hyun had consistently ruled out joining efforts to interdict North Korean vessels as part of the US-led Proliferation Security Initiative (PSI).³⁶ China also expressed opposition to the practice of cargo inspections.³⁷

³³ Kwanwoo, J., Agence France-Presse, 'North Korean hardline military behind nuclear test say analysts', *Space War*, 16 Oct. 2006, URL <http://www.spacewar.com/reports/North_Korean_Hardline_Military_Behind_Nuclear_Test_Say_Analysts_999.html>.

³⁴ O'Neill, J. and Choe, S., 'U.S. softens proposal on North Korea at U.N.', *New York Times*, 12 Oct. 2006; and Kerr, P., 'North Korean test provokes widespread condemnation', *Arms Control Today*, vol. 36, no. 9 (Nov. 2006), URL <<http://www.armscontrol.org/act/archived.asp>>. Chapter VII of the UN Charter authorizes the Security Council to use enforcement powers to maintain or restore international peace and security in situations where the Security Council has determined the existence of 'any threat to the peace, breach of the peace or act of aggression'. Military force is permitted under Article 42. The text of the Charter of the United Nations is available at URL <<http://www.un.org/aboutun/charter>>.

³⁵ On these UN sanctions see chapter 15 in this volume.

³⁶ O'Neill and Choe (note 34). For an analysis of legal aspects of the PSI see Ahlström, C., 'The Proliferation Security Initiative: international law aspects of the Statement of Interdiction Principles', *SIPRI Yearbook 2005: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 2005), pp. 741–65.

³⁷ Permanent Mission of the People's Republic of China to the United Nations, 'Explanatory remarks by Ambassador Wang Guangya at the Security Council after taking vote on draft Resolution on DPRK nuclear test', New York, N.Y., 14 Oct. 2006, URL <<http://www.china-un.org/eng/smhwj/2006/t276121.htm>>.

The North Korean nuclear test provoked a particularly sharp reaction from China. It issued a strongly worded rebuke to its neighbour that condemned the test as a 'brazen' act of defiance of the international community.³⁸ China, which is North Korea's largest supplier of oil and food aid, had previously counselled caution in dealing with North Korea and had refused to support proposed economic sanctions against it. However, North Korea's decision to carry out the test in the face of Chinese opposition had reportedly angered China, prompting it to threaten sanctions of its own—including a reduction of oil shipments—if North Korea did not return to the Six-Party Talks.³⁹ This pressure was widely credited with inducing North Korea to announce, on 31 October 2006, that it was prepared to return to the talks.⁴⁰ China was also reported to have played an instrumental role in persuading the USA to agree to discuss the financial sanctions issue directly with North Korea as a way of enticing the latter back to the negotiating table.⁴¹

On 18 December 2006 the Six-Party Talks resumed in Beijing after a year-long hiatus.⁴² During one of several bilateral meetings on the margins of the talks, the USA offered North Korea a package of economic and energy assistance measures on condition that North Korea agree to begin dismantling its nuclear infrastructure, as envisioned in the 19 September 2005 Joint Statement. For its part, North Korea continued to insist that the USA must first lift its banking and other financial sanctions before it would discuss nuclear disarmament. The talks adjourned on 22 December without any apparent progress and with no date set for the next round.⁴³

III. Iran and nuclear proliferation concerns

In 2006 the international controversy over the scope and nature of Iran's nuclear programme intensified as Iran proceeded apace with its uranium enrichment and other sensitive nuclear fuel cycle activities.⁴⁴ The controversy emerged at the end of 2002 and centred on findings by the IAEA that Iran had

³⁸ 'Beijing "resolutely opposed" to DPRK nuclear test', *People's Daily*, 10 Oct. 2006.

³⁹ Kahn, J., 'China seems set to harden stance', *International Herald Tribune*, 20 Oct. 2006, pp. 1, 4; and McGregor, R., 'Failure of policy to restrain neighbour rankles with China', *Financial Times*, 9 Oct. 2006, pp. 1, 5.

⁴⁰ Korea Central News Agency, 'Spokesman for DPRK Foreign Ministry on resumption of Six-Party Talks', Pyongyang, 31 Oct. 2006, URL <<http://www.kcna.co.jp/item/2006/200611/news11/02.htm>>; and 'North Korea talks set to resume', BBC News, 31 Aug. 2006, URL <<http://news.bbc.co.uk/2/6102092.stm>>.

⁴¹ Cooper, H., 'U.S. debates value of North Korea talks', *New York Times*, 2 Nov. 2006.

⁴² Kerr, P., 'No progress at North Korea talks', *Arms Control Today*, vol. 37, no. 1 (Jan./Feb. 2007), URL <<http://www.armscontrol.org/act/archived.asp>>.

⁴³ The Six-Party Talks resumed on 8 Feb. 2007 and concluded with an agreement on a series of steps for implementing the Sep. 2005 Joint Statement, beginning with the 'disablement' of North Korea's heavy water reactor at Yongbyon. US Department of State, 'North Korea: denuclearization action plan', Media note, Washington, DC, 13 Feb. 2007, URL <<http://www.state.gov/r/pa/prs/ps/2007/february/80479.htm>>.

⁴⁴ For a description of the origins of the nuclear controversy see Kile, S. N., 'Nuclear arms control and non-proliferation', *SIPRI Yearbook 2004: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 2004), pp. 604–607.

failed, over a period of two decades, to declare important nuclear activities in contravention of its NPT-mandated comprehensive safeguards agreement with the agency.⁴⁵ It was heightened by revelations, in 2003, that Iran had procured nuclear technology and equipment through the smuggling network organized by the former head of Pakistan's nuclear weapon programme, Abdul Qadeer Khan.⁴⁶ Iran maintains that its nuclear programme is intended solely for peaceful purposes and that any safeguards violations were minor in nature, involving failures to report certain permitted activities to the IAEA.⁴⁷ However, in Europe, the USA and elsewhere, there is concern that Iran is attempting to put into place, under the cover of a civilian nuclear energy programme, the sensitive fuel cycle facilities needed to produce plutonium and highly enriched uranium (HEU) for nuclear weapons. Since October 2003, three European Union (EU) member states—France, Germany and the UK, known as the E3—have taken the lead in attempting to resolve the controversy through negotiations with Iran. These negotiations have also involved the participation of the High Representative for the EU's Common Foreign and Security Policy (CFSP), Javier Solana.⁴⁸

Iran's resumption of uranium enrichment activities

At the beginning of 2006, Iran took steps to restart its uranium enrichment programme in the face of mounting international pressure to permanently halt the programme. On 3 January 2006 Iran informed the IAEA that it had decided to end the 'voluntary and non-legally binding suspension' of its enrichment programme and resume centrifuge research and development (R&D) activities.⁴⁹ The suspension had been in place since November 2004, when Iran pledged to halt all enrichment-related activities while talks were under way with the E3/EU about a broader package of measures aimed at addressing international concerns about the country's nuclear programme.⁵⁰ At the time, Iran categorically rejected E3/EU demands for a permanent cessation

⁴⁵ Iran acceded to the NPT as a non-nuclear weapon state on 2 Feb. 1970. Its comprehensive safeguards agreement with the IAEA (INFCIRC/214) entered into force on 15 May 1974.

⁴⁶ For further detail on the Khan network see Kile, S. N., 'Nuclear arms control and non-proliferation', *SIPRI Yearbook 2005* (note 36), pp. 552–55; and Clary, C., 'A. Q. Khan and the limits of the non-proliferation regime', *Disarmament Forum*, no. 4 (2004), URL <<http://www.unidir.org/pdf/articles/pdf-art2188.pdf>>.

⁴⁷ Iranian officials have also argued that the country had been compelled to carry out some civil nuclear activities in secrecy in order to evade US efforts, in contravention of its obligation under Article IV of the NPT, to block Iran's nuclear programme. See 'Statement by Ambassador Ali A. Soltanich, Islamic Republic of Iran', IAEA Board of Governors meeting, Vienna, 12 Sep. 2003, URL <http://www.iaea.org/NewsCenter/Focus/IaeaIran/bog12092003_statement-iran.pdf>.

⁴⁸ For European and Iranian views on the nuclear issue see Kile, S. N. (ed.), *Europe and Iran: Perspectives on Non-Proliferation*, SIPRI Research Report No. 21 (Oxford University Press: Oxford, 2005).

⁴⁹ International Atomic Energy Agency (IAEA), 'Iran to resume nuclear research and development', Press release PR 2006/01, Vienna, 3 Jan. 2006, URL <<http://www.iaea.org/NewsCenter/PressReleases/2006/prm200601.html>>.

⁵⁰ The text of the agreement between France, Germany, Iran and the UK, signed in Paris on 15 Nov. 2004, is reproduced in IAEA, INFCIRC/637, 26 Nov. 2004, URL <<http://www.iaea.org/Publications/Documents/Infcircs/2004/infirc637.pdf>>. For the background to these negotiations see Kile (note 48).

of its enrichment programme. In August 2005 Iran partially lifted the suspension when it restarted uranium conversion operations, under IAEA monitoring, at a facility near Esfahan.⁵¹ That move led to the collapse of the negotiations with the E3/EU.

On 10 January 2006 Iran began removing IAEA seals from centrifuges and other equipment at the Pilot Fuel Enrichment Plant (PFEP) at Natanz and at two subsidiaries of the Atomic Energy Organization of Iran (AEOI).⁵² In response, the E3 foreign ministers and Solana issued a statement that condemned Iran's decision as a 'clear rejection of the [negotiating] process'.⁵³ They noted that the IAEA Board of Governors had previously requested that Iran continue the suspension while the agency worked to resolve questions about Iran's past nuclear activities. Declaring that the time had come 'for the Security Council to become involved to reinforce the authority of IAEA Resolutions', they announced that the three governments would call for an 'Extraordinary IAEA Board meeting with a view for it to take the necessary action to that end'.

On 4 February 2006 the IAEA Board of Governors adopted a resolution requesting the Director General to 'report to the Security Council all IAEA reports and resolutions' relating to the Iranian nuclear issue.⁵⁴ The Board's decision to report Iran to the Security Council followed its adoption, on 24 September 2005, of a resolution stating that 'Iran's many failures and breaches of its obligations to comply' with its safeguards agreement 'constitute non-compliance in the context of Article XII.C of the Agency's Statute'.⁵⁵ In the new resolution, the Board expressed 'serious concern' that the IAEA was still 'not in a position to clarify some important issues relating to Iran's nuclear programme' and urged Iran to extend 'indispensable and overdue cooperation' to the agency. The resolution listed five steps that the Board required Iran to take in order to build confidence about the 'exclusively peaceful nature of its nuclear programme': (a) re-establish full and sustained suspension of all enrichment-related and reprocessing activities; (b) reconsider the construction at Arak of a 40-megawatt research reactor moderated by heavy water; (c) promptly ratify and implement in full the 2003 Additional

⁵¹ IAEA, 'Iran starts feeding uranium ore concentrate at uranium conversion facility', Press release PR 2005/09, Vienna, 8 Aug. 2005, URL <<http://www.iaea.org/NewsCenter/PressReleases/2005/prn200509.html>>.

⁵² IAEA, 'Iran begins removal of IAEA seals at enrichment-related locations', Press release PR 2006/02, Vienna, 10 Jan. 2006, URL <<http://www.iaea.org/NewsCenter/PressReleases/2006/prn200602.html>>. The AEOI subsidiaries were Farayand Technique and Pars Trash.

⁵³ 'E3/EU statement on the Iran nuclear issue', Berlin, 12 Jan. 2006, URL <<http://www.diplomatic.gouv.fr/actu/bulletin.gb.asp?liste=20060113.gb.html>>.

⁵⁴ IAEA, 'Implementation of the NPT safeguards agreement in the Islamic Republic of Iran', Resolution adopted by the IAEA Board of Governors, GOV/2006/14, Vienna, 4 Feb. 2006, URL <<http://www.iaea.org/Publications/Documents/Board/2006/gov2006-14.pdf>>.

⁵⁵ IAEA, 'Implementation of the NPT safeguards agreement in the Islamic Republic of Iran', Resolution adopted by the IAEA Board of Governors, GOV/2005/77, Vienna, 24 Sep. 2005, URL <<http://www.iaea.org/Publications/Documents/Board/2005/gov2005-77.pdf>>, p. 1. According to Article XII of the IAEA Statute, the 'Board shall call upon the recipient State or States to remedy forthwith any [safeguards] non-compliance which it finds to have occurred. The Board shall report the non-compliance to all members and to the Security Council and General Assembly of the United Nations.'

Protocol;⁵⁶ (d) continue to act in accordance with the provisions of the Additional Protocol pending its ratification; and (e) implement transparency measures, as requested by the Director General, which 'extend beyond the formal requirements of the Safeguards Agreement and Additional Protocol'. The latter measures would include granting inspectors unhindered access to key personnel, workshops and R&D sites as well as making available to them all original documentation related to the procurement of dual-use equipment.⁵⁷

The Board approved the resolution by 27 votes to 3, with five abstentions.⁵⁸ Russia and China, two of the five permanent members (P5) of the Security Council, agreed to support the resolution after an agreement was reached with the other P5 states and Germany that the Security Council would not take any action until after the March 2006 meeting of the IAEA Board, when Director General Mohamad ElBaradei's next report on Iran's nuclear programme was due. The delay was intended to give Iran time to halt its enrichment activities and to improve cooperation with the IAEA.⁵⁹

Iran reacted defiantly to the resolution, making good on its earlier threat to end voluntary cooperation with the IAEA if the Board reported Iran's nuclear file to the Security Council.⁶⁰ On 6 February Iran informed the IAEA that it would no longer act in accordance with the provisions of the Additional Protocol and would suspend as well all other non-legally binding transparency measures.⁶¹ It also asked the IAEA to remove all containment and surveillance measures, such as seals and cameras, 'that were in place beyond the normal Agency safeguards measures'.⁶² In addition, on 15 February Iran announced that it had begun small-scale 'enrichment tests' on a 10-centrifuge cascade at the PFEP at Natanz.⁶³

The IAEA Director General's assessment of Iran's nuclear programme

On 27 February ElBaradei issued the latest in a series of reports to the IAEA Board on Iran's implementation of its safeguards agreement.⁶⁴ The report painted a mixed picture of the results achieved by IAEA inspections. It stated

⁵⁶ On 18 Dec. 2003 Iran signed an Additional Protocol to its comprehensive safeguards agreement. IAEA, 'Iran signs Additional Protocol on nuclear safeguards', IAEA News Center, 18 Dec. 2003, URL <<http://www.iaea.org/NewsCenter/News/2003/iranap20031218.html>>.

⁵⁷ IAEA (note 54).

⁵⁸ Kerr, P., 'IAEA reports Iran to UN Security Council', *Arms Control Today*, vol. 36, no. 2 (Mar. 2006), URL <<http://www.armscontrol.org/act/archived.asp>>.

⁵⁹ Weisman, S. R., 'China and Russia support sending Iran case to U.N.', *New York Times*, 31 Jan. 2006.

⁶⁰ Esfandiari, G., 'Tehran threatens to end nuclear cooperation if referred to UN', Radio Free Europe/Radio Liberty (RFE/RL), 13 Jan. 2006, URL <<http://rfe.rferl.org/featuresarticle/2006/01/01726b6f-65db-47ef-86ca-cbc59a21048a.html>>.

⁶¹ IAEA, 'Implementation of the NPT safeguards agreement in the Islamic Republic of Iran', Report by the Director General to the IAEA Board of Governors, GOV/2006/15, 27 Feb. 2006, URL <<http://www.iaea.org/Publications/Documents/Board/2006/gov2006-15.pdf>>, p. 6; and Kerr (note 58).

⁶² Kerr (note 58); IAEA (note 61); and Reuters, 'Iran tells nuclear watchdog to remove monitoring gear', ABC News, 7 Feb. 2006, URL <<http://www.abc.net.au/news/newsitems/200602/s1563703.htm>>.

⁶³ Kerr (note 58).

⁶⁴ IAEA (note 61).

that agency inspectors were able to verify that none of the declared nuclear materials inside Iran had been diverted to prohibited activities. However, because the agency was not satisfied that it could adequately reconstruct the history of Iran's previously undeclared nuclear activities, it was yet not in a position to conclude that there were no such activities under way, including activities that might have a military dimension.

EIBaradei's report stated that the IAEA had made little progress in the preceding months towards resolving a number of outstanding safeguards compliance issues, most of which had to do with Iranian activities in the 1980s and 1990s. The first of these involved determining the origins of low-enriched uranium (LEU) and HEU particles discovered in environmental samples taken at various centrifuge-related facilities and workshops in Iran. According to EIBaradei, the results of the environmental samples taken in Pakistan in December 2005, together with the results of earlier samples, 'tended, on balance, to support Iran's statement' attributing the presence of the enriched uranium particles to contamination from centrifuge components imported through 'foreign intermediaries', although the agency had yet to establish a definitive conclusion with respect to all of the contamination.⁶⁵ The second issue had to do with Iran's P-1 and P-2 centrifuge programmes; in particular, verifying Iranian statements about the procurement of centrifuge design information, components and related equipment through a network of foreign intermediaries; and determining the scope and timelines of Iran's centrifuge R&D activities.⁶⁶

In addition to these issues, EIBaradei reported that the IAEA was continuing to assess other aspects of Iran's nuclear activities. These included the dates of plutonium separation experiments; the purpose of experiments involving the isotope polonium-210; and certain activities at the Gchine uranium mine. The IAEA also continued to press for expanded access to Lavisan-Shian, a site outside Tehran where undeclared nuclear weapon-related activities may have taken place at the Physics Research Centre previously located there.⁶⁷

EIBaradei's report stated that the IAEA had not been able to shed further light on the origins of a 15-page document, discovered by inspectors the previous year, that 'related to the fabrication of nuclear weapon components'. The document described 'procedures for the reduction of [uranium hexafluoride] to uranium metal in small quantities, and for the casting of enriched and depleted uranium metal into hemispheres'.⁶⁸ The existence of the document has been a matter of concern, since the uranium metal hemispheres could

⁶⁵ IAEA (note 61), pp. 2–3. On the contamination issue see IAEA, 'Implementation of the NPT safeguards agreement in the Islamic Republic of Iran', Report by the Director General to the IAEA Board of Governors, GOV/2004/83, Vienna, 15 Nov. 2004, URL <<http://www.iaea.org/Publications/Documents/Board/2004/gov2004-83.pdf>>, pp. 8–10.

⁶⁶ IAEA (note 61), pp. 3–4, 10. On Iran's gas centrifuge enrichment programmes see International Institute for Strategic Studies (IISS), *Iran's Strategic Weapons Programme: A Net Assessment* (Routledge: Abingdon, 2005), pp. 45–56.

⁶⁷ IAEA (note 61). See also Shire, J. and Albright, D., 'Iran's NPT violations: numerous and possibly on-going?', Institute for Science and International Security (ISIS), ISIS Issue Analysis, 13 Sep. 2006, URL <<http://www.isis-online.org/publications/iran/iranntptviolations.pdf>>.

⁶⁸ IAEA (note 61), pp. 4–5.

be used to form the core of an implosion-type nuclear weapon.⁶⁹ ElBaradei's report noted that in January 2006 Iran had complied with an IAEA request to allow inspectors to re-examine the document but had insisted that it remain in Tehran under IAEA seal. During the visit, Iran had again told the agency that it had never requested the document, which had been provided by a foreign intermediary.⁷⁰

The report also noted that the IAEA had made no headway in confirming information about a secretive Iranian project known as Green Salt.⁷¹ It had been described the previous month in a written update on the IAEA's progress in verifying Iran's implementation of its safeguards agreement prepared by the Deputy Director General for Safeguards, Olli Heinonen.⁷² The project allegedly involved work on the conversion of uranium dioxide into uranium tetrafluoride ('green salt'), as well as tests related to high explosives and the design of a missile re-entry vehicle.⁷³ ElBaradei's report stated that the IAEA was not able to substantiate whether Iran ever had such a project, but it noted that the purported activities 'appeared to have administrative connections'; the report did not repeat Heinonen's earlier statement that these activities 'could have a military nuclear dimension'.⁷⁴ In response to IAEA queries in February 2006, Iran had restated that the information about the alleged project was 'baseless'. Iran's denials notwithstanding, there was considerable media interest in the alleged Green Salt project, since it appeared to link Iran's nuclear fuel production activities to a military programme.⁷⁵

Nuclear diplomacy at the Security Council

Following the conclusion of the IAEA Board of Governor's meeting on 8 March, the 15 members of the UN Security Council took up consideration of the Iranian nuclear file.⁷⁶ On 29 March the president of the Security Council issued a statement about Iran's nuclear programme expressing 'serious concern' about its resumption of enrichment-related activities and suspension of

⁶⁹ Jahn, G., 'Iran said to have nuclear warhead plans', Associated Press, 31 Jan. 2006, URL <<http://www.breitbart.com/news/2006/01/31/D8FG37780.html>>.

⁷⁰ IAEA (note 61), p. 5.

⁷¹ This information was based at least in part on intelligence provided by the USA, which had come into possession of an allegedly stolen laptop computer containing a large number of documents describing the project's activities. Sciolino, E. and Broad, W. J., 'Atomic agency sees possible link of military to Iran nuclear work', *New York Times*, 1 Feb. 2006.

⁷² IAEA, 'Developments in the implementation of the NPT safeguards agreement in the Islamic Republic of Iran and agency verification of Iran's suspension of enrichment-related and reprocessing activities', Update brief by the Deputy Director General for Safeguards, Vienna, 31 Jan. 2006, URL <<http://www.iaea.org/NewsCenter/Statements/DDGs/2006/heinonen31012006.pdf>>.

⁷³ Some processes for enriching uranium involve an intermediate step in which uranium dioxide is converted to uranium tetrafluoride, a green crystalline compound commonly called 'green salt'. The compound is then converted to uranium hexafluoride (UF₆), a volatile gas used in isotopic separation (i.e. enrichment) processes to yield uranium-235.

⁷⁴ IAEA (note 61), p. 8; and IAEA (note 72), p. 3.

⁷⁵ Sciolino and Broad (note 71).

⁷⁶ Webb, G., 'Nuclear standoff with Iran moves to Security Council', *Global Security Newswire*, 8 Mar. 2006, URL <<http://www.nti.org>>.

cooperation with the IAEA under the Additional Protocol.⁷⁷ The presidential statement called on Iran to take the steps demanded by the IAEA Board's February resolution, including a return to the full suspension of its enrichment and related R&D activities.

In response to the Security Council statement, Iran emphasized that it was legally entitled, as a non-nuclear weapon state party to the NPT, to pursue the development of nuclear energy for peaceful purposes. On 11 April 2006 Iranian President Mahmoud Ahmadinejad announced that Iran had succeeded in enriching uranium to the 3.5 per cent level required for nuclear fuel.⁷⁸ Iranian nuclear officials explained that the uranium had been enriched in laboratory-scale quantities using a 164-centrifuge cascade at the PFEP. They added that Iran aimed to complete a 3000-centrifuge complex by March 2007 as the first stage in a planned commercial-scale, 54 000-centrifuge fuel production facility to be built underground at Natanz.⁷⁹ Ahmadinejad's theatrically staged announcement of the feat was greeted sceptically by many foreign experts, who speculated that it had less to do with a scientific breakthrough than with a political message to Europe and the United States that Iran's enrichment programme was unstoppable.⁸⁰ Subsequent reports indicated that the programme continued to be plagued by technical difficulties, especially with respect to the sustainability of centrifuge operations and the production of uranium hexafluoride (UF₆) for the centrifuges.⁸¹

Iran's defiance of the non-binding presidential statement led to protracted discussions at the Security Council about how to induce or compel Iran to comply with the Security Council's requests. In early May 2006 France, the UK and the USA put forward a draft resolution, under Chapter VII of the UN Charter, requiring Iran to stop all enrichment-related activities. At the insistence of China and Russia, the draft resolution did not set a deadline for compliance or specify the action to be taken should Iran fail to comply.⁸² The E3/EU also put forward, with US support, a new offer of nuclear technology assistance to Iran in exchange for the latter's suspension of its enrichment programme.⁸³ The offer was rejected by President Ahmadinejad, who complained that by asking Iran to make a major concession without any guarantee that the

⁷⁷ UN Security Council, Statement by the president of the Security Council, S/PRST/2006/15, 29 Mar. 2006.

⁷⁸ 'Iran proclaims breakthrough in nuclear program', *Global Security Newswire*, 12 Apr. 2006, URL <<http://www.nti.org>>.

⁷⁹ See International Institute for Strategic Studies (note 66), pp. 48–51.

⁸⁰ Fathi, N., Sanger, D. E. and Broad, W. J., 'Iran reports big advance in enrichment of uranium', *New York Times*, 12 Apr. 2006.

⁸¹ Fitzpatrick, M., 'Assessing Iran's nuclear programme', *Survival*, vol. 48, no. 3 (autumn 2006), pp. 18–21; and Marcus, J., 'Iran enrichment: a Chinese puzzle?', BBC News, 19 May 2006, URL <<http://news.bbc.co.uk/2/4995350.stm>>. Iran is believed to have achieved the 3.5% enrichment level announced by Ahmadinejad by using Chinese-supplied UF₆ rather than domestically produced UF₆, which was reportedly contaminated by metal particles that rendered it unsuitable for use as gas centrifuge feedstock. See Hibbs, M., 'Intelligence estimates vary widely on Iran's timeline to purify UF₆', *Nuclear Fuels*, vol. 30, no. 18 (29 Aug. 2005), p. 1.

⁸² Sciolino, E., 'U.S., Britain and France draft U.N. resolution on Iran's nuclear ambitions', *New York Times*, 3 May 2006.

⁸³ Dombey, D., 'EU to offer Iran nuclear reactor', *Financial Times*, 17 May 2006.

promised benefits would materialize, the E3/EU were offering ‘candy for gold’.⁸⁴

With the discussions at the Security Council nearing an impasse, the United States moved to adjust its diplomatic strategy towards Iran. In a major shift in US policy, Secretary of State Condoleezza Rice announced on 31 May 2006 that the United States would join the E3/EU for direct talks with Iran if the latter ‘immediately’ suspended all enrichment and reprocessing activities and resumed cooperation with the IAEA under the Additional Protocol.⁸⁵ Rice said that the US offer was meant to ‘give new energy’ to European efforts to reach a deal with Iran. The announcement was widely seen as a recognition by the US Administration that it could not hope to assemble a coalition of states to enforce punitive sanctions—or to consider taking military action against Iran’s nuclear facilities—unless it had first demonstrated its commitment to exhausting all diplomatic options by directly engaging the Iranian regime.⁸⁶ Officials in Tehran described the offer as being driven by the USA’s diplomatic isolation rather than by a sincere desire to reach a deal with Iran. They emphasized that Iran would not agree to suspend its enrichment programme as a precondition for direct talks with the USA.⁸⁷

The P5+1 proposal

On 6 June 2006 China, France, Germany, Russia, the UK and the USA (the ‘P5+1 states’) announced a new package of incentives on nuclear energy, technology cooperation, and political and security issues aimed at persuading Iran to suspend indefinitely its uranium enrichment.⁸⁸ The offer came as ElBaradei issued a report to the IAEA Board showing that Iran had stepped up its uranium enrichment activities, in disregard of the non-binding March UN Security Council presidential statement.⁸⁹ The P5+1 proposal set out what was in effect a negotiating agenda. However, it stipulated that before any negotiations could begin, Iran would have to take the following steps: commit to addressing all the outstanding safeguards compliance concerns through full cooperation with the IAEA; suspend all enrichment-related and reprocessing activities for the duration of the negotiations; and resume implementation of

⁸⁴ Mehr News Agency, ‘EU incentives like candy for gold’, Arak, 17 May 2006, URL <<http://www.mehrnews.com/en/NewsDetail.aspx?NewsID=327636>>.

⁸⁵ US Department of State, ‘Statement by Secretary of State Condoleezza Rice’, Washington, DC, 31 May 2006, URL <<http://www.state.gov/secretary/rm/2006/67088.htm>>.

⁸⁶ Sanger, D. E., ‘Bush’s realization on Iran: no good choice left except talks’, *New York Times*, 1 June 2006.

⁸⁷ Mehr News Agency, ‘Tehran rejects Washington’s condition for nuclear negotiations, Tehran, 1 June 2006, URL <<http://www.mehrnews.com/en/NewsDetail.aspx?NewsID=334472>>; and Slackman, M., ‘Tehran rebuffs U.S. on talks’, *International Herald Tribune*, 2 June 2006.

⁸⁸ Kerr, P., ‘U.S. allies await Iran’s response to nuclear offer’, *Arms Control Today*, vol. 36, no. 6 (July/Aug. 2006), URL <<http://www.armscontrol.org/act/archived.asp>>.

⁸⁹ IAEA, ‘Implementation of the NPT safeguards agreement in the Islamic Republic of Iran’, Report by the Director General to the IAEA Board of Governors, GOV/2006/38, 8 June 2006, URL <<http://www.iaea.org/Publications/Documents/Board/2006/gov2006-38.pdf>>.

the Additional Protocol.⁹⁰ In return for these commitments, the P5+1 states were prepared to discuss with Iran the package of nuclear and other incentives. The proposal warned that the UN Security Council would adopt unspecified ‘proportionate measures if Iran refused to negotiate’.⁹¹

The proposal contained several nuclear-related provisions, including the setting up of a multilateral venture to provide Iran with a light-water reactor (LWR) for power generation, giving Iran part ownership of a Russian enrichment facility and creating a five-year ‘buffer stock’ of enriched uranium stored in Iran under IAEA supervision.⁹² A number of these elements, such as the provision of the LWR, had been included in the E3/EU proposal made to Iran in August 2005. Significantly, the proposal left open the possibility that Iran could be allowed to domestically enrich uranium to produce nuclear fuel. However, US officials indicated that before this could happen Iran would have to restore international confidence that its nuclear activities were entirely for peaceful purposes—a task that would probably take many years.⁹³

The P5+1 proposal set no deadline by which Iran had to respond. Despite repeated prompting by world leaders, officials in Tehran emphasized that they would take ‘as long as necessary’ before replying to the proposal.⁹⁴ Concerned that Iran was seeking to buy time for its enrichment programme, on 12 July 2006 the P5+1 states issued a statement declaring that ‘Iran has failed to take the steps needed to allow negotiations to begin, specifically the suspension of all enrichment-related and reprocessing activities’.⁹⁵ As a result, they were compelled to return to the UN Security Council, where they would seek a resolution ‘which would make the IAEA-required suspension mandatory’.

Resolution 1696

In July 2006 the UN Security Council passed Resolution 1696.⁹⁶ The resolution, which was adopted by 14 votes to 1 (Qatar was the sole dissenter), demanded that Iran suspend by 31 August all uranium enrichment-related and plutonium reprocessing activities, subject to verification by the IAEA. It stated that the enrichment suspension, as well as full Iranian compliance with the requirements of the IAEA Board of Governors, would contribute to a ‘diplomatic, negotiated solution’ that guaranteed Iran’s nuclear programme was for exclusively peaceful purposes. The resolution warned that in the case of Iran-

⁹⁰ Iran Focus, ‘Text of P5+1 package of nuclear incentives offered to Iran’, London, 18 July 2006, URL <<http://www.iranfocus.com/modules/news/article.php?storyid=7946>>.

⁹¹ Kerr (note 88).

⁹² The package also promised support for Iran’s membership in the World Trade Organization, the lifting of restrictions on the use of US technology in agriculture and the supply of US-manufactured spare parts for Iranian civilian aircraft.

⁹³ Cooper, H. and Sciolino, E., ‘U.S. says plan offers Iran uranium option’, *New York Times*, 8 June 2006.

⁹⁴ Islamic Republic News Agency, ‘Larijani rejects any deadline for responding to P5+1 offer’, Tehran, 29 June 2006, URL <<http://www.irna.com/en/news/view/menu-234/0606292803093903.htm>>.

⁹⁵ Douste-Blazy, P., French Foreign Minister, ‘P5+1 statement: negotiations with Iran’, Press statement, Paris, 12 July 2006, URL <<http://www.state.gov/eur/rls/or/68910.htm>>.

⁹⁶ UN Security Council Resolution 1696, 31 July 2006.

ian non-compliance the Security Council would be forced to adopt unspecified 'appropriate measures'.

Iran's chief nuclear negotiator, Ali Larijani, promptly denounced Resolution 1696 as 'illegal' and declared that Iran would continue its enrichment programme beyond the suspension deadline set by the Security Council.⁹⁷ Shortly before the Security Council deadline, Iran responded officially to the P5+1 proposal. Larijani described the lengthy document as offering a 'new formula' for resolving international concerns about its nuclear programme.⁹⁸ He also said that Iran was willing to hold 'serious talks' with the P5+1 states on all aspects of their proposal.⁹⁹ However, Larijani reiterated that Iran would not agree to suspend its enrichment programme as a precondition for those talks.¹⁰⁰

Iran's decision to defy the Security Council's demand that it halt all enrichment-related activities was confirmed by a report from IAEA Director General ElBaradei on 31 August 2006.¹⁰¹ The report stated that Iran appeared to be making modest progress in its enrichment programme. It was continuing to carry out tests of a 164-centrifuge cascade at the Natanz pilot plant, which involved feeding UF₆ gas into the centrifuges 'for very short periods of time', and was in the process of installing a second 164-centrifuge cascade there. Iran was also proceeding with a uranium conversion campaign begun in June 2006 at the Esfahan facility and as of 24 August had produced 26 tonnes of UF₆. In addition, Iran was continuing to build a heavy water-moderated reactor near Arak, despite the Security Council's call for the country to 'reconsider' the project. With regard to safeguards compliance, ElBaradei's report stated that the IAEA was asking Iran for information regarding HEU particles found in environmental samples taken at a waste storage facility.¹⁰² The discovery, which had not previously been reported, raised the possibility that Iran might have either imported or produced undeclared enriched uranium.¹⁰³

The autumn of 2006 was marked by protracted discussions among the P5+1 states over how to respond to Iran's defiance of Resolution 1696. While there was general agreement that the Security Council had to take action against

⁹⁷ Slackman, M., 'Iran says it will ignore U.N. deadline on uranium program', *New York Times*, 7 Aug. 2006.

⁹⁸ Shire, J. and Albright, D., 'Iran's response to the EU: confused but sporadically hopeful', Institute for Science and International Security (ISIS), ISIS Issue Analysis, 13 Sep. 2006, URL <<http://www.isis-online.org/publications/iran/confusedbuthopeful.pdf>>.

⁹⁹ Fars News Agency, 'Larijani calls for immediate talks with 5+1', Tehran, 22 Aug. 2006, URL <<http://www.farsnews.com/English/newstext.php?nn=8505310280>>.

¹⁰⁰ Slackman, M., 'Iran won't give promise to end uranium effort', *New York Times*, 23 Aug. 2006.

¹⁰¹ IAEA, 'Implementation of the NPT safeguards agreement in the Islamic Republic of Iran', Report by the Director General to the IAEA Board of Governors, GOV/2006/53, 31 Aug. 2006, URL <<http://www.iaea.org/Publications/Documents/Board/2006/gov2006-53.pdf>>.

¹⁰² IAEA (note 101), p. 4. The particles were found in containers that had been used to store depleted uranium targets used in plutonium separation experiments.

¹⁰³ Iran later informed the IAEA that the contamination may have resulted from the temporary storage of spent fuel from the Tehran Research Reactor in containers that were used at the Karaj facility. IAEA, 'Implementation of the NPT safeguards agreement in the Islamic Republic of Iran', Report by the Director General to the IAEA Board of Governors, GOV/2006/64, 14 Nov. 2006, URL <<http://www.iaea.org/Publications/Documents/Board/2006/gov2006-64.pdf>>, p. 3.

Iran, disagreements persisted over the type of measures to be included in a resolution. The USA called for the imposition of comprehensive trade and economic sanctions aimed at isolating Iran. In contrast, China, Russia and, to a lesser extent, the E3 favoured a more restricted series of low-level measures, at least as a first step towards reinforcing the Security Council's authority.¹⁰⁴ There were also disagreements on specific issues, such as Russia's insistence—over US objections—that any resolution exempt from sanctions the Russian-supplied Bushehr nuclear power plant.

Finally, on 23 December 2006, the Security Council unanimously adopted Resolution 1737 under Article 41 of Chapter VII of the UN Charter. The resolution, which was sponsored by the E3, was based on a draft that had been put forward in October and amended several times after objections from China and Russia.¹⁰⁵ The resolution expressed the Security Council's determination to 'persuade Iran to comply with Resolution 1696 and with the requirements of the IAEA, and also to constrain Iran's development of sensitive technologies in support of its nuclear and missile programmes'. It required UN member states to 'take the necessary measures to prevent the supply, sale or transfer directly or indirectly' of a variety of items that could 'contribute' to Iran's enrichment or heavy-water reactor programmes as well as the development of nuclear-weapon delivery systems, such as ballistic missiles. The relevant items were contained in several lists referenced by the resolution.¹⁰⁶

Iran promptly rejected the UN resolution as 'invalid' and 'illegal'.¹⁰⁷ As 2006 ended, Iran announced that it would begin work on assembling and installing the initial 3000 uranium centrifuges at Natanz. It also vowed to take unspecified action to reduce its cooperation with the IAEA.

IV. The Indian–US Civil Nuclear Cooperation Initiative

In 2006 India and the United States took steps towards implementation of the controversial Civil Nuclear Cooperation Initiative.¹⁰⁸ The CNCI had been launched in July 2005 in a joint statement by US President George W. Bush and Indian Prime Minister Manmohan Singh. The initiative reflects the growing rapprochement between India and the USA and the two leaders'

¹⁰⁴ 'Security Council leaders move towards Iran sanctions', *Global Security Newswire*, 10 Oct. 2006, URL <<http://www.nti.org>>; and Dinmore, G. and Bozorgmehr, N., 'Rice fails to win support for Iran referral to Security Council', *Financial Times*, 17 Oct. 2006.

¹⁰⁵ 'UN passes Iran nuclear sanctions', BBC News, 23 Dec. 2006, URL <<http://news.bbc.co.uk/2/6205295.stm>>.

¹⁰⁶ On Security Council Resolution 1737 and the lists of sensitive items see chapter 15 in this volume.

¹⁰⁷ 'UN votes for Iran nuclear sanctions', AlJazeera, 23 Dec. 2006, URL <<http://english.aljazeera.net/NR/exeres/A742D5DB-379A-4A0F-8DFA-40213800A37C.htm>>; and Reuters, 'Iran defies UN nuclear sanctions', *Financial Times*, 24 Dec. 2006.

¹⁰⁸ For further information about the origins of the CNCI see Ahlström, C., 'Legal aspects of the Indian–US Civil Nuclear Cooperation Initiative', *SIPRI Yearbook 2006* (note 8), pp. 669–85.

commitment to transform Indian–US relations in the direction of a ‘global partnership’.¹⁰⁹

The goal of the CNCI is the resumption of ‘full civil nuclear cooperation’ between India and the USA. This represents a reversal of three decades of US non-proliferation policy, which had been aimed at preventing India from obtaining nuclear fuel and reactors from US and other suppliers following India’s ‘peaceful nuclear explosion’ of 1974.¹¹⁰ Alluding to this shift, President Bush declared in the joint statement that India, as a ‘responsible state’ with a demonstrated commitment to preventing the spread of WMD, ‘should acquire the same benefits and advantages’ as other such states with advanced nuclear technology. He promised to work to persuade the US Congress to amend legislation that currently prohibited most nuclear trade with India.¹¹¹ He also pledged to work to create an exemption in the Nuclear Suppliers Group (NSG) Guidelines that would allow India to have access to international markets for nuclear fuel and technology.¹¹²

In return, Singh pledged that India would assume the same ‘responsibilities and practices’ aimed at preventing nuclear weapon proliferation as other countries with advanced nuclear technology.¹¹³ As part of this commitment, India would separate its civilian from its military nuclear facilities, voluntarily place the civilian facilities under IAEA safeguards, and sign and adhere to an Additional Protocol. Furthermore, Singh promised that India would continue its moratorium on nuclear testing, work with the United States for the conclusion of a global fissile material cut-off treaty, refrain from exporting uranium-enrichment and plutonium-separation technologies to countries that did not already have them, and harmonize its export control legislation with NSG and Missile Technology Control Regime (MTCR) guidelines.¹¹⁴

¹⁰⁹ The White House, ‘Joint statement between US President George W. Bush and Indian Prime Minister Manmohan Singh’, News release, Washington, DC, 18 July 2005, URL <<http://www.whitehouse.gov/news/releases/2005/07/20050718-6.html>>; and Ahlström (note 108).

¹¹⁰ The Indian nuclear explosive device was widely believed to have used US and other foreign-supplied nuclear technology provided for peaceful purposes. For a comprehensive history of India’s nuclear programme see Perkovich, G., *India’s Nuclear Bomb: the Impact on Global Proliferation* (University of California Press: Berkeley, Calif., 1999).

¹¹¹ The 1978 Nuclear Non-proliferation Act (NNPA), 10 Mar. 1978, US Public Law 95-242, reprinted in *Nuclear Regulatory Legislation*, NUREG-0980, vol. 1, no. 6 (US Nuclear Regulatory Commission, Office of the General Counsel: Washington, DC, June 2002), pp. 151–53. The NNPA requires non-nuclear weapon states to conclude with the IAEA a comprehensive or ‘full scope’ safeguards agreement (INFCIRC/153), covering all sources of special fissionable material on their territories, as a condition for peaceful nuclear cooperation with the USA. India is not a party to the NPT and is not legally recognized as a nuclear weapon state.

¹¹² The Nuclear Suppliers Group was created in 1975 in response to India’s nuclear test explosion the previous year. On the NSG’s composition and activities in 2006 see the glossary and chapter 15 in this volume. The latest version of the NSG Guidelines, as well as a statement on how they are to be applied, are available at URL <<http://www.nuclearsuppliersgroup.org/guide.html>>.

¹¹³ The White House (note 109).

¹¹⁴ The White House (note 109). On the MTCR see the glossary and chapter 15 in this volume. The MTCR Guidelines for Sensitive Missile-Relevant Transfers are available at URL <http://www.state.gov/www/global/arms/treaties/mtrc_anx.html>.

The Indian separation plan

One of the most controversial aspects of the CNCI had to do with India's commitment to separate its nuclear programme into civilian and military components. The July 2005 joint statement established a bilateral working group to discuss India's plan for doing so and to agree other legal and technical modalities for resuming nuclear commerce.¹¹⁵

Through the separation plan, India sought to demonstrate its commitment to non-proliferation and responsible nuclear stewardship practices, while preserving flexibility for pursuing its long-term nuclear energy development programme and for maintaining its military nuclear capability in accordance with perceived national security requirements.¹¹⁶ As a way of balancing these goals, India initially indicated that it would only accept voluntary safeguards arrangements for civilian nuclear facilities of the type that the IAEA had in place in the five NPT-recognized nuclear weapon states.¹¹⁷ The voluntary arrangements would allow India to add and remove at will facilities that were subject to IAEA facility-specific safeguards. This would keep open the possibility that a 'civilian' nuclear facility could be reassigned to the country's military programme. It would also help to overcome the reluctance of India's nuclear establishment to place more of the country's nuclear facilities under civilian safeguards.¹¹⁸

US officials called for a separation plan that was 'credible, transparent and defensible from a non-proliferation standpoint'.¹¹⁹ They insisted that any future safeguards arrangements for India's civilian nuclear fuel cycle had to apply in perpetuity in order to give adequate assurance to supplier states that nuclear material and technology imported by India for peaceful purposes would not be diverted to military activities.¹²⁰ US officials also urged the Indian Government to take a 'comprehensive' approach in deciding which facilities would be designated as civilian and hence subject to permanent safeguards.¹²¹ While declining to suggest specific criteria for doing so, they appeared to want India to designate as civilian facilities all its nuclear infrastructure not directly associated with nuclear weapon production. Some non-governmental experts suggested that a more feasible and cost-effective

¹¹⁵ Squassoni, S., *India's Nuclear Separation Plan: Issues and Views*, US Library of Congress, Congressional Research Service (CRS) Report for Congress RL33292 (CRS: Washington, DC, 3 Mar. 2006), URL <<http://www.opencrs.com/document/RL33292>>, pp. 8–9; and 'U.S. says obstacles remain to U.S.–Indian agreement', *Global Security Newswire*, 23 Jan. 2006, URL <<http://www.nti.org>>.

¹¹⁶ Varadarajan, S., 'Nuclear separation plan seeks fine balance', *The Hindu*, 8 Mar. 2006.

¹¹⁷ Subramanian, T., 'Identifying a civilian nuclear facility is India's decision', *The Hindu*, 12 Aug. 2005.

¹¹⁸ Balachandran, G., 'International nuclear control regimes and India's participation in civilian nuclear trade: key issues', *Strategic Analysis* (New Delhi), vol. 29, no. 4 (Oct.–Dec. 2005).

¹¹⁹ Joseph, R., Under Secretary of State, 'The nonproliferation implications of the July 18, 2005 US–India joint statement', Prepared remarks before the US Senate Foreign Relations Committee, 2 Nov. 2005, URL <<http://foreign.senate.gov/testimony/2005/JosephTestimony051102.pdf>>.

¹²⁰ Squassoni (note 115), pp. 13–14. There was also concern that agreeing to voluntary offer safeguards arrangements of the type in place in the 5 nuclear weapon states would tacitly endorse India's claim to nuclear weapon state status.

¹²¹ Joseph (note 119).

approach, given the extensive commingling of India's civil and military nuclear activities, would be to focus on placing under permanent safeguards particularly sensitive facilities and programmes, such as India's fast breeder reactors and associated spent-fuel reprocessing plants.¹²²

At a summit meeting in New Delhi on 2 March 2006, President Bush and Prime Minister Singh announced that they had reached agreement on an Indian plan for separating its nuclear programme into civilian and military components.¹²³ In exchange for India's acceptance of permanent safeguards on its civilian facilities, the plan contained several measures aimed at guaranteeing foreign nuclear fuel supplies to India. These included the development by India of a nuclear fuel strategic reserve and a US commitment to help India find alternative sources of nuclear fuel in the event of a supply interruption.¹²⁴ Ensuring the reliability of fuel supplies has been a key Indian objective in implementation of the CNCI because of previous interruptions.¹²⁵ In the USA the fuel supply assurance was criticized since it appeared to mean that the USA would help India to find foreign sources of nuclear fuel even in the event that the latter resumed nuclear weapon testing.¹²⁶

The main focus of the separation plan was on India's 22 nuclear power reactors, 15 of which were operational and 7 under construction. India offered to designate 14 of these reactors as civilian facilities and to place them permanently under 'India-specific' IAEA safeguards in a 'phased manner by 2014'.¹²⁷ This figure included six foreign-supplied power reactors that India had already agreed would be subject to IAEA facility-specific (INFCIRC/66) safeguards.¹²⁸ The eight remaining planned or completed power reactors, as well as all research reactors, would be designated as military facilities. According to Indian calculations, the 14 reactors to be placed under civilian safeguards would account for 65 per cent of India's total installed nuclear power capacity (measured in megawatts-electric, MW(e)), compared to the 19 per cent accounted for by the reactors currently operating under facility-specific safeguards.¹²⁹ In the separation plan, India pledged to place under

¹²² Albright, D. and Basu, S., 'Separating Indian military and civilian nuclear facilities', Institute for Science and International Security (ISIS), ISIS Report, 19 Dec. 2005, URL <<http://www.isis-online.org/publications/southasia/indiannuclearfacilities.pdf>>.

¹²³ The White House, 'President, Prime Minister Singh discuss growing strategic partnership', News release, New Delhi, 2 Mar. 2006, URL <<http://www.whitehouse.gov/news/releases/2006/03/20060302-9.html>>.

¹²⁴ Indian Department of Atomic Energy, 'PM's Suo-Motu statement on discussions on civil nuclear energy cooperation with the US: implementation of India's separation plan', Press release, New Delhi, 7 Mar. 2006, URL <<http://www.dae.gov.in/press/suopm0703.htm>>; and Baruah, A., 'US, India clinch deal on nuclear separation', *The Hindu*, 3 Mar. 2006.

¹²⁵ The United States halted its supply of nuclear fuel to India's Tarapur reactors after India conducted its first nuclear test explosion, in 1974.

¹²⁶ Ruppe, D., 'U.S. would assure India fuel even if Delhi tests nuclear weapons', *Global Security Newswire*, 7 Apr. 2006, URL <<http://www.nti.org>>.

¹²⁷ Indian Department of Atomic Energy (note 124).

¹²⁸ Two of the 6 reactors—1000-MW(e) LWRs from Russia—are under construction at Kudankulam and are scheduled to be completed in 2007 and 2008, respectively.

¹²⁹ Indian Department of Atomic Energy (note 124). The 15 power reactors currently operated by India have an installed capacity of 3310 MW(e), which represents c. 3% of the country's total installed electricity generation capacity.

IAEA safeguards all future power reactors and breeder reactors designated as civilian facilities. Indian officials emphasized that India retained the sole right to determine which facilities would be so designated.¹³⁰

India declined to include on the list of civilian nuclear facilities several reactors that had been subjects of international concern. The ageing CIRUS reactor, located at the Bhabha Atomic Research Centre (BARC) in Trombay, has been at the centre of a long-running Indian dispute with Canada and the United States over whether India had violated the original supply contracts with those countries by reportedly using plutonium produced at the reactor in its 1974 nuclear explosion.¹³¹ Although CIRUS was not included in the list of civilian facilities, India announced that it would shut down the reactor in 2010. With regard to its fast-neutron breeder reactor programme, India rejected calls to place under safeguards the 500-MW(e) prototype fast breeder reactor (PFBR) under construction at Kalpakkam as well as the fast breeder test reactor there, which became operational in 1985. Singh and other Indian officials emphasized that a key principle guiding the separation process was that it not be prejudicial to the Indian Department of Atomic Energy's three-stage nuclear development plan, dating from the 1950s, which envisions a thorium-based closed fuel cycle.¹³² Despite numerous technical problems, the fast breeder reactor programme remains integral to the second stage of that plan. In the United States, India's unwillingness to place its fast breeder reactors under civilian safeguards emerged as a major concern, since those reactors could be used to produce large amounts of plutonium that would enable India to expand its nuclear arsenal significantly.¹³³

There were few details about which other facilities would be kept off the civilian list. An Indian Government document explaining the plan to the Indian Parliament indicated that civilian facilities located in 'larger hubs of strategic significance' would be excluded from the civilian list.¹³⁴ According to one Indian analyst, two such 'strategic hubs'—BARC and the Indira Gandhi Centre for Atomic Research in Kalpakkam—were considered to be too sensitive to permit outside inspections of any of the facilities they contain, including facilities not engaged in military-related activities.¹³⁵ The Rattahalli uranium enrichment facilities located at Mysore would similarly remain unsafeguarded. The separation plan postponed a decision about which of the plants located within the Nuclear Fuel Complex in Hyderabad would be offered for safeguards.

¹³⁰ Indian Department of Atomic Energy (note 124).

¹³¹ Perkovich (note 110), pp. 183–87.

¹³² Indian Department of Atomic Energy (note 124). For a description of the 3-stage plan see Perkovich (note 110), pp. 26–28.

¹³³ See Mian, Z. et al., 'Fissile materials in South Asia and the implications of the U.S.–Indian nuclear deal', Draft report for the International Panel on Fissile Materials, 11 July 2006, URL <http://www.armscontrol.org/pdf/20060711_IPFM-DraftReport-US-India-Deal.pdf>.

¹³⁴ Embassy of India, Washington, DC, 'Implementation of India–United States joint statement of July 18, 2005: India's separation plan', Press release, 7 Mar. 2006, URL <http://www.indianembassy.org/newsite/press_release/2006/Mar/sepplan.pdf>.

¹³⁵ Varadarajan, S., 'Nuclear separation plan seeks fine balance', *The Hindu*, 8 Mar. 2006.

US legislative action

In the autumn of 2005 the US Congress took up consideration of legislation that had been introduced by the Bush Administration amending the 1954 Atomic Energy Act (AEA) by specifically exempting India from certain of its provisions. Congress's approval of the legislation in December 2006 paved the way for negotiations to begin between India and the USA on a so-called 123 agreement specifying the terms governing the resumption of trade in nuclear materials and technology envisioned in the CNCI.¹³⁶ However, the resulting agreement will still have to be approved by a joint resolution of Congress before it can enter into force.

The hearings on the proposed legislation held by the US House of Representatives International Affairs Committee and the Senate Foreign Relations Committee reflected the wider public debate under way about the Indian–US nuclear deal. Proponents of the deal argued that the growing strategic importance of India, and its rapidly improving relations with the United States, warranted making a one-time exception to some non-proliferation rules and regulatory arrangements.¹³⁷ They also asserted that foreign nuclear fuel imports and technical cooperation would help India to expand energy production significantly while not meaningfully contributing to India's capacity to produce fissile material for nuclear weapons.¹³⁸ Furthermore, India's acceptance of safeguards on additional nuclear facilities, along with its accession to a future FMCT, would represent important gains for the non-proliferation regime and help to draw India into the regime.¹³⁹

In contrast, many critics of the deal rejected the idea that its implementation was crucial for strengthening the India–US relationship, since those relations were already strong and, in the long run, would grow stronger regardless of whether Congress approved the deal.¹⁴⁰ Opponents of the deal also warned that it would implicitly endorse, if not actually assist, the further growth of India's

¹³⁶ McGoldrick, F., Bengelsdorf, H. and Scheinman, L., 'The U.S.–India nuclear deal: taking stock', *Arms Control Today*, vol. 35, no.8 (Oct. 2005), URL <<http://www.armscontrol.org/act/archived.asp>>. Section 123 of the 1954 Atomic Energy Act, US Public Law 42-2153, 30 Aug. 1954, requires the US Government to conclude an agreement containing a number of binding conditions and assurances, including full-scope safeguards, as a prerequisite for any significant peaceful nuclear cooperation with any state not legally recognized under the NPT as a nuclear weapon state.

¹³⁷ See e.g. Schaffer, T. and Mitra, P., 'The Bush visit and the nuclear deal', *South Asia Monitor*, no. 93 (6 Apr. 2006), URL <http://www.csis.org/saprog/sam_archives/>; and Spring, B., 'Nuclear energy cooperation with India will strengthen US–India ties', Heritage Foundation, Executive Memorandum no. 1007, 25 July 2006, URL <<http://www.heritage.org/Research/AsiaandthePacific/em1007.cfm>>.

¹³⁸ Tellis, A., *Atoms for War? U.S.–Indian Civilian Nuclear Cooperation and India's Nuclear Arsenal* (Carnegie Endowment for International Peace: Washington, DC, June 2006), URL <<http://www.carnegieendowment.org/files/atomsforwarfinal4.pdf>>.

¹³⁹ The White House, 'India civil nuclear cooperation: responding to critics', News release, Washington, DC, 8 Mar. 2006, URL <<http://www.whitehouse.gov/news/releases/2006/03/20060308-3.html>>.

¹⁴⁰ Perkovich, G., 'Faulty promises: the US–India nuclear deal', Carnegie Endowment for International Peace, Policy Outlook no. 21, Sep. 2005, URL <<http://www.carnegieendowment.org/files/PO21.Perkovich.pdf>>.

nuclear arsenal, in contravention of US commitments under the NPT.¹⁴¹ There was particular concern that, if India were allowed to resume imports of nuclear fuel, it could use its limited domestic uranium reserves to support fissile material production for weapon purposes.¹⁴² In addition, critics argued that the proposed deal, by making a special exemption for a favoured US ally, would complicate efforts to enforce existing rules with states such as Iran and North Korea and to convince other states to accept tougher non-proliferation standards.¹⁴³ In doing so, it would undermine the non-proliferation regime, which was built on norms that apply universally, and damage important multilateral endeavours, including the NSG and the NPT regime itself. Finally, India's record on non-proliferation came under scrutiny, with some analysts identifying concerns related to India's nuclear procurement practices and its national export control system.¹⁴⁴

In spite of the controversy surrounding the proposed nuclear deal with India, there was strong bipartisan support in the US Congress for amending the Atomic Energy Act to allow the deal to go forward. Many congressional leaders praised it as a step towards cementing the emerging strategic partnership between India and the United States, although some also expressed concern that the Bush Administration had not been sufficiently forthcoming in releasing classified information about India's compliance with its non-proliferation commitments and about its relations with Iran.¹⁴⁵ On 8–9 December 2006 the House of Representatives and the Senate approved by wide margins a final version of the legislation, which became known as the Henry Hyde United States–India Peaceful Atomic Energy Cooperation Act, or Hyde Act, after the bill's chief sponsor in the House of Representatives.¹⁴⁶ President Bush signed the bill into US law on 18 December 2006.¹⁴⁷

¹⁴¹ As a nuclear weapon state party to the NPT, the United States is obligated under Article I 'not to assist, encourage or induce any non-nuclear weapon State to manufacture or otherwise acquire nuclear weapons or other nuclear explosive devices'. For a legal analysis of the CNCI's implications for the obligations assumed by the USA under the NPT see Ahlström (note 108).

¹⁴² Kimball, D., 'Civil, military separation plan not credible', *Asian Affairs*, Apr. 2006, URL <<http://www.asianaffairs.com>>.

¹⁴³ Motz, K. and Milhollin, G., 'Seventeen myths about the Indian nuclear deal: an analysis of nuclear cooperation with India', Wisconsin Project on Nuclear Arms Control, Washington, DC, 13 June 2006 <http://www.wisconsinproject.org/countries/india/Seventeen_Myths.htm>; and Kimball, D. J. and Cirincione, J., 'A nonproliferation disaster', Center for American Progress, Washington, DC, 11 Dec. 2006, URL <http://www.americanprogress.org/issues/2006/12/india_deal.html>.

¹⁴⁴ Albright, D. and Basu, S., 'Neither a determined proliferator nor a responsible nuclear state: India's record needs scrutiny', Institute for Science and International Security (ISIS), ISIS Report, 5 Apr. 2006, URL <<http://www.isis-online.org/publications/southasia/indiacritique.pdf>>.

¹⁴⁵ Sengupta, S., 'Pact transforms US–India ties', *International Herald Tribune*, 11 Dec. 2006, p. 4.

¹⁴⁶ US House of Representatives, 'United States and India Nuclear Cooperation Promotion Act of 2006: report and additional views', Report no. 109-590, part 1, 21 July 2006, URL <<http://thomas.loc.gov/cgi-bin/cpquery/T?&report=hr590p1&dbname=109>>. 'US approves Indian nuclear deal', BBC News, 9 Dec. 2006, <<http://news.bbc.co.uk/2/6219998.stm>>. The text of the 2006 Henry J. Hyde United States–India Peaceful Atomic Energy Act, US Public Law 109-401, 8 Dec. 2006, is available at URL <http://www.armscontrol.org/pdf/20061208_H5682CR_HSE.pdf>.

¹⁴⁷ The White House, 'President's statement on H.R. 5682, the "Henry J. Hyde United States–India Peaceful Atomic Energy Cooperation Act of 2006"', Press release, Washington, DC, 18 Dec. 2006, URL <<http://www.whitehouse.gov/news/releases/2006/12/20061218-12.html>>.

Indian reactions

With the US Congress's approval of the Hyde Act, the focus of efforts to implement the CNCI shifted to India, where the proposed deal has been the subject of considerable debate among scientific experts and policymakers.¹⁴⁸ Indian officials reacted cautiously to the US legislation. While welcoming it, Minister of External Affairs Pranab Mukherjee said that the legislation contained 'extraneous and prescriptive provisions' outside the scope of the July 2005 joint statement that potentially interfered with India's sovereign right to determine its foreign policy.¹⁴⁹ He also emphasized that India would not allow external scrutiny of, or interference with, its military nuclear programme.

A number of specific provisions in the US legislation were sharply criticized by leading figures in India's nuclear establishment, who urged that India should insist that they be eliminated when negotiating the 123 agreement.¹⁵⁰ Their main criticism was that the Hyde Act would limit India's nuclear options by imposing, 'through the back door', restrictions that in some cases went beyond those of the NPT. One specific objection was that the act called for a 'joint moratorium' by China, India and Pakistan on producing fissile material for nuclear weapons pending the conclusion of an FMCT.¹⁵¹ A second objection was that the act required made India's continued adhere to its unilateral moratorium on nuclear testing a condition for US nuclear cooperation.¹⁵² These provisions were seen as contradicting Prime Minister Singh's assurance to the Indian Parliament that the nuclear deal would not 'limit the options or compromise the integrity of [India's] strategic programme'.¹⁵³ The issue of nuclear testing was particularly important to many the leaders of India's nuclear establishment because they considered that tests might be necessary in the future in order to modernize India's nuclear arsenal in accordance with its perceived national security requirements.¹⁵⁴ The Hyde Act was seen as constraining this option because it stipulated not only that US nuclear cooperation would be terminated if India conducted tests but also that India would be required to return all equipment and materials of US origin that

¹⁴⁸ For Indian perspectives on the CNCI see Delhi Policy Group (DPG), *The Debate on Indo-US Nuclear Cooperation* (DPG: New Delhi, 2006).

¹⁴⁹ 'Text of the *suo motu* statement made by the Union Minister of External Affairs, Shri Pranab Mukherjee, on Indo-US Civil Nuclear Cooperation in the Lok Sabha, December 12, 2006', *The Hindu*, 17 Dec. 2006. There was particular concern in India that the Hyde Act, in Section 103, required the US president to report annually to the US Congress whether India was supporting US-backed efforts to 'sanction and contain' Iran for its alleged pursuit nuclear capabilities.

¹⁵⁰ 'Hyde Act and nuclear scientists' note', *The Hindu*, 16 Dec. 2006 .

¹⁵¹ Srinivasan, M., 'India may lose control of its nuclear future', *The Hindu*, 14 Dec. 2006.

¹⁵² 'Hyde Act and nuclear scientists' note' (note 150).

¹⁵³ Office of the Prime Minister of India, 'Statement of the PM in Rajya Sabha on the India-US nuclear agreement', New Delhi, 17 Aug. 2006, URL <<http://pmindia.nic.in/parl/pcontent.asp?id=30>>.

¹⁵⁴ 'India to keep option open on future N-test: Pranab', Rediff.com, 19 Dec. 2006, URL <<http://www.rediff.com/news/2006/dec/19ndeal12.htm>>.

it may have received under the deal as well as any material produced by India with these items.¹⁵⁵

A second area of criticism was that the Hyde Act reneged on the 2 March 2006 agreement on fuel supply guarantees for the power reactors that India promised to place under permanent civilian safeguards.¹⁵⁶ These guarantees were understood in India as having been offered unconditionally by the USA.¹⁵⁷ However, the congressional conference report accompanying the Hyde Act clarified that the assurance of supply arrangements to which the USA had agreed covered only the disruption of fuel supplies ‘due to market failures or similar reasons and not due to Indian actions that are inconsistent with the July 18, 2005 commitments, such as a nuclear explosive test’.¹⁵⁸

A third area of Indian criticism was that the Hyde Act in effect denied India ‘full cooperation’ in civilian nuclear energy. Specifically, the legislation did not permit the transfer to India of reprocessing, enrichment and heavy water technology and equipment: the requests for such transfers would have to be approved by the US Congress on a case-by-case basis.¹⁵⁹ The legislation also did not give India the right to reprocess spent fuel produced from reactors or material imported from the United States. These restrictions had been added to the final version of the act to ensure that India, which had already developed these technologies, would not divert—even inadvertently—US-supplied technology and equipment to the unsafeguarded facilities associated with its military programme.¹⁶⁰

Finally, the Hyde Act was criticized as an attempt by the USA to dictate the parameters of the safeguards agreement and Additional Protocol that India was supposed to sign with the IAEA.¹⁶¹ The US legislation required that ‘India and the IAEA [be] making substantial progress towards concluding an Additional Protocol consistent with IAEA standards and principles, practices and policies that would apply to India’s civil nuclear programme’ before the US Congress would remove restrictions on nuclear trade with India. It defined the Additional Protocol as one based on the IAEA’s Model Additional Protocol (INFCIRC/540) rather than as an India-specific complementary access protocol to a safeguards agreement with the IAEA, as demanded by India. India has consistently ruled out accepting an intrusive inspections regime that is reserved for non-nuclear weapon states.

¹⁵⁵ Chari, P. R., ‘Indo-US nuclear deal: unending drama in many acts’, Institute of Peace and Conflict Studies (IPCS), IPCS Issue Brief no. 42, Jan. 2007, URL <<http://www.ipcs.org/newlpcsPublications.jsp?status=publications&status1=issue&mod=d>>, p. 3.

¹⁵⁶ Varadarajan, S., ‘Lifetime fuel guarantee remains a sticking point in “123” talks with U.S.’, *The Hindu*, 13 Dec. 2006.

¹⁵⁷ Varadarajan (note 156). Some Indian officials cited as a precedent the Kudankulam reactor deal with Russia, in which India had received sovereign and unqualified Russian guarantees for the lifetime supply of fuel for the reactors being imported from Russia.

¹⁵⁸ US House of Representatives (note 146), p. 10. For the ‘July 18, 2005 commitments’ see The White House (note 109).

¹⁵⁹ ‘Hyde Act and nuclear scientists’ note’ (note 150).

¹⁶⁰ US House of Representatives (note 146), p. 21.

¹⁶¹ Srinivasan (note 151).

Next steps and implications for nuclear supplier arrangements

While the US Congress's approval of the Hyde Act enabled the USA to open negotiations with India on the 123 agreement in 2007, the negative reaction in India suggests that these negotiations are likely to be difficult.¹⁶² President Bush appeared to recognize this when he declared, in his signing statement for the act, that some of its provisions were 'advisory' rather than binding measures.¹⁶³

The Indian-US nuclear deal is emerging as a contentious issue for the 45-member Nuclear Suppliers Group. At the NSG's annual meeting, held on 1–2 June 2006, the USA called on it to make an India-specific exception in its guidelines for nuclear transfers.¹⁶⁴ This would exempt India from the rule, adopted by the NSG in 1992, that prohibits nuclear exports to states that have not concluded a comprehensive safeguards agreement (INFCIRC/153) with the IAEA covering all of their nuclear facilities. The US proposal was supported by France, Russia and the UK, and China later said that it would not oppose it.¹⁶⁵ At the same time, the idea of making an exemption for India was sharply criticized by several member states, notably Ireland and Sweden. The NSG, which operates on the basis of the consensus principle, reportedly decided not to take up the US request until India has completed the parallel negotiations on the 123 agreement with the USA and the new safeguards agreement with the IAEA.¹⁶⁶ Because these negotiations are likely to be protracted, some senior NSG representatives have speculated that the NSG will not formally address the issue until 2008.¹⁶⁷ President Bush's December 2006 signing statement for the Hyde Act suggested that he might waive restrictions on the transfer of items covered by the NSG Guidelines without waiting for the NSG's approval.¹⁶⁸

The US proposal for an India-specific exemption from the NSG Guidelines led to calls from other countries for similar treatment. In 2006 Israel reportedly sought an exemption from NSG transfer restrictions but was rebuffed by the USA.¹⁶⁹ In October 2006 Pakistan proposed a civil nuclear energy agree-

¹⁶² 'Be wary of banking on 123 Agreement', *Business Line*, 3 Jan. 2006, URL <<http://www.thehindu.com/businessline.com/2007/01/03/stories/2007010300580900.htm>>.

¹⁶³ The White House (note 147); and Varadarajan (note 156).

¹⁶⁴ Boese, W., 'Nuclear suppliers still split on U.S.–Indian deal', *Arms Control Today*, vol. 36, no. 6 (July/Aug. 2006), URL <<http://www.armscontrol.org/act/archived.asp>>.

¹⁶⁵ 'China not to oppose nuclear deal: US', *Dawn*, 20 Dec. 2006, URL <<http://www.dawn.com/2006/12/20/int6.htm>>.

¹⁶⁶ Hibbs, M., 'More delays loom over NSG trade sanctions and India', *Nuclear Fuel*, vol. 32, no. 1 (1 Jan. 2007), pp. 11–12.

¹⁶⁷ Hibbs (note 166). At the 1995 NPT Review Conference there was a consensus agreement among the states parties to establish the principle of comprehensive nuclear safeguards as a condition for nuclear supply that formed part of the bargain over the decision to indefinitely extend the NPT.

¹⁶⁸ The statement declared that the Hyde Act's prohibition, in Section 104(d)(2), on 'transferring or approving the transfer of an item to India contrary to Nuclear Suppliers Group transfer guidelines that may be in effect at the time of such future transfer' was not binding on the administration. The White House (note 147).

¹⁶⁹ Hibbs, M., 'US rebuffed Israeli request for exemption from NSG trade rule', *Nuclear Fuel*, vol. 32, no. 1 (1 Jan. 2007), pp. 1, 10.

ment with the USA, along the lines of the Indian–US deal.¹⁷⁰ It also urged the NSG to adopt a ‘non-discriminatory’ approach to regulating nuclear trade based on ‘objective criteria’ of responsible nuclear stewardship and non-proliferation practices, such as those being introduced in Pakistan’s export control system.¹⁷¹ China—which hopes to resume the sale of reactors to Pakistan—indicated that it would support Pakistan’s proposal.¹⁷²

The Indian–US nuclear deal stimulated other activities by nuclear suppliers. In March 2006 Russia agreed to supply a ‘limited amount’ of uranium fuel for India’s two safeguarded nuclear reactors at Tarapur. Russia’s decision to supply fuel at a time when the Tarapur reactors might have to shut down due to a fuel shortage was reportedly influenced by the 2 March 2006 agreement between Bush and Singh on implementing the CNCI.¹⁷³

V. International cooperation to improve nuclear security¹⁷⁴

In 2006 concern about the risk of nuclear materials falling into the hands of non-state actors who could use them in acts of terrorism led to continued investment in strengthening several countries’ national measures for protecting nuclear materials and facilities. Investment in international non-proliferation and disarmament assistance (INDA) programmes remained at roughly the same level as in previous years and several new political initiatives were launched in 2006. In particular, the major INDA donor, the USA, budgeted \$1.85 billion for the 2007 financial year (FY), only slightly less than the \$1.86 billion it budgeted in FY 2006.¹⁷⁵ The 19 member states of the Group of Eight (G8) Global Partnership against the Spread of Weapons and Materials of Mass Destruction¹⁷⁶ reaffirmed in July 2006 their commitment to raise up to \$20 billion by 2012 to support priority projects under the Global Partnership.¹⁷⁷ Some INDA programmes ended in 2006, either because they had accomplished their goals or because they were considered unnecessary in light of improvements in the Russian economy.

¹⁷⁰ Subramanian, N., ‘Pakistan presses U.S. for civil nuclear energy pact’, *The Hindu*, 26 Oct. 2006; and Akhtar, S., ‘US nuclear policy in South Asia’, *Dawn*, 31 Mar. 2006, URL <<http://www.dawn.com/2006/03/31/ed.htm>>.

¹⁷¹ See e.g. Ul-Haq, E., Chairman of the Pakistani Joint Chiefs of Staff Committee ‘Pakistan’s approach towards the challenges of non-proliferation and export controls’, Keynote address to the annual conference of the South Asian Strategic Stability Institute (UK), Brussels, Belgium, 16 Nov. 2006, URL <http://www.sassu.org.uk/html/HomePG_topics/General Ehsan Ul-Haq speech.htm>.

¹⁷² Hibbs (note 164); and Sappenfield, M. and Montero, D., ‘China woos India and Pakistan with nuclear know-how’, *Christian Science Monitor*, 21 Nov. 2006.

¹⁷³ ‘Russia to provide fuel for Tarapur reactors’, *Times of India*, 14 Mar. 2006. Russia invoked the ‘safety exceptions’ clause in the NSG Guidelines, as it had in 2001 when it supplied fuel to Tarapur.

¹⁷⁴ Vitaly Fedchenko, SIPRI Researcher, wrote this section of the chapter.

¹⁷⁵ Managing the Atom Project, Interactive Threat Reduction Budget database, accessed 16 Apr. 2007, URL <http://www.nti.org/e_research/cnwm/charts/cnm_funding_interactive.asp>.

¹⁷⁶ The G8 Global Partnership against the Spread of Weapons and Materials of Mass Destruction was established in 2002 at the G8 summit meeting in Kananaskis, Canada. Anthony, I., ‘Arms control in the new security environment’, *SIPRI Yearbook 2003* (note 3), pp. 567–70.

¹⁷⁷ G8 Summit 2006, ‘Report on the G8 global partnership’ and ‘GPWG Annual Report 2006: consolidated report data, Annex A’, St Petersburg, 16 July 2006, URL <<http://g8russia.ru>>.

Russian–US cooperation on nuclear security

In June 2006 Russia and the USA signed a protocol extending the 1992 Russia–USA Cooperative Threat Reduction (CTR) Umbrella Agreement for Russia for a further seven years.¹⁷⁸ The Umbrella Agreement provided the legal framework for activities in Russia under the CTR Program (also known as the Nunn–Lugar Program). This programme includes INDA programmes to the states of the former Soviet Union and, besides Russia, has also assisted Belarus, Kazakhstan and Ukraine to become free of nuclear weapons and their means of delivery and paved the way for the 2002 G8 Global Partnership.¹⁷⁹

The operational launch of the Mayak Fissile Material Storage Facility in Ozyorsk, Chelyabinsk oblast, Russia, was announced on 11 July 2006.¹⁸⁰ Construction of the facility was completed in 2003 with Russian and US funds. Its purpose is to provide safe and secure storage for surplus Russian weapon-grade plutonium and HEU. Its maximum storage capacity was reported to be 50 tonnes of plutonium and 200 tonnes of HEU.¹⁸¹ Russia currently plans to use about half of its plutonium storage capacity.¹⁸²

On 15 September 2006 Russia and the USA formally concluded an agreement that they had reached in July 2005 on issues relating to liability for accidents in the bilateral plutonium disposition programme.¹⁸³ This programme had been stalled since 2003 while the two sides negotiated language to resolve the impasse.¹⁸⁴ The plutonium disposition programme was established under the 2000 Russia–USA Plutonium Management and Disposition Agreement (PMDA), in which the two countries agreed to eliminate 34 tonnes of surplus weapon-grade plutonium each.¹⁸⁵ The new liability agreement

¹⁷⁸ The Agreement between the Russian Federation and the United States of America concerning the Safe and Secure Transportation, Storage, and Destruction of Weapons and the Prevention of Weapons Proliferation, commonly known as the CTR Umbrella Agreement for Russia, was signed on 17 June 1992 at Washington, DC. On the extension of the Umbrella Agreement see The White House, ‘Cooperative Threat Reduction Agreement with Russia extended’, Press release, 19 June 2006, URL <<http://www.whitehouse.gov/news/releases/2006/06/20060619-7.html>>. The agreement had previously been extended in 1999.

¹⁷⁹ Office of Senator Richard G. Lugar, ‘Progress made against roadblocks to the Nunn–Lugar program’, Press release, Washington, DC, 19 June 2006, URL <<http://lugar.senate.gov/pressapp/record.cfm?id=257390>>.

¹⁸⁰ Tkachenko, Y., ‘Fissile materials storage unit in S. Urals to guarantee n-security’, ITAR-TASS, Moscow, 11 July 2006.

¹⁸¹ US General Accounting Office, National Security and International Affairs Division, ‘Weapons of mass destruction: effort to reduce Russian arsenals may cost more, achieve less than planned’, Report to the Chairman and Ranking Minority Member, Committee on Armed Services, House of Representatives, Washington, DC, GAO/NSIAD-99-76, 13 Apr. 1999, URL <<http://www.gao.gov/archive/1999/ns99076.pdf>>.

¹⁸² ‘Rosatom: bomba sovsem ne strashnaya’ [Rosatom: the bomb is not scary at all], *Trud*, 15 Nov. 2006, URL <<http://www.trud.ru/issue/article.php?id=200611152110203>>.

¹⁸³ US Department of Energy, ‘U.S. and Russia sign liability protocol’, Press release, Washington, DC, 15 Sep. 2006, URL <<http://www.energy.gov/print/4160.htm>>; and Hebert, H. J., ‘US, Russia resolve plutonium dispute’, Associated Press, 15 Sep. 2006, URL <<http://www.partnershipforglobalsecurity.org/Publications/News/NuclearNews/index.asp>>.

¹⁸⁴ On the liability issue see Kile (note 8), pp. 634–37.

¹⁸⁵ The Agreement between the Government of the United States of America and the Government of the Russian Federation Concerning the Management and Disposition of Plutonium Designated as No

underwent Russian inter-agency review in 2006 and was signed as a protocol to the Plutonium Management and Disposition Agreement.

The Nuclear Cities Initiative (NCI), funded by the US Department of Energy (DOE), expired on 22 September 2006. The NCI was established in 1998 to manage the economic conversion of 10 Russian closed nuclear cities that had manufactured nuclear weapons and their essential ingredients. A key aim of the NCI was to provide alternative employment to laid-off nuclear weapon specialists in order to prevent them offering their skills to ‘states and organizations of proliferation concern’.¹⁸⁶ Because of Russia’s rejection of a US demand for a blanket liability exemption for all US staff working in NCI projects, the NCI was not extended in 2003, although a three-year grace period was agreed to allow the completion of existing projects.¹⁸⁷

The DOE reported in October 2006 that it had completed, two years ahead of schedule, a programme to install security enhancements designed to protect against terrorist attacks or unauthorized access at 50 Russian Navy nuclear sites. The programme was a part of a larger DOE-sponsored effort to upgrade the protection, control and accounting of nuclear materials in Russia. The DOE is also reportedly cooperating with the Russian Strategic Rocket Forces to install security upgrades at 25 sites, a task scheduled for completion by the end of 2007. In addition, the DOE started similar work at unidentified Russian military storage sites pursuant to an agreement reached at the 2005 Russia–US summit in Bratislava.¹⁸⁸

The Global Initiative to Combat Nuclear Terrorism

At the July 2006 G8 summit meeting, President Bush and President Putin launched the Russian–US Global Initiative to Combat Nuclear Terrorism.¹⁸⁹ The initiative is designed to ‘prevent the acquisition, transport, or use by terrorists of nuclear materials and radioactive substances or improvised explosive devices using such materials, as well as hostile actions against nuclear facilities’. It builds on the 2005 International Convention for the Suppression of Acts of Nuclear Terrorism.¹⁹⁰ It also complements the 1980 Convention on

Longer Required for Defense Purposes and Related Cooperation was signed on 1 Sep. 2000. The text of the agreement is available at URL <http://www.nnsa.doe.gov/na-20/docs/2000_Agreement.pdf>.

¹⁸⁶ US Department of Energy, Office of Nonproliferation and National Security, *Nuclear Cities Initiative Program Strategy* (Department of Energy: Washington, DC, Aug. 1999), URL <<http://www.ransac.org/new-web-site/primary/transform/nci/ncibook.html>>, p. 1.

¹⁸⁷ Harrington, C., ‘U.S.–Russian nuclear program expires’, *Arms Control Today*, vol. 36, no. 8 (Oct. 2006), URL <<http://www.armscontrol.org/act/archived.asp>>.

¹⁸⁸ US Department of Energy, National Nuclear Security Administration (NNSA), ‘NNSA secures all Russian navy nuclear sites’, Press release, 24 Oct. 2006, URL <http://www.nnsa.doe.gov/docs/news_releases/2006/PR_2006-10-24_NA-06-39.pdf>. On the 2005 agreement see the White House, ‘Joint statement by President Bush and President Putin on nuclear security cooperation’, Press release, 24 Feb. 2005, URL <<http://www.whitehouse.gov/news/releases/2005/02/20050224-8.html>>.

¹⁸⁹ G8 Summit 2006, ‘Joint statement by U.S. President George Bush and Russian Federation President V. V. Putin announcing the Global Initiative to Combat Nuclear Terrorism’, St Petersburg, 15 July 2006, URL <<http://en.g8russia.ru/docs/5.html>>.

¹⁹⁰ Kile (note 8), p. 637.

the Physical Protection of Nuclear Material and Nuclear Facilities¹⁹¹ and UN Security Council resolutions 1373 and 1540,¹⁹² as well as relevant national legal instruments. The aims of the initiative are to improve protection, control and accounting of nuclear and radioactive materials; to detect and suppress illicit handling of such materials, especially for terrorist purposes; to improve preparedness for responding to acts of nuclear terrorism; to facilitate development of technical means to combat nuclear terrorism; and to improve law enforcement and national legal instruments for preventing and penalizing acts of terrorism. The initiative does not cover military stockpiles and facilities.

A meeting was held on 30–31 October 2006 in Rabat, Morocco, at which Russia, the USA and 11 ‘Global Initiative partner’ states agreed a statement of principles for the Global Initiative.¹⁹³ The states also established terms of reference for facilitating provision of assistance for states requiring it in the framework of the initiative.¹⁹⁴

VI. The fissile material cut-off treaty

In 2006 there were renewed, but ultimately unsuccessful, efforts at the Conference on Disarmament in Geneva to overcome the procedural impasse that has prevented the opening of negotiations on a fissile material cut-off treaty. The negotiations have been delayed since 1995, when the CD adopted a mandate (the so-called Shannon mandate, named after the Canadian ambassador to the CD, Gerald Shannon, who had been appointed special coordinator) to ‘negotiate a non-discriminatory, multilateral and effectively verifiable treaty banning the production of fissile material for nuclear weapons or other nuclear explosive devices’.¹⁹⁵ The Shannon mandate left unresolved key differences over the scope of the proposed ban, but its adoption paved the way for the decision in 1998 to establish an ad hoc committee for negotiating an

¹⁹¹ The Convention on the Physical Protection of Nuclear Material was opened for signature on 3 Mar. 1980 and entered into force on 8 Feb. 1987. In 2005 it was amended and renamed the Convention on the Physical Protection of Nuclear Material and Nuclear Facilities. The CPPNM is the only multilateral treaty in force that deals with physical protection issues. For a brief description and the parties to the convention see annex A. The 1980 text of the convention is available at URL <<http://www.iaea.org/Publications/Documents/Conventions/cppnm.html>>. For details of the 2005 amendments see IAEA Board of Governors General Conference, ‘Nuclear security: measures to protect against nuclear terrorism: amendment to the Convention on the Physical Protection of Nuclear Material’, Report by the Director General, GOV/INF/2005/10-GC(49)/INF/6, 6 Sep. 2005, URL <<http://www.iaea.org/About/Policy/GC/GC49/Documents/gc49inf-6.pdf>>.

¹⁹² UN Security Council Resolution 1373, 28 Sep. 2001; and UN Security Council Resolution 1540, 28 Apr. 2004.

¹⁹³ McCormack, S., Spokesman, US Department of State, ‘Statement of principles by participants in the Global Initiative to Combat Nuclear Terrorism’, Press statement, Washington, DC, 31 Oct. 2006, URL <<http://www.state.gov/r/pa/prs/ps/2006/75405.htm>>.

¹⁹⁴ The 11 states were Australia, Canada, China, France, Germany, Italy, Japan, Kazakhstan, Morocco, Turkey and the UK. Porth, J. S., ‘Nations meet in Morocco on how to counter nuclear terror threat’, Current Issues, US Department of State, Bureau of International Information Programs (USINFO), 30 Oct. 2006, URL <<http://usinfo.state.gov/usinfo/products/washfile.html>>.

¹⁹⁵ Shannon, G. E., Report on consultations on the most appropriate arrangement to negotiate a treaty banning the production of fissile material for nuclear weapons or other nuclear explosive devices, CD/1299, 24 Mar. 1995, URL <<http://www.reachingcriticalwill.org/political/cd/shannon.html>>.

FMCT.¹⁹⁶ However, the CD has subsequently been unable to adopt a work programme—which is a prerequisite for convening the negotiating committee—because of a dispute over whether to establish negotiating committees for other items on its agenda.¹⁹⁷ Many member states and informal groups of states insist that progress towards an FMCT should be linked to simultaneous movement on issues of particular concern to them, notably nuclear disarmament, the prevention of an arms race in outer space (PAROS) and negative security assurances (NSAs).¹⁹⁸ All of these agenda items have been perennially divisive issues in the CD. This insistence on a ‘balanced programme of work’ has effectively stalled the FMCT negotiation process because the CD operates on the consensus principle.¹⁹⁹

In recent years PAROS has become a top priority for both China and Russia, largely because of their concern that the USA may eventually deploy a space-based missile defence system that would threaten their strategic nuclear forces. Other states, in particular Canada, have warned that the deployment of space-based weapons might precipitate a destabilizing arms race in outer space. In 2006 China and Russia reiterated their view that the FMCT negotiations could not be the sole item on the CD’s work programme and must be accompanied by the convening of a body to consider the PAROS issue.²⁰⁰ China reaffirmed its position that such a body could have a discussion mandate rather than a negotiation mandate, as long as this were understood to be a step towards negotiating a new legal instrument governing the military uses of space.²⁰¹ However, the USA has resolutely rejected proposals for re-establishing an ad hoc committee on PAROS and has refused to discuss the issue.²⁰² The USA has also ruled out consideration of an international ban on space-based weapons, arguing that such a ban would be ‘impossible to define in a way that

¹⁹⁶ Conference on Disarmament, ‘Decision on the establishment of an ad hoc committee under item 1 of the agenda entitled “Cessation of the nuclear arms race and nuclear disarmament”’, CD/1547, 11 Aug. 1998.

¹⁹⁷ The CD has a permanent agenda that was agreed in 1978 at the UN General Assembly’s first Special Session on Disarmament. For more information on the CD see Center for Nonproliferation Studies, ‘Conference on Disarmament (CD)’, Inventory of International Nonproliferation Organizations and Regimes, URL <http://nti.org/e_research/official_docs/inventory/pdfs/cd.pdf>.

¹⁹⁸ NSAs are commitments by the 5 nuclear weapon states not to use, or threaten to use, nuclear weapons against non-nuclear weapon states parties to the NPT.

¹⁹⁹ There have been numerous proposals for revising the CD’s rules of procedure, in particular the consensus principle, which has remained unchanged since the now 65-member body originated as the Ten Nation Committee on Disarmament in 1959. See e.g. Weapons of Mass Destruction Commission (the Blix Commission), *Weapons of Terror: Freeing the World of Nuclear, Biological and Chemical Weapons* (Weapons of Mass Destruction Commission: Stockholm, 2006), p. 180.

²⁰⁰ Cheng, J., Ambassador for Disarmament Affairs of China, Statement on PAROS by at the plenary of the Conference on Disarmament, Geneva, 8 June 2006, URL <<http://www.reachingcriticalwill.org/political/cd/speeches06/8JuneChina.pdf>>; and Loshchinin, V., Permanent Representative of the Russian Federation to the Conference on Disarmament, ‘PAROS: the importance of the issue’, Statement to the Conference on Disarmament, Geneva, 8 June 2006, URL <<http://www.reachingcriticalwill.org/political/cd/speeches06/8JuneRussia1.pdf>>.

²⁰¹ Cheng (note 200). Prior to 2003 China had insisted on convening an ad hoc negotiating committee on PAROS.

²⁰² Between 1985 and 1995, the CD had a subsidiary committee on PAROS, which analyzed relevant issues and terminology but never conducted a negotiation.

excludes practical and important uses of space-based systems' for peaceful purposes.²⁰³

In addition to differences over which agenda items to include on the work programme, there have been two main substantive obstacles to opening negotiations on an FMCT. The first has to do with the linkage of an FMCT to progress towards nuclear disarmament. The Group of 21 (G-21) non-aligned states at the CD have long called for the establishment of an ad hoc committee on nuclear disarmament that would negotiate, in parallel with the FMCT ad hoc committee, a convention leading to the phased elimination of nuclear weapons within a specified period of time.²⁰⁴ France, Russia, the UK and the USA have adamantly opposed the establishment of a committee on nuclear disarmament. The second obstacle has to do with questions about the scope of an FMCT: whether it should ban only the future production of fissile material for weapon purposes or should also prevent existing stocks of such material from being used to manufacture new weapons. Many non-aligned states, in particular Egypt and Pakistan, have demanded that the ban should go beyond mandating a cut-off of fissile material production and cover existing stocks. This idea has generated strong opposition from the P5 states, which continue to hold large inventories of fissile material for military purposes.²⁰⁵ These states, along with India, argue that the mandate should apply only to the future production of fissile material.

The disputes over the treaty's scope and its relationship to nuclear disarmament reflect an underlying disagreement at the CD over the basic purpose of an FMCT. The P5 states tend to view it as an extension of existing non-proliferation arrangements and commitments. By banning the future production of fissile material for nuclear weapons after an agreed date, it would serve to make permanent the moratorium on producing such material that the P5 are already observing.²⁰⁶ At the same time, it would cap the supply of weapon-usable material available to the de facto nuclear weapon states that have not joined the NPT—India, Israel, Pakistan and possibly North Korea—and promote their adherence to an emergent global norm.²⁰⁷

Most of the other member states have sought to forge an FMCT that would be a measure for nuclear disarmament as well as non-proliferation. Some G-21 states, among them Algeria, Brazil and South Africa, do not use the term 'fis-

²⁰³ Delegation of the United States of America to the Conference on Disarmament, Statement at the Conference on Disarmament, Geneva, 13 June 2006, URL <<http://www.reachingcriticalwill.org/political/cd/speeches06/13JuneUS.pdf>>.

²⁰⁴ al-Shibib, B., Permanent Representative of the Republic of Iraq, Statement on behalf of the Group of 21 at the Conference on Disarmament, Geneva, 28 Feb. 2006, URL <<http://www.reachingcriticalwill.org/political/cd/speeches06/28FebG21.pdf>>. See also Kile, S. N., 'Nuclear arms control', *SIPRI Yearbook 1998: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 1998), p. 431; and Kile, S. N., 'Nuclear arms control', *SIPRI Yearbook 1998: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 1999), p. 530. For a list of the current members of the G-21 see URL <<http://www.reachingcriticalwill.org/political/cd/cdindex.html>>.

²⁰⁵ For an estimate of global inventories of fissile material see appendix 12C.

²⁰⁶ France, Russia, the UK and the USA have publicly declared they no longer produce HEU and plutonium for nuclear weapons. China is also believed to have halted such production.

²⁰⁷ Rissanen, J., 'Time for a fissban—or farewell?', *Disarmament Diplomacy*, no. 83 (winter 2006), URL <<http://www.acronym.org.uk/dd/dd83/83fissban.htm>>.

sile material cut-off treaty', since this implies only a ban on future production. They refer instead to a 'fissile material treaty' that would have a broader mandate covering existing stocks.²⁰⁸ Under most proposals, these stocks would have to be declared and then placed under some form of international safeguards or supervision. In 2006 Pakistan renewed its call for a fissile material treaty that would impose upper limits, based on 'the principles of proportionality and sufficiency', on existing stocks so that all national holdings of fissile material for military purposes would be 'equalized at the lowest level possible'.²⁰⁹ For Pakistan and some other countries, the inclusion of existing stocks has become a *sine qua non* for an FMCT, primarily because of regional security rivalries. Pakistan is concerned that a treaty banning only future production would perpetuate its perceived inferiority in holdings of weaponisable fissile material vis-à-vis those of India. In the Middle East, Egypt and other Arab states see an FMCT as way to constrain and eventually reduce Israel's nuclear arsenal.²¹⁰

The US draft treaty

On 18 May 2006 the USA put forward at the CD the draft text of an FMCT. In presenting the document, Acting Assistant Secretary of State Stephen Rademaker declared that the US objective was to set out, 'with no preconditions', the essential elements of an 'effective FMCT' that could be negotiated and opened for signature by the end of the year.²¹¹ He emphasized that the United States saw 'no need at this time . . . for the negotiation of new multilateral agreements' apart from the FMCT, which was the only item on the CD's agenda that enjoyed consensus support. However, Rademaker added that the US delegation was prepared to discuss a range of 'new' and 'traditional' security issues in conjunction with the FMCT negotiations. The latter remark was welcomed at the CD, since it improved the prospects for reaching a deal on a work programme.²¹²

²⁰⁸ See e.g. Mtshali, G. J., Permanent Representative of the Republic of South Africa to the Conference on Disarmament, Statement of the Republic of South Africa on a fissile material treaty, Conference on Disarmament, Geneva, 17 May 2006, URL <<http://www.reachingcriticalwill.org/political/cd/speeches/06/17MaySouthAfrica.pdf>>.

²⁰⁹ Khan, M., Permanent Representative of Pakistan to the Conference on Disarmament, Statement at the Conference on Disarmament, Geneva, 16 May 2006, URL <[http://www.reachingcriticalwill.org/political/cd/speeches06/statements/16 may/16MayPakistan.pdf](http://www.reachingcriticalwill.org/political/cd/speeches06/statements/16%20may/16MayPakistan.pdf)>.

²¹⁰ Rissanen (note 207).

²¹¹ Rademaker, S. G., US Acting Assistant Secretary of State for International Security and Non-proliferation, 'Rising to the challenge of effective multilateralism', Remarks at the Conference on Disarmament, Geneva, 18 May 2006, URL <<http://www.state.gov/t/isn/rls/rm/66419.htm>>.

²¹² A compromise work programme was proposed in 2003—the so-called Five Ambassadors Initiative or A5 proposal—envisioning the concurrent 'negotiation' of an FMCT and 'discussions' of negotiating mandates for the other 3 issues, appeared to win the support of most member states. Conference on Disarmament, 'Initiative of the ambassadors Dembri, Lint, Reyes, Salander and Vega: proposal of a program of work', CD/1693/Rev.1, 5 Sep. 2003, URL <<http://www.reachingcriticalwill.org/political/cd/A5.pdf>>.

Under the US draft treaty, the states parties would undertake not to produce fissile material for nuclear weapons or other nuclear explosive devices.²¹³ The draft's definition, in Article II, of the term 'fissile material' includes only those materials most likely to be used in nuclear weapons rather than a wider range of 'weapon-grade' or 'weapon-usable' materials, as has been proposed by some arms control advocates.²¹⁴ The text also defines the term 'produce fissile material', which is directly linked to the scope of the proposed treaty:²¹⁵ it states that 'the term "produce fissile material" does not include activities involving fissile material produced prior to entry into force of the Treaty'. This is consistent with the long-standing US position that existing stocks of fissile material would be unaffected by an FMCT. The draft treaty does not prohibit the production of fissile material for non-explosive purposes, such as HEU for naval propulsion reactors.

The most controversial feature of the US draft treaty is that it does not include any provisions for an international verification mechanism. According to Rademaker, the lack of a verification mechanism does not 'mean that compliance with the treaty would be unverified, but rather that the primary responsibility for verification would rest with the parties using their own national means and methods'.²¹⁶ This reflects the Bush Administration's position, announced in 2004, that an FMCT is not 'effectively verifiable'.²¹⁷ The administration's main justification was that, because an FMCT would allow the retention of existing stocks as well as the continued production of fissile material for civilian and non-explosive uses, inspectors would find it difficult to determine the purpose for which any suspect fissile material had been made and whether it had been manufactured before or after the treaty took effect.²¹⁸

²¹³ US Mission to the United Nations in Geneva, 'US tables draft FMCT text at Conference on Disarmament', Press release, Geneva, 18 May 2006, URL <<http://geneva.usmission.gov/Press2006/0518DraftFMCT.html>>.

²¹⁴ The US draft treaty defines 'fissile material' as: (a) plutonium, except plutonium whose isotopic composition includes 80% or greater plutonium-238; (b) uranium containing a 20% or greater enrichment in the isotopes uranium-233 or uranium-235, separately or in combination; or (c) any material that contains the material defined in a or b.

²¹⁵ The US draft treaty defines 'produce fissile material' as: (a) to separate any fissile material from fission products in irradiated nuclear material; (b) to enrich plutonium-239 in plutonium by any isotopic separation process; or (c) to enrich uranium-233 or uranium-235 in uranium to an enrichment of 20% or greater in those isotopes, separately or in combination, by any isotopic separation process.

²¹⁶ Rademaker (note 211).

²¹⁷ Sanders, J. W., Permanent Representative of the USA to the Conference on Disarmament and Special Representative of the President for the Nonproliferation of Nuclear Weapons, 'US proposals to the Conference on Disarmament', Remarks to the Conference on Disarmament, Geneva, 29 July 2004, URL <<http://www.state.gov/t/ac/rls/rm/2004/34929.htm>>; and Boese, W., 'Bush shifts fissile material ban policy', *Arms Control Today*, vol. 34, no. 7 (Sep. 2004), URL <<http://www.armscontrol.org/act/archived.asp>>.

²¹⁸ Nuclear forensic techniques exist that are designed to determine the 'age' of nuclear material (i.e. the time since the parent isotope was last chemically separated from its decay products). IAEA, *Nuclear Forensics Support*, Technical Guidance, Reference manual, IAEA Nuclear Security Series no. 2, STI/PUB/1241 (IAEA: Vienna, 2006), URL <http://www-pub.iaea.org/MTCD/publications/PDF/Pub1241_web.pdf>, p. 30; and Moody, K. J., Hutcheon, I. D. and Grant, P. M., *Nuclear Forensic Analysis* (CRC Press: Boca Raton, Fla., 2005), pp. 207–40. E.g. the method for determining the age of HEU is given in Moorthy, A. R. and Kato, W. Y., 'HEU age determination', BNL-52535, Formal report, Brookhaven National Laboratory, Department of Advanced Technology, Long Island, N.Y., 1 July 1997, URL <<http://www.osti.gov/energycitations/purl.cover.jsp?url=534522-eS1Bs2/webviewable/>>.

The US Administration concluded that even extensive verification measures might not be able to detect or deter a determined cheater. At the same time, such measures would provide a false sense of security for compliant parties while also intruding into the legitimate security affairs of some states.²¹⁹

This position put the United States at odds with most other CD member states, which believed that an FMCT should include formal verification provisions, as was clearly envisioned in the Shannon mandate. There has been widespread support for the idea that a verification regime should be based on the system of comprehensive safeguards agreements already in place between the IAEA and non-nuclear weapon states parties to the NPT.²²⁰ In practical terms, this would involve extending safeguards-based verification arrangements to the nuclear weapon states as well as to the states outside the NPT, leading to the eventual ‘convergence’ of the FMCT and NPT regimes.

While not endorsing the US draft treaty’s lack of verification measures, Australia and several European states pointed out that this was not an obstacle to opening negotiations without preconditions. The talks could focus initially on reaching a framework agreement that would establish a norm regarding the cessation of fissile material production for nuclear weapons; measures to verify compliance could be left to subsequent, largely technical, negotiations.²²¹ However, many other member states were reluctant to embrace the idea of starting negotiations in which some of the parties might not be committed to an ‘effectively verifiable’ FMCT. India expressed concern that the omission of a verification mechanism might ‘engender a lack of confidence in compliance with the treaty, encourage wilful non-compliance and lead to allegations and counter-allegations of non-compliance’.²²²

The reactions at the CD to the US draft treaty were generally reserved. The USA won plaudits for showing some flexibility regarding procedural roadblocks.²²³ However, many observers noted that the US proposal would require a revision of the Shannon mandate—a task likely to be as divisive as adopting a work programme. There was also considerable speculation that the main factor driving the USA’s submission of the draft treaty was the Bush Adminis-

²¹⁹ US Mission to the United Nations in Geneva, ‘United States of America White Paper on a fissile material cutoff treaty’, Geneva, 18 May 2006, URL <<http://geneva.usmission.gov/Press2006/0518WhitePaper.html>>.

²²⁰ For a discussion of how IAEA safeguards arrangements and practices contribute to verifying an FMCT see Rauf, T., Head of Verification and Security Policy Coordination, IAEA, ‘A cut-off of production of fissionable material: considerations, requirements and IAEA capabilities’, Statement to the Conference on Disarmament, Geneva, 24 Aug. 2006, URL <<http://www.reachingcriticalwill.org/political/cd/speeches06/24AugustIAEA.pdf>>.

²²¹ Millar, C., Ambassador for Disarmament of Australia, ‘Fissile material cut-off treaty’, Statement to the Conference on Disarmament, Geneva, 17 May 2006, URL <<http://www.reachingcriticalwill.org/political/cd/speeches06/17MayAustralia.doc>>.

²²² Prasad, J., Ambassador and Permanent Representative of India to the Conference on Disarmament, Statement to the Conference on Disarmament, Geneva, 17 May 2006, URL <<http://www.reachingcriticalwill.org/political/cd/speeches06/17MayIndia.pdf>>.

²²³ Crail, P., ‘U.S. fissile material proposals stir cautious optimism’, *WMD Insights*, July/Aug. 2006, URL <http://wmdinsights.com/17/17_G1_USFissileMaterial.htm>.

tration's desire to draw India into an FMCT and thereby improve the chances that the US Congress would approve the Indian–US nuclear deal.²²⁴

The CD ended its annual sessions for 2006 having failed, for the 11th consecutive year, to open negotiations on a treaty banning the production of fissile material for nuclear weapons. The frustration with procedural ‘hostage-taking’ and other dysfunctional features of the CD has led to a number of proposals for negotiating a fissile material treaty in an ad hoc forum of like-minded states outside that body.²²⁵ To be effective, any resulting treaty would eventually have to include countries such as India, Israel and Pakistan, which either are producing fissile material for weapon purposes or, in the case of China, may be determined to keep open the option to do so in the future. While not publicly opposing an FMCT, none of these countries has shown enthusiasm for concluding a ban on the production of fissile materials in the short term.

VII. Conclusions

In 2006 the UN Security Council moved to the centre of the escalating confrontations over the nuclear programmes of Iran and North Korea. In a reflection of the depth of international concern about these programmes, the Security Council demanded that both countries halt their activities of proliferation concern—including non-proscribed activities such as ballistic missile flight-testing—and subsequently imposed sanctions on them for failing to heed its demands. The sanctions agreed to by the Security Council involved a set of limited financial and trade restrictions that were specifically aimed at denying Iran and North Korea access to the technology, equipment and expertise that could contribute to their nuclear and ballistic missile programmes. Together with punitive measures imposed by individual Security Council members, the selective sanctions seemed likely to have some effect in constraining the Iranian and North Korean programmes. They did not, however, appear to change the structure of incentives for Iran and North Korea to engage to pursue these programmes and may actually have reinforced Iran's commitment to developing sensitive nuclear fuel-cycle facilities. In this regard, the Security Council was largely ineffective in asserting its authority under the UN Charter to take action to preserve international peace and security.

It remains an open question whether a fractious and often fractured Security Council can summon the resolve and unity of purpose to take a more robust approach to dealing with tough proliferation cases such as Iran and North Korea. The diplomatic bargaining preceding the Security Council's resolutions on Iran and North Korea underscored the fact that for many states non-proliferation is only one objective among numerous—and often competing—commercial, economic and strategic objectives. The nuclear diplomacy at the Security Council also highlighted the difficulty of mobilizing international

²²⁴ Krepon, M., ‘The Bush Administration tables a draft “cutoff” treaty: analysis of key elements’, Stimson Center, Washington, DC, 18 May 2006, URL <<http://www.stimson.org/pub.cfm?id=293>>.

²²⁵ Rissanen (note 207).

support for a global non-proliferation regime that has come under increasingly sharp criticism, especially from the non-aligned states, for perpetuating a discriminatory division between those countries that have nuclear weapons and those that do not. This difficulty was compounded in 2006 by the widespread perception that, in the proposed nuclear deal with India, the US Administration was seeking to impose one set of rules for states that it deemed to be 'responsible' and another set for those deemed to be dangerous, based on whether the states were friends or potential adversaries of the USA. The growing discontent with the global non-proliferation regime raises the prospect that fewer and fewer states may be willing to defend its rules and regulatory restraints against alleged transgressors unless the normative legitimacy of the regime itself is strengthened. This will require, above all, a renewed commitment by all states to implement fully their non-proliferation and disarmament commitments within a framework of rules and norms that apply universally.