6. Nuclear arms control and ballistic missile defence

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I. Introduction

In 2000 the nuclear arms control agenda was dominated by the controversy over the United States' missile defence plans and efforts to amend the 1972 Treaty on the Limitation of Anti-Ballistic Missile Systems (ABM Treaty). This controversy obstructed efforts to further reduce strategic nuclear arms and gave rise to international concern that the entire framework of nuclear arms control was in danger of breaking down. Although the Russian Federal Assembly (parliament) ratified the 1993 Treaty on Further Reductions and Limitations of Strategic Offensive Arms (START II Treaty) in 2000, the prospect loomed that the treaty would never enter into force because of the conditions attached by the Russian Parliament to its ratification bill. There was one positive development during the year: the 2000 Review Conference of the 1968 Treaty on the Non-Proliferation of Nuclear Weapons (Non-Proliferation Treaty, NPT) ended with the adoption by consensus of a Final Document setting out a number of concrete nuclear disarmament goals.

This chapter reviews the principal developments in nuclear arms control in 2000. Section II examines the US programme to develop and deploy a limited national missile defence (NMD) system. It describes the Russian–US discussions on a US proposal to amend the ABM Treaty to permit the USA to deploy the proposed NMD system and assesses the reactions of other governments. Section III examines developments related to the START treaty regime and assesses the prospects for negotiating deeper nuclear arms reductions. Section IV describes developments related to other Russian–US nuclear arms control agreements. Section V describes the procedural impasse in the Conference on Disarmament (CD) that again blocked the opening of negotiations on a Fissile Material Cut-off Treaty (FMCT), while section VI highlights developments and concerns related to the Comprehensive Nuclear Test-Ban Treaty (CTBT). Section VII presents the conclusions.

Appendix 6A summarizes the results of the 2000 NPT Review Conference. It also analyses the conference's implications for the strengthened NPT review process and the future of the nuclear non-proliferation regime. Appendix 6B provides data on the nuclear forces of the five NPT-defined nuclear weapon states and on the nuclear arsenals of India, Israel and Pakistan. Appendix 6C examines the problem of illicit trafficking in nuclear and radioactive materials and describes measures to combat this problem.

II. Ballistic missile defence and the future of the ABM Treaty

The US missile defence debate

The issue of ballistic missile defence (BMD) and the ABM Treaty has been a recurrent source of partisan controversy in the USA.[1] In recent years there has been renewed interest in missile defence, especially among Republican leaders in Congress, in the light of perceived new proliferation threats. Proponents of missile defences have argued that they are needed to protect the population of the USA, as well as US troops and allies overseas, against an attack by a small number of long-range missiles—possibly armed with nuclear or other non-conventional weapons—launched by so-called states of concern.[2] They have complained that the ABM Treaty is an artefact of the cold war which precludes the development of the effective defences needed to counter these new threats.[3]

At the core of the current debate are disputes over three interrelated issues: (*a*) the nature of the threat posed by the proliferation of nuclear, biological and chemical (NBC) weapons and the means to deliver them; (*b*) the technical feasibility of NMD and its likely effectiveness in addressing these threats; and (*c*) the relationship between deterrence and defence in the post-cold war world and the relevance of the ABM Treaty to US national security as the cornerstone of strategic stability. Although there is a wide range of views on these issues, the 'battle line' has been drawn roughly between two groups: those who favour preserving the ABM Treaty regime essentially intact, either by leaving the treaty unchanged or negotiating modest amendments to it in order to permit the deployment of a limited national missile defence system; and those who favour overturning the ABM Treaty regime, either by making comprehensive changes to the treaty or by scrapping it altogether in order to move forward with the development of more robust missile defences. Underlying this division is a deeper disagreement about the adequacy of the existing framework of interlocking arms control treaties and multilateral supplier arrangements designed to prevent the spread of nuclear weapons and the means to deliver them. This disagreement has been fuelled by growing scepticism among US conservatives about the efficacy of the non-proliferation

[1] Stützle, W., Jasani, B. and Cowen, R., SIPRI, *The ABM Treaty: To Defend or Not to Defend?* (Oxford University Press: Oxford, 1987); Cirincione, J., 'The persistence of the missile defense illusion', Paper presented at the conference on Nuclear Disarmament, Safe Disposal of Nuclear Materials or New Weapons Developments?, Como, Italy, 2–4 July 1998, available at URL <http://www.ceip.org/programs/npp/bmd.htm>; and FitzGerald, F., *Way Out There in the Blue: Reagan, Star Wars and the End of the Cold War* (Simon & Schuster: New York, 2000).

[2] Heritage Foundation Commission on Missile Defence, *Defending America: A Plan to Meet the Urgent Missile Threat* (Heritage Foundation: Washington, DC, 1999); and Spence, F., Office of the Chairman of the Armed Services Committee, US House of Representatives, 'Nuclear deterrence: the cornerstone of US national security', *National Security Report*, vol. 3, no. 2 (Aug. 1999), pp. 1, 4.

[3] The ABM Treaty was signed by the USA and the USSR in May 1972 and entered into force in Oct. 1972. For a summary of the main provisions of the treaty see annexe A in this volume. The text of the ABM Treaty; the Agreed Statements, Common Understandings and Unilateral Statements; and the 1974 Protocol are presented in Stützle, Jasani and Cowen (note 1), pp. 207–13.

regime—and about the value of arms control agreements in general—and by their inclination to favour unilateral responses to proliferation challenges.[4]

One of the main arguments put forward by NMD proponents is that strategic defence usefully supplements nuclear deterrence in the multipolar post-cold war world. Some argue that this supplement is increasingly needed, given the emergence of states armed with long-range ballistic missiles which might not be deterred by threats of devastating retaliation. Others discount the emergence of potentially 'undeterrable' states, arguing that the real danger is that states might miscalculate and start an armed conflict in the belief that the USA will be deterred by their missiles from intervening in the conflict; the deployment of an effective NMD system would force these states to reassess the risks they would face in confronting the USA. NMD supporters point out that, in deploying an NMD system, the USA would concomitantly enhance its freedom of action to intervene in regional trouble spots.

Emergent consensus on NMD

Political support for NMD was galvanized by growing concerns about perceived new ballistic missile threats to the USA. North Korea's unannounced launch, on 31 August 1998, of a three-stage Taepo Dong I missile heralded an important turning point in the missile defence debate and was widely perceived as lending credence to concerns that the USA faced a long-range missile threat from North Korea, including the prospect that the latter would soon develop a ballistic missile capable of striking US territory.[5] These concerns were reinforced by the findings of several influential expert commissions and intelligence community reports which concluded that the long-range ballistic missile capabilities being developed by countries such as Iran and North Korea represented an emerging threat to the USA.[6] However, some critics have argued that these reports were misused by missile defence proponents to create an exaggerated sense of threat by focusing attention on the programmes in a few developing nations and then adopting a series of worst-case assumptions.[7]

[4] E.g., Perle, R., 'Good guys, bad guys and arms control', eds I. Anthony and A. D. Rotfeld, SIPRI, *A Future Arms Control Agenda* (Oxford University Press: Oxford, 2001), pp. 43–49.

[5] For a comprehensive overview of North Korea's ballistic missile programme, see Bermudez, J., *A History of Ballistic Missile Development in the DPRK*, Occasional Paper no. 2 (Center for Nonproliferation Studies, Monterey Institute of International Studies: Monterey, Calif., Nov. 1999); and Anthony, I., 'Responses to proliferation: the North Korean ballistic missile programme', *SIPRI Yearbook 2000: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 2000), pp. 647–66.

[6] 'Executive Summary of the Report of the Commission to Assess the Ballistic Missile Threat to the United States (Rumsfeld Commission Report)', 15 July 1998, URL <http://www.house.gov/hasc/testimony/105thcongress/BMThreat.htm>; and National Intelligence Council, 'Foreign missile developments and the ballistic missile threat to the United States through 2015', Sep. 1999, URL <http://www.fas.org/irp/threat/missile/nie99msl.htm#rtoc2>.

[7] Cirincione, J., 'Assessing the ballistic missile threat', *Nonproliferation Review*, vol. 7, no. 1 (spring 2000), pp. 125–37. In addition, it has been argued that the USA faces a greater threat from non-state actors armed with weapons of mass destruction using non-missile delivery means. Lewis, G., Gronlund, L. and Wright, D., 'National missile defense: an indefensible system', *Foreign Policy*, no. 117 (winter 1999/2000), pp. 120–31.

The emerging US political consensus on the threat posed by ballistic missile proliferation led to the passage of the National Missile Defense Act of 1999. This law, which was supported by both the legislative and executive branches and by both political parties, committed the USA 'to deploy as soon as is technologically possible an effective National Missile Defense system capable of defending the territory of the United States against limited ballistic missile attack (whether accidental, unauthorized, or deliberate)'.[8] Its enactment was part of the broader shift that occurred in the US missile defence debate: the main point of contention was no longer whether a limited NMD system should be deployed but how limited that system should be and the degree to which it should be constrained by the ABM Treaty.[9]

The planned US national missile defence system

The USA has outlined plans for a limited NMD system that would be deployed in two or more phases following a series of presidential decisions to do so, although considerable uncertainty remains regarding the timing and size of any eventual deployment. Under the '3 + 3' formula adopted in 1997, the US Department of Defense (DOD) was committed to pursuing a 'deployment readiness' programme for a limited NMD system rather than the 'technology readiness' programme adopted in 1993. An initial Deployment Readiness Review was scheduled to take place in June 2000, at which time a decision could be taken by the president to begin deployment of a limited NMD system three years later (i.e., in 2003). However, in order to reduce the technical risks associated with meeting an early deployment deadline, the programme was restructured in 1999 so that the target date for achieving an initial operating capability (IOC) was postponed until 2005.

In the spring of 2000, US Ballistic Missile Defense Organization (BMDO) officials announced that the NMD programme would be expanded beyond the initial Capability 1 (C1) architecture to meet near-term threats larger than the original architecture was designed to handle.[10] The 'Expanded C1' deployment option builds upon the revised NMD programme guidance announced by the DOD in the autumn of 1999; according to Pentagon officials, it is based on consideration of the source of the missile threat as well as the number and sophistication of missiles and warheads that 'states of concern' like North Korea and Iran are expected to possess.[11] The aim is to put in place by 2005–2007 an initial missile defence system able to defend the 50 US states against what is deemed to be the most immediate missile threat, that is, the 'launch of

[8] National Missile Defense Act of 1999, Public Law 106-38, 22 July 1999.

[9] Daalder, I. *et al*., 'Deploying NMD: not whether, but how', *Survival*, vol. 42, no. 1 (spring 2000), pp. 6–28.

[10] Statement of Lt Gen. Ronald T. Kadish, Director, Ballistic Missile Defense Organization, before the Senate Appropriations Committee Defense Subcommittee, 12 Apr. 2000, BMDO Internet site, URL <http://www.acq.osd.mil/bmdo/bmdolink/html/kadish12apr00.html>.

[11] Statement of Lt Gen. Ronald T. Kadish, Director, Ballistic Missile Defense Organization, before the House Armed Services Committee, Subcommittee on Military Research & Development, 22 June 2000, URL <http://www.acq.ods.mil/bmdo/bmdolink/html/kadish22jun00.html>.

a few warheads accompanied by simple penetration aids' by North Korea.[12] The system would also defend against a similar attack launched from the Middle East, although this would require the use of early-warning radars with inferior missile-tracking and interceptor-guidance capabilities. By 2010–11, the NMD system would be upgraded and expanded to meet larger and more sophisticated missile threats. The goal is to be able to defend US territory from an attack by 'a few tens' of warheads, accompanied by complex decoys and penetration aids, launched from either North Korea or the Middle East.[13] In addition, the system is intended to provide protection against an accidental or unauthorized missile launch.

NMD system architecture

The NMD system currently planned by the BMDO would use interceptor missiles, initially deployed at a single site in Alaska and later at a second site, supported by ground-based radars and satellite-based sensors. This system, which is designed to be compatible with future upgrades and enlargements, consists of four main components.

1. *Interceptors*. The weapon element of the NMD system is the ground-based interceptor (GBI) missile. The GBI consists of a three-stage solid-propellant booster carrying an exo-atmospheric kill vehicle (EKV) payload towards its intended intercept point. The EKV is designed to collide with an incoming ballistic missile warhead outside the earth's atmosphere and destroy it by the force of the impact. Following its separation from the booster rocket, the EKV would use a long-range infrared sensor to autonomously acquire and track the target warhead and to distinguish (or 'discriminate') it from decoys and associated debris.[14]

Plans for the initial, Expanded C1, system call for the deployment of 100 GBI missiles at a launch site in central Alaska by 2007. Beginning in 2010 the NMD system would be expanded with the deployment of 100–150 GBI missiles and a second launch site, most likely in North Dakota.[15]

2. *Radars*. The GBI interceptors would be supported by an extensive network of ground-based radars providing tracking and guidance information. A key component in this network is the X-band ground-based radar (GBR), which has significantly improved target-tracking and -discrimination capabilities compared to existing radars.[16] In the initial NMD system, an X-band radar would be built in the western Aleutian Islands at Shemya Island, Alaska. After

[12] Testimony of Walter B. Slocombe, Under Secretary of Defense for Policy, to the Armed Services Committee, US House of Representatives, 13 Oct. 1999, in US Information Service (USIS), *Washington File*, available at the Federation of American Scientists (FAS) Space Policy Project site at URL <http://www.fas.org/spp/starwars/program/news99/991013-missile-usia.htm>.

[13] Slocombe (note 12).

[14] US Ballistic Missile Defense Organization (BMDO), 'National missile defense architecture', BMDO fact sheet JN-00-06, June 2000.

[15] Kadish (note 10).

[16] US Ballistic Missile Defense Organization (BMDO), 'X-band radar', BMDO Fact sheet JN-00-19, June 2000. The GBR is a phased array radar operating at the X-band frequency of 8–12 gigahertz.

2010 the system would be expanded by up to nine additional X-band radars, possibly including one each in Japan and South Korea.[17]

Pentagon plans also envision a network of upgraded early-warning radars (UEWR). The five existing ballistic missile early-warning radars, located in the USA (in Alaska, California and Massachusetts) and at Thule, Greenland, and Fylingdales, UK, would be upgraded to provide limited tracking information for missile flight trajectories outside X-band radar coverage.[18] The upgrading of the radars at Thule and Fylingdales would require the consent of the host countries, Denmark and the UK.

3. *Satellites*. The planned NMD system also envisions the use of space-based sensors. A new generation of launch-detection satellites, called the Space-Based Infra-Red System (SBIRS)–High, will augment and eventually replace the current Defense Support Programme (DSP) satellites.[19] The first SBIRS–High satellite is scheduled to be placed in geosynchronous orbit in 2004, with the full constellation of four satellites becoming operational in 2010.[20] The NMD architecture would also include the SBIRS–Low satellite system, which is now scheduled for initial deployment in low-earth orbit in 2006; when the system becomes fully operational after 2010, it will consist of 24 satellites capable of tracking missiles along their entire flight trajectories.[21] The satellites are designed to cue interceptor missiles with accurate mid-course guidance and target discrimination information. The SBIRS–Low system has been considered to be a critical element of the NMD architecture, especially for later years, when missiles are expected to carry complex decoys and penetration aids. However, officials in the US Air Force, which is in charge of developing the problem-plagued system, are reportedly questioning whether it is affordable or even technically feasible.[22]

4. *Command and control*. An integral part of the proposed NMD sensor network is a missile defence battle management and command, control and communications (BM/C^3) system. This system is to be built at the North American Aerospace Defense (NORAD) headquarters at Cheyenne Mountain in Colorado. It would integrate the data from ground-based radars and space-based sensors and would include an interceptor communication system providing a data link to GBI missiles in flight.[23] A key task of this system is to determine on the basis of initial intercept reports whether or not a target warhead has

[17] Broad, W., 'A missile defence with limits: the ABC's of the Clinton plan', *New York Times* (Internet edn), 30 June 2000, URL <http://nytimes.com/library/world/americas/063000missile-plan.html>.

[18] Federation of American Scientists (FAS), Special Weapons Monitor, 'Upgraded Early Warning Radar (UEWR)', updated 6 Mar. 2000, available at the FAS Internet site, URL <http://www.fas.org/spp/starwars/program/uewr.htm>. These long-range radars currently cannot track re-entry vehicle targets with sufficient accuracy to guide interceptor missiles.

[19] US Ballistic Missile Defense Organization (BMDO), 'Early warning system', BMDO Fact sheet JN-00-13, Feb. 2000.

[20] Hewish, M., 'Raising the ballistic shield', *Jane's International Defense Review*, vol. 33, no. 9 (Sep. 2000), p. 34.

[21] Hewish (note 20).

[22] Ratnam, G. and Singer, J., 'Support falters for SBIRS Low', *Defense News*, vol. 15, no. 37 (18 Sep. 2000), pp. 1, 60.

[23] US Ballistic Missile Defense Organization (BMDO), 'Battle management and command, control and communications', BMDO Fact sheet JN-00-24, June 2000.

been destroyed; if necessary, it will order the launch of additional interceptors against the target.[24]

Enlargement option

The limited NMD system envisioned by Pentagon planners would put into place a sensor infrastructure that is capable of supporting a much larger system.[25] The system could be enlarged, for example, by deploying more GBI missiles and building additional launch sites; indeed, current US plans explicitly include an option to deploy more interceptor missiles at a later date. It could also be expanded—as some proponents of more robust defences advocate—by incorporating new advanced-capability theatre missile defence (TMD) systems currently under development by the Pentagon (see below).[26]

Arms control analysts have cautioned that this feature of the planned NMD system threatens to undermine one of the key aims of the ABM Treaty, namely to put in place restrictions on missile defence components that will prevent the parties from being able to 'break out' from the treaty regime and deploy a system to defend their territories.[27] In contrast to missile interceptors and interceptor launch sites which can be built relatively quickly or covertly stored, the sensor infrastructure involves elements, such as tracking radars, which require a number of years to construct and are difficult to conceal. By putting these long lead-time elements in place, the planned NMD system sets the stage for the USA to be able to rapidly convert a 'thin' missile defence system into a much 'thicker' one.

Cost of the planned NMD system

In a report released in April 2000 the US Congressional Budget Office (CBO) presented the most comprehensive estimate to date of the cost of various elements of the planned NMD system. According to the CBO report, the Expanded C1 phase of the system, consisting of 100 missile interceptors, launchers and associated radars, would cost nearly $29.5 billion until the end of 2015: $20.9 billion for one-time costs and $8.5 billion for operations costs for the

[24] This 'shoot-look-shoot' capability (i.e., the ability to fire more than 1 interceptor at a specific warhead) raises the defender's chances of intercepting a target warhead. It requires that targets be engaged as soon as possible after launch so as to give the defenders time to launch multiple interceptors.

[25] Gronlund, L. and Lewis, G., 'How a limited national missile defense would impact the ABM Treaty', *Arms Control Today*, vol. 29, no. 7 (Nov. 1999), p. 8.

[26] According to a Pentagon study released in 1999, the sensors for the planned NMD system could support the high altitude sea-based TMD interceptor currently under development by the US Navy in engagements against strategic ballistic missiles, thereby providing additional protection 'against attacks by unsophisticated Third World threats'. US Ballistic Missile Defense Organization (BMDO), 'Summary of report to Congress on utility of sea-based assets to national missile defense', 1 June 1999, URL <http://www.acq.osd.mil/bmdo/bmdolink/pdf/seanmd.pdf>.

[27] Gronlund and Lewis (note 25), p. 9. The ABM Treaty limits the parties to a single deployment area containing no more than 100 ABM launchers and 100 single-warhead missile interceptors. The associated engagement radars within the deployment area cannot exceed specified numbers and are subject to qualitative restrictions, as are radars used for early warning of ballistic missile attack. In addition, the treaty prohibits the development, testing or deployment of sea-, air-, space- or mobile land-based ABM systems or components.

years 2000–2015.[28] This figure is $2.9 billion higher than the BMDO's estimate of $26.6 billion for the cost of building the first phase of the system. The CBO estimated that the cost of the full system, which would involve 150 more interceptor missiles as well as a second interceptor launch site and expanded radar network, would be $48.5 billion; an additional $10.6 billion would be needed for the low-earth orbit component of the SBIRS satellite programme, bringing the total to $59.1 billion.[29] The Pentagon did not dispute the estimate, although officials commented that the CBO's estimate was based on programme plans that remained subject to revision.[30]

NMD programme problems

The ambitious timetable for the initial deployment of a limited NMD system continued to raise concern in 2000. The BMDO's research and development (R&D) efforts had been criticized for 'rushing to failure' in a 1998 report (the Welch Report) prepared by an independent review team (IRT) of experts appointed by the Pentagon.[31] The IRT warned in a new report released in June 2000 that the NMD programme continued to face significant schedule and performance risks. It noted that engineering problems with the GBI missile which will carry the EKV into space had resulted in delays that would significantly compress the testing programme. However, the team concluded that there was no 'technical reason to change the schedule at present'.[32] A report issued at the same time by the US General Accounting Office (GAO) similarly warned that the NMD programme's 'performance and schedule risks remain significant because of the technical challenge, test limitations and the ambitious schedule'.[33]

The widely publicized setbacks suffered in the BMDO's Integrated Flight Test (IFT) programme underscored concerns about the readiness and reliability of NMD technology.[34] In a flight test conducted in January 2000 (IFT-4) the EKV successfully acquired the target re-entry vehicle; however, because

[28] US Congressional Budget Office (CBO), *Budgetary and Technical Implications of the Administration's Plan for National Missile Defense*, Apr. 2000, available at the CBO Internet site, URL <http://www.cbo.gov>. See also chapter 4 in this volume.

[29] CBO (note 28).

[30] Becker, E., 'Missile defense may have price of $60 billion', *New York Times* (Internet edn), 26 Apr. 2000, URL <http://www.nytimes.com/library/world/global/042600missile-defense.html>.

[31] Report of the Panel on Reducing Risk in Ballistic Missile Defense Flight Test Programs, 27 Feb. 1998, URL <http://www.acq.osd.mil/bmdo/bmdolink/pdf/welchrpt.pdf>.

[32] Report of the National Missile Defense Independent Review Team, 13 June 2000, Executive summary reprinted in *Arms Control Today*, vol. 30, no. 6 (July/Aug. 2000), p. 37; and Suro, R. and Ricks, T., 'Red flags for US missile defense', *International Herald Tribune*, 19 June 2000, p. 9.

[33] US General Accounting Office (GAO), *Status of the National Missile Defense Program*, GAO-NSIAD-00-131, 31 May 2000; and Suro, R. and Mufson, S., 'GAO report finds fault with missile shield plan', *Washington Post*, 17 June 2000, p. A5.

[34] The first 2 IFTs were fly-by missions (i.e., missions in which no target interceptions were attempted) to develop algorithms for use in the EKV. In IFT-3, conducted in Oct. 1999, the EKV successfully destroyed a target vehicle over the central Pacific Ocean carried by a modified Minuteman intercontinental ballistic missile. However, BMDO officials later acknowledged that the interceptor had suffered a number of guidance and target-discrimination problems during the test.

of a malfunction in an infrared sensor, the EKV missed the target.[35] In the IFT-5, conducted in July 2000, the EKV failed to separate from the prototype booster rocket and crashed in the Pacific Ocean.[36] The IFT-6, scheduled for October 2000, was subsequently postponed until early 2001.[37] These failures reinforced doubts about whether the proposed NMD system, which has been described as the most complex weapon system ever developed, could achieve a high degree of operational reliability. Critics pointed out that this is essential, since the defence must work flawlessly the first time it is used.[38]

Throughout the year 2000 there were also a number of reports casting doubt on the likely effectiveness of the planned NMD system. These reports questioned whether the system could overcome the countermeasures, such as warhead decoys, that are expected to be available to a state with an emerging ballistic missile programme; they also expressed concern that the BMDO was not testing the components of the planned NMD system against realistic countermeasures. The June 2000 IRT report recommended that future flight tests be made more challenging and that more attention should be paid to potential countermeasures that the NMD system could be expected to face.[39] In the spring of 2000, a comprehensive study prepared by an independent panel of senior US physicists and engineers had raised similar concerns.[40] It found that even the full NMD system envisioned for deployment after 2010 could be defeated by technically simple countermeasures that 'would be available to any emerging missile state that deploys a long-range ballistic missile'.[41] The panel concluded that the USA should 'demonstrate—first by analysis and then in intercept tests—that the planned defense would be effective against realistic countermeasures' before making a commitment to deploy even the first phase of the system.[42] The panel's conclusions came amid allegations made by Theodore Postol, a prominent arms control expert at the Massachusetts Institute of Technology, that the flight tests of the EKV had been

[35] Becker, E., 'Missile fails in setback for US defense plan', *International Herald Tribune*, 20 Jan. 2000, p. 1.

[36] 'National Missile Defense conducts intercept test', News release, Office of Assistant Secretary of Defense (Public Affairs), 392-00, 8 July 2000; and Sciolino, E., 'Key missile parts are left untested as booster fails', *New York Times* (Internet edn), 9 July 2000, URL <http://www.nytimes.com/library/world/global/070900missile-test.html>.

[37] According to BMDO officials, only 19 integrated flight tests of the NMD system are planned to take place before the NMD system achieves an IOC in late 2005.

[38] Lewis, Gronlund and Wright (note 7).

[39] Report of the National Missile Defense Independent Review Team (note 32).

[40] Report of the Study Group organized by the Union of Concerned Scientists and the Security Studies Program of the Massachusetts Institute of Technology (MIT), *Countermeasures: A Technical Evaluation of the Operational Effectiveness of the Planned US National Missile Defense System* (Union of Concerned Scientists and MIT Security Studies Program: Cambridge, Mass., Apr. 2000), p. xix, URL <http://www.ucsusa.org/arms>.

[41] These countermeasures include: using sub-munitions carrying chemical or biological weapons; disguising nuclear warheads to make them look like balloon decoys; and covering nuclear warheads with cooling shrouds so as to avoid detection by the EKV's infrared sensors. Report of the Study Group (note 40).

[42] Report of the Study Group (note 40).

manipulated to hide an inherent flaw in its capacity to discriminate between warheads and decoys.[43]

Postponement of the NMD deployment decision

On 1 September 2000 President Bill Clinton announced that he had decided to postpone authorizing the deployment of the planned limited NMD system.[44] He said that the USA would instead continue a programme of development and testing that would permit the next president to decide whether to move forward with a full deployment; even with this delay, an initial system could be in place by 2006–2007. In explaining his decision Clinton stated that, while the NMD system was sufficiently promising and affordable to justify continued development and testing, he could not conclude on the basis of current information that 'we have enough confidence in the technology and the operational effectiveness of the entire NMD system to move forward with deployment'.[45] He specifically noted that there were questions to be resolved about whether it could work reliably under realistic conditions and whether it could effectively deal with countermeasures. He also pointed out that delaying a deployment decision gave the USA more time to consult with China, Russia and the European allies in order to 'strengthen their understanding' of US efforts to meet emerging ballistic missile threats.[46]

Clinton's announcement confounded expectations that, for domestic political reasons, he would give a 'limited green light' for an initial NMD deployment.[47] This would involve authorizing preparatory work for the X-band tracking radar to be built at Shemya Island in Alaska.[48] According to Pentagon officials, a decision had to be taken before the end of 2000 in order for work on the radar to get under way in time to meet the 2005 target date.[49] This had led to a spirited legal debate within the executive branch over whether begin-

[43] Broad, W., 'Pentagon has been rigging antimissile tests, critics maintain', *New York Times* (Internet edn), 9 June 2000, URL <http://www.nytimes.com/library/national/science/060900sci-missile-defense.html>; and Abel, D., 'The missile plan skeptic', *Boston Globe*, 12 June 2000, pp. 1, 5.

[44] Clinton had previously stated that a deployment decision would be based on the following considerations: (*a*) a determination that a new long-range ballistic missile threat to the USA is emerging; (*b*) an assessment of the technological feasibility and operational effectiveness of a proposed NMD system; (*c*) overall system cost; and (*d*) the progress made in achieving US arms control objectives, 'including any amendments to the ABM Treaty that may be required to accommodate a possible NMD deployment'. United States Information Service (USIS), 'Text: President Clinton signs Missile Defense Act', The White House, Office of the Press Secretary, *European Washington File* (US Embassy: Stockholm, 23 July 1999).

[45] United States Information Service (USIS), 'Transcript of remarks by the President on national missile defense', The White House, Office of the Press Secretary, *European Washington File* (US Embassy: Stockholm, 1 Sep. 2000).

[46] USIS (note 45). Clinton's decision reportedly was strongly influenced by Russia's unyielding opposition to amending the ABM Treaty to permit the deployment of a limited NMD system. Myers, S., 'Russian resistance key in decision to delay missile shield', *New York Times* (Internet edn), 3 Sep. 2000, URL <http://www.nytimes.com/library/world/global/090300missile-assess.html>.

[47] Ricks, T. and Mufson, S., 'US eyes starting missile defense', *Washington Post* (Internet edn), 28 June 2000, URL <http://www.washingtonpost.com/wp-dyn/articles/A6110-2000Jun27.html>.

[48] Knowlton, B., 'Clinton postpones decision on building missile shield', *International Herald Tribune*, 2–3 Sep. 2000, pp. 1, 5.

[49] Testimony of Lt Gen. Ronald T. Kadish, Director, Ballistic Missile Defense Organization, before the Senate Armed Services Committee, 30 June 2000.

ning preliminary deployment activities, such as preparing the site for the X-band radar, was permissible under the ABM Treaty and how far that work could proceed before the USA would be required to give formal notice that it was withdrawing from the treaty.[50]

Interest in alternative NMD systems

Clinton's announcement came against the background of a growing debate about the merits of the proposed NMD system architecture. Both proponents and opponents of an NMD system have argued that the current plan, which uses a mid-course intercept, hit-to-kill system, has inherent problems, particularly with regard to overcoming likely countermeasures.[51] This has led to calls for an alternative NMD architecture to be considered. Three former senior Pentagon officials urged Clinton to abandon current NMD plans, arguing that they are unduly expensive, technically unfeasible and strategically counterproductive. They advocated instead the development of a sea-based system, based on current US Navy TMD programmes, to intercept missiles during the boost phase (i.e., during the powered ascent phase) of their trajectories. Such a system could be positioned relatively close to the shores of states like North Korea; since it would intercept ascending missiles before they could deploy warheads and decoys, it would not face the discrimination problem inherent in the mid-course intercept approach.[52] According to a senior Pentagon official, however, such a boost-phase intercept system would face formidable technical challenges that would require a 'major reworking' of the sea-based missile defences under development by the US Navy and could not be deployed for at least a decade.[53]

During 2000, the size and scope of the administration's NMD system continued to come under partisan fire from advocates of more robust missile defences, who argued that current plans would lead to a fragile defence capability that would be inadequate to meet emerging ballistic missile threats.[54] In the Senate, Republicans complained that Clinton was driven more by concerns about preserving the ABM Treaty intact—and thereby not upsetting China, Russia and US allies—than by considerations of operational effectiveness.[55] During his presidential campaign, Republican candidate George W. Bush called for extensive missile defences to protect both the USA and its allies; these should incorporate a sea-based as well as a land-based component—to

[50] Myers, S., 'Washington split deepens in debate over missile plan', *New York Times* (Internet edn), 30 Aug. 2000, URL <http://nytimes.com/library/world/global/083000missile-defense.html>.

[51] Garwin, R., 'A defense that will not defend', *Washington Quarterly*, vol. 23, no. 3 (summer 2000), pp. 109–23; and Suro, R., 'Floating a shield at sea', *International Herald Tribune*, 29 May 2000, p. 3.

[52] Deutch, J., Brown, H. and White, J., 'National missile defense: is there another way?', *Foreign Policy*, no. 119 (summer 2000), pp. 91–104.

[53] Lt Gen. John Costello, US Army Space and Missile Defense Command, cited in Cirincione, J., 'Lost at sea', *Inside Missile Defence*, 6 Sep. 2000.

[54] Spring, B., 'Beware of a US–Russia deal on missile defense', Heritage Foundation, *Backgrounder*, no. 1356 (6 Apr. 2000).

[55] Becker, E. and Schmitt, E., 'GOP senators tell Clinton that they oppose him on ABM Treaty and defense system', *New York Times* (Internet edn), 22 Apr. 2000, URL <http://www.nytimes.com/library/world/global/042200us-missile-treaty.html>.

be supplemented later by space-based components—to form a layered missile defence. Acknowledging that this would require major changes to the ABM Treaty, Bush argued that the USA must be prepared to withdraw from the treaty if it could not gain Russia's approval of the changes.[56]

Russian–US discussions on strategic stability and the ABM Treaty

In 2000 Russia and the USA continued to spar over US missile defence plans while pledging their commitment to preserving and strengthening the ABM Treaty as the 'cornerstone of strategic stability'. In the months leading up to a Russian–US summit meeting held in Moscow on 3–4 June 2000 there had been considerable speculation that Clinton and Russian President Vladimir Putin might negotiate a deal on missile defences and strategic nuclear arms. However, a breakthrough failed to materialize, in part because of Russian scepticism about Clinton's ability to get Congress to go along with a deal towards the end of his term in office.[57]

On 4 June 2000, at the conclusion of their Moscow summit meeting, Clinton and Putin issued a Joint Statement on Principles of Strategic Stability.[58] The Joint Statement represented an attempt by the two presidents to find common ground on the NMD issue and to forge a more cooperative relationship. One apparent point of convergence was that Clinton and Putin agreed that 'the international community faces a dangerous and growing threat of proliferation of weapons of mass destruction and their means of delivery, including missiles and missile technologies'; they noted that this 'new threat represents a potentially significant change in the strategic situation and the international security environment'.[59] However, the two leaders remained at odds over how best to address these threats. In an allusion to US missile defence plans, Putin cautioned that, while he shared some US concerns about new missile threats, he was against 'having a cure that is worse than the disease'.[60]

On 7 September 2000, while attending the United Nations Millennium Summit in New York, Clinton and Putin issued a Joint Statement outlining a Strategic Stability Cooperation Initiative.[61] The new initiative contained several elements intended to 'enhance strategic stability and to counter the proliferation of weapons of mass destruction, missiles and missile technologies worldwide'.[62] First, Russia and the USA expressed their willingness to expand

[56] 'New leadership on national security', Address by Gov. George W. Bush to the National Press Club, Washington, DC, 23 May 2000.

[57] Gordon, M., 'Moscow talks fail to forge the big breakthrough', *International Herald Tribune*, 5 June 2000, pp. 1, 4.

[58] 'Joint Statement by the Presidents of the United States and the Russian Federation on Principles of Strategic Stability', The White House, Office of the Press Secretary, *European Washington File* (US Embassy: Stockholm, 5 June 2000).

[59] Joint Statement (note 58).

[60] Quoted in Hoffman, D., 'Clinton and Putin spar on ABM plan', *International Herald Tribune*, 5 June 2000, pp. 1, 4.

[61] United States Information Service (USIS), 'US–Russian Joint Statement on the Strategic Stability Cooperation Initiative', The White House, Office of the Press Secretary, *European Washington File* (US Embassy: Stockholm, 8 Sep. 2000).

[62] US–Russian Joint Statement (note 61).

their discussion of missile proliferation 'to include annual briefings based on assessments of factors and events related to ballistic and cruise missile proliferation'. Second, the two countries pledged to resume and expand their cooperation on theatre missile defences and to consider the possibility of involving other states.[63] Third, they announced their intention to work together to strengthen the Missile Technology Control Regime (MTCR). Finally, Russia and the USA promised to work to reach early agreement on a regime for exchanging notifications of missile launches, which is to be open for all interested countries.[64]

Throughout the year, a Russian–US working group on strategic stability continued to meet periodically to discuss issues related to the ABM Treaty issues and to a future START III treaty. However, the two sides made little headway in resolving the missile defence impasse that was blocking progress towards further bilateral reductions in nuclear forces. The USA remained intent on gaining Russia's acceptance of amendments to the ABM Treaty, while Russia steadfastly refused to enter into negotiations on changing the treaty.[65] Russian Foreign Ministry officials denied reports from the USA that Russia was willing to consider amending the ABM Treaty.[66]

US proposals for amending the ABM Treaty

In talks in January 2000, US negotiators presented their Russian counterparts with a draft protocol for amending the ABM Treaty to permit the USA to proceed with the initial deployment of a limited NMD system.[67] The protocol set out only those amendments to the ABM Treaty that would be necessary to permit the Expanded C1 phase of the system.[68] However, in a unilateral statement the USA reserved the right to request 'negotiations to draft further amendments to the Treaty to protect against more serious and sophisticated threats from North Korea and the Near East'; an article in the protocol allowed either

[63] Russia and the USA agreed to conduct a joint TMD planning and simulation exercise in February 2001 and a joint field training exercise by late 2001 or early 2002. US–Russian Joint Statement (note 61).

[64] US–Russian Joint Statement (note 61).

[65] ITAR-TASS, 10 July 2000, in 'Foreign Minister Ivanov urges retaining 1972 ABM, START Treaties', Foreign Broadcast Information Service, *Daily Report–Central Eurasia* (FBIS–SOV), FBIS-SOV-2000-0710, 11 July 2000; and Interfax (Moscow), 5 Dec. 2000, in 'Russian defence minister rules out negotiations on ABM Treaty terms', FBIS-SOV-2000-1207, 12 Dec. 2000.

[66] Interfax (Moscow), 12 Oct. 2000, in 'Russian foreign ministry denies Russia ready to consider changing ABM Treaty', FBIS-SOV-2000-1012, 13 Oct. 2000.

[67] The draft protocol and accompanying documents outlining the administration's argument for changing the treaty were subsequently made public by a private US arms control journal, *The Bulletin of the Atomic Scientists*, which had obtained them in Russia. The documents are available at URL <http://www.thebulletin.org/issues/2000/mj00/treaty_doc.html>.

[68] The deployment of the NMD system planned for after 2010 would require more comprehensive changes to the treaty, including the abandonment of the numerical limitations on ABM interceptors and bases imposed by the 1974 Protocol. It would also require an amendment of the treaty's prohibition (in Article V) on the use of space-based sensors to provide tracking and guidance information for ABM interceptors.

party to reopen negotiations as soon as on 1 March 2001 'to take into account further changes in the strategic situation'.[69]

The protocol contained three proposed amendments to the ABM Treaty. First, it would permit the parties to deploy up to 100 ABM launchers and up to 100 anti-missile interceptors at 'launching positions within one deployment region within their national territory'.[70] This would allow the USA to change its designated missile interceptor launch site permitted under the ABM Treaty to Alaska.[71] Second, the protocol specified that existing early-warning radars may be 'enabled for use as ABM radars' to support a limited national missile defence system.[72] Third, it specified that each party 'may deploy one additional ABM radar at any site within its national territory'.[73] In addition, the protocol contained an annexe on verification to 'increase confidence in compliance' with the ABM Treaty.[74]

In an accompanying document, US officials stressed that the planned NMD system would enable the USA to defend its territory only against a limited attack involving relatively unsophisticated missiles. Since it would be overwhelmed by Russia's large arsenal of long-range missiles, the system would not threaten Russia's second-strike nuclear retaliatory capability. US officials argued that the stability of the strategic balance would not be undermined even if the two countries agreed to further reductions in strategic offensive nuclear arms to the levels envisioned in a START III treaty (see below), since 'forces of this size can easily penetrate a limited system of the type the United States is now developing'.[75] They also argued that the limited NMD programme would not undermine Russia's deterrent because Russia keeps its nuclear

[69] According to US Administration officials, the decision to ask for only the first phase, while insisting on the right to expand it later, was based on the calculation that it would be easier to win Russian acceptance of that phase, which the USA considers to be the most urgent. Myers, S. and Perlez, J., 'A detailed bid to Russia on anti-missile treaty', *International Herald Tribune*, 29–30 Apr. 2000, pp. 1, 4.

[70] Draft Protocol to the Treaty between the Union of Soviet Socialist Republics and the United States of America on the Limitation of Anti-Ballistic Missile Systems, 20 Jan. 2000, URL <http://www.thebulletin.org/issues/2000/mj00/treaty_doc.html#ANCHOR6>.

[71] Under the original terms of the treaty, each party was permitted 2 ABM deployment areas, 1 to protect the national capital and the other to protect an ICBM launch site. The 1974 Protocol limits the parties to a single deployment area containing no more than 100 ABM launchers and 100 single-warhead missile interceptors. The USSR chose to deploy (and Russia continues to maintain) an ABM system around Moscow. The USA deployed an ABM system known as Safeguard at an ICBM launch-silo complex at Grand Forks, North Dakota; it achieved an initial operating capability in 1975 but was deactivated in 1976.

[72] Articles III and VI of the ABM Treaty prohibit radars designed to give early warning of strategic ballistic missile attack from performing the function of ABM radars. In the case of the early-warning radars at Thule, Greenland, and Fylingdales, UK, Article IX (under which each of the parties undertakes not to deploy ABM systems or their components outside its territory) would have to be amended.

[73] Article III of the ABM Treaty prohibits the USA from building an X-band tracking radar at Shemya Island, since it is located more than 150 km from a proposed ABM interceptor launch site in central Alaska.

[74] This annexe contained several elements: an annual exchange of information on key elements in the ABM system; notification of planned events pertaining to the system; and inspections to verify the accuracy of information exchanges. Draft Annex to the Protocol to the Treaty between the Union of Soviet Socialist Republics and the United States of America on the Limitation of Anti-Ballistic Missile Systems, 20 Jan. 2000, text available at URL <http://www.thebulletin.org/issues/2000/mj00/treaty_doc.html#ANCHOR7>.

[75] Draft Protocol (note 70).

forces on constant alert (to permit launch on warning) and would continue to do so.[76]

Russian objections to US proposals for amending the ABM Treaty

In Russia missile defences continued to be viewed primarily from the perspective of the Russian–US strategic nuclear balance. Concern was expressed that US deployment of an NMD system would lead to an imbalance between Russia and the USA, thereby weakening mutual deterrence during a period of transition in their relations. Russian officials dismissed complaints from some quarters in the USA that such concerns were anachronistic; they showed little interest in the idea of moving towards a strategic relationship featuring a mixture of deterrence and strategic defence. On the whole, US missile defence plans were widely viewed in Russia as being an attempt by the USA to unilaterally achieve security for itself at the expense of other countries and to achieve 'strategic dominance based upon its technological advantages'.[77]

Russian officials emphasized that the ABM Treaty was the cornerstone of the entire Russian–US nuclear arms control framework and warned that the deployment of any NMD system—the prohibition of which is the 'basic purpose' of the ABM Treaty—would lead to the collapse of that framework.[78] Russian Ministry of Defence officials warned that an abrogation of the ABM Treaty by the USA would lead to a Russian withdrawal from existing arms reduction treaties, including the START I and START II treaties. This would mean that 'all mutual exchanges of information will be ended, and hundreds of verification missions that both sides carry out on a reciprocal basis will be discontinued'.[79] The result would be a reversal of the arms control achievements of the past two decades, with the Russian and US strategic forces becoming less transparent and more unpredictable to one other.

There were also repeated warnings that Russia would respond to any unilateral US decision to deploy an NMD system with a variety of technical countermeasures. One widely mentioned response was Russian development of a multiple-warhead version of its new single-warhead Topol-M (SS-27) intercontinental ballistic missile (ICBM). In addition, Colonel General Vladimir Yakovlev, commander of the Russian Strategic Rocket Forces (SRF), sug-

[76] This suggested to some analysts that the USA is willing to sacrifice 2 important arms control goals: the opportunity to make deep cuts in nuclear arsenals, beyond the START III levels; and the possibility of 'de-alerting' strategic nuclear arsenals and thereby reducing the danger of unauthorized, accidental and erroneous launches. Gronlund, L. and Wright, D., 'Documents reveal US intentions', available at *The Bulletin of the Atomic Scientists* Internet site, URL <http://www.thebulletin.org/issues/2000/mj00/treaty_gronlund.html>.

[77] Lt Gen. Leonid Ivashov, head of the Department for International Cooperation, Russian Ministry of Defence, quoted by ITAR-TASS (Moscow), 29 June 2000, in 'General: NMD attempts overtly anti-Russian', FBIS-SOV-2000-0629, 30 June 2000. Dimitri Rogozin, chairman of the Duma's International Affairs Committee, called the US NMD system the 'system of unequal security'. Quoted by ITAR-TASS (Moscow), 18 May 2000, in 'Rogozin to discuss strategic security with US', FBIS-SOV-2000-0518, 18 May 2000.

[78] 'Russia rebuffs US on altering ABM pact', *International Herald Tribune*, 26 Apr. 2000, p. 6.

[79] Maj. Gen. Vladimir Dvorkin, Director of the Central Research Institute of the Russian Ministry of Defence, quoted in Hoffman, D., 'Russians scoff at missile defenses', *International Herald Tribune*, 24 Nov. 1999, p. 6.

gested that, as an 'asymmetric response' to a US NMD system, Russia would consider withdrawing from the 1987 Treaty on the Elimination of Intermediate- and Shorter-Range Missiles (INF Treaty) and resuming production of medium-range missiles.[80]

Some Russian military officials and experts have concluded that the US NMD plan, at least in its initial limited form, would 'not affect existing nuclear parity' and would not undermine Russia's 'retaliatory-strike capabilities'.[81] However, they note that current US missile defence plans envision the deployment of more interceptors and sensors as possible 'evolutionary options'. This raises the prospect that, if Russia accepts the initial modest treaty amendments proposed by the USA, it will be subsequently forced to acquiesce to more far-reaching changes demanded by the USA as it moves ahead with these options—a situation that has been derisively called 'Russia à la carte'.[82] Particular concern has been expressed in Russia that the planned US NMD system will put in place the long lead-time elements, such as tracking radar and satellite-based sensors, which will enable the USA to rapidly expand its 'thin' NMD system into a 'thick' one that might eventually have a significant capability against Russia's nuclear deterrent.[83] Underlying this concern is the fear of a continuous expansion of the US NMD system juxtaposed against the continuous decline, imposed by financial exigencies, in Russia's strategic nuclear forces.

In the light of these concerns, Russian experts have argued that a deal to amend the ABM Treaty should contain several elements. First, it must not only contain a pledge by the USA that its limited NMD system will not be targeted against Russia but must also put in place appropriate technical assurances that this could not happen at a later date. These assurances should clearly define the scope and scale of the limited NMD system.[84] Furthermore, in return for permitting the USA to deploy a nationwide missile defence, the agreement should permit Russia to retain ICBMs able to carry MIRVs (multiple independently targetable re-entry vehicles). The retention of these missiles, which are banned by the START II Treaty, is seen by many analysts as guaranteeing Russia the technical means for penetrating even an extensive US deployment of missile defences.[85]

[80] Cited in RIA (Moscow), 21 June 2000, in 'Missile troops chief views possible responses to US ABM system', FBIS-SOV-2000-0621, 22 June 2000; and LaFraniere, S., 'Russia threatens action over US missile plan', *Washington Post*, 23 June 2000, p. A21.

[81] Shevtsov, A., 'Treaty on the limitation of anti-ballistic missile systems: foundation of strategic stability or bone of contention?', *Yaderny Kontrol*, 14 Apr. 2000, pp. 45–53, in 'Analysis of US, FR ABM Treaty actions, treaty amendments, RF refusal to negotiate', FBIS-SOV-2000-0717, 31 July 2000.

[82] Pikayev, A., 'ABM Treaty revision: a challenge to Russian security', *Disarmament Diplomacy*, no. 44 (Mar. 2000), pp. 6–10.

[83] Hoffman, D., 'Russian general rejects ABM changes', *International Herald Tribune*, 6–7 May 2000, p. 3; and ITAR-TASS (Moscow), 10 Dec. 2000, in 'Russian military stresses awareness of US missile defence plans', FBIS-SOV-2000-1210, 13 Dec. 2000.

[84] Timarbaev, R., 'ABM/NMD and the START process', *Yaderny Kontrol Digest*, vol. 5, no. 4 (fall 2000), pp. 37–41.

[85] Nazarkin, Y., 'The role of the major powers in the arms control and disarmament process', in eds Anthony and Rotfeld (note 4), pp. 55–64; and Maslin, Y. and Safranchuk, I., 'Nuclear deadlock: a way out', *Disarmament Diplomacy*, no. 46 (May 2000).

In November 2000 another idea for a possible Russian–US compromise arrangement for amending the ABM Treaty was put forward by Yakovlev. Arguing that since the current treaty was unlikely to survive, he proposed that Russia and the USA agree to a 'strategic index' setting an overall limit on both strategic offensive and defensive weapons; an increase in the number of weapons in one category would require a corresponding decrease in the other category.[86] Yakovlev's proposal fuelled speculation that Russia was softening its opposition to amending the ABM Treaty. However, senior Russian officials dismissed this speculation, stating that Yakovlev had merely expressed his personal views and reiterating Russia's opposition to making any amendments to the treaty.[87]

Russian alternatives to NMD

While conceding that new ballistic missile threats were emerging, Russian experts and senior government officials emphasized that the problem of missile proliferation must be considered within the broader framework of international legal and political non-proliferation arrangements. US missile defence plans were widely condemned in Russia as an inappropriate response to the problem of missile proliferation as well as a worrying sign that the USA was unwilling to engage in the patient diplomacy needed to address proliferation incentives.[88]

During the year Russia launched several initiatives intended to offer alternatives to the USA's NMD system. At the opening of the 2000 NPT Review Conference, Russian Foreign Minister Igor Ivanov proposed the establishment of a multilateral Global Control System (GCS) to prevent the spread of missiles and missile technologies. As subsequently explained by Russian Foreign Ministry officials, the GCS would be open to all interested states on a voluntary basis to work out 'rules of conduct' in the missile field and to reduce the dangers of missiles being used in peacetime.[89] The GCS would consist of four main elements: a missile launch transparency regime, including the establishment of an international missile launch notification centre; security assurances for the GCS participating states which have renounced the possession of missile delivery vehicles for NBC weapons; incentives, including assistance to national space programmes, for states which have renounced missile delivery vehicles for NBC weapons; and a consultation mechanism for improving the

[86] ITAR-TASS (Moscow), 15 Nov. 2000, in 'Russia's Yakovlev: US may exit from ABM Treaty, not to ratify START 2', FBIS-SOV-2000-1115, 15 Nov. 2000; and 'Yakovlev proposes ABM index', Radio Free Europe/ Radio Liberty (RFE/RL) *Newsline*, 14 Nov. 2000.

[87] Press Briefing by Yuri Kapralov, Director of the Russian Foreign Ministry Department for Security and Disarmament Affairs, 14 Nov. 2000, URL <http://www.ransac.org/new-web-site/related/other/kapralov-11.14.00.html>; and Interfax (Moscow), 5 Dec. 2000, in 'Russian defense minister rules out negotiations on ABM Treaty terms', FBIS-SOV-2000-1207, 12 Dec. 2000.

[88] Williams, D., 'Russia wants political shield', *Washington Post*, 14 June 2000, p. A34.

[89] 'Concept of the Global Control System for non-proliferation of missiles and missile technology', presented at the International Global Control System Experts Meeting, Moscow, 16 Mar. 2000, available at the Embassy of the Russian Federation in Sweden Internet site, URL <http://www.russianembassy.org/embassy/GCS_content.htm>.

functioning of the GCS and resolving disputes.[90] Although the US response to the GCS proposal was lukewarm, the two countries agreed to discuss ways to integrate it with a US proposal for a missile 'code of conduct'.

Russia also put forward two proposals for cooperative non-strategic missile defence systems. Shortly before the June summit meeting with Clinton, Putin proposed a joint Russian–US missile defence system that would be designed specifically to intercept intermediate-range ballistic missiles launched by North Korea.[91] The proposed system would use a boost-phase interceptor missile, possibly deployed on ships.[92] In the wake of the summit meeting, Putin also proposed the creation of a joint non-strategic BMD system in Europe.[93] His proposal envisioned wide-ranging cooperation between Russia and NATO states, beginning with expert consultations to assess whether a missile threat existed, and leading to the development of a joint concept of an ABM system.[94] The initiative generated interest in Washington and in European capitals, although some critics there argued that it was as an attempt to discourage allied support for US missile defence plans and to drive a wedge between the USA and its European allies.[95] The idea was brought up in discussions between Russian and European leaders in the autumn of 2000, *inter alia* during Putin's visits to France, Germany and Italy.[96] It was scheduled to be discussed in the NATO–Russia Permanent Joint Council during 2001.[97]

International reactions

Despite Clinton's postponement of a decision on whether to deploy a limited NMD system, US missile defence plans continued to arouse considerable international concern and unease. On 20 November the United Nations General Assembly approved a resolution sponsored by Belarus, China and Russia

[90] 'Concept of the Global Control System for non-proliferation of missiles and missile technology' (note 89).

[91] ITAR-TASS (Moscow), 30 Apr. 2000, in 'Russia proposes cooperation on non-strategic ABM systems', FBIS-SOV-2000-0430, 2 May 2000; and Gordon, M., 'Missile defense, Putin-style', *International Herald Tribune*, 3–4 June 2000, pp. 1, 4.

[92] Isachenkov, I., 'US, Russians disagree on ABM', *Washington Post*, 23 June 2000, URL <http://www.washingtonpost.com/wp-srv/aponline/20000613/aponline104239_000.htm>.

[93] Buchan, D. and Blitz, J., 'Putin proposes joining west in missile system', *Financial Times*, 6 June 2000, p. 4.

[94] A senior military official explained that Russia did not envision the creation of a new anti-missile shield over Europe but rather the coordination of existing systems. Lt Gen. Leonid Ivashov, head of the Department for International Cooperation, Russian Ministry of Defence, quoted by RIA (Moscow), 11 June 2000, in 'Top Russian military official outlines European ABM plans', FBIS-SOV-2000-0611, 12 June 2000.

[95] Drozdiak, W., 'US rejects Russia's own proposal for a joint system to protect Europe', *International Herald Tribune*, 10–11 June 2000, pp. 1, 3; and Traynor, I. and Norton-Taylor, R., 'Russians turn to Europe to thwart US missile plan', *The Guardian*, 8 June 2000, p. 6. US officials emphasized that the proposed non-strategic system could not serve as a substitute for an NMD system.

[96] Kapralov (note 87); ITAR-TASS (Moscow), 30 Oct. 2000, in 'Russia, France confirm joint stance on ABM', FBIS-SOV-2000-1030, 1 Nov. 2000; and ITAR-TASS (Moscow), 7 Dec. 2000, in 'Sergeyev says London will be blamed if US deploys anti-ballistic missiles', FBIS-SOV-2000-1207, 7 Dec. 2000.

[97] ITAR-TASS (Moscow), 14 Dec. 2000, in 'Russia ready for talks with Europe on non-strategic ABM', FBIS-SOV-2000-1214, 18 Dec. 2000; and ITAR-TASS (Moscow), 15 Dec. 2000, in 'Ivanov: Russia to continue discussion on strategic stability with Bush', FBIS-SOV-2000-1215, 18 Dec. 2000.

which stressed 'the paramount importance of full and strict compliance' by the parties with the ABM Treaty and called for 'continued efforts to strengthen and preserve its integrity'.[98]

Concerns in Europe

During 2000 there was a growing debate in Europe about US missile defence plans and the future of the ABM Treaty. While European states shared concerns about missile proliferation, they tended to dismiss as exaggerated US claims about the emerging ballistic missile threat posed by states such as Iran, Iraq and North Korea. Furthermore, European states emphasized that the problem of missile proliferation must be addressed within the broader framework of international legal and political non-proliferation arrangements; many analysts in Europe doubted that the USA's proposed missile defence system was the most appropriate response to new missile threats.[99]

Throughout the year US allies in Europe exhibited considerable unease about Washington's missile defence plans.[100] This unease was especially acute in Denmark and the United Kingdom, where there has been political opposition to allowing the USA to use radar early-warning installations based on their territories as part of its limited NMD system.[101] However, it was France and Germany that took the lead in disapproval of NMD.

European misgivings about—and in some cases hostility to—US missile defence plans derived from several main concerns.[102] First, while welcoming US assurances that missile defence is intended to supplement deterrence rather than replace it, virtually all the USA's European allies were concerned that a unilateral US move to deploy a nationwide missile defence system would undermine the logic of mutual assured destruction codified in the ABM Treaty; this was seen as having a negative impact on the strategic stability that nuclear deterrence has provided since the beginning of the cold war. Second, there was concern that the abandonment or evisceration of the ABM Treaty

[98] 'General Assembly adopts 49 disarmament, international security texts on recommendation of its First Committee', United Nations press release GA/9829, 20 Nov. 2000. The resolution was approved by 88 member states, with 5 states voting against (Albania, Honduras, Israel, Micronesia and the USA) and 66 abstentions.

[99] See, e.g., Delpech, T., 'US ballistic missile defence: a French view', *Disarmament Diplomacy*, no. 44 (Mar. 2000), pp. 11–13.

[100] Reid, T., 'Blair noncommital on missile shield', *Washington Post*, 18 Apr. 2000, p. A20; Perlez, J., 'Europe cautions US on plans for missile defence shield', *International Herald Tribune*, 3 May 2000, pp. 1, 4; and Sciolino, E., 'Clinton finds Germans critical of US missile defense plan', *New York Times* (Internet edn), 2 June 2000, URL <http://www.nytimes.com/library/world/europe/060200germany-missiles.html>.

[101] Wintour, P., 'British role in US Star Wars shield', *The Guardian*, 30 Mar. 2000, p. 1; Nicoll, A., 'Talks planned over US security shield', *Financial Times*, 8–9 Apr. 2000, p. 5; 'NMD: UK must decide', Press advisory, British American Security Information Council (BASIC), 6 July 2000; and Brooke, J., 'Greenlanders wary of a new role in US defenses', *New York Times* (Internet edn), 18 Sep. 2000, URL <http://www.nytimes.com/2000/09/18/world/18gree.html>. For an overview of British parliamentary concerns about US NMD plans, see House of Commons, Select Committee on Foreign Affairs, *National Missile Defence and the Anti-Ballistic Missile Treaty*, Eighth Report, Session 1999–2000, 25 July 2000, URL <http://www.publications.parliament.uk/pa/cm199900/cmselect/cmfaff/407/40702.htm>.

[102] Grand, C., 'Missile defense: the view from the other side of the Atlantic', *Arms Control Today*, vol. 30, no. 7 (Sep. 2000), pp. 12–18.

would complicate relations with Russia and sound the death knell for nuclear disarmament, possibly reversing the progress made to date. Third, a number of NATO allies expressed concern about the ramifications of the US missile defence plans for alliance cohesion. They worried that these plans would contribute over the long term to 'decoupling' transatlantic security by creating a situation in which Europe would be vulnerable to ballistic missile attack emanating from a regional trouble spot such as the Middle East while the USA would not be; related concerns were expressed about a perceived US shift towards a 'Fortress America' policy. Finally, there was considerable reluctance in Europe to substantially increase defence spending in order to follow the US lead in developing missile defences.[103]

In response to these doubts, the US Administration engaged in extensive intergovernmental discussions at NATO and elsewhere to listen to its allies' concerns and explain the USA's approach to missile defence. Clinton also sought to reassure European allies by announcing that the USA would share the technology for a missile defence system with friendly countries.[104]

Concerns in Asia

US NMD plans have raised deep concern in China. Chinese officials and analysts maintain that the US NMD system is primarily intended to counter China's small force of ICBMs, rather than those of states such as Iran and North Korea which do not have missiles capable of reaching US territory.[105] In 2000 a senior Chinese Foreign Ministry official warned that a US decision to deploy an NMD system posed 'an unacceptable threat to China's security and might force it to significantly expand its own strategic nuclear arsenal'.[106] Some military analysts believe that China is likely to respond by converting some of its missiles to carry MIRVs as well as sophisticated penetration aids and decoys.[107] However, US officials pointed out that China is pursuing a long-term strategic nuclear forces modernization programme that was initiated well before NMD became a source of concern and that it was far from clear what impact US missile defence plans would actually have on the Chinese modernization programme.

The prospect that China might expand its nuclear forces gave rise to worries about the impact of such a buildup on regional stability. Some analysts

[103] Grand (note 102); 'NMD: the hard sell', *Jane's Defence Weekly*, vol. 33, no. 11 (15 Mar. 2000), pp. 19–23; Hitchens, T. and Samuels, S., *NMD: Allied Fears In Focus*, British American Security Information Council, BASIC Paper no. 32 (Apr. 2000); and Pfaff, W., 'America's infatuation with missile defence baffles Europe', *International Herald Tribune*, 8 June 2000, p. 6.

[104] Babington, C., 'US set to share its ABM research', *Washington Post*, 1 June 2000, p. A1.

[105] Zhaozhong, Z., 'The United States continues to weave its dream of a national missile defense sky net', *Ta Kung Pao* (Hong Kong), 23 July 2000, p. B1, in 'PRC opposes US missile defence system', Foreign Broadcast Information Service, *Daily Report–China* (FBIS–CHI), FBIS-CHI-2000-0724, 31 July 2000.

[106] Sha Zukang, Director of the Department of Disarmament Affairs, Ministry for Foreign Affairs of China, quoted by Eckholm, E., 'China warns of a buildup if US erects missile shield', *International Herald Tribune*, 12 May 2000, p. 5.

[107] Chinese strategic nuclear forces are described in appendix 6A in this volume.

expressed concern that it might prompt India to expand its nuclear arsenal.[108] This would prompt Pakistan to do the same, thereby undermining international efforts to encourage nuclear restraint in South Asia.[109]

Developments in theatre missile defence

US programmes to develop, procure and deploy a family of new, advanced-capability theatre missile defences have proceeded apace over the last half-decade (see table 6.1). The BMDO has developed a 'family of systems' concept, which involves a combination of interoperable low- and high-altitude TMD systems, to protect key overseas facilities and forward-deployed elements of the US armed forces, as well as allied countries, in conflicts with adversaries which might be armed with short- to intermediate-range ballistic missiles.[110] Although these TMD programmes have been overshadowed to some extent by the controversy over NMD plans, they represent a significant percentage of the BMDO's planned spending. For fiscal year 2001, the total budget request for the BMDO was $4.5 billion: of this amount, TMD programmes accounted for $1.95 billion, while NMD programmes accounted for $1.92 billion.[111]

International developments

The proliferation of short- and medium-range ballistic missiles has sparked a growing interest in missile defence systems in countries other than the USA. This marks a significant difference from earlier periods, in which interest in BMD was limited primarily to the superpowers. A number of countries, such as Taiwan, have expressed a desire to purchase US advanced-capability TMD systems.[112] Several countries have programmes under way to develop TMD systems or to upgrade existing air defence systems to have some anti-missile capability. In Russia the S-400 air defence system has been touted as being at least as capable as the Patriot PAC-3.[113] The Franco-Italian Aster 30 air defence missile has been given some limited TMD capability in order to

[108] Siddiqa-Agha, A., 'Another deadly missile race?', *Dawn* (Internet edn), 24 July 2000, URL <http://www.dawn.com/2000/07/24/op.htm#1>; and 'Rockets' glare', *The Telegraph* (Calcutta), 12 July 2000, p. 10, in 'US NMD test likely to have spill-over effect on India', FBIS-CHI-2000-0712, 13 July 2000.

[109] Gordon, M. and Myers, S., 'US missile defense could start arms buildup in Asia', *International Herald Tribune*, 29 May 2000, p. 3.

[110] Cohen, W., Secretary of Defense, *Annual Report to the President and the Congress* (US Department of Defense: Washington, DC, 2000), pp. 74–75.

[111] These figures for TMD and NMD spending combine the requests from 3 budget categories: research, development, testing and evaluation, RDT&E ($3.9 billion); procurement ($444 million); and military construction activities ($103.5). Kadish (note 10).

[112] Cheong, C., 'Taiwan should think twice about TMD', *Japan Times*, 22 Feb. 1999, p. 5; and Gertz, B., 'Taiwan confirms Beijing's intent to deploy missiles', *Washington Times* (Internet edn), 25 Nov. 1999, URL <http://www.washtimes.com/internatl/internatl1.html>.

[113] Petrov, A., 'S-400: extraordinary protection', *Rossiyskaya Gazeta*, 30 June 2000, p. 4, in 'Russian S-400 "will be the best defensive weapon in the world in the next 20–50 years"', FBIS-SOV-2000-1973, 30 June 2000.

Table 6.1. Summary of principal US theatre missile defence programmes

Programme	Basing mode/ system	Status
Endo-atmospheric[a]		
Medium Extended Air Defense System (MEADS)[b]	Land-based. Lightweight launcher equipped with Patriot PAC-3 missile and mobile fire control radar	Projected first unit equipped (FUE) in FY 2012 for Block I variant
Navy Area Defense (NAD)[c]	Sea-based. Aegis cruisers and destroyers equipped with reconfigured AN/SPY-1 radar and upgraded Standard Missile SM-2 (Block IVA)	Low-rate initial production of Block IVA missile in FY 2001; projected FUE in FY 2003
Patriot Advanced Capability-3 (PAC-3)[c]	Land-based. Mobile launcher, equipped with high-speed hit-to-kill interceptor missile, and associated X-band radar and engagement control station	Procurement of PAC-3 missiles to begin in FY 2001; projected FUE in FY 2001
Exo-atmospheric[d]		
Navy Theater Wide (NTW)[e]	Sea-based. Aegis cruisers and destroyers equipped with new Standard Missile SM-3, carrying Lightweight Exo-Atmospheric Projectile (LEAP) hit-to-kill warhead, upgraded and expanded radar	Projected FUE in FY 2010 for Block IC system, with contingency capability beginning in FY 2006; Block II system planned as 'evolutionary option'
Theater High Altitude Area Defense (THAAD)[e]	Land-based. Truck-mounted launchers equipped with high-speed hit-to-kill interceptor missiles, mobile X-band ground-based radar (GBR), and battle management command and control system	Entered into engineering and manufacturing development (EMD) phase in 1999; projected FUE for initial C1 capability in FY 2007; FUE for C2 capability in 2011
Boost-phase[f]		
Airborne Laser	Air-based. Modified Boeing 747-400 aircraft carrying multiple laser modules to create megawatt-class chemical laser	Demonstration of laser lethality against an in-flight ballistic missile scheduled for FY 2005

[a] Interception of target missile occurs inside earth's atmosphere, in the terminal phase of its flight trajectory.

[b] Joint US–German–Italian programme designed to protect troops in the field from short-range ballistic missiles, cruise missiles and aircraft. Replaces HAWK anti-aircraft system.

[c] The Patriot PAC-3 and NAD systems are designed to defend limited areas from short- and medium-range ballistic missiles, cruise missiles and aircraft.

[d] Interception of target missile occurs above earth's atmosphere, in the mid-course phase of its flight trajectory. THAAD is also able to engage missiles within the earth's atmosphere.

[e] The sea-based NTW and the land-based THAAD systems are designed to defend large areas from medium- and intermediate-range ballistic missiles.

[f] Interception of target missile occurs during the powered ascent phase of its flight.

Sources: Cohen, W., Secretary of Defense, *Annual Report to the President and the Congress*, (US Department of Defense: Washington, DC, 2000), pp. 74–76; and Statement of Lt Gen. Ronald T. Kadish, Director, Ballistic Missile Defense Organization, before the Senate Appropriations Committee Defense Subcommittee, 12 Apr. 2000, URL <http://www.acq.osd.mil/bmdo/bmdolink/html/kadish12apr00.html>.

enhance its export appeal and to prevent a US monopoly on the technology.[114] In the UK BAE Systems is under contract to supply a multifunction radar which can support a TMD system to equip the Royal Navy's new Type 45 destroyer.[115] There are also several TMD development programmes under way involving significant international cooperation with the USA.

Israel and the USA. The most mature of the collaborative BMD programmes is the US–Israeli Arrow Weapon System (AWS). The Arrow-2 uses a mobile two-stage interceptor missile carrying a blast-fragmentation warhead. It has an 'engagement footprint' (i.e., defended area of coverage) between that of the Patriot PAC-3 and Theater High Altitude Air Defense (THAAD).[116] There have been four successful intercept tests of the system, the last two of which were conducted in September and November 1999. The first Arrow-2 battery entered service with the Israeli Air Force in March 2000.[117] Israel had originally planned to deploy two Arrow-2 batteries but has since sought and won promises of funding from the US Congress for a third battery.[118] The joint US–Israeli Arrow project, which includes missiles, interceptor launcher batteries, tracking radar and fire-control system, cost $1.3 billion to develop; the USA has provided the greater part of the funding. The total programme is expected to cost $2.3 billion.[119]

Japan and the USA. Elsewhere, the Japanese and US governments agreed in 1999 to cooperate on TMD R&D efforts.[120] The five-year programme will focus on improving the Standard Missile SM-3, the interceptor used in the US Navy's Theater Wide missile defence system.[121] A Pentagon analysis of options for missile defence in East Asia had determined that a BMD architecture using the Navy Theater Wide system would require fewer elements for defending Japan against a ballistic missile attack launched from North Korea than one based on other systems.[122] The 1998 launch of the Taepo Dong I missile had spurred the Japanese Government to move forward on TMD cooperation with the USA, after several years of inaction on US proposals. Chinese officials have expressed concern about the political implications of Japanese–US cooperation in developing regional missile defences that might eventually include Taiwan.[123]

[114] Arnett, E., 'Military research and development', *SIPRI Yearbook 1998: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 1998), p. 281.

[115] Hewish (note 20), p. 31

[116] US Ballistic Missile Defense Organization (BMDO), 'Fact sheet: Arrow deployability program', BMDO Fact Sheet AQ-00-07, Mar. 2000.

[117] Hewish (note 20), p. 30.

[118] Kadish (note 10).

[119] Federation of American Scientists (FAS), Special Weapons Monitor, 'Arrow TMD', updated 28 June 2000, URL <http://www.fas.org/spp/starwars/program/arrow.htm>.

[120] Kadish (note 10).

[121] Wall, R., 'US, Japan agree on cooperative missile defense', *Aviation Week & Space Technology*, vol. 151, no. 8 (23 Aug. 1999), p. 46.

[122] Wall, R., 'Asia examines missile defense', *Aviation Week & Space Technology*, vol. 150, no. 24 (14 June 1999), p. 203.

[123] Zhang, M., *China's Changing Nuclear Posture* (Carnegie Endowment for International Peace: Washington, DC, 1999). pp. 48–49; and Diamond, H., 'China warns US on East Asian missile defense cooperation', *Arms Control Today*, vol. 29, no. 1 (Jan./Feb. 1999), p. 27.

NATO. As part of the Defense Capabilities Initiative agreed at the Washington summit meeting in April 1999, the NATO allies have undertaken to develop passive and active measures to protect forces and infrastructure from attacks with weapons of mass destruction.[124] NATO has been studying doctrine and programmes to protect its European territory and its peacekeeping forces for several years.[125] In early 2001 NATO will award two contracts worth approximately $15 million each for initial feasibility studies of an upper-tier TMD system that can defend Europe—and allied forces deployed elsewhere—from short- and intermediate-range ballistic missiles. The Active Layered Theatre Ballistic Missile Defence System would complement lower-tier weapons, such as the Medium Extended Air Defense System (MEADS) and the Patriot PAC-3, that are already under development or on order by European countries.[126]

Also within NATO, the Spanish and Norwegian navies have adopted the USA's Aegis SPY-1 radar to equip their new frigate classes, which potentially could be used in a TMD role.[127]

TMD and the ABM Treaty

A controversy over US TMD plans had appeared on the arms control agenda in 1993, when the USA put forward a proposal to clarify the ABM Treaty to permit the testing and deployment of a new generation of advanced-capability TMD systems.[128] In September 1997, as part of a package of agreements related to TMD and the ABM Treaty, the foreign ministers of Belarus, Kazakhstan, Russia, Ukraine and the USA signed two Agreed Statements setting out technical parameters to clarify the demarcation line between strategic and theatre (non-strategic) missile defences, thereby partly resolving a protracted dispute between Russia and the USA over the issue.[129] This demarcation agreement has faded in importance as the issue of national missile defences has moved to the fore on the arms control agenda; as a means for preserving intact the ABM Treaty, the demarcation agreement is a subsidiary issue in the context of efforts to substantially amend or eliminate the treaty

[124] Defense Capabilities Initiative, approved by the Heads of State and Government participating in the meeting of the North Atlantic Council in Washington, DC on 23 and 24 April 1999, text reproduced in NATO, *The Reader's Guide to the NATO Summit in Washington, 23–25 April 1999*, pp. 61–63, available at NATO Internet site, URL <http://www.nato.int/docu/home.htm>.

[125] See, e.g., Benson, S., 'Will NATO deploy European missile defenses?', *Comparative Strategy*, vol. 16, no. 4 (autumn 1997), pp. 386–97; and Tigner, B., 'Alliance considers joint TMD project', *Defense News*, vol. 13, no. 17 (27 Apr.–3 May 1998), pp. 1, 20.

[126] Hewish (note 20), p. 30.

[127] Hewish (note 20).

[128] TMD systems occupy a 'grey zone' and are not formally subject to the restrictions of the ABM Treaty, which limits only strategic ABM systems. However, the demarcation between strategic and theatre ballistic missiles is not clearly defined and the technical characteristics of defences against them overlap considerably.

[129] For a description of the Agreed Statements, see Kile, S., 'Nuclear arms control', *SIPRI Yearbook 1998* (note 114), pp. 420–23. In addition to the Agreed Statements, a Memorandum of Understanding on Succession (MOUS) was signed by the foreign ministers of Belarus, Kazakhstan, Russia, Ukraine and the USA, pursuant to which these 4 former Soviet republics collectively assumed the rights and obligations of the USSR under the ABM Treaty.

altogether. However, the 1997 Agreed Statements and related agreements, have yet to be approved by the US Senate, where they face strong opposition.[130] They also continue to complicate Russian–US arms reduction efforts and have emerged as an obstacle blocking the entry into force of the START II Treaty.

III. The START treaties

Implementation of the START I Treaty

The Treaty on the Reduction and Limitation of Strategic Offensive Arms (START I Treaty) was signed by the Soviet Union and the USA in 1991 and entered into force in 1994. The Soviet Union's obligations under the treaty were assumed by Russia as its legal successor state and later by Belarus, Kazakhstan and Ukraine, the other former Soviet republics with strategic nuclear weapons based on their territories. In 2000 the parties remained ahead of schedule in implementing the reductions in strategic nuclear delivery vehicles (SNDVs) and accountable warheads mandated by the treaty (see table 6.2). During the year a controversy arose regarding the implementation of these reductions. Russia accused the USA of violating the treaty's Conversion or Elimination Protocol by not destroying all three stages of its MX ICBM, as required by that protocol. The USA claimed that only the first stage had to be destroyed in order for the missile to be considered eliminated.[131]

The START II Treaty

The START II Treaty was signed by Russia and the United States on 3 January 1993.[132] It was ratified by the US Senate in January 1996 but it was not ratified by the Russian Parliament until April 2000. In Russia the treaty had been criticized for its allegedly inequitable impact on the country's defence budget and the structure of its strategic nuclear forces.[133] In addition, support in Russia for START II had been undermined by the treaty's linkage to wider security policy controversies, such as over NATO enlargement, the bombing of Iraq and crises in the Balkans, that fuelled tensions in Russia's relations with the West, particularly with the USA.

[130] Republican leaders in Congress remained opposed to ratifying the 1997 TMD demarcation agreement for allegedly hindering the development of effective missile defences to protect US troops and allies. They also vowed to defeat the 1997 Memorandum of Understanding on Succession (MOUS), which would make the ABM Treaty a multilateral accord. They have claimed that the ABM Treaty has lapsed and is 'of no force and effect' unless the Senate ratifies the MOUS. Kile, S., 'Nuclear arms control', *SIPRI Yearbook 2000* (note 5), pp. 452–53.

[131] Interfax (Moscow), 4 Jan. 2001, in 'Foreign Ministry spokesman accuses US of START Treaty violation', FBIS-SOV-2001-0104, 5 Jan. 2001.

[132] For a description of the provisions of the START II Treaty, see Lockwood, D., 'Nuclear arms control', *SIPRI Yearbook 1993: World Armaments and Disarmament* (Oxford University Press: Oxford, 1993), pp. 554–59.

[133] For a discussion of Russian concerns about START II, see Kile, S., 'Nuclear arms control', *SIPRI Yearbook 1997: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 1997), pp. 371, 374–77.

Table 6.2. START I aggregate numbers of strategic nuclear delivery vehicles and accountable warheads, 1 July 2000[a]

Category[b]	Russia	Ukraine[c]	Ex-Soviet total[d]	USA	Final limits 5 Dec. 2001[e]
Strategic nuclear delivery vehicles	1 313	43	1 356	1 407	1 600
Total treaty-accountable warheads	6 464	396	6 860	7 519	6 000
ICBM and SLBM warheads	5 812	260	6 072	5 941	4 900

ICBM = intercontinental ballistic missile; SLBM = submarine-launched ballistic missile.

[a] The numbers in this table are in accordance with the START I Treaty counting rules and include delivery vehicles which have been deactivated; the estimates of the number of operational systems in appendix 6A are smaller.

[b] The START I Treaty also places limits on inventories of mobile and heavy ICBMs and on aggregate ballistic missile throw-weight.

[c] The transfer of strategic nuclear warheads from Ukraine to Russia was completed in May 1996. The warheads remain START-accountable until their associated delivery vehicles have been eliminated or converted in accordance with procedures specified in the treaty.

[d] Belarus and Kazakhstan completed the elimination of the former Soviet ICBMs and associated launchers based on their territories in 1996.

[e] These ceilings applied equally to the USA and the Soviet Union as the signatories of the START I Treaty. Of the former Soviet parties (Belarus, Kazakhstan, Russia and Ukraine), only Russia will retain strategic nuclear forces at the end of the START I implementation period in 2001.

Source: START I Treaty Memorandum of Understanding, 1 July 2000.

The prospects for START II ratification were improved by changes on the Russian domestic political scene in 1999–2000. President Putin pushed vigorously for the Duma to approve the accord in what many observers saw as part of a broader effort to improve Russia's relations with the West. Putin's task was facilitated by the results of the December 1999 parliamentary elections, in which the communist and nationalist factions, which were most ardently opposed to the treaty, lost ground. In addition, Yeltsin's decision to step down as president at the end of 1999 had improved the treaty's ratification prospects, since the issue had become a political lightning conductor for discontent with his administration.

One of the key arguments in favour of START II ratification put forward by Putin was that Russia could not afford to maintain its Soviet-era strategic nuclear forces at present levels. Officials from the foreign, defence and other ministries testifying in parliamentary hearings convened in the spring of 2000 impressed upon deputies that Russian nuclear force levels are set to decline well below the START II limits during the first decade of the new century, regardless of whether or not the treaty enters into force; some military planners and defence experts predicted that in the light of the scheduled decommissioning of ageing ICBMs and ballistic missile submarines Russia would not be able to deploy more than 1500 strategic nuclear warheads in 2010. The hearings reinforced another argument made by treaty proponents, namely, that START II ratification was a necessary step in a strategic arms reduction pro-

cess that offers the possibility of preserving an approximate numerical balance between the Russian and US strategic forces.[134]

Russian ratification of START II

On 14 April 2000, the lower chamber of the Russian Federal Assembly, the State Duma, voted to ratify the START II Treaty.[135] The Duma also ratified the START II Protocol extending the treaty's implementation period.[136] As expected, the treaty was approved on 19 April by the upper house of parliament, the Federation Council, and signed into law by Putin.

The ratification law contained a number of binding conditions.[137] Among other responsibilities in implementing the treaty, the government is required to negotiate a START III treaty that will rectify specific shortcomings identified in START II. The ratification law also specified the 'extraordinary events' which would give Russia the right to withdraw from the treaty; these included a US withdrawal from the ABM Treaty or violation of that treaty's provisions. In addition, the law stipulated that Russia would exchange the START II instruments of ratification only after the US Senate ratified a package of agreements signed in 1997 related to the ABM Treaty (see section III above). This condition represents a potential 'show-stopper' in implementing START II, since the agreements—which were ratified by the Duma at the same time as START II—face strong opposition in the US Senate.[138] It has led to a situation in which the START II Treaty has been ratified by both parties but may never enter into force.

A START III treaty

In 2000 Russia and the USA continued to discuss elements of a START III treaty that would mandate deeper bilateral cuts in their strategic nuclear forces. The main elements of a START III treaty were agreed in principle at the March 1997 summit meeting held in Helsinki, Finland, between Russian President Boris Yeltsin and US President Clinton.[139] The Helsinki Framework Agreement envisioned reductions in aggregate levels of deployed strategic

[134] ITAR-TASS (Moscow), 21 Mar. 2000, in 'Official sees benefits from START II ratification', FBIS-SOV-2000-0321, 21 Mar. 2000; and ITAR-TASS (Moscow), 13 Apr. 2000, in 'Russian Duma to ratify START 2, urge US to abide by ABM treaty', FBIS-SOV-2000-0413, 13 Apr. 2000.

[135] Wren, C., 'Russian lawmakers approve nuclear arms treaty', *New York Times* (Internet edn), 14 Apr. 2000, URL <http://www.nytimes.com/yr/mo/ day/late/14cnd-arms-treaty.html>.

[136] In Sep. 1997 Russia and the USA signed a Protocol to the START II Treaty extending the treaty's final reduction deadline by 5 years to 31 Dec. 2007; the Protocol also extended the START II interim reduction deadline from 5 Dec. 2001 (i.e., 7 years after the entry into force of the START I Treaty) to 31 Dec. 2004. For a description of the START II Protocol, see Kile (note 129), pp. 410–11.

[137] 'Text of Russian Federal Law No. 56, "On the ratification of the Treaty between the Russian Federation and the United States of America on the Further Reduction and Limitation of Strategic Offensive Arms"', *Rossiyskaya Gazeta*, 6 May 2000, p. 6, in 'Russian START II Ratification Law', FBIS-SOV-2000-0508, 10 May 2000.

[138] Mufson, S., 'Protocols may draw Senate fire, spur bid for broader arms pact', *Washington Post*, 15 Apr. 2000, p. A17.

[139] For a description of the 1997 Helsinki Framework Agreement on START III, see Kile (note 129), pp. 414–16.

nuclear warheads to between 2000 and 2500 for each side. Clinton and Yeltsin also agreed that START III should contain 'measures relating to the transparency of strategic nuclear warhead inventories and the destruction of strategic nuclear warheads'.[140] The measures, which have raised particular interest in Russia as remedies for perceived shortcomings in START II, are intended to 'lock in' nuclear arms reductions and make them irreversible. However, since the transparency discussions have run into technical difficulties and bureaucratic resistance on both sides, the proposed START III force reductions are not linked to progress in this area.

In the Joint Statement issued in September 2000, the two countries noted that they had held 'intensified discussions on further reductions within the framework of a future START III Treaty and on ABM issues, with a view to initiating negotiations expeditiously'.[141] These informal discussions were continued during the autumn.[142] However, as the year ended formal negotiations had yet to get under way. According to US Deputy Secretary of State Strobe Talbott, the opening of negotiations on START III would have to wait until Russia was prepared to begin formal negotiations on amending the ABM Treaty.[143] Russian officials insisted that START III talks could not begin until both sides made 'definite commitments' to leave unchanged the ABM Treaty.[144]

Towards deeper cuts?

Russian officials have suggested lowering the START III warhead ceiling from 2000 to 2500 each, as agreed in 1997, to 1500 warheads. In November 2000 Putin proposed that Russia and the USA should reduce their strategic nuclear arsenals below the 1500 warhead level. While not specifying a new limit, he called for 'radically reduced ceilings' for nuclear warheads that could be reached either jointly or in parallel moves.[145] Putin added that any cuts would be contingent upon progress in preserving and strengthening the ABM Treaty.

[140] The START I and the START II treaties do not require the dismantlement of nuclear warheads removed from delivery vehicles scheduled to be eliminated.

[141] US–Russian Joint Statement (note 61).

[142] Interfax (Moscow), 16 Oct. 2000, in 'Russia, US to hold consultations on START, ABM', FBIS-SOV-2000-1016, 17 Oct. 2000.

[143] United States Information Service (USIS), 'Transcript: Talbott briefing on Clinton–Yeltsin meeting in New York', The White House, Office of the Press Secretary, *European Washington File* (US Embassy: Stockholm, 6 Sep. 2000). The US Administration had previously insisted that it would not enter into formal negotiations until Russia had ratified START II. Some Russian observers complained that the US Administration was adding a new condition for beginning START III talks. 'Russia at the beginning of a third millennium', Remarks delivered by Yevgeniy M. Primakov at the Stockholm International Peace Research Institute, 11 Dec. 2000.

[144] Yuri Kapralov, Director of the Russian Foreign Ministry Department for Security and Disarmament Affairs, quoted by ITAR-TASS (Moscow), 4 Nov. 2000, in 'Russian diplomat calls for ABM Treaty to remain unchanged', FBIS-SOV-2000-1104, 7 Nov. 2000.

[145] 'Statement by the President of the Russian Federation Vladimir V. Putin', 13 Nov. 2000, Press release no. 48, Embassy of the Russian Federation in the United Kingdom, 14 Nov. 2000, URL <http://www.great-britain.mid.ru/GreatBritain/pr_rel/pr48.htm>; and LaFraniere, S., 'Putin suggests deeper bilateral weapons cuts', *Washington Post*, 14 Nov. 2000, p. A37.

The idea of deeper reductions has become increasingly attractive in the Duma, even among some arms control sceptics, since it holds out the prospect of requiring the USA to make reductions to force levels that Russia could afford to sustain as it eliminates ICBMs, ballistic-missile submarines and heavy bombers reaching the end of their service lives. As some Russian analysts have pointed out, however, this means that the START III agreement essentially would be an agreement for unilateral reductions in US nuclear weapons. They predicted that the USA is likely to demand from Russia significant—and possibly unacceptable—concessions, such as accepting its proposals for amending the ABM Treaty, as compensation for moving to the lower warhead ceiling.

This prospect has given rise to questions about whether Russia should continue to seek to maintain the quantitative strategic nuclear parity with the USA. Some military analysts have argued that this goal is increasingly unrealistic in the light of the country's economic problems and competing demands for scarce budget resources; in their view, Russia should determine—independently of arms control agreements with the USA—the size and structure of its strategic forces needed to ensure a robust minimum nuclear deterrent and may safely proceed with unilateral reductions.[146] However, according to Defence Minister Igor Sergeyev, Russia's policy is to continue to maintain a balance of nuclear forces with the USA in the future, albeit 'at the minimum sufficiency level'.[147] At the same time, Russia is preserving options for maintaining a larger strategic nuclear force. It could do this, for example, by extending the service lives of missiles scheduled to be retired.

At a meeting of the Russian Security Council on 11 August 2000 President Putin approved a much-contested plan for the reorganization of the Strategic Rocket Forces.[148] The reorganization plan, which was part of a broader restructuring and modernization programme for the Russian military, had been the focal point of a simmering controversy within the Defence Ministry.[149] The version of the plan approved by Putin reportedly envisions sharply downsizing the SRF over the next 15 years. The SRF are responsible for land-based missiles, which constitute the backbone of Russia's strategic offensive nuclear forces. In addition, after 2006, the SRF reportedly will be downgraded from an independent branch of the armed forces to a service and ultimately transferred

[146] Diakov, A., Kadyshev, T. and Podvig, P., 'Nuclear parity and national security in new conditions', ed. I. Safranchuk, *Russian Nuclear Policy: Problems and Prospects*, PIR Study Papers, no 14 (Center for Policy Studies: Moscow, May 2000), pp. 40–47.

[147] Interfax (Moscow), 4 Dec. 2000, in 'Sergeyev: Russia to maintain minimum sufficiency balance with US', FBIS-SOV-2000-1204, 8 Dec. 2000.

[148] Williams, D., 'Russia to cut its nuclear stockpile', *Washington Post*, 13 Aug. 2000, p. A16; and Sokov, N., *The Fate of Russian Nuclear Weapons: An Anticlimax on August 11*, CNS Reports, Center for Nonproliferation Studies, Monterey Institute of International Studies, 14 Aug. 2000, URL <http://cns.miis.edu/pubs/reports/denuke2.htm>.

[149] Interfax (Moscow), 13 July 2000, in 'Russian defense minister opposed to reorganizing strategic missile forces', FBIS-SOV-2000-0713, 17 July 2000; and Williams, D., 'Putin moves to resolve military dispute', *Washington Post*, 12 Aug. 2000, p. A16.

to the air force.[150] The money saved on maintaining the strategic forces is to be shifted into the conventional forces.[151]

The emerging US nuclear posture debate

Prior to the June 2000 summit meeting between Clinton and Putin, there had been considerable speculation that the US Administration might be willing to agree to a lower ceiling in exchange for Russia's agreement to amend the ABM Treaty to permit the deployment by the USA of a limited NMD system. However, the US military was notably unenthusiastic about embracing a lower warhead ceiling as part of a Russian–US 'grand bargain'.[152] In Senate hearings in May 2000, the US Joint Chiefs of Staff testified that they were 'uncomfortable' with making reductions below 2000–2500 warheads in the absence of new presidential targeting guidance.[153] Analysts noted that the deeper cuts would require removing targets from the US strategic war plan or lowering the required level of damage against targets believed to be needed for deterrence.[154]

The Joint Chiefs' testimony came against the background of renewed political interest in revising US nuclear targeting doctrine and nuclear force levels to reflect the new strategic environment. At a press briefing in May, Republican presidential candidate George W. Bush pledged that, if elected, he would request the Pentagon to undertake a comprehensive nuclear posture review; this review would reconsider targeting strategy and the number of nuclear weapons needed for deterrence. He said that he would reduce—possibly in a unilateral step—US strategic nuclear forces to 'the lowest possible number consistent with our national security'. Bush added that he would consider unilaterally lowering the alert rate of US strategic forces.[155] In June 2000, the Senate approved a Republican-sponsored bill that would allow the US president to make unilateral nuclear arms cuts below the START I level, upon completion of a new Pentagon strategic posture review.[156] One argument made by

[150] Danilov, I., ITAR-TASS, 14 Aug. 2000, in 'Analyst views prospects for rocket forces after Security Council talks', FBIS-SOV-2000-0814, 15 Aug. 2000.

[151] Some military officers and experts argued that Russia would in fact save little money under the plan because of costs connected with dismantling existing weapons and infrastructure. Yuzbashev, V., 'Tactical rather than strategic thinking: missilemen criticize General Staff's proposal for unilateral RSVN cuts', *Vremya MN* (Moscow), 21 July 2000, p. 3, in 'Russian strategic missile troops argue against reductions', FBIS-SOV-2000-0724, 28 July 2000.

[152] Schmitt, E., 'Pentagon feels pressure to cut more warheads', *New York Times* (Internet edn), 11 May 2000, URL <http://www.nytimes.com/library/world/global/051100russia-us-arms.html.>

[153] Whitesides, J., Reuters, 'US military chiefs unhappy with nuke proposal', 23 May 2000, URL <http://dailynews.yahoo.com/h/nm/20000523/ts/arms_nuclear_12.html.>

[154] Despite the end of the cold war, there are currently 2230 'vital' Russian targets on the US strategic war plan (the Single Integrated Operating Plan, SIOP); targets in China were reintroduced into the SIOP in 1998–99 after an absence of nearly 20 years. US strategic planners have traditionally set the required level of damage against vital targets at 80%. With current targeting guidance (which was last modified in 1997 by a Presidential Decision Directive), *c*. 2500 deployed strategic nuclear warheads are considered to be the minimum necessary to execute the SIOP. Blair, B., 'Background paper on the strategic war plan and START reductions', Center for Defense Information, 18 May 2000, URL <http://www.cdi.org/issues/proliferation/blairbckReduc.html>.

[155] Myers, S., 'Bush backs deep cuts in warheads', *International Herald Tribune*, 25 May 2000, p. 3.

[156] Under a US law passed in 1995, the president is prohibited from reducing deployed nuclear warheads below the START I level of 6000 warheads without the approval of Congress.

supporters of deeper cuts was that the USA was essentially forcing Russia to maintain nuclear forces beyond what it can afford to safely maintain.[157]

IV. Other Russian–US arms control agreements

Cooperative strategic warning

At the June summit meeting held in Moscow, presidents Clinton and Putin signed a Memorandum of Agreement on the Establishment of a Joint Center for the Exchange of Data from Early Warning Systems and Notifications of Missile Launches.[158] The agreement was hailed as a 'significant milestone in ensuring strategic stability' between the USA and Russia.[159] It built upon a cooperative early-warning initiative that had been signed by Clinton and Yeltsin in September 1998 but subsequently delayed by unrelated political disputes that poisoned the atmosphere for arms control cooperation.[160]

The idea of a joint early-warning centre has been advocated by Russian and US defence experts concerned about the deterioration of Russia's strategic early-warning and nuclear command and control systems.[161] The overriding goal of the initiative is to reduce the risk of a false missile-attack warning and to prevent the launching of a retaliatory attack in response to such a warning. The agreement signed in June 2000 establishes a Joint Data Exchange Center (JDEC) in Moscow for the exchange of information derived from each side's national command centres on the launches of ballistic missiles and space vehicles. In addition, the JDEC, which is scheduled to open by the end of 2001, is intended to serve as the repository for the notifications to be provided as part of a ballistic missile pre-launch notification regime that is being negotiated separately.[162]

Plutonium disposition

At their June summit meeting Clinton and Putin also announced that they had worked out the details of an agreement providing for the 'safe, transparent and

[157] Pincus, W. and Dewar, H., 'Approved nuclear measure unlikely to affect Clinton', *Washington Post*, 8 June 2000, p. A12.

[158] United States Information Service (USIS), 'Agreement on the establishment of a Joint Warning Center for the exchange of information on missile launches and early warning', The White House, Office of the Press Secretary, *European Washington File* (US Embassy: Stockholm, 5 June 2000).

[159] United States Information Service (USIS), 'Fact Sheet: US–Russian Joint Warning Center on Missile Launches', The White House, Office of the Press Secretary, *European Washington File* (US Embassy: Stockholm, 5 June 2000).

[160] Kile, S., 'Nuclear arms control', *SIPRI Yearbook 1999: Armaments, Disarmament and International Security* (Oxford University Press: Oxford, 1999), p. 540; and Buchan, D., 'US–Russian missile data vision mired in disputes', *Financial Times*, 3 May 2000, p. 3.

[161] Forden, G., Podvig, P. and Postol, T., 'False alarm, nuclear danger', *IIEE Spectrum*, vol. 37, no. 3 (Mar. 2000); and Hoffman, D., '"Blind" satellites heighten Moscow's anxiety over US missile shield', *International Herald Tribune*, 2 June 2000, p. 4.

[162] USIS (note 159); and Interfax (Moscow), 4 June 2000, in 'Russian–US launch reporting center to open in Moscow in 2001', FBIS-SOV-2000-0604, 5 June 2000.

irreversible disposition of 68 metric tons of weapon-grade plutonium';[163] the agreement was subsequently signed on 1 September 2000. Under its terms, each party must dispose of at least 34 tonnes of weapon-grade plutonium by irradiating it as fuel in reactors or by immobilizing it with high-level radioactive waste, thereby rendering it suitable for geological disposal. The USA intends to use 25.5 tonnes as fuel and to immobilize 8.5 tonnes;[164] Russia intends to use all 34 tonnes as fuel.[165] The agreement requires both countries to seek to begin by 2007 the operation of industrial-scale facilities for conversion of the plutonium and its fabrication into fuel; it also mandates a disposition rate of at least 2 tonnes of weapon-grade plutonium each year. Significantly, the agreement establishes a regime for monitoring and inspecting the disposition and the end-products to ensure that the plutonium can never again be used for nuclear weapons.[166] This has been seen as a useful step towards establishing a more comprehensive nuclear warhead dismantlement regime.

V. Negotiations on a Fissile Material Cut-off Treaty

The CD concluded its 2000 session without opening negotiations on a treaty to ban the production of fissile material for military purposes.[167] This was the second consecutive year in which the CD failed to open negotiations, despite having agreed to establish an ad hoc negotiating committee for a fissile material treaty in 1998.[168] The start of negotiations was again blocked by a procedural impasse arising from the failure of the CD to reach agreement on a programme of work for the year, which is a prerequisite for convening the negotiating committee. This impasse resulted in the CD not conducting any negotiations during its 2000 session and led to renewed calls for changes in the CD's structure and procedures.[169]

As in the previous year's session, two principal issues prevented the CD, which operates on the basis of consensus, from agreeing on a work programme. The first was connected with the long-standing demand from the Group of 21 (G-21) non-aligned states in the CD for the establishment of an ad

[163] United States Information Service (USIS), 'Fact Sheet: US–Russian plutonium disposition agreement', The White House, Office of the Press Secretary, 4 June 2000, *European Wireless File* (US Embassy: Stockholm, 5 June 2000).

[164] According to a senior US official, *c.* 75% of the 34 t of excess plutonium will be in the forms of 'pits' or 'clean metal', which means that it comes from weapons. United States Information Service (USIS), 'Transcript: White House backgrounder on US–Russian Agreements, June 4', The White House, Office of the Press Secretary, 4 June 2000, *European Wireless File* (US Embassy: Stockholm, 5 June 2000).

[165] Russian environmental groups have objected to the plan, arguing that burning weapon-grade plutonium in Russia's commercial reactors will cause extensive plutonium contamination across the country. 'Burning plutonium too hot for Russian reactors to handle', Environmental News Service, 28 June 2000, URL <http://ens.lyco.com/ens/jun2000/2000L-06-28-11.html>.

[166] USIS (note 163).

[167] Conference on Disarmament, 'Conference on Disarmament concludes 2000 session', Press release DCF/404, 21 Sep. 2000.

[168] A mandate had been agreed in Mar. 1995 for a committee to 'negotiate a non-discriminatory, multilateral and effectively verifiable treaty banning the production of fissile material for nuclear weapons or other nuclear explosive devices'. Conference on Disarmament document CD/1299, 24 Mar. 1995.

[169] Rissanen, J., *Gloom Hangs over CD*, BASIC Reports, no. 74 (14 Aug. 2000), pp. 1, 2.

hoc committee on nuclear disarmament.[170] The second issue, which generated an uncharacteristically acrimonious debate, was connected with Chinese-led calls for the re-establishment of an ad hoc negotiating committee under item three of the CD agenda, 'Prevention of an arms race in outer space' (PAROS).[171] China, along with Russia and some other member states, has argued that the 'weaponization' of outer space has become an urgent topic for the CD to address, particularly in the light of the possibility that the USA will develop space-based components for its NMD system.[172] For its part, the USA has been unwilling to go along with proposals to initiate negotiations in the CD on the military uses of outer space. The US Representative to the CD, Robert Grey, called these proposals 'unwise and unrealistic', adding that US plans for a possible limited missile defense 'do not involve emplacing any weapons in space'.[173]

VI. The Comprehensive Nuclear Test-Ban Treaty

The CTBT will enter into force 180 days after it has been ratified by the 44 members of the CD with nuclear power or research reactors on their territories, as listed in Annexe 2 of the treaty. The future of the CTBT was complicated when the US Senate voted in October 1999 to reject ratification of the treaty. The Senate vote marked at least a temporary setback for international efforts to bring the CTBT into force, since the USA is one of the 44 states which must ratify the treaty in order for it to enter into force. The treaty's prospects were given a boost, however, when the Russian Duma voted overwhelmingly to ratify it on 21 April 2000; Putin had urged the deputies to ratify the CTBT prior to the opening of the 2000 NPT Review Conference.[174] In addition, in September Indian Prime Minister Atal Bihari Vajpayee pledged that his government would not conduct further nuclear testing while it attempted to build a consensus on signing the CTBT.[175] There had been a flurry of press reports earlier in the year speculating that India was preparing to begin a new campaign of nuclear testing.

[170] See the glossary in this volume for the over 30 (originally 21) member states of the Group of 21.

[171] In 1999 China proposed the establishment of an ad hoc committee 'to negotiate the conclusion of an international legal instrument banning the testing, deployment and use of any weapons, weapon systems or components thereof in outer space'. 'Re-establishment of an ad hoc committee on the prevention of an arms race in outer space and its mandate', Conference on Disarmament document CD/1576, 18 Mar. 1999. An ad hoc committee established in 1994 failed to reach agreement on a set of proposed confidence-building measures in outer space.

[172] 'China's position on and suggestion for ways to address the issue of prevention of an arms race in outer space at the Conference on Disarmament', Conference on Disarmament document CD/1606, 9 Feb. 2000.

[173] United States Information Service (USIS), 'Statement of Ambassador Robert T. Grey, United States Representative to the Conference on Disarmament', *European Washington File* (US Embassy: Stockholm, 15 Sep. 2000).

[174] Interfax (Moscow), 21 Apr. 2000, in 'Duma ratifies Comprehensive Nuclear Test Ban Treaty', FBIS-SOV-2000-0412. The treaty was subsequently approved by the Federation Council (upper chamber of parliament) on 17 May and signed by President Putin. ITAR-TASS (Moscow), 21 Apr. 2000, in 'Rogozin says CTBT signing can give Russia initiative', FBIS-SOV-2000-0421, 24 Apr. 2000.

[175] Nakashima, E., 'Clinton lauds India's pledge to forgo more nuclear tests', *International Herald Tribune*, 16–17 Sep. 2000, p. 5.

As of 1 January 2001, the CTBT had been ratified by 69 states and signed by a further 93 states; of the 44 states whose ratification is required for the CTBT to enter into force, 30 had ratified the treaty and an additional 11 states had signed but not ratified the treaty.[176]

VII. Conclusions

In 2000 the controversy over missile defences and the ABM Treaty continued to dominate the nuclear arms control agenda. The dispute between Russia and the USA over the future of the ABM Treaty as the cornerstone of strategic stability showed few signs of abating. This dispute complicated efforts to move ahead with further reductions in nuclear forces and led to renewed warnings from Russia that the achievements made in recent years in building smaller, more transparent nuclear arsenals were in jeopardy. It also raised concern in a growing number of countries about the prospects for building a nuclear order based on stability, restraint and deeper cuts in nuclear arms.

There were indications during the year that strategic nuclear arms control, as it has existed since the 1960s, might be reaching the end of the road. That process had evolved over time as a tool for managing the superpower military competition within the wider East–West ideological confrontation. It was characterized by complex arms reduction agreements that mandated precisely equilibrated force limits accompanied by detailed verification provisions. With the end of the cold war, the relevance of the concept of strategic parity codified in those agreements has been coming under increasing scrutiny. There is political pressure in both Russia and the USA to adjust what are essentially cold war-era nuclear force postures and underlying targeting strategies to bring them into line with changed political and financial circumstances. This has led to proposals for reducing nuclear arsenals outside the framework of 'traditional' arms control treaties, perhaps in the form of unilateral measures.

While the overall post-cold war nuclear arms control framework was not in danger of collapse at the end of 2000, it was increasingly clear that serious problems need to be addressed. This in turn underscored that there is an urgent need to conceptualize a new arms control and disarmament agenda that will be able to address the risks and challenges likely to emerge in the future international security system.[177]

[176] See annexe A in this volume.

[177] SIPRI, 'The Stockholm Agenda for Arms Control', in eds Anthony and Rotfeld (note 4), pp. 359–66.