



The explosion at .053 seconds.

Towards Zero: nuclear disarmament and non-proliferation – UNA-UK Briefing Report no. 4

Embedding the CTBT in norms, law and practice

Report written for the United Nations Association - UK

Dr Rebecca Johnson

Embedding the CTBT in norms, law and practice

Report written for the United Nations Association-UK

Dr Rebecca Johnson



About the author

Dr Rebecca Johnson is Director of the Acronym Institute for Disarmament Diplomacy, Co-Chair of the International Campaign to Abolish Nuclear Weapons (ICAN), and a member of the International Panel on Fissile Materials (IPFM).

After an early training in physics, a BSc from Bristol University and MA from the School of Oriental and African Studies, University of London (SOAS), Dr Johnson monitored the CTBT negotiations in Geneva on behalf of a consortium of NGOs (1994-96). While building up the Acronym Institute and its journal *Disarmament Diplomacy*, which tracked developments and negotiations on a range of treaties in the United Nations and other relevant international fora, she obtained her PhD from the London School of Economics (LSE) in International Relations, with a thesis on 'The 1996 Comprehensive Test Ban Treaty: A Study in Post-Cold War Multilateral Arms Control Negotiations'.

Dr Johnson was formerly senior advisor to the International WMD Commission (2004-06) and Vice Chair of the Bulletin of the Atomic Scientists (2001-07). Rebecca Johnson has published extensively on international security, non-proliferation, treaty-making and compliance, the United Nations, NPT and CTBT. Recent books include *Unfinished Business*, about civil society and government strategies to achieve the CTBT (United Nations, 2009), *Trident and International Law: Scotland's Obligations*, (Luath Press, 2011), and *Decline or Transform: Nuclear disarmament and security beyond the NPT review process* (with Tim Caughley and John Borrie, London 2012).

About UNA-UK

The United Nations Association UK (UNA-UK) is the UK's leading source of independent analysis on the UN and a grassroots movement campaigning for a safer, fairer and more sustainable world. UNA-UK seeks to increase knowledge of the UN and stimulate thought and debate on how to make it stronger, more credible and more effective.

Our flagship *Towards Zero* programme builds on our historic role as a leading campaigner for nuclear non-proliferation and multilateral disarmament. The core strands of the programme are:

- influencing decisions-makers and opinion-shapers in the UK;
- working with key individuals and organisations in other nuclear-weapon states;
- collaborating with experts on policy options; and
- re-establishing nuclear disarmament as a central issue for young people.

For more information, visit www.una.org.uk/towards-zero or contact James Kearney, UNA-UK Peace and Security Programmes Manager, on kearney@una.org.uk or 020 7766 3446.

The views expressed in this paper are solely those of the author.

Cover photo: A photograph on display at Trinity Site, New Mexico showing the world's first atomic explosion on July 16, 1945. The photo caption reads "The explosion at .053 seconds."
© Jonathan Larsen/Diadem Images/Alamy 2008

Contents

1	Introduction	5
2	Halting all nuclear tests - a longstanding international commitment	7
3	Scope and verification	8
4	Prospects for full entry into force	11
5	Provisional Application of the Treaty as a fall-back?	17
6	Reducing Nuclear Salience	18
7	Conclusions	19

“The CTBT was a milestone. It is an essential building block in strengthening the rule of law in nuclear disarmament and non-proliferation.

That is why it is distressing that this Treaty has yet to enter into force.

When I chaired this Preparatory Commission, I never imagined I would one day return as Secretary-General. But I certainly believed that this Treaty would have entered into force by now.

We will continue pressing to reach this goal.”

Ban Ki-moon, UN Secretary-General

Vienna, 17 February 2012

Remarks on Fifteenth Anniversary of the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization

Introduction

More than 50 years after the first atomic weapon was tested in New Mexico, the 1996 Comprehensive Nuclear-Test-Ban Treaty (CTBT) prohibited nuclear explosions in all environments – underground, atmospheric, under water and outer space, and established a global verification regime. The treaty's international monitoring system and organisational headquarters in Vienna have already proved their worth in detecting and identifying seismic events and releases of radioactivity, whether the cause is natural, such as earthquakes and tsunami, accidental, such as Fukushima, or clandestine nuclear testing such as the three underground nuclear tests conducted by North Korea since 2006.

When the treaty was opened for signature, the United States was the first to sign.¹ The US Senate had helped get negotiations underway by mandating a moratorium on nuclear testing in October 1992, following similar moratoria from Russia and France. China was not ready to stop, so continued to conduct one or two tests per year during the negotiations, which took place at the Conference on Disarmament (CD) in Geneva between 1994 and 1996. And even though France dramatically violated its own moratorium to conduct six final tests in 1995 and 1996, China and France joined the United States, Russia and United Kingdom in signing the treaty when it was opened for signature at the United Nations on 24 September 1996. No signatory state has conducted a nuclear test explosion since signing the CTBT.

Three states that have not yet signed are India and Pakistan, which each carried out between 5 and 6 underground tests in May 1998, and North Korea, whose tests in 2006, 2009 and 2013 were detected and identified by the CTBT Organisation (CTBTO) in Vienna. These are the last gasps of nuclear testing after more than 2050 nuclear explosions were carried out in the decades after 1945. Far from undermining the CTBT, they demonstrate why this nuclear test ban treaty is so important for national and global security. Without the CTBT, all the nuclear-armed states would still be conducting nuclear tests, and new proliferators would have one less hurdle to overcome.

The CTBT is one of the most widely supported treaties in history, having been signed by 183 states and ratified by 159.² Regrettably, it has still not entered into force. The reasons have to do with the treaty's history, negotiating process and structural outcome, which included an entry into force requirement (Article XIV) of signature and ratification by all states on a list of 44 states with nuclear research capabilities (attached to the treaty as "Annex 2").³ Because of this structural requirement, which was most vociferously advocated during the negotiations by Russia, the UK, Pakistan and Egypt,⁴ the security interests of the majority of governments who favoured early entry into force have been made hostage to the domestic politics of a few. The eight remaining states are the United States, China, India, Pakistan, the Democratic People's Republic of Korea (North Korea), Israel, Iran and Egypt.

Lessons can be learned from the flawed entry-into-force negotiations and outcome for future treaties, but that is not my purpose here. With over 180 states members of the CTBTO Preparatory Commission, the test ban treaty is already more strongly embedded in the international non-proliferation and security regimes than some other treaties that have legally entered into force.

1. President Bill Clinton signed with the same pen that President Kennedy had used for signing the Partial Test Ban Treaty in 1963.
2. As of 13 March, 2013, Comprehensive Test Ban Treaty Organisation website: www.ctbto.org
3. Article XIV of the CTBT states: "This Treaty shall enter into force 180 days after the date of deposit of the instruments of ratification by all States listed in Annex 2 to this Treaty". The criterion for Annex 2 listing was given as: "States members of the Conference on Disarmament as at 18 June 1996 which formally participated in the work of the 1996 session of the Conference and which appear in Table 1 of the International Atomic Energy Agency's April 1996 edition of 'Nuclear Power Reactors in the World', and of States members of the Conference on Disarmament as at 18 June 1996 which formally participated in the work of the 1996 session of the Conference and which appear in Table 1 of the International Atomic Energy Agency's December 1995 edition of 'Nuclear Research Reactors in the World'". The listed states are: Algeria, Argentina, Australia, Austria, Bangladesh, Belgium, Brazil, Bulgaria, Canada, Chile, China, Colombia, Democratic People's Republic of Korea, Egypt, Finland, France, Germany, Hungary, India, Indonesia, Iran (Islamic Republic of), Israel, Italy, Japan, Mexico, Netherlands, Norway, Pakistan, Peru, Poland, Romania, Republic of Korea, Russian Federation, Slovakia, South Africa, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom of Great Britain and Northern Ireland, United States of America, Viet Nam, Zaire. All but 8 states in Annex 2 have now ratified, including Russia, France and the UK.
4. Rebecca Johnson, *Unfinished Business: The Negotiation of the CTBT and the End of Nuclear Testing*, (United Nations/ UNIDIR, 2009).

“The CTBT is one of the most widely supported treaties in history, having been signed by 183 states and ratified by 159. Regrettably, it has still not entered into force”

The second term of President Obama has again raised hopes that the United States will ratify the treaty and bring several additional dominoes with it. This briefing considers the prospects for ratification (and, where relevant, signature) by the eight remaining states necessary for CTBT entry into force in accordance with Article XIV as it currently stands. If that proves to be out of reach in the near term, two different kinds of international approach are considered with a view to preventing erosion of the test ban regime and bolstering its effectiveness for the future.

Since amending the treaty text is not currently viewed as desirable or feasible, one option consistent with treaty law would be for states that have ratified to make a collective agreement on ‘provisional application’ of the treaty until the full Article XIV conditions are met. Irrespective of whether such a legal strategy were decided upon, much could also be achieved through national, regional and international political approaches that would uphold and further embed the nuclear testing taboo enshrined in the CTBT and maintain and strengthen the role and capabilities of the CTBTO in detecting, monitoring and deterring nuclear explosions around the world. On the larger international security and non-proliferation canvas, potentially game-changing initiatives are reducing the role and value attached to nuclear armaments and highlighting the humanitarian consequences of nuclear policies and risks. Nuclear disarmament is now being pursued on three fronts, with the progressive delegitimising of nuclear weapons providing further impetus for reducing existing arsenals and minimising proliferation incentives. Even if full entry into force continues to be thwarted by the domestic politics of a handful of states, the CTBT will continue to play a vital role in constraining horizontal and vertical proliferation and promoting the security conditions for a nuclear-weapons-free world.

During ratification debates in the United States, the treaty’s scope and verifiability are most frequently raised, so I shall start with a brief overview of the treaty’s background and negotiations on these core issues.

Halting all nuclear tests - a longstanding international commitment

The earliest calls for a comprehensive nuclear test ban came in 1954, when India's Prime Minister, Jawaharlal Nehru, and the Japanese Parliament made separate appeals for nuclear testing to be banned. The impetus came from growing public concern about the radioactive mushroom clouds that illustrated the terrible, contaminating power of nuclear weapons, since most nuclear testing at that time took place above ground in the Pacific, Kazakhstan as well as the US states of Nevada and New Mexico.

President Eisenhower worked hard for a CTBT during the late 1950s, primarily with UK Prime Minister Harold Macmillan and Soviet General-Secretary Nikita Khrushchev. In Geneva, the Ten Nation Disarmament Conference was briefly convened – the first of several multilateral bodies that eventually grew into the Conference on Disarmament.⁵

John F. Kennedy tried to revive Eisenhower's test ban initiative when he took over the US Presidency in January 1961, but got nowhere until the 1962 Cuban Missile Crisis shocked the superpowers into taking action to curb nuclear dangers. After failing to agree on banning underground nuclear testing, on 5 August 1963, the Soviet Union, United Kingdom and United States signed the Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water, widely known as the Partial Test Ban Treaty (PTBT).⁶ As the treaty was opened for signature by other states, the political mood facilitated prompt ratification by all three negotiating partners. The US Senate ratified on 24 September 1963, by 80 votes to 19, which enabled the PTBT to enter into force on 10 October, 1963. Over the next few years more than 120 states signed up to this treaty. Even though France and China never joined the PTBT, both countries found themselves legally and politically constrained by its existence and prohibitions.⁷ The discontinuance of all nuclear testing was also enshrined in the preamble of the 1968 Non-Proliferation Treaty (NPT), which China and France were finally persuaded to join in 1992.

Though various governments and organisations kept up pressure for a CTBT, this proved impossible to achieve during the Cold War. In the early 1990s, however, new opportunities opened up. On 2 October, 1992, President George H. W. Bush signed into law an Appropriations bill that mandated a nine-month moratorium on US nuclear testing and required the government to seek to conclude a comprehensive test ban treaty by September 1996. Together with similar moratoria from France and Russia, and carrying also the UK (which used the Nevada test site), the US moratorium kick-started negotiations on a CTBT.

Based largely on a bilateral draft circulated by Russia and the United States and agreed among the P-5,⁸ Japan piloted a negotiating mandate through the CD that underlined that the CTBT was to have both a disarmament purpose and a role in non-proliferation, and specified the establishment of at least two working groups, for verification and for legal and institutional issues. In January 1994, the CD commenced negotiations in Geneva.

5. The Ten Nation Disarmament Conference functioned only briefly, 1959–60, and comprised five states from each side of the Iron Curtain. Founded by the Foreign Ministers of France, the Soviet Union, United Kingdom and United States, it included Bulgaria, Canada, Czechoslovakia, Italy, Poland and Romania. By 1994, when negotiations on the CTBT opened in Geneva, the CD comprised 38 members (though war and dissolution meant that Yugoslavia's seat was empty). In June 1996, shortly before the treaty was concluded, the CD was enlarged to 61, and now comprises 65 states.
6. The PTBT is known in the US as the "Limited Test Ban Treaty" (LTBT).
7. France stopped atmospheric testing in 1974 when Australia and New Zealand initiated a court case citing the PTBT. China came under increasing pressure from PTBT member states and in 1980 conducted the world's last atmospheric nuclear test explosion.
8. The P5 abbreviation is used because China, France, Russia, the United Kingdom and United States are all permanent members of the UN Security Council. It is a politically counterproductive but significant fact that they are also the five 'nuclear weapon states' defined in the NPT text, in Article IX.

Scope and verification

The CD negotiated intensively on the CTBT over 3 years, with particular recognition that banning nuclear testing was regarded by most non-nuclear states parties to the NPT as a critical element in the package of consensus decisions that accompanied the NPT's extension in May 1995. They effectively adopted the US target date of September 1996, committing to conclude "negotiations on a universal and internationally and effectively verifiable Comprehensive Nuclear-Test-Ban Treaty no later than 1996".⁹

The NPT's indefinite extension caused consternation among India's political elite, who railed against the NPT's apparent perpetuation of nuclear-weapons-related status for just five states, including regional rival China. India's concerns were manifested in their increasing pull-back from the test ban in the final stages of negotiations. India's cynicism appeared to be reinforced when China tested within days of the adoption of the NPT extension decision advocated by the P-5, and then France resumed testing in the Pacific a few months later.

The massive international outcry, with civil society protests around the world, jolted other governments as well, and heightened awareness of the international importance of being seen to curb nuclear weapons. This prompted simultaneous US and French announcements in August 1995 that they would support a zero yield scope text, as advocated by almost all the non-nuclear participants in the negotiations. Cutting through the deadlock among the P-5, who couldn't agree on whether to permit low yield testing or so-called "peaceful nuclear explosions", the zero yield decision provided clarity and unified the negotiators in support of an Australian draft text that subsequently became the Article I basic obligation of the CTBT:

1. *Each State Party undertakes not to carry out any nuclear weapon test explosion or any other nuclear explosion, and to prohibit and prevent any such nuclear explosion at any place under its jurisdiction or control.*
2. *Each State Party undertakes, furthermore, to refrain from causing, encouraging, or in any way participating in the carrying out of any nuclear weapon test explosion or any other nuclear explosion.*

Giving evidence to the Senate Foreign Relations Committee in 1999, the chief negotiator for the United States, Ambassador Stephen Ledogar, succinctly summed up what "zero yield" meant: "If what you did produced any [nuclear] yield whatsoever, it was not allowed. If it didn't, it was allowed."¹⁰ Ledogar died in May 2010 and cannot be called to give further evidence to support US ratification of the CTBT. Therefore, it is worth noting that this eminent diplomat held that treaties should be considered on their merits for national security interests, and not subjected to counterproductive partisan politicisation. Ledogar told the Committee that he had first been appointed as an ambassador by President Ronald Reagan, and had served under Presidents George H.W. Bush and Bill Clinton as chief negotiator for the Chemical Weapons Convention as well as the CTBT. Giving an overview of how the CTBT outcomes on scope, verification and entry into force had been negotiated and what they meant, Ledogar argued that the "zero means zero" yield decision was in US interests as it cut short the "squabbling" among the P-5 and ensured that there would be "no threshold for anybody".¹¹

9. 1995 Review and Extension Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Final Document, Part I, New York, 1995, NPT/CONF.1995/32 (Part I). For a fuller account of the process and politics of the 1995 Conference, see Rebecca Johnson, *Indefinite Extension of the Non-Proliferation Treaty: Risks and Reckonings*, ACRONYM 7, The Acronym Consortium, London, September 1995.

10. Prepared Testimony of Ambassador Stephen J. Ledogar (ret.) Chief US Negotiator of the CTBT before the Senate Foreign Relations Committee, Washington D.C., 7 October, 1999.

11. Ambassador Stephen J. Ledogar (ret.) Chief US Negotiator of the CTBT, Testimony before the Senate Foreign Relations Committee, Washington D.C., 7 October, 1999.

At a meeting in the UN in May 2009, a former member of China's CD delegation confirmed Ledogar's view of the zero yield decision, pointing out that when it had been accepted by all the P-5 their respective technical experts met in Geneva to clarify the technical implications. Though he could not confirm the existence of a formal memo on this, he said that it was clearly understood and agreed that "hydronuclear experiments were prohibited, but hydrodynamic and non-fission experiments were not."¹²

Once the basic scope and obligations had been agreed, the negotiators were able to finalise a very robust verification system. Nuclear test explosions produces four kinds of primary effects: blast, heat and light, nuclear radiation, and residual radionuclide contamination. These phenomena result in different short, medium and long-range effects able to be detected by a range of different technologies and techniques. In accordance with the treaty, an International Monitoring System (IMS) established seismic, hydroacoustic, infrasound and radiation sensors all round the world to feed into the International Data Centre (IDC) at the CTBTO in Vienna.

Even before entry into force of the CTBT, the IMS effectively monitors the major nuclear-armed states with, for example, 32 IMS stations in Russia, 12 in China and 39 in the United States. North Korea is covered by 23 monitoring stations in China, Japan and South Korea. Some 17 IMS stations monitor the Middle East, while India and Pakistan are surrounded with over 40 stations in Australia, Bangladesh, China, Sri Lanka and Thailand. Africa, the South Pacific and Latin America may be nuclear-weapons free zones, but they are also well covered, which has proved invaluable for civilian emergencies such as earthquakes and early warning for tsunami. As of February 2013, 274 out of the treaty-envisaged 337 IMS facilities have been certified.¹³ To these CTBTO assets must be added the data fed in from academic and civilian seismographs and radionuclide detectors, as well as additional national technical monitoring and intelligence capabilities, which are permitted under the treaty.¹⁴

Two verification issues that were particularly hard fought concerned on-site inspections (OSI)¹⁵ which have to strike a balance between effectiveness, intrusiveness, national security sensitivities and international confidence, and the use of 'national technical means' (NTM). By the final year of negotiations, the major arguments about the OSI provisions in the treaty were between the United States and China. The US interagency process had resulted in proposals for OSI to be quickly launched and robustly intrusive if the IMS detected a sufficiently suspicious event. China, by contrast, wanted to ensure that the US and its allies would not have an automatic decision-making majority on the Executive Council that might be used to inspect other countries' nationally sensitive sites regardless of whether there was sufficient treaty-based evidence to warrant an OSI. It is interesting to note that when China's chief CTBT negotiator, Sha Zukang, shared a panel with his counterpart, Stephen Ledogar, when "*Unfinished Business*" was officially launched at the United Nations in May 2009, both confirmed that the book's analysis of these verification issues (and, indeed, the overall negotiations) was accurate.¹⁶ Both also impressed on the audience that despite frequently putting higher bargaining demands into the negotiations, they were confident that the outcome covered all their "red lines" and met their respective countries' security interests.

In his earlier testimony to the Senate Foreign Relations Committee, Ledogar had confirmed this, stressing "that the US succeeded in the negotiations in getting virtually everything the intelligence community and other parts of the government wanted from the Treaty to strengthen our ability to detect and deter cheating and to seek appropriate redress if cheating did occur. At the same time, we succeeded in getting virtually everything the Defense Department and others wanted to ensure the protection of sensitive national security information." Ledogar acknowledged that there had been considerable opposition to the US position on national technical means as providing "a clear advantage and a license to spy", but confirmed that the US delegation "crafted a complicated, highly detailed proposal that balanced our offensive and defensive needs". In the end, he concluded, "the Treaty read pretty much like the original US paper put together jointly by the Departments of Defense, Energy and State, the Intelligence Community and the then existing Arms Control Agency."¹⁷

As China and the US resolved their verification differences, the negotiations were running out of time to address India's concerns following the NPT's indefinite extension. India wanted the

"The massive international outcry, with civil society protests around the world, jolted other governments as well, and heightened awareness of the international importance of being seen to curb nuclear weapons"

12. UN launch of *Unfinished Business* by Rebecca Johnson, United Nations, New York, May 13, 2009. Though statements by the panel were on the record, this comment was made by a Chinese technical expert and member of the Chinese delegation 1995-6, so under the 'Chatham House Rule' he cannot be named.
13. Source: Comprehensive Nuclear Test Ban Treaty Organisation (CTBTO). See also the discussions in *CTBT Spectrum* and other CTBTO and UN publications: www.ctbto.org/
14. See Thomas Graham, Jr. and David Hafemeister, Nuclear Testing and Proliferation - an Inextricable Connection, *Disarmament Diplomacy 91* (Summer 2009). www.acronym.org.uk/dd/dd91/91tgdh.htm and Rebecca Johnson, *Unfinished Business: Lessons from the CTBT Negotiations, Disarmament Diplomacy 91* (Summer 2009): www.acronym.org.uk/dd/dd91/91ctbt.htm
15. See CTBTO website, See also www.ctbto.org/verification-regime/on-site-inspection/the-final-verification-measure/
16. UN launch of *Unfinished Business: The Negotiation of the CTBT and the End of Nuclear Testing*, (United Nations/ UNIDIR, 2009) by Rebecca Johnson, United Nations, New York, May 13, 2009. The meeting comprised more than 150 governmental and civil society experts, and the panel comprised former ambassadors Sha Zukang, and Stephen Ledogar, UN High Representative for Disarmament Affairs Sergio Duarte, CTBTO Executive Secretary Tibor Tóth, and the author.
17. Ambassador Stephen J. Ledogar (ret.) Chief US Negotiator of the CTBT, Testimony before the Senate Foreign Relations Committee, Washington D.C., October 7, 1999.

CTBT to include explicit commitments relating to nuclear disarmament, which were resisted by the P-5. The September 1996 deadline, which reflected the US electoral timetable and had been adopted by others in the CD and NPT fora, contributed to a fraught and polarised endgame. Mistakes and mismanagement resulted in the adoption of an overly rigid entry-into-force provision that was perceived by India as “coercive”. India’s opposition made it impossible for the CD to achieve the required consensus to adopt its own treaty. After much wrangling, Australia, and Belgium took the CTBT direct to the UN General Assembly, where it was debated over two days and adopted by majority vote (158 to 3 with 5 abstentions)¹⁸ before it was opened for signature on 24 September 1996.

18. Only India, Bhutan and Libya voted against. Bhutan is a tiny protectorate of India and likely to join when India does (but has no nuclear facilities). Libya signed in 2001 and ratified in 2004.

Prospects for full entry into force

To date, eight states are still impeding entry into force 17 years after the CTBT was opened for signature. The reasons vary from ideological opposition to politically difficult domestic processes; “after you” domino politics among certain states due to geostrategic or client relationships means that ratification by one may make it more likely that others will follow. Although all are supposedly sovereign and independent, China appears to be waiting for the United States, where ratification requires a two-thirds majority of a partisan Senate. India, as discussed below, may now be ready to have a more constructive debate about the CTBT, but not until the US and China have ratified. In the Middle East, Israel, Egypt and Iran may be applying political linkages to their ratification decisions. Therefore, the first question to be addressed is whether there are realistic prospects for obtaining the necessary ratifications (and signatures, in the case of India, Pakistan and North Korea) and if so, what price will be expected by domestic supporters of nuclear weapons or in other economic or foreign policy areas.

If ratification by all the 44 listed states is not achievable in the near term, other approaches for strengthening and implementing the test ban regime should also be taken forward. One legal approach that is seldom used but available would be for states that have already ratified to agree on provisional application pending full entry into force. A second, more political approach that is gaining adherents among the majority of non-nuclear governments, is to greatly strengthen the norms, regimes and laws that prohibit, constrain and delegitimise nuclear weapons, thereby facilitating full implementation of the CTBT, NPT and other related treaties without acceding to the undue structural power such treaties have accorded to the very nuclear-armed states that are most likely to try to keep their options open.

United States

Despite President Barack Obama’s explicitly expressed commitment to the CTBT on many occasions, he chose to prioritise other issues in his first Administration. For internal reasons, the CTBT was lined up behind New START (the 2010 Strategic Arms Reduction Treaty) with Russia. When getting New START negotiated and then ratified proved more time consuming and challenging than initially anticipated, the CTBT slipped further down the Administration’s political agenda. The CTBT had been brought before the Senate in 1999, when a majority of Senators voted in favour of ratification but not by the required two-thirds majority. Recognition that a second failure would be even more devastating has led to higher than usual levels of caution and anxiety.

To try to overcome partisan divisions in the US Senate, numerous official, semi-official and NGO reports were undertaken during 2009–2011, in efforts to lay the groundwork for a more constructive debate. Several, including from the National Academy of Sciences, the EastWest Institute, Nuclear Threat Initiative and Arms Control Association¹⁹ highlighted the advances in verification technologies, the CTBTO’s impressive verification and monitoring capabilities and other changes and developments since 1999. In different ways, all concluded that ratifying the CTBT is in US national security interests. In particular, as explained by the Arms Control Association, while the US continues to benefit from the CTBT as it stands, “without entry into

“If ratification by all the 44 listed states is not achievable in the near term, other approaches for strengthening and implementing the test ban regime should also be taken forward”

19. See for example, ‘Findings and Recommendations Concerning the Comprehensive Nuclear Test Ban Treaty’ www.state.gov/www/global/arms/ctbtpage/ctbt_report.html, Report by General John Shalikashvili (USA, Ret.), Special Advisor to the President and Secretary of State, submitted 5 January, 2001 and John M. Shalikashvili, “Findings and Recommendations Concerning the Comprehensive Nuclear Test Ban Treaty”, *Arms Control Today*, vol. 31, no. 1, 2001, pp. 18–28; Tom Z. Collina with Daryl G. Kimball, *Now More than Ever: The case for the Comprehensive Nuclear Test Ban Treaty*, (Washington DC: Arms Control Association, February 2010); Jacqueline McClaren Miller (ed.), *The Comprehensive Nuclear Test Ban Treaty: New technology, new prospects*, The EastWest Institute, New York, January 2010.

force, the United States will be denied the full benefits of the treaty, including on-site inspections and compulsory consultation and clarification procedures".²⁰

As recently as March 20, 2013, US Acting Under Secretary for Arms Control and International Security, Rose Gottemoeller, told an international audience that the CTBT "remains a top priority for the United States".²¹ She also reinforced the importance of this for US national security by quoting from the April 2010 US Nuclear Posture Review, that US ratification would contribute to "leading other nuclear weapons states toward a world of diminished reliance on nuclear weapons, reduced nuclear competition, and eventual nuclear disarmament".²² What is still missing is a coherent strategy and plan for achieving the required votes in the Senate.

Although it made a strong case on New START's merits, it appeared that the Obama administration's main strategy for persuading enough Republican senators to ratify the US-Russian treaty was through financial inducements, with billions of dollars reportedly promised to the US nuclear laboratories for "stockpile stewardship" as well as military-industrial programmes in certain Senators' states. Vote 'buying' (through political or economic promises) is notoriously unreliable, and often results in trade-offs that are materially counterproductive, for example with inducements that undermine the security purpose of the treaty in question. In some cases, ratification trade-offs call into question the credibility of a country's accession and genuine intent, with the counterproductive consequence of reducing the incentives for others to adhere. And after all the inducements and concessions have been delivered, there is still no guarantee that the most vocal opponents will vote in favour, as was borne out in the case of New START.

Since the US nuclear labs already received a big financial boost following New START, the chances of further such inducements delivering CTBT ratification have become even thinner. The CTBT could, however, be won on its merits for US security, if the Obama administration were prepared to mount a robust offensive, spearheaded by Defense Secretary Chuck Hagel and a raft of sensible military and political figures, preferably with Republican credentials. The strategy should be to shift the burden of proof to the Republicans - to make them explain why they are impeding ratification of a security treaty that is self-evidently in US interests.

The Case: whether or not the US ratifies the CTBT, there is no realistic likelihood that it will ever test again; a well-embedded CTBT will prevent any significant military rivals from being able to resume nuclear explosions; US ratification would pull other important states into the treaty, including China and India; US negotiators fought hard to get a strong verification including on-site inspections into the treaty, but inspections cannot be carried out unless the US ratifies and the treaty is brought into force. Conclusion: US security interests have much to gain and nothing relevant to lose from ratifying the CTBT, and those that continue to impede should be held accountable for holding American national security hostage to partisan politicking.

The case is undoubtedly enhanced by demonstrating the effectiveness of the CTBTO's impressive international monitoring system, its manifest civilian as well as verification benefits, the CTBT's importance for the non-proliferation regime and credibility of the NPT, and other internationally important arguments. In US politics, however, these benefits are unlikely to be clinchers. The technical, military and intelligence arguments for the CTBT that are showcased in numerous studies and analyses may not be the means of persuasion,, but they will be important in providing rational justifications for Senators who feel that they need to explain their ratification votes to party colleagues still trapped in the past. The studies and Commissions have done their job. The evidence and case for the CTBT are clear for anyone who wants a rational debate. But to win the day there needs to be high level political determination and a robust rather than defensive strategy that challenges Republican Senators to justify holding US security hostage. A well targeted media campaign needs to include not only scientific facts, but emotionally engaging programmes reminding of the humanitarian suffering caused by nuclear testing in the "bad old days" and hilarious satire to lampoon the illogic of the hold outs. Most of all, there need to be far more national - and especially local - opinion pieces and editorials making the simple case for the CTBT on national (and international) security grounds. Get them into local media to mobilise constituents in the home states of Senators who are open-minded enough to be persuaded to vote on the treaty's merits for US security. By now, the CTBT

20. Tom Z. Collina with Daryl G. Kimball, *Now More than Ever: The case for the Comprehensive Nuclear Test Ban Treaty*, (Washington DC: Arms Control Association, February 2010), p 20. www.armscontrol.org/system/files/ACA_CTB_Briefing_Book.pdf

21. Rose Gottemoeller Acting Under Secretary for Arms Control and International Security, Remarks to Geneva Centre for Security Policy, Geneva, Switzerland, March 20, 2013

22. Quotation from 2010 US Nuclear Posture Review, in Gottemoeller, *ibid.*

should be seen as low hanging fruit. With a strong strategy it is ripe for achieving early on in this second term. President Obama has been re-elected and should be confident enough now to put this one in the bag.

China

Around the time that Russia ratified the CTBT in 2000, Beijing submitted the treaty to China's National People's Congress. Since then, China has repeatedly expressed its support for the CTBT and its adherence to the P-5 moratorium on nuclear testing pending entry into force. At the 2012 NPT Preparatory Committee (PrepCom) meeting, for example, the position in the General Debate was given as: "China supports the Comprehensive Nuclear Test Ban Treaty and is dedicated to promoting its early entry into force."²³ This was slightly elaborated in the "Cluster 1" (disarmament) debate, where China argued: "countries that have not done so should sign and ratify the Comprehensive Nuclear Test Ban Treaty as soon as possible so that it may enter into force at an early date according to relevant provisions. Pending the entry-into-force of the Treaty, nuclear weapon states should continue to observe their moratoria on nuclear explosion tests."²⁴

For many years I have argued that China should not wait for the US Senate, but should ratify the CTBT on its own merits for Chinese security, as had France, Russia and the UK. During a visit to Beijing in October 2012, I pressed this argument again, asking why ratification had been held up in the the National People's Congress for more than 12 years and what still had to be done to facilitate their ratification. Once again, I was told that some NPC members had raised genuine security concerns, but the government officials assured me that China would be ready to ratify as soon as it became clear that US ratification would go through. One discussion touched on the fact that Beijing had seriously considered going ahead in hope that by doing so China could positively feed into the US ratification debate. Apparently they decided against after assessing that in the politicised US debate early Chinese ratification could end up being pocketed, with the Obama Administration then losing the benefit of Chinese ratification as an incentive while China would lose leverage, as they judge Russia did by ratifying before the 2000 NPT Review Conference. In a debate with some Beijing foreign policy students, there was speculation that if US Senate ratification looked certain, China might race Obama to deposit the instruments of accession with the United Nations! Be that as it may, it does seem clear that once the US ratifies, China would be unlikely to delay much longer.

India and Pakistan

Though India voted against the CTBT in September 1996, there have been growing signs that attitudes towards the treaty are changing, at least among policy elites in Ministries and major Parties. One explanation is Delhi's desire to present itself as a responsible nuclear state, particularly in view of the advantages India gained through the 2008 US-India nuclear deal, even though the George W. Bush administration's blind spot caused it to ignore advice and neglect to promote India's accession to the CTBT as part of that deal. In wooing some of the nations that opposed the US-India deal, Indian officials themselves began indicating (usually in off-the-record meetings) that they would be prepared to reconsider accession to the CTBT if the US and China ratify. This was confirmed in an email exchange I had in May 2010 with a retired but influential diplomat whose opposition to the CTBT in 1996 had been very high profile. During a visit to India in January 2013 I sounded out various officials, scholars and civil society representatives. Some continued to give the long-expressed official line that India "would not stand in the way of entry into force" of the CTBT, which can be read in several ways. Others were more forthcoming, arguing that the CTBT could now be advantageous for India's security, since it would reinforce the bilateral no-testing moratorium with Pakistan.

While they took the view that India would be ready to have a more positive debate on the CTBT now, my interlocutors underlined that there was no point in initiating a new debate until the US and China have ratified. Asked about Pakistan, opinion was divided. The majority alluded to Pakistan's position in 1996, which was presented as support for the CTBT while making Pakistan's signature and ratification dependent on India's signature and ratification. Others

23. Cheng Jingye, Head of Chinese Delegation and Permanent Representative to the UN in Vienna, General Debate Statement, First Session of the Preparatory Committee for the 2015 Review Conference of the Parties to the NPT, Vienna, 30 April 2012.

24. Wu Haitao, Chinese Ambassador for Disarmament Affairs, Statement on the Issue of Nuclear Disarmament at the first Session of the Preparatory Committee for the 2015 Review Conference of the Parties to the NPT, Vienna, 3 May, 2012.

were not so sanguine that Pakistan would fall into place once its originally stated condition of Indian accession was met. They pointed to Pakistan's recent politics and long term blocking of the CD and expressed concerns that Islamabad might try to hold out even after India showed itself to be ready to join the treaty, perhaps in the hope of leveraging political or economic benefits (from the US rather than from India, it was suggested). Some thought that it might be necessary to manage accession by India and Pakistan to take effect simultaneously, as France and the UK did in 1998.

Pakistan's statement to the 2012 UN General Assembly First Committee mentioned the CTBT only in passing, as an illustration of a successful agreement negotiated by the CD. No reference was made to Pakistan's own position on the treaty, despite the fact that many other statements called on the remaining Annex 2 states to sign and ratify. The Pakistani officials that I've spoken to about the treaty in the past few months have repeated the official position that they've always voted for and continue to support the CTBT but will not join without accession by their larger neighbour. Pakistan's institutional and political interests are different from India's. Since the CTBT is in the security interests of both countries, the US, China and other influential political actors should avoid being drawn into any kind of trade-off that might undermine regional or international security in other ways. Noting that Pakistan's governing elite may try to negotiate for nuclear trade benefits on a par with those provided to India through the Bush administration's nuclear deal, it must be recognised that such a price for CTBT ratification would be too high.

Israel, Iran and Egypt

“While it is still on the cards that Israel would ratify if that is what Washington supports (especially if the US itself succeeds in getting ratification through the Senate), this cannot be automatically assumed”

Iran, Israel and Egypt have all signed the CTBT, but not ratified. There were strong indications some years ago that Israel would have been willing to ratify if it had not been for Bush administration opposition, but it is not clear that this still applies, since Israel has not taken the opportunity to ratify during the past four years despite Obama administration support for the treaty. While it is still on the cards that Israel would ratify if that is what Washington supports (especially if the US itself succeeds in getting ratification through the Senate), this cannot be automatically assumed. Though Israel does not have a problem with the test ban as such, it has some remaining concerns about the prospect of intrusive inspections at sensitive sites like Dimona. Further factors to take into account are Israel's heightened concerns about Iran's nuclear programme and the pressure from Egypt and other neighbours to participate in talks aimed at achieving a zone free of nuclear and other weapons of mass destruction in the Middle East (MEWMDFZ). It is possible that Israel might now withhold or delay its ratification of the CTBT, perhaps for use as a bargaining chip. On the other hand, Israel, like China, participates fully in the CTBTO and has a number of highly qualified personnel in staff or advisory positions, so this could potentially be leveraged further if Israeli decision-makers need to be persuaded that they have more to gain by ratifying than by continuing to stall.

Judging from recent discussions in Israel, there may now be pressure from some parts of the Israeli policy elite to parlay CTBT ratification for other security benefits, including (but not necessarily limited to) reciprocal ratification from Iran and Egypt and more concerted international efforts to curb the Iranian nuclear and missile programmes. This may not be explicitly required, but is likely to form part of the Israeli calculus.

Iran and Egypt both participated fully and constructively in CTBT negotiations in the 1990s, and were appointed to various responsibilities, including as Friends of the Chair. Both have continued to express public support for the CTBT, including in UN General Assembly debates and votes. However, the way in which Egypt and several other Arab states have linked their accession to the Chemical Weapons Convention to Israel joining the NPT as a non-nuclear-weapon state party suggests that such kinds of regional linkage may also be applied to their timetables for ratifying the CTBT. If so, that may need to be managed on the level of regional confidence building (whether stand alone or part of WMDfZ talks). While concession trading for confidence building can often be valuable in terms of regional developments, there is the risk that linkage politics will foster further delays and complications for CTBT entry into force.

In view of concerns about Iran's nuclear programme, both Iran and its neighbours should have clear – if somewhat different – incentives to get the CTBT locked down. Ratifying the CTBT would be an important way for Tehran to demonstrate that the international community can have confidence in its stated denials of any intention to emulate North Korea in the future by withdrawing from the NPT and using its civilian nuclear programme to make nuclear weapons. As part of the ongoing negotiations over Iran's uranium enrichment programme, it would make sense at the very least for Iran to demonstrate its good faith as an NPT party by ratifying the CTBT. Though Iran's ratification of the CTBT would not alleviate all concerns, continuing to hold out compounds suspicions that Tehran harbours ambitions to pursue nuclear weapons.

North Korea

On 9 October 2006, at 01h35 GMT, seismic stations across the world recorded tremors with the characteristics of a small underground nuclear explosion. Within two hours, CTBT signatory states were sent an automatic preliminary analysis from the Provisional Technical Secretariat (PTS) of the Preparatory Commission for the CTBTO in Vienna. This included data from more than 20 IMS stations, and located the explosion within North Korea, with indications that it had a body wave magnitude between 3.58 and 4.2, i.e. characteristic of a small underground nuclear explosion. The North Korean leadership, which had announced its withdrawal from the NPT in 2002, subsequently admitted it had carried out a nuclear test. Since then, two further nuclear tests (in 2009 and 2013) have been conducted, part of the regime's concerted effort to convince others – most notably the United States, South Korea and Japan – that it has a nuclear weapon capability.

The tests have undoubtedly enabled the CTBTO to demonstrate the effectiveness of its multilateral monitoring system. They have negative implications for entry into force, however. The political value that North Korea's military-despotic government attaches to nuclear weapons, combined with international isolation, makes for a dangerous and unpredictable situation, compounded by weak leadership (a relatively young and insecure dynastic inheritor Kim Jong-un) and opaque decision-making. Recent experience indicates that approaches perceived as coercive backfire in conditions such as these. International pressure and sanctions have failed to head off North Korea's nuclear programme, and may have had the unintended consequence of increasing its salience, at least in domestic terms.

Realistically, North Korea is unlikely to sign and ratify the CTBT unless it changes its nuclear policy away from wanting to demonstrate weapons capabilities. This could follow regime change or arise from a significant, less extreme domestic policy shift, creating incentives to come in from the cold. Or it could be precipitated by some kind of political, military, nuclear or environmental 'shock' (such as a nuclear accident or 'Cuban missile crisis' type emergency). None of these scenarios is predictable in terms of timing or outcome, and a nuclear emergency is certainly not desirable, even if such a shock might be an effective precipitator for change.

More positively, ratification by the US and China could potentially result in greater Chinese engagement to persuade North Korea to stop testing and accede to the CTBT. If the Six Party Talks²⁵ are able to be reconvened with a chance of making progress, then an Action Plan for confidence building and disarmament should include North Korea's accession to the CTBT. Recent experience, however, indicates that this cannot be assumed, and success would be by no means assured even if Beijing proved willing to invest significant political capital into promoting such an objective.

It may be tempting for some to cite the North Korean tests as examples of how the CTBT has failed. If so, they would be wrong to draw such a conclusion. If anything, these tests emphasise the importance of strengthening the regime against nuclear testing. They have also had the unintended but extremely useful consequence of testing the treaty's verification regime, and showing how it has continued to improve. The tests have proved the case made by many scientists during the negotiations that the different IMS technologies would work synergistically to provide detection and location of nuclear explosions significantly smaller than the verification system's baseline of 1kt. They vindicated the inclusion of noble gas sensors

25. The Six Party Talks on North Korea take place among the six principal regional stakeholders: China, Japan, the Republic of Korea (ROK/South Korea), Russia and the United States as well as DPRK (North Korea). Of these, Japan, South Korea and Russia have already ratified the CTBT.

in some radionuclide monitoring stations and demonstrated the effectiveness of the IMS sensors. The tests also directed attention to what additional resources would be available if the treaty had entered into force. As noted by the CTBTO and eminent US military and diplomatic experts following North Korea's most recent test, prompt on-site inspections, which cannot be launched while the CTBT is in legal limbo, would likely have resolved most if not all remaining uncertainties about the North Korean tests, including more precise information about exact location and yield.²⁶

26. CTBTO Spokesperson Annika Thunborg was quoted in a Reuters report following the 12 February North Korean test, pointing out: "On-site inspections would have been an option to search the location for evidence of a nuclear explosion," but that "without the [Comprehensive Nuclear-Test-Ban] Treaty in force, we cannot make use of this option, unfortunately." CTBTO newsletter, <http://us4.campaign-archive1.com/?u=cf0fa45cea6a3989c40e39aaf&id=c35524b1fe&e=9ec9674d61> See also Thomas R. Pickering, 'US leadership needed to prevent nuclear testing by North Korea', *Christian Science Monitor*, 20 February 2013, <https://www.google.co.uk/search?q=US-leadership-needed-to-prevent-nuclear-testing-by-North-Korea&ie=utf-8&oe=utf-8&aq=t&rls=org.mozilla:en-US:official&client=firefox-a>

Provisional Application of the Treaty as a fall-back?

Provisional application is a rarely employed but potentially useful mechanism to bypass extraordinary, temporary or unanticipated political obstacles impeding entry into force. It enables a treaty that is supported by a significant number of ratifiers to be implemented, at least for the consenting states, thereby preventing a minority from holding an international security objective hostage. Provisional application (similar to, but considered more operationally practical than provisional entry into force) is not a panacea or substitute for entry into force, but it can provide temporary reinforcement to bolster the legal authority of a treaty and prevent it from being undermined by transient and arbitrary circumstances. On the few occasions that it has been invoked in the recent past, provisional application has contributed toward building confidence and helping to create more positive conditions and incentives to facilitate full entry into force.²⁷

According to Article 25 of the 1969 Vienna Convention on the Law of Treaties, “A treaty or part of a treaty is applied provisionally pending its entry into force” if “the treaty itself so provides”—which the CTBT does not—or if “the negotiating States have in some other manner so agreed”. Depending on how provisional application is entered into, this means that, pending entry into force, all or part of a treaty takes legal effect for those who wish to abide by the agreement. Though not binding on those who remain outside, a treaty that is provisionally applied by a large number of states has enhanced legal standing, increasing the political costs of violation.

The CTBT text does not specifically mention provisional application, but nor does it prohibit it. During the difficult negotiations over entry into force, provisional application was discussed as a way to prevent an individual state from exercising a de facto veto. Though it was not explicitly referred to publicly, provisional application was envisaged and discussed among Canadian and Dutch diplomats and others as they were developing their ideas for special conferences in the event that the specified Article XIV and Annex 2 conditions made it difficult for the treaty to enter into force in good time.

Provisional application would require the agreement of most but not all states that had ratified the treaty. There are several ways in which this could be taken forward. At its most straightforward, a group of states could decide to convene a special conference and invite all states that had ratified (together with signatories, who would participate as non-voting observers) to negotiate and agree a protocol on provisional application. This could be done in conjunction with an Article XIV conference,²⁸ or separately, in an extraordinary conference specially convened for the purpose. Based on precedent and the particular needs of the CTBT, it could then be endorsed by a majority vote in the UN General Assembly. The provisional application decision can be crafted to co-opt all ratifiers automatically (with a provision for opting out if a national decision is taken to that effect) as well as to provide a mechanism for signatories to opt in by executive decision. It is important to note that provisional application would only bypass Article XIV pending full entry into force. So it would increase and not negate incentives to bring the remaining hold-out states on board. All other obligations, rights and provisions in the treaty would be applied without modification.²⁹

“The CTBT text does not specifically mention provisional application, but nor does it prohibit it”

27. For example, the 1990 Treaty on Conventional Armed Forces in Europe (CFE); and the Law of the Sea Convention (UNCLOS). See Rebecca Johnson, ‘Beyond Article XIV: Strategies To Save The CTBT’, *Disarmament Diplomacy* 73 (October–November 2003), accessed at www.acronym.org.uk/dd/dd73/index.htm

28. Special “Article XIV” conferences have been taking place every couple of years since 1999 with the mandate to “consider and decide by consensus what measures consistent with international law may be undertaken to accelerate the ratification process in order to facilitate the early entry into force” of the CTBT. Article XIV, Comprehensive Nuclear-Test-Ban Treaty Text.

29. It is generally simpler if the decision to provisionally apply the CTBT does not require additional legislative or judicial action by states that have already ratified (unless specific conditions have already been attached to a state’s ratification). See Rebecca Johnson, “Beyond Article XIV: Strategies to Save the CTBT”, *Disarmament Diplomacy* 73 (October–November 2003); and Rebecca Johnson, “Is it time to consider provisional application of the CTBT?”, *Disarmament Forum*, no. 2, UNIDIR, 2006.

Reducing Nuclear Salience

“Whether or not it enters into force officially, the CTBT has already demonstrated its effectiveness. Though North Korea’s tests are regrettable, they are the exceptions that in many ways prove the CTBT rule”

Nuclear testing was embedded as both cause and consequence of nuclear arms races, from the Cold War to South Asia. The ending of the Cold War created a window of opportunity to negotiate a global ban. It is significant that since September 1996 none of the P-5 nuclear armed states has tested, and that India and Pakistan felt compelled to declare moratoria on testing after they each carried out a flurry of underground nuclear explosions in May 1998. From conversations with some of the weapons scientists and military-nuclear establishments of several of these countries, it has been intimated that the CTBT acted as a constraint on political pressures that would otherwise have resulted in further nuclear tests. In the South Asian situation, for example, the CTBT’s strong normative credibility created the conditions for India and Pakistan to enact a bilateral moratorium, even though India was not yet prepared to reconsider its ideological opposition to the CTBT. This demonstrates that treaties such as the CTBT contribute towards strengthening international norms, rules and institutions even before they enter into force or are acceded to by all relevant states. Strong, well supported treaties delegitimise certain activities, and experience shows that this can significantly constrain and influence the options and behaviour of non-parties as well as parties.

The CTBT was not conceived as a stand-alone treaty. From the beginning it was connected with calls for nuclear disarmament, and from 1968 became linked to the non-proliferation regime in NPT text and through review process negotiations. Whether or not it enters into force officially, the CTBT has already demonstrated its effectiveness. Though North Korea’s tests are regrettable, they are the exceptions that in many ways prove the CTBT rule. Together with progressive reductions in the size of existing arsenals, further international initiatives aimed at implementing the NPT and banning nuclear weapons globally will further constrain any of the current nuclear-armed states or future proliferators that might still be trying to hedge their bets or keep open an option to resume nuclear testing.

In this context, and in view of concerns that legislators or governments in some of the remaining Annex 2 states may attach a high price to their CTBT ratification in terms of nuclear deals, political blackmail, nuclear-related trade commitments or cash for their nuclear weapons establishments, some non-nuclear governments are questioning whether much international attention needs to be devoted to pursuing the final few signatures and ratifications. They will of course continue to make public statements that call for “early entry into force” of the CTBT.

Conclusions

With 183 signatories, of which 157 have already ratified, a compelling argument can be made that the CTBT is already strongly embedded in the international non-proliferation and security regimes. Its legal effectiveness should be seen in the context of the progressive delegitimising of nuclear weapons worldwide. While entry into force is desirable, the remaining ratifications to enact formal entry into force should not be pursued at *any* cost.

US ratification will be key to unlocking the accession of many of the eight remaining states that must sign and/or ratify the CTBT for full entry into force. The key to US ratification will be a change in political approach. The Administration needs to move away from the defensiveness of technical overload combined with pork-barrel vote-buying, to a strategy that makes a clear, simple, publicly engaging national security and humanitarian case that puts opponents in the Senate on the defensive if they try to justify obstructing this US security objective any longer.

To prevent the test ban regime unravelling if full entry into force takes an extended period of time, it will be important to sustain a high level of political support and ensure that the CTBTO continues to be adequately funded. This will support the functioning and further development of the global monitoring system and enable participating states to benefit from training programmes in various aspects of verification as well as managing the regime. Signatory states can already participate in training and exercises, such as the CTBTO's Integrated Field Exercise for on-site inspections held on the decommissioned Semipalatinsk test site in Kazakhstan in 2008,³⁰ which should be further supported and developed. Incentives could be provided to encourage the remaining hold-out states to participate more fully in the CTBTO, including in such exercises, to develop commitment and understanding as well as the skills and technologies for verification. Greater efforts should be made to involve non-signatories as well, increasing the incentives to draw their scientists and governments closer to the test ban regime. The first steps have been taken. Though the next steps look hard, they are worth it to make the world a safer place. We need leaders with the political courage to carry this through.

30. See Rebecca Johnson, *Testing the test-ban treaty: An inspection exercise in Kazakhstan*, 15 September 2008. www.thebulletin.org/web-edition/reports/testing-the-test-ban-treaty/testing-the-test-ban-treaty-an-inspection-exercise-k

More than 50 years after the first atomic weapon was tested in New Mexico, the 1996 Comprehensive Nuclear-Test-Ban Treaty (CTBT) prohibited nuclear explosions in all environments - underground, atmospheric, under water and outer space, and established a global verification regime. The treaty's international monitoring system and organisational headquarters in Vienna have already proved their worth in detecting and identifying seismic events and releases of radioactivity, whether the cause is natural, such as earthquakes and tsunamis, accidental, such as Fukushima, or clandestine nuclear testing such as the three underground nuclear tests conducted by North Korea since 2006.

However, although the CTBT is one of the most widely supported treaties in history, having been signed by 183 states and ratified by 159, it has still not entered into force. In this report Dr Johnson asks why this is the case, scrutinising the origins and history of the treaty, and the politics that surround it. Crucially, the author stresses the importance of the CTBT in embedding vital norms globally on the prohibition of testing, highlights its part in fostering a reduction of nuclear salience internationally, and assesses future prospects for its entry into force.

For more information visit www.una.org.uk



A safer world

