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Revitalizing Diplomatic Efforts to Advance CTBT Entry Into Force

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More than two decades after the opening for signature of the Comprehensive Test Ban Treaty (CTBT), the treaty has near universal support and has established a global norm against nuclear test explosions. The nuclear testing taboo impedes the development of new and more advanced nuclear warhead designs, which helps prevent dangerous nuclear competition, and maintain international security.

Although the CTBT has created a norm against testing and a robust technical organization responsible for the operation and maintenance of a highly sensitive global nuclear test monitoring system, the treaty has not entered into force due to the failure of eight key states, including the United States and China, to ratify.

The CTBT is and will continue to be an essential pillar in the global nuclear nonproliferation and disarmament enterprise. Moving closer to the goal of the CTBT's formal entry into force is the task of every CTBT state party, every nuclear Nonproliferation Treaty (NPT) state-party, every state that supports the new Treaty on the Prohibition of Nuclear Weapons, and any other state that considers itself a "responsible" nuclear actor.

But in order to realize the full potential of the treaty and to close the door on testing, friends of the CTBT will need to rejuvenate and update their efforts to achieve its entry into force and reinforce the taboo against nuclear testing.

HIGHLIGHTS

- The CTBT has been a central goal of the NPT states-parties since the NPT was opened for signature in 1968.
- The 1996 CTBT has brought the era of frequent nuclear testing to an end and has established a strong norm against any kind of nuclear test explosion.
- Unfortunately, the door to nuclear testing remains open as the treaty has not entered into force due to the failure of China, Egypt, the DPRK, India, Iran, Israel, Pakistan, and the United States to ratify.
- Despite the fact that the United States has signed the CTBT and says it does not need nuclear testing, the Trump administration has declared that it will not seek Senate advice and consent for U.S. ratification.
- CTBT supporters will need to update and tailor their outreach and diplomacy to shift the outdated attitudes of the CTBT hold-out states.
- The international community should seek to solidify North Korea's pledge to close its only known nuclear test site by securing Pyongyang's signature and ratification of the CTBT.
- The establishment of a "nuclear-test-free zone" in the Middle East by way of CTBT ratifications could move the region toward a long-sought WMD-Free Zone.
- Pending CTBT entry into force, states-parties should issue a declaration in support of the CTBT ahead of the 2020 NPT Review Conference.

For the first five decades of the nuclear age, nuclear weapon test explosions were the most visible symbol of the dangers of nuclear weapons, nuclear arms racing, and the omnipresent danger of nuclear war—or as President John F. Kennedy described it, the nuclear "Sword of Damocles" that hangs over every man, women and child on the planet.

The 1996 Comprehensive Test Ban Treaty has brought the era of frequent nuclear testing to an end and has established a strong norm against any kind of nuclear test explosion. The treaty has near-universal support with 183 signatories, including the five original nuclear testing states.

The Comprehensive Test Ban Treaty Organization (CTBTO), with headquarters in Vienna, is operating on a 24/7 basis to collect and analyze data in real time from a global network of nuclear test monitoring stations. The CTBTO's International Monitoring System, which is nearly complete and is operating on a 24/7 basis, serves as a strong deterrent against any state that might consider conducting a clandestine nuclear test explosion.

However, the door to nuclear testing remains open as the treaty has not entered into force due to the treaty's onerous Article XIV provisions, which require that 44 specific states sign and ratify. Currently there are eight "hold out" states—China, the Democratic People's Republic of Korea (DPRK), Egypt, India, Iran, Israel, Pakistan, and the United States—which have failed to ratify.[1]

The non-testing norm cannot be taken for granted and, over time, it must be actively renewed and reinforced. In order to realize the full potential of the treaty, to close the door on further nuclear testing, and to reinforce the nonproliferation regime, states must need to rejuvenate their efforts to achieve the entry into force of the CTBT.

Unfortunately, the United States, which was leading proponent for the CTBT during the 1990s is now lagging behind. Without explanation or a high-level review or consultation with allies, the Donald Trump administration announced in February 2018 that it will not seek Senate approval for U.S. ratification of the CTBT.

In response, other hold-out states, particularly China, need to lead the way by signing and/or ratifying the treaty, and all signatory states should reaffirm their support for a permanent, verifiable end to nuclear test explosions by achieving entry into force of the CTBT, including by means of a joint heads of state declaration in the run-up to the 2020 NPT Review Conference.

Supporters of the global norm against nuclear testing and CTBT entry into force should also explore how North Korea's pledge to close its only known nuclear test site at Punggye-ri beginning April 21 and suspend nuclear testing for the foreseeable future can be solidified into a legally-binding, more verifiable commitment by securing Pyongyang's signature and ratification of the CTBT through the ongoing diplomatic negotiations with South Korea and the United States on the denuclearization and the establishment of a lasting peace regime on the Korean peninsula.

Regional adherence to the CTBT in the Middle East—and the creation of a regional nuclear weapons test free zone—should also be pursued as a new approach toward building the foundation for a WMD-free zone in the region, which is a long-standing but unfulfilled goal of every state party to the NPT.

The Role of the Comprehensive Test Ban in Nonproliferation and Disarmament

Since 1945, nuclear testing has been used to develop new, more advanced nuclear-warhead designs and to demonstrate nuclear-weapon capabilities. Nuclear testing has propelled the global nuclear-arms competition and undermined global peace and security. In aggregate, at least eight states (United States, Soviet Union, United Kingdom, France, China, India, Pakistan, and North Korea) have conducted more than 2,056[2] nuclear test explosions, with U.S. tests accounting for nearly half that total.

For nearly as long, a global, verifiable ban on nuclear test explosions has been a goal for international nuclear risk reduction, nonproliferation, and disarmament. Without the ability to conduct nuclear explosive tests, a country cannot confidently develop more advanced types of nuclear warheads.

A global nuclear test ban was first formally proposed in 1954 by Indian Prime Minister Jawaharlal Nehru as a step toward ending the nuclear arms race and preventing proliferation—and to prevent the significant health and environmental damage produced by atmospheric nuclear-test explosions.

In the negotiations for the 1968 Treaty on the Non-proliferation of Nuclear Weapons (NPT), the CTBT was widely recognized as a critical part of the nuclear-weapon states' obligation to meet their NPT Article VI commitment to "effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament."[3] The preamble of the NPT specifically cites the goal of "the discontinuance of all test explosions of nuclear weapons for all time and to continue negotiations to this end."[4]

Not until the end of the Cold War would the conditions to secure the CTBT finally became more favorable. An important catalyst was the pressure of a popular protest movement in Kazakhstan, which successfully pressed the

Kazakh citizens gather to demand an end to nuclear testing at the Soviet nuclear test site near Semipalatinsk in August 1989.
(UN Photo/MB)

Soviet government in Moscow to close the Semipalatinsk test site and announce a unilateral nuclear test moratorium in October 1991. Late the following year, the U.S. Congress approved legislation mandating a nine-month U.S. moratorium with conditions on the resumption of nuclear testing. The next year, President Bill Clinton decided to extend the U.S. test moratorium and pursue negotiations on a CTBT at the Conference on Disarmament.

The push for the comprehensive test ban became a key variable in the negotiations between the "nuclear-haves" and the "nuclear-have-not states" at the pivotal 1995 NPT Review and Extension Conference. Support from the NPT's five recognized nuclear-weapon states for the CTBT gave non-nuclear-weapon states leverage at the NPT conference and contributed to the decision to extend the treaty and adopt a strong "program of action" for disarmament, including the conclusion of CTBT negotiations by the end of 1996.[5]

Following two years of intense multilateral negotiations, the United Nations General Assembly overcame an attempt by India to block the treaty when it adopted a resolution endorsing the CTBT on September 10, 1996, by a vote of 158-3. Two weeks later, on September 24, the treaty was opened for signature. U.S. president Bill Clinton became the first signatory.

As the Executive Secretary of the Comprehensive Test Ban Treaty Organization, Lassina Zerbo, and Russian Deputy Foreign Minister, Sergei Ryabkov, wrote in an April 2017 essay, Article I of the CTBT prohibits "'any nuclear weapon test explosion or any other nuclear explosion' anywhere on Earth, whatever the yield."[6] This provision of the treaty is recognized by all of the major negotiating parties to mean that supercritical hydronuclear tests (which produce a self-sustaining fission chain reaction) are banned, but subcritical hydrodynamic experiments (which do not produce a self-sustaining fission chain reaction) are permitted.[7]

In 1997, the Comprehensive Test Ban Treaty Organization was formally established to work with state parties to build and operate a robust International Monitoring System (IMS) and International Data Center (IDC). Today, the IMS is nearly 90 percent complete, the IDC is fully functional, and the CTBTO is a mature, highly professional, and fully operational organization that is collecting and analyzing information on a continuous round-the-clock basis for the purpose of detecting and deterring clandestine nuclear-test explosions and to provide the technical basis for international responses to noncompliance.

Once the treaty formally enters into force, the verification system will also include the option for short-notice on-site inspections to investigate suspicious events. Information from states' national intelligence networks, which are more sensitive in some geographic regions, can be taken into account.

In anticipation of the fact that the treaty's onerous Article XIV entry into force provisions would delay entry into force, Canadian negotiators insisted on a provision in Article XIV that allows for conferences of states-parties to meet every two years to develop strategies and seek ways

to accelerate the process toward securing the necessary 44 ratifications. Beginning with the first such conference in 1999, there have been ten such meetings, which have, unfortunately become *pro forma* affairs that primarily allow states which have signed and/or ratified to reiterate their support, exhort hold-out states to take action, and to develop a modest joint diplomatic outreach plan.

The Nuclear Testing Taboo

Since the CTBT opened for signature it has established a powerful standard of "responsible" behavior. Nations that conduct nuclear tests are outside the international mainstream and will bear the consequences of global isolation. Only one country—North Korea—has conducted nuclear test explosions in this century.

Even India, which strongly opposed the CTBT during and after the conclusion of the negotiations in 1996, has declared a moratorium on nuclear testing following its May 1998 series of nuclear tests.[8] Pakistan, which responded with its own nuclear tests weeks later, has also since observed a testing moratorium and declared it would not be the first state in the region to resume nuclear testing.[9]

International support for the CTBT has been reaffirmed over the years through multiple UN General Assembly resolutions and UN Security Council (UNSC) resolutions. UNSC Resolution 1887 (2009) calls upon all states "to refrain from conducting a nuclear test explosion and to sign and ratify the Comprehensive Nuclear Test-Ban Treaty, thereby bringing the treaty into force at an early date."[10]

On the occasion of the twentieth anniversary of the opening for signature of the CTBT in Sept. 2016, the UNSC adopted the first-ever, CTBT-specific resolution (UNSCR 2310), which reaffirms the global norm against nuclear-weapon-test explosions, calls on the eight remaining states that must ratify for entry force to do so, and urges all states to provide their full financial and technical support to the CTBTO. The resolution was formally co-sponsored by forty-two states, including Israel.[11]

The new UNSC test-ban resolution also formally recognizes the important September 15, 2016, statement[12] from the permanent five members of the council expressing the view that any nuclear test explosion would "defeat the object or purpose of the treaty." The statement gives public expression to the existing legal obligation of all CTBT signatories not to test a nuclear weapon, even before the treaty enters into force.[13]

The Treaty on the Prohibition of Nuclear Weapons (TPNW) negotiated, which was opened for signature in 2017, further reinforces the CTBT and the non-testing norm. Under the TPNW, states parties may not "test" nuclear weapons or any other nuclear explosive devices.

Nonproliferation and Disarmament Benefits

A global ban on nuclear explosions has been a central element of the nuclear nonproliferation and disarmament enterprise because an effective, comprehensive, verifiable test ban directly constrains the ability of all parties to develop more-advanced nuclear weapons.

As noted in the preamble of the 1996 treaty: "the cessation of all nuclear weapon test explosions and all other nuclear explosions, by constraining the development and qualitative improvement of nuclear weapons and ending the development of advanced new types of nuclear weapons, constitutes an effective measure of nuclear disarmament and non-proliferation in all its aspects."[14]

Technically, a state might have some degree of confidence that a simple, relatively cumbersome fission device would work without testing, as the United States did with the Hiroshima bomb in 1945. Today, a country with no or little nuclear-weapons design and nuclear test explosion experience might be able to acquire an ambiguous nuclear deterrent without nuclear-explosive testing, but under the CTBT it could not use a nuclear test to demonstrate that capability, as India did with its first nuclear-test explosion in 1974.

However, the test ban constrains nuclear weapons development by states with little or no nuclear testing experience by blocking the progression from simple fission designs to "boosted" fission designs to two-stage thermonuclear designs with better yield-to-weight ratios.

How far along the developmental ladder a proliferator could go without nuclear explosive testing is not exactly clear, but states intent on acquiring and deploying modern, two-stage thermonuclear weapons compact and light enough to deliver on long-range ballistic missiles would certainly not have confidence in their performance without multiple, multi-kiloton nuclear-test explosions, which would very likely be detected by the CTBTO's International Monitoring System and national technical means of intelligence.

Despite substantial science and technological advances over the past two decades that can aid in maintaining and extending the service life of existing nuclear warheads, the CTBT also creates a technical barrier for states with a substantial history of nuclear testing who may in the future see new nuclear warhead designs, such as China, France, Russia, the United Kingdom, and the United States.

According to the exhaustive 2012 study by the U.S. National Academy of Sciences on CTBT technical issues,

U.S. Secretary of State John Kerry and other diplomats vote to adopt the resolution in support of the Comprehensive Test Ban Treaty during a UN Security Council meeting September 23, 2016. (Photo: Astrid Riecken/CTBTO)

these states "… are unlikely to be able to deploy new types of strategic nuclear weapons that fall outside the design range of their nuclear-explosion test experience without several multi-kiloton tests. Such multi-kiloton tests would likely be detectable (even with evasion measures) by appropriately resourced … national technical means and a completed IMS network."[15]

Tailored Strategies to Bring the Eight Hold-Out States Into the Treaty

Movement toward ratification of the CTBT by the remaining hold-out states would strengthen international and regional security, and each of the remaining eight states have good reason to do so. But in order to make progress, advocates of the CTBT in government and in civil society will need to update and tailor their outreach and diplomacy if there is to be a shift in outdated attitudes of the governments of these eight "hard cases." CTBT states parties will also need to rejuvenate the bi-annual gatherings of foreign ministerial meetings on the CTBT and signatory states at "Article XIV Conferences on Facilitating Entry Into Force" so they are more impactful.

North Korea: The Democratic People's Republic of Korea (DPRK)'s nuclear program represents the most direct and immediate threat to the global nuclear-test ban enterprise. Pyongyang's policies with respect to further nuclear testing and the CTBT are inextricably tied to the resolution of long-running security and political disputes with the United States and South Korea, and to resumptions of sustained negotiations on denuclearization and a peace regime on the Korean peninsula.

As President Trump and South Korean President Moon Jae-in engage in talks with their DPRK counterpart, it is vital that they seek to solidify Pyongyang's pledge to halt ballistic missile and nuclear testing and close their nuclear test site, and also to bring an end to further North Korean fissile material production.

For now, North Korea possesses enough plutonium for fewer than a dozen bombs, but if left unchecked, it will amass a larger and more potent arsenal. Additional successful nuclear weapon test explosions will improve confidence in the DPRK's warhead designs and facilitate the mass production of a compact warhead design that can be delivered on its short- or medium-range ballistic missiles. Further tests long-range ballistic missiles, coupled with additional nuclear testing, would likely expand Pyongyang's nuclear retaliatory potential.

Although the DPRK's leaders may no longer be willing to negotiate away their nuclear weapon's program altogether, the regime in Pyongyang still appears to be willing to freeze and possibly abandon portions of his nuclear program in exchange for improved relations with the United States, a reduction of tension on the Korean peninsula, and the possibility of much-needed foreign economic trade and food and energy aid.

On April 21, the DPRK's supreme leader Kim Jong-un announced that North Korea had developed smaller and lighter nuclear, high-yield nuclear weapons and their means of deliver and could therefore "… discontinue

Diagnostic cables snake their way across the Nevada Test Site towards the Icecap tower, which housed the diagnostic cannister. One of three U.S. nuclear tests planned for 1993. The test was to have been in the 20-to-150-kiloton range and would have been conducted 1,557 feet underground.
(Photo: National Nuclear Security Administration)

nuclear test and inter-continental ballistic rocket test-fire from April 21, 2018. The northern nuclear test ground of the DPRK will be dismantled to transparently guarantee the discontinuance of the nuclear test."

He also said that "…the discontinuance of the nuclear test is an important process for the worldwide disarmament, and the DPRK will join the international desire and efforts for the total halt to the nuclear test."

Now, as the United States and South Korea and other states in the region pursue diplomacy and pressure to achieve denuclearization, they should seek solidify Kim Jong-un's no testing pledge by securing North Korean signature and ratification of the CTBT, along with confidence building visits by CTBTO technical teams.

Some have suggested the Punggye-ri test site may not be available for additional nuclear tests because of cavity and tunnel collapses caused by previous nuclear blasts. But, in reality the site could still be used for further tests. Clearly, the DPRK's pledge to close down its main nuclear weapons test site and join the international effort to halt all nuclear testing is a very significant pledge toward denuclearization that clearly puts the DPRK's accession to the CTBT within reach.

The DPRK's April 20 announcement to halt nuclear and ballistic missile tests was welcomed by key leaders, including the European Union's High Representative Federica Mogherini who, in an April 21 statement, called it a "positive, long sought-after step on the path that has now to lead to the country's complete, verifiable and irreversible denuclearization, the full respect for its international obligations and all relevant UNSC resolutions, and the ratification of the CTBT."

In a statement to the 2018 preparatory committee meeting for the 2020 NPT Review Conference, the CTBTO's Executive Secretary Lassina Zerbo also welcomed the DPRK announcement and added that the "CTBT can provide the security and certainty needed by solidifying the commitment to turn away from nuclear testing."

Kim Jong-un's remarks on nuclear testing are consistent with the logic expressed years earlier in a statement about nuclear testing and the CTBT that was delivered by a senior DPRK official at a conference in Moscow in 2012:

> "Once the CTBT becomes effective … then there is no doubt that it would make a great contribution to the world peace and stability. [However,] unless the U.S. hostile policy and its nuclear threats are completely withdrawn and a solid and permanent peace regime is in place on the Korean peninsula, the DPRK is left with no other choices but to steadily strengthen its self-defensive nuclear deterrent to the standard it deems necessary."[16]

As the United States and the international community explores options to achieve the denuclearization of the Korean peninsula, another option, pending the entry into force of the CTBT, would be for North Korea to begin technical cooperation with the CTBTO so that, in the event there is seismic event in North Korean territory, CTBT teams could use their remote monitoring tools, and potentially on-site confidence building visits, to ensure that Pyongyang continues to respect its nuclear test moratorium commitment.

India and Pakistan: Since their destabilizing tit-for-tat nuclear detonations in 1998, India and Pakistan have stubbornly refused to reconsider the CTBT even though

neither country has an interest in or technical justification for renewing nuclear testing.

India and Pakistan could advance the cause of nuclear disarmament and substantially ease regional tensions by converting their unilateral test moratoria into legally binding commitments through the CTBT. Pakistan has said it supports the principles and goals of the CTBT and would welcome a legally binding test ban with India, but leaders in Islamabad have failed to take the first step by signing the CTBT.[17]

In particular, India's ongoing campaign for recognition as one of the world's "responsible nuclear-armed states," its effort to win support for membership in the Nuclear Suppliers Group (NSG), and obtain a permanent seat on the UN Security Council would get a strong boost if leaders in New Delhi would commit to sign and ratify the CTBT.

The NSG's 2008 decision to exempt India from the full-scope safeguards standard for civil nuclear trade was taken with the understanding that India would continue to observe a complete nuclear-test moratorium.[18] The renewal of nuclear testing by India would re-open that decision and jeopardize its hard-won access to the international civil nuclear technology and uranium market—an "intolerable" price to pay, according to former Indian Foreign Secretary Kanwal Sibal, who noted in 2009: "We will suffer international isolation. It will be a huge setback to our bid for permanent membership of the United Nations Security Council."[19]

This makes it all the more logical for New Delhi's leaders to join the nuclear-test ban mainstream and reinforce global efforts to detect and deter testing by ratifying the CTBT.

For their part, UN member states that are serious about their commitment to the CTBT and nuclear-risk reduction should insist that India and Pakistan sign and ratify the CTBT before they are considered for NSG membership and insist that India should sign and ratify the treaty before its possible permanent membership on the Security Council is considered.

The Middle East: Ratification of the CTBT by Israel, Egypt, Iran—all of which must ratify to trigger CTBT entry into force—and Saudi Arabia would reduce nuclear weapon-related security concerns in the region. It would also help create the conditions necessary to achieve their common, stated goal of a Middle East zone free of nuclear and other weapons of mass destruction.[20]

"As a stepping-stone towards this long-term objective, a 'nuclear-test-free zone' could be created in the Middle East, by way of CTBT ratifications by the remaining states of the region," High Representative Federica Mogherini suggested in June 2016 at special ministerial meeting in Vienna to mark the twentieth anniversary of the treaty.[21]

Israel was among the first nations to sign the CTBT in 1996 and has been actively involved in the development of the treaty's monitoring system and on-site inspection mechanisms. Israel's Permanent Representative to the International Atomic Energy Agency and CTBTO Merav Zafary-Odiz said in 2016 that: "a regional moratorium [on nuclear testing] could enhance security, and potentially lead to a future ratification of the CTBT. Israel has announced its commitment to a moratorium, it would be useful for others to do the same."

Unfortunately, Israel has hesitated to take the next steps toward its own ratification of the CTBT—a move that would bring that nation closer to the nuclear nonproliferation mainstream and lend encouragement to other states in the region to follow suit.

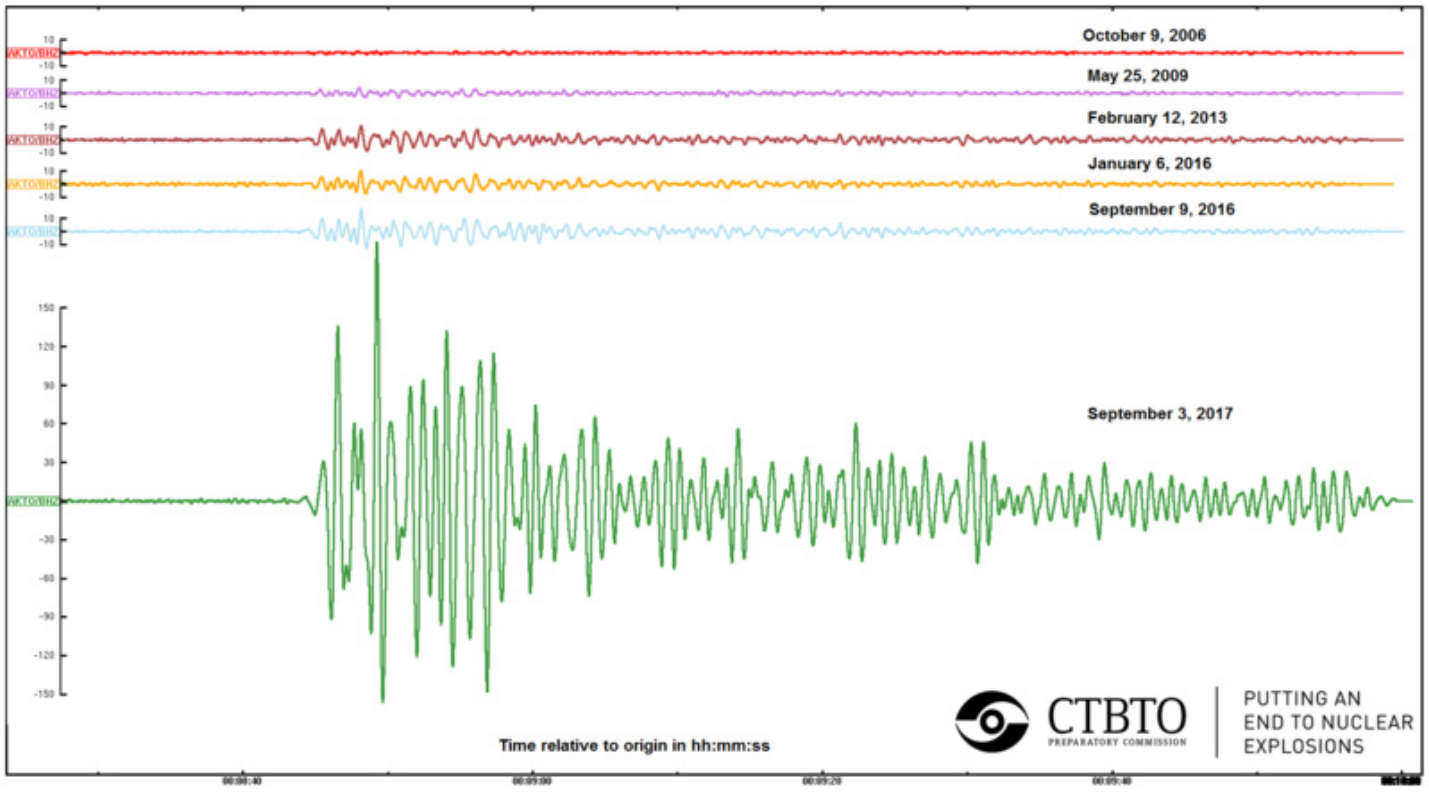
Iran has signed the CTBT but has not yet ratified. In September 1999, at the first Conference on Facilitating the Entry-Into-Force of the CTBT, Iranian Foreign Minister Mohammad Javad Zarif, then Iran's deputy foreign minister, spoke in support of the CTBT and later endorsed a UN conference statement calling for cooperation aimed at bringing the treaty into effect.

Iran is understandably focused on the implementation of the 2015 Joint Comprehensive Plan of Action (JCPOA) and eventual approval of the Additional Protocol to its nuclear safeguards agreement—and the future of the JCPOA itself has been put into doubt as a result of the Donald Trump administration's critical approach to the agreement.

Regardless of the status of the JCPOA, if over time Iran fails to ratify the CTBT and fully cooperate with the operation of IMS monitoring stations in the years ahead, it will add to concerns about the purpose of its sensitive nuclear-fuel activities.

If the JCPOA survives the Trump era, Iran could help assuage concerns about the purposes of its nuclear program as key JCPOA limits on its uranium enrichment program expire over the course of the next ten-to-fifteen years by making clear its support for and intention to ratify the CTBT in a timely manner.

China's Potential Leadership Role: China decided two decades ago to join the CTBT regime and become one of the treaty's early signatories. China's leaders and officials have consistently expressed their support for the CTBT, but it is clear that China has made a quiet decision to stop short of ratification until the United States completes its ratification process.



Comparison of seismic signals (to scale) of all six declared DPRK nuclear tests, as observed at IMS station AS-59 Aktyubinsk, Kazakhstan. (Credit: Comprehensive Test Ban Treaty Organization)

To most observers outside of China, there does not appear to be any serious political impediments to Chinese ratification at this time, aside from the inaction of the United States on the CTBT. Beijing's failure to ratify has likely also given cover for India not to consider ratification more seriously and has undermined the credibility of Beijing's overtures to Pyongyang to refrain from further nuclear test explosions.

Recently, however, Beijing has been more energetic in its support for the CTBT. With encouragement from CTBTO Executive Secretary Dr. Lassina Zerbo, China has in the past year certified its first five International Monitoring System (IMS) stations, of the twelve it is treaty-bound to certify in order to realize the completion of the global nuclear test detection system.

The first Chinese IMS station, radionuclide station RN21, was certified in December 2016. The most recent four stations include two primary seismic stations, and two other radionuclide stations, all certified between the months of September to December of 2017. These most recent certifications will "fill in an important geographical coverage gap in terms of event detection in the region," according to a CTBTO press statement.

During a certification ceremony in January 2018 in China, Zerbo commended China for setting a "positive example" for other Member States in regard to its technical engagement, and Vice Director of Equipment Development at the Chinese Department of the Central Military Commission Lt. General Zhang Yulin noted that the certification of the five stations in one year was "of landmark significance."

In a statement released following a meeting with Zerbo, Chinese Foreign Minister Wang Yi said that the CTBT is "an important pillar of international nuclear disarmament," and has an "irreplaceable" role. He also noted that China is "willing to deepen" it's cooperation with the CTBTO and further "promote the construction and certification of follow-up stations," which will provide further concentrated monitoring of potential nuclear test activity in the region, particularly North Korean activity.[22]

The United States: The policy of the United States—which has conducted more nuclear weapon test explosions than all other states combined and has the world's most potent nuclear arsenal—toward the CTBT is perhaps the most important of all the remaining Annex 2 states. Much has changed since the Senate last examined the CTBT in 1999 and rejected the treaty by a

51-48 margin after a brief and highly partisan debate that centered on questions about the then-unproven program to maintain the existing nuclear warheads in the U.S. stockpile without nuclear explosive tests (a.k.a. the Stockpile Stewardship Program) and the then-unfinished global test-ban monitoring system.[23]

The substantive case for U.S. ratification of the CTBT is stronger than ever. Today, the global monitoring system can detect any militarily significant nuclear test explosion and U.S. stockpile stewardship programs to maintain its nuclear arsenal without nuclear test explosions has proven to be more effective than originally anticipated.[24] The United States no longer has a technical or military need for nuclear explosive testing and it is clearly in U.S. national security interests to prevent other states from testing, which would create new nuclear tensions and enable advances in other states' nuclear weapons arsenals.

Unfortunately, the U.S. Senate is deeply divided and dysfunctional and has not systematically debated the issues related to the CTBT for nearly two decades. Few senators are familiar with the technical issues surrounding the CTBT or its potential benefits.

Worse still, the Trump administration's 2017 Nuclear Posture Review (NPR) asserts that "the United States does not support the ratification of the CTBT," even though there is no technical need to resume nuclear testing.[25]

The review, which generally defines U.S. policy regarding the role of nuclear weapons in security strategy, says "the United States will continue to support the Comprehensive Nuclear Test Ban Treaty Preparatory Committee" and "the related International Monitoring System and the International Data Center."

The NPR calls upon other states not to conduct nuclear testing and states that "[t]he United States will not resume nuclear explosive testing unless necessary to ensure the safety and effectiveness of the U.S. arsenal …."[26]

The Trump administration's test ban policy implies that it wants to reap the benefits of the CTBT, including obtaining data from the monitoring system, without fulfilling earlier pledges to reconsider ratification of the treaty. Unfortunately, this policy is not likely going to change during the Trump administration and will not change without stronger international pressure from U.S. allies and civil society. With a renewed push for U.S. leadership on CTBT ratification and movement on the treaty by other hold-out states, it is possible that a new administration and a new Senate will take another look at the CTBT, which is clearly in the U.S. and international security interests.

When the United States does eventually ratify the treaty, it can put additional pressure on other holdout states to follow suit. Until then, it is vital that other states continue to reinforce the global taboo against nuclear testing to reduce the risk of renewed nuclear testing and a dangerous cycle of global nuclear-arms competition.

Bottom Line

Moving closer to the goal of the CTBT's formal entry into force is the task of every NPT state party, every CTBT state-party, every state that supports the new Treaty on the Prohibition of Nuclear Weapons, and any other state that considers itself a "responsible" nuclear actor, because the CTBT is and will continue to be an essential pillar of the global nuclear nonproliferation and disarmament architecture.

Doing so will, however, take political energy, more diplomatic creativity, and a more serious and sustained commitment from national and international leaders in government and in civil society, beginning now.

ENDNOTES

1. The eight key states that must still ratify before the CTBT enters into force are: China, the DPRK, Egypt, India, Iran, Israel, Pakistan, and the United States. This onerous requirement is spelled out in Article XIV of the treaty, which references forty-four states listed in Annex II.
2. *United States Nuclear Tests 1945 Through September 1992*, U.S. Department of Energy, DOE/NV-209, Rev. 14, December 1994; V. N. Mikhailov, editor, Catalog of Worldwide Nuclear Testing, Begell-Atom, LLC 1999; "The Nuclear Testing Tally," Arms Control Association Fact Sheet, September 2016, https://www.armscontrol.org/factsheets/nucleartesttally
3. Treaty on the Non-Proliferation of Nuclear Weapons, March 5, 1970, Article VI, www.un.org/en/conf/npt/2005/npttreaty.html
4. Ibid., preambular paragraph 11.
5. For a detailed history, see: Jayantha Dhanapala, *Multilateral Diplomacy and the NPT: An Insider's Account* (Geneva: United Nations Institute for Disarmament Research, 2005).
6. "The Nuclear Test Ban: Time to Finish What We Started," by Sergei Ryabkov and Lassina Zerbo, *The Diplomat*, April 21, 2017. See: https://thediplomat.com/2017/04/the-nuclear-test-ban-time-to-finish-what-we-started/
7. "Scope of the CTBT, Fact Sheet, US Department of State, Bureau of Arms Control, Verification and Compliance, n.d. http://www.state.gov/t/avc/rls/212166.htm
8. In a statement to the UN General Assembly in September 1998, Indian Prime Minister Atal Bihari Vajpayee told the 53rd UN General Assembly that India would not be among the last states standing in

the way of the treaty's entry into force. Vajpayee said that India's series of five underground tests, conducted on May 11 and 13, 1998, "do not signal a dilution of India's commitment to the pursuit of global nuclear disarmament. Accordingly, after concluding this limited testing program, India announced a voluntary moratorium on further underground nuclear test explosions." He went on to say that: "We conveyed our willingness to move towards a de jure formalization of this obligation. In announcing a moratorium, India has already accepted the basic obligation of the CTBT… . We expect that other countries, as indicated in Article XIV of the CTBT, will adhere to this Treaty without conditions." See: https://www.pminewyork.org/adminpart/uploadpdf/92927lms48.pdf

9. Ayesha Riyaz, Statement of Pakistan before the Ministerial Meeting on the CTBT, June 13, 2016, Vienna. See: https://www.ctbto.org/fileadmin/user_upload/statements/2016_Ministerial_Meeting/Pakistan.pdf

10. "Historic Summit of Security Council Pledges Support for Progress on Stalled Efforts to End Nuclear Weapons Proliferation," Security Council 6191st Meeting, United Nations Meetings Coverage and Press Releases, September 24, 2009. See: http://www.un.org/press/en/2009/sc9746.doc.htm

11. United Nations S /PV.7776 Security Council Seventy-first year 7776th meeting, 23 September 2016, page 2. See: http://www.un.org/en/ga/search/view_doc.asp?symbol=S/PV.7776

12. Joint Statement on the Comprehensive Nuclear-Test-Ban Treaty by the Nuclear Nonproliferation Treaty Nuclear-Weapon States, Media Note, Office of the Spokesperson Washington, D.C., September 15, 2016. See: http://www.state.gov/r/pa/prs/ps/2016/09/261993.htm

13. Under Article XVIII of the Vienna Convention on the Law of Treaties, which is widely recognized as customary international law, states are obliged not to take actions that would "defeat the object and purpose" of treaties they have signed. Vienna Convention on the Law of Treaties, May 23, 1969, Article 18, https://treaties.un.org/doc/Publication/UNTS/Volume%201155/volume-1155-I-18232-English.pdf

14. Comprehensive Nuclear-Test-Ban Treaty, September 24, 1996, preambular paragraph 5, www.ctbto.org/fileadmin/content/treaty/treaty_text.pdf

15. National Academy of Sciences (NAS), "The Comprehensive Nuclear Test Ban Treaty: Technical Issues for the United States," 2012, p. 117.

16. Jang Song Chol, Statement to "The Comprehensive Test Ban Treaty (CTBT): Prospects for Making Its Global Benefits Permanent," presented at the Moscow Nonproliferation Conference, September 6, 2012. See: http://ceness-russia.org/data/page/p915_1.pdf

17. On August 16, 2016, the Pakistani Ministry of Foreign Affairs released a statement on the proposal, noting: "The bilateral non-testing arrangement, if mutually agreed, could become binding immediately without waiting for the entry into force of the CTBT at the international level."

18. In a September 5, 2008 statement by Pranab Mukherjee, India's external affairs minister issued on the eve of the key NSG meeting, India's reiterated its commitment to adhere to a unilateral nuclear testing moratorium among other nuclear restraint pledges. The text of the approved waiver states that it is "based on the commitments and actions" described by Mukherjee. Several states asserted this reference indicated that the group will end nuclear trade with India if it does not honor the Mukherjee statement, particularly if it conducts a nuclear test. In a Sept. 6 statement, New Zealand declared, "It is our expectation that in the event of a nuclear test by India, this exemption will become null and void." Other states, including Japan and Ireland, offered similar statements. See: "NSG, Congress Approve Nuclear Trade with India," by Wade Boese, *Arms Control Today*, vol. 38, no. 8, October 2008.

19. Rama Lakshmi, "Key Indian Figures Call for New Nuclear Tests Despite Deal With U.S.," *Washington Post*, October 5, 2009, <www.washingtonpost.com/wp-dyn/content/article/2009/10/04/AR2009100402865.html>.

20. See: "WMD-Free Middle East Proposal at a Glance," Arms Control Association Fact Sheet, June 2015 https://www.armscontrol.org/factsheets/mewmdfz For more detail on Israel's position, see: Dr. Paul Chorev, Director General of the Israel Atomic Energy Commission, Statement at the 53rd General Conference of the International Atomic Energy Agency, September 2009 https://www.iaea.org/About/Policy/GC/GC53/Statements/israel.pdf

21. Speech by High Representative of the European Union for Foreign and Security Policy and Vice President of the European Commission Federica Mogherini at the Ministerial-level meeting of the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty, Vienna, June 13, 2016. https://eeas.europa.eu/headquarters/headquarters-homepage/5005/speech-by-high-representative-of-the-european-union-for-foreign-and-security-policy-and-vice-president-of-the-european-commission-federica-mogherini-at-the-ministerial-level-meeting-of-the-preparatory-commission-for-the-comprehensive-nuclear-test-ban-trea_fr

22. Shervin Taheran, "China Adds Monitoring Stations," *Arms Control Today*, Vol 48, No. 2, March 2018. https://www.armscontrol.org/act/2018-03/news-briefs/china-adds-monitoring-stations

23. Daryl G. Kimball, "What Went Wrong: Repairing the Damage to the CTBT," *Arms Control Today* Vol. 29, No. 10, December 1999. https://www.armscontrol.org/act/1999_12/dkde99

24. "U.S. Has No Need to Test Atomic Arsenal, Report Says," by Matthew L. Wald, *The New York Times*, March 31, 2012. http://www.nytimes.com/2012/03/31/science/earth/us-tests-of-atomic-weapons-not-needed-report-says.html

25. *Nuclear Posture Review*, U.S. Department of Defense, February 2018, page 63. https://www.defense.gov/News/SpecialReports/2018NuclearPostureReview.aspx

26. Ibid.