

Shaking the Rust Off the Comprehensive Nuclear-Test-Ban Treaty Ratification Process

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I. REASONS TO STRENGTHEN SUPPORT FOR THE CTBT ARE VARIED AND PERSUASIVE

The twentieth century witnessed over 2,000 nuclear testing detonations, which wreaked havoc on the international system, catalyzed costly and dangerous arms races, and inflicted untold harm on the environment. If and when the Comprehensive Nuclear-Test-Ban Treaty (“CTBT”) enters into force, each State Party would undertake: (1) “not to carry out any nuclear weapon test explosion or any other nuclear explosion”; (2) “to prohibit and prevent any such nuclear explosion at any place under its jurisdiction or control”; and (3) “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.”¹

Strengthening support for these simple but powerful prohibitions by moving the CTBT closer to entry into force would benefit the international system and humanity in many ways. These include: (i) reinforcing the vital but imperiled nuclear nonproliferation order; (ii) helping meet Nuclear Non-Proliferation Treaty (“NPT”) Article VI disarmament commitments; (iii) limiting the development of more advanced nuclear weapons and curbing potential arms races; and (iv) strengthening critical non-testing norms that help prevent the saber-rattling and harmful environmental effects that come with testing.

First, securing further CTBT ratifications would reinforce the vital but endangered nuclear nonproliferation order. The order’s success is astounding when considering assessments like President Kennedy’s 1963 speech that predicted up to 25 nuclear-armed states by the 1970s.² Instead, there are only nine states with nuclear-weapons programs today, despite roughly 30 countries that have sought programs.³ These successes were made possible by a robust international nonproliferation regime, headlined by the NPT alongside arms-reduction treaties like New START, voluntary non-governmental organizations like the Nuclear Suppliers Group (“NSG”), and others. Of course, nonproliferation successes are also explained by economic and political factors like the prohibitive cost of developing and maintaining a nuclear arsenal (particularly one capable of surviving a first strike), as well as economic sanctions and diplomatic isolation that have been levied on states like Iran and North Korea for their pursuit of

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¹ Comprehensive Nuclear-Test-Ban Treaty art. I, Sept. 10, 1996, 1996 U.S.T. LEXIS 110 (not yet in force).

² Press Conference, President John F. Kennedy, President’s News Conference (Mar. 21, 1963), <https://perma.cc/B7LW-7WYR>.

³ *Nuclear Weapons Programs Worldwide: An Historical Overview*, INST. FOR SCI. & INT’L SECURITY, <https://perma.cc/3XQV-P7LY>.

weapons programs. Yet even these factors have been reinforced and legitimized by the nonproliferation order.

Although there have been massive reductions compared to Cold War tallies, Russia retains roughly 6,500 warheads and the United States 6,185,⁴ with both nations and China pursuing massive modernization and recapitalization efforts.⁵ China's program – although still small relative to the U.S. and Russian programs – is growing, while France and the United Kingdom retain their stockpiles as the other nuclear-armed NPT powers.⁶ For nations outside the NPT, there are an estimated 150 warheads in Pakistan, 140 in India, 80 in Israel, and 25 in North Korea.⁷ North Korea has tested weapons in this century and represents the most immediate threat to test again, particularly after the breakdown in talks with the Trump administration. Israel's existing nuclear arsenal, the uncertain future of the Iranian program, and Gulf countries with peaceful nuclear programs and possible weapons-related ambitions, all threaten to spark a nuclear-arms race in the Middle East.⁸ Pakistan also presents a substantial threat, as it has not declared a “no first-use” doctrine,⁹ has developed the short-range Nasr ballistic missile with a “quick response system” designed to “deter evolving threats” (i.e. those emanating from India),¹⁰ and has large and growing fissile-material stockpiles of at least 280 kg of plutonium and 3,000 kg of highly-enriched uranium (“HEU”).¹¹ The CTBT is a critical component of the nonproliferation order, and securing vital CTBT ratifications from nuclear powers would do much to support this order.

A second major benefit to CTBT ratification, specifically by China and the United States, is the contribution that ratification would make toward each nation's Article VI disarmament commitments. Article VI of the NPT states in part that each Party “undertakes to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament.”¹² The “undertakes to pursue” language, although a legally-binding commitment, provides states with immense flexibility in determining what constitutes “good faith,” “an early date,” and even “disarmament.” Many non-nuclear-weapon state (“NNWS”) NPT Parties discern a lack of progress on these commitments by the five

⁴ Hans M. Kristensen & Matt Korda, *Status of World Nuclear Forces*, FED'N OF AM. SCIENTISTS (May 2019), <https://perma.cc/4P8H-Y3ZZ>.

⁵ See *Fact Sheets and Briefs: U.S. Nuclear Modernization Programs*, ARMS CONTROL ASS'N (Aug. 2018), <https://perma.cc/F8KW-8JT2>.

⁶ See Kristensen & Korda, *supra* note 4.

⁷ *Id.*

⁸ See Bilal Y. Saab, *The coming Middle East missile arms race*, BULL. ATOMIC SCIENTISTS (Sept. 25, 2018), <https://perma.cc/DKX2-46C9>.

⁹ See, e.g., Ankit Panda, *'No First Use' and Nuclear Weapons*, COUNCIL ON FOREIGN REL. (July 17, 2018), <https://perma.cc/48WY-HFL6>.

¹⁰ Mansoor Ahmed, *Pakistan's Tactical Nuclear Weapons and Their Impact on Stability*, CARNEGIE ENDOWMENT FOR INT'L PEACE (June 30, 2016), <https://perma.cc/BW3K-ZK5K>.

¹¹ See *Countries: Pakistan*, INT'L PANEL ON FISSILE MATERIALS (Feb. 12, 2018), <https://perma.cc/FMC9-L7KQ>; see also *Weapon Materials Basics*, UNION OF CONCERNED SCIENTISTS (July 18, 2009), <https://perma.cc/FUX9-WTCU> (Only 2-4 kg of plutonium or 9-12 kg of HEU are needed to build a “sophisticated implosion weapon. A “simple implosion weapon” requires more of each material.).

¹² Treaty on the Non-Proliferation of Nuclear Weapons art. VI, July 1, 1968, 21 U.S.T. 483, 729 U.N.T.S. 161.

nuclear-weapon state (“NWS”) Parties and have sought to take the lead on disarmament efforts, including through the largely symbolic Treaty on the Prohibition of Nuclear Weapons (“TPNW”).¹³ If the United States and China ratify the CTBT, all five NWS Parties will have ratified, showing a renewed dedication to their Article VI obligations.

A third major benefit is that codifying a legal norm to end all nuclear explosions for testing purposes would also “constrain the development and qualitative improvement of nuclear weapons and end the development of advanced new types of nuclear weapons.”¹⁴ This “vertical” proliferation can lead to destabilizing and dramatic arms races, which can deal substantial blows to non-nuclear norms.¹⁵ Just a few years after detonating the fission-based bombs over Japan to end World War II, the United States tested the immensely more powerful fusion bomb in 1952, and the Soviet Union followed suit one year later.¹⁶ When and if the CTBT enters into force, the treaty would prohibit its members from explosive testing, which is a critical factor in developing more-advanced nuclear weaponry. This, of course, is not the only method of testing, as will be explained below.

Finally, revitalized support for the CTBT can also reinforce and expand global non-testing norms, which in turn can help ensure that the saber rattling and harmful environmental effects of testing will remain largely relegated to history. Many scholars commend the increasingly successful internalization of the nuclear non-use and non-testing norms.¹⁷ In evaluating these norms, it is worth briefly discussing how states and their citizens view the normative permissibility of nuclear weapons. Press, Sagan, and Valentino provide illustrative perspectives, including a “moralistic” perspective that argues people use preconceived notions of right and wrong to determine an appropriate action in a situation like the testing and use of nuclear weapons, and utilitarian perspectives that focus on the “consequences” of an action and the “strategic interaction[s]” with other states.¹⁸

Under the moralistic perspective, a taboo against nuclear weapons and testing has developed across much of the world. A total of 184 states have signed the CTBT (12 have not), and 168 states have ratified it (28 have not) after Zimbabwe’s recent ratification on February 13, 2019.¹⁹ Most of these nations do not actually have the capacity to test, but they have importantly elected to ratify the CTBT instead of seeking to acquire or test nuclear weapons. The TPNW is a recent example of this expanding global opposition to nuclear weapons that is framed in moral terms, as State Parties: “Acknowledge[e] the ethical imperatives for nuclear disarmament and the urgency of achieving and maintaining a nuclear-weapon-free world, which is a global public good of the

¹³ See Treaty on the Prohibition of Nuclear Weapons, July 7, 2017, U.N. Gen. Assembly A/Conf.229/2017/8.

¹⁴ S.C. Res. 2310, ¶ 6 (Sept. 23, 2016).

¹⁵ See, e.g., Vitaly Goldansky, *Connection between Horizontal and Vertical Proliferation of Nuclear Weapons, in COEXISTENCE, COOPERATION AND COMMON SECURITY* 21, 21-22 (Joseph Rotblat & Laszlo Valki eds., 1988).

¹⁶ See JOSEPH CIRINCIONE, *BOMB SCARE: THE HISTORY AND FUTURE OF NUCLEAR WEAPONS* 23 (2008).

¹⁷ See, e.g., BRIAN M. MAZANEC, *THE EVOLUTION OF CYBER WAR: INTERNATIONAL NORMS FOR EMERGING-TECHNOLOGY WEAPONS*, 110-140 (2015).

¹⁸ See Daryl G. Press et al., *Atomic Aversion: Experimental Evidence on Taboos, Traditions, and the Non-Use of Nuclear Weapons*, 107 AM. POL. SCI. REV. 188 (2013).

¹⁹ *Status of Signature and Ratification*, CTBTO PREPARATORY COMM’N, <https://perma.cc/EZ9A-UNSX>.

highest order, serving both national and collective security interests.”²⁰ The moralistic approach is limited by the reality that some political systems (e.g. those of the United States, United Kingdom, France, and India) are generally more capable of translating popular moral or ethical concerns into policy than are others (e.g. those of China and Russia).

Under the utilitarian perspective, the strategic interactions of nations accentuate the importance of a multi-party bargain to ratify the CTBT. Forgoing testing could reduce the reliability of nuclear weapons, depending on the development of a nation’s alternative capabilities like computer simulations. Nations are thus disincentivized from ratifying the CTBT and limiting its options, particularly if rival states do not reciprocate. For example, the Indian government prefers to retain its testing capacity and strategic flexibility vis-à-vis China and Pakistan. But if Beijing and Islamabad agree to limit their strategic flexibilities in the same way, this could change New Delhi’s calculus and perhaps create the conditions for Indian ratification.

Given that states largely conducted global nuclear tests in the twentieth century, it is easy to downplay the chance of future testing (outside of North Korea) and disregard the harmful effects of testing on peaceful relations between nuclear powers and on the environment. Assuming that the major nuclear powers will never test again is short-sighted, however, and the best way to reinforce the tenuous non-testing norm is to pursue additional CTBT ratifications, thus codifying the norm into a set of binding legal commitments. The historical connection between nuclear testing and arms races should not be forgotten. The Cold War arms race has its roots in the U.S. interagency report NSC-68, which called for substantially greater U.S. military spending partly as a response to the first Soviet nuclear test in 1949.²¹ Similarly destructive patterns were seen after Chinese tests shocked India into the nuclear era, and the arms race between India and Pakistan culminated in competing tests in 1998. There are fewer more fearsome and harmful means of saber-rattling than a nuclear detonation.

Regarding the environmental toll of testing, states have conducted over 2,000 nuclear tests worldwide, roughly half by the United States.²² States conducted many of these tests above-ground before the 1963 Limited Test Ban Treaty (“LTBT”), at least among signatories, banned atmospheric tests.²³ The LTBT codified an important norm of non-atmospheric testing, and despite subsequent tests by France and China before either nation joined,²⁴ the norm has largely held strong since the LTBT entered into force. The consequences of the released radiation from both atmospheric and underground tests, including on humans and animals, have of course been dramatic.²⁵ As just one example, a study done on the effects of testing in Semipalatinsk,

²⁰ Treaty on the Prohibition of Nuclear Weapons, *supra* note 13, preamble.

²¹ See William Burr, *U.S. Intelligence and the Detection of the First Soviet Nuclear Test, September 1949*, NAT’L SEC. ARCHIVE AT THE GEO. WASH. U. (Sept. 22, 2009), <https://perma.cc/XE57-G2ZA>.

²² *The Nuclear Testing Tally*, ARMS CONTROL ASS’N (Feb. 2019), <https://perma.cc/H9DV-DU5G>.

²³ Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water art. I, Aug. 5, 1963, 14 U.S.T. 1313. This treaty is also sometimes referred to as the Partial Test Ban Treaty or LTBT.

²⁴ See *General Overview of the Effects of Nuclear Testing*, CTBTO PREPARATORY COMMISSION, <https://perma.cc/XKV8-SB6D>.

²⁵ See, e.g., Remus Prävălie, *Nuclear Weapons Tests and Environmental Consequences: A Global Perspective*, 43 *AMBIO* 729 (2014), <https://perma.cc/767Y-UGCK>.

Kazakhstan showed a significantly increased risk of acute leukemia and potentially other forms of cancer-based on proximity to the test site, particularly among children.²⁶ Underground testing has mitigated some of the radiation-exposure problems associated with atmospheric testing, but the tests still release immense levels of plutonium and other dangerous elements underground.²⁷ CTBT ratification by individual nations and potential entry into force of the Treaty would help ensure that these sorts of disastrous tests do not recur.

The above reasons demonstrate that it is essential to reinvigorate the CTBT ratification process, which can be best accomplished through an agreement for simultaneous ratification by nuclear powers China, India, Pakistan, and the United States. This agreement would align with each state's national interest and temper the pernicious strategic interactions that have dissuaded each state from pursuing unilateral ratification. Of course, even if these four nations ratify, the CTBT would still not enter into force until the remaining Annex 2 states and others ratify as well. Further still, even if the Treaty actually enters into force, this would not eliminate the nuclear-security threats from Pakistan and elsewhere, erase tensions on the Korean Peninsula or Indian Subcontinent, or reduce the overwhelming nuclear superiority enjoyed by the United States and Russia that threatens many states. Yet for the reasons given and others, the immense benefits of a four-sided ratification more than justify the effort.

The rest of the paper will proceed as follows. Section II will give some historical perspective on why the CTBT has not entered into force. Section III will explain the proposed four-sided ratification agreement in greater detail. Section IV will introduce some of the common technical counterarguments to CTBT ratification. Sections V through VIII will show that the intertwined national interests of China, Pakistan, India, and the United States – four nuclear-armed powers that have not ratified the CTBT largely due to counterproductive strategic interactions between them – would all benefit from a four-sided ratification agreement. Finally, Section IX will show there is a greater chance than commonly believed that the domestic politics of each nation could align in favor of mutual ratification in the near future.

II. THE DEVELOPMENT AND CODIFICATION OF NUCLEAR NON-TESTING NORMS HAS FAILED TO REACH ITS LOGICAL CONCLUSION, A COMPREHENSIVE GLOBAL PROHIBITION ON NUCLEAR TESTING THROUGH ENTRY INTO FORCE OF THE CTBT

For some context, the 1963 Limited Test Ban Treaty predated the CTBT and prohibited all non-underground nuclear tests and other nuclear explosions.²⁸ Co-sponsored by the United States, United Kingdom, and Soviet Union, it enjoyed strong international support despite a tense global environment that had witnessed the failed Bay of Pigs invasion and Cuban Missile Crisis within the preceding two years. The LTBT impressively achieved the needed ratifications for

²⁶ See David Zaridze et al., *Childhood Cancer Incidence in Relation to Distance from The Former Nuclear Testing Site in Semipalatinsk, Kazakhstan*, 59 INT'L J. CANCER 471, 471-475 (1994).

²⁷ See *General Overview of the Effects of Nuclear Testing*, *supra* note 24.

²⁸ Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water, *supra* note 23, at art. I.

entry into force just two months after opening for signature and provided vital international understanding and forward momentum for further test-ban treaties. In 1974, the United States and Soviet Union signed the Threshold Test Ban Treaty (“TTBT”), designed as an intermediate solution that limited testing yield to 150 kilotons and sought continued negotiations to cease all underground nuclear tests.²⁹ The Peaceful Nuclear Explosions Treaty (“PNET”) was a companion treaty to the TTBT and provided for verification through national technical means (“NTM”) as well as certain data exchanges and site visits.³⁰ Both the TTBT and PNET were ratified by the United States and Soviet Union and entered into force in December 1990.³¹ These and other test-ban efforts throughout the twentieth century culminated in the CTBT, which opened for signature in 1996.

The CTBT, however, has not yet entered into force, which requires ratification by all 44 states listed in Annex 2 to the Treaty.³² Annex 2 states are those that participated in the CTBT negotiations and were listed by the International Atomic Energy Agency (“IAEA”) as possessing at least one nuclear reactor in 1995-96.³³ Eight Annex 2 nations have yet to ratify (China, Egypt, India, Iran, Israel, North Korea, Pakistan, and the United States), while three of those (India, North Korea, and Pakistan) have not even signed.³⁴ Only three Annex 2 states have ratified since 2004.³⁵ As of this writing, 28 total states have yet to ratify the CTBT and only 17 have since 2009.³⁶ In short, the ratification process has stagnated dramatically in recent years.

III. A “GRAND BARGAIN” FOR MUTUAL RATIFICATION BY CHINA, INDIA, PAKISTAN, AND THE UNITED STATES IS AN AMBITIOUS BUT NECESSARY METHOD OF STRENGTHENING SUPPORT FOR THE CTBT

CTBT ratification by China, India, Pakistan, and the United States would not only contribute to international security for the reasons given above, but it would also align with the national interest of each country. This can best be done by an agreement whereby each nation simultaneously ratifies the CTBT, an approach that would overcome a primary impediment to individual ratifications, which is the perceived strategic disadvantage that unilateral ratification would have for one nation vis-à-vis the others. A four-sided agreement could thus produce the synergy necessary to regenerate a long-moribund process.

²⁹ Treaty on the Limitation of Underground Nuclear Weapon Tests art. I, U.S.-U.S.S.R., July 3, 1974, S. TREATY DOC. NO. 94-25(A) (1976).

³⁰ Treaty on Underground Nuclear Explosions for Peaceful Purposes art. IV, U.S.-U.S.S.R., May 28, 1976., S. TREATY DOC. NO. 94-25(B), 94th Cong., 2d Sess. 5.

³¹ *Narrative: Treaty Between The United States of America and The Union of Soviet Socialist Republics on Underground Nuclear Explosions For Peaceful Purposes (and Protocol Thereto) (“PNE Treaty”)*, BUREAU OF ARMS CONTROL, VERIFICATION & COMPLIANCE, U.S. DEP’T OF STATE, <https://perma.cc/6M3G-LMDE>.

³² Comprehensive Nuclear-Test-Ban Treaty, *supra* note 1, art. XIV(1).

³³ *Id.* at annex 2.

³⁴ *Status of Signature and Ratification*, *supra* note 19.

³⁵ *Id.* Vietnam, Colombia, and Indonesia are the three Annex 2 states that have ratified since 2004.

³⁶ *Id.* Furthermore, only 35 total states have signed the Treaty since 1997 and 12 still have not.

Mutual codification of the non-testing norm would provide greater global stability and certainty by transforming a set of unilateral and non-binding policy decisions into binding legal obligations. The sacrifice required in signing and ratifying the CTBT is a reciprocated reduction in strategic flexibility, which would not dramatically alter the security postures of the four nations because each already adheres to unilateral testing moratoria. The last test conducted by each of the four was over 20 years ago in the last century – 1992 by the United States, 1996 by China, and 1998 by India and Pakistan. President George H.W. Bush signed legislation in 1992 that provided for a unilateral testing moratorium for nine months, which subsequent U.S. presidents have extended.³⁷ After China’s last test, the Chinese state-owned news agency declared that its moratorium “is not only a response to the appeal of the vast number of non-nuclear weapon states, but also a concrete action to promote nuclear disarmament.”³⁸ It further declared: “Halting nuclear tests is an important step toward nuclear disarmament.”³⁹ Indian Prime Minister Vajpayee announced a voluntary moratorium after India’s 1998 tests, asserting that by doing so, “India has already accepted the basic obligation of the CTBT.”⁴⁰ After Pakistan’s tests, Prime Minister Sharif declared that Pakistan will thereafter “adhere to the CTBT.”⁴¹ Each nation has thus far held firm to these moratoria, although they may, of course, be retracted without warning at any time.

Importantly, CTBT signatories that have not ratified would still be bound by Article 18 of the Vienna Convention on the Law of Treaties (“VCLT”) to not “defeat the object and purpose” of a treaty after signing or exchanging instruments to ratify, accept, or approve the treaty, unless a signatory makes clear its intention not to become a party.⁴² Since Article 18 is considered customary international law, it would apply not just to states like China that are VCLT Parties but also to states like the United States that are not. It could be argued that the long period without ratification by the United States and China, including often-hostile rhetoric by the U.S. side, shows sufficient intent to not join the CTBT for purposes of VCLT Article 18. However, evidence against this position is seen most clearly in the Joint P5 Statement in September 2016 that reaffirmed a mutual desire for a “prompt entry into force” of the CTBT and recognized that any nuclear explosion, including those for testing purposes, would defeat the object and purpose of the Treaty.⁴³ Regardless, neither India nor Pakistan have signed the CTBT, so they are not obligated to resist defeating its object and purpose. If India and Pakistan committed to the CTBT through ratification and the United States and China moved their initial commitments forward through ratification, the CTBT and non-testing norm would benefit tremendously.

³⁷ See *23 September 1992 – Last U.S. Nuclear Test*, CTBTO PREPARATORY COMM’N, <https://perma.cc/K6UK-SKP4>.

³⁸ Seth Faison, *China Sets Off Nuclear Test, Then Announces Moratorium*, N.Y. TIMES, July 30, 1996, at A3.

³⁹ *Id.*

⁴⁰ JONATHAN MEDALIA ET AL., CONG. RESEARCH SERV., 98-570F, INDIA-PAKISTAN NUCLEAR TESTS AND U.S. RESPONSE 6 (1998).

⁴¹ *Id.*

⁴² Vienna Convention on the Law of Treaties art. 18, May 23, 1969, 1155 U.N.T.S. 331.

⁴³ See *Joint Statement on the Comprehensive Nuclear-Test-Ban Treaty by the Nuclear Nonproliferation Treaty Nuclear-Weapon States* (Sept. 15, 2016), <https://perma.cc/W5WN-L5BN>.

Another consideration to address upfront is that although certain “carrots” could be added to facilitate a four-sided agreement, the temptation should be avoided. Membership in the Nuclear Suppliers Group (“NSG”) and civil nuclear cooperation agreements are two such toxic carrots. India is currently a member of three major export-control regimes – the Australia Group, Missile Technology Control Regime (“MTCR”), and the Wassenaar Agreement.⁴⁴ New Delhi also struck a 123 Agreement for civil nuclear cooperation with the United States over ten years ago.⁴⁵ India, however, is still not a full NSG member due to Chinese opposition, although New Delhi received a waiver in 2008 permitting it to trade in civilian nuclear fuel and technology.⁴⁶ Much of Indian media believes that fully joining the NSG would be a political boon for the Modi government or potentially for any future government that completes the task.⁴⁷ Yet it is highly unlikely that India would support Pakistan’s NSG membership or that India agreeing to join the CTBT would be sufficient for China to lift its block on India’s NSG membership. A spokesman for China’s foreign ministry reaffirmed that India must join the NPT as a NNWS Party for China to lift its opposition to Indian NSG membership.⁴⁸ Beijing is certainly aware that this demand is a non-starter for New Delhi.

There have also been talks between the United States and Pakistan about Pakistani NSG membership, whereby Pakistan would take unspecified arms control measures in return for membership and the international legitimacy that it provides.⁴⁹ Yet it is unlikely that the NSG would grant Pakistan the same exception it provided to India in 2008, when it permitted nuclear exports to India despite India refusing to open all of its nuclear facilities to international inspection.⁵⁰ Pakistan would also certainly benefit vis-à-vis India if both nations became full NSG members, given the existing civil-nuclear cooperation that India boasts (and that Pakistan does not) with the United States and others. Providing these carrots to India and Pakistan could also induce China and perhaps even the United States to seek their own carrots or carve-outs, adding further complications and likely poisoning an already-delicate process.

IV. MANY TECHNICAL CONCERNS THAT DISSUADE NATIONS FROM RATIFYING THE CTBT ARE COMMON TO ALL NUCLEAR-ARMED STATES, INCLUDING ISSUES RELATED TO VERIFICATION, SUBCRITICAL TESTING, AND STOCKPILE RELIABILITY

⁴⁴ See *Multilateral Export Control Regimes*, BUREAU OF INDUSTRY & SECURITY, <https://perma.cc/2WBS-CQYR> (The Australia Group targets the trade of certain chemicals, equipment, technologies, and other components of chemical-weapon and biological-weapon programs. The Missile Technology Control Regime seeks to limit the trade in components and technologies for missiles capable of delivering WMD. The Wassenaar Agreement deals with conventional arms sales and dual-use goods and technologies).

⁴⁵ See *Fact Sheet: U.S.-India Civil Nuclear Cooperation Initiative*, BUREAU OF SOUTH & CENT. ASIAN AFF., U.S. DEP’T OF STATE (Oct. 15, 2008), <https://perma.cc/DCY8-QJTH>.

⁴⁶ See Wade Boese, *NSG, Congress Approve Nuclear Trade with India*, ARMS CONTROL TODAY, Oct. 2008, at 27.

⁴⁷ See, e.g., Jayanth Jacob, *India working on strategy to make another bid for NSG membership*, HINDUSTAN TIMES (May 28, 2018), <https://perma.cc/AGR8-34YS>.

⁴⁸ Press Conference, Geng Shuang, Spokesperson, Foreign Ministry of China (Jan. 31, 2019).

⁴⁹ See Daniel Horner, *Pakistan, U.S. Said to Be Talking on NSG*, ARMS CONTROL TODAY, Nov. 2015, at 31.

⁵⁰ See *id.*

I will briefly introduce some of the technical counterarguments to CTBT ratification here and discuss them further in the sections that follow when relevant.

First, verification of compliance obligations under the CTBT is a perpetual concern for many nations, particularly when the Treaty opened for signature in 1996. The Comprehensive Nuclear Test-Ban Treaty Organization (“CTBTO”) was created to ensure implementation and verification of the Treaty.⁵¹ CTBT verification consists of on-site inspections as well as monitoring stations under the International Monitoring System (“IMS”). On-site inspections would be provided based on evidence obtained by the IMS and/or gathered through the NTM of individual nations.⁵² These inspections, however, cannot be authorized before the CTBT enters into force.⁵³ Even if they become available, CTBT inspections would likely be relatively rare compared to inspections under IAEA safeguards, for example, as the former could only be conducted via direct state challenges.⁵⁴

Former State Department Deputy Legal Adviser Newell Highsmith highlights that the core of the CTBT testing regime is the monitoring stations, which provide substantially greater treaty verification without the intrusive inspections that many countries fear.⁵⁵ The IMS detected all six North Korean tests without a physical presence on North Korean soil, using a global network of seismic, hydroacoustic, infrasound, and radionuclide technologies, which are unobtrusive and offer important civilian dual uses as well.⁵⁶ Seismic-wave detectors can also detect and measure earthquakes, and there are currently 170 IMS seismic stations across 76 countries.⁵⁷ Hydroacoustic technology (commonly known as sonar) monitors for underwater tests based on changes in water pressure from sound waves, with 11 stations worldwide.⁵⁸ The technology was initially created to facilitate ocean travel by making icebergs and other dangers at sea detectable earlier, and civilian applications now also include studying whale-migration patterns and detecting tsunamis.⁵⁹ Infrasound monitoring measures certain pressure changes that could be caused by atmospheric nuclear tests and can also detect volcanic eruptions and other natural disasters, with 60 stations globally.⁶⁰ Finally, radionuclide monitoring complements the other technologies and is the only method that can determine if a detected explosion is indicative of a nuclear test, by using 80 stations and 16 laboratories worldwide to measure the atmospheric concentrations of radioactive particles and certain noble gases like xenon.⁶¹

⁵¹ Comprehensive Nuclear-Test-Ban Treaty, *supra* note 1, art. II, para. 1.

⁵² *Id.* at art. IV, para. 37.

⁵³ See *Comprehensive Test Ban Treaty at a Glance*, ARMS CONTROL ASS’N (Feb. 2019), <https://perma.cc/9GMT-R7WF>.

⁵⁴ See Edward Ifft, *On-Site inspection under the Comprehensive Nuclear-Test-Ban Treaty*, AM. INST. PHYSICS CONF. PROC. 4 (2017).

⁵⁵ Telephone Interview with Newell Highsmith, Former Deputy Legal Adviser, U.S. Dep’t of State (May 2, 2019).

⁵⁶ See Lassina Zerbo, *The Nuclear Test Ban and the Verifiable Denuclearization of North Korea*, ARMS CONTROL TODAY, Nov. 2018, at 6.

⁵⁷ *Seismic Monitoring*, CTBTO PREPARATORY COMM’N, <https://perma.cc/6MQF-5VE9>.

⁵⁸ *Hydroacoustic Monitoring*, CTBTO PREPARATORY COMM’N, <https://perma.cc/6ESU-F94H>.

⁵⁹ *Id.*

⁶⁰ *Infrasound Monitoring*, CTBTO PREPARATORY COMM’N, <https://perma.cc/4SKC-3BGX>.

⁶¹ *Radionuclide Monitoring*, CTBTO PREPARATORY COMM’N, <https://perma.cc/7UCB-S58Z>.

In short, the IMS verification and monitoring system is robust and constantly improving. All nuclear-weapon states, including the four that are the focus of this paper, should support further development of this system. A robust IMS regime can reduce reliance on NTM and provide independent, verifiable evidence to shine a spotlight on any future tests while also contributing to important civilian uses like natural-disaster detection, which is becoming increasingly important due to extreme global weather patterns.

There is also debate over verification of subcritical nuclear testing, which involves simulating aspects of explosive testing using chemical explosives and masses of plutonium or surrogate materials that are entirely subcritical.⁶² There is general agreement that any test reaching criticality would violate the terms of the CTBT, as Article I prohibits “any nuclear weapon test explosion or any other nuclear explosion.”⁶³ Yet verifying if and when a certain “subcritical” test actually reaches criticality and therefore violates the Treaty is often a very difficult task.

Finally, stockpile reliability is also a concern for virtually all nations with nuclear-weapons programs. As described by the U.S. National Nuclear Security Administration (“NNSA”), ensuring reliability generally includes “routine maintenance, periodic repair, replacement of limited life components, and surveillance.”⁶⁴ The NNSA asserts that a “science-based assessment” to accurately model weapons performance without testing is possible through a combination of new scientific research, data from previous nuclear tests, and computer simulations.⁶⁵ There are obviously differences among nuclear-armed nations in these capacities, including the relative dearth of testing data for nations outside the United States (which has conducted over 1,000 tests) and the Soviet Union/Russia (over 700 tests).⁶⁶ In comparison, China has only conducted 45 tests, India has conducted three, and Pakistan two, according to the TTBT’s definition of a test.⁶⁷

Even accounting for these arguments, the national interests of China, Pakistan, India, and the United States all align in favor of mutual ratification.

V. CHINESE NATIONAL INTEREST WOULD BENEFIT FROM CTBT RATIFICATION, PARTICULARLY IF DONE CONCURRENTLY WITH THE UNITED STATES

⁶² See Steven Aftergood, *JASON on Subcritical Nuclear Tests*, FED’N OF AM. SCIENTISTS (Mar. 6, 2017), <https://perma.cc/QE4K-JQCR>.

⁶³ Comprehensive Nuclear-Test-Ban Treaty, *supra* note 1, art. I.

⁶⁴ *Maintaining the Stockpile*, NAT’L NUCLEAR SECURITY ADMIN., <https://perma.cc/8YYX-TK2Y>.

⁶⁵ *Id.*

⁶⁶ See *The Nuclear Testing Tally*, *supra* note 22.

⁶⁷ *Id.* The Arms Control Association standardized its data by using a definition of a nuclear test given in the TTBT, which counts India’s three simultaneous nuclear explosions on May 11, 1998 as one test. It also counts as one test India’s two explosions on May 13 and Pakistan’s five explosions on May 28. Regardless of the definition and tally used, the discrepancy in testing data available to the U.S. and Russia versus the other nuclear-armed nations is clear.

Beijing was one of the first signatories of the CTBT and has expressed its continued support for the Treaty.⁶⁸ Many observers believe that the only consideration preventing China from ratifying is that the United States has not done so, and many assume that Beijing will never unilaterally ratify without Washington on board as well.⁶⁹

According to a declassified CIA report from 1996, China's initial wariness to the CTBT stemmed in part from its own perceived nuclear inexperience, both in its nuclear-weapons capabilities and the expertise needed to successfully negotiate and develop arms control regimes in line with Chinese national interest.⁷⁰ This reality, however, has changed dramatically since the CTBT was opened for signature. China's nuclear capabilities continue to grow and evolve, including the investment of "considerable resources to maintain and modernize a limited, but survivable nuclear force."⁷¹ China's recent development of nuclear-capable bombers provides it with a nuclear triad for the first time.⁷² Beijing also has a growing fleet of nuclear-powered ballistic missile submarines and is likely seeking to field a continuous, 24/7 sea-based nuclear deterrence and improved second-strike capability through its Jin-class submarines.⁷³

China has also become much more involved with arms control treaty negotiations. Beijing has long been a major player in North Korean affairs, but it often took a back seat to Washington in negotiations with Pyongyang, including the 1994 Agreed Framework that was a bilateral venture between the United States and North Korea. China has since taken a greater leadership role in nuclear discussions, including Beijing's participation in and hosting of the six-party talks with North Korea from 2003-09.⁷⁴ China was also an important player in striking the Joint Comprehensive Plan of Action ("JCPOA") with Iran, and the Chinese Foreign Ministry trumpeted its own "unique and constructive" role in the talks.⁷⁵ Beijing further agreed in 2012 to lead a P5 working group to define key nuclear terms to increase "mutual understanding and facilitate further P5 discussions."⁷⁶ Initiatives like these make it clear that China has developed the capacity and expertise to play a greater role in nuclear arms control negotiations.

Initial Chinese opposition to the CTBT also stemmed from Beijing's perception of the weakness in CTBT monitoring capabilities and its own relative inadequacy in monitoring compared to U.S. NTM that could effectively detect Chinese activities and perhaps gather

⁶⁸ Daryl G. Kimball, *Policy White Paper: Revitalizing Diplomatic Efforts to Advance CTBT Entry into Force*, ARMS CONTROL ASS'N (Apr. 25, 2018), <https://perma.cc/KH24-6ZKR>.

⁶⁹ *See id.*

⁷⁰ CENTRAL INTELLIGENCE AGENCY, CHINA'S WARY APPROACH TO A COMPREHENSIVE TEST BAN TREATY (Jan. 16, 1996), <https://perma.cc/9M9T-ECM4>.

⁷¹ OFFICE OF THE SEC'Y OF DEF., ANNUAL REPORT TO CONGRESS: MILITARY AND SECURITY DEVELOPMENTS INVOLVING THE PEOPLE'S REPUBLIC OF CHINA 75 (2018).

⁷² *Id.* at 77.

⁷³ *See* Greg Torode & David Lague, *Special Report: China's Furtive Underwater Nukes Test The Pentagon*, REUTERS (May 2, 2019), <https://perma.cc/WPZ6-YAJ9>.

⁷⁴ *See The Six-Party Talks at a Glance*, ARMS CONTROL ASS'N (June 2018), <https://perma.cc/AVX8-4CEX>.

⁷⁵ Wang Yi: *China Plays Unique and Constructive Role in Reaching Comprehensive Agreement on Iranian Nuclear Issue*, CHINA EMBASSY (July 14, 2015), <https://perma.cc/8JPE-ZZNE>.

⁷⁶ *Third P5 Conference: Implementing the NPT*, U.S. DEP'T OF STATE (June 29, 2012), <https://perma.cc/5NL4-HWSD>.

evidence to trigger on-site inspections under the CTBT.⁷⁷ The IMS, however, has improved dramatically since China initially expressed concerns over verification. Further, despite improvements in China's own satellite-based and other capabilities over the past 20 years, China's NTM are still inferior to those of the United States. Beijing should thus be motivated to bolster the IMS regime to reduce the need for dependence on its own domestic verification capabilities, and Beijing's increased acceptance of monitoring stations on Chinese territory has shown a tentative willingness to support the IMS more fully.

Another consideration relates to subcritical testing capabilities. China likely conducted subcritical tests at its Lop Nur site to "evaluate the safety and reliability of its nuclear weapons," according to reports by the U.S. State Department.⁷⁸ The State Department has acknowledged that subcritical experiments are generally consistent with a nation's obligations under the CTBT,⁷⁹ so China or any other nation could ratify the CTBT without losing this capacity. Although U.S. subcritical capabilities are superior to Chinese equivalents and would remain so regardless of CTBT ratification, China's lack of explosive testing since 1996 shows that Beijing does not deem it necessary to conduct this sort of testing to guarantee its subcritical capabilities.

VI. PAKISTANI NATIONAL INTEREST WOULD BENEFIT FROM CTBT RATIFICATION, PARTICULARLY IF DONE CONCURRENTLY WITH INDIA

Pakistan designed its nuclear program with its rivals on the Subcontinent in mind, using the program to offset Indian conventional superiority and compete with India's own developing nuclear program, despite Pakistan's neighborhood also including China and Iran. The program was also created with an eye toward national prestige, although even this must be viewed relative to India. It is therefore highly unlikely that a Pakistani administration would unilaterally ratify the CTBT without Indian ratification. Yet given the greater strategic certainty and the defused tensions that could result, simultaneous ratification by India and Pakistan could produce a rare commodity on the Subcontinent – mutual strategic benefit.

When the CTBT opened for signature in 1996, neither Pakistan nor India had yet fully developed or tested a nuclear weapon.⁸⁰ This was despite an estimated 28,000 weapons globally, owned then by the P5 and Israel.⁸¹ Pakistani leaders were hesitant to sign a treaty that would minimize its strategic flexibility before the nation tested a weapon. Yet today, Pakistan and India are both established nuclear powers and their programs are at rough parity, which creates the kind of mutual stability needed to make strides toward disarmament. India possesses roughly

⁷⁷ CENTRAL INTELLIGENCE AGENCY, *supra* note 70.

⁷⁸ See *Fact Sheet: CTBT: Regional Issues and U.S. Interests*, U.S. DEP'T OF STATE (Oct. 8, 1999), <https://perma.cc/5K3S-LZEG>.

⁷⁹ *Id.*

⁸⁰ See Hans M. Kristensen & Robert S. Norris, *Global nuclear weapons inventories, 1945-2013*, 69 BULL. ATOMIC SCIENTISTS 75, 78 (2013).

⁸¹ *Id.*

130-140 nuclear warheads, while Pakistan has 150-160.⁸² India has nine types of ballistic missiles intended primarily to deter Pakistan and China, is developing ship-launched and submarine-launched ballistic missiles, and is working with Russia to expand its cruise-missile capabilities.⁸³ Pakistan boasts ten types of ballistic missiles that can target India, successfully tested a submarine-launched cruise missile (“SLCM”) known as the Babur-3,⁸⁴ and is developing cruise-missile capabilities and multiple independent reentry vehicle (“MIRV”) technology to combat Indian missile-defense developments.⁸⁵

Despite continued tensions on the Subcontinent, unilateral testing moratoria adhered to since 1998 have reduced the uncertainty that defined Indo-Pakistani nuclear relations in the 1990s. Pakistan announced its unilateral moratorium to relax tensions with India after the dual tests and to counteract some of the harm from economic sanctions levied by much of the international community on Pakistan.⁸⁶ This shows that at least one Pakistani administration – that of former Prime Minister Nawaz Sharif – was responsive to international pressure related to nuclear testing, and there is no reason to doubt that current Prime Minister Imran Khan or future regimes could be similarly responsive. Pakistan has also occasionally shown its willingness to reach out to India on nuclear-related issues, including in 2003 when a foreign-ministry spokesman stated that Pakistan was ready to “de-nuclearise” if India did the same, although India did not respond to the offer.⁸⁷

Furthermore, Pakistan’s rivalry with India could help catalyze Pakistani support for the CTBT. Pakistani media gleefully highlighted India’s absence from a 2016 CTBT Ministerial Meeting that a Pakistani delegation attended,⁸⁸ showing that competition on the Subcontinent is not limited to arms buildups and pugnacious rhetoric. In fact, both nations have room to compete for a global image as the less-belligerent nation and a greater advocate for disarmament. Given Pakistan’s image across much of the Western world as a hotspot for terrorism and proliferation concerns, Islamabad has much to gain. Along these lines, it is possible that either Islamabad or New Delhi could *sign* the CTBT without ratifying in a bid to pressure the other to sign and ratify as well.

Another issue worth noting is the uncertain status of Pakistan’s subcritical testing program. Unfortunately, it is unclear whether Pakistan has the capacity to reliably verify its nuclear arsenal without the use of traditional explosives tests, and this uncertainty could work against Islamabad

⁸² See *Arms Control and Proliferation Profile: India*, ARMS CONTROL ASS’N, <https://perma.cc/Q9ZY-5Y94>; see also *Arms Control and Proliferation Profile: Pakistan*, ARMS CONTROL ASS’N, <https://perma.cc/7GJS-2HHQ>.

⁸³ See CTR. FOR STRATEGIC & INT’L STUDIES, *Missiles of India*, MISSILE DEF. PROJECT (June 14, 2018), <https://perma.cc/NKS4-HNTY>.

⁸⁴ Shervin Taheran, *Pakistan Advances Sea Leg of Triad*, ARMS CONTROL TODAY (June 2018), <https://perma.cc/3NAG-37V7>.

⁸⁵ See CTR. FOR STRATEGIC & INT’L STUDIES, *Missiles of Pakistan*, MISSILE DEF. PROJECT (June 14, 2018), <https://perma.cc/HJ7K-UKUY>.

⁸⁶ See Hugh Pope, *Pakistan Declares a Moratorium on Nuclear Tests, Releases Budget*, WALL ST. J. (June 12, 1998), <https://perma.cc/G52J-ZZQR>.

⁸⁷ *We’ll disarm if India does too, says Pakistan*, IOL (May 6, 2003), <https://perma.cc/XRK3-8MMD>.

⁸⁸ See *Pakistan reaffirms commitment to N-test moratorium*, DAWN (June 15, 2016), <https://perma.cc/E4Y2-VV27>.

joining the CTBT. Yet the benefits to Pakistan of concurrently limiting India's options would likely outweigh the risks to the Pakistani program of not being permitted to conduct explosive tests.

VII. INDIAN NATIONAL INTEREST WOULD BENEFIT FROM CTBT RATIFICATION, PARTICULARLY IF DONE CONCURRENTLY WITH CHINA AND PAKISTAN

India has firmly opposed CTBT ratification, including when its Minister of External Affairs stated in 2009 that India would never join the CTBT and has a continued right to test.⁸⁹ New Delhi's initial opposition to the Treaty stemmed from concerns laid out by Harsh Pant that the regime would not go far enough to protect Indian interests, including that: (1) the CTBT would fail to provide a clear path toward disarmament for NWS Parties and thus unfairly harm NNWS Parties and those outside the NPT; (2) the CTBT would only ban nuclear explosive testing and not simulations and other forms of non-explosive testing; (3) the CTBT would not aid India in dealing with continued security threats from its neighbors, namely China and Pakistan (with both threats referenced indirectly during negotiations);⁹⁰ and (4) the CTBT's verification regime would be overly intrusive (a notion that has proven to be entirely misguided).⁹¹

Related to the first concern, New Delhi has largely dropped its demand for complete disarmament for obvious reasons: It is now a major nuclear power with a program that it wishes to keep. Even still, disarmament efforts by the United States and Russia have proceeded apace since the CTBT was opened for signature. Although roughly 14,500 warheads are still in existence today, this is actually down substantially from a high in the mid-1980s of 70,000, which were owned primarily by the United States and Soviet Union.⁹² For those in India that still desire complete disarmament, a test-ban treaty could help move toward this ideal by limiting the ability of nations to develop increasingly-advanced weapons technologies. The CTBT was never designed for global disarmament, but increased ratifications of the Treaty would only aid the overall disarmament process.

On the second concern, India's subcritical testing capability has improved dramatically since the 1998 tests, which were designed in part to bolster this capability.⁹³ India's "nuclear design establishment" generally believes that the reliability of its existing nuclear weapons can be guaranteed through computer simulations, testing of components and subsystems, and subkiloton

⁸⁹ *India will not sign CTBT or NPT: Pranab Mukherjee*, INDIA TODAY (Jan. 17, 2009), <https://perma.cc/2S2H-BKQR>.

⁹⁰ HARSH V. PANT, INDIAN FOREIGN POLICY: AN OVERVIEW 214-15 (2016) (stating that during debate over the CTBT in 1996, India's permanent representative to the United Nations, Prakash Shah, asserted that India cannot be constrained while "countries around [it] continue their weapons programs either openly or in a clandestine manner" and as long as nuclear-weapon states remain unwilling to "accept the obligation to eliminate their nuclear arsenals").

⁹¹ *Id.* at 215 (asserting that the Indian delegation argued during CTBT negotiations that Article XIV governing entry into force disregarded India's position and was "contrary to the fundamental norms of international law" because the provision sought to impose unwanted obligations on India.). India, like all Annex 2 nations, is certainly pressured to ratify the CTBT, but I would argue that this pressure needs to be dialed up further.

⁹² See Kristensen & Korda, *supra* note 4.

⁹³ See *India conducts nuclear tests*, EMBASSY OF INDIA, <https://perma.cc/RTT8-MGJJ>.

tests.⁹⁴ The Indian military, however, remains skeptical that India's previous explosive tests collected enough data to guarantee reliability.⁹⁵ Still, the engineers and technicians are confident in their ability to maintain reliability, and India's subcritical efforts may continue even after CTBT ratification.

On the third concern, CTBT ratification by China and Pakistan alongside India would at least not exacerbate India's security fears and would likely help assuage them. The verification regime, if completely successful, would limit all member nations from making provocative tests and easily developing more-advanced weapons capabilities. Many Indian scholars believe that it was a mistake for India to not sign the CTBT when it opened for signature in 1996, and many argue that if India had signed and not tested, the Pakistani tests in 1998 that followed on the heels of the Indian tests would never have occurred.⁹⁶ If the four-sided ratification agreement is completed and the CTBT enters into force (which would again not be assured), then all State Parties would be subject to the same verification measures. For India, this means that geopolitical rivals China and Pakistan would face the same limits to their abilities to test and develop advanced weapons.

On the fourth concern, the CTBT's verification regime has proven to be far from overly intrusive. If the CTBT enters into force, it would provide for on-site inspections based on evidence from the IMS and/or the NTM of individual nations.⁹⁷ These inspections would likely be rare because they can only be made via state challenges, which would open up other states to retaliatory challenges.⁹⁸ Inspections would also likely be conducted in remote and outdoor areas, not within sensitive military installations and other buildings (although even outdoor inspections can still provide valuable information).⁹⁹

Another concern commonly expressed by the Indian government related to arms control negotiations broadly is that India wishes to avoid being a sort of second-class citizen within an agreement like the NPT, which distinguishes between nuclear "haves" and "have-nots."¹⁰⁰ The CTBT, in contrast with the NPT, does not maintain this same dichotomy between NWS Parties and NNWS Parties. The CTBT would mandate the same restrictions and commitments for all ratifying nations once it enters into force, precluding any contrary Indian or Pakistani arguments.

Furthermore, despite India's current opposition to CTBT ratification, India has a proud history of a different kind of opposition – to nuclear testing and proliferation – although this originated before the development of its own weapons program. The "father" of India, Jawaharlal Nehru, called in 1954 for an immediate prohibition on nuclear testing (termed a

⁹⁴ See Gaurav Kampani, *India's Evolving Civil-Military Institutions in an Operational Nuclear Context*, CARNEGIE ENDOWMENT FOR INT'L PEACE (June 30, 2016), <https://perma.cc/FK44-W8YP>.

⁹⁵ See *id.*

⁹⁶ See, e.g., Praful Bidwai & Achin Vanaik, *Why India Should Sign CTBT: Returning to Our Own Agenda*, 33 *ECON. & POL. WKLY.* 2469 (1998).

⁹⁷ Comprehensive Nuclear-Test-Ban Treaty, *supra* note 1, art. IV, para. 37.

⁹⁸ See Ifft, *supra* note 54, at 4.

⁹⁹ See *id.*

¹⁰⁰ See, e.g., Jayita Sarkar & Sumit Ganguly, *India and the NPT After 50 Years*, *THE DIPLOMAT* (June 22, 2018), <https://perma.cc/9WSV-BMX9>.

“standstill agreement”) between the United States and Soviet Union.¹⁰¹ This demand formed a central pillar of the Non-Aligned Movement’s agenda across the subsequent decades.¹⁰² Current Prime Minister Narendra Modi may share relatively few governing principles in common with Nehru, but this does not detract from the reality that India was the first and leading nation to advocate for a test ban.

VIII. U.S. NATIONAL INTEREST WOULD BENEFIT FROM CTBT RATIFICATION, PARTICULARLY IF DONE CONCURRENTLY WITH CHINA, INDIA, AND PAKISTAN

Given the conventional military superiority of the United States and its nuclear arsenal that is unrivaled by any nation outside of Russia, the United States stands to gain much by reinforcing the non-testing norm and helping to ensure that rival nations like China do not test. The last of 1,032 U.S. nuclear tests occurred in September 1992, which was soon followed by a nine-month moratorium signed by the George H.W. Bush administration, the first of multiple such actions taken by U.S. presidents.¹⁰³ Russia has already ratified the CTBT and Putin has expressed continued support for its entry into force, making a U.S. lack of leadership on this point even more disappointing.¹⁰⁴ Headlined by the defunct Intermediate-Range Nuclear Forces Treaty (“INF”), a series of arms control agreements and norms are in jeopardy, and the U.S. national interest would benefit from preventing an unraveling of the existing regime.

Some in the United States have expressed technical doubts related to the CTBT, including over stockpile reliability.¹⁰⁵ These doubts, however, seem far-fetched. The United States has a well-developed subcritical testing capacity, including conducting the first subcritical experiment in the world, at Los Alamos in 1997.¹⁰⁶ The NNSA predicts weapon performance by comparing simulation results with data from prior nuclear explosive testing, subcritical experiments, and non-nuclear experiments.¹⁰⁷ The United States uses hydrodynamic, laser, pulsed power, and accelerator technologies to strengthen its stockpile,¹⁰⁸ and the National Academy of Sciences determined that the United States has the technical capability to maintain the safety and reliability of its existing stockpiles without further explosive testing.¹⁰⁹ Newell Highsmith emphasizes a simpler and powerful argument – if the United States or another major nuclear

¹⁰¹ REBECCA JOHNSON, U.N. INST. FOR DISARMAMENT RESEARCH, UNFINISHED BUSINESS: THE NEGOTIATION OF THE CTBT AND THE END OF NUCLEAR TESTING, at 11, UNIDIR/2009/2, U.N. Sales No. GV.E.09.0.4 (2009).

¹⁰² *See id.*

¹⁰³ *See 23 September 1992 – Last U.S. Nuclear Test, supra note 37.*

¹⁰⁴ *See Statement By the President of Russia on the 20th anniversary of the signing of the Comprehensive Nuclear-Test-Ban Treaty*, KREMLIN (Apr. 11, 2016), <https://perma.cc/2YAJ-8KNE>.

¹⁰⁵ *See, e.g., Baker Spring & Michaela Dodge, Keeping Nuclear Testing on the Table: A National Security Imperative*, THE HERITAGE FOUND. (Feb. 27, 2013), <https://perma.cc/K6GA-GBZH>.

¹⁰⁶ *Nuclear Weapon Hydronuclear Testing*, GLOBAL SECURITY, <https://perma.cc/MPP9-L9TM>.

¹⁰⁷ NAT’L NUCLEAR SEC. ADMIN., U.S. DEP’T OF ENERGY FISCAL YEAR 2019 STOCKPILE STEWARDSHIP AND MANAGEMENT PLAN – BIENNIAL PLAN SUMMARY REPORT TO CONGRESS 2-2 (2018).

¹⁰⁸ *Id.* at 3-13, 3-14.

¹⁰⁹ NAT’L ACAD. OF SCI., TECHNICAL ISSUES RELATED TO THE COMPREHENSIVE NUCLEAR TEST BAN TREATY (2002), at 34.

power truly felt the need to test their weapons to ensure stockpile reliability or for another reason, they would have done so because there is no legal prohibition preventing this conduct.¹¹⁰

Another ongoing U.S. concern is about compliance verification under the CTBT. As discussed above, despite recent successes by the IMS in detecting the North Korean tests, the verification regime is imperfect. Yet improvements in the IMS, including stations in China and Russia, should minimize this concern. The aforementioned report by the National Academy of Sciences further asserted that verification capabilities under the CTBT are generally better than commonly assumed.¹¹¹ The United States is also able to leverage its improved satellite-based and other verification capabilities to further minimize those concerns.

Although the CTBT clearly prohibits “any nuclear weapon test explosion or any other nuclear explosion,”¹¹² there is an issue in verifying that a subcritical test does not cross the threshold into criticality. Although difficult to fully verify, the CTBT would at least not harm any nation’s ability to confirm these sorts of tests, as it would provide a mechanism for state-based verification challenges. The National Academy also found that subcritical and lower-yield tests are both difficult to conceal and would produce “limited insights.”¹¹³

Despite substantial U.S. opposition in some quarters, history has shown that dramatic national shifts in positions on arms control are certainly possible, as seen by the passage of the LTBT in 1963. The LTBT was proposed by the United States and Soviet Union in a toxic political environment that included the 1962 Cuban Missile Crisis and 1961 Bay of Pigs incident. Its entry into force was largely due to the contributions of individual actors like U.S. President John F. Kennedy and British Prime Minister Harold Macmillan, who both viewed a limited test ban as in the national interest of their respective countries and successfully concluded it despite political obstacles.¹¹⁴ This impressive achievement is instructive for CTBT ratification efforts today and touches on the connection between national interest and domestic politics, leading us into the brief analyses of domestic political considerations that follow.

IX. IT IS MORE POSSIBLE THAN COMMONLY BELIEVED THAT THE DOMESTIC POLITICS OF EACH NATION COULD ALIGN BEHIND THIS FOUR-SIDED RATIFICATION AGREEMENT IN THE NEAR FUTURE

Even more than the analyses of national interest, analyzing domestic politics in such a short space for four immensely-complex nations is inherently a superficial effort. Yet my argument in this section is equally limited: To merely show that, contrary to common belief, the domestic politics of these nations could realistically align in the near future in favor of the proposed four-sided CTBT ratification agreement.

¹¹⁰ Telephone Interview with Newell Highsmith, *supra* note 55.

¹¹¹ See NAT’L ACAD. OF SCI., *supra* note 109, at 15-16.

¹¹² Comprehensive Nuclear-Test-Ban Treaty, *supra* note 1, art. I.

¹¹³ See NAT’L ACAD. OF SCI., *supra* note 109, at 9.

¹¹⁴ See James E. Goodby, *The US Arms Control and Disarmament Agency in 1961-63*, HOOVER INST. at 4 (2017), <https://perma.cc/7LZC-A73V>.

A. Beijing has demonstrated support for the CTBTO and IMS.

An analysis of Chinese domestic politics is easy in some ways (e.g. civil society organizations are largely not a consideration) and hard in others (e.g. the complete lack of government transparency). Simply put, China's national interest is relatively more important and domestic political considerations less important, as compared to India and the United States. Beijing has tentatively increased its cooperation with the CTBTO and has been recognized for these efforts. After delays, Beijing permitted four IMS stations (two seismic and two radionuclides) on Chinese soil in 2017.¹¹⁵ When CTBTO representatives visited, Chinese Foreign Minister Wang Yi pronounced the "irreplaceable role" of the CTBT architecture.¹¹⁶ There are still dramatically fewer IMS stations located in China than are in Russia, the United States, and the other NPT nuclear-weapon powers.¹¹⁷ Still, even reluctant Chinese support for the CTBTO and IMS perhaps foreshadows the potential for CTBT ratification under the right conditions (i.e. the United States taking the same step). Importantly, if Xi Jinping wishes to ratify the CTBT based on his calculation of Chinese national interest, then he will almost certainly do so without being deterred by countervailing domestic political winds or bureaucratic opposition.

B. Islamabad has demonstrated support for the CTBTO.

Unlike India, Pakistan has demonstrated at least tentative support for the CTBT and CTBTO, including "engaging in a positive dialogue with the Organization" and displaying a "readiness to interact at all levels."¹¹⁸ Pakistan also enjoys observer status on the CTBTO's Preparatory Commission.¹¹⁹ Islamabad's statement at the 2016 Ministerial Meeting showed substantial support for ratification, rhetorically asking if the "hegemonic designs of a few states" would be permitted to delay implementation of a testing ban that, by preventing the development of new nuclear weapons, would have "a positive impact on global nuclear disarmament and non-proliferation regimes."¹²⁰

Despite this lofty rhetoric, Pakistan has just two planned and still uncertified IMS stations that are intended for its territory (while India has none even in the planning stages).¹²¹ Much of Pakistan's lack of direct contribution to the IMS regime is likely due to India's outright refusal to substantively contribute, and this bilateral distrust colors each nation's relationship with the

¹¹⁵ See 2017: *Four More IMS Stations Certified in China*, CTBTO PREPARATORY COMM'N (2017), <https://perma.cc/8GBM-3TFS>.

¹¹⁶ *Remarkable Progress: China and the CTBT*, CTBTO PREPARATORY COMM'N (2018), <https://perma.cc/9CNR-NRXC>.

¹¹⁷ See *Station Profiles*, CTBTO PREPARATORY COMM'N, <https://perma.cc/R99C-QW4G>.

¹¹⁸ *CTBTO Visit to Pakistan*, CTBTO PREPARATORY COMM'N (2018), <https://perma.cc/8QGZ-NCQM>.

¹¹⁹ *Id.*

¹²⁰ Pakistan, Statement at the Eighth Ministerial Meeting of the Friends of the CBTB (Sept. 21, 2016), <https://perma.cc/PB3V-VJSX>.

¹²¹ *International Monitoring System Global Overview – Certified Stations and Non-Certified Stations*, CTBTO PREPARATORY COMM'N (Dec. 14, 2019), <https://perma.cc/3WBG-2EV7>.

CTBT and the non-testing norm generally. Pakistan also reportedly made at least two failed offers to design a bilateral arrangement with India that would have codified the non-testing norm between the two nations.¹²²

A final consideration here is that Pakistani Prime Minister Imran Khan has shown an ability to defuse tensions with India and engage in dialogue. He released the Indian pilot who was shot down in February 2019 over Pakistani territory as a “goodwill gesture,” after a suicide bombing in Kashmir claimed by Pakistan-based Jaish-e-Mohammed (“JeM”) killed 44 Indian paramilitary officers.¹²³ At the same time, the initial spark to this crisis came from Pakistan’s inability and/or unwillingness to effectively deal with the threat posed by JeM, and the escalating tensions could have catalyzed a broader crisis.

C. Indian domestic politics could provide a narrow opportunity to ratify the CTBT.

Indian domestic politics does not often allow its leaders to take perceived political risks regarding China or Pakistan. Even the largely politically-invulnerable Jawaharlal Nehru struggled to withstand his failure to take a more assertive foreign policy vis-à-vis China. After the disastrous 1962 invasion by China – the so-called “Himalayan blunder” – it was written that Nehru was “so shattered by the brief but brutal conflict on bleak heights that the subsequent two years of his life turned into a tragic twilight period.”¹²⁴ Many Indian leaders seem to have overlearned this lesson at times. By prioritizing strategic flexibility over the CTBT, they are ignoring the continued threats posed by China and Pakistan that, like India, are restrained from explosive testing primarily by their own revocable words (and for China the loose object and purpose considerations discussed above).

The struggle between the Bharatiya Janata Party (“BJP”) and the Indian National Congress (“INC”) defines much of modern Indian politics. The BJP defeated the INC in general elections in early 1998.¹²⁵ Subsequent elections later that year, in November, were widely seen as a referendum on the performance of the BJP-led National Democratic Alliance (“NDA”).¹²⁶ Sandwiched between those two important elections were the May 1998 nuclear tests, one of the few policy areas that enjoyed support across most of the political spectrum, with the exception of the far-left parties. The BJP’s decision to test was thus largely driven by its electoral rivalry with the INC, and any evaluation of Indian support for nuclear testing (or any issue) must consider these political dynamics that often incentivize hawkish stands. Although each Party has an

¹²² However, it was commonly believed that Pakistan’s strong desire for NSG membership was a primary motivator for offering this sort of arrangement. As with India, NSG membership is a politically-volatile issue and should be avoided in the context of negotiating this CTBT ratification agreement. See Nandini Krishnamoorthy, *Pakistan Offers Proposal to India For Mutual Ban on Nuclear Tests to Ease Entry Into NSG*, INT’L BUS. TIMES (Aug. 17, 2016), <https://perma.cc/6E57-6VAQ>.

¹²³ Krishna N. Das & Abu Arqam Naqash, *Pakistan releases captured Indian pilot; confrontation cools*, REUTERS (Mar. 1, 2019), <https://perma.cc/T3FC-A7WZ>.

¹²⁴ Inder Malhotra, *Nehru’s Luminous Legacy*, 33 INDIA INT’L CTR. QUARTERLY 22, 27 (2006).

¹²⁵ Devesh Kapur & Pratap Bhanu Mehta, *India in 1998: The Travails of Political Fragmentation*, 39 ASIAN SURV. 163, 164 (1999).

¹²⁶ See *id.* at 163.

incentive to take such a stand during elections in particular, there is often room for a softening after elections. By securing simultaneous CTBT ratifications from China, Pakistan, and the United States, an Indian ruling coalition could present this four-sided agreement as a major geopolitical victory crafted on equal terms with China and the United States, as well as a logical codification of what is already a *de facto* moratorium on nuclear testing.

D. U.S. domestic politics could also provide an opportunity to ratify the CTBT.

As in India, domestic politics is critical to evaluating U.S. opposition to a test ban, an opposition that is substantial and well-documented. In 1999, a bitterly-divided Senate rejected the CTBT due to staunch Republican opposition for an initiative by Democratic President Bill Clinton, with 51 voting against and 48 in favor (far short of the two-thirds majority required).¹²⁷ Senate Republicans also threatened in 2016 to defund the IMS in response to unfounded reports that President Barack Obama was considering ways to pass a binding resolution to end U.S. nuclear testing.¹²⁸

Despite this opposition, survey data going back to 1957 shows that consistent majorities of the American public support a global nuclear test ban treaty in theory,¹²⁹ including 84 percent in 2012,¹³⁰ although many remain unsure about whether the Senate should provide its advice and consent to the CTBT.¹³¹ Republican President Dwight Eisenhower, for one, declared his failure to end nuclear testing “the greatest disappointment of any administration, of any decade, of any time and of any party.”¹³²

The Trump administration has little interest in arms control. In contrast with the 2010 Nuclear Posture Review (“NPR”) that asserted Obama’s goal of pursuing CTBT ratification,¹³³ Trump’s 2018 NPR dourly asserted that his administration will refuse to seek ratification but will at least continue to support the CTBTO and the IMS.¹³⁴ The 2018 NPR did reaffirm the United States’ commitment to a testing moratorium and called on all nuclear-armed states to “declare or maintain” their own moratoria.¹³⁵ Yet while the 2010 NPR flatly stated that the United States “will not conduct nuclear testing,”¹³⁶ the 2018 NPR stated the moratorium would apply unless

¹²⁷ Helen Dewar, *Senate Rejects Test Ban Treaty*, WASH. POST, Oct. 14, 1999, at A1.

¹²⁸ Steven Pifer, *What’s the deal with Senate Republicans and the test ban treaty?*, BROOKINGS (Sept. 26, 2016), <https://perma.cc/6BX4-VNWH>.

¹²⁹ See Alicia Sanders-Zakre, *Majority of Americans Still Support the CTBT*, ARMS CONTROL ASS’N (June 21, 2018), <https://perma.cc/5TPA-MRX5>.

¹³⁰ DINA SMELTZ, FOREIGN POLICY IN THE NEW MILLENNIUM: RESULTS OF THE 2012 CHICAGO COUNCIL SURVEY OF AMERICAN PUBLIC OPINION AND U.S. FOREIGN POLICY, CHICAGO COUNCIL ON GLOBAL AFF. 23 (2012).

¹³¹ See Stephen Herzog & Jonathan Baron, *Public support, political polarization, and the nuclear-test ban: evidence from a new US national survey*, 24 THE NONPROLIFERATION REV. 357 (2017).

¹³² See *Factsheet: The Comprehensive Test Ban Treaty*, CLINTON WHITE HOUSE ARCHIVES, <https://perma.cc/RZY8-D72E>.

¹³³ U.S. DoD, NUCLEAR POSTURE REVIEW REPORT XIV (2010).

¹³⁴ OFFICE OF THE SEC. OF DEF., NUCLEAR POSTURE REVIEW XVII (2018).

¹³⁵ *Id.*

¹³⁶ U.S. DoD, *supra* note 133, at XIV.

testing was “necessary to ensure the safety and effectiveness of the U.S. nuclear arsenal”¹³⁷ or “to meet severe technological or geopolitical challenges.”¹³⁸ These carve-outs reflect the strategic flexibility desired above all else by the Trump administration, given what its 2018 NPR terms “an unprecedented range and mix of threats” in the world.¹³⁹ This obviously reduces the chances that the current administration will pursue CTBT ratification.

Yet Trump’s unpredictability in North Korea negotiations and his desire to take credit for any minor success in those negotiations show that it is not beyond the realm of possibility for the Administration to reverse its stance and strive for a deal on the CTBT. Trump has expressed a willingness both to negotiate with North Korea and walk away from negotiations, ostensibly reflecting high-pressure business tactics perhaps better-suited to real estate deals than nuclear negotiations. Trump also took credit for a lack of rocket launches and nuclear testing by Pyongyang for eight months, declaring: “If not for me, we would now be at War with North Korea!”¹⁴⁰ He earlier proclaimed that a nuclear threat from North Korea no longer exists, adding “everybody can now feel much safer than the day I took office.”¹⁴¹ These proclamations hint that Trump views an arms control deal as a potential source of victory for his embattled administration, whether with Pyongyang or elsewhere if those negotiations continue to falter. Talks with Pyongyang and even potential negotiations on the CTBT both have an added advantage to Trump: They are not corroded by Obama’s legacy, as are the JCPOA and talks with Tehran. Although unlikely, it is not beyond the realm of possibility that Trump could seek an arms-control victory through mutual ratification of the CTBT, particularly if stalled negotiations with North Korea are not ultimately fruitful.

CONCLUSION

This four-sided agreement is politically impossible now, but the strategic calculus makes sense for simultaneous ratification of the CTBT by China, India, Pakistan, and the United States, once domestic political conditions align and if skillful diplomacy is conducted on all sides. These simultaneous CTBT ratifications would greatly reinforce the international nonproliferation order, codify testing moratoria that have existed for over 20 years in each nation, and reinvigorate the pursuit of critical arms control objectives like entry into force of the CTBT and NPT Article VI disarmament commitments.

If the four nations strike an understanding, they can operationalize their arrangement through a written or even oral agreement declaring that each will simultaneously deliver their respective instruments of ratification to the depositary. They would likely also seek to hold a ceremony with international fanfare whereby all four governments deposit their ratifications. The differences in ratification processes between the four nations must also be accounted for, including the role of

¹³⁷ OFFICE OF THE SEC. OF DEF., *supra* note 134.

¹³⁸ *Id.* at 63.

¹³⁹ *See id.* at V.

¹⁴⁰ Donald Trump (@realDonaldTrump), TWITTER (July 3, 2018), <https://perma.cc/2EEB-HPC7>.

¹⁴¹ Donald Trump (@realDonaldTrump), TWITTER (June 13, 2018), <https://perma.cc/694J-5KDE>.

the U.S. Senate's advice and consent versus the lack of any Chinese equivalent. Yet China could simply wait for the U.S. Senate to consent and then deposit its instrument of ratification at the same time that the U.S. president does so.

Again, even a successful four-sided ratification agreement as proposed here would not immediately lead to entry into force of the CTBT, due to continued holdouts from Annex 2 states like Egypt, Iran, Israel, and North Korea. Yet if the proposed agreement is successful, those nations would face ratcheted up political, moral, and likely economic pressure for holding out. China could turn the screws on North Korea to ratify, China and Russia could do the same for Iran, China and the United States for Egypt, and the United States for Israel. Even short of this, each of the four nations would again be bound by Article 18 of the VCLT to not "defeat the object and purpose" of the CTBT once each has signed or ratified, unless a nation makes clear its intention not to become a party.¹⁴² The value of this guarantee is certainly debatable.

Also worth noting is that if this four-sided agreement is successful, the trust and cooperation accrued from the process could catalyze political, economic, diplomatic, and other improvements in bilateral relations between each permutation of the four countries involved. Broadly speaking, mutual distrust between the United States and China could be reduced, to the potential benefit of global economic markets and even tensions in the Asia-Pacific region. The United States and Pakistan could bolster their cooperation related to counterterrorism. A demonstrated capacity for India and Pakistan to strike an arms-related agreement would help ameliorate general tensions on the Subcontinent and perhaps lead to partnerships in other areas. The success of this arrangement could generate a *de facto* negotiating bloc between the four nations that would be capable of applying intense pressure to deal with proliferation issues posed by Iran, North Korea, and others. Benefits to the nuclear order and international cooperation in other areas are potentially enormous, and they are worth the daunting pursuit.

¹⁴² Vienna Convention on the Law of Treaties, *supra* note 42, art. 18.