

CTBT Today: More Reasons for Ratification

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Summary

Four main concerns temper the debate surrounding the Comprehensive Nuclear Test Ban Treaty (CTBT). These concerns are: 1) whether the Test Ban Treaty has genuine non-proliferation value; 2) whether cheating might threaten US security; 3) whether it is possible to maintain the safety and reliability of the US nuclear stockpile without testing; and 4) whether it is wise to endorse a test ban treaty that will last indefinitely, rather than simply rely on the current moratorium. In the years since 1999, when the United States Senate failed to ratify the CTBT, many changes have occurred. These changes call for a renewal of the debate surrounding CTBT concerns.

The CTBT would make it nearly impossible for any non-nuclear countries to develop a thermonuclear weapon and place limitations on countries that already possess nuclear weapon capabilities. The treaty is a vital step toward the goal of nuclear non-proliferation. Since, 1999, computing power has vastly exceeded the performance goals that the Energy Department established as necessary for stockpile stewardship. It is now possible to successfully maintain the U.S. nuclear stockpile without nuclear testing. Further, Life Extension Programs (LEPs) are working. These programs ensure that older warheads will not become obsolete. The United States has successfully completed an LEP for the W87 warhead as well as the W76, which make up roughly one third of the current US nuclear stockpile.

In addition, the international verification regime of the CTBTO has made it tougher than ever for cheaters to expect any chance at secret nuclear testing. The North Korean nuclear test on October 9, 2006 provides proof that the IMF possesses a sufficient ability to detect nuclear testing at only 50% capacity; one can only imagine its abilities at 100%. Over twenty seismic stations registered the test and within two hours the location, magnitude and time of the test were available to state signatories. A detailed analysis of the event was issued and distributed to state signatories on October 11, confirming preliminary information. The organization had proved the location of the test within 1000 square kilometers.

The current moratorium on nuclear testing is not sufficient to ensure the continued protection of American citizens. Technological and political advancements, including the increased terrorist threat and increasing danger of nuclear weapons falling into the wrong hands, make it imperative that we allow the CTBTO to operate at 100 percent capacity, ensuring that no new nuclear weapons can be tested or ultimately used. The U.S. must take the lead once again on nuclear non-proliferation and ratify the CTBT.

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Outdated Concerns

In his 2001 report to President Bill Clinton, United States Army General John M. Shalikashvili pointed to the four main concerns that have tempered the debate surrounding the Comprehensive Nuclear Test Ban Treaty (CTBT). While much has changed since 2001, these concerns still hold true today. The main issues are: 1) whether the Test Ban Treaty has genuine non-proliferation value; 2) whether cheating might threaten US security; 3) whether it is possible to maintain the safety and reliability of the US nuclear stockpile without testing; and 4) whether it is wise to endorse a test ban treaty that will last indefinitely, rather than simply rely on the current moratorium. Although many in the Senate have stated their belief that little has changed regarding the CTBT debate during the last decade, it may be time to take another look. Numerous technical advancements and political changes have put a new face on a very old problem.

The American efforts to ban nuclear testing go back to President Dwight D. Eisenhower, who believed a test ban would prevent the U.S.-Soviet arms race from spiraling out of control. President John F. Kennedy eventually signed the Limited Test Ban Treaty in July 1963, eliminating all testing in the atmosphere, outer space and under water. Unfortunately, Kennedy was unable to reach agreement about verification of a ban on underground testing. In 1970, the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) was passed and affirmed the link between banning nuclear tests and preventing the spread of nuclear weapons. In 1992, President George H.W. Bush determined that the US would no longer engage in nuclear testing to develop new nuclear weapon designs for force modernization purposes. Congress then imposed an eight month moratorium on U.S. nuclear weapon tests, restricted subsequent tests even for safety and reliability purposes, and directed the president to begin work on a multilateral comprehensive ban to be achieved by 1996.

The CTBT was negotiated by the Conference on Disarmament, the single multilateral disarmament negotiating forum, between January 1994 and August 1996. On September 24, 1996, President Bill Clinton became the first world leader to sign the CTBT. In 1999, however, the U.S. Senate failed to ratify the treaty by a vote of 51-48. The terms of the treaty stipulate that it cannot enter into force until the United States and 43 other specified states with nuclear power or research reactors have ratified it. Of these states, nine have yet to ratify: China, Democratic Peoples Republic of Korea (DPRK), Egypt, India, Indonesia, Iran, Israel, Pakistan and the US. Only 15 countries have not signed the CTBT, including the DPRK, India and Pakistan.¹

Non-proliferation: An Essential Step toward Zero

The non-proliferation benefits of the treaty would be vast. Although from a technical standpoint it might be possible for a state to develop an unsophisticated fission device without testing, the treaty would make it nearly impossible for any non-nuclear countries to develop a thermonuclear weapon, let alone a sophisticated one that could travel intercontinental distances. Further, the treaty would place limitations on countries that already possess nuclear weapon capabilities. This would rule out developments that might – for instance - lead to an arms race between India

¹ United Nations. [Comprehensive Nuclear Test-Ban Treaty \(CTBT\)](#). 4 June 2009

<<http://www.un.org/Depts/ddar/ctbt/ctbt.htm>>.

and Pakistan, prevent China from developing a more advanced warhead than it currently possesses, or provide insurance against the renewal of the U.S.-Russia nuclear arms race through “third generation” designs.

Further, the CTBT is essential to sustain support for the Non-Proliferation Treaty and the international non-proliferation strategy. U.S. allies see the CTBT as a vital step toward the goal of non-proliferation, something they have fought for since the days of President Eisenhower. Many U.S. security partners already have ratified the treaty and expect the US to do the same. Once the U.S. ratifies the treaty, it will be better poised for cooperation on export controls, economic sanctions and other coordinated responses to specific problems. Greater support for international military action also can be expected as a result of U.S. steps toward the full use of cooperative threat reduction measures. Unfortunately, as Shalikhshvili stated in 2001, “Until we ratify the Test Ban Treaty, we offer a convenient excuse for a country that wants to renounce its NPT obligations and openly acquire nuclear weapons to threaten its neighbors or intimidate us.”²

Verification: The Strength of the CTBTO

The need for effective verification measures has been central to the CTBT debate since its inception. The last decade brought about immense advancements in technology, proving that what the international community thought impossible in 1999 is, in fact, possible today. The Preparatory Commission for the Comprehensive Nuclear Test-Ban Organization (CTBTO) was founded in 1996 with approximately 260 staff from most of the CTBT’s 180 member states. The CTBTO seeks to promote the treaty and build up the international verification regime so that it is operational when the treaty enters into force. At the heart of this verification regime is the International Monitoring System (IMS), which consists of 337 facilities located throughout the world that constantly monitor the planet for nuclear explosions using seismic, hydroacoustic, infrasound and radionuclide technologies. About 70 percent of these facilities already are sending data to the International Data Centre at the CTBTO headquarters in Vienna, Austria. If this data indicates a nuclear test has taken place, member states will then be able to request an on-site inspection to verify whether or not a treaty violation has occurred. To prepare for this process the CTBTO carried out the first-ever integrated on-site inspection exercise in Kazakhstan in September 2008. The operation was a great success, providing “an additional layer of the verification muscle of the CTBTO,”³ according to the Executive Secretary of the Preparatory Commission for the CTBTO, Tibor Tóth. The first layer of CTBTO effectiveness was apparent during the DPRK testing of a nuclear device on October 9, 2006. The test was recorded throughout the world by the IMS. More than twenty seismic stations registered the test and within two hours the location, magnitude and time of the test were available to state signatories. A detailed analysis of the event was issued and distributed to state signatories on October 11,

² Shalikhshvili, General John M. Letter to the President and Report on the Findings and Recommendations

Concerning the Comprehensive Nuclear Test Ban Treaty. Washington: US State Department, 2001.

³ CTBTO. "Integrated On-Site Inspection Exercise in Kazakhstan Reaches a Successful Conclusion." 9 October 2008. CTBTO. 4 May 2009 <<http://www.ctbto.org/press-centre/press-releases/2008/integrated-on-site-inspection-exercise-in-kazakhstan-reaches-a-successful-conclusion/>>.

2006, confirming preliminary information. The organization had proved the location of the test within 1000 square kilometers. Even in 2001, Shalikhshvili reported that,

A potential cheater would have to calculate correctly the combined capabilities of national, international, and scientific monitoring systems. If it wanted to muffle or mask the signals from a test, it would have to surmount numerous practical constraints and make tough judgment calls on a long list of technical questions about which even American experts disagree. Attempts to camouflage a test or test preparations generate their own suspicious signals.⁴

It appears the country most likely to violate testing agreements would be an experienced nuclear weapons state and tests that are small and infrequent enough to avoid detection would not afford the ability to develop new or better weapons systems.

The Success of Stockpile Stewardship

Ambassador Sir Michael Weston, head of the British delegation to the Conference on Disarmament in Geneva, was correct during the negotiations when he stated, the CTBT “bans the bang, not the bomb.”⁵ The Test Ban Treaty allows the US to maintain a strong nuclear deterrent while simultaneously pursuing its non-proliferation objectives. Much has changed since the Clinton administration created the Stockpile Stewardship Program (SSP) in 1993. The purpose of this program is to use computational and diagnostic tools to replace the role of nuclear testing. However, in 1993 and again in 1999, the directors of the nuclear national laboratories charged with maintaining the nuclear weapons worried that the administration was relying on unrealistic advances in computing power to model nuclear explosions. Since then, computing power has vastly exceeded the 100 teraflop performance goal that the Energy Department established as necessary for stockpile stewardship. This places the national laboratories in a position to answer many of the questions they raised during the 1999 debate over CTBT ratification.⁶

During the 2009 Carnegie International Non-proliferation Conference, Dr. Sidney Drell of the Stanford Linear Accelerator Lab and the Hoover Institution pointed to four more major technical achievements during the last decade. The first of these is the Life Extension Program (LEP). Overall, current LEPs appear to be working. The United States successfully completed an LEP for the W87 warhead as well as the W76, which make up roughly one third of the current U.S. nuclear stockpile. Most refurbishments and upgrades are able to be tested outside of CTBT requirements, since they concern elements that lie outside the nuclear explosive package, such as arming, fusing, firing and boost gas transfer systems. Further, it is possible to validate reengineered components within the nuclear explosive package using the SSP. Second, Los Alamos has reestablished the capability to produce new plutonium pits, core components of the primaries of a nuclear weapon. For the first time in 20 years, the US is able to build replacement pits. Lab tests have demonstrated that ability without testing on the W88 warhead, which has

⁴ Shalikhshvili, General John M. Letter to the President and Report on the Findings and Recommendations

Concerning the Comprehensive Nuclear Test Ban Treaty. Washington: US State Department, 2001.

⁵ Ibid.

⁶ Lewis, Jeffrey. "After the Reliable Replacement Warhead: What's Next for the U.S. Nuclear Arsenal?" Arms Control Today (2008).

been certified for deployment. Third, recent peer-reviewed studies have removed the critical concern about the stability of the crystal structure of plutonium metal because of radioactive decay while it sits in the stockpile. It has been confirmed that plutonium pits have a lifetime of at least 85-100 years, which is much longer than what the designers originally thought (30-40 years), not to mention the 22,000 year lifespan of plutonium nuclei. Lastly, boost gas systems have seen major improvements in recent years, guaranteeing proper ignition of the secondary bomb from the primary. These technical advancements have only ensured that the US will have the capability to respond to any future need, regardless of testing.⁷

Flawed Logic

Finally, some suggest the U.S. might enjoy the same benefits by indefinitely continuing the U.S. moratorium on nuclear explosive testing in the hopes that others would do the same. This logic is flawed. Without an endpoint in sight, other countries will be less likely to sustain their testing moratoria, seeing them only as interim measures to an eventual goal. Further, other countries could renounce their moratoria more easily than the U.S., France or Britain could. Each state would define its own obligations, leaving no international verification regime such as that which exists in the CTBT. In addition, without U.S. support behind the CTBT, other nations may conclude that the non-proliferation effort is dying and question their own support for the NPT, creating a far less stable environment than that which exists today.

Senator Jon Kyl, R-Arizona, recently stated, “It has been nine years since the CTBT was the subject of any deliberation by the Senate, which ultimately concluded that its ratification was not in the nation’s interests. There were numerous objections that proved determinative then and remain true today.”⁸ This does not appear to be the case. Technological and political advancements, including the increased terrorist threat and increasing danger of nuclear weapons falling into the wrong hands, make it imperative that we allow the CTBTO to operate at 100 percent capacity, ensuring that no new nuclear weapons can be tested or ultimately used. The U.S. must take the lead once again on non-proliferation.

Conclusion

Shalikashvili stated that “Only the United States has both a compelling reason and the necessary resources to lead global non-proliferation efforts.”⁹ Most national security experts believe that U.S. ratification of the CTBT will prompt other hold-out states, including China, India, Iran, Israel and Pakistan, to ratify. The incentive should be clear.

The Test Ban Treaty will prevent new states from acquiring nuclear weapons and will prevent current nuclear weapons regimes from developing more dangerous weapons or engaging in a renewed arms race. The international verification regime of the CTBTO has made it tougher

⁷ Drell, Sidney. "The Future of the CTBT." Carnegie International Non-Proliferation Conference. Washington: Federal News Service, 2009.

⁸ Isaacs, John. "A Strategy for Achieving Senate Approval of the CTBT." Bulletin of the Atomic Scientists (2009): 2.

⁹ Shalikashvili, General John M. Letter to the President and Report on the Findings and Recommendations Concerning the Comprehensive Nuclear Test Ban Treaty. Washington: US State Department, 2001.

than ever for violators to expect any chance at secret nuclear testing. The 1996 DPRK nuclear test provides proof that the IMF possesses a sufficient ability to detect nuclear testing at only 50 percent capacity. This could be greatly enhanced with U.S. ratification.

Finally, reliance on the current moratorium is not sufficient. The international obligations and safeguards required are insufficient to ensure the continued protection of American citizens. As ACDA Director and Acting Under Secretary of State John Holum said in 1998, "we don't need tests; proliferators do".¹⁰ Today these words ring more true than ever.

¹⁰ Holum, John. "Testimony of ACDA Director and Acting Under Secretary of State John Holum." Senate Committee on Governmental Affairs; International Security, Proliferation & Federal Services Subcommittee. Washington: US State Department, 1998.