

ISSUE BRIEF

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CTBT: New Study Fails to Resolve Differences over Risks to U.S. Nuclear Arsenal

Baker Spring

On March 30, the National Academy of Sciences (NAS) released a report that is already starting to be described as having resolved all of the technical issues surrounding the Comprehensive Test Ban Treaty (CTBT).

Descriptions of the NAS study by CTBT advocates are certain to be overstatements. There are disagreements among technically knowledgeable people regarding these issues. It was just these kinds of disagreements that caused the Strategic Posture Commission to report in 2009 that it could not reach a consensus position regarding U.S. ratification of the CTBT. For example, the opponents of CTBT ratification on the commission stated that “maintaining a safe, reliable nuclear stockpile in the absence of testing entails real technical risks that cannot be eliminated by even the most

sophisticated science-based program because full validation of these programs is likely to require testing over time.”

Further, there is an array of narrower technical questions that surround the debate over the value of the CTBT. It is worth examining some of these questions, most of which are raised in the NAS study.

Unanswered Questions

- **Are explosive tests valuable in discovering safety and reliability problems with nuclear weapons already in the stockpile?** Some technical people are likely to assert that many of the nuclear weapons in the stockpile underwent post-deployment testing to resolve problems and that in many of these cases problems were discovered as a result of testing. For example, David H. Sharp of the Los Alamos National Laboratory wrote in 2008, “While any clear indications of potential performance issues that are revealed by non-destructive and destructive inspections, non-nuclear experiments or simulations should be taken seriously, one cannot be sure that warning

signs will be apparent, even for very serious problems.”

- **Can new military requirements be met with untested weapons?** Some technical experts will argue that maintaining a stockpile of militarily effective nuclear weapons—when the ways for meeting existing military requirements may change and altogether new military requirements may emerge—can be addressed only through modernizing the nuclear force. Supporters of the CTBT acknowledge that the treaty would impede meeting altogether new requirements. Most technical experts agree. For example, the Lawrence Livermore National Laboratory pointed out in 1987, “To avoid being caught by technological surprise, we must retain the capability to develop new systems in response to new developments by our adversaries. The new systems will often require nuclear testing.”
- **Would CTBT ratification make replacing aging delivery systems more difficult?** From this perspective, replacement missiles would have to be designed and

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The Heritage Foundation
214 Massachusetts Avenue, NE
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(202) 546-4400 | heritage.org

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built to the requirements of the warheads, as opposed to a more integrated fashion. “Even if an existing warhead is used in a new system,” the Livermore Lab said, “a nuclear test within current yield limits is extremely important, both to ensure that revised packaging or environmental conditions do not affect warhead function and to verify the adequacy of the new production lot.”

- **Would the CTBT exacerbate the problems with an aging nuclear stockpile?** Some technical experts will point out that when the United States was still conducting explosive tests and producing new weapons, it could replace weapons before serious aging concerns arose. Under the CTBT, the process of total replacement would stop. Thomas P. D’Agostino, director of the National Nuclear Security Administration, stated in 2008, “The metallurgical and chemical issues we face with our aging warheads continue to be a technical challenge for our best scientists and risk of catastrophic technical failure occurring as our warheads age cannot be ruled out absolutely.”
- **Would CTBT ratification constrain improvements in the safety of weapons in the stockpile?** Not all the weapons currently in the stockpile contain the full array of safety features. In this regard, D’Agostino said, “We deploy warheads today that have 1970-80’s safety, security and anti-terrorism features.” There are technical people who will point out that the inability to test would require more exertion to
- outfit U.S. nuclear warheads with improved safety and security features.
- **Would CTBT ratification exacerbate the problems stemming from decreasing diversity in the stockpile?** Overall, the U.S. has developed 100 types of nuclear warheads, but only 15 remain active. Some technical experts will point out that problems in just one type of weapon could result in the “standing down” of a relatively large portion of the warheads in the active stockpile.
- **Is a “zero-yield” ban on testing verifiable?** Some with technical knowledge in this area will say it is not verifiable. Kathleen Bailey and Tom Scheber wrote in a 2011 study for the National Institute for Public Policy, “The CTBT verification and monitoring system, and supplemental U.S. national technical means, cannot detect decoupled nuclear explosions of one-to-two kilotons, and perhaps several kilotons.”
- **Would CTBT ratification make it more difficult to certify warheads in the stockpile?** Some experts think it would make it more difficult. Bailey and Scheber state in this regard, “Warhead certification is increasingly less certain.”
- **Is explosive testing still the most efficient and economical way to maintain high confidence in the safety, security, reliability, and effectiveness of warheads in the stockpile?** In this case, it appears that the preponderance of the expert community believes that explosive testing

is more efficient and economical than an elaborate program of stockpile stewardship based on non-explosive testing. In other words, the drive to non-explosive testing is being driven by policy considerations more than financial considerations.

Nuclear Disarmament

The debate over whether the U.S. should ratify the CTBT is not exclusively over technical issues. Vital policy issues are also part of this debate. The most prominent of these is the link between U.S. ratification and the Obama Administration policy of nuclear disarmament.

The CTBT itself is not silent on this issue. Paragraph 5 of the preamble states:

Recognizing that the cessation of all nuclear weapon test explosions and all other nuclear explosions, by constraining the development and qualitative improvement of nuclear weapons and ending the development of advanced new types of nuclear weapons, constitutes an effective measure of nuclear disarmament and non-proliferation in all its aspects.

Clearer and more concise language advocating nuclear disarmament by atrophy is hard to imagine. Indeed, the State Department’s article-by-article analysis accompanying the treaty states nothing that refutes the notion that a comprehensive ban on nuclear testing would eventually lead to nuclear disarmament.

At the policy level, it is impossible to reconcile this language in the preamble with preserving a secure, safe, reliable, and effective nuclear

arsenal. A stockpile stewardship program that is designed to *prevent* atrophy in the nuclear arsenal is clearly incompatible with the treaty's stated intent to *produce* nuclear weapons atrophy. Put a different way, even if the U.S. is capable of maintaining a secure, safe, reliable, and effective nuclear arsenal absent explosive nuclear testing, it is the stated intent of the treaty to prohibit a stockpile stewardship program that includes the necessary capabilities. Indeed, the NAS study acknowledges that a variety of steps are necessary to prevent further atrophy of nuclear weapons infrastructure and the stockpile.

Accordingly, most proponents of U.S. ratification of the CTBT, both here and abroad, will likely object to every specific step in the stockpile stewardship program that serves to sustain the U.S. nuclear stockpile

and arsenal, including those recommended by the NAS study, following U.S. ratification of the CTBT. They are certain to point to Paragraph 5 of the preamble in these objections, and by the terms of the language in Paragraph 5, the objections will be unassailable.

Fool Me Once ...

These treaty proponents are likely to make all sorts of commitments to stockpile stewardship in the course of any future ratification debate here in the U.S., but this is all but certain to be a bait-and-switch. This is exactly the path followed by the Obama Administration in the commitments it made regarding modernization of the U.S. nuclear weapons infrastructure during the ratification debate over New START. Those commitments did not even last a year.

President Obama's effective renunciation of his certification to support rapid progress for the Chemistry and Metallurgy Research Replacement facility at Los Alamos National Laboratory, which is an essential part of the stockpile stewardship program, is Exhibit A of how commitments to nuclear infrastructure modernization made in the course of the arms control process are ultimately abandoned by those seeking "nuclear zero."

—*Baker Spring* is F. M. Kirby
Research Fellow in National Security
Policy in the Douglas and Sarah
Allison Center for Foreign Policy
Studies, a division of the Kathryn and
Shelby Cullom Davis Institute for
International Studies, at The Heritage
Foundation.