

Test Ban Treaty, Take Two

Banning Tests Won't Stop Nuclear Weapons Development

To judge by the hopes of its supporters, the Comprehensive Test Ban Treaty (CTBT) is indispensable to the longstanding goal of nuclear disarmament: It would preclude the development of new nuclear weapons and set existing stockpiles on the road to aging and unreliable obsolescence. To its critics, however, the

treaty's flaws more than match these claimed benefits. In their view, the CTBT is a mischievous plot to disarm the most sophisticated and scrupulous nuclear-armed state—namely, the United States—while leaving reliable weapons in the hands of those with less technically advanced designs and giving cheating opportunities to those

who lack our reluctance to break the treaties we sign.

Both proponents and critics, however, miss the true implications of the test ban treaty. And if indeed the U.S. Senate will, as President Obama has promised, be given a chance to reconsider its 1999 rejection of the treaty, a far more nuanced debate—and one that revises fundamental assumptions about the supposedly unbreakable link between testing and development—must take place.

When the Senate considered the CTBT a decade ago, there were two main arguments publicly proffered for its rejection. First, it was feared to be unverifiable. Countries with a more jaundiced view of the rule of law and fewer internal checks and balances than the United States might be able to conduct testing secretly, continuing their nuclear weapons development while we—an open, legalistic, and democratic society congenitally unable to keep a secret—scrupulously observed the ban. Second, it was feared that our own arsenal of highly sophisticated warheads—designed in an era when it was assumed we could conduct explosive tests in order to be sure our weapons would still work correctly even as materials and complex precision components aged—might become less reliable over the years. Consequently, CTBT skeptics worried that a test ban would gradually bring about *de facto* self-disarmament, whether or not this was in our interest at the time, and without any public debate of, or accountability for, such a

decision. Worse still, it was feared, such creeping American self-disarmament would be to some extent unilateral, for nuclear weapons possessors with less sophisticated, fine-performance-margin designs would find their weapons' performance degraded less rapidly than that of U.S. warheads.

In fact, there may have been another, unstated reason for the apprehension about adopting the CTBT: Russia. The May 2009 report of the congressionally-appointed Strategic Posture Review Commission (SPRC) suggests that, notwithstanding its own moratorium on nuclear testing, Russia has “apparently” been conducting secret low-yield tests as part of the Kremlin’s ongoing warhead development program and overall modernization of both strategic and shorter-range nuclear forces. This finding is surprising only in the sense that it has now been publicly acknowledged—somehow surviving the difficult declassification review invariably attendant to “sanitizing” reports drafted by official commissions given access to national security secrets. Substantively, it is quite consonant with comments made by Russian officials for some years. Russian Defense Minister Sergei Ivanov, for instance, bragged in 2005 that “new types of nuclear weapons are... emerging in Russia.” The SPRC report indicates that Ivanov’s comment was not mere braggadocio: the U.S. intelligence community apparently has information substantiating it.

If this is true, and if such activity has been known or suspected for

some time, then the 1999 Senate rejection of the CTBT might also have reflected concerns about the prospect of Russian CTBT violations undetected by the treaty's monitoring system. This was yet another way that CTBT skeptics may have feared the treaty would disproportionately disadvantage America: our scrupulous observance of the CTBT's zero-yield standard—its first article flatly prohibits “any” nuclear explosion—would limit American weapons development capabilities, while our principal strategic nuclear rival would continue to reap whatever benefits could be had from secretive testing at low-yield levels. (Interestingly, this concern may no longer be limited to the potential impact of Russian warhead development. The SPRC report also describes China as “possibly” engaging in low-yield testing. Perhaps the looming CTBT debate in the Senate will now also focus upon the implications of China's ongoing nuclear modernization efforts and strategic buildup.)

At any rate, even though the Senate rejected the CTBT a decade ago, the United States continues to observe a test moratorium—but only as a matter of *policy*, which we could reverse if we became concerned about warhead reliability or if some new strategic threat emerged. If the Senate is now to reconsider the CTBT responsibly—and not simply to change course reflexively, out of some heady feeling of arms-control momentum in this era of airy promises—it will need to be confident that all such concerns have now been

allayed conclusively enough that a mandatory, permanent test ban is now in the interest of the United States.

Let us assume for a moment that the CTBT's supporters are right that a ban *is* sufficiently verifiable for us to be confident that countries such as Russia and China would indeed not test when subjected to its strictures. Even under this optimistic assumption, what impact would the treaty really have on nuclear weapons development? A lesser one, most likely, than either its supporters or its critics suppose.

To begin with, it is worth remembering that the United States may well end up facing more long-term reliability problems with its nuclear arsenal than many current weapons possessors. Today, domestic debates about warhead reliability under the CTBT occur against the backdrop of America's development during the Cold War of very finely tuned warhead designs that sought to maximize performance in tiny, multiply-deliverable packages. Countries that built their present arsenals without facing the anticipated all-out warfighting requirements of the Cold War may not have felt any need for such elegant and temperamental designs even if they had possessed the capability to build them in the first place (which most did not). Accordingly, in a test-ban environment, long-term reliability questions may conceivably cause more problems for the U.S. arsenal than for those of many or most other weapons possessors. (It is out of fear of such problems, for instance, that the United

States has been spending so much money on the “Stockpile Stewardship Program,” which is designed to reduce or perhaps eventually replace the need for testing in order to ensure that U.S. designs perform as intended.)

But that is not the end of the story—for the United States or any other reasonably sophisticated weapons possessors—because explosive testing is not absolutely necessary for nuclear weapons development. Particularly for existing nuclear-weapons possessors with a history of pre-moratorium testing and access to advanced computing capabilities, it might be possible to continue new weapons development even under the CTBT, especially if one is willing to have “lower standards” for design complexity than American planners felt necessary during the Cold War. (Indeed, some in the disarmament community distrust the U.S. Stockpile Stewardship effort for precisely this reason, fearing that it might permit America to circumvent a test ban.) Even newcomers to the business might be able to do reasonably effective development work without testing if they were content to develop weapons of only modest sophistication. If you are willing to use a bit more fissile material per weapon and feel no need to explore the cutting edge of warhead efficiency or other performance metrics, you can be reasonably certain a design will work without testing it.

It is often forgotten that the first nuclear weapon ever used in war—a simple “gun-type” design using only uranium for its fissile material—was

not considered to need testing even in an era when scientists designed weapons with slide rules. Its first explosion was the one over Hiroshima. (The “Trinity” test that preceded Hiroshima was of a different design.) A country could easily develop a gun-type arsenal that needed no testing; in fact, South Africa did just that, though it later dismantled its arsenal. (Pretoria did plan an underground test on at least one occasion, but it likely had objectives that were more political than technical: it may have been intended to signal Pretoria’s nuclear prowess to outside powers rather than to ensure design integrity.) At any rate, nobody seems to think South Africa’s uranium-filled gun-type designs would have had any trouble performing as intended.

It bears mention, moreover, that a gun-type design might be in some respects perfectly suited to at least one new mission considered in recent years for nuclear weapons in the post-Cold War era: attacking deeply buried underground facilities. The intrinsic ruggedness of a gun-type design and its relatively low yield arguably make it a better candidate for “bunker buster” warheads than plutonium-based implosion designs. Building such a device would probably be easy, and it would surely function quite reliably without testing.

Nor should we forget that if we already know that a particular design works, there is little need to test it, at least for quite a few years. The “Reliable Replacement Warhead” proposed in recent years (and defunded

by Congress in 2008 before being officially abandoned by President Obama in 2009) would not have required testing; it was adapted from an older design that had been tested long ago. Renegade Pakistani nuclear weapons scientist A. Q. Khan, moreover, provided *pre-tested* Chinese designs to Libya—the so-called CHIC-4 design, which some experts wryly describe as Beijing’s “export model”—and perhaps to other clients of his smuggling network. In short, re-using designs that have already been tested, an approach available not only to existing possessors but evidently also to proliferators, is another way to circumvent a test ban.

Since testing is not a prerequisite for weapons development, we should not assume that even the most verifiable CTBT regime would simply stop the development of nuclear weapons. A global test ban could simply push competition toward design approaches that do not require testing. This would not necessarily be a worse outcome than imposing *no* restrictions on test-

ing, but CTBT supporters should not oversell the treaty by pretending that work on nuclear weapons would grind to a halt around the world upon the treaty’s entry into force.

As the saying goes, the devil is in the details. The key to evaluating the real merits of a test ban regime would be to ask whose weapons development plans it would most inhibit, which competitive behaviors would be favored in the wake of a prohibition, and what the impact of these developments would be upon our national security and the global security environment. Answering such questions will require much more careful analysis than has been in evidence so far as the treaty’s second chance in the Senate draws near.

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