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NATIONAL SECURITY AND THE
COMPREHENSIVE TEST BAN TREATY

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National Security and the *
Comprehensive Test Ban Treaty

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National Security and the Comprehensive Test Ban Treaty

For nearly three years now, the U.S., U.K., and U.S.S.R. have been working on the draft of a treaty that would ban all nuclear explosions (both peaceful applications and weapon tests) and institute verification and monitoring provisions to ensure compliance with the treaty. The box on the next page summarizes the status of the draft treaty. This article addresses the question: Is a CTBT really in the interest of U.S. national security?

Treaty proponents give the following arguments in favor of a CTBT:

- . It has been stated as a foreign policy goal by at least six U.S. administrations.
- . It would reduce the risks of nuclear war.
- . It would help limit the proliferation of nuclear weapons.
- . It would provide valuable verification precedents for future arms-control agreements.

Treaty opponents make these arguments against a CTBT:

- . It would lead to deterioration of our nuclear deterrent force.
- . It would prevent the U.S. from deploying new nuclear weapon systems that would be safer, less vulnerable, or otherwise more desirable than existing systems.
- . It cannot be adequately verified.
- . It would impact the U.S. and the U.S.S.R. asymmetrically, probably to the advantage of the Soviets.

These issues are explored below in greater detail.

ARGUMENTS FOR A TEST BAN

A goal of the U.S. foreign policy would be achieved. For more than twenty years, the U.S. has publicly called for an adequately verified CTBT in statements made at the U.N. General Assembly and the Conference of the Committee on Disarmament in Geneva. Talk was translated into action

Status of the Comprehensive Test Ban Treaty (CTBT)

Trilateral treaty negotiations between the United States, the Soviet Union, and the United Kingdom have taken place in Geneva since June 1977. The intent is that the treaty would become multilateral after ratification by twenty states including the three negotiators.

All nuclear weapon tests would be banned by the treaty, and all peaceful nuclear explosions would be banned by an accompanying protocol. The parties are considering formulations relating to the duration of the treaty.

The multilateral treaty would be verified by:

- . National technical means.
- . International seismic-data exchange.
- . Voluntary on-site inspections, procedures for which would be developed on an ad hoc basis.

The U.S., U.K., and U.S.S.R. would have an additional verification agreement which would include:

- . Voluntary on-site inspections with agreed-on equipment, rights, and functions for the inspection party. "Voluntary" means that a requested inspection could be turned down by the country in which the suspect event occurred.

- . National seismic stations, inside each of their countries, whose number, locations, and technical characteristics would be agreed on.

Although a good deal of the text of the draft treaty has been agreed on, important aspects of the treaty and the separate verification agreement remain unresolved.

during early negotiations on a CTBT when the U.S. and the Soviet Union agreed to a moratorium on testing that lasted from 1958 until the Soviets resumed testing in 1961.

In 1963 the U.S., the U.S.S.R., and other countries ratified the Limited Test Ban Treaty, which prohibits testing except underground. This treaty is still in effect.

The U.S. and the U.S.S.R. signed the Threshold Test Ban Treaty (TTBT) in 1974 and the Peaceful Nuclear Explosions Treaty (PNET) in 1976, which limit weapon tests and peaceful explosions to 150 kt. Although neither of these treaties has been ratified by the U.S. Congress, the 150-kt testing limit is being officially observed by both the U.S. and the U.S.S.R. (The U.S. monitors the TTBT by means of teleseismic stations located outside the Soviet Union. Yields measured in this way are believed accurate to within a factor of 2. A few recent Soviet tests may have exceeded the 150-kt limit, but this cannot be verified because of the large measurement error.)

Risks of nuclear war would be reduced. Proponents of a CTBT believe that a cessation of testing would reduce or stop the introduction of new nuclear weapons into the stockpile and make their use less likely because their reliability would degrade with time, making them less effective for first-strike use or against hard targets. In addition, proponents believe that a CTBT would help create a climate that is gradually less dependent on nuclear weapons.

Those opposed to a CTBT insist that as long as nuclear weapons are considered indispensable to our nation's security, they must be kept in a usable and reliable state. A more likely route to reducing the possibility of nuclear war would be through the SALT process and improvements in international relations to reduce the need for a nuclear deterrent force, not through a CTBT. However, the current debate on the merits of SALT II shows that there is not even a clear domestic consensus that this more direct route to nuclear disarmament will reduce the risks.

Internationally, some nonnuclear weapon states have taken the view that the CTBT is more responsive than SALT to the nuclear weapon states' obligations, under the 1970 Non-proliferation Treaty (NPT), "...to pursue negotiations in good faith on effective measures relating to the cessation of the nuclear arms race at an early date."

Although everyone agrees that eliminating the possibility of nuclear war is necessary, there is no agreement as to how to achieve this goal. One could argue that modernizing nuclear weapons to reduce collateral effects and improve command and control would make their use more credible, which in turn would reduce the probability of their ever being used.

Proliferation of nuclear weapons would be limited. Three arguments support this claim. First, the nuclear weapon states must satisfy their obligation under the NPT in order to balance the obligation assumed by nonnuclear states in accepting permanent nonnuclear status. Thus, a CTBT would strengthen the NPT. (This argument ignores another NPT obligation for nuclear weapon states to share peaceful nuclear explosive benefits with nonnuclear members.)

Second, the elimination of testing would improve the climate in favor of nonnuclear status. That is, testing reminds the nonnuclear states of their "second-class" status, while the elimination of testing would remove this reminder. A variant of this argument is that a state would have to consider the domestic implications and international opprobrium it might suffer if it were to test when other countries had ceased doing so.

Third, some countries unwilling to sign the NPT might be willing to sign the CTBT, thus effectively precluding the nuclear option for them.

Although these arguments have some validity, the situation must be analyzed to see if a CTBT would result in any practical proliferation constraints. It seems more likely that nations will choose whether or not to go nuclear on the basis of their capabilities, their security needs,

and their desire for the political stature that nuclear weapons might give them.

A CTBT would have no effect on a non-signatory state, whereas current U.S. policies and actions do affect the capabilities of nonnuclear states to acquire nuclear weapons. These policies include IAEA safeguarding of all nuclear exports to nonnuclear states, strict constraints or prohibitions on exports of sensitive nuclear technology, and efforts to increase the physical security of nuclear materials in storage or transit.

A CTBT would not necessarily change a country's perception of its need for nuclear weapons. For example, a nuclear threat could arise from some country that already has nuclear weapons or from a country that obtained a crude nuclear capability without ever making a test. There is also the possibility that a country might believe it needs nuclear weapons to counter a nonnuclear threat posed by its adversaries.

Although a CTBT might not increase a country's confidence in its own security, that confidence could be increased by other actions the U.S. can take. Security guarantees and assistance treaties can help satisfy national security needs so that nuclear weapons are not perceived to be necessary. The security guarantees we have made to our allies in Europe have helped prevent proliferation by some of the industrialized countries most capable of producing nuclear weapons.

What will a CTBT do to a country's perception of the political prestige to be earned by becoming a nuclear power? This question is hard to analyze. There could well be a political effect inhibiting a democracy from proliferating while there might be no such effect on a totalitarian government. The inhibiting effect would also depend on whether all countries had ceased testing. If China, France, or some other country continues testing while the U.S., U.K., and U.S.S.R. forego it, any political inhibitions against proliferation would be weakened.

In assessing the effect of a CTBT on proliferation, one must consider

the probable response of each potential proliferator. A list of possible proliferators includes Israel, Libya, Iraq, Pakistan, South Korea, Taiwan, Brazil, Argentina, and South Africa. It is arguable that these countries' potential plans for proliferation would be influenced by a CTBT. Other nonproliferation actions, as described above, will more plausibly affect a country's decision and capabilities to proliferate.

Precedents would be set for future treaty verification provisions.

Provisions for verifying the CTBT are expected to include on-site inspections and the installation of seismometers within the country being monitored. The on-site inspection provisions of the CTBT allow the inspector to choose the time and place of inspection, while the PNET provides for inspections only when a country gives notice that it intends to carry out certain inspectable actions. However, the CTBT does not provide an absolute right to inspect: the country to be inspected can refuse to allow it.

Use of the inspecting nation's seismometers in the country being monitored is clearly a new arms-control treaty provision. Installation of such internal monitoring equipment could be a valuable precedent for future treaties.

ARGUMENTS AGAINST A TEST BAN

Our nuclear deterrent force would deteriorate. The Department of Energy certifies the performance of nuclear weapons in the U.S. stockpile, in effect guaranteeing they will function properly under specified stockpile and delivery conditions. This certification process involves knowledgeable people, careful nonnuclear examination, a large body of nuclear tests done primarily for reasons other than certification, and occasional nuclear tests dedicated to certification and to understanding or fixing an observed problem. Without nuclear testing, the certification process could not be completed. Any observed problem would have to be fixed by a rebuild or a replacement without the assurance of confirmatory testing.

Proponents of a CTBT believe that stockpile problems occur only infrequently and that, when they do occur, satisfactory rebuilt and replacement weapons could be obtained without nuclear testing. They further claim that some uncertainty in stockpile performance is good since it would inhibit first-strike use. Opponents of a CTBT believe that the nuclear weapon stockpile will deteriorate under a CTBT -- as elements of the stockpile have deteriorated without a CTBT -- but that problems might not be recognized or might be hard to fix without tests.

Certainly the nuclear weapon stockpile is not static. Changes have been made, are being made, and will be made. We expect that all nuclear weapons will have to be replaced or remanufactured within a few decades of their original manufacture. More and more of our stockpiled weapons are approaching retirement age. No amount of good intentions or executive decisions will ensure the availability of exact replacement materials or prevent subtle changes in manufacturing processes. Moreover, budgetary considerations and probable new safety or systems requirements will provide an irresistible motivation for future changes in our weapons or their replacements, even under a CTBT.

Recognizing stockpile problems, determining their effects on weapon performance, and making reliable fixes are responsibilities that can be entrusted only to experienced scientists and engineers. Unfortunately, such personnel will not be available long under a CTBT. Some will leave weapons work for other fields or will leave because of the lack of experimental confirmation necessary for scientific professionalism. Those who stay will lose their expertise because they do not have to face the hard reality of experimental validation.

During the 1958-1961 test moratorium, a number of new weapons were put into stockpile for new systems such as Minuteman and Polaris. Later, design errors in these new weapons were discovered, some by nuclear testing and some by nonnuclear testing. It is important to note that nuclear tests were needed to correct some of these errors.

That nuclear testing of stockpile weapons has only infrequently pointed out problems in the stockpile does not negate its importance in maintaining stockpile reliability. Nuclear testing of non-stockpile weapons has helped us recognize and fix stockpile problems. We need the whole body of nuclear test data to provide our scientists and engineers with the expertise to recognize, prevent, and fix stockpile problems and to assert with confidence that the current stockpile is highly reliable.

We could not deploy new weapon systems. Proponents of a CTBT believe that the introduction of new weapon systems drives the arms race and makes the use of nuclear weapons more probable. They feel that the U.S. nuclear stockpile is sufficient to meet our national security needs.

Opponents of a CTBT believe new weapons are necessary and desirable to meet changing and often more stringent military and political requirements. Although some minor changes in the stockpile could be made under a CTBT, major changes would clearly be imprudent. We could not deploy new warheads that have better safety, security, or command and control features, nor could we deploy new weapons with enhanced outputs or reduced collateral effects. Neither could we efficiently fit warheads into new delivery systems, nor harden them against newly discovered countermeasures.

Changes in the safety requirements for plutonium dispersal are likely to occur. Consider what might result if a nuclear accident, like those that occurred at Palomares and Thule, happened in today's climate of political and environmental concern. At a minimum, there would be a demand for enhanced safety. We are now designing warheads with improved safety features, but a CTBT within the next few years would preclude our deploying them in any but a few systems. Similarly, weapons that are less vulnerable to terrorist attack could suddenly become a necessity. A CTBT would eliminate the development of warhead design features to thwart terrorist attacks, and we would have to focus instead on modified deployment procedures. It is likely that such new deployment limitations would detract from our capability to make prompt use of weapons and would

thus reduce their deterrent effect.

Another major concern is that future SALT negotiations may lead to situations where new nuclear systems will be required in response to emerging vulnerabilities. The proper goal of national security and arms control should be to provide stability. Vulnerable forces could lead to instabilities. A case in point is our Minuteman force, which is expected to become vulnerable to Soviet attack in the early 1980s. Leaving an element of our strategic triad vulnerable to attack makes a first strike by either side more attractive, reducing stability. Fixes to the Minuteman problem include deploying a site defense ABM along with the MX mobile missile system. Although we could provide an ABM warhead without further testing, it would not have the enhanced safety features and low special nuclear material usage we consider necessary. Under an early CTBT, our options would be limited. Thus, a CTBT could prevent the development of new weapons whose deployment might be both dictated by national security needs and required by responsible arms control.

A CTBT could not be adequately verified. Even with the verification procedures being discussed in the current negotiations, it will be difficult or impossible to detect and identify nuclear explosions if they are of sufficiently low yield or carefully carried out using other evasive means. For instance, there is essentially no chance of detection and identification of sub-kiloton tests carried out in a medium which is less seismically coupling than granite and at a sufficient depth to avoid a subsidence crater forming on the surface. Such areas do exist in the Soviet Union, though their extent is debatable. Evasion possibilities also exist for tests up to tens of kilotons using large cavities to lessen the seismic signal or by exploding the test weapon in the seismic noise of a natural earthquake. In addition, tests of megaton size could be carried out in outer space with little chance of detection and at non-prohibitive cost. Of course, one would not expect a country to undertake lightly the evasion of a binding international agreement. As discussed below, however, even low yield evasive testing can have strategic significance.

New asymmetries may be introduced, favoring the Soviets. A number of significant differences exist between the U.S. and U.S.S.R. which could, under a CTBT, lead to the following asymmetries:

- . The U.S.S.R. has greater missile throw-weight capability than the U.S. Thus it has greater deployment flexibility and a wider choice of replacement options if problems occur.
- . We cannot assume that stockpile degradation will be symmetrical in respect to U.S. and Soviet weapons. We do not know how Soviet weapons are made, what their remanufacturing problems are, or by what means the Soviets can maintain the skills of their weapon scientists.
- . Tests of a few kilotons yield, or even less, could be crucial to assessing or fixing a deteriorating strategic warhead, developing new tactical warheads, new ABMs, or maintaining technical competence. Such tests could be carried out evasively with a low chance of detection and identification by treaty-monitoring procedures. Considering societal and geographical differences, the Soviets would have a considerably greater opportunity to evade detection in this way than we would have.

Proponents of a CTBT agree that asymmetries might exist, but they believe that such asymmetries will not lead to significant strategic advantage. They believe that the missile throw-weight advantage of the Soviets is countered by our greater missile accuracy (although this difference is rapidly evaporating) and technological know-how, that the Soviets' ability to retain scientific and engineering competence under a CTBT is no better than ours, and that the chance of being caught makes the risk of carrying out evasive tests too large for the Soviet government to accept.

CONCLUSIONS

There are arguments both for and against a CTBT. But for those whose approach to national security can be expressed as "peace through preparedness," the arguments against a CTBT appear persuasive.

After current negotiations on the CTBT had begun, some of the negative national security implications became clearer. As a result, the United States has reconsidered its potential adverse effects. The U.S. is now proposing a treaty of limited duration, so that we could resume testing if stockpile problems occur. Of course, this does not solve the problems of stockpile deterioration, which might go undetected without testing, nor does it address the probable reluctance of the U.S. to resume testing, after having once stopped.

Experimental programs for civil power applications, such as laser fusion, would probably be unaffected by the treaty. If so, we might be able to perform interesting pellet-implosion experiments that would help us keep our trained personnel, refine computer codes, and develop better experimental technology. Nevertheless, such small fusion experiments would be of limited use to weapon designers and could not be used to develop nuclear weapons. While these small-scale experiments would undoubtedly aid in the retention of scientific and engineering competence, their effect would not be large and the stockpile maintenance problem would not be mitigated, except indirectly.

A program is being formulated to maintain, to the extent possible, our nuclear weapons capability under a CTBT. This program would be called Safeguards, in analogy to the high-altitude and atmospheric test-readiness program we instigated after the ratification of the LTBT. Certainly such special programs and enhanced funding can lessen the impact of a CTBT on personnel, aid in the detection of stockpile problems, and help keep us prepared to resume testing at some later time. Overall, however, Safeguards could only slow the inexorable decline of nuclear weapons capability that would result under a CTBT.