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Nuclear Weapons: Comprehensive Test Ban Treaty

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Nuclear Weapons: Comprehensive Test Ban Treaty

SUMMARY

A comprehensive test ban treaty, or CTBT, is the oldest item on the nuclear arms control agenda. Three treaties currently limit testing to underground only, with a maximum force equal to 150,000 tons of TNT. According to the Natural Resources Defense Council, the United States conducted 1,030 nuclear tests, the Soviet Union 715, the United Kingdom 45, France 210, and China 45. Since 1997, the United States has held 13 "subcritical experiments" at the Nevada Test Site to study the behavior of plutonium under pressures generated by explosives. The most recent was held December 14, 2000. Russia has reportedly conducted several such tests since 1998, including several in fall 2000. It claims it has not done other nuclear tests since 1991, though some suspect it may have conducted a low-yield nuclear test in August 1997 and September 1999, and others at unspecified times in the last five years. The last U.S. test was held in 1992; the last U.K. test, in 1991. In May 1998, India and Pakistan each announced several nuclear tests and declared themselves nuclear weapons states. Each declared a moratorium on further tests, but separately stated, in the summer of 2000, that the time was not right to sign the CTBT.

The Conference on Disarmament held CTBT negotiations from 1994 to 1996. India blocked the treaty there, but in September 1996 the U.N. General Assembly voted 158-3 to adopt it. President Clinton and others signed it later that month. As of February 23, 2001, 160 states had signed it and 71, including Russia, had ratified. The President linked his position on testing to "strengthen[ing] our commitments in the areas of intelligence, monitoring and verification, stockpile stewardship, maintenance of our nuclear laboratories, and test readiness." He would be prepared to withdraw from the treaty to conduct testing "if the safety and reliability of our nuclear deterrent could no longer be certified."

In September 1997, President Clinton transmitted the CTBT to the Senate. In 1998 and 1999, he asked the Senate to approve it, but Senator Helms opposed bringing it up while the Clinton Administration withheld certain other agreements. On September 30, 1999, Senator Lott offered a unanimous-consent request to consider and vote on the treaty. The final agreement envisioned a vote October 12 or 13. On October 11, with the treaty appearing far short of the votes needed for ratification, President Clinton wrote to request that a vote be delayed. While many Senators on both sides favored that approach, the vote was held on October 13, rejecting the treaty – 48 for, 51 against, and 1 present.

In January 2000, Gen. John Shalikashvili (USA, ret.), former Chairman of the Joint Chiefs of Staff, was named to lead the Administration's effort for ratifying the treaty. He issued a report favoring the treaty in January 2001. Later that month, Gen. Colin Powell, then the nominee for Secretary of State, said at his confirmation hearing that the Administration would not ask for CTBT ratification "in this next session" of Congress.

Congress continues to consider the Stockpile Stewardship Program, the Clinton Administration's plan for maintaining U.S. nuclear weapons under a CTBT.

MOST RECENT DEVELOPMENTS

On March 4, the New York Times *reported a bitter division within the U.S. intelligence community on whether Russia has been conducting clandestine tests of very low yield for the past several years. On February 23, Ukraine and the Philippines ratified the CTBT.*

BACKGROUND AND ANALYSIS

The Senate and the CTBT

On September 22, 1997, President Clinton submitted the CTBT to the Senate. On January 21, 1998, Senator Jesse Helms wrote to the President, "the CTBT is very low on the [Senate Foreign Relations] Committee's list of priorities." President Clinton, in his State of the Union address of January 27, asked the Senate to approve the treaty in 1998. The Indian and Pakistani tests clouded ratification prospects, shattering the international "norm" against testing. Senator Trent Lott said on May 29 that the tests showed "the irrelevance of U.S. action on the [CTBT] ... American policy should shift from a misguided focus on an unverifiable and ineffective treaty that precludes maintaining the safety and reliability of the U.S. nuclear deterrent to a sustained effort to build international support for de-escalating the nuclear arms race in Asia." Senator Helms said, "India's actions demonstrate that the Comprehensive Test Ban Treaty, from a non-proliferation standpoint, is scarcely more than a sham. ... I, for one, cannot and will not agree to any treaty which would legitimize de facto India's possession of these weapons, just so long as they are not caught further testing them."

President Clinton and Senator Helms reiterated their 1998 CTBT positions in January 1999. The President, in his State of the Union address, asked the Senate to approve the treaty in 1999. Senator Helms wanted the Administration to submit ABM Treaty modifications and the 1997 Kyoto environmental treaty to the Senate, both of which might be rejected, as part of an arrangement to consider the CTBT. A letter by all 45 Democratic Senators to Senator Helms in July 1999, asking for the Senate Foreign Relations Committee to hold hearings on the treaty, met a negative response. Of concern for CTBT supporters was that only States that have ratified the treaty may participate in the conference on expediting entry into force, scheduled for October 1999; others would have observer status. On September 8, Senator Dorgan pledged to "plant myself on the [Senate] floor and object" until the treaty is brought to the floor for debate and a vote.

On September 30, 1999, Senator Lott offered a unanimous-consent request to discharge the Senate Foreign Relations Committee from considering the treaty, to have ten hours of debate beginning October 6, and then vote. An agreement was reached to begin up to ten hours of general debate on October 8, and have two amendments (each of which could contain multiple provisions), one by each side, with up to four hours of debate on each. The vote on the treaty would be held October 12 or 13. The Senate Armed Services Committee held hearings October 5-7; the Foreign Relations Committee held a hearing October 7.

It quickly developed that the treaty was far short of the votes for approval, leading many on both sides to seek to delay a vote. As the vote was scheduled by unanimous consent, and several Senators opposed delaying the vote, the focus of CTBT activity has been whether a way could be found either to obtain unanimity or to delay a vote short of unanimous consent. Republicans demanded as conditions for delaying a vote that, as Senator Helms said on October 6, "[The President] must request in writing two things: one, that the treaty be withdrawn; and two, that it not be considered by the Senate for the duration of his presidency." President Clinton said on October 8, "I hope that the Senate will reach an agreement to delay the vote" but refused to meet the two conditions. On October 11, he wrote to ask for a delay, but would not rule out asking for the treaty's consideration later. The next day, however, Senator Daschle reportedly was willing to pledge not to seek a vote on the CTBT again in the 106th Congress, barring "extraordinary circumstances," to try to meet Republican demands. On October 12, Republicans, in caucus, agreed to oppose a possible Democratic motion to block consideration of the treaty by pulling it from the executive calendar, which would require a simple majority. On October 13, 62 Senators wrote to Senators Lott and Daschle to urge them to defer the vote. It was not possible, however, to reach unanimous consent for that course of action, and a motion to move to the executive calendar was approved, 55-45, on a party line vote. (Rejecting that motion would have blocked consideration of the treaty.) The vote was held October 13, rejecting the treaty, 48 for, 51 against, and 1 present.

The CTBT debate drew in many participants. On October 12, China urged the United States to ratify the treaty. On October 8, the Senate concluded its first day of debate on the treaty. Also on that day, the conference on accelerating the CTBT's entry into force concluded a three-day meeting with a statement urging "states that have signed but not yet ratified the treaty, in particular those whose ratification is needed for its entry into force, to accelerate their ratification process." The conference, however, decided to drop as counterproductive the idea of setting a deadline for ratification. The leaders of Britain, France, and Germany wrote in the *New York Times* on October 8, "Failure to ratify the Comprehensive Test Ban Treaty will be a failure in our struggle against proliferation." The previous day, the Senate Armed Services Committee held the last of three days of hearings. Of note, the directors of the three weapons labs expressed some uncertainty about the future of the stockpile without testing. On October 6, six former Secretaries of Defense urged the Senate to reject the treaty, while 32 Nobel laureates in physics urged its approval.

History

A ban on nuclear testing is the oldest item on the arms control agenda. Efforts to curtail tests have been made since the 1940s. In the 1950s, the United States and Soviet Union conducted hundreds of hydrogen bomb tests. The radioactive fallout from these tests spurred worldwide protest. These pressures, plus a desire to reduce U.S.-Soviet confrontation after the Cuban Missile Crisis of 1962, led to the Limited Test Ban Treaty of 1963, which banned nuclear explosions in the atmosphere, in space, and under water. The Threshold Test Ban Treaty, signed in 1974, banned underground nuclear weapons tests having an explosive force of more than 150 kilotons, the equivalent of 150,000 tons of TNT, ten times the force of the Hiroshima bomb. The Peaceful Nuclear Explosions Treaty, signed in 1976, extended the 150-kiloton limit to nuclear explosions for peaceful purposes. President Carter did not pursue ratification of these treaties, preferring to negotiate a comprehensive test ban treaty, or CTBT, a ban on all nuclear explosions. When agreement seemed near, however, he pulled

back, bowing to arguments that continued testing was needed to maintain reliability of existing weapons, to develop new weapons, and for other purposes. President Reagan raised concerns about U.S. ability to monitor the two unratified treaties and late in his term started negotiations on new verification protocols. These two treaties were ratified in 1990.

With the end of the Cold War, pressures for a CTBT grew. The need for improved warheads dropped, as evidenced by the Bush Administration's policy of July 1992 to conduct no further tests to develop new warheads for five years. The U.S.S.R. and France began nuclear test moratoria in October 1990 and April 1992, respectively. In early 1992, many in Congress favored a one-year moratorium on testing. The effort led to the Hatfield amendment to the FY1993 Energy and Water Development Appropriations Bill, which banned testing before July 1, 1993, set conditions on a resumption of testing, and banned testing after September 1996 unless another nation tested. President Bush signed the bill into law (P.L. 102-377) October 2, 1992.

National Positions on Testing and the CTBT

United States: Under the Hatfield amendment, President Clinton had to decide whether or not to ask Congress to resume testing. On July 3, 1993, he announced his decision. He noted that "(a) test ban can strengthen our efforts worldwide to halt the spread of nuclear technology in weapons," and that "the nuclear weapons in the United States arsenal are safe and reliable." While testing offered advantages for safety, reliability, and test ban readiness, "the price we would pay in conducting those tests now by undercutting our own nonproliferation goals and ensuring that other nations would resume testing outweighs these benefits." Therefore, he (1) extended the moratorium at least through September 1994; (2) called on other nations to extend their moratoria; (3) said he would direct DOE to "prepare to conduct additional tests while seeking approval to do so from Congress" if another nation tests; (4) promised to "explore other means of maintaining our confidence in the safety, the reliability and the performance of our own weapons"; and (5) pledged to refocus the nuclear weapons laboratories toward technology for nuclear nonproliferation and arms control verification. He extended the moratorium twice more; on January 30, 1995, the Administration announced his decision to extend the moratorium until a CTBT enters into force, assuming a treaty is signed by September 30, 1996. The treaty opened for signature on September 24, 1996, in effect extending the moratorium indefinitely. With the defeat of the treaty in the Senate, President Clinton, in his State of the Union Address on January 27, 2000, said, "I hope we can have a constructive bipartisan dialogue this year to build a consensus which will lead eventually to the ratification of the Comprehensive Nuclear Test Ban Treaty." State Department spokesman James Rubin said the next day, "We do not expect to seek consent of the Senate this year."

On January 28, Secretary of State Albright announced that Gen. John Shalikashvili (ret.) would "spearhead the Administration's effort to achieve bipartisan support for ratification..." On March 16, Gen. Shalikashvili described his task as "to help lay the groundwork for eventual ratification by engaging in a low-key, nonpartisan dialogue with every Senator interested in understanding better the different views on the issues and in exploring ways to bridge these differences." He issued a report on findings and recommendations on the treaty on January 4, 2001. He concluded, "I believe that it is very much in our national interest to secure [certain] benefits through entry into force of the Test Ban Treaty. If this opportunity is lost, the United States' ability to lead an effective global campaign against nuclear

proliferation will be severely damaged." Of his 16 recommendations, the one receiving the most attention called for a joint Senate-Administration review every ten years of the treaty's net value, with possible withdrawal from the treaty if "grave doubts remain about the Treaty's net value for U.S. national security ..." In response, Senator Kyl was quoted as stating that the report "simply rehashed the same flawed arguments that failed to persuade the Senate to support the treaty." On January 17, 2001, Colin Powell, then nominee to be Secretary of State, told the Senate Foreign Relations Committee that the Administration would not ask for CTBT ratification in this session of Congress.

United Kingdom: The United Kingdom cannot test because it has conducted all its nuclear tests for several decades at the Nevada Test Site and does not have its own test site. Its last test was held in 1991. Britain and France became the first of the original five nuclear weapon states to ratify the CTBT, depositing instruments of ratification with the United Nations on April 6, 1998.

France: On June 13, 1995, President Jacques Chirac announced that France would conduct eight nuclear tests at its test site at Mururoa Atoll in the South Pacific, finishing by the end of May 1996. The armed services had reportedly wanted the tests to check existing warheads, validate a new warhead, and develop a computer system to simulate warheads to render further testing unneeded. Many nations criticized the decision. On August 10, 1995, France indicated it would halt all nuclear tests once the test series was finished and favored a CTBT that "prohibit(ed) any nuclear weapon test explosion or any other nuclear explosion." France conducted six tests from September 5, 1995, to January 27, 1996. On January 29, 1996, Chirac announced the end to French testing. On April 6, 1998, France and Britain deposited instruments of ratification of the CTBT with the United Nations.

Russia: The Russian moratorium continued at least through 1995. The *Washington Times* reported in March 1996, that Russia may have conducted a low-yield nuclear test at its Arctic test site at Novaya Zemlya in January 1996. The *Washington Post* reported in August 1997, that the Clinton Administration had determined the event to be an earthquake. In August 1997, over 40 seismic stations worldwide detected signals from an event near Novaya Zemlya. Three months later, the *Washington Post* reported that a CIA panel of independent experts found "that the seismic event clearly took place in the Kara Sea near Novaya Zemlya and was not linked to activities at the test site." Accordingly, "The CIA and the White House have formally dropped their claim that [the] seismic disturbance ... may have been caused by a nuclear explosion." In January 1999, the *Washington Post* reported that in the fall of 1998, Russia conducted three nuclear tests, apparently subcritical experiments. The report stated, "The tests were small enough to be permitted under the Comprehensive Test Ban Treaty." The *Washington Times* reported on September 15, 1999, that Russia may have conducted a small nuclear test at Novaya Zemlya, though it was unclear if the event was a nuclear or chemical explosion or a subcritical experiment. On January 1, 2000, Russia announced plans to conduct about five subcritical experiments in 2000, and on February 4 announced that it conducted seven such experiments between September 23, 1999, and January 8, 2000. On September 4, 2000, the Atomic Energy Ministry announced that Russia had conducted three subcritical experiments at Novaya Zemlya between August 28 and September 3. On November 3, Russia announced it had completed, at Novaya Zemlya, its fifth and final series of subcritical tests for 2000 during the week of October 30.

CTBT critics claim the 1997 event shows problems with the CTBT. Said the Center for Security Policy, "Russians and other nations will secretly conduct underground nuclear tests ... By exploiting inherent uncertainties about the signatures of low-yield tests, such nations will almost certainly be able to escape detection." Senator Jon Kyl stated, "if you have a treaty, because of the consequences of declaring a violation, administrations seldom want to pursue actions against treaty partners." CTBT supporters counter that the incident shows that the detection network can detect very small events, and that, as a Pentagon spokesman said, the event "indicates that we need to have the kinds of transparency that the treaty offers to us," requiring U.S. and Russian ratification. Others point out that on-site inspections of suspicious events could be performed only if the treaty enters into force.

A *Washington Post* article of October 3, 1999, stated, "the Central Intelligence Agency has concluded that it cannot monitor low-level nuclear tests by Russia precisely enough to ensure compliance with the Comprehensive Test Ban Treaty ..." The *Post* report continued that at very low levels, the CIA "cannot reliably distinguish between a conventional explosion and a nuclear test or even natural seismic activity ..." The report pointed to a military intelligence assessment that "over the past 18 months Russia has conducted tests ... to develop a low-yield tactical nuclear weapon that is the linchpin of a new military doctrine to counter U.S. superiority in precision guided munitions." In response, the Clinton Administration negotiated with Russia to arrange for measures, such as visits by American experts to the Russian test site and advance notification of subcritical experiments (see below). On June 30, 2000, Russia ratified the CTBT.

On March 4, 2001, the *New York Times* reported that U.S. intelligence experts were bitterly divided on whether Russia had been testing for the past several years. According to the report, both sides agree that Russia is doing more than it acknowledges. Some U.S. analysts believe that Russia has been conducting hydronuclear tests, which produce a nuclear yield (as distinct from the yield of a weapon's chemical explosive) that can range as low as pounds or even grams of TNT equivalent. Such explosions would violate the CTBT, which Russia has ratified but which has not entered into force, would be undetectable by seismic means, would be hard to identify as nuclear explosions by other monitoring methods, and are said to have limited value for weapons development. The charge that Russia is conducting these tests is reported to be based on intelligence sources. Other U.S. officials, however, are skeptical of such charges.

Russia has urged the United States to ratify the treaty. In late February 2001, President Vladimir Putin of Russia and President Kim Dae Jung of the Republic of Korea issued a joint communique that said in part that they "appealed to other countries to ratify the treaty without any delays and they also appealed to those countries whose ratification is needed for it to come into effect." While the passage did not mention the United States by name, the *New York Times* stated that "the object of the communique's criticism was unmistakable."

China: China did not participate in the moratorium. It conducted a nuclear test on October 5, 1993, that many nations condemned. China countered that it had conducted 39 tests, vs. 1,054 for the United States, and needed a few more tests for safety and reliability. The Chinese government reportedly wrote to U.N. Secretary General Boutros Boutros-Ghali after its test that "after a comprehensive test ban treaty is concluded and comes into effect, China will abide by it and carry out no more nuclear tests." China conducted other tests on June 10 and October 7, 1994, May 15 and August 17, 1995, and June 8 and July 29, 1996.

Many nations criticized the post-1992 Chinese tests. China announced that the July 1996 test would be its last, as China would begin a moratorium on July 30, 1996. In a speech of January 1999, Chinese Ambassador Sha Zukang said China was "accelerating its preparatory work" and would submit the CTBT for ratification in the first part of 1999. On February 29, 2000, the Chinese government submitted the CTBT to the National People's Congress for ratification. As of April 2000, China had not ratified the treaty, but in the wake of the Duma's adoption of the treaty, a Chinese Foreign Ministry spokesman said that China was likely to accelerate approval of it.

India: On May 11, 1998, Prime Minister Atal Behari Vajpayee announced that India had conducted three nuclear tests. A government statement said, "The tests conducted today were with a fission device, a low yield device and a thermonuclear device. ... These tests have established that India has a proven capability for a weaponised nuclear programme. They also provide a valuable database which is useful in the design of nuclear weapons of different yields for different applications and for different delivery systems. ..." India announced two more sub-kiloton tests on May 13. A September 1998 study by Terry Wallace, a University of Arizona seismologist, concluded based on seismic data that India and Pakistan overstated the number and (by a factor of four) the explosive yields of their tests. India has conducted no tests since May 1998. In a September 1998 address to the U.N., Vajpayee said that India had a test moratorium and that it is "prepared to bring [certain] discussions to a successful conclusion, so that the entry into force of the CTBT is not delayed beyond September 1999." The collapse of his government in April 1999 delayed Indian consideration of the treaty until after elections held in September. Vajpayee's party, the BJP, won, and the government reaffirmed that it would maintain a test moratorium while trying to build a consensus on the CTBT. However, Senator Spector, who visited India and Pakistan in January 2001, stated, "In my discussions with officials, it became evident that securing compliance with the CTBT by these two nations without U.S. ratification would be problematic." (*Congressional Record*, January 24, 2001: S514.) For example, Lalit Mansingh, India's Foreign Secretary, "expressed his sentiment that the U.S. should not expect India to sign a Treaty that the U.S. itself perceives as flawed." (Ibid.: S513)

Pakistan: Pakistan announced on May 28, 1998, that it had conducted five nuclear tests, and announced a sixth on May 30. Conflicting reports placed the yields of the smallest devices between zero and a few kilotons, and between two and 45 kilotons for the largest. The number of tests is also uncertain; seismic evidence points clearly to only two tests on May 28, though signals of smaller simultaneous tests might have been lost in the signals of larger tests. Pakistan made no claims of testing fusion devices. By all accounts, Pakistan's weapons program relies extensively on foreign, especially Chinese, technology. Pakistan claimed that the units tested were "ready-to-fire warheads," as opposed to experimental devices, and included a warhead for the Ghauri, a missile with a range of 900 miles, and low-yield tactical weapons. It appears that Pakistan will conduct no further tests. In an address to the U.N. of September 23, 1998, Pakistan's Prime Minister Nawaz Sharif stated that his country had a moratorium on testing and was "prepared to accede to the CTBT" by September 1999, with the implicit condition that sanctions are lifted and the explicit condition that India does not resume testing. The United States has been lifting various sanctions on India and Pakistan, such as on agricultural, economic, and military-assistance programs. On November 8, 1999, Abdul Sattar, the foreign minister of the military government that took power in October 1999, said that his nation would not sign the CTBT unless economic sanctions were lifted, but that "[w]e will not be the first to conduct further nuclear tests." In August 2000, General

Pervez Musharraf, the nation's military ruler, said the time was not ripe to sign the CTBT because so doing could destabilize Pakistan.

The CTBT: Negotiations and Key Provisions

The Conference on Disarmament, or CD, calls itself "the sole multilateral disarmament negotiating forum of the international community." It is affiliated with, funded by, yet autonomous from the United Nations. It operates by consensus; each member state can block a decision. On August 10, 1993, the CD gave its Ad Hoc Committee on a Nuclear Test Ban "a mandate to negotiate a CTB." On November 19, 1993, the United Nations General Assembly unanimously approved a resolution calling for negotiation of a CTBT. The CD's 1994 session opened in Geneva on January 25, with negotiation of a CTBT its top priority.

The priority had to do with extension of the Nuclear Non-Proliferation Treaty (NPT). That treaty entered into force in 1970. It divided the world into nuclear "haves" — the United States, Soviet Union, Britain, France, and China, the five declared nuclear powers, which are also the permanent five ("P5") members of the U.N. Security Council — and nuclear "have-nots." The P5 would be the only States Party to the NPT to have nuclear weapons, but they (and others) would negotiate in good faith on halting the nuclear arms race soon, on nuclear disarmament, and on general and complete disarmament. Nonnuclear weapon states saw attainment of a CTBT as the touchstone of good faith on these matters. The NPT provided for reviews every five years; a review in 1995, 25 years after it entered into force, would determine whether to extend the treaty indefinitely or for one or more fixed periods. The Review and Extension Conference of April-May 1995 extended the treaty indefinitely. Extension was accompanied by certain non-binding measures, including a Decision on Principles and Objectives for Nuclear Non- Proliferation and Disarmament that set forth goals on universality of the NPT, nuclear weapon free zones, etc., and stressed the importance of completing "the negotiations on a universal and internationally and effectively verifiable Comprehensive Nuclear-Test-Ban Treaty no later than 1996."

The extension decision, binding on States Party to the NPT, was contentious. Nonnuclear States Party argued that the P5 failed to meet their NPT obligations by not concluding a CTBT. They saw progress on winding down the arms race as inadequate. They assailed the NPT as discriminatory because it divides the world into nuclear and nonnuclear states, and argued for a regime in which no nation has nuclear weapons. The CTBT, in their view, symbolized this regime because, unlike the NPT, the P5 would give up something tangible, the ability to develop new sophisticated warheads. Some nonnuclear states saw NPT extension as their last source of leverage for a CTBT. Other nonnuclear states felt that the NPT was in the interests of all but would-be proliferators, that anything less than indefinite extension would undermine the security of most nations, and that the NPT was too important to put at risk as a means of pressuring the P5 for a CTBT. The explicit linkage finally drawn between CTBT and NPT lent urgency to negotiations on the former.

The CD reached a draft treaty in August 1996. India argued that the CTBT "should be securely anchored in the global disarmament context and be linked through treaty language to the elimination of all nuclear weapons in a time-bound framework." India also wanted a treaty to bar weapons research not involving nuclear tests. The draft treaty did not meet these conditions, which the nuclear weapon states rejected, so India vetoed it at the CD on August

20, barring it from going to the U.N. General Assembly as a CD document. Nations then sought an alternate way to open the treaty for signing. On August 23, Australia asked the General Assembly to begin considering a resolution to adopt the draft CTBT text and for the Secretary-General to open it for signing. In this way, the treaty could be adopted by a simple majority, or by the two-thirds majority that India sought, avoiding the need for consensus. A potential pitfall was that the resolution (i.e., the treaty text) was subject to amendment, yet the nuclear weapon states viewed amendments as unacceptable. India did not raise obstacles to the vote, which was held on September 10. The result was 158 nations in favor, 3 against (India, Bhutan, and Libya), 5 abstentions, and 19 not voting. The treaty was opened for signing on September 24. President Clinton signed it on that date, along with representatives of Britain, China, France, Russia, and other nations. As of April 17, 2000, 155 states had signed it, and 56 had ratified.

A sixth five-year review conference was held April 24 to May 19, 2000, in New York. U.S. rejection of the CTBT, lack of Chinese ratification, U.S. efforts to seek renegotiation of the ABM Treaty, and efforts to ban nuclear weapons in the Middle East led some to fear dire outcomes from the conference. However, some contentious issues were ironed out, some were avoided, and concessions were made. For example, a joint statement by the P5 to the conference on May 1 said, "No effort should be spared to make sure that the CTBT is a universal and internationally and effectively verifiable treaty and to secure its earliest entry into force." As a result of effort by many nations, the final document of the conference was adopted by consensus. Regarding the CTBT, that document reaffirmed that a halt to all nuclear explosions will contribute to nuclear nonproliferation and nuclear disarmament; called on all States, especially the 16 that must ratify the CTBT for it to enter into force, "to continue their efforts to ensure the early entry into force of the Treaty"; and agreed, as a practical step toward disarmament, "An unequivocal undertaking by the nuclear-weapon States to accomplish the total elimination of their nuclear arsenals leading to nuclear disarmament to which all States parties are committed under Article VI" of the NPT.

The balance of this section summarizes key CTBT provisions. For text and the Clinton Administration's analysis, see "*Comprehensive Nuclear Test-Ban Treaty.* Message from the President...." (Full cite under For Further Reading.)

Scope (Article I): The heart of the treaty is the obligation "not to carry out any nuclear weapon test explosion or any other nuclear explosion." This formulation bars even very low yield tests, as some in the nuclear weapon states had wanted, and bars peaceful nuclear explosions, as China had wanted, but rejects India's concern that a CTBT should "leave no loophole for activity, either explosive-based or non-explosive based, aimed at the continued development and refinement of nuclear weapons."

Organization (Article II): The treaty establishes a Comprehensive Nuclear Test- Ban Treaty Organization, composed of all member states, to implement the treaty. Three groups are under this Organization. The Conference of States Parties, composed of one representative from each member state, shall meet in annual and special sessions to consider and decide issues within the scope of the treaty and oversee the work of the other groups. An Executive Council with 51 member States shall, among other things, take action on requests for on-site inspection, and may request a special session of the Conference. A Technical Secretariat shall carry out verification functions, including operating an

International Data Center, processing and reporting on data from an International Monitoring System, and receiving and processing requests for on-site inspections.

Verification (Article IV): The treaty establishes a verification regime. It provides for collection and dissemination of information, and permits States Party to use national technical means of verification. It specifies verification responsibilities of the Technical Secretariat. It establishes the International Monitoring System, provides for consultation and clarification regarding "possible non-compliance," and makes detailed provisions for on-site inspections. A Protocol elaborates on the monitoring system and on-site inspections.

Review of the Treaty (Article VIII): The treaty provides for a conference ten years after entry into force (unless a majority of States Party decide not to hold such a conference) to review the treaty's operation and effectiveness. Further review conferences may be held at subsequent intervals of ten years or less.

Duration and Withdrawal (Article IX): "This treaty shall be of unlimited duration." However, "Each State Party shall, in exercising its national sovereignty, have the right to withdraw from this Treaty if it decides that extraordinary events related to the subject matter of this Treaty have jeopardized its supreme interests." President Clinton indicated his possible willingness to withdraw from the Treaty using this withdrawal provision, which is common to many arms control agreements, in his speech of August 11, 1995, as one of several conditions under which the United States would enter the CTBT.

Entry into force (Article XIV): The treaty shall enter into force 180 days after 44 states named in Annex 2 have deposited instruments of ratification, but not less than two years after the treaty is opened for signature. If the treaty has not entered into force three years after being opened for signature, and if a majority of states that have deposited instruments of ratification so desire, a conference of these states shall be held to decide how to accelerate the ratification process. Unless otherwise decided, subsequent conferences of this type shall be held annually until entry into force occurs. The 44 States are the ones with nuclear power or research reactors that participated in the work of the CD's 1996 session and were CD members as of June 18, 1996. This formulation includes nuclear-capable states, includes nuclear threshold states (in particular Israel, which, along with other States, joined the CD on June 17, 1996), and excludes Yugoslavia, which did not participate in the CD's work of 1996. India, North Korea, and Pakistan are on the list of 44 but have not signed the treaty.

Protocol: The Protocol provides details on the International Monitoring System and on functions of the International Data Center (Part I); spells out on-site inspection procedures in great detail (Part II); and provides for certain confidence-building measures (Part III). Annex 1 to the Protocol lists International Monitoring System facilities: seismic stations, radionuclide stations and laboratories, hydroacoustic stations, and infrasound stations. Annex 2 provides a list of variables that, among others, may be used in analyzing data from these stations to screen for possible explosions.

Preparing for Entry into Force

The Preparatory Commission (PrepCom) for the Comprehensive Test Ban Treaty Organization (CTBTO) is working to create the structures and instruments of the CTBT in anticipation of the treaty's entry into force. The PrepCom states that its main task "is to

establish the global verification regime foreseen in the Treaty so that it will be operational by the time the Treaty enters into force." It has two working groups, on administrative and budgetary matters and on verification, and an advisory group on financial, budgetary, and other administrative matters. The PrepCom's first meeting was in November 1996. There have been nine such meetings, with the thirteenth scheduled for November 2000. Various CTBTO groups meet as well. PrepCom funding was a matter of contention in the Congress in 1998. In late October 1999, the *New York Times* reported that treaty foes in the Senate were considering eliminating from the FY2000 Foreign Operations Appropriations bill, H.R. 2606, the $16 million U.S. contribution to the monitoring network. The conference on entry into force, as provided for by Article XIV, was held in Geneva October 6-8, 1999.

Stockpile Stewardship

P5 states want to maintain their nuclear warheads under a CTBT and assert that they need computers and scientific facilities to do so. They also want to retain the ability to resume testing in the event that other nations leave a CTBT, or that high confidence in key weapons cannot be maintained with testing. Nonnuclear nations fear that the P5 will simply carry on business as usual under a CTBT, designing new warheads without testing. Maintaining nuclear weapons, especially without testing, is termed "stockpile stewardship." This is a contentious issue. This section focuses on the U.S. debate

Stewardship bears on Senate advice and consent to CTBT ratification. Beginning with the Nuclear Test Ban Treaty of 1963, the United States has implemented "safeguards," or unilateral steps to maintain its nuclear weapons capability consistent with treaty limitations. President Kennedy's agreement to safeguards was critical for obtaining Senate approval of the 1963 treaty. The safeguards were modified most recently by President Clinton. In his August 11, 1995, speech announcing a zero-yield CTBT as a goal, he stated:

> As a central part of this decision, I am establishing concrete, specific safeguards that define the conditions under which the United States will enter into a comprehensive test ban. These safeguards will strengthen our commitments in the areas of intelligence, monitoring and verification, stockpile stewardship, maintenance of our nuclear laboratories, and test readiness.

These safeguards are: Safeguard A: "conduct of a Science Based Stockpile Stewardship program to insure a high level of confidence in the safety and reliability of nuclear weapons in the active stockpile"; Safeguard B: "maintenance of modern nuclear laboratory facilities and programs"; Safeguard C: "maintenance of the basic capability to resume nuclear test activities prohibited by the CTBT"; Safeguard D: "a comprehensive research and development program to improve our treaty monitoring"; Safeguard E: intelligence programs for "information on worldwide nuclear arsenals, nuclear weapons development programs, and related nuclear programs"; and Safeguard F: the understanding that if the Secretaries of Defense and Energy inform the President "that a high level of confidence in the safety or reliability of a nuclear weapon type which the two Secretaries consider to be critical to our nuclear deterrent could no longer be certified, the President, in consultation with Congress, would be prepared to withdraw from the CTBT under the standard 'supreme national interests' clause in order to conduct whatever testing might be required."

Regarding the stewardship program, the President noted that the Secretary of Energy and the directors of the nuclear weapons laboratories had assured him that the United States could maintain its nuclear deterrent under a CTBT through a program of science-based stockpile stewardship. "In order for this program to succeed," he said, "both the administration and the Congress must provide sustained bipartisan support for the stockpile stewardship program over the next decade and beyond."

The ability of the stewardship program to maintain nuclear weapons without testing was a crucial issue in the Senate debate on the CTBT. The treaty's opponents claimed that stewardship offered no guarantee of maintaining weapons, and indeed that computer models, experiments, and other techniques might offer no clue to some problems that develop over time. They further argued that it could be perhaps a decade before the tools for the program were fully in place, and by that time many weapon designers with test experience would have retired. Supporters held that the program was highly likely to work, having already certified the stockpile three times, and that safeguard "F" provided for U.S. withdrawal from the treaty in the event high confidence in a key weapon type could not be maintained without testing.

The FY1997 request for Weapons Activities under DOE's Atomic Energy Defense Activities was $3.710 billion; the appropriation was $3.911 billion. The FY1998 request was $4.044 billion (excluding $1.034 billion in budget authority for transition to full funding of construction line items, a change that Congress denied); the appropriation was $4.147 billion. The FY1999 appropriation was $4.400 billion, $100 million less than the request; the FY2000 request was $4.531 billion, and the appropriation was $4.444 billion. The FY2001 request is $4.594 billion. For FY2001, DOE changed the relevant budget categories. In recent years, it has used Stockpile Stewardship (mainly R&D) and Stockpile Management (mainly production-type activities). Now, it uses these elements: Directed Stockpile Work, activities directly supporting weapons in the stockpile; Campaigns, technical efforts to develop and maintain capabilities needed to certify the stockpile for the long term; and Readiness in Technical Base and Facilities, mainly infrastructure for the weapons complex. DOE indicates that the $4.594 billion is roughly comparable to a budget of $4.7 billion when compared to the $4.5 billion annual funding goal discussed in recent budgets.

Operating expenses for nuclear testing have dropped since the United States halted testing in 1992, as follows (figures in millions of then-year dollars): FY1992, 457.5; FY1993, 375.0; FY1994, 371.7; FY1995, 166.5; FY1996, 166.8; FY1997, 161.6; FY1998, 181.0; FY1999, 190.5; FY2000 (requested); 177.1, FY2001 (requested), 187.9.

Subcritical experiments: As part of Stockpile Stewardship and Management Program, DOE is conducting "subcritical experiments." CRS offers the following definition based on documents and on discussions with DOE and laboratory staff: "Subcritical experiments at Nevada Test Site involve chemical high explosives and fissile materials in configurations and quantities such that no self-sustaining nuclear fission chain reaction can result. In these experiments, the chemical high explosives are used to generate high pressures that are applied to the fissile materials. The only fissile material under current consideration for use in near-term subcritical experiments is plutonium-239." As there is no chain reaction, the Clinton Administration sees these experiments as consistent with the CTBT. The 13 held so far are: *1997:* Rebound, July 2, Holog, September 18; *1998:* Stagecoach, March 25, Bagpipe, September 26, Cimarron, December 11; *1999:* Clarinet, February 9, Oboe, September 30, Oboe 2, November 9; *2000:* Oboe 3, February 3, Thoroughbred, March 22, Oboe 4, April

6, Oboe 5, August 18, Oboe 6, December 14. They are held in a tunnel complex about 1,000 feet underground at the Nevada Test Site. The complex could contain explosions up to 500 pounds of explosive and associated plutonium. These experiments try to determine if radioactive decay of aged plutonium would degrade weapon performance. In September 1998, Secretary of Energy Bill Richardson said, "These experiments are a key part of our scientific program to provide new tools and data that assess age-related complications and maintain the reliability and safety of the nation's nuclear deterrent."

Lawrence Livermore National Laboratory developed a new technique for its subcritical experiments. In past practice, an alcove would be dug off an underground tunnel for each experiment and another for its diagnostic equipment. The experimental alcove would be sealed after the experiment to contain scattered plutonium, and the diagnostic equipment would be damaged. In the new method, each experiment will be conducted in a containment vessel about 3 feet in diameter by 4 feet high, with 2 inch thick steel walls. When the experiment is over, the vessel is moved to an alcove and sealed with grout. DOE holds that the new method will permit faster turnaround, will spare the diagnostic equipment, and will cut costs in half. Livermore conducted six experiments through 2000 using this approach. Los Alamos National Laboratory conducted one subcritical experiment in FY2000. Called Thoroughbred, it was held in March 2000 and used the earlier method.

Critics respond that these experiments would help design new weapons without testing; are unnecessary; may look like nuclear tests if not monitored intrusively; and are inconsistent with the spirit of a CTBT, which, critics believe, is aimed at halting development of nuclear weapons, not just stopping testing. India criticized Rebound as proving the CTBT was not "genuinely comprehensive" as it "contains loopholes which are exploited by some countries to continue their testing activity, using more sophisticated and advanced techniques." A Chinese spokesman said, "We will certainly pay close attention to this situation."

CTBT Pros and Cons

For a more detailed discussion, see CRS Report RS20351, *Comprehensive Test Ban Treaty: Pro and Con,* October 5, 1999.

A CTBT is contentious. Supporters argue it would fulfill disarmament commitments the nuclear weapon states made in the Nuclear Nonproliferation Treaty and its 1995 Review and Extension Conference; end a discriminatory regime in which nuclear weapon states can test while others cannot; and aid nonproliferation by preventing nonnuclear weapon states from developing nuclear weapons of advanced design. Some supporters hold a CTBT would freeze a U.S. advantage in nuclear weaponry and that this Nation could maintain its weapons without testing through a program of science and production. A CTBT, it is argued, would also prevent the development of weapons of advanced design by the P5, reducing future threats to the United States, and impede India's ability to develop a thermonuclear weapon. Some hold the treaty would bar China from incorporating any lessons learned from espionage into new warheads.

Critics counter that testing is the only sure way to maintain confidence in the safety and reliability of U.S. nuclear weapons. They contend that if friends and allies doubt U.S. nuclear capability, they might feel compelled to develop their own nuclear weapons to protect their

security. Some opponents believe that a CTBT, by undercutting confidence in the U.S. deterrent, could lead to nuclear disarmament, thereby exposing the United States and the world to blackmail by a nation or group possessing a few weapons. Critics also charge that nations wanting to develop nuclear weapons would likely not sign a CTBT and in any event could develop fairly sophisticated weapons without testing; that verification would be difficult; and that the United States might need to develop new weapons to meet new threats. If other nations become nuclear powers or if existing ones develop new weapons, the proper response, in this view, is ballistic missile defense.

U.S. Nuclear Tests by Calendar Year

1945-49	6	1960-64	202	1980-84	92
1950-54	43	1965-69	231	1985-89	75
1955-59	145	1970-74	137	1990-92	23
		1975-79	100	Total	1054

Source: U.S. Department of Energy.
Note: These figures include all U.S. nuclear tests, of which 24 were U.K. tests conducted at the Nevada Test Site between 1962 and 1991. They reflect data on unannounced tests that DOE declassified on December 7, 1993. They exclude the two atomic bombs that the United States dropped on Japan in 1945. On June 27, 1994, Secretary O'Leary announced that DOE had redefined three nuclear detonations (one each in 1968, 1970, and 1972) as separate nuclear tests. This table reflects these figures. She also declassified the fact that 63 tests, conducted from 1963 through 1992, involved more than one nuclear explosive device.

CHRONOLOGY

03/04/01 — The *New York Times* reported that U.S. intelligence experts were divided on whether Russia had conducted clandestine tests over the past several years.

02/23/01 — Ukraine and the Philippines ratified the CTBT.

01/17/01 — Gen. Powell, as nominee for Secretary of State, said that the Administration would not ask for CTBT ratification in this session of Congress.

01/04/01 — Gen. Shalikashvili issued a report supporting the CTBT.

12/14/00 — DOE conducted the 13th subcritical experiment, "Oboe 6."

11/03/00 — Russia announced that it completed its fifth and final series of subcritical experiments for 2000 at Novaya Zemlya during the week of October 30.

11/01/00 — The First Committee of the U.N. General Assembly recommended,144-1, with 12 abstentions, adopting a resolution that, among other things, called for ratifying the CTBT by 2003.

06/30/00 — Russia ratified the CTBT.

02/04/00 — Russia announced that it conducted seven subcritical experiments between September 23, 1999, and January 8, 2000.

01/28/00 — Secretary of State Albright announced that Gen. John Shalikashvili (ret.) would head the Clinton Administration's effort to achieve bipartisan support for CTBT ratification, but the State Department indicated that the Administration did not expect to seek Senate approval of the treaty in 2000.

01/01/00 — According to reports, Russia indicated that it would conduct approximately five subcritical experiments at its arctic test site at Novaya Zemlya in 2000.

11/08/99 — The First Committee of the U.N. General Assembly passed a draft resolution (A/C.1/54/L.23), 137-0, with 5 abstentions, calling on States that had not signed the treaty to sign and ratify it as soon as possible, States that had signed but not ratified to accelerate their ratification processes, and all States to maintain a nuclear explosion moratorium.

10/13/99 — The Senate rejected the CTBT on a vote of 48 for, 51 against, and 1 present.

10/11/99 — President Clinton wrote to Senators Lott and Daschle to request that a vote on the CTBT be delayed.

10/08/99 — (1) States that have ratified the CTBT ended a 3-day conference in Vienna on expediting entry into force. (2) The Senate began debate on the treaty.

09/30/99 — (1) Senator Lott proposed a unanimous-consent request that would bring the CTBT to the Senate floor for ten hours of debate beginning October 6, and then to a vote. (2) The Department of Energy conducted its seventh subcritical experiment, "Oboe," at the Nevada Test Site.

For earlier chronology, see CRS Report 97-1007, *Nuclear Testing and Comprehensive Test Ban: Chronology Starting September 1992.*

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Selected World Wide Web Sites

Center for Security Policy. Short articles critical of the CTBT; updated often in response to pro-CTBT media articles and treaty-related events.
[http://www.security-policy.org]

CTBT Site. Sponsored by Coalition to Reduce Nuclear Dangers. Articles, transcripts, activities, links to other sites, etc.
[http://www.clw.org/coalition/]

DOE's Office of Defense Programs; information on stockpile stewardship.
[http://www.dp.doe.gov/]

DOE's Office of Nonproliferation and National Security: information on DOE's program for R&D into technical means of monitoring a CTBT; home page includes a checklist for ordering hard copies of research reports.
[http://www.nn.doe.gov/]

Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization: Information on the work of the commission, including its organization and meetings; verification; CTBT signatories and ratifications; and treaty text.
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