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Issue Brief for Congress

Nuclear Weapons: Comprehensive Test Ban Treaty

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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. The last U.S. test was held in 1992; the last U.K. test, in 1991. Russia claims it has not conducted nuclear tests since 1991. An article of May 2002 reported "intelligence indicating that Russia is preparing to resume nuclear tests." Russia rejected the charge.

Since 1997, the United States has held 19 "subcritical experiments" at the Nevada Test Site – most recently on September 26, 2002 – to study how plutonium behaves under pressures generated by explosives. It asserts these experiments do not violate the CTBT because they cannot produce a self-sustaining chain reaction. Russia has reportedly held some since 1998, including several in 2000.

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 U.N. General Assembly adopted the CTBT in September 1996. As of December 11, 2002, 166 states had signed it and 97, including Russia, had ratified. In 1997, President Clinton transmitted the CTBT to the Senate. On October 13, 1999, the Senate rejected the treaty, 48 for, 51 against, 1 present. It is now on the Senate Foreign Relations Committee's calendar. It would require a two-thirds Senate vote to send the treaty back to the President for disposal or to give advice and consent for ratification; few see either event as likely.

In January 2002, the Administration, in briefings on the Nuclear Posture Review, indicated that it continues to oppose the CTBT, continues to adhere to the test moratorium, plans to reduce the time between a decision to conduct a nuclear test and the test itself, is considering modifying existing warheads for use against hard and deeply-buried targets, has not ruled out resumed testing, and has no plans to test. Critics raised concerns about the implications of these policies for testing and new weapons. Congress addressed some of these issues in the FY2003 National Defense Authorization Act.

Congress continues to consider the Stockpile Stewardship Program, which seeks to maintain nuclear weapons without testing. The FY2002 budget request for the program (Weapons Activities) was $5.300 billion; the final appropriation was $5.429 billion. The FY2003 request is $5.869 billion; the authorization is $5.902 billion.

MOST RECENT DEVELOPMENTS

In December, the Comprehensive Nuclear-Test-Ban-Treaty Preparatory Commission issued the first edition of its newsletter, CTBTO Spectrum, *to provide information on the Comprehensive Test Ban Treaty (CTBT) and the work of the commission. On September 14, 18 foreign ministers signed a statement urging renewed effort to secure the treaty's entry into force. The tenth anniversary of the last U.S. nuclear weapon test was September 23. A report in September by DOE's Office of Inspector General found that DOE's ability to restart underground testing within three years, as required, is "at risk." In December, President Bush signed the FY2002 National Defense Authorization Act into law (P.L. 107-314, H.R. 4546); section 3142 requires a report on alternatives to reduce this restart time.*

BACKGROUND AND ANALYSIS

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, the need for improved warheads dropped and pressures for a CTBT grew. 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 test moratorium. 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. The CTBT was negotiated in the Conference on Disarmament, and in September 1996 was adopted by the U.N. General Assembly and opened for signature.

On September 22, 1997, President Clinton submitted the CTBT to the Senate. He asked the Senate to approve it in his State of the Union addresses of 1998 and 1999, but Senator Helms, Chairman of the Senate Foreign Relations Committee, rejected that request on grounds that the treaty "from a non-proliferation standpoint, is scarcely more than a sham"

and was of low priority for the committee. In the summer of 1999, Senate Democrats pressed Senators Helms and Lott to permit consideration of the treaty. On September 30, 1999, Senator Lott offered a unanimous-consent request to discharge the Senate Foreign Relations Committee from considering the treaty and to have debate and a vote. The request, as modified, was agreed to. The Senate Armed Services Committee held hearings October 5-7; the Foreign Relations Committee held a hearing October 7. It quickly became clear 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 a delay, the vote was held October 13, rejecting the treaty, 48 for, 51 against, and 1 present. At the end of the 106th Congress, pursuant to Senate Rule XXX, paragraph 2, the treaty moved to the Senate Foreign Relations Committee calendar, where it currently resides.

National Positions on Testing and the CTBT

United States: Under the Hatfield amendment, President Clinton had to decide whether to ask Congress to resume testing. On July 3, 1993, he announced his decision. "A test ban can strengthen our efforts worldwide to halt the spread of nuclear technology in weapons," and "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 tested; (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 entered into force, assuming a treaty was signed by September 30, 1996. The treaty opened for signature on September 24, 1996.

The Bush Administration takes a different position on the CTBT and nuclear testing. In January 2001, Colin Powell, as nominee to be Secretary of State, told the Senate Foreign Relations Committee that the Administration would not ask for ratification in this session of Congress. Later in 2001, some in the Administration expressed interest in withdrawing the treaty from the Senate to mark formal U.S. rejection. Pursuant to Senate Rule XXX, paragraph 1(d), a Senate motion to return the treaty to the President would require a simple majority vote, but that motion would be debatable, and cloture would require 60 votes. There was no motion in the 107th Congress to return the treaty to the President. As another sign of the Administration's view, the United States did not send a delegation to a conference held November 11-13, 2001, at U.N. headquarters to expedite the treaty's entry into force. Explained one State Department official, as quoted in the *Washington Post* of November 12, "This is a meeting for ratifying states and we've made it clear we're not going to ratify."

The Nuclear Posture Review and Nuclear Testing: In the FY2001 National Defense Authorization Act (P.L. 106-398, Sec. 1041), Congress directed the Secretary of Defense, in consultation with the Secretary of Energy, to review nuclear policy, strategy, arms control objectives, and the forces, stockpile, and nuclear weapons complex needed to implement

U.S. strategy. Although the resulting Nuclear Posture Review is classified, J.D. Crouch, Assistant Secretary of Defense for International Security Policy, presented an unclassified briefing on it on January 9, 2002, dealing in part with the CTBT and nuclear testing. He stated there would be "no change in the Administration's policy at this point on nuclear testing. We continue to oppose CTBT ratification. We also continue to adhere to a testing moratorium." Further, "DOE is planning on accelerating its test-readiness program," referring to the time needed between a decision to test and the conduct of a test, currently 24 to 36 months. He discussed new weapons. "At this point, there are no recommendations in the report about developing new nuclear weapons. ... we are trying to look at a number of initiatives. One would be to modify an existing weapon, to give it greater capability against ... hard targets and deeply-buried targets. And we're also looking at non-nuclear ways that we might be able to deal with those problems." President Bush has left open the door to resumed nuclear testing. A *Washington Post* article of January 10, 2002, quoted White House Press Secretary Ari Fleischer as saying that the President has not ruled out testing "to make sure the stockpile, particularly as it is reduced, is reliable and safe. So he has not ruled out testing in the future, but there are no plans to do so."

Critics expressed concern about the implications of these policies for testing and new weapons. Daryl Kimball, executive director of the Arms Control Association, said that since increasing funding for test readiness "would amount to giving prior approval for testing, the debate [in Congress] would be substantial." A statement by Physicians for Social Responsibility said, "The Administration's plan ... would streamline our nuclear arsenal into a war-fighting force, seek the opportunity to design and build new nuclear weapons, and abandon a ten-year-old moratorium on nuclear weapons testing."

The Nuclear Posture Review, if fully implemented, could add new tasks to the nuclear weapons complex and augment existing ones. Work would be needed at Nevada Test Site to accelerate test readiness. Indeed, a September 2002 report by DOE's Office of Inspector General found that while a Presidential Decision Directive requires DOE to be able to restart underground testing within three years, that ability is "at risk" due to staff losses, obsolete equipment, and fewer facilities dedicated to testing. Pantex Plant would see an increase in dismantlement or storage of weapons, and disposition of some components and materials from dismantled weapons. Other plants would be involved in dismantlement, disposition, or storage of components. The labs would design any new weapons or modify existing ones. Nuclear tests would draw mainly on the resources of the labs and Nevada Test Site. Production of new weapons or of components for modified ones would draw on the resources of the entire weapons complex.

Since January 2002, there has been increased interest in nuclear weapons and nuclear testing. DOE is studying earth penetrator weapons, which would detonate some tens of feet underground, coupling more of their energy to the ground. This would improve their ability to destroy hardened and deeply buried targets, which might house weapons of mass destruction in potentially hostile nations. While the weapons under study would be modifications of existing weapons and would not require testing, some fear that pursuing such weapons could lead to testing. Moreover, John Foster, Chairman of the Panel to Assess the Reliability, Safety, and Security of the United States Nuclear Stockpile, testified before a House Armed Services Committee panel that "prudence requires that every President have a realistic option to return to testing, should technical or political events make it necessary." The Foster panel recommended being able to return to testing within three months to a year,

depending on the type of test, vs. 24-36 months now. (Congressional action on earth penetrators and test readiness is detailed under Legislation, below.)

In July 2002, a National Academy of Sciences panel report on technical aspects of the CTBT concluded, in the words of an Academy press release, "that verification capabilities for the treaty are better than generally supposed, U.S. adversaries could not significantly advance their nuclear weapons capabilities through tests below the threshold of detection, and the United States has the technical capabilities to maintain confidence in the safety and reliability of its existing weapons stockpile without periodic nuclear tests."

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. On February 14, 2002, the United Kingdom conducted its first subcritical experiment jointly with the United States at the Nevada Test Site.

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.

On June 30, 2000, Russia ratified the CTBT. On March 4, 2001, the *New York Times* reported that U.S. intelligence experts were divided on whether Russia had been testing for the past several years. On May 12, 2002, the *New York Times* reported, "Administration officials have briefed Congress on what they described as disturbing intelligence indicating that Russia is preparing to resume nuclear tests." Some in Congress expressed concern, while others were skeptical. Russia denied the charge.

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. It countered that it had conducted 39 tests, vs. 1,054 for the United States, and needed a few more 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." It conducted other tests on June 10 and October 7, 1994, May 15 and August 17, 1995, and June 8 and July 29, 1996. It announced that the July 1996 test would be its last, as it 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 December 2002, China had not ratified the treaty.

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." It 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 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 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 won, and the government reaffirmed that it would maintain a 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.) 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) As of December 2002, India had not signed the CTBT.

Pakistan: Pakistan announced on May 28, 1998, that it had conducted five nuclear tests, and announced a sixth on May 30. 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 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 it tested "ready-to-fire warheads," not 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. As of December 2002, Pakistan had not signed the CTBT.

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 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 so 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, with 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 other nations. As of December 2002, 166 states had signed it and 97 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 Preparatory Committee for the 2005 NPT Review Conference met April 8 to19, 2002. According to a press report, the committee called for more nations to ratify the CTBT and issued a report that concluded the treaty must enter into force as soon as possible.

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 a 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, permits States Party to use national technical means of verification, and specifies verification responsibilities of the Technical Secretariat. It establishes an International Monitoring System (IMS) with 321 stations in 90 countries, provides for consultation on "possible non-compliance," and provides for on-site inspections. As of December 2002, 34 IMS stations had been certified and another 103 installed; surveys had been completed for 87 percent of the 321 sites. (See *CTBTO Spectrum* for details.)

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 Nuclear-Test-Ban Treaty Organization (CTBTO) is working to create the structures and instruments of the CTBT in anticipation of its 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." Its first meeting was in November 1996. There have been 19 such meetings, with the next scheduled for June 24-27, 2003. Other CTBTO groups have 8 meetings scheduled for 2003; CTBTO also holds training sessions, workshops, etc. The conference on entry into force, as provided for by Article XIV, was held in Geneva October 6-8, 1999. A second such conference was held November 11-13, 2001, at U.N. headquarters. On September 14, 2002, 18 foreign ministers, including those of Britain, France, and Russia, issued a statement calling for early entry into force of the CTBT.

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, President Clinton said 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.

Stewardship is funded by the Weapons Activities account in the budget of the National Nuclear Security Administration, or NNSA. (Congress established NNSA in 1999 as a semiautonomous agency within DOE to manage stockpile stewardship and related programs.) The three main elements of this account are 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 and operations for the weapons complex. The appropriation for Weapons Activities was $5.006 billion in FY2001 and $5.429 billion in FY2002. Of the latter amount, NNSA estimates "test readiness" – readiness to conduct nuclear tests at Nevada Test Site in 24 to 36 months – to cost $181 million. The FY2003 request for Weapons Activities is $5.869 billion.

Subcritical experiments: As part of the stockpile stewardship program, NNSA 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." They are held in a tunnel complex, about 1,000 feet underground at 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 1998, Secretary of Energy Bill Richardson called them "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." As they produce no chain reaction, the Clinton Administration saw them as consistent with the CTBT. Critics counter that they 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.

The 19 subcritical experiments 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; *2001:* Oboe 8, September 26; Oboe 7 (held after Oboe 8), December 13; *2002:* Vito (jointly with United Kingdom), February 14; Oboe 9, June 7; Mario, August 29; Rocco, September 26.

Test Readiness: As noted earlier, a Presidential Decision Directive directs DOE to be prepared to conduct a nuclear test within three years of a decision to do so. Yet a September 2002 report by DOE's Office of Inspector General found this ability to be "at risk." In January 2002, the Nuclear Posture Review briefing called for an unspecified acceleration of nuclear test readiness, and in March 2002 the Panel to Assess the Reliability, Safety, and Security of the United States Nuclear Stockpile assessed that "test readiness should be no more than three months to a year." The FY2003 National Defense Authorization Act, P.L. 107-314, sec. 3142, requires the Secretary of Energy to report on alternative test readiness postures and recommend the optimal readiness posture.

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.

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.

LEGISLATION

P.L. 107-314 (H.R. 4546)

Bob Stump National Defense Authorization Act for Fiscal Year 2003. Reported (H.Rept. 107-772) from Committee of Conference November, 12, 2002. Measure signed into law December 2. Measure directed the Secretary of Energy to report on test readiness postures, continued a provision in the FY1994 National Defense Authorization Act (P.L. 103-160, sec. 3136) barring most R&D on nuclear weapons under 5 kilotons, and delayed obligation of $15 million for the Robust Nuclear Earth Penetrator weapon pending a study by the Secretary of Defense, in consultation with the Secretary of Energy, on military requirements for this weapon and employment policy. The House had earlier rejected, on May 9, an amendment to H.R. 4546 by Representative Markey to bar permanently R&D on nuclear earth penetrator weapons and to bar use of FY2003 funds for a feasibility study of these weapons. The amendment's supporters feared that developing these weapons could

lead to nuclear testing and make nuclear weapons more usable; opponents countered that these weapons' increased effectiveness against targets of particular concern (e.g., deeply buried targets sheltering leaders or weapons of mass destruction in state sponsors of terrorism) would enhance deterrence.

S. 2784 (Reid)

Energy and Water Development Appropriation Bill, 2003. Reported (S.Rept. 107-220) from Senate Committee on Appropriations July 24, 2002. The bill as reported recommended increasing Weapons Activities funds to $6,109.0 million from $5,867.0 million requested. The bill would, among other things, increase funds (compared to FY2002) for subcritical testing, provide $246.0 million (vs. $194.5 million requested) for pit manufacturing and certification, and provide $64.2 million within available funds for test site readiness.

H.R. 5431 (Callahan)

Energy and Water Development Appropriations Bill, 2003. Reported (H.Rept. 107-681) from House Committee on Appropriations September 24, 2002. The committee recommended $5,772.1 million for Weapons Activities, including $15.0 million to begin a study for a Robust Nuclear Earth Penetrator, $194.5 million for pit manufacturing and certification, and $15.0 million (as requested) to study enhanced test readiness.

Note: As of December 2002, the Energy and Water Appropriations Bill had not reached conference. In the absence of final legislation, programs funded by this bill are being funded through January 11, 2003, by a continuing resolution (P.L. 107-294).

CHRONOLOGY

10/28/02 — Botswana became the 97th nation to ratify the CTBT.

09/26/02 — The National Nuclear Security Agency held the 19th U.S. subcritical experiment, "Rocco."

09/23/02 — The last U.S. nuclear test, "Divider," was held ten years ago.

08/29/02 — The National Nuclear Security Agency held the 18th U.S. subcritical experiment, "Mario."

07/31/02 — The National Academy of Sciences issued a report asserting that the main technical concerns raised in regard to the CTBT are manageable.

05/10/02 — The House passed H.R. 4546, as amended, the Bob Stump National Defense Authorization Act for FY2003; it called for DOE to achieve the ability to conduct a nuclear test within a year of a presidential direction to test.

02/15/02 — The National Nuclear Security Agency held the 16th U.S. subcritical experiment, and the first with United Kingdom participation, "Vito."

11/11/01 — The Conference on Facilitating the Entry into Force of the CTBT began on this date at U.N. headquarters in New York and ended November 13.

06/26/01 — The House Appropriations Committee declined to add funds to the FY2002 Energy and Water Development Appropriations Bill to increase nuclear test readiness, arguing the Secretary of Defense, President, Armed Services Committees, and Congress must first request or approve these funds.

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.

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.

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

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