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China and the CTBT Negotiations

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Abbreviations

AEB	Abnormal Events Bulletin
CAEP	China Academy of Engineering Physics
CD	Conference on Disarmament
CTB	comprehensive test ban
CTBT	Comprehensive Nuclear Test Ban Treaty
CWC	Chemical Weapons Convention
EC	Executive Council
EIF	entry into force
EMP	electromagnetic pulse
FMCT	Fissile Material Cutoff Treaty
G-21	Group of 21
HEU	highly enriched uranium
HNE	hydro-nuclear experiment
IAEA	International Atomic Energy Agency
ICF	Inertial Confinement Fusion
IDC	International Data Center
IMS	International Monitoring System
ISMS	International Seismic Monitoring System
LEP	lightning electromagnetic pulse
Minatom	Russian Ministry of Atomic Energy
NTB	nuclear test ban
NNWS	non-nuclear-weapon states
NTM	national technical means
NWS	nuclear-weapon states
OSI	on-site inspection
P5	five declared nuclear-weapon states
PNE	peaceful nuclear explosions
PrepCom	Preparatory Commission
PTBT	Partial Test Ban Treaty
PTS	Provisional Technical Secretariat
REB	Reviewed Events Bulletin
SBSS	science-based stockpile stewardship
SSOD II	Second Special Session on Disarmament of the United Nations
TTBT	Threshold Test Ban Treaty
UNGA	United Nations General Assembly

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Executive Summary

This report reviews Chinese participation in the international negotiations for a Comprehensive Nuclear Test Ban Treaty (CTBT) at the Conference on Disarmament (CD) in Geneva and provides background for China's decision-making procedures during the negotiations.

The CTBT negotiations marked the first important international negotiations for a multilateral disarmament treaty in which China participated from beginning to end. They were the first important international negotiations in which China, as a nuclear power, had great influence. The Chinese delegation to the CD assumed a serious and responsible attitude during the entire course of the negotiations. In part to increase international confidence that it would sign the CTBT by 1996 as scheduled and in part to indicate its intent to adapt itself to the world trend toward increased international cooperation and nuclear arms reduction, China announced during the latter stage of the negotiations that it would suspend nuclear testing.

As an example of successful multilateral negotiations, the conclusion and signing of the treaty, although long postponed, is an important achievement in arms control.¹ As the sole declared nuclear-weapon state of the Third World at that time and the last among the five nuclear-weapon states (P5) to cease nuclear testing, China's stance toward the CTBT negotiations was the object of world attention and concern. The population of China accounts for nearly one-quarter of the world's total; China's positive position on the CTBT and its contributions toward this end has a major worldwide impact now and in the future.

Prior to the commencement of the CTBT negotiations in Geneva, China declared on October 5, 1993, that while supporting an early conclusion of the treaty it would "take an active part in the negotiating process and work together with other countries to conclude this treaty no later than 1996."² China kept its promise.

China pursued a fair, reasonable, and verifiable treaty with universal adherence and unlimited duration.³ During the negotiations, China presented many working papers, non-papers, and suggestions regarding the CTBT draft text (including a number of revisions), and dealt with a series of critical issues in the Preamble, Basic Obligations, Organization, Verification, and Entry into Force sections of the treaty. The Chinese delegation played an active role at

the conference table, and contributed positively to the weekly P5 consultations that ran in parallel with the CTBT talks.

China adhered toughly to its positions on two issues in the latter stage of the CTBT negotiations. One concerned potential abuses of the on-site inspection procedures. The other was that all nuclear-test-capable states (assumed to be the P5, India, Israel, and Pakistan) must accede to the treaty in order for it to enter into full legal force.⁴ Although China was not entirely satisfied with the final draft CTBT, it accepted the treaty. It agreed to sign the CTBT in the belief that the treaty text represented the best achievable result of the negotiations of the preceding two and a half years, reflected by and large the state of the negotiations, and was in general balanced.⁵

Signing the CTBT was in line with China's consistent stand in support of "the complete prohibition and thorough destruction of nuclear weapons." This was one of the major reasons China supported an early conclusion of the treaty.⁶ Of course, China's desire to meet the trend of the modern world also motivated it to sign. Because economic development had long been Beijing's top priority, China needed a peaceful security environment in order to devote itself completely to the modernization of the nation.⁷ To this end, its defense buildup had been steadily subordinated to national economic development.⁸ Beijing's decision on the CTBT negotiations stemmed also from its self-defense and no-first-use nuclear policies. China had established an effective nuclear force for self-defense.⁹

China is now making preparations for the treaty to enter into force. After the conclusion of the CTBT, China will continue efforts in pursuit of world peace, development, and cooperation. Meanwhile, China will continuously ensure the safety and reliability of its nuclear weapons without nuclear testing.

¹ Rebecca Johnson, "A CTBT: Signed but Not Sealed," *ACRONYM* (London), No. 10, May 1997, p. 78.

² "Statement by the Government of the People's Republic of China on the Question of Nuclear Testing," *Renmin Ribao* [People's Daily], Oct. 6, 1993, p. 1.

³ "Statement of the Ministry of Foreign Affairs of the People's Republic of China," *Beijing Ribao* [Beijing Daily], June 9, 1996.

⁴ Johnson, "CTBT," pp. 42, 62.

⁵ Sha Zukang's statement at the CD Plenary, Aug. 22, 1996, *CD/PV.747*, p. 20.

⁶ Ambassador Hou Zhitong's statement at the UN Disarmament Commission, April 19, 1994.

⁷ Information Office of the State Council of P. R. China, *China: Arms Control and Disarmament* (Beijing, 1995), p. 1.

⁸ "Army Paper Rejects 'China Threat,'" *FBIS-CHI-96-133*, July 10, 1996, p. 36.

⁹ "Statement of the Government of the People's Republic of China (July 29, 1996)," *Renmin Ribao* [People's Daily], July 30, 1996, p. 1.

I. Introduction

Since the end of the Cold War, there have been profound changes in the international situation. The pursuit of peace, development, and cooperation has become the mainstream, and this has made possible the achievement of major progress in the field of arms control and disarmament. In this regard, the CTBT is a typical example. It is widely recognized that the CTBT constitutes an important step forward in the process of multilateral nuclear disarmament.¹

A comprehensive test ban treaty, or CTBT, has long been on the nuclear arms control agenda. A CTBT was a central objective of campaigners for arms control and nuclear disarmament from the 1960s to the 1980s. In 1993, the P5 joined 156 countries in adopting a consensus resolution in the United Nations General Assembly (UNGA) that endorsed a mandate for the Conference on Disarmament (CD) to negotiate for a CTBT. The CTBT negotiations started in January 1994 and ended in August 1996. In the first year the negotiations examined the range of technical and political questions pertinent to a CTBT. The CD produced a 95-page draft text of a treaty in September 1994. The substantive negotiations continued in 1995 and 1996. On September 10, 1996, the UNGA voted 158 to 3 to adopt the treaty and the CTBT was opened for signing on September 24 in New York. As of October 1998, 151 states have signed the treaty and twenty-one have ratified it. On April 6, 1998, Britain and France became the first declared nuclear-weapon states to ratify the treaty.

The CTBT consists of a Preamble, seventeen Articles, two Annexes, and a Verification Protocol comprising three parts and two annexes. The key provisions of the treaty include the Scope (later changed to "Basic Obligations," Article I), which, as the heart of the treaty, stresses the obligation "not to carry out any nuclear weapon test explosion or any other nuclear explosion"; Organization (Article II), which establishes a CTBT organization, composed of all member states, to implement the treaty; Verification (Article IV), which establishes a verification regime; Review of the Treaty (Article VIII); Duration and Withdrawal (Article IX); Entry into Force (Article XIV), and Protocol.²

Two years have passed since the treaty opened for signature. The toughest problem is how to enable the treaty to become effective. In order to enter into force, the treaty must be ratified by the forty-four states that participated in the CD on June 18, 1996 (after expan-

sion), and appeared on the 1995 and 1996 International Atomic Energy Agency lists of countries with nuclear research or nuclear power reactors. Three of the forty-four states have not signed the treaty: India, Pakistan, and North Korea. India has formally declared that it will never sign the CTBT because the treaty does not ensure the elimination of all nuclear weapons by a fixed date and because it makes India's signature mandatory.³ It is obvious that negotiation of the CTBT cannot be reopened to bring India on board.

Moreover, Indian and Pakistani nuclear weapon tests in May 1998 have dealt a heavy blow to global efforts to prevent nuclear proliferation and advance the cause of nuclear disarmament. On one hand, the crisis resulting from the nuclear testing in South Asia has made the entry into force of the CTBT much more uncertain; on the other, the significance of the treaty should not be underestimated. It is our common goal to bring the CTBT into force as early as possible.

II. China's Attitude Toward the CTBT Negotiations

A. A Turning Point in the 1980s

As a result of the implementation of an opening-up policy starting in 1978, China began to readjust its policy toward arms control. In the spring of 1980, China formally sent for the first time a delegation to the CD in Geneva.⁴ In the early 1980s, China began putting forward concrete proposals on nuclear arms control. In 1982, China put forth a proposal called "three stops and one reduction" at the Second Special Session on Disarmament of the United Nations. It was proposed that the United States and the Soviet Union should stop testing, improving, and producing nuclear weapons, and should take the lead in reducing drastically their stockpiles of all types of nuclear weapons and means of delivery. During the Cold War, China resolutely opposed the arms race between the two superpowers, and stressed that the key to success in disarmament lay in the positions of the two superpowers—whether they would take real action on their own initiative. In the early 1980s, China, as a newcomer to the CD, assumed a comparatively positive and responsible attitude toward the nuclear test ban. For instance, the Chinese delegation once expressed that it understood the eager desire of non-nuclear-weapon states for the CTB, but that the separation of the nuclear test ban from nuclear disarmament did not contribute to the goal of the CD. China maintained that because the nuclear test ban and nuclear disarmament were interrelated, international peace and security would not derive benefit from a nuclear test ban without a drastic reduction in nuclear weapons. On the contrary, a nuclear test ban alone would only benefit the two superpowers' maintenance of nuclear superiority and their nuclear threats toward other countries.

The readjustment in the nuclear arms policies of the United States and the Soviet Union that was begun in 1985 resulted in the greatest degree of relaxation of the nuclear arms race since the birth of nuclear weapons. Both the United States and the Soviet Union began dismantling and destroying their deployed medium-range and medium- and short-range missiles. Their foreign ministers met frequently and summits were also held for this purpose.⁵ Moreover, the Soviet Union announced on July 26, 1985, that it would unilaterally suspend nuclear tests. Under such circumstances, the United Nations designated 1986 the "International Year of Peace."

When 1986 arrived, China, after several years of carrying out its opening-up policy, wanted to do something in line with this relaxation of international tension. On March 21, 1986, China declared to the world that it “has not conducted nuclear tests in the atmosphere for many years and will no longer conduct atmospheric nuclear tests in the future.”⁶

China meanwhile displayed positive action toward the nuclear test ban issue at the CD. The nuclear test ban had been a priority of the CD ever since China joined the conference in 1980. In the first half of the 1980s, the CD did not resume significant negotiations on nuclear issues after several years of failures to establish relevant subsidiary bodies including the Nuclear Test Ban Ad Hoc Committee. The Chinese delegation held that it was high time for such a state of affairs to be changed. In 1986, the Chinese delegation announced at the CD that “if an ad hoc committee on a nuclear test ban is established this year, the Chinese delegation will participate in its work.”⁷

In an attempt to show its active involvement in the CD’s work, in 1985 China took part in the work of the Ad Hoc Group of Scientific Experts to detect seismic events relating to nuclear test ban verification measures, and expressed its willingness to “reconsider its position” if the Nuclear Test Ban Ad Hoc Committee were to be established that year.⁸ To “reconsider its position” meant that the Chinese delegation would participate in the work of the Ad Hoc Committee. China took a resolute stand on the issue of complete prohibition and thorough destruction of nuclear weapons, however. As a link in the chain of efforts to suspend the nuclear arms race and prevent a nuclear war, a nuclear test ban, which was a relatively easy goal to attain, could be helpful in restraining qualitative improvements in nuclear weapons. Stockpiled nuclear weapons would probably increase, however, if mankind remained at the phase of pursuing a nuclear test ban only and did not resort to a sharp reduction of nuclear weapons. The nuclear arms race would not be stopped and the menace posed by nuclear wars would not be lessened. What the Chinese believed is true and a correct view of arms control and disarmament, especially in the Cold War era. The fact that the United States and the Soviet Union had reached agreements on START I and START II long before the conclusion of a CTBT proved this judgment.

China’s assumption of a positive position on the nuclear test ban in 1985 was significant. The year marked the fortieth anniversary of the founding of the United Nations. China made it clear in 1985, the year of the ox in the Chinese calendar, that it would stand ready to join others in toiling for and reaping a harvest in the CD. Ambassador Qian Jiadong was not aiming to please anyone when he announced that China was willing to “reconsider its position.” It was the need for disarmament shared by all mankind that motivated China to make this announcement.⁹ In fact, the Chinese announcement was made before that of France, which did not agree to participate in the work of the Nuclear Test Ban Ad Hoc Committee until 1992.¹⁰

B. The CD Agenda and China’s Timetable for Concluding the CTBT

Before 1993, the Conference on Disarmament had wrestled for decades with the possibility of negotiating a CTBT. The nuclear-weapon states, specifically the United States, the United Kingdom, and France, had blocked repeated attempts to agree on a negotiating mandate.¹¹ China had never held up negotiations on a comprehensive test ban.¹² On August 10, 1993, the CD made a historic decision to begin CTBT negotiations in January 1994. For the first time in its fifteen-year history, the CD had been given a mandate to negotiate a

nuclear test ban treaty, and all the nuclear-weapon states had made a commitment to engage in the test-ban negotiations.¹³

After conducting a nuclear test (the thirty-ninth of its testing program) on October 5, 1993, China committed itself to a CTBT “no later than 1996” in a statement issued the same day. After conducting another test on June 10, 1994, China reiterated this timetable in the course of the CD negotiations but did not refer to joining the international moratorium.¹⁴ China later repeated on many occasions its commitment to the goal of achieving a CTBT by 1996.

China’s timetable was indeed positive and optimistic. The CD had negotiated for almost twenty years the signing of the Chemical Weapons Convention (CWC) in 1993. China’s timetable happened to coincide with the requirement of the U.S. Congress for a CTBT by September 30, 1996. Before the CD started negotiations, many people believed that this timetable was unrealistic.¹⁵ Beijing expressed that it would have no objection to the original schedule of establishing the treaty by June 1996 and signing it by September. A large majority of participants in the negotiations supported this timetable.¹⁶

It is beyond doubt that China was sincere in its wish to conclude the CTBT as early as possible.¹⁷ In order to keep its promise regarding the timetable, China declared on June 8, 1996, the same day it conducted its last test, that it would suspend nuclear testing after September 1996. China reiterated many times its sincere desire to bring about an early conclusion to the nuclear-test-ban talks. Ambassador Sha Zukang’s statement was proof of this. After India and Iran refused to allow the CD to transmit to the UNGA the Nuclear Test Ban Committee Report even without the treaty text, Sha said on August 22, 1996, “It is the belief of my delegation that continued negotiation on or amendment of this treaty text does not seem to be very practical. Should negotiations be reopened, the intricate and fragile balance of the current treaty provisions might be destroyed.” He signaled a warning: “Worse still, should the situation be mishandled or affected by certain developments in the international situation. ...we might even be pushed further away from the prospect of a CTBT, which has been long cherished by the international community.”¹⁸

C. Testing and Timing

China conducted its first nuclear test in Lop Nor in 1964. Before the CTBT was concluded, China had conducted forty-five nuclear tests, of which twenty-three were atmospheric tests. China carried out all nuclear tests underground after 1981. When the CTBT negotiations began in 1994, the United States had conducted 1,032 nuclear tests, of which 217 were above ground and 815 were underground; Russia (including the former Soviet Union), 715, of which 207 were above ground and 508 were underground; Britain, 45; France, 191; and China, 39.¹⁹ Of the five nuclear powers, China has exercised the most restraint by conducting the fewest nuclear tests.²⁰

The CTBT negotiations caught China in the middle of its nuclear weapons program, whereas the United States, Russia, and Britain had completed several development cycles.²¹ Before China ultimately suspended nuclear testing, it had to exercise the utmost restraint to conduct only limited nuclear tests to ensure the safety and reliability of its nuclear weapons. On October 5, 1993, just prior to the commencement of negotiations in Geneva, China conducted its first nuclear test following the moratorium on testing by other nuclear-weapon states. This was the first nuclear test since the beginning of the CTBT negotiations. The second test occurred on June 10, 1994, in the middle of the second session of the CD. Several other negotiating states, mostly Western non-nuclear-weapon countries, criticized China in

the CD for carrying out nuclear explosions during the negotiations. Remarkably, the non-aligned states had little criticism for China.

China continued nuclear testing in 1995. The first of the two tests in that year took place on May 15, the second on August 17. This brought the total number of tests China had conducted since 1964 to forty-three. Of twenty underground tests, seven were conducted in tunnels and thirteen in vertical shafts. It was logical to assume that the Chinese were traversing the same technical paths that the other nuclear powers had pursued.²²

The May 15, 1995, test inflicted the most political damage on China. The test took place less than forty-eight hours after the end of the Non-Proliferation Treaty Review and Extension Conference. At the conference, all nuclear-weapon states pledged to act with the “utmost restraint” in nuclear testing. China conducted a nuclear test before the delegations departed for their capitals, however, angering the Non Aligned Movement.²³ After the May 1995 event, China carried out three more tests. Each was accompanied by an announcement that China’s restrained testing program was nearing completion.

The year 1996 was the deadline for the CD to make the CTBT open for signature. In 1996, China carried out its last two tests, which were accompanied by announcements containing good news for the CTBT. On June 8, 1996, China announced that it would conduct only one more test for ensuring the safety of its nuclear weapons and that thereafter it would impose a moratorium on nuclear testing, providing a hint that China would be ready to sign a CTBT.²⁴ The test, in the early hours of July 29, 1996, was a masterpiece of political timing. July 29 was the first day of the resumption of negotiations following the tabling of the draft treaty at the end of the second 1996 session. When China made the test public, it also announced the commencement of its moratorium on nuclear testing. That China’s last nuclear test was conducted hours before the resumption of the last negotiating session of the CTBT was a symbolic gesture.

D. China’s Support for the CTBT

Because the Chinese Government had announced that China would “stand for” the conclusion of the CTBT no later than 1996, the Chinese delegation played an active part in the CTBT negotiations in Geneva.²⁵ On July 8, 1996, China declared a moratorium on nuclear testing. As China’s president Jiang Zemin stated, China’s declaration of a moratorium on nuclear explosions from September on “is not only a response to the legitimate demand of the vast number of non-nuclear-weapon states, but also a move to quicken the conclusion of the CTBT.”²⁶

It was difficult for China to declare a moratorium on nuclear testing. The CTBT has direct bearing on China’s fundamental security interests. China’s plan for testing was shortened and cut for the sake of the treaty.²⁷ As is known to all, China has conducted the fewest nuclear tests of the five nuclear-weapon states. China had not intended to join the nuclear arms race and therefore its nuclear weapons are no match for those of the other nuclear-weapon states in terms of quantity and quality. The sudden outbreak of a nuclear war would imperil the survival of mankind because of the existence of huge nuclear arsenals and the first-use policies of the other nuclear-weapon states.²⁸ China was repeatedly subject to nuclear threats and its nuclear weapons are not as advanced as those of the other powers. Moreover, as it is a member of no military alliance, China is not under the protection of any “nuclear umbrella.” Under such circumstances, China took political and security risks to negotiate and conclude a CTBT.²⁹

The following reasons combined to prompt China to make a policy decision in favor of a CTBT:

First, Beijing's leaders thought it necessary to adjust their security policy after the end of the Cold War. In order to adapt itself to a swiftly changing new world, China, they believed, should make greater efforts to promote world peace and development. The ongoing international arms-control negotiations had convinced them that a CTBT, as an important component of nuclear disarmament, was coincident with China's consistent goal of nuclear disarmament.

The initiation and conclusion of a CTBT were closely connected with the changes in the international situation. As more and more countries in the world began to arrive at a common understanding of the keen need for peace, stability, economic development, and social progress, the nuclear superpowers embarked on a path of nuclear arms reduction. Such an international trend made it possible to achieve major progress in the field of arms control and disarmament,³⁰ and was the backdrop for the commencement of the CTBT negotiations.³¹ Accordingly, China began moving ahead in this matter to contribute to world peace and stability.

In addition, Beijing's leaders began supporting the CTBT negotiations because the treaty was consistent with their established policy on complete prohibition and thorough destruction of nuclear weapons. They believed that the CTBT would promote world peace and security by prohibiting the exploding of any nuclear weapon.³² The CTBT is an important step toward the elimination of nuclear weapons: a treaty that bans all nuclear testing will help create an atmosphere favorable for promoting peace and coordination and eventually will push forward nuclear disarmament.³³

Since the end of the Cold War, China has been more active in participating in international efforts to build a peaceful world free of weapons of mass destruction. China has attached great importance to negotiations on arms control and disarmament for promoting peace and security.³⁴ The CTBT negotiations contribute to that goal.

Second, the attitude of the non-nuclear-weapon states, especially the Third World countries, prompted Beijing's leaders to take a more active position on the CTBT negotiations. In international disarmament negotiations, China has always supported rational disarmament proposals initiated by Third World countries.³⁵ For decades it has been a goal of the Third World countries to sign a CTBT. Taking into account its historical friendly relations with them, China had to maintain its image in the Third World countries. China's image as a responsible major power is reportedly increasing.³⁶

Third, economic development has long claimed precedence in China over all other considerations. A peaceful international environment is indispensable for China's rapid economic development.³⁷ As is known, China is still comparatively poor. Economic development across China is unbalanced. Today sixty-five million Chinese still lack adequate food and clothing. The growth of the population has exerted pressure on China to provide more food, employment, education, and resources. National defense is inevitably subordinated to economic development.³⁸ As part of its comprehensive efforts to achieve the stable international environment necessary to its economic development, China has assumed a positive attitude toward the CTBT negotiations.³⁹

Fourth, China supported the CTBT negotiations in part because it had the capability to undertake the obligations of the treaty. China has long assumed a policy of building limited nuclear weapons for the purpose of self-defense only. As explicitly indicated in an official announcement on October 16, 1964, after its first nuclear test, at no time and under no

circumstances will China be the first to use nuclear weapons. The late premier Zhou Enlai wisely suggested that such a policy declaration be made.⁴⁰ Because of its stated no-first-use policy, China does not need to build a large number and variety of nuclear weapons and therefore does not necessarily need to conduct many nuclear tests. This is one more factor that prompted Beijing to assume a positive position on the CTBT negotiations.

The international environment forced China in the mid-1950s to pursue nuclear weapons. China repeatedly faced serious nuclear threats and undisguised nuclear blackmail after its founding.⁴¹ The Chinese Government decided to develop nuclear weapons to maintain minimum retaliation capabilities that would prompt nuclear powers to think twice before taking reckless action against China.⁴²

The Chinese carried out their first nuclear test on October 16, 1964, and their first atomic bomb was dropped from an imported Tu-16 seven months later. On October 27, 1966, they launched a nuclear-armed medium-range missile and detonated the warhead at a height of 569 meters over the impact zone. They simultaneously devoted attention to the design and manufacture of the hydrogen bomb. They conducted a full-yield thermonuclear test on June 17, 1967, only thirty-two months after the first nuclear test.⁴³ China exercised the utmost restraint in its nuclear testing program, conducting the minimum of tests necessary to meet limited requirements. The number of Chinese nuclear tests is only 4 percent of U.S. nuclear tests, fewer than the number of U.S. tests in 1958 alone.⁴⁴

Fifth, massive U.S. and Russian nuclear arsenals had become heavy burdens as a result of significant changes in the international situation. Nuclear reduction is even more expensive than building nuclear weapons. The U.S.-Soviet arms-control negotiations had convinced the Chinese of the correctness of their decision to build a small-scale nuclear arsenal only.⁴⁵ The Chinese are certain that if they conducted more nuclear tests and built a massive nuclear arsenal, they would sooner or later drastically reduce their nuclear weapons at a cost as high as that facing the United States and Russia. Having drawn a lesson from the U.S. and Soviet nuclear buildup, the Chinese began to further deemphasize the need to upgrade their nuclear weapons and therefore enabled the suspension of nuclear tests ahead of the completion of the scheduled testing program.

Sixth, China intended to play a positive role in the CTBT negotiations in pursuit of non-proliferation and a stable regional security environment. As a nuclear-weapon state and a permanent member of the UN Security Council, China opposes the proliferation of all weapons of mass destruction. The need for nonproliferation is widely accepted by the international community. As a regional power in the Asian-Pacific region, China is specially concerned with the security, stability, and development of the region. The CTBT negotiations can function as a significant step to stop nuclear proliferation and thereby promote global and regional stability. China also regards nonproliferation as part of the international efforts to eliminate nuclear weapons.⁴⁶ In this regard, China, as a close neighbor of South Asia, does not want to see tensions and nuclear escalation in that region. China and the whole world would benefit if nuclear-capable countries like India and Pakistan signed the treaty.

Seventh, China would recover its sovereignty over Hong Kong by 1997. The announcement in 1996 of the suspension of nuclear testing and the signing of the CTBT by China may have greatly contributed to world peace and created the right international atmosphere for China's resumption of sovereignty over Hong Kong.

III. Chinese Participation in the CTBT Negotiations

The CTBT negotiations began at the Conference on Disarmament on January 25, 1994, following a resolution passed unanimously in December 1993 by 156 states at the United Nations General Assembly. The historic negotiations ended on August 14 when the CD issued the final treaty text.

Under the instructions of the Chinese Government, the Chinese delegation participated positively in the two-and-a-half year course of the CTBT negotiations in a joint attempt with other parties to conclude the treaty by 1996. The Chinese delegation displayed flexibility and compromise on almost all key provisions of the treaty and made indelible contributions over the entire course of the negotiations in order to ensure the timely conclusion of the treaty. The flexibility of the delegation on critical issues such as security assurances for states parties, peaceful nuclear explosions, and on-site inspection contributed greatly to the progress of the negotiations.⁴⁷

A. China's Position on Major Issues and Its Specific Concerns in the CTBT Negotiations

To a great extent, the CTBT negotiations focused on a “rolling” text of basic treaty language on main provisions. The rolling text contained elements of a draft text of the treaty, with alternative proposals and wording in square brackets. The square brackets would be deleted once consensus was reached. The rolling text was revised over and over again as the negotiations went on.

When the negotiations started in early 1994, the infrastructure of the rolling text was based largely on informal drafts submitted by the Australian and Swedish delegations. By September 1994, the Chinese delegation had made several proposals which were added to the rolling text to be considered by its counterparts at the CD.⁴⁸ The Chinese made proposals with respect to treaty provisions in the Preamble, Verification, Entry into Force, Duration and Withdrawal, Scope, PNE, Amendment, Review, Organizational Structure, and Security Assurances for States Parties sections, as well as their proposed wording. The Chinese delegation attached great importance to the verification regime of the treaty because a good verification system makes a good treaty.

Suggestions of the Chinese delegation on key verification issues such as the goal of verification, the composition of the international monitoring system, the object of challenge on-site inspection, consultation and clarification, the Executive Council decision-making process, the size of the area of a challenge on-site inspection, and aerial inspection were incorporated into the revised version of the chairman's paper issued on August 4, 1994, which was the only “textbook” those in Working Group I of the Nuclear Test Ban Committee would have to read. Starting in late 1994 and continuing into 1995, China proposed more treaty language to the protocol, including with regard to satellite monitoring and the EMP monitoring system. Indeed, the Chinese delegation put forward its stances on many key issues regarding the rolling text at different stages of the negotiations.

1. Structural Outline of the Rolling Text

Some state delegations put on the table at the beginning of the CTBT negotiations proposals concerning the structural outline of the treaty. The Chinese delegation put forward an informal paper, “Suggested CTBT Basic Structure Illustrative List” on February 23, 1994, and it became a formal working paper entitled “Basic Structure of a Comprehensive Test-Ban Treaty”

dated March 30, 1994. In this paper, the Chinese listed all the key elements of a draft treaty, comprising Scope of Prohibition, Definition, Activities not Prohibited under this Treaty, Peaceful Use of Nuclear Energy and Peaceful Nuclear Explosions, Security Assurances for States Parties, Relation to Other International Agreements, etc. The Chinese concept of the outline of the CTBT was somewhat different from those of other countries. For example, they considered “security assurances for states parties,” “PNE,” and “relation to other international agreements” necessary treaty elements that should become articles of a CTBT. Other states in the CD considered it unnecessary to list them as articles of a CTBT.

2. Preamble

The Preamble, which lists disarmament principles and objectives, establishes the overall political context of the treaty. In a September 1994 revision, a rolling text for the Preamble to the treaty was added to the Nuclear Test Ban Committee’s report. Described as a U.S.-Australian-Swedish core with Chinese additions, the draft Preamble contained sixteen paragraphs, most of which were wholly in brackets.⁴⁹ In a working paper entitled “Proposed wording for the Preamble to the CTBT” dated June 20, 1994, China once again urged the adoption of a no-first-use policy, security assurances, and a recognition of the particular responsibilities of the nuclear-weapon states to undertake thorough nuclear disarmament. China attempted to link the CTBT to a prohibition on the first use of nuclear weapons and to a commitment to security assurances for non-nuclear-weapon states. The Chinese delegation explained in its working paper containing the proposal that it considered that, since all parties would agree not to conduct nuclear tests, they should receive security assurances that they would not come under nuclear attack.⁵⁰

While China believed it necessary to have a nuclear test ban, it felt it was more important to commit nuclear powers not to use nuclear weapons, because such a commitment—in addition to making the testing, development, production, and deployment of nuclear weapons meaningless and helping advance the process of nuclear disarmament—would enhance international peace and security.⁵¹ The nonaligned states showed interest in security assurances and a no-first-use treaty. There was little formal support for the Chinese proposal, however, because of a prevailing desire not to link the CTBT to other agreements and issues and to focus the negotiations on nuclear testing.⁵²

In September 1995, the Chinese delegation agreed to replace its proposed text on nuclear disarmament with the relevant reference from the “Principles and Objectives for Nuclear Non-proliferation and Disarmament” adopted by the NPT Review and Extension Conference.⁵³ But it reserved its paragraph on security assurances and no first use.⁵⁴

On the provision of security assurances to the non-nuclear-weapon states (NNWS), China’s position was consistent and well-known. China has stood for an unconditional commitment by all nuclear-weapon states (NWS) not to use or threaten to use nuclear weapons against any NNWS or nuclear-free zone, and not to be the first to use nuclear weapons against others. China has considered it necessary for the NWS to provide security assurances to the NNWS in the form of legally binding international instruments to resolve the inherent imbalance of the NPT.⁵⁵ China has held that agreement on this provision would greatly reduce the danger of nuclear war, enhance security for all states, and create favorable conditions for the acceleration of the nuclear disarmament process.⁵⁶ As another gesture of flexibility, the Chinese delegation later agreed to withdraw from the rolling text its proposed text on “negative security assurances” to non-nuclear-weapon states and mutual no first use of nuclear weapons among the nuclear-weapon states.⁵⁷

In 1996, the Preamble was one of the few areas in which the NNWS still hoped to influence the final text. India tabled a working paper on the Preamble containing five proposals for new or additional language. India wanted a general reference to the relationship between the cessation of testing and nuclear disarmament and made three proposals for the total elimination of nuclear weapons within a “time-bound framework,” “agreed time frame,” and “time-bound process.” The nonaligned nations supported this “time-bound” nuclear disarmament initiative; the NWS rejected it.

In this regard, China’s stance is somewhat different from that of other NWS. China agreed that the complete destruction of nuclear weapons should be advocated in the Preamble.⁵⁸ It held that nuclear disarmament was an issue that the treaty could not evade. China had always stood for the early elimination of all nuclear weapons and regarded the CTBT as a concrete step toward this objective. For this reason, China supported the position of the Group of 21 (G-21, the nonaligned countries) that some language on nuclear disarmament be included in the relevant part of the treaty. The Chinese delegation said that it understood and sympathized with a time-bound framework. Yet China also stated that “[i]n the meantime, we should note that the advent and development of nuclear weapons has undergone a historical process. Likewise, the complete elimination of such weapons also takes time.” The Chinese delegation was of the view, however, that the specific time frame for nuclear disarmament should be settled within the framework of negotiations on a convention banning nuclear weapons.⁵⁹

3. Scope and Basic Obligations

As the backbone of the treaty, the Scope determined what the CTBT would prohibit or permit. In the latter stage of the negotiations, the term “Scope” changed to “Basic Obligations.” The Basic Obligations defined the scope of the treaty, encompassing the core principles of what the CTBT would prohibit or permit.⁶⁰

a. Peaceful nuclear explosions

The issue of peaceful nuclear explosions (PNE) was directly related to the scope of the treaty. The term PNE covered the use of nuclear devices for large excavations, incineration of waste, and so on. In March 1994, China first raised the question of PNE in its paper on the structural outline of a CTBT. It had favored in the past two and a half years of negotiations that the treaty not ban nuclear explosions for peaceful purposes. China held that the treaty should not prohibit PNE, but rather that PNE should be subject to rigorous authorization and verification procedures. Unfortunately, China finally became the only nation at the CD that supported the allowance of PNE.⁶¹

China started its nuclear weapons program later than other nuclear-weapon states. It has conducted extremely limited nuclear tests, and has not had time to start PNE studies. In the early 1980s, the Ministry of Petroleum Industry requested that Chinese nuclear experts probe the application of PNE to oil recovery for increasing the oil output of the Daqing Oil Field. For economic considerations, China did not want PNE to be stopped.

It was stated in a Chinese working paper on PNE that no international legal instrument on nuclear disarmament and nuclear nonproliferation “should obstruct or restrain the development and peaceful uses of science and technology, nor impair the legitimate right of States Parties, the mass of developing countries in particular, to make peaceful use of nuclear energy.”⁶² Moreover, such important agreements in the field of international nonproliferation as the NPT and the Treaty of Tlatelolco “clearly affirm the right to use nuclear explosions for peaceful purposes.” Further grounds were given:

“It is true that PNE have so far only been conducted by the United States and former Soviet Union. It is also true that the experts of these two countries had different assessments on the economic and environmental impact of PNE. But different experts of each country had differences of opinion on PNE even among themselves and these differences are not sufficient to negate the potential technological benefits of PNE or to provide a good ground to ban PNE as a technology.”⁶³

The Chinese pointed out that the exploration of PNE was far from finished and that PNE had extensive prospects for application to purposes that would benefit mankind as a whole.⁶⁴ The Chinese felt that ‘the baby should not be thrown out with the bath water’; as a populous developing country with insufficient per capita energy and mineral resources, “China cannot abandon forever any promising and potentially useful technology that is suited to its economic needs.”⁶⁵

Following a working document entitled “CTBT Article on the Peaceful Use of Nuclear Energy and Peaceful Nuclear Explosions” dated August 23, 1994, the Chinese delegation proposed treaty language on PNE on March 9, 1995.⁶⁶ The two disputed texts in Part 2 of the Scope in the rolling text related to China’s desire to retain the right to conduct nuclear explosions “purely for scientific research or civilian applications.” One deals specifically with PNE, setting out the conditions for preparing and conducting the explosions, and the other underlines the “inalienable right” of states parties to nuclear energy for nonmilitary purposes.⁶⁷

Algeria and Iran had earlier wanted further consideration of the use of PNE, but both states came to the conclusion in the summer of 1994 that these explosions should be prohibited in the treaty, thus leaving China isolated on the issue.⁶⁸ Nevertheless, Russia’s position on PNE was somewhat equivocal. The Russian delegation would neither fight for PNE nor speak out against it and maintained that it would not obstruct consensus on banning PNE. Behind the scenes there was considerable cooperation between officials and scientists from the Russian Ministry of Atomic Energy (Minatom) and Chinese scientists, with Minatom providing extensive data purporting to back China’s claim that PNE could be safe and economically viable for a developing country.⁶⁹

Most states, however, wanted a CTBT to ban all nuclear explosions and would not accept a treaty with any provision for PNE. The non-nuclear-weapon states had made it clear that they wanted nuclear explosions to be comprehensively banned, with no thresholds or exceptions. Some non-nuclear states, including Japan and Canada, were reportedly strongly opposed to inclusion of the term “peaceful explosions” in any form in the treaty text.⁷⁰ The nuclear powers except for China also opposed PNE both in P5 meetings and in the CD negotiations. The main objection to the allowance of peaceful nuclear explosions under a CTBT was the possibility that they could be used to hide a clandestine nuclear weapons testing program.

To counter this fear, China proposed at the outset that PNE only take place under the strictest international control and be carried out only by nuclear-weapon states, although one of these states could conduct a test for another state if needed. Not much attention was paid, however, to the restrictions on PNE set forth by China. On the contrary, the problem with China’s view was that some in the CD held that even if international inspectors could verify that the device was being exploded to create a dam or an irrigation canal (as proposed by Chinese scientists), and even if they could be sure that no detectors were in place to measure sensitive information that could assist in a nuclear weapons program, in the final

analysis the most important piece of information that comes from a nuclear explosion is its yield. Yield is measured by seismic detectors and could serve as a crucial part of a clandestine nuclear weapons testing program.⁷¹

The PNE issue became more complicated when India made an additional proposal on PNE. India proposed adding the phrase “a State party that has conducted a peaceful nuclear explosion” to the rolling text on PNE of China’s textual proposal, thus changing the meaning of the paragraph: that is, not only “a nuclear-weapon State party” but also “a State Party that has conducted a PNE” (like India) would have the right to submit a request to the Executive Council for approval of a PNE.⁷²

Meanwhile, China persisted in its support of PNE. Yet when delegates reached the conclusion that PNE was one of the obstacles to signing the treaty, China made a major move on this issue in early June 1996. China agreed that the CTBT could temporarily ban nuclear explosions for peaceful purposes. It also allowed this issue to be discussed at future treaty review conferences. In its statement to the CD on June 6, 1996, the Chinese delegation said that, recognizing the fact that the CTBT negotiation had reached its final stage and in order to “facilitate the conclusion of the treaty within the time frame” as planned,

“the Chinese delegation is now ready to go along with a temporary ban on PNE. Namely, China can agree to a treaty provision that the possibility of permitting the conduct of PNE shall be considered by the review conference of States Parties. If States Parties agree to permit the conduct of PNE by consensus, the Conference of States Parties shall immediately commence its work with a view to agreeing on arrangement for the possible approval and conduct of such nuclear explosions.”⁷³

By using the wording “by consensus,” China had made it very difficult for PNE to be permitted. Most delegations did not accept this. Consequently, Canada put forward an alternative paragraph under Article VIII on review with additional safeguards, and China accepted it. On June 27, 1996, the Canada-China Compromise Text for Article VIII provision was put forward to be included in the chair’s draft text:

“On the basis of a request by any State Party, the Review Conference shall consider the possibility of permitting the conduct of underground nuclear explosions for peaceful purposes. If the Review Conference decides by consensus that such nuclear explosions may be permitted, it shall commence work without delay, with a view to recommending to State Parties an appropriate amendment to this Treaty that shall preclude any military benefits of such nuclear explosions.”

This is more stringent than the requirements for any other kind of proposed amendment, requiring two stages of consensus: at a Review Conference and again in an Amendment Conference. Nevertheless, it was important for China that “nuclear explosions for peaceful purposes” was included as an issue that could be raised in the future.⁷⁴

b. A ban on any nuclear explosion “that releases nuclear energy”

In early April 1994, the Chinese delegation announced that the CTBT, as a comprehensive treaty, “should ban all forms of nuclear weapon test explosions that release nuclear energy” in order not to grant any leeway for further development and improvement of nuclear weapons. As the delegation stated, the treaty should provide for “a strict scope of prohibition and clear definitions.”⁷⁵ In the document CD/NTB/WP.166, entitled “CTBT’s scope of Prohibi-

tion,” dated August 23, 1994, the Chinese delegation proposed that “[e]ach State Party undertakes to prohibit and not to carry out, at any place or in any environment, any nuclear-weapon test explosion which releases nuclear energy.” The phrase “which releases nuclear energy” soon appeared in the Scope of the rolling text.

The phrase “release of nuclear energy” in the Chinese text was intended to distinguish the scope of the CTBT from that of the PTBT (Partial Test Ban Treaty, 1963) and the TTBT (Threshold Test Ban Treaty, 1974) and to define the scope of the CTBT with more precise and scientific language. The Chinese felt that the scope of the CTBT should exclude any threshold.⁷⁶ They used this phrase to indicate that the CTBT should not become another threshold test ban treaty. Only through effective prohibition of all nuclear weapon test explosions could the improvement of existing nuclear weapons be contained and the objectives of nuclear disarmament and nuclear nonproliferation be promoted. As large stocks of nuclear weapons still exist, this was the realistic balance of rights and obligations between nuclear-weapon states and non-nuclear-weapon states that could be achieved within the framework of the CTBT.⁷⁷

From 1994 to 1995, the P5 conducted real debates on the scope of the CTBT, with a focus on activities not to be prohibited, including hydro-nuclear experiments (HNE).⁷⁸ By early 1995, some nuclear-weapon states had reached a tacit agreement that some form of hydro-nuclear tests could be carried out. As defined by the United States, hydro-nuclear tests are extremely low-yield tests of nuclear devices in which less than 1.8 kg TNT equivalent of explosive energy is released. Other nuclear weapon states were demanding a much higher yield.

Chinese opposition to any fission yield was also intended to obstruct agreement on a low threshold of a few kilograms, however, which it believed would solely benefit the United States.⁷⁹ First, the Chinese felt that the HNE were in fact low-threshold nuclear tests and failure to ban them would undermine the credibility of a comprehensive test ban. Second, allowing HNE would leave countries like China very vulnerable. Some technically advanced nuclear-weapon states could carry out very low-level hydro-nuclear experiments. Other nuclear-weapon states, however, including China, did not have the expertise to carry out such tests. In addition, it would be impossible to make sure that the HNE would stay within a specified yield because such a yield would be below the detection of the international seismic network for verification. Fearing that other nuclear-weapon states could thus continue to carry out their weapon-design programs, China worried that the HNE would widen the technical gap between China and other nuclear-weapon states.⁸⁰ In March 1994, after hearing that HNE would not be considered nuclear explosions per se by Ambassador Stephen Ledogar of the U.S. delegation, Ambassador Hou Zhitong argued at a regular P5 meeting that HNE that would produce a small nuclear yield were indeed nuclear explosions and should be prohibited.

The persistent disagreements among the P5 over permitted thresholds prevented the United States from holding on to its preferred level of a four-pound yield. Britain wanted tests with explosive yields of up to a few hundred pounds. Russia wanted tests up to tens of tons. France wanted tests up to two hundred tons. China’s position reportedly depended on whether the treaty would contain a blast threshold at all. If it did, China would favor relatively large yields to compensate for its perceived lack of technical expertise.⁸¹ The issue of low-yield tests and experiments was resolved when France, in compensation for announcing that it would conduct a series of nuclear tests in the South Pacific, declared on August 10, 1995, that it

wanted a “truly comprehensive prohibition.” The next day, President Clinton committed the United States to a true zero-yield ban on all nuclear explosions.⁸²

The zero-yield decision ruled out low-yield testing and hydro-nuclear experiments resulting in any fission yield. Beijing embraced the decision since zero yield had been China’s position in negotiations.⁸³ Acknowledging the widespread understanding that the phrase “any nuclear weapon test explosion” essentially meant a zero-yield CTBT, China withdrew its proposed language prohibiting “any nuclear weapon test explosion which releases nuclear energy.”⁸⁴ On March 28, 1996, China stated that a “common understanding” had been reached on the phrase “any nuclear weapon test explosion,” so that the CTBT would prohibit, with no threshold, all nuclear weapon test explosions.⁸⁵

4. Verification

The treaty’s verification regime consisted of four basic elements: the International Monitoring System (IMS), consultation and clarification, on-site inspections (OSI), and confidence-building measures. The purpose of the verification regime was to provide at reasonable cost a system for the detection and location of a possible nuclear test. Since no verification regime could provide complete certainty, the aim was to deter cheating with a system credible enough to raise the uncertainties and risks of discovery, and thereby the financial and political costs to any would-be violator. The major areas of contention during the three years of negotiations were: (1) which technologies should be incorporated into the IMS; (2) the role, if any, of national technical means (NTM) or intelligence information; (3) the decision-making procedure and the level of intrusion of the OSI; (4) how much analysis and interpretation should be provided from the international data center (IDC) to states parties; and (5) costs.⁸⁶

The Chinese delegation stressed the importance of the verification regime of the treaty and therefore played an active role in the CTBT negotiations. The Chinese specialists participated in all kinds of expert group meetings on the IMS, the OSI, the IDC, etc.

a. International Monitoring System

As a result of the CTBT negotiations, the International Monitoring System would comprise a network of 50 primary and 120 auxiliary seismological monitoring stations, 80 radionuclide stations, 16 radionuclide laboratories, 60 infrasound (acoustic) stations, and 11 hydro-acoustic stations. China, followed by Pakistan, argued early on that the IMS would be inadequate unless it included networks of satellites and electromagnetic pulse (EMP) sensors. China persisted in this position for a long time. But most states argued that it would be neither necessary nor cost-effective.⁸⁷ Accordingly, the definition of the IMS in the treaty did not include these two techniques.

Satellites and electromagnetic pulse monitoring. The real debate between China and the majority on IMS was over the composition of the system. China, backed by Pakistan, had additionally proposed an international network of satellites and electromagnetic pulse monitoring to ensure coverage of upper atmospheric and space nuclear explosions. By the end of 1994, substantial agreement was reached in the negotiations on an IMS system consisting of networks of four technologies, namely seismic, hydro-acoustic, radionuclide, and infrasound. The Chinese delegation still argued, however, that the IMS should include networks of satellites and EMP sensors, and they insisted on this stance until May 1996.

Satellite monitoring is the most effective, timely, and reliable means of detecting atmospheric and space nuclear explosions.⁸⁸ The EMP monitoring system is also a useful verification technique because of its high sensitivity, precise location, and prompt response. More-

over, none of the four technologies included in an IMS system can effectively monitor nuclear explosions in the upper atmosphere or space. Consequently, the IMS will be incomplete if it depends only on these monitoring techniques, and will be unable to accomplish fully the mission vested in it by the CTBT to monitor nuclear explosions in all environments.⁸⁹ Therefore, the Chinese believed it necessary to include satellites and EMP techniques in the IMS. The Chinese delegation provided detailed technical explanations in various meetings to support its arguments. It also proposed treaty language for the rolling text for these two techniques.⁹⁰

In contrast, most of the states parties considered a CTBT-specific satellite prohibitively expensive and therefore they preferred to rely on existing satellite capabilities.⁹¹ As for the EMP monitoring system, some delegates from Russia and France raised the question that its false-alarm rate might be high because EMP monitoring might be easily interfered with by lightning electromagnetic pulse (LEP). In fact, every monitoring technique has advantages and disadvantages. The problem of false alarms might be solved through some technical means.⁹² As early as 1995, the Americans, believing that four techniques were enough, had decided to exclude EMP and other techniques even if they were useful. The more techniques the IMS included, the more complicated the negotiations would become, and the more time needed to establish the monitoring system. Thus the signing of the treaty would be postponed, let alone its entry into force. For the United States, the sooner this treaty were signed, the better. This was the main reason the IMS failed to include the EMP technologies and satellites.⁹³

Noble gas monitoring. Noble gas monitoring was another source of disagreement between the Chinese delegation and others regarding the IMS. The release of radioactive isotopes of certain gases, notably argon and xenon, is characteristic of nuclear explosions. The on-site experiences in the past have shown that even the most skillfully conducted underground explosions may unpredictably vent these gases. While argon-37 has a half-life of thirty-five days, xenon-133 has a half-life of only five days, and xenon-135 a half-life of nine hours. Investigation must be prompt to detect these gases. While many states maintained that a network of noble gas monitors, co-located with the already agreed-upon sensors for radioactive particles, could increase the chances of picking up this important evidence, China regarded such a network as otiose.⁹⁴

The Chinese delegation had long expressed strong reservations about making noble gas monitoring part of the IMS for monitoring atmospheric radionuclides. First, adding noble gas monitoring would be superfluous since consensus had been reached that atmospheric nuclear explosions could be detected, located, and identified through the detection of radioactive aerosols (particles).

Second, the detection of underground nuclear explosions relies mainly on seismic monitoring. In the case of underground testing, the detection of noble gases would be effective only when a station monitoring noble gases was located close to the test site. But the distribution of the IMS network would not consider this factor at all and would not even know where a possible violator's test site was. Technically, detecting noble gases might be of real significance in the OSI course. According to the report of the OSI expert group submitted in December 1994, an inspection team must have arrived at the test site within two weeks after a nuclear test to detect precisely xenon gas, the most time-critical phenomenon of a nuclear explosion.

Third, the noble gas monitoring system is not in widespread use. This makes the technical effectiveness of the system difficult to judge.

Fourth, the states parties should consider the cost-effectiveness of the noble gas monitoring system. According to the cost estimates made by a nuclear test ban expert group in the CD, adding noble gas monitoring to the atmospheric radionuclide monitoring network would significantly increase the total cost.

Based on these considerations, the Chinese delegation proposed that adding a noble gas monitoring capacity to the atmospheric radionuclide monitoring network not be discussed further until several years after the IMS becomes operational.⁹⁵

However, the United States, Germany, and others urged adding a noble gas monitoring capacity to the atmospheric radionuclide monitoring network, and eventually the IMS included the noble gas monitoring in the treaty language. The Chinese delegation was dissatisfied with the decision and issued the following statement at the last moment: "The treaty has listed noble gas in IMS and stipulated the number of monitoring stations under conditions lacking adequate technical studies and mutual agreement on the relevant technologies."⁹⁶

Monitoring test sites. On January 18, 1996, Russia caused surprise with a proposal that four seismic and radionuclide stations be located at the four operational test sites: Nevada, Lop Nor, Novaya Zemlya, and Moruroa (although with the French decision to close the Pacific Test Site, Russia was prepared to forgo the latter). Russia contended that Novaya Zemlya was monitored more closely than Nevada and Lop Nor, arguing for "identical transparency at the test sites."⁹⁷

Most of the CD members were not prepared for such a contingent proposal because by then the IMS expert group had reached consensus on an IMS without these three stations. China strongly objected to the Russian proposal. The next day, the Chinese delegation demonstrated its displeasure with this proposal at the Nuclear Test Ban Ad Hoc Committee by stating that the Russian proposal presented only Russian views. It was obvious that the essence of the Russian proposal was to set up stations within the international monitoring system specifically for monitoring the test sites of nuclear-weapon states. In line with the negotiation mandate of the Ad Hoc Committee, however, an equal and non-discriminative treaty was to be universal and effective at multiple verification. In terms of the international monitoring system, all future signatories to the treaty should enjoy the right to participate in international monitoring as well as to undertake the obligation to accept international verification on an equal basis. The Russian proposal left the impression that only nuclear-weapon states might be suspected to violate the treaty. In addition, the Chinese delegation asserted that China's nuclear test site was already subject to a monitoring intensity higher than the global average; further enhancing the detection level for China's test site was excessive and unacceptable.⁹⁸

Apparently prompted by political concerns, Russia and China both argued on principle. The Nevada Test Site was reportedly the target of Russian concerns, although Russia had rejected a U.S. offer for bilateral confidence-building measures. With China displeased by increased monitoring at Lop Nor, the debate became deadlocked. The P5 held several meetings in an attempt to resolve the issue among themselves.⁹⁹ The Russian proposal appeared to be an unanticipated problem. The Russian delegation said that the Russian Duma would not approve the treaty if this issue was not solved within IMS. Consequently, both the United States and China sought compromise. The U.S. MINA seismic station (array) and a Chinese three-component seismic station located in Sheshan were added to the IMS. Neither of the two seismic stations is located on its respective country's nuclear test site.

c. International Data Center

Information (data) collected by the IMS would be transmitted to the International Data Center (IDC), an essential part of the Technical Secretariat responsible for data storage and processing. Because the IMS would generate an enormous amount of raw data, the IDC would regularly provide states parties with a number of services designed to help them monitor compliance with the treaty's provisions. Under the treaty, the IDC would also generate standard screened-event bulletins that filter out those events that appear to be of a non-nuclear nature.¹⁰⁰ The data-screening function of the IDC was largely the result of efforts and contributions made by the Chinese delegation.

As is known, the IMS data would amount to hundreds of millions of bytes of computerized information in its raw form, thousands of pages per day. In the negotiations, most states wanted the IDC to send them regular bulletins, although they differed on what these bulletins should cover. It was agreed that the role of the IDC was to provide all states with the information they needed to assess compliance with the treaty, and that all states parties should have equal access to the raw data. However, technology levels of states parties vary, and few have the capacity to analyze raw data regularly or effectively enough to make a correct judgement or to raise doubts and request an inspection. Afraid that conclusions of the IDC could lead to a usurpation of states parties' responsibility to assess compliance, the United States argued that the IDC should only process, compact, and disseminate data.¹⁰¹

In order to make the treaty a just one, China, as a developing country, emphasized the equal rights and equal obligations in the treaty's verification regime, including the IDC. China was the first to raise the question of data screening by the IDC. China suggested that apart from data collection and distribution, the IDC should conduct preliminary data processing and screen all events in accordance with uniform criteria agreed upon by states parties so as to substantially reduce the quantity of normal events. This approach would enable more states parties to be willing to participate in monitoring activities to manage the data received and make necessary judgments. In this way, a just and equitable CTBT verification system could be realized.¹⁰² The Chinese delegation considered this screening process necessary. At the Working Group I meeting on February 14, 1996, the Chinese made a proposal on basic functions of the CTBT/IDC and presented a technically detailed non-paper entitled "Proposed Screening Procedure" for seismic data. They suggested in this paper that the IDC should provide two kinds of events bulletins to states parties according to the criteria and format specified in the IMS Protocol, a Reviewed Events Bulletin (REB) and an Abnormal Events Bulletin (AEB). The Chinese also presented a "Procedure and Criteria for IDC to Screen Radionuclide Monitoring Data" to the working group meeting.

Dr. Ralph Alewine, Friend of the Chair of the IDC for most of 1995 and reappointed in 1996, accepted most of the Chinese proposal regarding "screening." At the end of the first session of the CD of 1996, he issued a working paper in which he itemized a set of eight "core" services and related products of the IDC. Finally, it was described in the treaty that the IDC would regularly provide states parties with integrated lists of all signals picked up by the IMS, as well as standard event lists and bulletins. The IDC would also generate standard screened-event bulletins that would filter out those events that appeared to be of a non-nuclear nature.

d. On-site inspection

On-site inspection means to inspect the area of a suspected event. As an important component of the verification regime, the role of OSI is to provide compelling evidence of viola-

tion—if a violation has occurred—or to dispel suspicion when there has in fact been no violation. As Chinese ambassador Sha Zukang pointed out, OSI was a crucial factor of the “success or failure of the talks on the treaty.”¹⁰³ China paid great attention to this issue because on-site inspections had the potential to be politically sensitive and to infringe on the sovereignty of the inspected state party. On the one hand, the IMS itself would constitute an effective deterrent against treaty violations; on the other, the synergy of different IMS monitoring networks could clarify a considerable number of events. Therefore, OSI should be a rare rather than a routine event, as in the Chemical Weapons Convention. The Chinese delegation held that OSI should be the last resort of the verification system under extreme circumstances only. China proposed that the treaty should provide necessary procedures of consultation and clarification to avoid unnecessary on-site inspections as well as to establish a stringent decision-making process for the Executive Council of the CTBT Organization to review and approve requests for an OSI and to prevent any abuse of the OSI.¹⁰⁴

Trigger mechanism. One of the toughest issues in the CTBT negotiations was the trigger mechanism for on-site inspections. The trigger mechanism involved two key issues: the basis for requesting an OSI and the decision-making procedure of the Executive Council. The Chinese delegation considered it the “most important issue” because it would touch upon the security interests of all states parties and exemplify the principle of equality and justice of the treaty.¹⁰⁵ In this matter there was great divergence between China and the United States. The Western countries, led by the United States, wanted a mechanism capable of quickly triggering such an inspection for the investigation of possible treaty violations. Other countries, particularly Russia, China, and a few nations in the developing world, stressed that OSI was politically highly sensitive and only a more cautious mechanism could prevent possible abuses.¹⁰⁶

In terms of the information basis for triggering an OSI, the Chinese delegation believed that an OSI should only be triggered by monitoring data from the IMS, and not by any data obtained through national technical means or what was termed “any other appropriate information.”¹⁰⁷ Relevant parties all agreed that the data obtained by the IMS set up by the treaty should be taken as the grounds for proposing an OSI. However, Western nations proposed that on-site inspections be initiated also with the use of information obtained through the so-called national technical means (NTM) and what they called “any relevant information.” Third World nations, including China, objected to this, saying that NTM, although they could play a supplementary role, should be restricted, and “relevant information” obtained through hearsay or espionage must be forbidden.¹⁰⁸

Therefore, the role and status of national technical means had become an issue of major controversy. It involved two aspects: Should NTM be included in the CTBT verification provisions? and, Should data obtained from NTM be used as a basis for requesting an OSI? Backed by Britain and France, the United States wanted quick and unimpeded access to any suspect site, demanding that a state party be able to present any kind of information including that obtained through the NTM.¹⁰⁹ As a phrase enshrined in U.S.-Soviet treaties in the Cold War, NTM meant the technical means which belonged to, and were operated by, a state that provided information on the compliance of treaty partners with a given treaty.¹¹⁰ The NTM include imaging satellites, signals intelligence, communication intercepts, state-owned “IMS-type” data, etc. Human and “illegal” intelligence sources including whistleblowers, leaks, and spies might not be verifiable. For reasons of cost and practicality, the IMS had been developed to ensure worldwide detection and identification of explosions down to one kiloton. Many countries agreed with the United States that relevant information from NTM

should be applicable to making an inspection determination because the IMS could not be expected to be infallible, especially in detecting very low-yield explosions.

China, backed by India and Pakistan and several nonaligned G-21 countries, was opposed to any incorporation of NTM.¹¹¹ On the information basis for triggering an OSI, it was the first position of China that only the monitoring data obtained by the IMS be included.¹¹² In June 1995, the G-21 stated: "the judgment by the Organization (regarding OSI) should be based on data received from the IMS. The three main concerns over the inclusion of NTM in the verification regime of the CTBT were: the disparity of technical capability between states (the U.S. and Russia possessing equipment far superior to other states); the possible use of information obtained from spying; and the potential for mischief-making in the triggering of OSI through NTM information."¹¹³

China strongly and repeatedly argued that the IMS, under the supervision of the treaty organization representing all states parties and providing services to all states parties, was relatively objective and just. In comparison, NTM have been controlled and used by individual or small groups of states parties. Indeed, only a small number of developed countries have possessed the NTM suitable for the treaty, and abuses might lead to discrimination against developing countries.¹¹⁴ China asserted that if the NTM were to be incorporated into the international verification or used for triggering OSI, most of the states parties, developing countries in particular, would inevitably be placed in an extremely unequal position because of the selectivity and subjectivity that would be inherent in the use of such means. It would be unacceptable to any country that one country or a number of countries should "take advantage of their exclusive NTM and monopolize international verification in disregard of the IMS with a self-assumed mandate as a world police."¹¹⁵

Although China demanded for quite a long time that verification be provided solely by the international regime without any incorporation of NTM, Beijing began offering some flexibility as the negotiations developed. In a speech on June 6, 1996, Chinese ambassador Sha Zukang argued that IMS data should serve "as the primary basis" for triggering an OSI, but he urged people not to overlook the gap between the capabilities of the IMS and the verification requirements of the treaty due to factors like "financial constraints." In this connection, he stated, "the NTM may have a supplementary role to play."¹¹⁶ He imposed some restrictions on NTM by saying that the NTM data used to trigger an OSI "must be technical, reliable, verifiable, and obtained in consistence with universally accepted principles of international law." Such data should also go through a process of "technical and political examination," although he did not expand on what this meant.¹¹⁷

Decision-making process ("red light" versus "green light"). The Executive Council (EC) of the treaty organization will be responsible for OSI decisions. Borrowing from the CWC negotiations, the alternative decision-making procedures were referred to as "red light," in which an OSI request would be carried out automatically unless the Executive Council countermanded it, and "green light," in which no inspection could go ahead unless specifically authorized by a majority decision of the EC. There was disagreement over whether the decision should be made by a simple majority or by two-thirds or even three-quarters of the EC.¹¹⁸

The United States, backed by most Western delegations, wanted to ensure quick access and collection of time-critical evidence of violation. It advocated a relatively simple decision-making process. Ideally, the United States preferred a red-light process, by which the Technical Secretariat (of the treaty organization) could seek to clarify an anomalous event by sending in an inspection team, unless a majority of the Executive Council decided that an OSI

should not take place. China, India, Pakistan, Russia, Israel, and a number of G-21 countries were more concerned about abusive use of OSI procedures for political harassment or spying on their military facilities. They wanted a much more stringent process in which no inspection could go ahead without the specific authorization of a two-thirds or three-quarters majority of the Executive Council, after it had considered the available evidence as presented by a state party making a formal request for an inspection of another state party (the green-light process).¹¹⁹

As early as August 1, 1994, the Chinese delegation proposed a two-thirds majority for the EC's OSI procedures. The Chinese delegation believed that in light of the importance and high political sensitivity of OSI and the serious damage that could result from its abuse, OSI must be treated with caution and an inspection able to be triggered only after the EC approved the request for the OSI by a two-thirds majority of all its members.¹²⁰ In 1995, the United States proposed that an OSI could be conducted in two stages or phases: the first stage would take place automatically, unless there was a red light, while the second phase could be either red or green. In an attempt to provide a compromise option, France suggested that an OSI request based solely on national technical means should be subject to a green-light process, whereas a request using international data should go ahead automatically unless stopped by a red-light decision.¹²¹

China favored the idea that each phase should be subject to a separate green-light decision, and further argued that "triggering OSI through an automatic or simplified procedure will make OSI vulnerable to possible abuse, which is the reason why China, together with many other countries, opposes this idea." For an OSI request with verifiable and convincing evidence, the Chinese argued, the requesting state party should not worry about approval of its "reasonable request" by a two-thirds majority of EC members.¹²²

During the second 1996 session of the CD, China and Pakistan continued to press for a two-thirds majority, which the United States categorically rejected. China had taken a more adversarial position, resisting what it regarded as unnecessary or dangerous intrusion by the United States and its allies.¹²³ The "red light" versus "green light" issue would be the final compromise of the treaty negotiations. More detail of this will follow in a later section.

5. Entry into Force

The CTBT should enter into force 180 days after the forty-four states named in Annex 2 of the treaty deposit instruments of ratification, but not less than two years after the treaty was opened for signature.¹²⁴ Under Article XIV, the CTBT will not enter into force until it has been signed and ratified by forty-four states—including the five nuclear-weapon states (the United States, Russia, Britain, France, and China) and the three "threshold states" (India, Israel, and Pakistan)—listed by name in Annex 2. The forty-four states, all participating members of the CD, possess nuclear power and research reactors as determined by the IAEA.¹²⁵

The entry-into-force (EIF) requirements were a subject of dispute in the CTBT negotiations, especially in the last few months. No one disagreed that all five nuclear-weapon states should have to ratify the treaty before it entered into force. The dispute was over whether the three "threshold" states—India, Israel, and Pakistan, those states believed to have the technological capability to manufacture nuclear weapons but under no treaty obligations not to do so—should have to ratify the treaty before it could enter into force.¹²⁶

Several different formulae for entry into force had been proposed or backed during the negotiations. For example, ratification by forty countries including all the P5 (Sweden); by all expanded members of the CD (France and Britain); by those sixty-eight states on the IAEA

list having nuclear reactors or nuclear research programs (Russia). The United States earlier considered entry into force to be subject to a minimum condition of ratification by the five nuclear-weapon states. The most popular proposal, however, was ratification by the list of sixty-eight states identified by the IAEA. The United States, which feared that this would give too many states the power to hold the treaty hostage, preferred limiting the specific requirement to the P5 plus a number such as forty or sixty-five. The United States also had a proposal for 90 or 95 percent of the list.¹²⁷

The political challenge of entry into force was to balance universality with early implementation. In particular, Russia, Britain, China, Pakistan, and Egypt made clear their requirement that all nuclear-test capable states (assumed to be the P5, India, Israel, and Pakistan) should accede to the treaty before its entry into full legal force.¹²⁸

The Chinese delegation had always adhered to the CTBT's two main objectives: the promotion of nuclear disarmament and the prevention of nuclear proliferation. These two objectives are closely linked and equally important, and neither should be emphasized at the expense of the other. The accession of all nuclear-capable states to the treaty should be the legal guarantee for the realization of the two objectives. As early as June 20, 1994, China proposed in its working paper entitled "Entry into Force of the CTBT" that the EIF requirement be ratification by all CD member states and by all nuclear-test-capable states identified by the IAEA.¹²⁹

In September 1995, China dropped its requirement that all CD member states ratify the treaty and favored the IAEA list. Under the EIF article, the Chinese delegation withdrew its proposed text stipulating that the participation of all CD members was to be a condition of the entry into force of the CTBT, supporting instead the formula that the CTBT should enter into force after the deposit of instruments of ratification by all nuclear-capable states as specified in the relevant IAEA list. China emphasized that the treaty would enter into force only under the condition that all those countries capable of conducting nuclear tests joined the treaty; otherwise, the Chinese would question what kind of significance the treaty would have for them in the end.

Moreover, in terms of EIF provisions, China could not accept a kind of political discrimination against the five nuclear-weapon states. It stressed that it could not agree to confining the conditions for the treaty's entry into force to ratification by the P5 only. From the perspective of political equality, it would be inappropriate to single out the P5.¹³⁰

Nevertheless, faced with a seemingly non-negotiable demand by Britain, China, and Russia (as well as Pakistan and Egypt) for a provision that would bind the "five plus three" declared and undeclared nuclear-weapon states, few seemed prepared to challenge this in the final stage of negotiations. On June 20, 1996, India conveyed an unmistakable warning that it was preparing to exercise its veto unless the entry-into-force provision were made less specific.¹³¹ India and some other nonaligned countries did try to reopen negotiations on the Preamble and Entry into Force of the chair's "final text" of June 28, but were told that negotiations were closed.

B. China in 1996: Meeting the Deadline

At the beginning of 1996, the Nuclear Test Ban Ad Hoc Committee had a new chair, Jaap Ramaker, the experienced Netherlands ambassador. There were about 1,200 brackets of disputed language, concepts, and punctuation in the rolling text when the Nuclear Test Ban Committee began work in January. Many belonged to China. Starting in early 1996, the

weekly meetings of the P5 assumed greater prominence as the delegates attempted to thrash out the difficult issues between them, such as the treaty's scope, PNE, verification (especially on-site inspections), and entry into force, in order to meet the deadline of concluding a CTBT in 1996 as called for in UN General Assembly resolution 50/65 adopted by consensus on December 12, 1995. Before bringing a specific issue to the CD, the P5 usually reached consensus or a degree of agreement on it. China, like other states, began to make compromises one by one on many issues both in the CD and the P5 meetings. Of course, the Chinese delegation made it clear that all parties concerned should show flexibility and continue to work with a serious and responsible attitude to push the talks ahead.¹³² China was not willing to make unilateral compromises. As the delegation stated, "No country can impose its will on China under any circumstances."¹³³

1. Key Compromises

China had shown great flexibility, especially in 1996, on several major issues in the CTBT negotiations.¹³⁴ The Chinese delegation put forward numerous proposals from 1994 to 1995 on many issues in the rolling text. Only a few of its original treaty-language proposals had been left in the treaty. Late in the negotiations, the Chinese delegation made important contributions to the progress of the negotiations by demonstrating great flexibility on major issues such as security assurances for states parties, PNE, and OSI.¹³⁵

The CD could hardly make substantial progress if it could not solve the problem of the scope of the treaty. In this regard, the proposal put forward by the Chinese delegation at the outset of the negotiations to prohibit any nuclear weapon test explosion that would release nuclear energy posed an obstacle because of the phrase "release of nuclear energy." The Chinese delegation withdrew this phrase in March 1996 after a shared understanding was reflected in the Scope that the CTBT would, with no threshold, prohibit all test explosions.

It was not until May 1996 that China indicated that it was prepared to be flexible over the issue of peaceful nuclear explosions.¹³⁶ On June 6 China made a number of significant compromises. The most important was its agreement to go along with a temporary ban on PNE. China relaxed its demand that PNE be permitted in exchange for the assurance that such explosions could be reviewed at periodic review conferences, although Chinese officials acknowledged that such reviews were unlikely to lead to revisions of the prohibition.¹³⁷ At the same time, China also demonstrated flexibility on verification issues, such as satellite and EMP monitoring proposals that had long been insisted on by the Chinese delegation. China stated that, taking into account the discussions held in the preceding two years, it was "reviewing its position on such remaining issues," hinting that it might consider giving them up.¹³⁸

The Chinese delegation dropped other proposals from the rolling text. With the support of some nonaligned countries, China initially intended to include language in the treaty related to "no first use," the "complete prohibition and thorough destruction of nuclear weapons," and universal security assurances to non-nuclear-weapon states. As one more gesture of flexibility, China now withdrew its proposed text on "no first use" and "negative security assurances to non-nuclear-weapon states."

To sum up, China showed varying degrees of compromise and flexibility on almost every important issue in the treaty in order to facilitate its scheduled conclusion:

- On the scope of the treaty, China dropped the phrase "release of nuclear energy," and agreed to ban "any other nuclear explosion" besides test explosions of nuclear weapons.

- On the issue of peaceful nuclear explosions, China respected the position of other countries and agreed to ban PNE temporarily.
- On the issue of a declaration by nuclear-weapon states that they would not be the first to use nuclear weapons against one another and not use or threaten to use nuclear weapons against non-nuclear-weapon states and nuclear-weapon-free zones, China withdrew its relevant textual proposals. China also dropped its textual proposals on the “peaceful use of nuclear energy” and “relation to other international agreements.”
- On the issue of the IMS, China withdrew its proposal to incorporate EMP and satellite monitoring networks into the system. The Chinese delegation also showed great flexibility on OSI-related issues, such as consultations and clarification before OSI, purpose, timelines, preparations, inspection plans, technical methods, and the size of inspection areas. On the access regime of OSI, China accepted the right of authorized inspection teams to conduct overflights over the inspection areas.
- On the issue of national technical means, China had consistently opposed over the preceding two years allowing NTM to play a role in the CTBT verification regime, particularly in the triggering of OSI. In a drastic adjustment of its position, China displayed flexibility by allowing purely technical NTM to play a supplementary role in the triggering of OSI. In the U.S.-China trade-off, China’s agreement to the role of technical NTM in triggering an OSI was a remarkable compromise.¹³⁹

2. The U.S.-China Trade-off in the End Game

On June 28, 1996, the last day of the second session, Ramaker tabled his revised version of the May 28 chair’s text to indicate to the Nuclear Test Ban Ad Hoc Committee that negotiations had been concluded. Some countries, including China, objected to this move. On that very day, the Chinese delegation offered a preliminary response to the “final text” of June 28. It stated that the chairman’s text did “not reflect China’s positions on some important issues,” such as the basis for OSI and the decision-making procedure of the Executive Council on OSI. “[U]nsatisfied with this,” the Chinese delegation would put forward its own amendments to the chairman’s text.¹⁴⁰

The Chinese held that a cautious attitude toward the CTBT negotiations was necessary since the treaty would bear heavily on the security interests of all future states parties. They stressed that “we have no ground and no authority to make a hasty and arbitrary decision to end the negotiations” prematurely, when divergent views still existed on some major issues. The negotiations should be resumed at the outset of the coming session, the Chinese maintained. They stressed that such decisions as the format of negotiations and the timing of their end could be made only by consensus of all the sovereign participating states. At the June 28 meeting, the twenty-eight nonaligned countries in the CD (originally the G-21), especially India, Pakistan, Iran, and Mexico, also challenged the chairman’s declaration that negotiations were concluded that day.

In early July 1996, however, the Clinton administration decided to support Ramaker’s text as it was. The Americans hoped to discourage any further negotiations, which they feared could cause the treaty to unravel. The United States then secured public declarations of support for the draft treaty from Britain, France, Russia, Indonesia, and others.¹⁴¹

Because of their “treaty-breaking” importance for the United States and China, the issues related to OSI and NTM had become the main focus of the P5’s sidebar meetings beginning with the second CD session of 1996. China asserted that its flexibility and compromise would

stop at matters concerning its fundamental national security interests, and “OSI is a key one.”¹⁴² For the United States, the issue of NTM was “treaty breaking,” as U.S. ambassador Ledogar repeated over and over.

There was a one-month break between the second and third sessions. Ambassador Sha Zukang stated on June 28 that the Chinese Government would put forward its amendments to the chairman’s text in the interest of “safeguarding its own legitimate security interests and other countries’ concerns on relevant issues.” Both U.S. president Clinton and China’s president Jiang Zemin decided to intervene in the matter. On July 12, Jiang wrote a letter to President Clinton in response to Clinton’s letters “dated respectively 26 June and 8 July” on the Comprehensive Test Ban Treaty. Jiang stated that frequent correspondence between the leaders of China and the United States on issues relating to the treaty “helps deepen mutual understanding and also gives full expression to the good bilateral cooperation on major international issues.” Jiang raised the question of OSI in his letter: “I am afraid that China and the U.S. still have some differences over the trigger basis and decision-making procedure of on-site inspections.” He continued: “It is my hope that the two sides can reach agreement on this matter prior to the resumption of the Conference on Disarmament on 29 July with a view to avoiding the reopening of talks on the chairman’s text during the resumed meeting and to facilitating the signing of a CTBT within this year.”

The message of Jiang’s letter was that top Chinese leaders were seriously concerning themselves with this issue. The U.S. side soon responded to Jiang’s suggestion but remained opposed to revision of the chairman’s treaty text. The U.S. side proposed, however, that U.S.-China bilateral talks be held in Geneva before the resumption of the CD meetings in late July.

The atmosphere was tense when the CD resumed negotiations on July 29. Of the representatives of twenty-seven countries who made speeches to the Ad Hoc Committee, only six expressed dissatisfaction with the chairman’s text, and China was one of them. China became the focus of concerns in the CD. Despite U.S. assertions that Ramaker’s June 28 text must not be reopened, the United States found it necessary to negotiate with China over OSI. In June, Britain, France, and Russia indicated in the intensive P5 negotiations over a package of agreements that they were willing to go along with a “green light” process requiring approval by three-fifths of the Executive Council members, which China was also prepared to accept. The United States at first refused to go beyond the simple majority in Ramaker’s draft. After China rejected this provision in the June 28 draft, however, intensive bilateral U.S.-Chinese discussions took place in the first weeks of August. Chinese ambassador Sha Zukang made it clear in the discussions that China would be unable to sign the treaty without this concession. Obviously, there would be no treaty if China did not sign. When China’s signature appeared to be uncertain, the United States, under pressure from the other nuclear-weapon states, finally agreed that authorization of an OSI would require “at least thirty affirmative votes” of the 51-member council. In return, China agreed to allow information from technical NTM as the basis for triggering an OSI.¹⁴³ But the Chinese stressed that the NTM information used must be “truly technical, verifiable, and substantial.”¹⁴⁴ The only substantive amendment to the June 28 text was thus made. At that point the chair’s working paper CD/NTB/WP.330/Rev.2 finalized the treaty.

The United States also made a commitment to China regarding possible abuse of verification. As U.S. secretary of state Warren Christopher expressed in his letter to vice premier of the State Council and minister of foreign affairs Qian Qichen, dated September 20, 1996, the United States understood China’s concern on NTM and was committed to compliance by all parties to the CTBT with these CTBT provisions against possible abuse.

IV. Conclusion

For China, gains and losses balanced one another in the CTBT negotiations. China had demonstrated that it, as a peace-loving country, had contributed to world peace. Signing the CTBT would be in the interests of China and the rest of the world. In concluding the CTBT, the international arms-control community has achieved success. However, the people of the world agree that the test ban is only the beginning, not the end, of the disarmament process. There is much more work ahead to be done.

A. China's Evaluation of the Final Text of the CTBT

Although India refused to allow the treaty text to be attached in any way to the Nuclear Test Ban Committee report and further blocked transmission of the report to the United Nations General Assembly, the August 14, 1996, treaty text (Working Paper 330/Rev.2) is the final CTBT text. Australia decided on August 22 to take it directly to a resumed session of the 51st UNGA. On September 9, with 127 co-sponsors, Australia formally proposed in resolution A/50/L.78 that the UNGA adopt the CTBT as finalized in Geneva.¹⁴⁵

In general, China accepted the final CTBT text, although some dissatisfaction remained. In a statement following the adoption of the treaty, Sha Zukang, the Chinese disarmament ambassador, pointed out that the CTBT text "represents the results" of the CD negotiations over the preceding two and a half years, "basically embodies" the actual conditions of the negotiations, and "is balanced as a whole." He also pointed out, however, that the text of the treaty was not entirely satisfactory, because it did not reflect the legitimate demands and rational proposals of many developing countries, including China. The following are the main points of the treaty text that are unsatisfactory to China:

First, the CTBT treaty text does not contain a commitment by the nuclear-weapon states not to be the first to use nuclear weapons as well as not to use or threaten to use nuclear weapons against non-nuclear weapon countries and nuclear-free zones. China holds that the Preamble of the treaty should reflect, as much as possible, the common desire of the international community and should point out that the international community should continue to work to realize the above objectives after concluding the CTBT.

Second, on the issue of triggering on-site inspections, the CTBT treaty text puts the international monitoring system on a par with national technical means, failing to make the necessary distinction between the positions of the two. That is to say, it fails to make a distinction between the data and information acquired for verification from the international monitoring system and those from NTM. Only a small number of countries possess advanced technical means; therefore, a high degree of subjectivity and discrimination exists in the use of such means, and this may lead to abuse or the erroneous use of the right to conduct an OSI.

Third, the stipulations in the CTBT treaty text regarding the procedures for examination and approval of an OSI are not entirely rational. Because of its politically confrontational and highly sensitive nature, the Chinese believe that OSI, as a last and exceptional resort for verification of the treaty, is the CTBT's most substantial obligation. It should be stipulated that an OSI request must be approved by a two-thirds majority of all Executive Council members. The Chinese delegations's eventual acceptance of the condition that an OSI must be approved by "at least thirty affirmative votes of members of the Executive Council" was a gesture of flexibility.¹⁴⁶ The council has fifty-one members.

Fourth, the CTBT treaty uses financial contributions to the treaty organization as one of the criteria for the election of EC members. This sets a bad precedent for a multilateral treaty organization.

Fifth, the CTBT treaty text includes noble gas monitoring with a network of monitoring stations. However, insufficient technical proof is available and no technical consensus on this network has been reached.¹⁴⁷

B. Impact of the CTBT on China

1. China's Sacrifices for the CTBT

The obligations assumed by states signatories under the treaty will have an impact—in a variety of ways—upon their fundamental security interests.¹⁴⁸ As mentioned above, China is the country that has paid the highest price for the CTBT because the treaty negotiations caught China in the middle of its nuclear weapon program.¹⁴⁹ A CTB will impose severe limitations on any further modernization of the Chinese nuclear arsenal.¹⁵⁰ For China, it would have been better to have at least a few more tests to acquire the experience required to better ensure the reliability and safety of its nuclear weapons. As is known, the development of China's nuclear weapons has lagged far behind that of other nuclear-weapon states. China has conducted a total of only forty-six tests. From a purely technical perspective, China needs to conduct more nuclear tests. In order to achieve the goal of complete prohibition and thorough destruction of nuclear weapons, however, China decided, at some sacrifice, to support the international negotiations and signing of the CTBT.

China's peaceful foreign policy has both a deep-rooted historical background and a realistic basis. Understanding this fact is indispensable for understanding China's position on arms-control issues (including the CTBT). China has suffered foreign invasion and oppression over the past 100-plus years. These bitter experiences have inevitably led the Chinese people to attach great importance to safeguarding their national security, sovereignty, and territorial integrity. As the ancient Chinese philosopher Confucius said, "Do not do to others whatever you would not like them to do to you." China has also attached great importance to safeguarding the security, sovereignty, and territorial integrity of other nations.

China's establishment of the policy of reform, opening to the outside world, and economic development as its central mission has dictated its need for a peaceful and secure international environment. The relaxation of international tension after the conclusion of the Cold War makes possible the development of China's economy in such an environment. This is the realistic basis of China's peaceful foreign policy. The establishment of China's position on arms control (including the CTBT) is designed to help preserve world peace and security by reducing and eliminating the threat of a large-scale war and especially a nuclear war. For China, preserving world peace and safeguarding national security are one and the same goal.¹⁵¹

2. Technical Impact

The Preamble of the CTBT recognizes that a comprehensive test ban will constitute an effective measure of nuclear disarmament and nonproliferation by "constraining the development and qualitative improvement of nuclear weapons and ending the development of advanced new types of nuclear weapons." The most direct consequence of the CTB is its role in preventing the development of new-type nuclear weapons by both the nuclear-weapon states and threshold states. The treaty will have a significant impact on eight states: the five de-

clared nuclear-weapon states and the three threshold states (India, Israel, and Pakistan).¹⁵² The experiences of Israel and South Africa have suggested that technically capable states can develop first-generation fission bombs without a test. The further development of more sophisticated fission and thermonuclear weapons, however, requires nuclear testing.¹⁵³ For China, like other nuclear states, the CTBT will inevitably impede its nuclear weapon development. It will also have an impact on China's efforts to ensure the safety and reliability of its very limited nuclear stockpile.

The impact of the CTBT upon the nuclear arsenals of the nuclear-weapon states is a matter of consequence. Whether safety and reliability can be accomplished in other ways will be the subject of debate for many years to come. The United States now has high confidence in the safety, reliability, and performance margins of the nuclear weapons that are designated to remain in the enduring stockpile. U.S. confidence is based on the experience and analysis of more than one thousand nuclear tests conducted over the past fifty-plus years, including the results of approximately 150 nuclear tests on new-type weapons conducted in the past twenty years.¹⁵⁴

China has conducted only about 2 percent of the total nuclear tests ever conducted in the world. To complete its nuclear weapon program, China should have conducted more tests.¹⁵⁵ Yet it ceased nuclear testing and signed the CTBT in 1996. It is thus logical to assume that China did not have enough opportunities to devote its nuclear testing to the enhancement of its nuclear weapons' safety and reliability. Under the CTBT, the technical gap between China and the other nuclear powers is forever frozen.

Under the CTBT, the nuclear-weapon states have to maintain their nuclear stockpiles without testing. China must try even harder than other nuclear powers to ensure the safety and reliability of its nuclear weapons because of the small number of tests it has conducted. In addition, other nuclear powers have done considerable work in preparation for a nuclear test ban, including computational simulation initiated years ago. They have acquired from their experience a rich store of knowledge to ensure the safety and reliability of their nuclear weapons. Whatever gaps already exist between China and other nuclear powers, such as computational simulation and experimental capabilities, may well be perpetuated into the future. These gaps will be aggravated by the advanced technologies and financial resources committed by the other nuclear powers to such activities. Therefore, the CTBT will have a far greater impact on China and will make it more difficult for China to maintain its nuclear weapon establishment.

C. China after the CTBT

1. Preparing for Entry into Force

Since September 1996, China has become active in preparation for the entry of the CTBT into force. The Preparatory Commission (PrepCom), which is located in Vienna and meets at regular intervals, has the status of an international organization. It comprises two bodies: a plenary body composed of all signatory states and the Provisional Technical Secretariat (PTS) headed by the executive secretary. The mandate of the Preparatory Commission is to ensure that the verification regime of the treaty is operational at the time of entry into force. It will do so by building up the network of monitoring stations and by establishing the International Data Center.¹⁵⁶ The first PrepCom met from November 20 to 22, 1996, and met again in March 1997. The March meeting appointed the executive secretary for the PTS and estab-

lished working groups on technical and legal matters. The second PrepCom meeting was held May 12–16, 1997, to make preparations for implementing the treaty such as financial and staff regulations, rules of procedure, and on-site inspection processes, and to make progress on completing the International Monitoring System and the IDC. The third and fourth meetings were held in 1997 and more will be held in the coming years. Parallel to the PrepCom meetings are ongoing discussions by the two working groups. China has actively participated in all these PrepCom-related meetings and has been making joint efforts with other nations to facilitate the process of the entry into force of the treaty.

In preparation for the implementation of the CTBT, China has made great domestic efforts regarding every aspect of the treaty's entry into force. For instance, in order to cooperate with the IMS network, China has dedicated its IMS-related stations, including seismic, radionuclide, and infrasound stations, to be prepared for participation in the IMS network. China has been participating in the GSETT-III experiment which began testing in January 1995 and is intended to develop and test the concepts for an International Seismic Monitoring System (ISMS), with a specially designed seismographic network and a modern communication system feeding continuous data to a single centralized IDC.¹⁵⁷

According to Annex 1 to the Protocol of the CTBT treaty, there will be two seismological IMS stations (primary network) in China, located in Hailar and Lanzhou. In addition, four auxiliary network seismic stations, in Baijiatuan (in Beijing), Kunming, Sheshan, and Xi'an, will join the IMS. The three radionuclide stations in Beijing, Lanzhou, and Guangzhou will also join the IMS. A radionuclide laboratory in Beijing will join the IMS network (altogether there are sixteen of its type in the world). The IMS network will include two infrasound stations in Beijing and Kunming.

2. China Needs a Small-scale "Stockpile Stewardship"

Under the CTBT, the P5 states must ensure the safety and reliability of their nuclear weapons by making use of computation and scientific research. The United States and Russia have declared that they are prepared to withdraw from the CTBT under the standard "supreme national interests" if they are unable to ensure safety and reliability without testing. So long as nuclear weapons exist in the world, it is critical to ensure their safety. The safety of nuclear weapons involves the security interests of the nuclear-weapon states as well as those of other countries and the entire international community.

After they agreed with the zero-yield CTBT, some nuclear-weapon states emphasized the importance of strengthening research and skills in alternative activities including laboratory testing and simulations. The United States has a \$4 billion plan for the "science-based stockpile stewardship (SBSS)" program. The SBSS includes a planned program to use the Nevada Test Site for "subcritical" tests. The United States conducted three "subcritical experiments" from 1997 to 1998 to study the behavior of plutonium under pressures generated by explosives, and more experiments are planned.¹⁵⁸

The SBSS operates three major experimental facilities, the National Ignition Facility (NIF) and the Contained Firing Facility (both at Lawrence Livermore National Laboratory), and the DARHT, a double-axis, core-punching dynamic radiography facility to supplement the single-arm, single-pulse FXR and PHERMEX which already exist and the ASCI machines. There is also the Atlas Facility at Los Alamos National Laboratory to downsize existing weapons industrial plants and reestablish at Los Alamos the capability to manufacture plutonium components for nuclear weapons. The Senate included an amendment to the START II resolution of ratification on December 22, 1995, expressing the U.S. commitment to "ensur-

ing the safety, reliability, and performance of its nuclear forces.” Specific commitments include developing a robust stockpile stewardship program, sustaining nuclear weapons production capacity, maintaining the weapons labs, providing for tritium production, maintaining the Nevada Test Site, and reserving the right to resume testing if needed.

Russia spoke of stockpile management in terms almost identical to those of the United States after accepting the zero-yield decision in May 1996. Russia reportedly has plans for conducting “subcritical experiments” as well.¹⁵⁹ Russia has stated that when the CTBT treaty enters into force it will engage in activities related to nuclear stockpile maintenance and take the following measures:

- Adoption and implementation of a federal program of activities aimed at ensuring the safety and reliability of the Russian nuclear arsenal without conducting nuclear explosions.
- Continued support to existing Russian nuclear centers and the implementation of programs in the field of theoretic and nuclear technology research activities, which would ensure the maintenance of the scientific and technological potential and the high level of qualification of the scientists, designers, and employees of those centers.
- The upkeep of the basic potential for the renewal of test explosion activities in case the world situation develops in such a way that the Russian Federation will cease to be bound by the restraints contained in the treaty.
- The continuation of activities aimed at improving Russian capabilities in monitoring the nuclear test ban.
- Further improvement of information-gathering and analytical means, including intelligence means, in order to ensure the collection of reliable and timely information and data on nuclear arsenals and possible concealed development of nuclear activities or other activities conducted by third countries that could be relevant for nuclear weapons purposes.¹⁶⁰

The French case is similar. France is building its own ignition facility for ICF, the Laser Megajoule near Bordeaux, and has begun construction on a DARHT-style facility for conducting hydrodynamic experiments, known as AIRIX.¹⁶¹

Having signed the CTBT, China, like other NWS, needs to adopt non-nuclear-explosion means for ensuring the safety and reliability of its nuclear weapons. It might be assumed that the P5 states will follow the same technological path for ensuring the safety and reliability of nuclear weapons. Of course, if it decides to adopt such a program China’s “stockpile stewardship” will certainly be much smaller than that of the United States and Russia because its nuclear stockpile is much smaller than theirs. In addition, China’s economic size and technical capacity are no match for those of other NWS. The wisdom and creativity of Chinese nuclear scientists are not open to doubt, however.¹⁶² Chinese nuclear scientists will surely apply their talent to ensuring the safety and reliability of China’s nuclear weapons, and therefore its small-scale stockpile stewardship will no doubt be cost-effective.

Because of its limited nuclear testing and in part because of its policy of self-reliance and its economic limitations, China is facing a greater challenge than other NWS to ensure the safety and reliability of its nuclear weapons. The United States has cooperative stewardship with some NWS. For example, the close U.S.-British cooperation in nuclear weapon programs can be traced back to World War II. U.S.-French cooperation dates from the early 1970s. On June 4, 1996, France and the United States signed a secret agreement to share information to

aid each other in stewardship. For instance, France will get data from past U.S. nuclear tests and computational simulations; the United States will have access to a new French laser facility.¹⁶³ The 1997 U.S. Defense Authorization Act forbids cooperation on stockpile stewardship with both Russia and China.

Located in Mianyang City, Sichuan Province, the China Academy of Engineering Physics (CAEP) is responsible for ensuring the safety and reliability of Chinese nuclear weapons.¹⁶⁴ Eight of CAEP's ten research institutes are located in Mianyang, one is in Beijing, and the other is in Shanghai. Of the ten research facilities, five are listed as key national laboratories. Of the five, three are in Mianyang, one is in Beijing, and the other is in Shanghai. The laboratory in Shanghai is the Institute for High Power Laser Physics and Technology (under the joint administration of the CAEP and the Chinese Academy of Sciences). Another even larger high-power laser is being built in Shanghai.¹⁶⁵

Since the conclusion of the CTBT, one of the CAEP's three major missions has shifted from China's nuclear weapons program to maintenance of the safety, reliability, and effectiveness of the nation's nuclear arsenal.¹⁶⁶ The CAEP has accorded top priority to this mission before complete elimination of nuclear weapons in the world. In terms of the SBSS, CAEP's president, Hu Side, has said that the Chinese have studied U.S. SBSS. The Chinese believe that "it is necessary for the United States to work on SBSS." "China itself has begun studies on this issue but not figured out a research plan for that," he continued. "China will find a less expensive method if it decides to work on a kind of SBSS." President Hu did not believe that SBSS-related activities could be used to design new-type weapons: "I don't believe that American scientists will take a chance to design new-type weapons by bypassing nuclear testing." "Because U.S. nuclear weapons have reached a very high level," he added.

3. Future Arms-Control and Disarmament Negotiations

The CTBT bans nuclear explosions only. It is not a treaty by which the nuclear-weapon states agree to give up nuclear weapons, reduce their numbers, or even stop their development.¹⁶⁷ The conclusion of the CTBT is only a step in the process of comprehensive nuclear disarmament. There are still huge nuclear stockpiles in the world. Some nuclear powers still refuse to make the commitment not to be the first to use such weapons. The people of the world still have a long way to go toward nuclear disarmament and must continue to work strenuously to achieve the ultimate goal of complete prohibition and thorough destruction of nuclear weapons.

a. Continuous pursuit of nuclear disarmament

To this end, China has called on all states to negotiate for concluding an international convention on the complete prohibition and thorough destruction of nuclear weapons.¹⁶⁸ The Chinese argue that the two largest NWS should "carry out further drastic reductions of their nuclear arsenals, abandon the strategy of nuclear deterrence, stop the research in and development of outer-space weapons and refrain from the development, deployment, and proliferation of missile defense systems, which undermine the global strategic security and stability."¹⁶⁹ China considers such progress necessary to create the conditions for all the NWS to participate in nuclear disarmament negotiations in the future.

With the deepening of the nuclear disarmament process, China attaches ever greater importance to genuine nuclear disarmament. It holds that the two largest NWS, the United States and Russia, should destroy removed nuclear warheads rather than simply transferring them from deployment to storage.¹⁷⁰ That is, they should not use the reduced nuclear weapons once again as weapons in any form.

China holds that the international community should promote fair, rational, comprehensive, and balanced arms control and disarmament, and is willing to bear its due share of international arms-control and disarmament obligations and responsibilities.¹⁷¹ This has been China's official policy.

b. Pushing forward negotiations on FMCT

After the conclusion of the CTBT, the negotiations for a Fissile Material Cutoff Treaty (FMCT) have become one focus of international arms control. To halt the race toward increasing numbers of nuclear weapons by banning production of plutonium and highly enriched uranium for such weapons has long been the goal of the FMCT.¹⁷²

UNGA Resolution 48/75L, adopted by consensus in December 1993, recommended negotiations for a nondiscriminatory and effectively verifiable treaty banning the production of fissile materials for nuclear weapons or other nuclear explosive devices. China maintains that the conclusion of a convention on the prohibition of fissile material for nuclear weapons "will be conducive to the prevention of nuclear proliferation and promotion of nuclear disarmament, a shared responsibility of every member of the international community."¹⁷³ China regrets that despite the fact that the international community believes that conditions are now ripe for a fissile material cutoff treaty, negotiations have yet to be initiated. According to Sha Zukang, the head of the Chinese delegation to the NPT Review Conference, "FMCT should have been the most appropriate subject for negotiation in the field of multilateral nuclear disarmament after CTBT."¹⁷⁴ The CD has created an ad hoc committee with a mandate to conduct FMCT negotiations. China actively participated in the CTBT negotiations; it will do the same in the FMCT negotiations.¹⁷⁵

Notes

Unless cited otherwise, all Chinese journals and newspapers are published in Beijing.

¹ "Statement by H. E. Mr. Sha Zukang, Head of Delegation of the People's Republic of China at the Second Session of the Preparatory Committee for the 2000 Review Conference of the Parties to the NPT," April 27, 1998, Geneva.

² Jonathan Medalia, "Nuclear Weapons: Comprehensive Test Ban Treaty (updated April 7, 1998)," Congressional Research Service, the Library of Congress.

³ CISAC, National Academy of Sciences, *The Future of U.S. Nuclear Weapons Policy*, Washington, D.C., 1997, p. 50.

⁴ Information Office of the State Council of P. R. China, *China: Arms Control and Disarmament*, p. 4.

⁵ Zou Yunhua, "Comprehensive Test Ban Results Inevitably from the Development of the Situation," *Guoji Wenti Yanjiu* [International Studies], No. 1, 1994, p. 9.

⁶ Speech by Premier Zhao Ziyang of the State Council of the People's Republic of China at the Chinese People's Rally for World Peace (Beijing, March 21, 1986), in Information Office of the State Council of P. R. China, *China: Arms Control and Disarmament*, pp. 4-5.

⁷ Ambassador Qian Jiadong's statement at the CD Plenary, Feb. 13, 1986, *CD/PV.339*, p. 32.

- ⁸ Qian Jiadong's statement at the CD Plenary, Feb. 19, 1985, *CD/PV.292*, p. 32.
- ⁹ Qian Jiadong's statement at the CD Plenary, Feb. 21, 1985, *CD/PV.293*, p. 23.
- ¹⁰ Zou Yunhua, "Comprehensive Test Ban Results Inevitably from the Development of the Situation," *International Studies*, No. 1, 1994, p. 12.
- ¹¹ Patricia M. Lewis, "China and the Nuclear Test Ban," *China Review*, Autumn/Winter 1996, p. 9.
- ¹² Sha Zukang's statement at the CD Plenary, Sept. 5, 1995, *CD/PV.717*.
- ¹³ Peter Herby, "CD to Negotiate Nuclear Test Ban," *Disarmament Times*, Vol. XVI, No. 4, Sept. 22, 1993, p. 1.
- ¹⁴ Rebecca Johnson, "A Comprehensive Test Ban: Disappointing Progress," *ACRONYM*, Booklet No. 3, September 1994, p. 11.
- ¹⁵ Rebecca Johnson, "A Comprehensive Test Ban within Reach," *ACRONYM*, booklet No. 1, May 1994, p. 15.
- ¹⁶ "PRC: Senior PRC Official: Beijing Ready for CTBT Compromise," *FBIS-CHI-96-094*, May 14, 1996, p. 1.
- ¹⁷ "PRC: Ambassador on Nuclear Test Ban Issue 'Sincerity,'" *FBIS-CHI-116*, June 14, 1996, p. 2.
- ¹⁸ See *CD/PV.747*, Aug. 22, 1996, p. 21.
- ¹⁹ *SIPRI Yearbook, 1994*, pp. 311-13.
- ²⁰ "PRC: Army Paper Rejects 'China Threat'—Part 1," *FBIS-CHI-96-133*, p. 33.
- ²¹ Rebecca Johnson, "A Comprehensive Test Ban within Reach," *ACRONYM*, booklet No. 1, May 1994, p. 18.
- ²² "Known Nuclear Tests Worldwide, 1945-1995," (NRDC Nuclear Notebook), *Bulletin of the Atomic Scientists*, May/June 1996, p. 61.
- ²³ Patricia M. Lewis, "China and the Nuclear Test Ban," *China Review*, Autumn/Winter, 1996, p. 10.
- ²⁴ "Statement of the Ministry of Foreign Affairs of the People's Republic of China," *Beijing Ribao*, June 9, 1996, p. 1.
- ²⁵ "Statement of the Ministry of Foreign Affairs of the People's Republic of China," *Beijing Ribao*, June 9, 1996, p. 1.
- ²⁶ "PRC: Jiang Zemin on Early Conclusion of Nuclear Treaty," *FBIS-CHI-131*, July 8 1996, p. 1.
- ²⁷ Sha Zukang's statements at the CD Plenary, June 6, 1996, *CD/PV.737*; June 13, 1996, *CD/PV.738*, p. 20; Eric Arnett, "The Comprehensive Nuclear Test-Ban Treaty," *SIPRI Yearbook 1997*, p. 410.
- ²⁸ "Army Paper Rejects 'China Threat'—Part 1," *FBIS-CHI-96-133*, July 10, 1996, p. 35; "PRC: 'Full Text' of Foreign Ministry Statement on Nuclear Test," *FBIS-CHI-96-112*, June 10, 1996, p. 40.
- ²⁹ "PRC: Army paper Rejects 'China Threat'—Part 1," *FBIS-CHI-96-133*, July 10, 1996, p. 34; Sha Zukang's statement at the CD Plenary, June 13, 1996, *CD/PV.738*.
- ³⁰ In 1995, China's president Jiang Zemin announced the five propositions of the Chinese Government at the fiftieth anniversary of the founding of the United Nations. This is the first

proposition. See “PRC: Article Refutes ‘China Threat Theory’—Part 3,” *FBIS-CHI-133*, July 10, 1996, p. 40.

³¹ Sha Zukang’s statement at the CD Plenary, March 28, 1996, *CD/PV.733*.

³² Information Office of the State Council of P. R. China, *China: China and Disarmament*, p. 5; “Statement by the Government of the People’s Republic of China on the Question of Nuclear Testing (Oct. 5, 1993),” *Renmin Ribao*, Oct. 6, 1993.

³³ Sha Zukang’s statement at the CD Plenary, March 28, 1996, *CD/PV.733*; “Statement by General Qian Shaojun of the Chinese Delegation at the CD NTB Ad Hoc Committee,” Jan. 26, 1996.

³⁴ Information Office of the State Council of P. R. China, *China: Arms Control and Disarmament*, pp. 4-7.

³⁵ Information Office of the State Council of P. R. China, *China: Arms Control and Disarmament*, p. 25.

³⁶ Interview with Foreign Minister Tang Jiaxuan. “China Committed to Peaceful, Independent Foreign Policy,” *China Daily*, May 22, 1998, p. 1.

³⁷ Information Office of the State Council of P. R. China, *China: Arms Control and Disarmament*, p. 4.

³⁸ “PRC: Army Paper Rejects ‘China Threat’—Part 2,” *FBIS-CHI-96-133*, July 10, 1996, p. 37; “‘Text’ of Qian Qichen Speech to UN Assembly,” *FBIS-CHI-93-188*, Sept. 30, 1993, p. 4.

³⁹ Sha Zukang’s statement at the CD Plenary, Mar 28, 1996, *CD/PV.733*.

⁴⁰ Personal communication with Russian ambassador (ret.) Roland M. Timerbaev on Mar 17, 1998 at the Center for International Security and Arms Control, Stanford University.

⁴¹ “Statement of the Government of the People’s Republic of China (July 29 1996),” *Renmin Ribao*, July 30, 1996, p. 1.

⁴² “PRC: Army Paper Rejects ‘China Threat’—Part 1,” *FBIS-CHI-96-133*, July 10, 1996, p. 34; “PRC: Article Defends China’s Position on Nuclear Test,” *FBIS-CHI-96-115*, June 13, 1996, p. 18.

⁴³ Robert S. Norris, “French and Chinese Nuclear Weapon Testing,” *Security Dialogue 1996*, Vol. 27 (1): pp. 39-54, Sage Publications.

⁴⁴ “PRC: Army Paper Rejects ‘China Threat’—Part 1,” *FBIS-CHI-96-133*, July 10, 1996, p. 34.

⁴⁵ Personal communication with Dr. Louis Rosen, senior scientist at Los Alamos National Laboratory, April 30, 1998.

⁴⁶ Information Office of the State Council of P. R. China, *China: Arms Control and Disarmament*, pp. 27, 30.

⁴⁷ See Sha Zukang’s statements at the CD Plenary, Aug. 1, 1996; at the 50th UNGA, Sept. 9, 1996; and at the CD Nuclear Test Ban Ad Hoc Committee, June 28, 1996.

⁴⁸ Rebecca Johnson and Sean Howard, “A Comprehensive Test Ban: Disappointing Progress,” *ACRONYM*, No. 3, September 1994.

⁴⁹ Rebecca Johnson and Sean Howard, *ACRONYM*, No. 3, September 1994, p. 12.

- ⁵⁰ *Disarmament*, Newsletter of the UN Centre for Disarmament Affairs, Vol. 12, No. 3, May–September 1994, p. 3.
- ⁵¹ “‘Text’ of Qian Qichen Speech to UN Assembly,” *FBIS-CHI-93-188*, Sept. 30, 1993, p. 1.
- ⁵² Patricia M. Lewis, “China and the Nuclear Test Ban,” *China Review*, Autumn/Winter, 1996, p. 9.
- ⁵³ Sha Zukang’s statement at the CD Plenary, Sept. 5, 1995, *CD/PV.717*, p. 6.
- ⁵⁴ Rebecca Johnson, *ACRONYM*, No. 9, April 1996, p. 9.
- ⁵⁵ Sha Zukang’s statement at the Fourth Preparatory Committee for the 1995 Review and Extension Conference for the NPT, Jan. 23, 1995.
- ⁵⁶ Ambassador Hou Zhitong’s statement at the UN Disarmament Commission, April 19, 1994.
- ⁵⁷ Sha Zukang’s statement at the CD Plenary, June 6, 1996.
- ⁵⁸ “PRC: Representative on Nuclear Test Ban Treaty,” *FBIS-CHI-96-117*, June 17, 1996, p. 2.
- ⁵⁹ Sha Zukang’s statements at the CD Plenary, March 28, June 6, 1996.
- ⁶⁰ Rebecca Johnson, “CTBT,” p. 24.
- ⁶¹ Rebecca Johnson, “Comprehensive Test Ban Treaty: The Endgame,” *ACRONYM*, No. 9, April 1996, p. 3; Tom Zamora Collina, “CTB Talks: India, China and the End Game,” *ISIS Trip Report*, March 18, 1996.
- ⁶² *CD/NTB/WP.167*, Aug. 23, 1994.
- ⁶³ General Qian Shaojun’s statement at the NTB Ad Hoc Committee, Jan. 26, 1996.
- ⁶⁴ “Peaceful Use of Nuclear Energy and Peaceful Nuclear Explosion,” a statement of the Chinese Delegation at the Working Group II of the NTB Ad Hoc Committee, March 9, 1995.
- ⁶⁵ Sha Zukang’s statement at the CD Plenary, June 6, 1996; General Qian Shaojun’s statement at the NTB Ad Hoc Committee, Jan. 26, 1996.
- ⁶⁶ “Peaceful Use of Nuclear Energy and Peaceful Nuclear Explosion,” a statement of the Chinese delegation at the Working Group II of the NTB Ad Hoc Committee, March 9, 1995.
- ⁶⁷ Rebecca Johnson, “Comprehensive Test Ban Treaty: Now or Never,” *ACRONYM*, No. 8, Oct. 1995, p. 17.
- ⁶⁸ Patricia M. Lewis, “China and the Nuclear Test Ban,” *China Review*, Autumn/Winter, 1996, p. 11.
- ⁶⁹ Rebecca Johnson, “A Comprehensive Test Ban Treaty: Signed but Not Sealed,” *ACRONYM*, No. 10, May 1997, p. 26.
- ⁷⁰ “PRC: Beijing Agrees to CTBT Banning of All Types of Nuclear Tests,” *FBIS-CHI-96-107*, June 3, 1996, p. 2.
- ⁷¹ Patricia M. Lewis, “China and the Nuclear Test Ban,” *China Review*, Autumn/Winter, 1996, p. 12.
- ⁷² *CD/1364*, Sept. 26, 1995, p. 46.
- ⁷³ Sha Zukang’s statement at the CD Plenary, June 6, 1996, *CD/PV.737*.
- ⁷⁴ Rebecca Johnson, *ACRONYM*, No. 10, May 1997, p. 27.

- ⁷⁵ Ambassador Hou Zhitong's statement at the UN Disarmament Commission, April 19, 1994.
- ⁷⁶ Sha Zukang's statement at the CD Plenary, March 28, 1996, *CD/PV.733*.
- ⁷⁷ General Qian Shaojun's statement at the NTB Ad Hoc Committee, Jan. 26, 1996.
- ⁷⁸ Rebecca Johnson, *ACRONYM*, No. 9, p. 11.
- ⁷⁹ Rebecca Johnson, "Comprehensive Test Ban Treaty: Now or Never," *ACRONYM*, No. 8, Oct. 1995, p. 15.
- ⁸⁰ Patricia M. Lewis, "China and the Nuclear Test Ban," *China Review*, Autumn/Winter, 1996, pp. 12-13.
- ⁸¹ "Atom Powers Want to Test Despite Treaty," *The New York Times*, March 29, 1995, p. 1.
- ⁸² Patricia M. Lewis, "China and the Nuclear Test Ban," *China Review*, Autumn/Winter, 1996, p. 13.
- ⁸³ Rebecca Johnson, *ACRONYM*, No. 10, p. 69.
- ⁸⁴ Bruce Hall, "Disagreements in Nuclear Test Ban Negotiations," *Disarmament Times*, Vol. XIX, No. 2, April 1996, p. 1.
- ⁸⁵ Sha Zukang's statement, March 28, 1996, *CD/PV.733*.
- ⁸⁶ Rebecca Johnson, *ACRONYM*, No. 10, p. 39.
- ⁸⁷ Rebecca Johnson, *ACRONYM*, No. 9, p. 18.
- ⁸⁸ Statement of a Chinese expert at Working Group I, NTB Ad Hoc Committee, Aug. 17, 1994.
- ⁸⁹ A working paper of the Chinese delegation entitled "Establishment of a Global Electromagnetic Pulse Monitoring System," *CD/NTB/WP.217*, Feb. 20, 1995.
- ⁹⁰ *CD/1364*, Sept. 26, 1995, pp. 97-98.
- ⁹¹ Rebecca Johnson and Sean Howard, *ACRONYM*, No. 3, September 1994, p. 19.
- ⁹² A Chinese working paper entitled "Further Views on a Global EMP Monitoring System," *CD/NTB/WP.267*, Sept. 5, 1995.
- ⁹³ Personal communication with a U.S. delegate in August 1994 in Geneva.
- ⁹⁴ Rebecca Johnson, *ACRNOYM*, No. 9, April 1996, p. 19.
- ⁹⁵ A Chinese working paper, "The question of including noble gas monitoring capacity in the atmospheric radionuclide monitoring network," Sept. 5, 1995.
- ⁹⁶ Sha Zukang's statement at the NTB Ad Hoc Committee, Aug. 13, 1996.
- ⁹⁷ Rebecca Johnson, *ACRONYM*, No. 9, April 1996, p. 18.
- ⁹⁸ Sha Zukang's statements at Working Group I of the NTB Ad Hoc Committee and at the CD Plenary, Jan. 17, 1996, and March 28, 1996.
- ⁹⁹ Rebecca Johnson, *ACRONYM*, No. 9, April 1996, p. 18.
- ¹⁰⁰ Spurgeon M. Keeny, Jr., and Craig Cerniello, "The CTB Treaty: A Historic Opportunity to Strengthen the Non-Proliferation Regime," *Arms Control Today*, August 1996, p. 18.
- ¹⁰¹ Rebecca Johnson, *ACRONYM*, No. 9, p. 19.
- ¹⁰² Statement by General Qian Shaojun of the Chinese Delegation at the NTB Ad Hoc Committee, Jan. 26, 1996.

- ¹⁰³ “PRC: Representative on the Nuclear Test Ban Treaty,” *FBIS-CHI-96-117*, June 17, 1996, p.2.
- ¹⁰⁴ Sha Zukang’s statement at the CD Plenary, June 6, 1996. *CD/PV.737*.
- ¹⁰⁵ Sha Zukang’s statement at the CD Plenary, June 6, 1996, *CD/PV.737*.
- ¹⁰⁶ “PRC: XINHUA Notes PRC Stand on Nuclear Test Ban Treaty,” *FBIS-CHI-96-127*, July 1, 1996, p. 3.
- ¹⁰⁷ A Chinese working paper, “China’s Position on CTBT On-Site Inspection,” *CD/NTB/WP.266*, Sept. 5, 1995.
- ¹⁰⁸ “PRC: Representative on Nuclear Test Ban Treaty,” *FBIS-CHI-96-117*, June 17, 1996, p. 2.
- ¹⁰⁹ Unless otherwise cited, the information in this paragraph is from Rebecca Johnson, “The Comprehensive Test Ban Treaty: Hanging in the Balance,” *Arms Control Today*, July 1996, pp. 6, 7.
- ¹¹⁰ Patricia M. Lewis, “China and the Nuclear Test Ban,” *China Review*, Autumn/Winter, 1996, p. 13.
- ¹¹¹ Rebecca Johnson, *ACRONYM*, No. 9, p. 22.
- ¹¹² General Qian Shaojun’s statement at the NTB Ad Hoc Committee, Jan. 26, 1996.
- ¹¹³ Indian ambassador Satish Chandra’s statement on behalf of the G-21, June 29, 1995, *CD/PV.710*; Patricia M. Lewis, “China and the Nuclear Test Ban,” *China Review*, Autumn/Winter 1996, p. 13.
- ¹¹⁴ “PRC: Fuller Version of Temporary Ban on Peaceful Nuclear Tests,” *FBIS-CHI-96-111*, June 7, 1996, p. 2.
- ¹¹⁵ Sha Zukang’s statements at the CD Plenary, Sept. 5, 1995, *CD/PV.717*; March 28, 1996, *CD/PV. 733*.
- ¹¹⁶ Sha Zukang’s statements at the CD Plenary, June 6, 1996.
- ¹¹⁷ Rebecca Johnson, “The Comprehensive Test Ban Treaty: Hanging in the Balance,” *Arms Control Today*, July 1996, p. 6.
- ¹¹⁸ Rebecca Johnson, *ACRONYM*, No. 9, April 1996, p. 23.
- ¹¹⁹ Rebecca Johnson, *ACRONYM*, No.10, May 1997, p. 42.
- ¹²⁰ A Chinese working paper, “China’s position on CTBT On-Site Inspection,” *CD/NTB/WP.266*, Sept. 5, 1995.
- ¹²¹ Rebecca Johnson, *ACRONYM*, No. 9, April 1996, p. 23.
- ¹²² Sha Zukang’s statement at the CD Plenary, March 28, 1996, *CD/PV.733*.
- ¹²³ Rebecca Johnson, “The CTBT: Hanging in the Balance,” *Arms Control Today*, July 1996, p. 7.
- ¹²⁴ Jonathan Medalia, “Nuclear Weapons: Comprehensive Test Ban Treaty,” *CRS Issue Brief, Order Code IB92099*, updated April 7, 1998, p. CRS-6.
- ¹²⁵ Spurgeon M. Keeny, Jr., and Craig Cerniello, “The CTB Treaty: A Historic Opportunity to Strengthen the Non-Proliferation Regime,” *Arms Control Today*, August 1996, p. 18.
- ¹²⁶ Verification Technology Information Center (London), *Trust & Verify*, Issue 67, July 1996, p. 3.

- ¹²⁷ Rebecca Johnson, *ACRONYM*, No. 9, p. 27.
- ¹²⁸ Rebecca Johnson, *ACRONYM*, No. 10, p. 62.
- ¹²⁹ The information in this and the next paragraph is from Sha Zukang's statements at the CD Plenary, Sept. 5, 1995, *CD/PV.717*, p. 6; March 28, 1996, *CD/PV. 733*; and at the NTB Ad Hoc Committee, June 25, 1996.
- ¹³⁰ Sha Zukang's statement, *CD/PV. 733*.
- ¹³¹ Rebecca Johnson, *ACRONYM*, No. 10, May 1997, pp. 15–16.
- ¹³² "PRC: Spokesman Explains Stance on Nuclear Test Treaty," *FBIS-CHI-96-129*, July 3, 1996, p. 1.
- ¹³³ Sha Zukang's statement at the CD Plenary, March 28, 1996, *CD/PV.733*.
- ¹³⁴ "PRC: Spokesman Explains Stance on Nuclear Test Treaty," *FBIS-CHI-96-129*, July 3, 1996, p. 1.
- ¹³⁵ Sha Zukang's statement at the NTB ad Hoc Committee, June 28, 1996.
- ¹³⁶ Patricia M. Lewis, "China and the Nuclear Test Ban," *China Review*, Autumn/Winter, 1996, p. 9.
- ¹³⁷ Eric Arnett, "The Comprehensive Test Ban Treaty," *SIPRI Yearbook 1997*, p. 405.
- ¹³⁸ Sha Zukang's statement at the CD Plenary, March 28, 1996, *CD/PV.733*.
- ¹³⁹ Sha Zukang's statement at the CD Plenary, Aug. 1, 1996.
- ¹⁴⁰ The information in this paragraph and the next is from Sha Zukang's statement at the NTB Ad Hoc Committee, June 28, 1996.
- ¹⁴¹ Rebecca Johnson, *ACRONYM*, No. 10, May 1997, p. 16.
- ¹⁴² Sha Zukang's statement at the CD Plenary, Aug. 1, 1996.
- ¹⁴³ Unless otherwise cited, the information in this paragraph is from Rebecca Johnson, *ACRONYM*, No. 10, May 1997, p. 16.
- ¹⁴⁴ Sha Zukang's statement at the CD Plenary, Aug. 1, 1996.
- ¹⁴⁵ Rebecca Johnson, *ACRONYM*, No. 10, May 1997, p. 17.
- ¹⁴⁶ Sha Zukang's statement at the NTB Ad Hoc Committee, Aug. 13, 1996.
- ¹⁴⁷ *Ibid.*
- ¹⁴⁸ Andrea Faulkner, "CTBT: Towards Its Entry into Force," *Disarmament*, Volume XX, Number 1, 1997, p. 26.
- ¹⁴⁹ Speech by Ed Fei, Deputy Director for Policy, International Policy and Analysis Division, U.S. Department of Energy, during a Chinese group visit to DOE on April 23, 1998.
- ¹⁵⁰ Spurgeon M. Keeny, Jr., and Craig Cerniello, "The CTB Treaty: A Historic Opportunity to Strengthen the Non-Proliferation Regime," *Arms Control Today*, August 1996, p. 15.
- ¹⁵¹ COSTIND Deputy Director Shen Chunnian's statement in an interview with a U.S. delegation headed by John Holum, director of the U.S. Arms Control and Disarmament Agency (ACDA), Oct. 8, 1996.
- ¹⁵² Rebecca Johnson, "Endgame Issues in Geneva: Can the CD Deliver the CTBT in 1996?" *Arms Control Today*, April 1996, p. 12.
- ¹⁵³ Spurgeon M. Keeny, Jr., and Craig Cerniello, "The CTB Treaty: A Historic Opportunity to Strengthen the Non-Proliferation Regime," *Arms Control Today*, August 1996, p. 15.

- ¹⁵⁴ JASON Group chaired by Sidney Drell, "Nuclear Testing, Summary and Conclusions," Aug. 3, 1995, p. 2.
- ¹⁵⁵ *SIPRI Yearbook 1997*, p. 433.
- ¹⁵⁶ Wolfgang Hoffmann, "The Future of the Comprehensive Nuclear-Test-Ban Treaty," *Disarmament* (United Nations), Volume XX, No. 1, 1997, p. 7.
- ¹⁵⁷ The information in this and the next paragraph is from Rebecca Johnson, *ACRONYM*, No. 3, September 1994, p. 20
- ¹⁵⁸ The information in this paragraph and the next is from Jonathan Medalia, "Nuclear Weapons: Comprehensive Test Ban Treaty," *Congressional Research Service*, The Library of Congress, updated April 7, 1998.
- ¹⁵⁹ Jonathan Medalia, "Nuclear Weapons: Comprehensive Test Ban Treaty," updated April 7, 1998.
- ¹⁶⁰ Statement by Russian ambassador Grigori Berdennikov at the CD Plenary, May 14, 1996.
- ¹⁶¹ Rebecca Johnson, *ACRONYM*, No. 10, May 1997, p. 69.
- ¹⁶² For example, it only took China less than three years from its first atomic test to conduct a thermonuclear test. In contrast, the United States, the Soviet Union, Britain, and France spent about seven, six, five, and eight years, respectively, to make this transition.
- ¹⁶³ Jonathan Medalia, "Nuclear Weapons: Comprehensive Test Ban Treaty," *Congressional Research Service*, Library of Congress, updated April 7, 1998, p. 10.
- ¹⁶⁴ Founded in 1958, the China Academy of Engineering Physics has contributed to the buildup of China's nuclear arsenal over the past four decades.
- ¹⁶⁵ Speech by CAEP president Hu Side at SLAC, Stanford University, June 15, 1998.
- ¹⁶⁶ The other two major missions of the CAEP are research on applied sciences and high technologies and research and development of civilian technologies. The information in this paragraph is from a speech by CAEP president Hu Side at SLAC, Stanford University, June 15, 1998.
- ¹⁶⁷ Richard L. Garwin, "The Future of Nuclear Weapons Without Nuclear Testing," *Arms Control Today*, Vol. 27, No. 8, November/December, 1997, p. 4.
- ¹⁶⁸ Statement by His Excellency Qian Qichen, Vice Premier, Minister of Foreign Affairs and Head of the Delegation of the People's Republic of China, at the 51st Session of the UNGA, Sept. 25, 1996, *Disarmament Diplomacy*, No. 8, September 1996.
- ¹⁶⁹ Statement by Chinese ambassador Li Changhe to the CD Plenary, *Disarmament Diplomacy*, No. 24, March 1998, p. 17.
- ¹⁷⁰ Statement by Sha Zukang, Head of Delegation of the People's Republic of China at the Second Session of the Preparatory Committee for the 2000 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, April 27, 1998, Geneva.
- ¹⁷¹ Information Office of the State Council of P. R. China, *China: Arms Control and Disarmament*, pp. 6-7.
- ¹⁷² George Bunn, "Viewpoint: Making Progress on a Fissile Material Cutoff Treaty after the South Asian Tests," *The Nonproliferation Review/Spring-Summer*, 1998.
- ¹⁷³ Statement by Chinese ambassador Li Changhe to the CD Plenary, *Disarmament Diplomacy*, No. 24, March 1998, p. 17.

¹⁷⁴ Statement by Sha Zukang, Head of Delegation of the People's Republic of China at the Second Session of the Preparatory Committee for the 2000 Review Conference of the Parties to the NPT, April 27, 1998, Geneva.

¹⁷⁵ Zou Yunhua, "Cutoff: Problems and Prospects," presented at the Oxford Research Group in association with the Chinese People's Association for Peace and Disarmament Seminar, April 28-30, 1997.

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