Is Nuclear Testing Nearly Over?
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Is Nuclear Testing Nearly Over?

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GLOSSARY


CTB Comprehensive Test Ban. A proposed agreement between the major powers that would ban all tests of nuclear weapons.

IAEA International Atomic Energy Agency. An independent agency of the United Nations that monitors both the development of nuclear energy for peaceful purposes and compliance with the Non-Proliferation Treaty (NPT).

INF Intermediate-Range Nuclear Forces Treaty, between USSR and USA, signed 8 December 1987. This agreement eliminates medium-range nuclear missiles in Europe.

NPT Treaty on the Non-Proliferation of Nuclear Weapons. Signed July 1969 and entered into force 5 March 1970. This treaty seeks to limit the spread of nuclear weapons.

PNET Peaceful Nuclear Explosions Treaty. A Treaty imposing limitations on the conduct of nuclear explosions for peaceful purposes, including a maximum yield of 150 kilotons. The Treaty was signed in 1976, but did not come into force until December 1990, after the US and Russia agreed on new verification protocols.

START I Strategic Arms Reduction Treaty. Negotiations between the US and the USSR began in June 1982 to limit and reduce their strategic arsenals, and the treaty was signed on 31 July 1991.

START II The Second Strategic Arms Reduction Treaty, signed in Moscow by the USA and Russia on 3 January 1993.

TTBT Threshold Test Ban Treaty. A Treaty prohibiting underground nuclear weapons tests having a yield which exceeds 150 kilotons. The Treaty was signed in July 1974, but did not come into force until December 1990, after the US and Russia agreed on new verification protocols.
MAJOR ISSUES

Since the mid-1950s, a Comprehensive Test Ban (CTB), with its fundamental purpose of banning all nuclear test explosions, has been one of the most persistent, yet elusive, objectives of arms control. Two sets of negotiations between the USA, the USSR and the UK, from 1958 to 1962 and from 1977 to 1982, ceased with little-or-nothing gained.

By contrast, the talks which began in the Conference on Disarmament on 25 January 1994 have every chance of delivering an agreement. The major reason for this is that the collapse of the Soviet Union has changed the strategic emphasis from nuclear deterrence to non-proliferation. The end of the Cold War has effectively nullified the argument that continually improving and expanding the nuclear arsenal serves the security interests of the US, and thus seriously weakened the opponents of a CTB within the Departments of Defense and of Energy. For decades, this pro-nuclear testing lobby had argued both that existing verification techniques were inadequate, and also that continued testing was essential to ensure the safety and reliability of the nuclear arsenal. The influence of the pro-testing group has been significant, and the attitude of the USA has generally constituted the major obstacle to progress on a CTB. But with few new nuclear weapons being developed and no known plans for their deployment, with massive cuts taking place in strategic nuclear weapons, and with the strategic focus on the prevention of nuclear proliferation, testing has become largely irrelevant. In October 1992, with Russia and France both operating moratoria on testing, the US Congress virtually enforced a moratorium on the Bush administration.

The subsequent negotiations in the Conference on Disarmament began promisingly, with the USA generally taking the front running. Australia has been extremely active in the talks, and its provision of a draft text of a treaty in March 1994 was a significant contribution. Some commentators have reported that the talks have lost some of their early momentum, but some slowing down was probably inevitable as the Conference began to grapple with the details of the more controversial and complex issues. An important step in September 1994 was the creation of an official draft treaty in the form of a "rolling text", which, hopefully, will provide the basis for a final document.

At this stage several major issues are still unresolved. These include:

- The scope of the treaty has not yet been decided, with some countries proposing that exemptions be permitted to the ban on testing. For example, China has argued that nuclear explosions intended purely for peaceful motives should be exempted from the ban.

- A decision is yet to be made on which organisation should implement the treaty. Some have proposed the International Atomic Energy Agency for this role, but Australia has advocated the creation of a new independent
organisation, based on the model conceived for the Chemical Weapons Convention.

- Although it has been agreed that a system of on-site inspections will be established to clarify possible cases of non-compliance with the treaty, just how this system will operate is still a matter of intense negotiation.

Progress in the CTB negotiations will be extremely significant for the Nuclear Non-Proliferation Extension Conference which begins on April 17th. It is difficult to forecast what effect this Conference will have on the CTB talks, but hopefully these have sufficient momentum to make completion of a treaty very likely in 1996.

What will be gained by a CTB Treaty? While there will be practical contributions, such as preventing, or at least seriously constraining, the modernisation of existing nuclear arsenals, the major importance of a test ban would appear to be symbolic, a significant step towards curbing the small elite of nuclear-weapons states.
INTRODUCTION

Since the mid-1950s, a Comprehensive Test Ban (CTB), with its fundamental purpose of banning all nuclear test explosions, has been one of the most persistent, yet elusive, objectives of arms control.

In December 1993, support for a CTB Treaty (CTBT) became virtually universal, with the UN General Assembly adopting by consensus a resolution calling for the negotiation of a multilateral CTBT. This was the first time that the resolution had not been opposed by at least one of the declared nuclear weapon states since such resolutions were first offered at the UN in the 1950s.¹

The negotiations which began in the Conference on Disarmament on 25 January 1994 are the third major set of negotiations to take place towards a CTB. Previous efforts, from 1958 to 1962 and from 1977 to 1982, ceased without substantial achievement. However, the current set of talks has every chance of delivering an agreement. The major reason is that the collapse of the Soviet Union has changed the strategic emphasis at the global level from nuclear deterrence to non-proliferation. The focus is no longer on the threat of Soviet strategic forces, but on the possibility of other states developing nuclear weapons. The danger of theft or diversion of military fissile material, especially from the Soviet arsenal, is one aspect of this proliferation threat.

A factor lending urgency to the talks in the last 15 months has been the approaching Nuclear Non-Proliferation Treaty Extension Conference, due to begin on 17 April 1995, and the awareness that substantial progress on a CTB could be crucial for the success of the Conference. With the Conference only weeks away, this paper will attempt to assess progress to date in the CTBT negotiations.

PREVIOUS NEGOTIATIONS²

* 1958 to 1962: Initially these tripartite negotiations, between the USA, the UK, and the USSR, made good progress on a number of issues, although verification was a major source of disagreement. From the start the three powers agreed to suspend nuclear tests. In May 1960 the shooting down over the USSR of an American U-2 reconnaissance plane worsened relations, and during 1961 the political climate deteriorated markedly, particularly because of the Berlin situation. In August 1961, the Soviets resumed testing, maintaining that testing by France, which had exploded

¹ A similar resolution in 1994 also achieved a consensus.

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its first bomb in February 1960, could improve the nuclear capability of NATO. The talks officially broke up in 1962.

The Cuban missile crisis of October 1962 convinced both Kennedy and Khrushchev that something needed to be done to reduce the likelihood of nuclear war, and in August 1963 the Partial Test Ban Treaty was signed, banning tests in the three non-controversial environments, i.e. in the atmosphere, in outer space and under water.3

* 1977 to 1982: In 1977 the Carter administration, encouraged by a more conciliatory Soviet attitude towards on-site inspections, began CTB negotiations with the UK and the USSR. Progress at first was good, including agreement on such things as a global network of seismic monitoring stations, including stations within the USSR. However, opponents of a CTB within the US government managed to slow proceedings, and the Soviet occupation of Afghanistan and then the advent of the Reagan administration brought the negotiations to an end. They were finally abandoned in July 1982.

TRADITIONAL POINTS OF OPPOSITION TO A CTB4

The Verification Problem

The demand for adequate verification has been the main obstacle, ostensibly at least, during the history of CTB negotiations. "Adequate verification" is usually understood to mean procedures that would reduce to an acceptable level the risk that clandestine test programs of military significance could be conducted, although there is some disagreement over what is meant by "acceptable level" and "programs of military significance".

It is accepted that seismological verification will constitute the principal component of a global control system for an underground test ban. Ideally the seismological system should comprise about 50 globally distributed, technically advanced, telesismic stations, and a network of the required capability should be virtually attainable by 1996. For decades the US squabbled with the Soviets over the effectiveness of existing means of verification, with Moscow claiming these were sufficient and the US maintaining that verification problems remain. The difficulty is not in detecting and locating a low yield explosion, but in identifying the occurrence as a nuclear explosion and not as

3 Both France and China continued atmospheric testing, although both eventually ceased, France in 1975 and China in 1985.

one of the thousands of other seismic events - earthquakes etc - which occur annually in the world at a magnitude of around 1 kiloton. Test ban advocates claim that the large majority of small earthquakes could readily be identified as such because they occur under the oceans or at depths too great to be nuclear tests. However, the problem is heightened by the various methods of concealing explosions, e.g. by "cavity decoupling", the use of a large underground cavity to muffle or reduce the seismic signal.

On-site Inspection

The USA has always insisted that seismological verification should be supplemented by the capacity to invoke on-site inspections to decide whether or not an explosion has taken place. However, on-site inspections were viewed by the Soviets with extreme suspicion as a device for gathering military intelligence, and were rejected as unnecessary as a back-up for verification. Thus a major breakthrough seemed to have been made in 1976 when Moscow agreed to inspections, although on a voluntary, not mandatory, basis. Another step forward was the 1986 Stockholm Accord, with its view of on-site inspections as a confidence-and-security-building measure, enhancing openness and transparency. In December 1987 the Soviets agreed to the Inspection Protocol of the Intermediate Range Nuclear Forces Treaty (INF Treaty), and the 1993 Chemical Weapons Convention contains quite sophisticated inspection provisions.

With steady improvements in seismological verification, and the development of additional technical verification methods, such as monitoring atmospheric radioactivity, to complement standard seismic technologies, the issue of verification, while still crucial to any agreement, has lost some of the element of risk. More important, the current level of trust between the United States and post-Soviet Russia is sufficiently high to warrant a less demanding approach to verification.

Stockpile Reliability

During the 1977-1980 series of tripartite talks, a new issue, the effects of a CTB on stockpile reliability, tended to replace verification as the chief concern, at least to the USA, or, more precisely, to the US nuclear testing lobby. Representatives from the Department of Energy and their nuclear weapons laboratories, and from the Joint Chiefs of Staff, argued that testing would be needed "in the long run" to protect against "stockpile aging" and to maintain the superpowers' nuclear arsenal in optimum condition. This position was disputed by CTB proponents, who argued that nuclear testing was not essential to maintain stockpile reliability, that visual and electronic inspection of components, together with simulation techniques, can achieve much, and that when a fault did appear in a weapon, it could be replaced by remanufacturing to the original design. Against this, the CTB critics argued that the original materials may not be available, and that, in any case, replacement could be extremely expensive.
Heated and protracted debate resulted, and long before the Soviet invasion of Afghanistan in December 1979 ended the CTB negotiations, they were losing momentum as President Carter became aware of the strength of opposition to a test ban among Department of Energy and Pentagon officials. Bureaucratic and political pressure was beginning to consume the treaty, and in 1978 Carter had changed the US position on the duration of a treaty from unlimited to three years, with option to resume testing after this time.

Stockpile Safety

The stockpile reliability argument stresses the need for confidence that devices will explode when required to do so, but a comparatively recent variation is the issue of stockpile safety - the fear of them exploding when not required to do so. This emphasis on safety is more appropriate for a time of peace, with no major enemy, than is reliability. It has been argued that nuclear testing is necessary to ensure continuing improvements in mechanisms designed to prevent nuclear weapons detonating unintentionally. But CTB advocates have pointed out that weapons that lack the most modern safety features, such as Enhanced Nuclear Detonation Safety, are all scheduled for retirement. Given the numerous allegations of the lack of security and control that exists in respect to post-Soviet Russia’s nuclear stockpile, it does seem this safety problem should be more a concern of Russia than of the USA.

Maintain the Nuclear Industry

The fundamental reason that a CTB has not been achieved to date is that the existing nuclear-weapon states, or at least strong elements within them, wish to continue testing in order to refine still further their nuclear stockpiles and keep their weapons laboratories active. In the USA, the main opponents of a CTB have been those responsible for the nuclear weapons program, headed by the directors of the nuclear weapons laboratories under the Department of Energy. They have often been supported by senior Defence officials, representing the potential users of the weapons. It can be assumed that, during the Cold War years, many of the pro-testing lobby were sincere in their belief that US security required the continual modification and development of nuclear weapons through testing. But it cannot be denied there has also been the more personal motive of wishing to preserve the nuclear weapons industry which gave them livelihood.

Although not without some validity, the arguments put forward by this group over the years do not, in themselves, justify continued testing. This is particularly so at a time when such testing is increasingly irrelevant, with few new nuclear weapons being developed and no known plans for their deployment, with massive cuts taking place in strategic nuclear weapons, and with the strategic aim no longer being nuclear deterrence but prevention of

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nuclear proliferation. Critics have been concerned by the erosion of the nuclear weapons infrastructure, and claim the expertise of technical staff can be maintained only if they are able to conduct tests from time to time. This argument is questionable, and, in any case, surely such "job protection" should not determine policy on an issue of such international importance.

THE CHANGE IN US POLICY

From Eisenhower in the 1950s to Carter in the 1970s, all US Presidents had been in favour of a CTB, but President Reagan was intent on augmenting and modernising the US nuclear arsenal, and relegated a CTB to the status of a "long-term objective". This attitude continued with President Bush, and as late as May 1992 Defence Secretary Cheney was rejecting any reduction in the US testing program as a "serious mistake".6

The breakthrough came in October 1992. The end of the Cold War had effectively removed the argument that continually improving and expanding the nuclear arsenal serves the security interests of the US. With Russia and France both operating moratoria on testing (since October 1991 and April 1992 respectively), on October 2nd the US Congress virtually enforced a nine months moratorium on the Bush administration on October 2nd, with the further provision that all testing was to cease by 30 September 1996, as the US led the way to a multilateral CTB. Prior to his election as President, Bill Clinton had indicated that he supported a CTB because it would help to restrain proliferation, and he has continued to extend this moratorium on testing.

However, in early 1993, opponents of a CTB began pushing for a definition of a CTBT that would permit continued testing of nuclear devices with yields of one kiloton or less.7 After a brief but intense controversy, the CTB supporters were able to prevail, a major argument being that such a watered-down agreement would undermine US efforts against the threat of proliferation. President Clinton gave enthusiastic support. After his election, he initiated a thorough study of the various arguments in favour of testing, especially those concerning safety and reliability. On 3 July 1993, he was able to say that "after a thorough review, my administration has determined that the nuclear weapons in the US arsenal are safe and reliable".8


In the current negotiations in the Conference on Disarmament, the USA has generally led the way, obviously conscious of the importance of a CTB to the approaching Non-Proliferation Treaty Conference in New York. During 1994, the USA took the position that there should be a right to withdraw from the CTBT ten years after its entry into force, but in a speech on 30 January 1995, President Clinton's national security adviser, Tony Lake, withdrew this proposal.

Concern has been expressed, especially by the non-aligned states, that the present US enthusiasm is aimed at bringing the international community on-side for the NPT Extension Conference, and that activity will diminish after the Conference. It is difficult to comment on this, although it is possible pressure on the Administration may increase - for example, to include in the treaty exemptions to the ban on testing. One encouraging sign is that, in his speech on 30 January 1995, Tony Lake described the completion of the CTB negotiations "at the earliest possible date" as one of the foremost goals of the US. At the same time the US testing moratorium was extended until September 1996 "on the assumption that a CTBT will be signed by that time".

WHAT WILL BE GAINED BY A CTB?

Over the decades, some fanciful ideas developed concerning the potential contribution of a CTBT, and it tended to become a symbol for a complete end to the nuclear arms race. Following is a brief discussion of the likely major gains:

- It has long been hoped that a complete ban on testing would prevent the emergence of new nuclear weapon states. However the widespread diffusion of knowledge about nuclear weapons has eliminated the need for testing in the development of an elementary nuclear weapon. For example, Israel has reportedly acquired a substantial nuclear arsenal without conducting a single test. Nevertheless, a ban on testing would provide some restraint on development, and given the world-wide enthusiasm that would be generated by a CTB Treaty, any country continuing or attempting nuclear testing would be stigmatised as an outlaw, or at least rogue, state.

Whether such international censure would be sufficient to deter states such as Iraq and North Korea from testing, if they have the need to, is difficult to say. China, the only country still testing at present, has been encouraging both in its positive contributions to the current negotiations, and in its attitude to an eventual treaty, committing itself to cease testing

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when a treaty is signed. China has performed only 41 tests in all, less than any of the declared nuclear-weapon states, and far less than the 1000 plus carried out by the USA. It is possible China’s present testing is to ensure safety and reliability of its stockpile in the event of a CTBT.

- A major aim of testing has been to develop new weapons, and it was felt that a CTB would prevent the nuclear-weapon states from continuing to modernise their nuclear arsenals. This is still a sound expectation, although certainly a CTB would not bring about nuclear disarmament. Without testing, the nuclear-weapon states could still maintain their existing large arsenals, and even expand them with weapons of a proven design. It is even possible the nuclear powers may utilise and develop non-nuclear testing methods, such as computer modelling and simulation, to modernise their arsenals.

- Nevertheless, a CTB retains considerable symbolic as well as practical importance. A major reason for this is its connection with the Nuclear Non-Proliferation Treaty. For decades a CTB has been regarded by the non-nuclear-weapon states as the single most important way for the nuclear powers to demonstrate their commitment to nuclear disarmament. The NPT’s Preamble mentions as an aim "the discontinuance of all test explosions of nuclear weapons for all time". The non-nuclear-weapon states see a ban on nuclear testing by all states as partially redressing the discriminatory nature of a Non-Proliferation Treaty which divides the world into nuclear haves and have-nots. Decades of debate, of General Assembly resolutions, of frustrated hopes have fired the determination of many nations in their pursuit of a CTB.

More benefit would very likely have come from a CTB a decade or so ago; even before the moratoria, testing had been falling for some time. However, a treaty will still make a significant contribution, giving fresh momentum to the arms control process. The attitude which such states as India, Pakistan, Israel, Iraq, North Korea and Iran take to the signing of an eventual treaty will, of course, be important for the control of proliferation. One encouraging fact is that India, Pakistan and Iran are all active participants in the current negotiations.

HAS THERE BEEN SATISFACTORY PROGRESS IN THE CTB NEGOTIATIONS?

Within the Conference on Disarmament in Geneva, the body charged with negotiating a CTB Treaty is the Ad Hoc Committee on a Nuclear Test Ban. It began its work in earnest on 25 January 1994, and has thus been in operation for 14 months. There are 38 members of the Committee, which includes Australia and the five declared nuclear-weapon states, although nearly 50 non-member states have been participating in the negotiations as observers. Soon after the Committee was established, two Working Groups were
established, one handling verification, the other to deal with legal and institutional issues.

During the first months of negotiations, articles reporting on progress were generally optimistic, highlighting the good spirit in which the talks were proceeding. However, in the second half of the year, the tone of some reports tended to change, with emphasis on the slower pace of the negotiations, and on issues that were causing delay. In particular, there has been pessimism concerning the possibility of a completed Treaty, or even substantial progress towards a treaty, by the time of the NPT Extension Conference in April 1995.\(^\text{10}\)

It does seem, however, that some commentators have been too negative in their attitude, perhaps because of unrealistic initial expectations as to how quickly a treaty could be completed. The actual picture seems much more hopeful, and it can be said that, given the complexity of the task, progress has been good. An official draft treaty in the form of a "rolling text" was made available in September 1994, and although the 1994 sessions officially concluded in September, the Ad Hoc Committee continued to operate in a series of inter-sessional meetings. One achievement of these November-December meetings was to reach agreement on the essentials of the all-important verification system of the treaty, although there is still considerable work to be done in this complex area.

A criticism has been made that the UK and France have displayed a lack of enthusiasm, and have slowed the pace of the negotiations. It is true that the USA and Russia have generally taken the front running in the talks. There have also been reports that, after President Mitterand's term ends in May 1995, France wants to conduct further nuclear tests in connection with its nuclear modernisation projects. Certainly, too, there are elements in the British Ministry of Defence which, despite the arguments noted above, still regard testing as necessary for reliability and safety reasons. If the number of working papers and other documents submitted to the Ad Hoc Committee can be taken as a rough indication of contribution, the numbers to the beginning of September 1994 seem to suggest some lack of initiative by the UK and France. Looking at the more active participants, the US had submitted 22 papers, far and away the most. Then came Australia with 14 papers, China 13, Canada 10, Russia and India each 7, and Sweden 6. France, on the other hand, had presented only 4 papers, and the UK nil.\(^\text{11}\) This of course says nothing about the significance or usefulness of the items presented, nor of other areas of participation, but the figures are interesting.

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On the other hand, other observers note an encouraging feature of the whole negotiations as being that all countries, including the UK and France, are actively engaged in the negotiations. These reports see any apparent slowing down in the negotiations as more a case of the Committee and Working Groups grappling with the details of some of the more controversial and complex issues. It is understandable that each of the declared nuclear powers will have problems adjusting to new requirements, but it also seems there is acceptance that a CTB is inevitable, an idea whose time has come. A legitimate concern is the future of a whole community of people whose employment has been involvement in nuclear programs.

AUSTRALIA'S POLICY

Australia’s strong commitment to a CTBT dates from the 1970s, is held by both Government and Opposition, and has been most clearly shown in the series of UN General Assembly resolutions which Australia has sponsored in conjunction with New Zealand. It was an Australian/New Zealand/Mexican resolution in August 1993 which set in train the Conference on Disarmament negotiations.

Australia has been active in the Ad Hoc Committee since negotiations began:

- As was mentioned earlier, Australia has been one of the most assiduous contributors of working papers and other documents. Early in January, before negotiations were under way, Australia presented a working paper providing a draft structural outline of the CTBT.

- On 30 March 1994 Australia presented a draft of the text of the treaty, entitled "Australian Resource Paper on Draft Treaty Elements". This supplemented, and provided an alternative to, an earlier draft treaty text presented by Sweden. These two draft texts formed the basis for the "rolling text" which was created in September 1994, and from which, hopefully, a final document will eventually emerge.

- A member of the Australian Delegation to the Conference on Disarmament is currently chairing a drafting group on the International Monitoring System within the verification Working Group.

- Australia has provided a number of scientific experts to participate in the negotiations in Geneva, and these are recognised as having made significant contributions to the shaping of an effective verification regime.

12 Assistance with both this section and the following section on major unresolved issues was provided by the Conventional and Nuclear Disarmament Section of the Department of Foreign Affairs and Trade.
WHAT MAJOR ISSUES ARE STILL NOT CONCLUDED?

The Scope of the Treaty

A major unresolved issue is whether exemptions to the ban on testing will be permitted. For example:

- China has proposed that peaceful nuclear explosions, those intended purely for scientific research or civilian application, should be exempted from the ban. Although for years the prevailing belief has been that few benefits stem from peaceful nuclear explosions (which are permitted under Article V of the Nuclear Non-Proliferation Treaty), China maintains they could still prove useful. No other states support the Chinese position.

- Britain and France continue to press for tests in "exceptional circumstances" to ensure the safety and reliability of nuclear stockpiles. It is difficult to know whether the two countries are serious with this proposal, or whether it is a negotiating tactic.

There are also definitional problems. For example, post-Soviet Russia has proposed that the treaty define each of the environments in which tests are banned - underground, in the atmosphere etc. - whereas most parties would prefer a general statement, that tests are banned everywhere.

Another problem still being debated is what exactly constitutes a nuclear explosion. For example, does it include very small yield explosions? There are still officials within, particularly, the US Defense Department who argue that the test ban should allow small nuclear explosions - "hydronuclear experiments" - to be conducted routinely for purposes of scientific research, and to ensure weapon safety and reliability. A scientific report earlier this year challenged this point of view, arguing that stockpile safety and reliability can be provided without nuclear tests, and that "hydronuclear tests would be potentially more valuable" to nascent nuclear powers attempting to develop weapons.13

Another definitional problem is that raised by Sweden and Germany in their proposal that preparations for a nuclear test be seen as part of the test, and thus be subject to the ban. To ban "preparations" in this way would involve acute pre-test verification difficulties. Australia's position is that the treaty is aimed at the traditional goal of banning nuclear explosions, and that attempting to broaden the scope to include essentially non-verifiable activities goes beyond the mandate of the negotiations. Australia sees the CTBT as just one in a series of arms control measures which move towards the goal of universal non-proliferation and disarmament.

Entry into force

A number of views have been put forward as to when the treaty will come into force. This requires agreement on such questions as how many ratifications are necessary before entry into force; whether ratification by each of the five nuclear-weapon states will be necessary before entry into force; whether a minimum time, say two years, should elapse from the date of the treaty being opened for signature.

It has been pointed out that the Nuclear Non-Proliferation Treaty was initially signed by only three of the five declared nuclear-weapon states, and nothing disastrous happened. Twenty years later, the other two nuclear powers also acceded to the NPT.

This issue should not, in the long run, delay negotiations.

What organisation should implement the Treaty?

Implementation includes the important task of verifying compliance with the Treaty. Sweden’s early proposal was to use the International Atomic Energy Agency (IAEA) for this role, but Australia has advocated the creation of a new independent organisation, based on the model conceived for the Chemical Weapons Convention. Given the additional verification tasks recently taken on by the IAEA, the debate over the Agency’s efficiency, and its inexperience in the verification technologies involved, the Australian position seems sensible. Of course if the necessary improvements were made to the IAEA, and it was provided with adequate resources for its tasks, it would be in a better position to take on this new role, thus avoiding the setting up of yet another international organisation.

In any case, Australia would want a new body to work closely with the IAEA, avoiding any duplication in role by sharing services. Probably the new organisation would be best situated in Vienna, near the IAEA headquarters.

Although not yet resolved, it is unlikely that this issue would hold up negotiations in the long run.

Verification

One of the two Working Groups set up by the Ad Hoc Committee is dealing with verification, and, as mentioned earlier, the main achievement of the intersessional meetings in November-December 1994 was to establish the main elements of a verification system. It does seem that the verification debate is prolonged not so much because of conflicts between states, although certainly there are conflicting positions, but because of the sheer complexity of the issue. There has been provisional agreement that the International Monitoring System should centre around four monitoring technologies:
* Seismological monitoring, which will provide the basis for detection of underground explosions. This will operate through a network of seismic stations and arrays.

* Hydroacoustic monitoring, for the detection of underwater explosions.

* Radionuclide monitoring

* Infrasound monitoring

The main role of these two technologies will be the detection of explosions in the atmosphere.

Verification technologies are very much in a state of evolution, with each of them being improved in performance, causing modification to the arrangements. There will most likely be provision for other technologies to be introduced as they become available.

**The nature of On-site Inspection**

It has been agreed that a system of on-site inspections is necessary to clarify possible cases of non-compliance with the Treaty, but just how this system will operate is still a matter of intense negotiation. It is a complex issue, and the delay is understandable in view of the intrusion of sovereignty which such inspection involves. The encouraging thing is that all parties agree on the concept, and it has been an essential part of a number of recent treaties, including the INF Treaty, START and the Chemical Weapons Convention.

The negotiations are not faced with the stalemate of the 1960s and 1970s, when the USA insisted on, and the Soviet Union opposed, the need for on-site inspections as a back-up when technical verification methods failed.

**CONCLUSION**

During the last 15 months, the nuclear-weapon states have been under some pressure as a number of non-aligned states have taken the position that a completed CTB Treaty is a necessary condition for indefinite extension of the Nuclear Non-Proliferation Treaty. The USA and the UK have resisted this "linkage", and, indeed, some spokesmen have responded with "reverse linkage", implying that if the NPT Extension Conference came up with anything less than indefinite extension, the CTB negotiations could suffer.

Whatever happens at the Extension Conference - and at this stage it appears likely that indefinite extension will gain at least a majority vote - it would be difficult to halt the CTB negotiations given their present momentum. Hopefully a Treaty will emerge in 1996.
### CHRONOLOGY OF MAJOR EVENTS RELEVANT TO NUCLEAR TESTING MORATORIUMS AND CTBT NEGOTIATIONS

(Compiled with assistance from the Conventional and Nuclear Disarmament Section of the Department of Foreign Affairs and Trade, particularly for recent entries)

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• main issue of negotiation: verification, especially obligatory on-line inspections.</td>
</tr>
<tr>
<td>31 Aug. 1962</td>
<td>Russia resumes testing, USA several weeks later.</td>
</tr>
<tr>
<td></td>
<td>• breakdown in negotiations mainly due to the deteriorating political climate, especially over the Berlin situation.</td>
</tr>
<tr>
<td>1962-1963</td>
<td>Negotiations continue in UN, especially in the Eighteen Nation Disarmament Committee (which later became the Conference on Disarmament).</td>
</tr>
<tr>
<td>1 July 1968</td>
<td>Nuclear Non-Proliferation Treaty signed (entered into force 5 March 1970).</td>
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<tr>
<td>8 May 1974</td>
<td>First and only Indian nuclear test.</td>
</tr>
<tr>
<td>3 July 1974</td>
<td>Threshold Test Ban Treaty (TTBT), agreeing to cease underground nuclear weapon tests having a yield exceeding 150 kilotons, signed by USSR and USA.</td>
</tr>
<tr>
<td>28 May 1976</td>
<td>Peaceful Nuclear Explosions Treaty (PNET) signed.</td>
</tr>
<tr>
<td>July 1977</td>
<td>Negotiations on nuclear test ban begin between USSR, USA and UK (France and China refuse to take part).</td>
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</tbody>
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- Main issue: stockpile reliability.

1980 Talks suspended following Soviet occupation of Afghanistan (negotiations formally broken off in July 1982).

21 April 1982 Ad hoc Committee on Nuclear Test Ban established to discuss and define issues of verification and compliance relating to a CTB.

6 Aug. 1985 USSR begins unilateral moratorium on nuclear testing, aimed at encouraging resumption of negotiations on nuclear testing (this moratorium ceased after 19 months; no other nation had ceased testing).

9 Nov. 1987 US-Soviet negotiations begin on nuclear testing, initially to agree upon verification measures towards ratification of the 1974 TTBT and the 1976 PNET.

1 June 1990 New Protocols signed for the TTBT and PNET. The two Treaties finally entered into force on 11 December 1990.


5 Oct. 1991 Soviet President Gorbachev announces a one year moratorium on testing.

26 Oct. 1991 Russian President Yeltsin endorsed the moratorium announced on 6 October 1991 (the moratorium still continues).

8 April 1992 French President Mitterrand announces a suspension of French testing until the end of 1992 (the moratorium still continues).


15 Nov. 1992 The ANZ-Mexican CTBT resolution adopted by the UN General Assembly 136 in favour, 1 opposed (US) and 4 abstentions (UK, France, China, Israel).
President Mitterrand extends the French moratorium indefinitely.

President Clinton announces that the US will begin consultations with Russia, US allies and other states aimed at beginning negotiations towards a multilateral test ban treaty.

President Clinton announces that the US will extend its current moratorium on nuclear testing at least until September 1994, provided that no other nation tests before that time.

President Yeltsin signs a decree extending the Russian testing moratorium as long as no other country conducts a nuclear test. He also instructs the Russian Ministry of Foreign Affairs to begin consultations with the other nuclear powers as soon as possible about negotiating a CTBT.

US commences consultations with NSW and Germany, Japan and India concerning a CTBT.

The Conference on Disarmament agrees to the Nuclear Test Ban Ad hoc committee beginning negotiations on a CTBT from the start of the 1994 session.

Chinese test.

UN General Assembly adopts by consensus a resolution calling for negotiation of a CTBT.

CTBT negotiations begin in the Conference on Disarmament.

CTBT negotiations begin in the Conference on Disarmament’s Ad hoc Committee on a Nuclear Test Ban.

President Clinton extends the US moratorium until at least September 1995.

Chinese test.

Conference on Disarmament’s Ad Hoc Committee on a Nuclear Test Ban, in its report to the Conference on Disarmament, produces CTBT rolling text.

1994 Annual Report of the Conference on Disarmament, including CTBT rolling text, submitted to UNGA.
<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>15 Dec. 1994</td>
<td>For the second year running, UN General Assembly adopts (with the P5 among the co-sponsors for the first time) a consensus resolution calling on the &quot;conclusion without delay&quot; of CTBT negotiations in the Conference on Disarmament.</td>
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<tr>
<td>30 Jan. 1995</td>
<td>US extends its moratorium until the CTBT enters into force, on the assumption that the Treaty will be signed before 30 September 1996; and withdraws its proposal for a right to special withdrawal from the CTBT after ten years.</td>
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<td>2 Feb. 1995</td>
<td>Conference on Disarmament's Ad Hoc Committee on a Nuclear Test Ban resumes negotiations on a CTBT.</td>
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