The CTBT Verification System

Entering Rough Waters?

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Executive Summary

- Five years after the Comprehensive Nuclear Test Ban Treaty (CTBT) was opened for signature, progress towards entry into force has been slowing.

- Political uncertainty about the timing of entry into force is complicating the work of the CTBT Organization's Preparatory Commission (PrepCom).

- The US decision, announced on 21 August 2001, not to pay its full share of financial contributions to the PrepCom and withdraw from activities not related to the International Monitoring System (IMS) may put it in non-compliance as a signatory to the treaty.

- States need to continue to support the work of the PrepCom by providing it with the necessary financial and technical means. Gaps left by the US decision need to be filled by other states.

- Completing the IMS remains a priority task which will need patience and support from all member states of the PrepCom.

- Establishing an effective regime for on-site inspections is greatly complicated by the new US policy. Those states in favour of a flexible regime need to redouble their efforts, including increased input into the development of an Operational Manual.

- States need to overcome undue concerns about confidentiality and create an open verification regime that makes its data available to scientific and humanitarian relief organisations.

- Taken together, these efforts will enable the PrepCom to complete its task of setting up the CTBT's verification system in the foreseeable future.

- Washington should live up to its commitment as a signatory to the CTBT and support the whole range of PrepCom activities.

- The Article XIV conference should urge the US to reconsider its new policy of reducing support to the PrepCom.
INTRODUCTION

Over the last political progress towards entry into force of the 1996 Comprehensive Nuclear Test Ban Treaty (CTBT) has been slowing. As of 7 September 2001, 161 states had signed the treaty, 79 had ratified. Five years after the treaty was opened for signature, 13 states still have to ratify before the treaty can enter into force. Especially worrying is that the US government has stated that it does not intend to ratify the treaty in the near future and that India, North Korea and Pakistan, which are also listed in Annex 2 of the treaty, have not even signed.

Meanwhile, good progress toward the implementation of the treaty’s verification system has been made. Since 1997, when the Provisional Technical Secretariat (PTS) for the future Comprehensive Nuclear Test Ban Treaty Organisation (CTBTO) in Vienna commenced work to implement the CTBT’s verification provisions, major milestones have been achieved. The groundwork for the International Monitoring System (IMS) has been laid and the system is increasingly being put into place. The Organisation itself has evolved into an efficient international verification body.

**Status of the 44 States Required to Ratify the CTBT Before it Enters into Force**

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As of 12 September 2001. Up-to-date information on signatures and ratification can be found at www.ctbto.org

**COMPLETING THE VERIFICATION SYSTEM**

But there are also first indications that the lack of political progress is beginning to affect the work being done in Vienna. Political support for the CTBTO Commission (PrepCom), which has oversight of the PTS, is needed because major hurdles still need to be overcome before its mission is accomplished and the verification system is established as foreseen in the treaty. There are four main challenges facing the PrepCom:

- Maintaining political support and funding for the verification regime;
- Completing the IMS;
- Creating an effective regime for on-site inspections (OSIs);
- Building an open organisation that can make its data available for the greater common good.

Maintaining support for the CTBT

Political and financial support for the work being done in Vienna has been good so far. It includes the willingness of states to pay for necessary budget increases. The main reason for the need to increase budgets is the growth of the organisation and the implementation of the IMS. The 2001 PrepCom budget was $US 83.5 million, compared with $US 79.9 million in 2000, $US 74.7 million in 1999 and $US 84.4 million in 1998. The PTS has requested about $US 86 for 2002.

The collection rate for assessed contributions to the budget was approximately 97 per cent for the 2000 budget and more than 84 per cent for the 2001 budget. 1 This is a good record compared with most international organisations, but needs to be maintained. While discussions about the PTS budget have been relatively smooth so far, there are some signs that this might change.

On 21 August 2001, the US representative to the PrepCom in Vienna announced that the US will continue to participate in and fund only those PrepCom activities directed to establishing and supporting the International Monitoring System including, to the extent required for IMS support, the International Data Centre (IDC) and Global Communications Infrastructure. 2 Reported, this new policy would result in a reduction of US contributions by about 4.5 per cent or $US 900,000 annually, starting in 2002. It would also include an end to US participation in efforts to develop an OSI regime. 3 Since the announcement, the US has stopped participating in discussions aimed at developing a manual for on-site inspections.

This new US policy sets a worrying precedent for arms control and disarmament verification regimes because states normally do not attempt to designate how their financial contributions to international organisations are spent. There is traditionally an unstated understanding among signatories to any treaty which mandates the establishment of a new organisation prior to the new regime going into force, that despite the apparent tenuousness of their legal obligations they will work cooperatively on their joint endeavour. The new US attitude disturbs this implicit assumption and may begin to undermine the global support for the IMS.

The partial US withdrawal from the work of the PrepCom could only do a lot of harm for two reasons. First, the PTS projects rising budgets over the next years to deal with the double burden of operating certified stations and installing new stations in order to complete the IMS. From the perspective of the Secretariat, substantial budget increases will be required for the next two to three years to provide the necessary funds for the installation of the remaining IMS stations. What is needed is increased support, not a reduction.

Second, there is the danger of a domino effect. A number of developing countries have recently begun questioning the funding levels necessary during the PrepCom phase of the verification system’s implementation. This discussion was triggered by agreement on a new scale of assessment for financial contributions to the UN and UN agencies, which will be used from 2002. This new scale pegs the US contribution at 22 per cent and redistributes the reduction to other countries. 4 States have argued that

2. Paragraph 5 of the Resolution Establishing the Preparatory Commission (CTBT/PP/Res/1), Annex, adopted on 19 November 1996 obliges all signatory states to annually meet their share, based on the UN scale of assessment, of the PrepCom. The resolution states that a “State Signatory which has not discharged in full its financial obligation to the Commission within 365 days of receipt of the request for payment shall have no vote in the Commission, until such payment is received.”
113 stations was in progress. Twelve IMS stations have been certified. However, technical difficulties have slowed the certification process in 2000. While the PTS planned to certify 27 stations this year, only one had been certified by the end of August.

Now, that more and more stations are being completed, the PrepCom is putting additional efforts into establishing legal and financial rules for the operation and maintenance of certified IMS stations. Like so many PrepCom issues, this is an uncharted territory. No international organisation has ever operated such an elaborate network of monitoring stations.

As a first step, Working Group B, responsible for verification, has made an initial recommendation for the provisional operation and maintenance of IMS facilities. This includes the development of rules for staff and operations.8

One controversial issue is whether the PTS will be responsible for the operational and maintenance costs for the 120 auxiliary seismic stations. These stations are normally used for scientific purposes and will only transmit data to the IDC when there is a need to clarify a suspicious event. However, auxiliary stations need to be maintained to be ready for use as stations in the primary network.9 Papua New Guinea is the first state to request that the PTS shoulder the operational costs of an auxiliary seismic station.10 Other developing countries are expected to make similar requests, but the PrepCom intends to deal with them on a case-by-case basis.

Setting up the International Data Centre (IDC)

All information from IMS stations is transmitted to the IDC via the Global Communications Infrastructure (GCI). The IDC receives, processes and distributes it to national technical and analytical means in member states. All CTBT member states can receive raw data and/or screened information from IMS stations, according to their individual wishes.

Data from the seismic, infrasound and hydroacoustic stations is automatically processed. It is the IDC's responsibility to screen and correlate the information for the IMS stations to the data delivered to the IDC. The product—so-called Standard Event Bulletins—are reviewed by human analysts, who produce Reviewed Event Bulletins (REBs). Because rumour control takes much longer to be collected and analysed, this takes place on a different time-scale.

The IDC will issue Standard Event Bulletins, which indicate the degree to which each detected event meets specific screening criteria.11 States without significant national technical and analytical means will naturally look to the IDC for more precise information if suspicions are around concerning a particular event. The IDC is expected to assist any state party in the technical analysis of IMS data as well as data provided by other state parties.12

Since 21 February 2000, when the IDC took over from the provisional IDC (pIDC) in Arlington, US, its products have been produced regularly, although on p IDC was delivering data to only 75% of the stations with delays and gaps in reporting. As of August 2001, the IDC is receiving about five gigabytes of data per day from IMS stations. Member states received, on average, 1.8 million pages of data within four days of the IDC's starts.13 Over the course of 2000, 74 IMS stations were sending data to the IDC but only 16 stations were transmitting data over the Global Communications Infrastructure. The REB reported on average 52 events a day.14

As more and more stations deliver data to the IDC on a near-real-time basis, the centre is distributing data and products to member states on a larger scale. This has raised the question of whether the IDC, prior to entry into force of the treaty, is expected to provide services to member states on a 24-hour, 7-day basis, thereby fulfilling the requirements for a fully operational IDC.

Three releases of IDC applications software, which filter and screen IMS data, have been successfully installed and tested at the IDC, the last one after some delay in June 2000.15 One setback for the IDC is that the pIDC in Arlington will not continue its

11 delivery of software. In line with the US decision to cut back involvement in the non-IMS parts of the PTS work, the pIDC will not develop or extend its software for the IDC software, but the PTS is still negotiating the details of further cooperation. Meanwhile, the PTS has begun to set up a Software Integration Unit and has budgeted US $1.8 million in 2001 for external contracts for the development, maintenance and documentation of IDC software.16

Agreeing rules for on-site inspections

OSIs may be mandated by the Executive Council of the CTBTO to clarify suspicious events detected by the IMS or on the basis of information from national technical means (NTM), obtained in a manner consistent with international law, and submitted by states parties. The CTBTO will not have a standing OSI inspectorate, but will draw on a pool of trained inspectors nominated by member states. This pool needs to be geographically representative and large enough to supply a team of up to 40 inspectors within six days.

OSI teams will be permitted to spend up to 130 days on an inspected state's territory and will therefore require significant in-country support. Substantial amounts of portable equipment will also be needed, including geophysical, radiological, drilling and communications equipment.

In November 1999 the PrepCom took steps to speed up the development of OSI procedures, thereby released of the component of this test ban's verification system was lagging behind. Consequently, the budget for developing an OSI capability was doubled to ensure that the process remains realistic.

Preparing for on-site inspections has several, interested aspects:

- the development of an Operational Manual (OSM)
- the selection and training of future inspectors, and
- the procurement of equipment.

To draft a text for an OSI manual, a group of Friends of the OSI Programme Coordinator was established in November 1999, open to participation by all signatories. This process did help identify some contentious issues, but was not capable of delivering a usable manual. To speed up the process, discussions on the text were opened in Working Group B. In late 2000, the new position of Task Leader for the 'OSI Operational Manual' was created. Since February 2001, Dutch Ambassador Arnd Meeburg has been in charge of this issue.

The manual is expected to be a guide for inspectors, detailing the rights and obligations of both the team and the inspected party. But this process faces several difficulties. First, there is no agreed understanding of the technical parameters of the IMSS, raising the question of whether any potential inspectors would be able to conduct intrusive on-site inspections. Second, the Manual is likely to be required. But the new task leader has not been able to

Finally, the current drafting method is still slow and ineffective. Based on contributions received so far, an Initial Draft Rolling Text of more than 1,000 pages was compiled. Delegations began discussing this text in June 2001. However, this process has not resulted in the acceleration of the deliberations that many hoped for. The OSIs are likely to be required. But the new task leader has not been able to

Meanwhile, the PTS is continuing to conduct exercises and mock on-site inspections to assist the development

8 See Background Document by the Provisional Technical Secretariat of the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization (PrepCom) for the Conference on Facilitating the Entry into Force of the CTBT (New York, 2001), CTBT/P-15/1/Annex IV/Appendix V, 24-26 April, 2001, p. 32.

9 The treaty states that the Technical Secretariat shall agree and cooperate to establish, operate, upgrade, finance and maintain monitoring facilities and radiological laboratories. Protocol to the CTBT, Part I, paragraph 4.


11 Protocol to the CTBT, Part I, Section F, paragraph 18.

12 Protocol to the CTBT, Part I, Section F, paragraph 20.

13 See pws.ctbto.org.

14 CTBTO PrepCom document CTBT/P-14/1/Annex III, 5-16 Feb, 2001, p. 7

15 One positive effect of this development is that IDC staff now has the opportunity to test and modify software according to its needs. Private Communication.

A number of training courses have been conducted, including an OSI Experimental Advanced Course in Snezhinsk, Russia, which was used to further develop on-site inspection arrangements in other regimes and observation and position finding and low resolution limitations be incorporated into the equipment’s 'blinded' so that it only reveals data indicative of a non-nuclear explosion. Further, they insist that these requirements for future OSIs, for example the facilities for the immediate and complete release of all IMS data. The treaty itself only obliges the Technical Secretariat to ‘make available all data, both raw and processed, and any reporting products, to all States Parties’ (Article IV paragraph 14.e). But it is unclear whether this excludes the possibility of making information available to others. Unlike other verification regimes, data that is available to the IMS is not confidential information provided by governments. Rather, it is scientific data that has been collected and analysed by the international organisation itself.

IMS data could be used in a variety of contexts. Scientific and humanitarian relief organisations, for example, have expressed an interest in receiving it. Data from seismic stations could give early warning of tsunamis, while infrasound stations could warn of volcanic eruptions. Another option would be to make IMS data available to everybody, possibly with a built-in delay for certain types of data. It will in any case be difficult to prevent leakage of the data, since data centres in all CTBT parties will have direct access to it. In order to evaluate confidentiality rules, the PTS has been planning a phased release of certain types of data to a limited number of non-state recipients. Thus, humanitarian organisations could promptly receive IMS data for disaster relief operations, while others would have only delayed access. The proposed test of a delayed release of certain types of IMS data beyond states parties’ National Data Centres has not begun because of the continued resistance of at least one state party. The development of the CTBTO as ‘a relatively open organisation that cooperates with other organisations, national and international to make the most effective use of its scientific and humanitarian capabilities’ was also contained in the report of an external review team that evaluated the functioning of the IDC in October and November 2000. Such a scheme of action would not only enable the CTBTO to freely exchange information with the scientific and non-governmental community, but also might provide another raison d’être for the IMS in addition to monitoring for nuclear explosions.

**THE WAY FORWARD**

Five years after the CTBT was opened for signature, the completion of the verification system is overshadowed by the uncertain prospects of entry into force because a small number of the countries required to ratify it before it enters into force have refused to do so. The political uncertainty means that the PrepCom and the PTS is working against a shifting deadline, further complicating the already difficult task of setting up the CTBTO’s verification system.

Several interrelated political issues need to be addressed by the PrepCom:

- **what is a realistic timeline for completing the IMS and the other components of the verification system so that the regime is ‘capable of meeting the verification requirements’ of the CTBT?**
- **what level of funding is required for the timely completion of the system and for maintaining the operational readiness of the IMS?**
- **what will eventually be required of the verification regime so that it is ‘capable of meeting the verification requirements’ of the CTBT?**

The answers to these questions will depend on the level of political commitment of states to work towards entry into force of the CTBT. Key to this process is the US’ position on the test ban, not only because of the political importance of the most powerful country towards a resumption of nuclear tests, but also because of the financial and technical importance of US support for the PrepCom.

The Bush administration’s approach toward the CTBT has greatly complicated planning for the PTS in several aspects. The new administration has made it clear that it does not intend to seek ratification of the treaty. On the contrary, the US has taken several steps to distance itself from the test ban:

- **in July 2001 it emerged that the administration had asked for legal advice on a possible withdrawal of the US signature of the treaty.** The State Department’s advice was that the CTBT remains before the Senate despite the failed ratification vote on 13 October 1999.
- **Parts of the Republican leadership both in Congress and the administration still want to renounce US signature of the treaty.**
- **The administration has taken steps to shorten the lead-time necessary for a resumption of nuclear testing.**

While the US is not the only state that has refused to ratify the treaty, Washington’s test ban policy has taken the pressure off other countries which are reluctant to do so. This is most obvious in the case of India and Pakistan, which have both stated that they will not stand in the way of entry into force but have taken no measures themselves to become state parties. All of this increases the uncertainty about the timing of entry into force. The PTS has developed a Programme Option Memorandum for 2002-2006, which describes several timelines for completion of the system. The PTS has made 2005 the target date for the completion of the IMS, even though this is not necessarily a realistic date for entry into force.

As a result, several states, including Latin American countries and China, have begun to make a connection between the rate of completion of the IMS and the entry into force of the treaty. As more and more IMS stations are certified, the PTS must absorb the operational and maintenance costs for these stations. Some PrepCom delegations have therefore floated the idea of ‘mothballing’ part of the system until the treaty enters into force. From a verification point of view, such partial withdrawal is possible, but would have to be maintained and operated on a continuous basis. In most cases, stopping operations of stations would necessitate re-certification and therefore only add to the costs of setting up the IMS.
Behind these practical questions looms the larger issue of what will be required for the verification regime ‘to be capable of meeting the verification requirements’ of the CTBT. The bottom line among delegations seems to be that the completion of the three Operational Manuals is a necessary requirement. But how much of the IMS needs to be completed? It is unlikely that all 321 stations will be completed in the near future as envisaged in the treaty, but this should not prevent entry into force and will not be necessary to verify the CTBT with sufficient confidence.

While this is not an urgent issue yet, developing realistic expectations of system requirements will make it easier to tailor the work of the PrepCom to the eventual political requirements.

While the completion of the CTBT’s verification system is ultimately dependent on the political decisions of states that have not yet signed and ratified the CTBT, progress made towards completing the system in turn fosters political progress towards entry into force in at least two ways.

First, demonstrable progress shows the capabilities of the treaty’s verification system and helps to dispel fears that the verification system has loopholes. Second, support for the verification system by the PrepCom is and will be seen as symbolising the political importance that states attach to the CTBT.

What is needed is that states maintain their political commitment towards the CTBT as a landmark international agreement, as well as to its early entry into force and smooth establishment of the treaty’s verification system. Steps to be taken include:

- keeping up the pressure on those states that need to ratify the treaty for it to enter into force,
- completing the IMS as a priority task. This will need patience and support from all member states of the PrepCom,
- creating a flexible and effective on-site inspection regime, by redoubling efforts to develop an Operational Manual,
- creating an open verification regime that can make its data available to scientific and humanitarian relief organisations by overcoming undue concerns about confidentiality,
- urging the US to reconsider its new policy, as announced on 21 August in Vienna.

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CTBT, Article IV.1.C.