

# ARTICLES

## **The Comprehensive Nuclear-Test-Ban Treaty Eight Years after the Opening of the Treaty for Signature: What is the Situation?**

**by Gilbert Le Goff and Denys Rousseau\***

The international community has just celebrated the eighth anniversary of the opening for signature, on 24 September 1996, of the Comprehensive Nuclear-Test-Ban Treaty (CTBT). This event provides an opportunity to review briefly the current situation with regard to the Treaty and the international organisation responsible for preparing the various steps necessary for its implementation.

The purpose of this paper is not to give once again a detailed description of the history of the Treaty, the issues at stake and its prospects. Readers looking for such information will find it in the various publications cited in the bibliography.<sup>1</sup>

It is simply recalled that the major undertaking by States Parties to the Treaty is “not to carry out any nuclear weapon test explosion or any other nuclear explosion, and to prohibit and prevent any such nuclear explosion at any place under its jurisdiction or control” [Article 1].

It is also useful to note that the Treaty provides for a verification regime consisting of the following four elements:

- creation of a permanent International Monitoring system (IMS);
- consultation and clarification procedures to be followed by states in the event of a suspicious occurrence;
- on-site inspections (OSIs), carried out at the request of a State Party;
- confidence-building measures.

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1. Bibliography: 1) Wolfgang Hoffmann: *Verification Yearbook* 2003 (Preface); 2) Ben Mines: Vertic brief (3 April 2003); 3) Merle Opelz: *Nuclear Law Bulletin* No. 58; 4) Joëlle Bourgois: *Nuclear Law Bulletin* No. 59.

On the eve of important deadlines particularly during 2005<sup>2</sup> for disarmament and non-proliferation, we felt it was useful to give a brief factual picture of the current Treaty situation and, above all, of the results obtained to date by the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO).<sup>3</sup>

From a strictly political and legal standpoint, the situation of the Treaty can be summarised as follows, at 30 September 2004: 173 states out of the 194 Member States of the UN have signed the CTBT, and 119 states have ratified it, thus indicating its universal appeal.

The Treaty will enter into force when the 44 states<sup>4</sup> listed in Annex 2 have signed and ratified it. Again as of 30 September 2004, only 33 states on this list had done so. Amongst the 11 absentees are:

- three non-signatory states: India, North Korea and Pakistan;
- eight states which have signed the Treaty but not yet ratified it: China, Colombia, Egypt, Indonesia, Iran, Israel, United States, Vietnam.

In these circumstances it is difficult today to give any forecast whatsoever as to when the CTBT will enter into force, even though a very large majority of signatory states continue to support it, if only through the regular payment of their contributions to the budget of the CTBTO Preparatory Commission.

The drafters of the Treaty had anticipated such difficulties as Article XIV of the Treaty provides for the holding of Conferences of the States Parties, commonly referred to as “Article XIV Conferences”. The main purpose of these Conferences is to examine the reasons why the Treaty has still not entered into force and to decide and implement measures “to facilitate the early entry into force of this Treaty”. Following the first of these Conferences, to be held, according to the Treaty, three years after the date of its opening for signature and which was held in Vienna in 1999, two other Conferences have been held at the initiative of the States Parties, in New York and Vienna in November 2001 and September 2003, respectively. A fourth Conference is to be held in 2005. This series of Conferences, each of which gives rise to a final declaration, also demonstrates the support of the States Parties for the Treaty.

By a Resolution dated 19 November 1996, the States Parties also set up a Preparatory Commission, the main task of which is to prepare and validate the necessary means of implementing the verification procedure after the entry into force of the Treaty. This Preparatory Commission is made up of representatives from all the signatory states. It meets twice a year in ordinary session (usually in June and November). It has three subsidiary bodies which draft, in close collaboration with the Provisional Technical Secretariat, each in its own domain, the recommendations which are communicated to the Preparatory Commission:

- working group A, dealing with financial, administrative and staff matters;

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2. The Non Proliferation Treaty (NPT) Review Conference will take place in April 2005.

3. Resolution adopted on 19 November 1996 establishing the Preparatory Commission.

4. Algeria, Argentina, Australia, Austria, Bangladesh, Belgium, Brazil, Bulgaria, Canada, Chile, China (People’s Republic of), Colombia, Congo (Democratic Republic of), Egypt, Finland, France, Germany, Hungary, India, Indonesia, Iran, Israel, Italy, Japan, Mexico, Netherlands, Norway, Pakistan, Peru, Poland, Korea (Republic of), Korea (Democratic People's Republic of), Romania, Russian Federation, Slovak Republic, South Africa, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom, United States, Vietnam.

- working group B, dealing with technical issues;
- an advisory group, contributing financial expertise.

These subsidiary bodies, composed of representatives from the signatory states, sit regularly in Vienna.

It is noteworthy that until now, the Preparatory Commission has managed to deal with its entire agenda on a consensus basis, and has never had to resort to a vote.

The Preparatory Commission is also, and above all, helped by a permanent organisation, the Provisional Technical Secretariat (PTS), which has its headquarters in Vienna and holds the status of an international organisation. The PTS implements on an everyday basis the decisions of the Preparatory Commission and reports to it on its activities. It is directed by an Executive Secretary, a post held since its creation by the German Ambassador Wolfgang Hoffmann. At its November 2003 session, the Preparatory Commission noted that the Executive Secretary wishes to terminate his mandate on 1 August 2005. Consultations are already underway to nominate his successor.

From the budgetary and technical standpoint, the activities of the PTS started at the beginning of 1997. After a period of rapid expansion in terms of personnel and budget, the staff has remained more or less stable at 275 persons since the year 2000.

Its budget for 2004 was some 95 million US dollars (USD). States make annual contributions to this theoretical budget at a level which is normally around 93 to 95% which, as already indicated, in itself illustrates the commitment of states vis-à-vis the Treaty. Some 80% of this budget is allocated to expenditure directly related to the setting up of the verification regime, the remainder being spent on administrative support, logistics and promotion of the Treaty. Lastly, the PTS budget will for the first time in the year 2005 be established and spent using a double euro/dollar system, the purpose of which is to protect the Secretariat's budget from any adverse financial effects of fluctuations in the exchange rate between these two currencies.

Two main components of the verification regime require funding: the International Monitoring System (IMS) and the On-Site Inspections (OSIs).

## **I. The International Monitoring System**

For the construction of the system, as strictly defined, the IMS was divided into three parts:

- a worldwide network of facilities, on the territory of 89 states, comprising 50 primary seismological stations, 120 auxiliary seismological stations, 11 hydroacoustic stations, 60 infrasound stations, 80 radionuclide stations, 16 radionuclide laboratories and 40 so-called "rare gas" stations;
- the Global Communications Infrastructure (GCI);
- the International Data Centre (IDC) in Vienna.

The performance of this network in terms of detection, characterisation and localisation is reliant not only on the performance of each sub-network but also on the bringing together of data provided by each technology.

A. There is a special investment fund for the IMS network of stations, with its own financial rules which allow, in particular, for state contributions to be carried over from one year to the next. The current estimate of this part of IMS investment is USD 276 million, excluding the funds required for recapitalisation and for the construction of the 40 “rare gas” stations planned after the entry into force of the Treaty. Including the 2004 contribution, some 80% of this investment has today been paid by states. The current objective is to have 90% of the network available at the end of 2007, and 100% by the end of 2009. At 30 September 2004, the situation, expressed in terms of the number of certified stations, i.e. those declared “ready for service”, can be summarised as follows:

- 27 of the 50 primary seismological stations;
- 15 of the 120 auxiliary seismological stations;
- 4 of the 11 hydroacoustic stations;
- 21 of the 60 infrasound stations;
- 23 of the 80 radionuclide stations;
- 4 of the 16 radionuclide laboratories.

To these must be added some 50 stations which have not yet been certified but the performances of which are close to those required for certified stations and which send their data to the IDC in Vienna. Overall, some 50% of the network can be considered to be operational today.

B. The main tasks of the GCI are to transmit data acquired from the stations to the IDC in Vienna and to redistribute these data, before and after processing, to country national data centres. The basic technology used is satellite links and it may be noted that 60% of this network is today installed and functioning in nominal conditions.

C. Lastly, the IDC is operational with regard to the processing of seismic data. Optimising techniques between the number of events to be processed and the sensitivity of this sub-network is one of the questions which remains to be answered. Software development is under way with regard to other technologies. Thus, for example, 100 000 events were reported during the first eight months of the year 2004. The role of the Centre in promoting national activities relating to the implementation of the Treaty and fostering technical exchanges between countries in this field is decisive.

For the last two years, expenditure on operation of the system has been growing steadily as a result of the increasing number of certified stations. This means that states must pay more in this respect, while the investment burden has not yet decreased very much. For reasons of global budgetary constraints, the Preparatory Commission has decided, for this initial operation of certified stations, to “suspend” the operational specifications provided for upon entry into force and to establish provisional specifications which are not as stringent technically, and therefore are less expensive.

Along with all of these construction and operation activities, operational manuals for the four technologies and for the IDC have been drafted and should be approved by States during their first meeting after entry into force. The final provisions of these manuals determine the global costs of IMS operations.

Today, the question of the integration of the system is a pressing one. Given the progress achieved in all three of the components originally defined, it is necessary to prepare the conditions for

the successful operation of the IMS by the PTS, in direct liaison with station operators, who work under contract with the PTS, and the national data centres which use the system's data on behalf of their respective national authorities. It is to this end that the Preparatory Commission decided to implement the first system-wide performance test (SPT1) to be conducted in 2005, after a preparatory phase which started at the beginning of the year 2004. At the same time, it called for collective thinking about the development of the PTS structure so as to adapt it to its final role of IMS operator. For this purpose, it mandated an international team of nine experts of varying diplomatic and managerial expertise, which will be required to submit its conclusions in summer 2005. The goal is to set up an adapted structure at the beginning of the year 2006, in the light of the lessons drawn from SPT1.

## **II. On-Site Inspections (OSIs)**

The objective of an on-site inspection is to gather, on a site localised by the International Data Centre, after detection of a suspect event, complementary information likely to corroborate or not the theory of a nuclear explosion. It is an investigative task. In any event, states remain the final judge as regards the conclusion. The second main component of the verification regime developed by the PTS raises both political and tactical questions.

An inspection is of an intrusive nature as it takes place on the territory of the inspected state. Depending on the object of the inspection, that state can attempt to protect issues which it considers to concern national security. The Treaty is very specific as regards the definition of available techniques and on rights and obligations of inspectors. However, these provisions need to be completed by implementing texts and procedures for the application of these techniques. This is the very objective of the revision of the OSI Operational Manual.

Tactical issues are very much conditioned by a "race against the clock" during each inspection. Signatures of a nuclear explosion have a very short lifespan. The most telling indicators are those which are detected by the simplest means but which disappear very quickly. These time restraints are amplified by the fact that potential inspectors will not be members of the CTBTO but rather will come from national "pools" thereby rendering their mobilisation more complicated and therefore longer. Finally, the delays necessary for preliminary negotiations leading to a decision to carry out an inspection slow down implementation considerably.

All of these difficulties and constraints are clearly demonstrated by the slow rate of progress with regard to the OSI Operational Manual which has been discussed at many technical meetings (roughly six weeks a year) and is very slow-moving.

Nevertheless, significant progress has been made through the use of exercises. In particular, an initial on-site half-scale experiment was conducted in Kazakhstan in September and October 2002. Based on a realistic scenario, this experiment enabled many lessons to be learned. It demonstrated in particular the efficiency of exercises in ensuring that the Manual is operationally effective. It resulted in strategic planning for all PTS activities with regard to the training of inspectors, the equipment necessary and the methodology and procedures to be used in conducting inspections. A full-scale exercise is planned for the end of 2007 (or beginning of 2008), which will focus essentially on PTS activities over the next three years in this field.

## **Conclusion**

Although it is difficult to make predictions today about the entry into force of the Treaty, the progress achieved in recent years with regard to the setting up of the verification regime is highly significant. Inasmuch as the resources currently available to the PTS are at least maintained, demonstrating the feasibility of the International Monitoring System is a reasonable objective. This is less true in respect of OSIs. However, such a demonstration necessarily requires measuring the System's performances, which may seem akin to verification activities. This has an effect at the political level within the Preparatory Commission, since many states are against all verification activity before the entry into force of the Treaty. This fundamental difference in approach has led the Commission to opt today by consensus for a budget policy with close-to-zero growth. In the not too distant future, such an option will not necessarily be compatible with the major uncertainties which currently apply to:

- the cost of operating the IMS at the level of performance initially required by the Preparatory Commission for the Treaty to enter into force;
- any adjustments in investment needed to complete the whole network of stations;
- the real cost of developing and validating the On-Site Inspections part of verification, which remains to be estimated correctly today.

The first IMS operating results seem fairly promising in terms of technical performance. Accordingly, consideration is increasingly being given in recent times to the civil and scientific applications of CTBT technologies. Examples include the remarkable quality of the work conducted by the PTS and the World Meteorological Organisation as part of their collaboration agreement concluded in 2003.

## **Postscript**

On 19 November 2004, during its 23<sup>rd</sup> Session, the Preparatory Commission nominated the Hungarian ambassador Tibor Toth to the post of Executive Secretary of the Provisional Technical Secretariat. He will therefore take over Wolfgang Hoffmann's position as of 1 August 2005. The nomination procedure involved a vote of the Preparatory Commission.