



## Notes & quotes

### North America and Western Europe and the CTBT

The North America and Western Europe (NAWE) region is the fourth largest of the six geographical regions defined by the Comprehensive Nuclear-Test-Ban Treaty (CTBT). The signing of the Treaty by all 28 Member States of the region demonstrates the overwhelming support the CTBT enjoys in the NAWE region. Not only have all Member States of the NAWE region signed the CTBT, but nearly all, with the exception of the United States of America, have ratified it.

The NAWE region accounts for a high proportion of signatures and ratifications in relation to its Member States and sets a prime example of a region's furtherance of the CTBT. The NAWE region is also of great significance inasmuch as three of the five nuclear weapon States are located in that region; namely France, the United Kingdom and the United States of America. All three States signed the Treaty on the day of its opening for signature in 1996, and France and the United Kingdom ratified the Treaty in 1998. In relation to the 44 States listed in Annex 2 to the Treaty, whose signatures and ratifications are needed for its entry into force, 15 are located in the NAWE region. All 15 of these States have signed, and all, with the exception of one, have ratified the CTBT.

State representatives from the NAWE region have also been actively involved in the administration of the CTBTO Preparatory Commission. Meetings of the Preparatory Commission were chaired by Ambassadors John Freeman of the United Kingdom in 1998, Jaap Ramaker of the Netherlands in 2001 and Thomas Stelzer of Austria in 2003. Furthermore, H.E. Erkki Tuomioja, Minister for Foreign Affairs of Finland, presided over the Conference on Facilitating the Entry

into Force of the CTBT (Article XIV Conference) in the year 2003 in Vienna.

Since 1998, States of the NAWE-region have hosted numerous workshops and seminars in order to promote international cooperation with respect to the CTBTO and to raise the general awareness of the CTBT. Such workshops have been held in Austria, Canada, Finland, France, Germany, Italy, Norway, the United Kingdom and the United States. They included Technical Training Programmes, Evaluation Workshops, a National Data Centre Manager Training Course, an On-Site Inspection (OSI) Experimental Advanced Course, an OSI Equipment Field Demonstration and an OSI Inspection Workshop.

The Commission has received valuable voluntary contributions for its workshops from, among others, Austria (2003), Finland (2005), the Netherlands (2001, 2002, 2005 and 2006) and Norway (2002). In addition, the European Union, the Netherlands and the Czech Republic are financing the global e-learning project of the Preparatory Commission, which is currently being set-up. In 2002, the Commission concluded a Host Country Agreement with the Government of Austria that regulates the activities of the Commission in Austria and grants the necessary privileges and immunities for the proper functioning of the organization.

That the CTBT enjoys strong support in the NAWE region should be capitalized on. Full ratification would allow the NAWE region to set an example for all other regions in their pursuit of nuclear non-proliferation and disarmament. States in other regions would sense the urgency of moving towards ratification so that the Treaty can enter into force. ■

### Facility Agreements in the NAWE region

Facility agreements are international agreements and arrangements between the CTBTO and a host country regulating the establishment, upgrading, testing, certification and operation and maintenance of monitoring facilities. Facility agreements also ensure that the necessary privileges and immunities are granted to the Commission and its staff. According to the CTBT, States hosting or otherwise taking responsibility for facilities of the International Monitoring System (IMS) shall conclude facility agreements with the Commission pending entry into force of the Treaty.

Of the 28 States in the NAWE region, 17 States host monitoring facilities: Austria, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Italy, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The CTBT envisages the total number of IMS facilities in the NAWE region to be 113, including 7 radionuclide laboratories. All of them have been established.

Eight States in the NAWE region have concluded facility agreements with the Commission. These States are Canada (2000), Finland (2000), Norway (2002), Spain (2003), France (2004), the United Kingdom (2004) and Iceland (2006). All these agreements have entered into force. The trend towards concluding facility agreements continues, with Italy being the latest country to sign in March 2006. Negotiations with other countries are ongoing. ■



## The importance of CTBT universalization

By Dr Javier Solana, High Representative for the Common Foreign and Security Policy,  
Secretary-General of the Council of the European Union



Being the High Representative for the European Union's Common Foreign and Security Policy, I am particularly proud that all European Union (EU) Member States have signed and

ratified the Comprehensive Nuclear-Test-Ban Treaty (CTBT). All other European countries are now also party to the Treaty, with Moldova being the latest country in the region to have ratified. This represents a major milestone towards universalization of the CTBT, a key disarmament and non-proliferation instrument.

The CTBT aims to be universal. It is an egalitarian Treaty from the viewpoint of obligations and rights: All States have to comply with the same obligations and all have access, in the same way, to the most extensive global verification regime ever built. While being egalitarian in terms of rights and obligations, the Treaty rightly requires the ratification by those countries, which possess significant nuclear activities, for its entry into force. This is not discrimination but a rather logical provision aimed at ensuring the credibility of the Treaty. Although 177 States have already signed the Treaty and 138 have deposited their ratification, the CTBT is still not nearing its entry into force. This is due to the fact that only 34 of the 44 States whose ratification is required for entry into have so far ratified the Treaty. There are ten so called 'hold-out'-States, among them two permanent Members of the United Nations Security Council.

Since the opening for signature of the CTBT ten years ago, the EU has been a strong supporter of the CTBT. The EU Strategy against Proliferation of Weapons

of Mass Destruction, adopted by our Heads of State and Government in December 2003, defines the EU policy as follows: "...to pursue the implementation and universalisation of the existing disarmament and non-proliferation norms ... and the early entry into force of the CTBT". Under this strategy, the EU has committed itself to make the best use of the existing multilateral verification systems and seek improvements where possible. This is why we have adopted a Joint Action providing financial support to the CTBTO in the area of training and capacity building in order to enhance the verification system. We are now in the process of preparing future activities for the implementation of the strategy and, among the projects envisaged, there are also new initiatives in support of the CTBT.

On 9 October 2006, the Democratic People's Republic of Korea (DPRK) tested a nuclear explosive device, in disregard of appeals from the international community not to do so. This event underscores how

important and urgent it is to bring the Treaty into force and to complete the build-up of the verification system. I hope that the event will facilitate a reconsideration of the ratification of the Treaty by those major States, which so far have stayed outside the regime.

I call on all States, particularly the ones whose signature and/or ratification is necessary for entry into force of the CTBT, to sign and ratify the Treaty without further delay. The CTBT, together with the Nuclear Non-Proliferation Treaty (NPT), the IAEA safeguards system and the implementation of United Nations Security Council Resolution 1540, in particular with regard to export controls, can make a real difference in reducing the risks of nuclear proliferation. The entry into force of the CTBT will also constitute the fulfilment of one of the fundamental steps towards nuclear disarmament that were agreed at the 1995 NPT Review and Extension Conference and again at the 2000 NPT Review Conference and it will testify that we are fully committed to all obligations of the NPT. ■



“It is now as important as ever to work towards the early entry-into-force of the Comprehensive Nuclear-Test-Ban Treaty and achieving the international community's longstanding goal of outlawing all nuclear tests, thereby advancing both nuclear disarmament and non-proliferation. The claim by the Democratic People's Republic of Korea that it conducted the test of a nuclear weapon on 9 October 2006 is a direct challenge to the nuclear non-proliferation regime and has increased tension in the region and beyond. I urge all States to refrain from acts that would defeat the object and purpose of the Comprehensive Nuclear-Test-Ban Treaty pending its entry-into-force.”

*United Nations Secretary-General Ban Ki-moon for CTBTO Spectrum*



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### Promoting the CTBT at the NAM Summit

The CTBTO Preparatory Commission was invited to participate with ‘guest status’ at the XIV Summit of the Non-Aligned Movement (NAM), held in Havana, Cuba, from 11 to 15 September 2006.

The Non-Aligned Movement has been a staunch supporter of the CTBT. Out of the 118 NAM countries, 102 have signed the Treaty and 69 have ratified it. Facility Agreements have been concluded with 13 countries. The CTBTO Preparatory Commission has sent delegations to all the major NAM meetings.

The CTBTO Executive Secretary, Mr Tibor Tóth, met with high-level representatives from the following countries: Colombia, Cuba, Dominica, Guatemala, Lesotho, Mozambique, the Philippines, and Trinidad and Tobago.

In all of his contacts, Mr Tóth explored ways and means to promote signature and ratification of the Treaty and offered assistance by the Provisional Technical Secretariat. He also underlined the political and technical benefits of the verification regime, including its potential scientific and civil applications. In addition, he reported about the status of ratification and the build-up of the International Monitoring System network, and mentioned the opportunities for training and e-learning for Member States.

In the Final Document of the Summit Meeting, the Heads of State or Government stressed “the significance of achieving universal adherence to the CTBT, including by all nuclear weapon States, which should contribute to the process of nuclear disarmament.” They reiterated that “if the objectives of the Treaty were to be fully realized, the continued commitment of all States Signatories, especially the nuclear weapon States, to nuclear disarmament would be essential.” ■

### Forensic seismology and CTBT verification ...

By Professor Paul G. Richards

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Nuclear explosion monitoring entails a series of steps, beginning with detection of signals (did a particular station detect anything?) and association (can we gather all the different signals, recorded by different stations, that originate from the same ‘event’?). The next steps involve making a location estimate and an identification (did it have the characteristics of an earthquake, a mining blast, a nuclear weapon test?). Then follow the steps of yield estimation (how big was it?) and attribution (if it was a nuclear test, what country carried it out?).

Many different technologies contribute to nuclear explosion monitoring, with seismology playing a major role in monitoring the underground and underwater environments of a possible nuclear test.

It is intrinsically difficult to do this work because there are so many events generating seismic signals. The International Seismological Centre, located in Berkshire, United Kingdom, provides the most thorough documentation of global seismicity. Its bulletin, published about two years in arrears, now reports several hundred events per day, most of them very small earthquakes occurring in well-monitored regions. Because the CTBT is a comprehensive ban on nuclear testing, all seismic events are potentially suspect and require some level of attention. But though monitoring is difficult, extensive resources are applied to do the work.

The fact that so many events are detected and located should not be seen so much as a problem in monitoring, but rather as a testament to the sensitivity of monitoring networks, which continue to improve in part because of ever-increasing needs to study earthquake hazards. The work of monitoring – for both earthquakes and explosions – is done in practice by hundreds of professionals who process the vast majority of seismic events

routinely, and who also look out for the occasional events that in the context of CTBT verification exhibit interesting characteristics, and which may then become the subject of special studies.

These special events have stimulated the development of effective new discrimination techniques and a better appreciation of overall monitoring capability. Examples include a mine collapse in 1989 in Germany and two such collapses in 1995 (in Russia and in the United States); a small earthquake of magnitude 3.5 and its smaller aftershock in 1997 beneath the Kara Sea near Russia’s former nuclear test site on Novaya Zemlya; and two underwater explosions in 2000 associated with the loss of a Russian submarine in the Barents Sea; the series of nuclear explosions carried out by India and Pakistan in 1998; and the nuclear test conducted by the Democratic People’s Republic of Korea (DPRK) on 9 October 2006.

The mining collapses were seismically detected all over the world, and caused concern because their mix of surface waves and body waves as recorded at great distances from the source appeared explosion-like using the classical Ms: mb discriminant. In this method, the strength of surface waves (Ms) is compared with that of body waves (mb). For seismic sources of a certain size, as determined by their mb value, surface waves are significantly stronger for shallow earthquakes than they are for an underground explosion.

But a careful analysis of regional waves from these events showed that although the surface waves were quite weak, and in this respect seemed explosion-like, they had the wrong sign. Therefore the motion at the source was implosive (the ground had moved inward toward the source), rather than explosive. Indeed, mining collapses are an implosion

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