Radionuclide particulate and noble gas station
Hydroacoustic (hydrophone) station
Auxiliary seismic three component station

Primary seismic array station
Infrasound station
Radionuclide particulate station
Radionuclide laboratory

International Monitoring System (337 facilities worldwide)

www.ctbto.org
Throughout the document, countries are referred to by the names that were in official use in the period for which the text was compiled.

The boundaries and presentation of material on maps contained in this document do not imply the expression of any opinion on the part of the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization concerning the legal status of any country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries.

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The map on the back cover shows the approximate locations of International Monitoring System facilities based on information in Annex 1 to the Protocol to the Treaty adjusted, as appropriate, in accordance with proposed alternative locations that have been approved by the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization for reporting to the initial session of the Conference of the States Parties following entry into force of the Treaty.

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The year 2012, which heralded the 15th anniversary of our organization, was defined by notable progress for the Treaty and its verification regime.

The number of States Signatories rose over the course of the year to 183, with 157 of these States having ratified the Treaty. Indonesia and Guatemala joined the ratifying States. Also, Niue signed the Treaty. The ratification by Indonesia, an Annex 2 State, was a landmark on the road to ensuring durable long term security through international nuclear non-proliferation and disarmament regimes. This also sent a message to the eight remaining Annex 2 States to take the necessary steps towards early entry into force of the Treaty. Guatemala’s ratification marked an important milestone in bringing the Latin America and the Caribbean region closer to full ratification of the Treaty. Niue’s signature contributes to the momentum towards universalization among Pacific island States.

Preparations for the 2014 Integrated Field Exercise (IFE) were vigorously pursued. The exercise aims to boost significantly our operational capabilities for on-site inspections (OSIs) anywhere and at any time. The CTBTO Preparatory Commission selected Jordan as the host country for the exercise. We held two extensive build-up exercises, involving launch, pre-inspection and post-inspection activities. Selected equipment was tested in small scale field experiments. In addition, major training courses and tabletop exercises were held for over one hundred national experts and staff of the organization. These undertakings can serve as an investment in future inspectors and inspection assistants of the CTBTO.

We had a thorough evaluation of the first and second build-up exercises in order to learn lessons for further improvements before we conduct the third build-up exercise, additional training courses and, most importantly, the IFE, as well as for further development of the OSI regime as a whole.

Our International Monitoring System (IMS) achieved a new record. The number of certified IMS stations and radionuclide laboratories increased to 274. This accounts for 81% of the total network. Also, the number of certified noble gas monitoring systems rose to 12 (30% of the systems planned).

The data availability at certified facilities of the system increased to 90%. We also managed to enhance our noble gas monitoring coverage. These achievements,
combined with our technological updates at IMS stations, will improve our network resilience and better our understanding of future events recorded by the network. Several major IMS recapitalization projects were undertaken in 2012. The multimillion dollar project for the repair of IMS facilities in the Juan Fernández Islands (Chile) was advanced further.

In 2012, the increase in volumes of data and high quality data products continued. The data and analysis were shared constantly with close to 1400 authorized users in 123 States Signatories. The integration of noble gas and infrasound monitoring systems into International Data Centre operations was further consolidated. We also expanded our capacity building programmes by offering various training opportunities for National Data Centre staff and station operators.

As part of the Capacity Development Initiative, we offered several courses throughout the year to educate the next generation of Treaty experts and connect with dozens of universities from around the world. In this regard, we took advantage of advanced and interactive e-learning tools to reach more than one thousand scientists, professionals, diplomats, academics, students, journalists and members of civil society in 2012 alone. In addition, the Commission has led the way among international organizations by establishing a unique presence on iTunes U, offering hundreds of hours of freely available academic material to thousands of users.

The implementation rate of the Programme and Budget of the organization in 2012 was 95.7%. The figure is indicative of many important factors, including high levels of efficiency, coordination and resource management.

On a related matter, the collection rate of the assessed contributions for 2012 shows a considerable increase compared with previous years. A collection rate of over 93% at a time of financial constraints experienced by many States Signatories indicates a belief in the mission and a trust in the performance of the organization. This will certainly strengthen our resolve to further the work of the Commission and seek new avenues of improvement.

I would like to take this opportunity to express my appreciation to the staff of the Commission for their dedication and tireless efforts in ensuring the effective functioning of the organization and serving its noble vision of a world free of nuclear weapons. Station and system operators, technicians, analysts and support personnel work day and night to run and maintain our system.

Finally, I am grateful to States Signatories for their unwavering and continuous support, which has enabled us to accomplish the many achievements detailed in this Annual Report. As the Commission takes on the remaining challenges leading to the completion of the Treaty’s verification regime and to its entry into force, we rely on their support and strategic guidance.

Tibor Tóth
Executive Secretary
CTBTO Preparatory Commission
Vienna, February 2013
Treaty

The Comprehensive Nuclear-Test-Ban Treaty (CTBT) is an international treaty outlawing nuclear explosions in all environments. In providing for a total ban on nuclear testing, the Treaty seeks to constrain the development and qualitative improvement of nuclear weapons and end the development of new types of nuclear weapon. In doing so, it constitutes an effective measure of nuclear disarmament and non-proliferation in all its aspects.

The Treaty was adopted by the United Nations General Assembly and opened for signature in New York on 24 September 1996. On that day, 71 States signed the Treaty. The first State to ratify the Treaty was Fiji on 10 October 1996.

Under the terms and provisions of the Treaty, the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) is to be established in Vienna, Austria. The mandate of this international organization is to achieve the object and purpose of the Treaty, to ensure the implementation of its provisions, including those for international verification of compliance with it, and to provide a forum for cooperation and consultation among States Parties.

Preparatory Commission

In advance of the entry into force of the Treaty and the establishment of the CTBTO proper, a Preparatory Commission for the organization was established by the States Signatories on 19 November 1996. The Commission was given the mandate of preparing for entry into force and is located at the Vienna International Centre.

The Commission has two main activities. The first consists of undertaking all necessary preparations to ensure the operationalization of the CTBT verification regime at entry into force. The second is the promotion of Treaty signature and ratification to achieve entry into force. The Treaty will enter into force 180 days after it has been ratified by all 44 States listed in its Annex 2.

The Preparatory Commission is made up of a plenary body responsible for directing policy and comprising all States Signatories, and a Provisional Technical Secretariat (PTS) to assist the Commission in its duties, both technically and substantively, and carry out such functions as the Commission determines. The PTS started work in Vienna on 17 March 1997 and is multinational in composition, with staff recruited from States Signatories on as wide a geographical basis as possible.
Summary

This report presents the major achievements of the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization in 2012.

The Commission continued to enjoy strong political support and registered notable progress in universalization of the Treaty. Many statesmen and -women and members of civil society repeatedly highlighted the significance of the Treaty, the international norm that it has established against nuclear testing and its contribution to regional and global security.

With ratifications by Indonesia and Guatemala, by the end of 2012 the Treaty boasted 157 ratifying States, thus approaching the historic milestone of 160. Niue also joined the ranks of States Signatories of the Treaty, increasing the number of such States to 183.

In 2012, joint efforts of the States hosting facilities of the International Monitoring System (IMS), local station operators, States Signatories and the Provisional Technical Secretariat (PTS) helped to further expand the coverage and data availability in all IMS technologies. Support and build-up of the IMS network continued with the testing and evaluation of data from new stations. Seven newly installed or upgraded stations and one radionuclide laboratory were introduced into the operations of the International Data Centre (IDC) as part of the certification process. Other stations awaiting certification were installed in the IDC test bed. The number of certified IMS stations and radionuclide laboratories reached 274, representing around 81% of the total foreseen by the Treaty. The number of certified IMS radionuclide noble gas monitoring systems increased to 12, which is 30% of the planned network.

These activities helped increase the overall data availability of the certified IMS stations, which has demonstrated a durable positive trend since 2009 towards the level required by the operational manuals. In an ever growing but also ageing IMS network, activities undertaken in recent years have thus not only mitigated the effects of obsolescence in the network but also reversed the decreasing trend in data availability experienced in the past.

The major project to repair IMS hydroacoustic station HA3 and infrasound station IS14 (Chile), which were destroyed by a tsunami in 2010, progressed further. A thorough bathymetric survey was conducted and the installation contract for HA3 was concluded in 2012. In light of the progress made, IS14 is expected to return to full operation in the first half of 2013.

Improvement in performance of the Global Communications Infrastructure (GCI) helped to keep overall adjusted availability consistently above 99.6%. The Commission also increased its GCI satellite capacity in five satellite regions to accommodate larger data volumes.

The PTS succeeded in further consolidating infrasound and noble gas monitoring into IDC operations. At the end of the year, 45 infrasound and 12 noble gas systems were in provisional operation. Moreover, some improvements in
reviewed noble gas data products were achieved by implementing a scheme that categorizes the sample spectra.

Efforts were also made to further enhance atmospheric transport modelling capabilities and to continue delivering high quality products to States Signatories. Atmospheric backtracking calculations are performed daily for each of the IMS radionuclide stations with near real time meteorological data obtained from the European Centre for Medium-Range Weather Forecasts. Using software developed by the PTS, States Signatories can combine these calculations with radionuclide detection scenarios and nuclide specific parameters to define regions in which sources of radionuclides are possibly located.

The state of health system deployed in the IDC Operations Centre was developed further. In addition, a host of activities were focused on IDC hardware enhancements and software developments. The PTS also continued the work on developing more robust and flexible data and product request services.

The technology foresight exercise continued to focus on identifying the scientific and technological developments that may affect future PTS operations. The aim of this phase is to deliver a medium- to long-term integrated technology forecast for the Commission together with a ‘taxonomy’ that enables intuitive and in-depth understanding of identified developments. The technology foresight initiative was presented and discussed at a number of specialist meetings. A range of posters describing the approach and initial results were presented for discussion and an online conference was convened to review emerging technologies relevant to signal acquisition, data analysis and on-site inspection (OSI). At the end of 2012, a new software called Pivot was being customized to present over two hundred emerging and relevant technologies, processes, concepts and ideas. The software was planned to become operational by March 2013.

Promoting the operational capabilities of the organization in the area of OSI continued to be a major priority in 2012. The OSI action plan was further advanced in five main areas, namely policy planning and operations, operations support and logistics, techniques and equipment, training, and procedures and documentation. Most importantly, considerable headway was made in preparation for the next Integrated Field Exercise (IFE) in 2014. The Commission selected Jordan as the host country for the exercise. Work on the preparation of a scientifically credible and comprehensive scenario began with the creation of a task force of external experts from States Signatories. Specific locations of interest in Jordan were identified and an agreement on the overarching background scenario was reached.
Further progress was also made in arranging for the long term provision of inspection equipment offered by States Signatories for the IFE.

With participation of around one hundred and fifty experts from States Signatories and staff of the Commission, two build-up exercises, involving procedures in the launch, pre-inspection and post-inspection phases of an inspection, were conducted. Major training courses were also held for over one hundred national experts and staff of the organization. Later, the build-up exercises were evaluated thoroughly in order to draw lessons for further improvements in the conduct of build-up exercises, training courses and, particularly, the IFE.

The Commission vigorously expanded its education and outreach activities through its capacity building efforts and the Capacity Development Initiative (CDI), as well as innovative public information campaigns.

Fourteen training events were held for station operators and eight training courses and workshops were conducted for staff of National Data Centres (NDCs): the first to ensure the smooth operation of the IMS and the second to build the capacity of NDCs to fulfil their obligations under the Treaty. More than four hundred station operators and NDC staff attended these events.

Four CDI courses reached over one thousand individuals from over one hundred countries in 2012 alone. Participants ranged from IMS station operators to NDC staff, diplomats, academics and members of civil society. Lecture courses addressed in depth the political, legal, technical and scientific challenges that face the Treaty, and were supplemented by a robust e-learning platform.

Using innovative approaches, the Commission further intensified its efforts in promoting the Treaty and its verification regime. Landmark events included the commemoration of the 15th anniversary of the organization in Vienna and the staged reading of the play “Reykjavik” during the week of the Ministerial Meeting in New York in September. During 2012, an increased level of public interest in the Treaty and the Commission was registered. Over 2700 articles and citations concerning the Treaty and its verification regime were counted. The presence of the Commission on social media channels was increased by 40%. With the help of United Nations TV, video material was distributed to broadcasters worldwide, while the video channel of the Commission attracted significantly more viewers.

The Commission continued to streamline its activities and to promote synergies and efficiencies by fostering results based management, accountability and oversight. This has resulted in a significant increase in the implementation rate of the organization. The development of an IPSAS-compliant Enterprise Resource Planning system also made significant progress, preparing the ground for its launch in 2013–2014.
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<td>BUE</td>
<td>build-up exercise</td>
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<td>CIF</td>
<td>Capital Investment Fund</td>
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<td>ECS</td>
<td>Experts Communication System</td>
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<td>ERP</td>
<td>Enterprise Resource Planning</td>
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<td>ESMF</td>
<td>Equipment Storage and Maintenance Facility</td>
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<td>EU</td>
<td>European Union</td>
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<td>FIMS</td>
<td>field information management system</td>
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<td>GCI</td>
<td>Global Communications Infrastructure</td>
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<td>GIS</td>
<td>geographical information system</td>
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<td>IAEA</td>
<td>International Atomic Energy Agency</td>
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<td>IDC</td>
<td>International Data Centre</td>
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<td>IFE</td>
<td>Integrated Field Exercise</td>
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<td>IIMM</td>
<td>Integrated Information Management System</td>
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<td>IISS</td>
<td>Integrated Inspection Support System</td>
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<td>IMS</td>
<td>International Monitoring System</td>
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<td>INGE</td>
<td>International Noble Gas Experiment</td>
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<td>International Public Sector Accounting Standards</td>
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<td>ISHTAR</td>
<td>Information System with Hyperlinks on Tasks Assigned by the Resolution Establishing the Preparatory Commission</td>
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<td>IT</td>
<td>inspection team</td>
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<td>ITF</td>
<td>inspection team functionality</td>
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<td>KPI</td>
<td>key performance indicator</td>
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<tr>
<td>MPLS</td>
<td>multiprotocol label switching</td>
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<td>MSIR</td>
<td>multispectral including infrared</td>
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<tr>
<td>NDC</td>
<td>National Data Centre</td>
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<tr>
<td>O&amp;M</td>
<td>operation and maintenance</td>
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<td>OPCW</td>
<td>Organisation for the Prohibition of Chemical Weapons</td>
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<tr>
<td>OSC</td>
<td>Operations Support Centre</td>
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<tr>
<td>OSI</td>
<td>on-site inspection</td>
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<tr>
<td>PCA</td>
<td>post-certification activity</td>
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<td>PTS</td>
<td>Provisional Technical Secretariat</td>
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<td>QMS</td>
<td>Quality Management System</td>
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<tr>
<td>REB</td>
<td>Reviewed Event Bulletin</td>
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<tr>
<td>RSTT</td>
<td>regional seismic travel time</td>
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<tr>
<td>SEL</td>
<td>Standard Event List</td>
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<td>SOP</td>
<td>standard operating procedure</td>
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<tr>
<td>VPN</td>
<td>virtual private network</td>
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<td>VSAT</td>
<td>very small aperture terminal</td>
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<td>WFP</td>
<td>World Food Programme</td>
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<tr>
<td>WIN</td>
<td>work instruction</td>
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<tr>
<td>WHO</td>
<td>World Health Organization</td>
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<tr>
<td>WMO</td>
<td>World Meteorological Organization</td>
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