The CTBTO Preparatory Commission offers States Signatories training courses and workshops in technologies associated with the International Monitoring System (IMS), the International Data Centre (IDC) and on-site inspection, thereby assisting in the strengthening of national scientific capabilities in related areas. In some cases, equipment is provided to National Data Centres to increase their capacity to participate actively in the verification regime by accessing and analysing IMS data and IDC products. Such capacity building serves to enhance the technical capabilities of States Signatories throughout the globe, as well as those of the Commission. As technologies expand and improve, so too do the knowledge and experience of designated personnel. Training courses are held at the Headquarters of the Commission, as well as in numerous external locations, often with the assistance of hosting States. The European Union also continues to contribute to the capacity building programme of the Commission.

**Highlights in 2011**

Development of country profiles and analyses for use in capacity building and training efforts for all geographical regions

Further development and use of e-learning modules as prerequisites for NDC training events

Installation of capacity building systems at six NDCs
CAPACITY BUILDING PHASES

The capacity building programme of the Commission for States Signatories includes training courses and workshops, equipment donations and technical follow-up visits. The programme, which continues to be supported by contributions from the EU, consists of various phases:

- Development of country profiles for all States Signatories
- Provision of a regional NDC development workshop
- Provision of a two week training course for NDC technical staff
- Provision of one or more experts
- Provision of basic NDC computer equipment

The programme has been considerably enhanced with e-learning, which is being used on a routine basis and as a prerequisite for all training events for NDC technical staff, station operators and OSI inspectors.

COUNTRY PROFILES

A standard country profile for all States Signatories has been developed. This profile contains the information available at the PTS regarding the number of authorized users that the State has, the use of IMS data and IDC products, and participation in previous training events. The profiles serve as a reference before and during events and meetings with States.

NDC DEVELOPMENT WORKSHOPS

Two NDC development workshops for African countries were conducted in 2011: in Ouagadougou, Burkina Faso (36 participants), and in Vienna (12 participants). Their purpose was to promote understanding of the Treaty and the work of the Commission and to enhance national capabilities of States Signatories in the implementation of the Treaty. They also provided a forum to promote the exchange of experience and expertise in the establishment, operation and management of an NDC, and to promote the application of verification data for civil and scientific purposes.

The workshops included presentations from the Commission emphasizing the information needed to build and sustain NDCs, and from representatives of NDCs in all stages of development. They also provided opportunities to collect additional information for the country profiles.

TRAINING NDC TECHNICAL STAFF

Following the NDC development workshops, a Regional Training Course on NDC Capacity Building: Access and Analysis of IMS Waveform Data and IDC Products was held in Accra, Ghana, from 17 November to 2 December for 27 NDC technical staff members from African countries. During the course, participants were trained in accessing IMS data and IDC products, downloading and installing the ‘NDC in a box’ software and analysing data.

NDC TECHNICAL VISITS

Following an advanced training course, a consultant is provided to the recipient country to assess how the participants are making use of what was learned at the course. The objective is to ensure that the trainees can routinely use data and products of the Commission. Specific needs and interests are also addressed during this visit.

NDC CAPACITY BUILDING EQUIPMENT

As part of the capacity building strategy of the Commission, several sets of equipment necessary for establishing an adequate technical infrastructure at NDCs were purchased by means of the Regular Budget and Joint Action Projects III and IV of the EU. The equipment has been delivered and installed at six NDCs and several more deliveries are planned for early 2012. The equipment, provided as part of the technical assistance given to States Signatories to establish or strengthen their NDCs, enhances the capacity of an NDC to participate in the verification regime and to develop civil and scientific applications in accordance with national needs.

TRAINING STATION OPERATORS

A diverse range of training events for station operators and NDC technical staff was provided in 2011. A total of 94 station operators benefited from nine courses, largely on the use and maintenance of equipment, but also covering procedures related to reporting and communication with the PTS.
WORKSHOPS ON MONITORING TECHNOLOGIES

Infrasound Technical Workshop 2011 was organized by the Commission jointly with the Jordanian Seismological Observatory of the Natural Resources Authority and held in Jordan at a location near the Dead Sea from 30 October to 4 November. This international forum discussed recent advances in infrasound research and operational capabilities of global and regional networks. The topics covered during the workshop included infrasound instrumentation, modelling, data processing, network detection capabilities, analysis of infrasound sources, the 2011 eastern Mediterranean experiment and infrasound station performance. The workshop also hosted an expert group meeting, funded by the EU, to facilitate a discussion among infrasound experts on three issues critical for the CTBT verification regime: wind noise reduction systems, on-site calibration techniques and performance assessment of infrasound stations.

The Nuclear Regulatory Authority of Indonesia hosted the 2011 International Noble Gas Experiment Workshop in Yogyakarta from 6 to 10 December with the support of the Commission and the EU. A total of 78 experts from around the globe in the field of noble gas monitoring attended the workshop. Research results, operational experience and information on procedures were exchanged and recommendations formulated on the following topics: science and technology, data analysis, the background xenon level, categorization, lessons learned from the Fukushima accident, operation and failure analysis, OSI, and laboratory quality assurance/quality control with respect to noble gas monitoring.

Top: Installation of capacity building equipment during a mission to Port-au-Prince, Haiti, September 2011. Middle: Participants in a training course at the NDC in Algiers, Algeria, November 2011. Bottom: Participants in a training course at the NDC in Accra, Ghana, November-December 2011.
Informal Radionuclide Laboratory Workshop 2011, which was held from 24 to 27 October in Vienna, was organized jointly with Seibersdorf Laboratories, Austria. A total of 36 participants from 16 countries presented and discussed advances in the set-up, operation and further improvement of IMS radionuclide laboratories. The main topics of the workshop were laboratory operations, Proficiency Test Exercises, laboratory techniques, surveillance assessment and certification, and noble gas measurements by laboratories.

E-LEARNING

The e-learning system, which was put into preliminary operation at the end of 2009, increased in use throughout 2011. The development of e-learning modules with support from the EU continued and with the available funds it was possible to expand the number of courses from that originally planned.

This e-learning system is being used for the training of NDC technical staff, station operators and OSI inspectors. The modules are made available for authorized users, station operators, OSI inspectors and PTS staff.