Capacity Development Initiative

Training and Educating the Next Generation of CTBT Experts

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Legal and External Relations Division
Comprehensive Nuclear-Test-Ban Treaty Organization
The CTBTO Capacity Development Initiative

Building and maintaining capacity to effectively confront technical, scientific, political and legal challenges facing the multilateral nonproliferation and disarmament regime:

- Investing in the next generation of disarmament and non-proliferation specialists
- Establishing a network of partnerships to strengthen and broaden participation in global monitoring and verification efforts
- Utilizing innovative technologies and educational tools
UNSG Report on Disarmament and Nonproliferation Education (A57/124) & UNGA resolution (57/60):

- Developing user-friendly and accessible educational material on disarmament and non-proliferation is becoming a global trend among relevant UN offices and International Organizations.

- Coordination among United Nations and other relevant international organizations and programmes is crucial for the successful implementation of the recommendations of the study.

- 2010 NPT Action Plan, Action 22: encourages all states to implement UNSG Report to advance the goals of the Treaty in support of achieving a world without nuclear weapons.
The CTBTO Capacity Development Initiative

Creating Network of Partners

Identifying Recipients

Development of CDI Tools

Assembling Resources

Broadened participation in CTBTO global monitoring and verification efforts and facilitated access to the many civil and scientific benefits of the verification regime.
The CTBTO Capacity Development Initiative

- Beneficial for member-states, especially from the developing world
- Free courses and lectures in Vienna, supplemented by an online e-learning platform
- Lectures are made available to a global audience through live streaming and archiving on the CDI e-learning platform
- The most complete and accessible repository of knowledge on the CTBT
CDI Introductory Course

• Held in Vienna and online on 5-9 September 2011
• Provided participants with an understanding of the science and political significance of the CTBT
• 266 participants registered (online and in Vienna) from 79 countries
• On average, 70 participants attended the course each day
• 20,000 minutes spent watching archived lectures
• 137 participants (online/Vienna) successfully passed the course
The Introductory CDI Course had a global reach!

<table>
<thead>
<tr>
<th>First name / Surname</th>
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<tbody>
<tr>
<td>Christian EHN</td>
<td>Vienna</td>
<td>Austria</td>
</tr>
<tr>
<td>Nicholas OPOKU</td>
<td>Accra</td>
<td>Ghana</td>
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<tr>
<td>Joy Ibifuro ALASIA</td>
<td>Vienna</td>
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<tr>
<td>Efren MORALES</td>
<td>Davao</td>
<td>Philippines</td>
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<tr>
<td>Jonathan BURNETT</td>
<td>London</td>
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<td>Yehoshua Michael BETTAN</td>
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<td>Anesu George CHIBI</td>
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<td>Serge FRANCHOO</td>
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<td>Ibrahim ABDULMAJED</td>
<td>Abuja</td>
<td>Nigeria</td>
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<tr>
<td>Ashley DAVIES</td>
<td>London</td>
<td>United Kingdom</td>
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The History of Nuclear Testing

Presentation:
- Introductory Module on the History of Nuclear Testing

Suggested Background Readings:
- Nuclear Testing Infamous Anniversaries. Preparatory Commission for the CTBTO

Additional Resources:

Mini-Quiz 2:
- The History of Nuclear Testing Quiz
Introductory Course Final Quiz

1. All states members to NWFZ arrangements have signed and ratified the CTBT.
   - True
   - False

2. Sort the following countries by the date of the first nuclear test (1= first in time)
   - Pakistan
   - India
   - North Korea
   - France
   - China
   - United Kingdom
   - United States
   - Soviet Union
Day 1 Presentations: Monday 5 September 2011

Lecture 1: Political Significance of the CTBT [iOS Video Link]
(Executive Secretary, Tibor Tóth)

Presentation Slides

Lecture 2: History of Nuclear Testing [iOS Video Link]
(Annika Thunberg, Chief, Public Information Section, Legal and External Relations Division)

Presentation Slides

Lecture 3: Shaping of the Treaty [iOS Video Link]
(Ambassador Jaap Ramaker, Former Chair of the CTBT Negotiations and former Special Representative to Promote the CTBT)

Presentation Slides
Advanced Course on CTBT

Held in Vienna from 28 November to 9 December

Targeted at:

• NDC Staff and Station Operators
• Universities
• Research Institutions
• Permanent Missions/Embassies
• Ministries of Foreign Affairs
• Government Agencies
• International Organizations
• NGOs
• Interested Individuals

Over 400 registered participants from nearly 100 countries!

CDI Online Learning Platform

• Designed to enhance understanding of the science underpinning verification regime and provide practical training on the CTBT-related issues
Advanced Course Participant Composition

Over 400 registered participants from nearly 100 countries!

CTBTO Preparatory Commission

- University: 23%
- Research Institute: 19%
- Permanent Mission/Embassy: 7%
- Other Ministry/Government Agency: 16%
- Other: 6%
- NDC: 13%
- NGO: 3%
- Station Operator: 3%
- Ministry of Foreign Affairs: 4%
- International Organization: 6%
Advanced Course on CTBT

• Approximately 60 participants in Vienna and many more following the course

• Visits to the OSI storage and maintenance facility, the IMS rooftop radionuclide station and mobile noble gas unit, observation of IDC analysts, and lectures and tour of the Institute of Atomic and Subatomic physics.

• OSI Table Top Exercise

• Panel on the Nexus of Science and Diplomacy featuring Dr Bharath Gopalaswamy of Cornell University, Dr Rebecca Johnson of the Acronym Institute, Andreas Presbo of VERTIC and Dr Particia Lewis of CNS, looked at the role that scientists play in setting the agenda for policy-makers.

<table>
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<tr>
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<td>Period: November 27, 2011 - December 9, 2011</td>
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<table>
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<td>November 29, 2011</td>
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<td>December 2, 2011</td>
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<td>December 7, 2011</td>
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<td>December 8, 2011</td>
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<td>December 9, 2011</td>
<td>27</td>
<td>6,17</td>
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<tr>
<td>Total</td>
<td>639</td>
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Average per Day 63,9 67,34
Advanced Course on CTBT

- Overview of Nuclear Weapons Technology & Testing and Development of Nuclear Weapons
- Understanding the Nuclear Explosion Source
- IMS Technologies: Seismic, Hydroacoustic, Infrasound, Radionuclide and Noble Gas Monitoring Monitoring
- Atmospheric Transport Modeling and Data Fusion
- IDC Data Analysis and Data Products
- Nuclear Explosion Signatures
- OSI: Technologies and Techniques
- Overview of Potential Civil and Scientific Applications of Monitoring Technologies
- CTBTO Response to Great East Japan Earthquake and Tsunami and Fukushima Nuclear Power Plant Accident
- Practical Exercises and visits to the CTBTO facilities
- AND MUCH MORE…
Advanced Science Course Participants

http://batchgeo.com/map/cdiparticipants
CDI Future Activities

• Original courses: Introductory and Advance

• Exploration of organizational synergies and avenues of collaboration

• Train the trainers workshop

• Incorporation of the CTBT technologies related topics in the educational curricula worldwide

• Continued support and cultivation of the next generation of professionals, especially from developing countries

• Targeted regional training and outreach
Welcome to the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) E-learning Training Centre. As part of the CTBTO’s capacity development strategy, this e-learning platform has been developed to help you gain a better understanding of the CTBTO’s global verification regime.

The e-learning modules found in your curricula contain interactive and virtual training tools to help facilitate your teaching, including a pre-assessment of the subject matter, step by step tutorials, video lectures, supplemental materials and links to external resources. Completion of these modules will provide you with a better understanding of the Comprehensive Nuclear-Test-Ban Treaty itself and is the basis for the training that is necessary to participate in the treaty’s verification regime.
E-learning system was used in 2010 and 2011 used for NDC workshops, training events, OSI training, and Station Operator training.

- All training/workshops participants were requested to complete the e-learning courses prior to the event. Feedback received was positive.
- Use of the system freed up ~4 days of classroom time which was then devoted to hands on and practical training.

Presently we have 30 modules of which 11 have been translated into all the official UN working languages.

E-learning system is being recognized as an up to date and easy to use resource/reference by in-house staff.

Off-line discs containing all e-learning materials are available to authorized users and training participants. Particularly useful for areas without internet access.
There are several key parameters in station design used by experts.

These are based on:

- the number of ground-based stations
- sampling and reporting time
- sensitivity of analysis system
- atmospheric transport modeling
- a 90% detection capability within approximately 14 days for a one kiloton (kt) nuclear explosion in the atmosphere or from venting by an underground or underwater detonation

To view a list of the Minimum requirements specified for Radionuclide stations, click [here](#).

For a list of noble gas monitoring specifications, click [here](#).
E-learning modules developed and translated

1. Overview of CTBT
2. National Implementation
3. OSI Phenomenology
4. Seismic Monitoring
5. Hydro Monitoring
6. Infrasound Monitoring
7. Radionuclide Monitoring
8. Standard Software
9. Seismo-acoustic and Infrasound Processing at IDC
10. Radionuclide Processing at IDC
11. OSI Core Technologies and Techniques
12. Operation of IMS Network
13. Configuration Management
14. Logistic Support
15. IMS Data and IDC Products
16. Access to IMS Data and IDC Products
17. NDC establishment and Operation
18. Basic Linux
19. Maintenance of IMS Stations
20. OSI Search Logic
21. Intro to OSI (Import of existing course)
22a. Radiological Fundamentals
22b. Biological Effects and Radiation Limits
22c. Personal Monitoring and Detection Equipment
22d. Risk Management and Incident Response
22e. Radiation Safety Final Assessment
23. Overview of IMS
24. Overview of IDC
25. Overview of OSI
26. Overview of ADM
Topics

• Infrasound Data and Processing
• Atmospheric Transport Modeling
• Noble Gas Data and Processing
• IDC Products
• Hydroacoustic Data and Processing
• OSI: Goals, Tools and Procedure
• OSI Seismic Aftershock Monitoring System
Welcome! The aim of the CTBTO Training Modules is to familiarize Inspection Team Members with many of the issues surrounding On-Site Inspections.

- Understanding OSI
- On-Site Inspection Processes
- Conduct of an On-Site Inspection
In 2007 the Russian Federation provided the OSI E-Training and Simulation System to the PTS. Comprises a server (Game Manager Computer) and workstations for the Inspected State Party and Inspection Team to allow for interaction between those parties.

The system simulates the whole process of an On-Site Inspection, and allows the conducting of an OSI in real time.
the comprehensive nuclear-test-ban treaty
putting an end to nuclear test explosions

Thank You!

www.ctbto.org