



POTENTIAL BENEFITS OF CTBTO TO IRAQ

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CTBT:
SCIENCE AND
TECHNOLOGY
2017 CONFERENCE

26 TO 30 JUNE
VIENNA, AUSTRIA

Abstract

The National Data Center (NDC) in Iraq is established at the Iraqi National Monitoring Authority to promote nonproliferation. The center is mandated to collect seismic, hydroacoustics, infrasound (SHI) and radionuclide data to monitor test explosions. In addition, the Iraqi NDC use data it receives from the International Data Center (IDC) and the International Monitoring System (IMS) to promote nonproliferation objectives and scientific applications, such as earthquake disaster mitigation. The Iraqi NDC has participated in many CTBTO workshops and capacity building training courses to strengthen the capabilities of our NDC staff and provide us with CBS system to strengthen our scientific capabilities. The proposed paper will focus on the role and comparison between the NDC IN A BOX and the extended NDC in a box, and the advantages of the new version. This paper will explore NDC-IN a box in the Iraqi NDC context and how the extended NDC in a box package improves the NDCs processing capabilities for SHI data. Our detection of the North Korea test by using all available IMS data is an example of scientific applications related to nonproliferation issues.

1. Establishment of NDC in Iraq

- Iraq has signed the Comprehensive Nuclear Test Ban Treaty on 19 August 2008.
- Iraq has ratified the Comprehensive Nuclear-Test-Ban Treaty (CTBT) . on 26 Sep 2013, raising the number of countries that have adhered fully to the Treaty up to 161. Iraq believes that implementing its obligations towards this treaty could be of significance to WMD prohibition and enhance the world peace and security.
- The Iraqi government designated the Iraqi National Monitoring Authority (INMA) as a national body to implement this Treaty
- National Data Center was established with well-trained specialized staff and have ability to analyze data received from IDC.
- The importance of setting up the National Data Centre, is to enable us constantly monitor, manage and coordinate both natural and man-made seismic activities in the country, and around the globe. But also uploading data to the International Data Centre (NDC), as well as receive, and use International Monitoring System (IMS) data and also IDC products for the treaty verification.

2. Donation of CTBT Capacity Building System Equipments

2.1. Virtual private Network (VPN)

The CTBTO Donated VPN to the National Data Center of Iraq in 2011 and Currently Iraq NDC receives data from nine IMS stations: BTR, GET, KBZ, THR, TORD, MKAR, KMBO, ZALV, AKASG).

The Purpose of VPN:

1. Establish connection to the IDC over the internet
2. National Data Center receiving data from PTS.



Virtual Private Network

2.2 Capacity Building System CBS (Forthcoming Shipment)

To address the challenges of limited infrastructure and inadequacy in analysis skills, the CTBTO donated a CBS to Iraq. This is a deliberate strategy designed to provide the necessary support and assistance to the emerging NDCs to enable them come to a level where their contributions will be significant and of the same quality as that of their peers from the well-established NDCs. The CBS donation is composed of the following elements: Training courses, workshops for NDC staff etc., donation of CBS equipment and Follow-up visits of experts from the CTBTO

- Think station monitor
- Rack
- Cisco Switch
- UPS
- Library
- Panel Monitor Console
- Printer
- Battery



Capacity Building System

3. Benefits of IMS Data and IDC Products

The IMS data and IDC Products have found wide range of civil and scientific applications outside the recognized prohibition of all nuclear weapons tests explosions. Some of these are in the areas of climate change monitoring, disaster management, earthquakes and tsunami early detection, radiation dispersal from nuclear accidents, research and development etc. Accessing PTS Data and Products in a wide range of Application:

- VPN
- From IDC Secure Website, for Data Request (AutoDRM, Subscription,... etc)

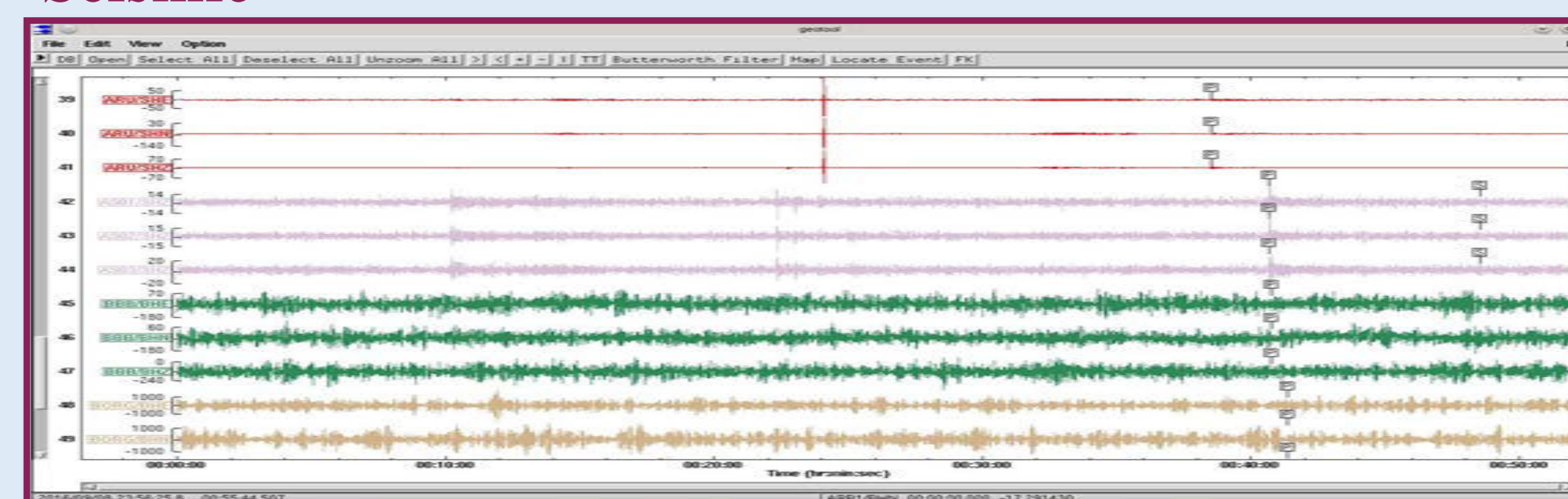
Accessing data and other CTBTO products for the end users has been made possible through the use of secure web portal.



SWP – Secure Web Portal

Data Analysis and NDC Tools

Seismic



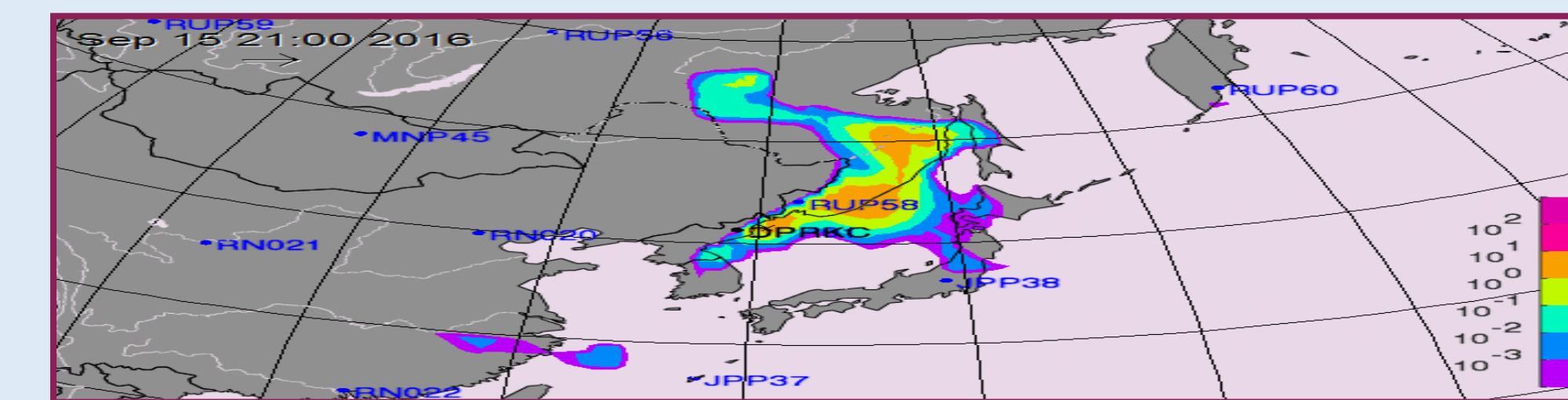
Data Analysis and NDC Tools of Nuclear Test of North Korea

Radionuclide

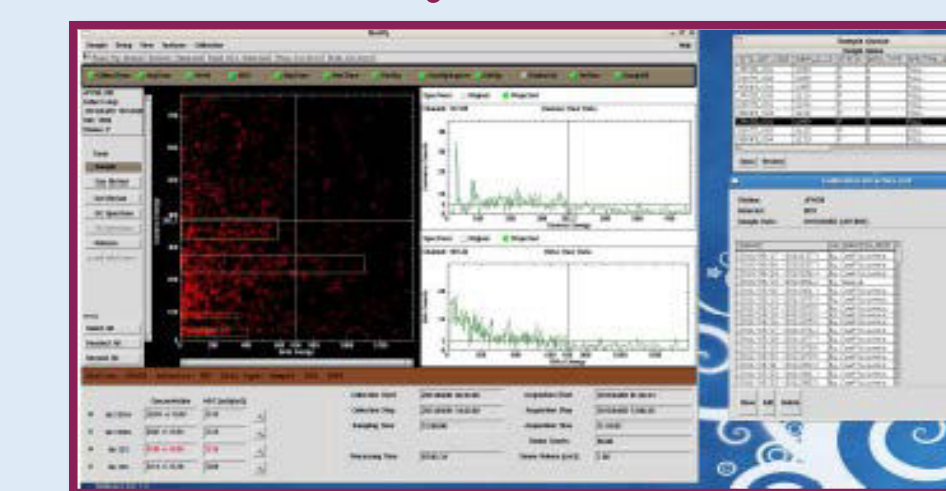
WEB-Grape: (WEB connected Graphics engine) analyzes the relation between a detection of an event in the radionuclide network and possible emission points on the globe.

WEB-grape hosts the generation and Data Analysis and NDC Tools :

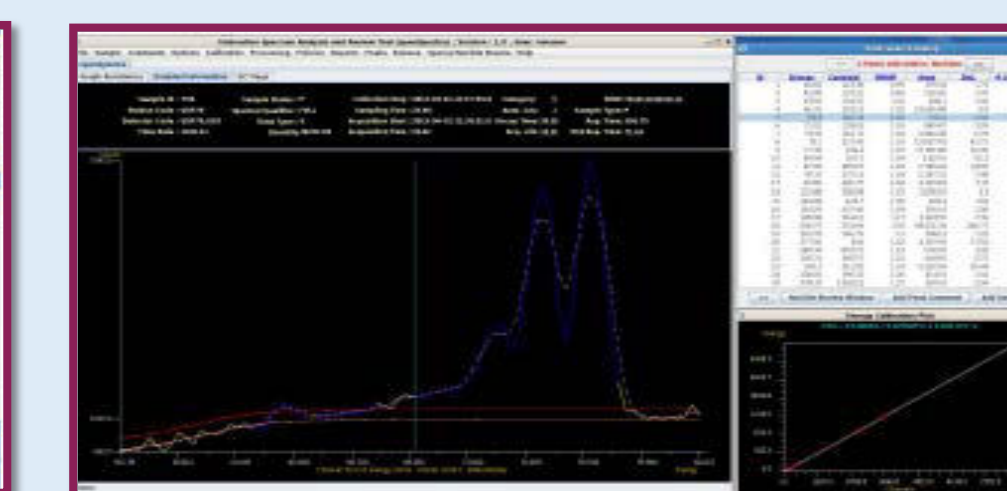
Radionuclide PSR visualization of the following ATM products: FOR and PSR based on CTBTO-WMO cooperation



Data Analysis



Norfy : Interactive GUI review tool for beta-gamma coincidence based NG



Open Spectra : GUI tool for inter-active review of particulates.

4. Software

The most potential benefits of the CTBTO to all National data centers: Acquisition of application software's (in a box) for analysis

1. The NDC-in-a-Box Enhance Iraq's national technical means to monitor nuclear explosions worldwide

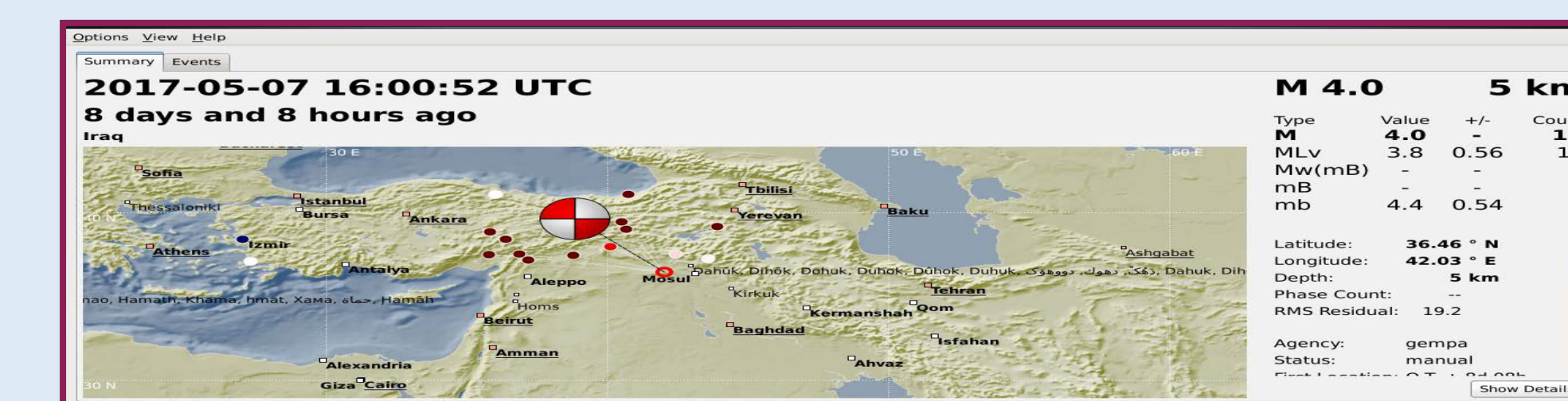
- Perform Analysis and Notify National Authority of suspicious Events.

2.Extended-NDC-in-a-Box

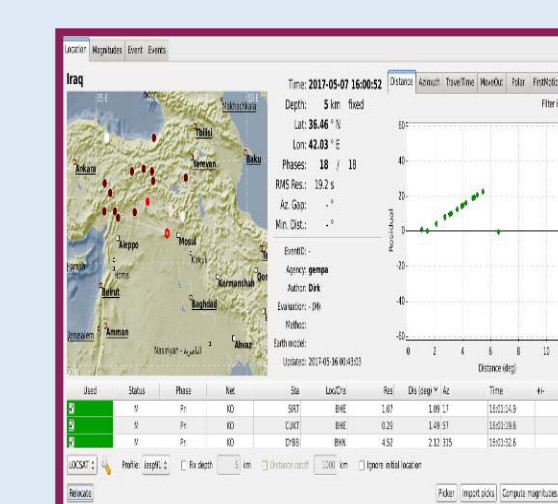
Purpose of extended-NDC-in-a-Box – to allow NDCs with national monitoring duties to combine these with IMS waveform data

- Use SeisComp3 for the monitoring– automatic location, magnitude and alert generation;
- Use Geotool for interactive QC of locations and waveforms and for “special event analysis” e.g. comparison with REB;

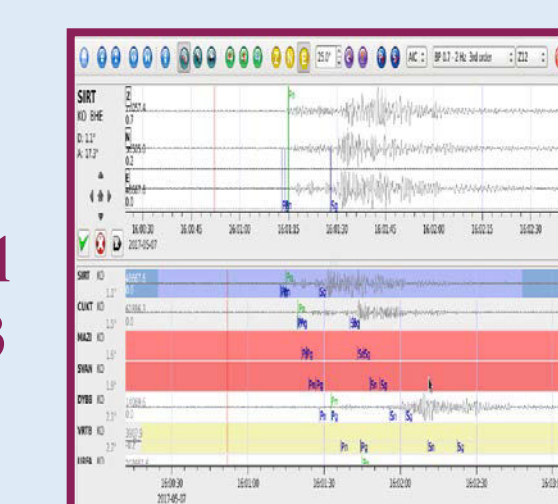
The Extended-NDC-in-a-Box also includes a graphical interface to PMCC and associated programs, to allow visual analysis of infrasound signals.



Data analysis using sesicomp3



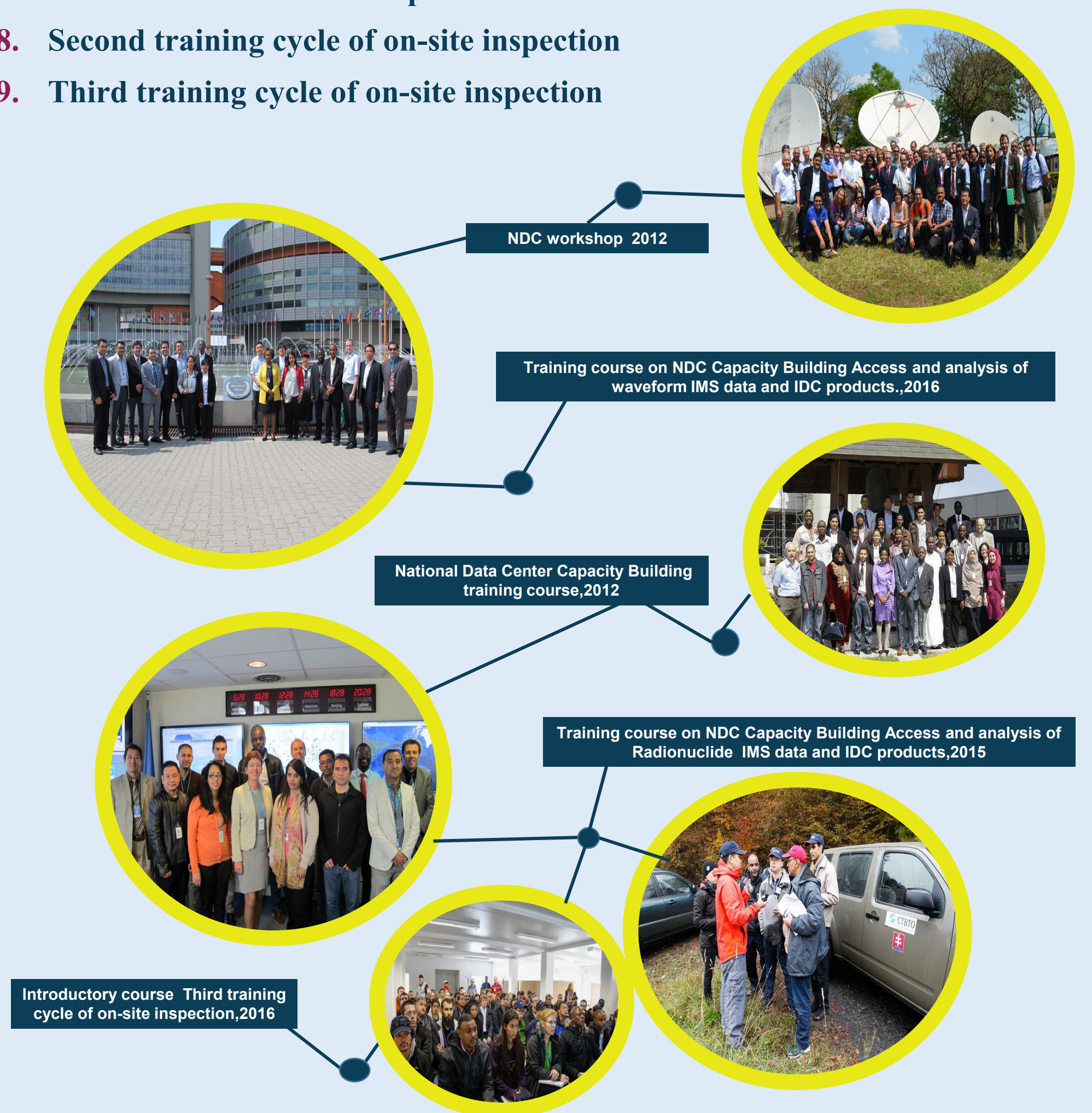
Data Analysis of Earthquake in Iraq using SESICOMP3



5. Training Courses

Technical staff have been attending training courses and workshops Iraq participated in many Trainings and workshops hosted by CTBTO:

1. Training course on NDC Capacity Building Access and analysis of waveform IMS data and IDC products.
2. Training course on NDC Capacity Building Access and analysis of Radionuclide IMS data and IDC products.
3. NDC Capacity Building: NDC waveform analyst training course.
4. NDC Capacity building :NDC waveform Training course using Seiscomp3.
5. Integrated Field Exercise 2014.
6. Infrasound Technology workshop.
7. NDC Evaluation Workshop.
8. Second training cycle of on-site inspection
9. Third training cycle of on-site inspection



6. CTBT Education

CTBT education activities and resources focus on building and maintaining the necessary awareness and capacity in the technical, scientific, legal and political aspects of the Treaty and its verification regime The RESOURCES

1. Knowledge and Training Portal
2. Open Course Archives
3. Global Partnerships
4. Past Course Highlights
5. CTBT Tutorial (multiple languages)
6. vDEC

Conclusion and perspectives

1. The implementation of the CTBT in Iraq enable us to monitor regional earthquakes as well as the monitoring of special events such as DPRK Nuclear tests.
2. The technical assistance of the PTS allows us to update the NDC.
3. The data shared by PTS is very useful to us when identifying the locations of distant events especially events with bigger magnitudes.

Our immense appreciation is to the CTBTO for its support.

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