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The International Monitoring System of CTBTO

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The primary objective of the Comprehensive Nuclear Test Ban Treaty (CTBT) is outlawing nuclear test explosions in all environments: in the atmosphere, underground and underwater, constituting an effective measure of nuclear disarmament and non-proliferation in all its aspects. The Treaty was adopted by the United Nations General Assembly and open for signature in New York on 24 September 1996. Since then it has been signed by 184 States and ratified by 168.

The Comprehensive Nuclear Test Ban Treaty Organization (CTBTO) was established with the specific mandates 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. A Preparatory Commission for the Organization was established by the United Nations on 19 November 1996 and located at the Vienna International Centre. As part of the verification regime for CTBT compliance, the Provisional Technical Secretariat (PTS) of the CTBTO Preparatory Commission is establishing a dedicated network denominated “The International Monitoring System” (IMS).

When completed, the IMS of the CTBTO will consist of 321 monitoring stations and 16 laboratories worldwide. These 337 facilities will operate in 89 countries around the world, monitoring the planet continuously for any sign of a nuclear explosion. The IMS uses four complementary verification technologies: Seismic, hydroacoustic and infrasound stations monitor underground, the oceans and the atmosphere respectively; radionuclide stations detect radioactive debris from atmospheric or underwater nuclear explosions or noble gases from underground explosions. The radionuclide technique constitutes the “smoking gun” of whether an explosion was actually nuclear or not. A Global Communications Infrastructure is in place to send raw data in near real time from the IMS facilities to IDC in Vienna for processing and analysis.

All CTBTO Member States are granted equal access to all verification-related information. Moreover, a large number of international scientists and experts receive CTBTO data for civil and scientific applications.

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Barbara Nadalut si è laureata in fisica nel 2003 all’Università degli Studi di Trieste, con una tesi nella collaborazione AGILE; ha fatto parte del team responsabile della costruzione e del test (sia durante il montaggio che su fasci di particelle estratti presso il PS del CERN) del tracciatore a silicio-tungsteno. Dal 2004 al 2009 si è occupata di monitoraggio ambientale presso l’ARPA – Friuli Venezia Giulia. Da aprile 2009 è *radionuclide engineering officer* presso il CTBTO.