

The CTBT is the culmination of lengthy efforts to ban all nuclear testing in all environments. The Treaty recognizes that halting all nuclear weapon test explosions and all other nuclear explosions constitutes an effective measure of nuclear disarmament and non-proliferation by stopping the development and improvement of nuclear weapons through testing.

New Verification Regime

An important difference between the CTBT and all the previous test ban treaties lies in the permanent monitoring system which will be more extensive than that of any other arms control or disarmament treaty in history. The principal components of its verification regime are an International Monitoring System (IMS); International Data Centre (IDC); and provision for On-Site Inspections (OSIs).

International Monitoring System and International Data Centre

The IMS, an international network of 321 monitoring stations, will continuously measure shock-waves in air, water and rock, and measure atmospheric radioactivity, using one or more of four relevant technologies. Each station will transmit data back to the IDC in Vienna, for collation and analysis.

The scientific experts who proposed the number, composition and distribution of the monitoring stations consider that the network will be capable of detecting, identifying and locating nuclear explosions anywhere in the world, down to a yield of at least one kiloton (a unit of explosive power equivalent to 1,000 tons of conventional high explosive trinitrotoluene (TNT)). The system may also detect significantly smaller explosions. Although the IMS still is only partially completed, it successfully detected the recent Indian and Pakistani nuclear explosions.

Technologies Used by the IMS

The four technologies of the IMS were selected for their technical and cost effectiveness, and the synergy between them. Three of the four technologies deal directly with the mechanical effects of nuclear explosions and the fourth deals with the detection of radioactive products:

- seismological monitoring measures shock waves through the earth;
- hydroacoustic monitoring measures shock waves in water;
- infrasound monitoring measures low frequency pressure fluctuations in the atmosphere.
- radionuclide monitoring detects certain radioactive fission products in the atmosphere and enables an event to be identified as a nuclear explosion in origin.