

# Radionuclide Component of the International Monitoring System (IMS) for the Comprehensive Nuclear-Test-Ban Treaty (CTBT)

## Content

The International Monitoring System (IMS) is a unique global network for surveillance of the Comprehensive Nuclear-Test-Ban Treaty. The radionuclide monitoring component of this network, which is set up to detect fission and activation products in the atmosphere at trace levels, is unprecedented in its combination of global coverage, sensitivity, network density and temporal resolution. Of the 80 globally distributed radionuclide stations, which measure aerosol borne radionuclides (particulates), 40 stations will be equipped with sensors to measure Xenon isotopes. The particulate monitoring network is equipped with high volume aerosol samplers which sample air continuously for 24 hours. Samples are measured on-site using high resolution gamma spectroscopy. The Xenon monitoring technology used for the CTBT has been specifically developed for the IMS and consists of air processing systems which extract Xenon from air, followed by measurement of stable and radioactive Xenon. Xenon isotopes are of particular interest for monitoring underground nuclear explosions and thus Xenon monitoring systems are a critical key component for the verification of the Nuclear-Test-Ban Treaty. High quality of data is of paramount importance in order to fulfil the verification mission of the IMS. In order to ensure high data quality, the monitoring network is supported by 16 laboratories for additional measurements. Once certified, the laboratories re-analyze samples from stations on a periodic basis for quality assurance, provide more accurate and precise measurements, and clarify the presence or absence of fission products and/or activation products in the case of a suspect or irregular analytical result from a particular station. Currently, 12 particulate laboratories have been certified, and 1 noble gas laboratory has been certified. This paper will discuss the whole picture of CTBT IMS network and will more details on the radionuclide laboratories.

## About the Presenter

Ms. Naoko Nakashima (Inoue) is Radionuclide Officer, International Monitoring System (IMS) Division, Comprehensive Nuclear Test-Ban-Treaty Organization (CTBTO). She joined CTBTO in December 2013, and mainly responsible on QA/QC program coordination of the 16 laboratories under the IMS network, including annual proficiency test exercises (PTEs). She also works for certification of the laboratories and for installation & certification of radionuclide monitoring stations, including particulate monitoring and noble gas monitoring.

Ms. Nakashima (Inoue) has received PhD from the University of Tokyo in the field of Nuclear Engineering and Management, a Masters in Radiochemistry from Kyushu University, and a Bachelor of Chemistry from Kyushu University.

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