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Editors' Note

The 1996 Comprehensive Test Ban Treaty (CTBT) aims to verifiably end explosive nuclear weapons testing. To verify the treaty, a global system of instruments, the International Monitoring System (IMS), was set up to detect nuclear tests using seismic, infrasound, and hydroacoustic waves and radionuclides. Signed by 182 states and ratified by 156, as of January 2012, the Treaty has not yet entered into force, but 285 out of the planned 337 IMS facilities are already operating. In states that have not yet ratified the treaty, especially the United States, the effectiveness of the IMS in detecting small, covert nuclear tests is seen by critics as a central element in establishing confidence in the CTBT and thus key to ratification.

A potentially important contribution to the debate over current CTBT verification capabilities is offered by Lars-Erik De Geer of the Swedish Defence Research Agency in *Radionuclide Evidence for Low-Yield Nuclear Testing in North Korea in April/May 2010*. The article presents a complex analysis of radionuclide data collected between 14 and 23 May 2010 at stations in South Korea, Japan, and Russia to suggest that North Korea carried out a very low-yield underground nuclear test on 11 May 2010. Reconstructing the initial radionuclide release from the explosion using a sophisticated treatment of the characteristics of the radionuclide detector, and atmospheric modeling software, it suggests the test may have had a yield of less than 50 tons of TNT equivalent (and possibly up to 200 tons of TNT equivalent if significantly decoupled from the surrounding rock). A yield in this range is consistent with the fact that no seismic signals associated with such a test have been detected. The previous North Korean tests in 2006 and 2009, which were detected seismically, and also by a radionuclide signature in the case of the 2006 test, are estimated to have had yields of 900 tons and 4.6 kt respectively. The analysis presented in the article suggests that the technical and analytical basis to detect small nuclear tests using radionuclide signatures may be much further advanced than many have assumed.

The March 2011 accidents at Japan's Fukushima nuclear power plants have raised important concerns about the safety and management of nuclear facilities worldwide and the questions about the effectiveness of existing government regulatory processes in the nuclear energy sector. *Nuclear Security and Nuclear Emergency Response in China*, by Dean Knox, reviews the organizational and legal structure of the nuclear regulatory process in China as it relates to nuclear safety. The article traces the regulation of licensing of

nuclear facilities, nuclear material accounting and control, transport, and emergency management and details some of the problems this structure faces as China rapidly expands its nuclear energy sector. It offers a basis for both the international community and Chinese non-governmental organizations to engage in a more informed way with China's government and its nuclear industry on safety issues.

To complement the discussion of the capabilities of radionuclide detection of nuclear tests by De Geer, this issue of *Science & Global Security* includes a review by David Hafemeister of the new book *Detect and Deter: Can Countries Verify the Nuclear Test Ban* by Ola Dahlman, Jenifer Mackby, Svein Mykkeltveit, and Hein Haak (Springer, 2011). The book is based on papers from a major technical conference in Vienna in June 2009 that brought together scientists from almost 100 states and provides a valuable technical overview of the current status of monitoring underground, atmospheric, and underwater nuclear explosions, on-site inspections and data analysis for CTBT verification.