



**T**hreats to U.S. security are becoming far more complicated, but our experts are helping by delivering viable solutions for challenging nonproliferation and national security issues.

At Oak Ridge National Laboratory, the Block II Chemical Biological Mass Spectrometer, an R&D 100 Award winner, is the first integrated instrument capable of detecting and identifying chemical and biological warfare agents in the field. The device is smaller, less expensive, and more sensitive than previous instruments.

New technology applications also emerged at Pacific Northwest National Laboratory. PNNL staff successfully demonstrated a technique that makes it possible to conduct a wide range of radiation measurements on American nuclear weapons components without divulging classified information. This approach resolves some of the sticking points in U.S.-Russia weapons negotiations.

The worldwide effort to monitor unauthorized testing of nuclear weapons was strengthened by the installation of the first Automated Radio-Xenon Sampler/Analyzer, or ARSA, in Germany. Developed by PNNL researchers, ARSA units will be deployed at additional strategic locations around the globe to conduct monitoring in accordance with the Comprehensive Nuclear-Test-Ban Treaty. PNNL staff, working

through the Nuclear Cities Initiative, also successfully established two new International Development Centers in the Russian cities of Zheleznogorsk and Snezhinsk. The centers are designed to bring economic vitality to Russia's closed "nuclear cities," speed the downsizing of the Russian nuclear weapons complex, and limit the availability of Russian scientists' expertise to rogue countries. Ten centers now have been established in Russia.

*PNNL and the Naval Aerospace Medical Research Laboratory are developing Tactical Medical Casualty Support (TacMedCS), a wireless communication system that uses radio frequency identification technology (RFID) to improve medical support for injured sailors and marines. A corpsman can gather background medical data stored on the victim's RFID dog tag, administer triage, then communicate the actions he took onto the dog tag and provide a status report to a rear echelon command. Field exercises demonstrated that TacMedCS—at its current stage of development—provides more timely casualty tracking information and critical unit operational status than existing methods.*

