



Nevada Site Office News

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For Immediate Release:

July 24, 2012

NNSA Conducts Third Seismic Source Physics Experiment

The National Nuclear Security Administration (NNSA) announced today that it has successfully conducted the third seismic Source Physics Experiment (SPE-3) at the Nevada National Security Site (NNSS). The seismic experiment was the third in a series of seven underground, fully-coupled, high-explosive field tests.

SPE-3 included detonating a chemical explosive equivalent to 2,200 pounds of TNT in a contained, confined environment 150 feet below ground. Information gathered from this experiment includes high-resolution accelerometer, infrasound, seismic, explosive performance, ground-based LIDAR (light detection and ranging), ground-based hyperspectral imagery and satellite data. These data will advance current, state-of-the-art strong ground motion and seismic wave propagation models and algorithms toward a predictive capability.

The series is a long-term NNSA research and development effort that aims at improving arms control and nonproliferation treaty verification. The experiment's findings are intended to advance the U.S.'s ability to detect and discriminate low-yield nuclear explosions amid the clutter of conventional explosions and small earthquake signals.

"These seismic Source Physics Experiments are significant achievements in the United States' efforts to develop, validate and improve on emerging technology that will be used to assure compliance with the Comprehensive Nuclear Test Ban Treaty," said NNSA Deputy Administrator for Defense Nuclear Nonproliferation Anne Harrington. "The work conducted at the NNSS and by the NNSA's Defense Nuclear Nonproliferation programs serves to advance the implementation of President Obama's nuclear nonproliferation agenda."

NNSA's three national laboratories have already used the data from the first experiment in the series, SPE-1, executed on May 3, 2011, and the second, SPE-2, executed Oct. 25, 2011, to refine and improve geophysical models and to make pre-shot predictions for SPE-3. The results of SPE-3 and all further experiments will continue to advance the national nuclear security strategy across the whole of government.

The Source Physics Experiments represent a U.S.-interagency wide endeavor, with NNSA's NNSS, Los Alamos National Laboratory, Lawrence Livermore National Laboratory, Sandia National Laboratories and the Department of Defense's Defense Threat Reduction Agency all serving as partners in SPE-3. Each entity brings their expertise and resources to the experiment and all will share the resulting data, saving the U.S. taxpayers the expense of conducting separate experiments for the various scientific disciplines that require these data.

The Comprehensive Nuclear Test Ban Treaty (CTBT) is an integral part of the U.S.'s nuclear nonproliferation and arms control agenda that prohibits all nuclear explosive testing. In the absence of nuclear explosive testing, the U.S. Government employs a number of programs to verify a safe, secure and reliable nuclear stockpile. Elements such as seismic Source Physics Experiments provide the ability to better monitor and characterize foreign weapons programs to verify treaty compliance.

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Established by Congress in 2000, NNSA is a semi-autonomous agency within the U.S. Department of Energy responsible for enhancing national security through the military application of nuclear science. NNSA maintains and enhances the safety, security, reliability and performance of the U.S. nuclear weapons stockpile without nuclear testing; works to reduce global danger from weapons of mass destruction; provides the U.S. Navy with safe and effective nuclear propulsion; and responds to nuclear and radiological emergencies in the U.S. and abroad. Visit www.nnsa.energy.gov for more information.

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