



Nevada National Security Site Overview

Introduction

The Nevada National Security Site (NNSS), formerly known as the Nevada Test Site (NTS), provides a unique and indispensable extension of the national laboratories' experimental capabilities in support of the Stockpile Stewardship Program. In addition to ongoing environmental cleanup of historic nuclear research and testing areas on the NNSS, non-defense research and development activities are conducted in cooperation with universities, industries, and other federal agencies.

In the beginning

After the first nuclear test at the Trinity Site in New Mexico, the United States moved its nuclear weapons experimentation program to the Pacific. Security and logistical issues quickly illustrated the need for a continental test site. After consideration of many possible sites, an Atomic Energy Commission meeting on December 12, 1950, concluded that the Las Vegas Bombing and Gunnery Range in Nevada satisfied nearly all of the established criteria for a continental proving ground. As a result, President Harry Truman authorized a 680-square mile section of the Nellis Air Force Gunnery and Bombing Range in Southern Nevada (65 miles northwest of Las Vegas) as the Nevada Proving Grounds on December 18, 1950. In 2010, the name was changed to the Nevada National Security Site.

Atmospheric and underground testing

On January 27, 1951, the first atmospheric nuclear test was detonated at the NNSS, code-named Able. A total of 100 atmospheric tests were conducted at the NNSS until July 1962. All atmospheric testing was banned on August 5, 1963, when the Limited Test Ban treaty was signed in Moscow; this gave birth to the age of underground testing. The United States conducted 828 underground tests at the NNSS. The last underground test, Divider, was conducted on September 23, 1992.

The end of nuclear testing and the start of subcritical experiments

After conducting 928 nuclear tests, full-scale nuclear testing came to an end in 1992 when the U.S. entered into the Comprehensive Nuclear Test Ban with Russia and France. In order for the U.S. to maintain the safety and reliability of its nuclear stockpile without conducting full-scale tests, subcritical experiments were initiated at the NNSS. An experiment is considered subcritical if no critical mass is formed and no self-sustaining nuclear reaction occurs. Subcritical experiments occur more than 900 feet below ground at the U1a tunnel complex.

Stockpile Stewardship

By careful measurement of the materials composing a nuclear weapon and studying how those materials interact and age, scientists can predict changes in safety, reliability, and performance of the nation's nuclear stockpile in the absence of nuclear testing. Scientists replicate the extreme temperatures and pressures of a nuclear reaction to measure important dynamic material properties of plutonium and other materials. Results from these experiments are combined with computer simulations to detect and predict the unique changes that occur in the aging stockpile.

Big Explosives Experimental Facility (BEEF)

The Big Explosives Experimental Facility provides data, through conventional or high explosive experiments, to support the Stockpile Stewardship Program, along with a variety of new experimental programs that expand the nation's non-nuclear experiment capabilities. Scientists also conduct weapons physics experiments, using high explosives to study and investigate impacted materials as they are merged together by the explosions.



Joint Actinide Shock Physics Experimental Research (JASPER) Facility

The JASPER gas gun plays an integral role in material property studies for the Stockpile Stewardship Program. JASPER provides a method to generate data pertaining to the properties of materials (radioactive chemical elements) at high shock pressures, temperatures, and strain rates. Experiment results are used in nuclear weapons code refinement and to enhance the program's predictive capability.

Atlas Pulse Power Machine

The Atlas pulse power facility is another valuable tool designed to investigate the properties of materials (non-nuclear) under extreme conditions and provide high energy density, hydrodynamic data used to assist in the validation of nuclear weapons codes. Atlas can also be used to conduct dynamic materials experiments for the scientific community.

Nevada National Security Site expands its role

In addition to supporting the Stockpile Stewardship Program, the NNSS also hosts:

The Nonproliferation Test and Evaluation Complex is the only facility of its kind for either large or small scale hazardous and toxic materials testing under controlled conditions. It is ideally suited for verifying effects of toxic and hazardous materials on the environment.

Weapons of Mass Destruction/First Responder Training provides emergency personnel who respond to terrorist acts involving chemical, biological, radiological, and high explosive weapons valuable hands-on training. Members from local, state, and federal agencies interact with emergency personnel to establish standard operating procedures and develop decontamination procedures. The NNSS is an ideal location to conduct these training exercises due to the existing industrial environments and open areas to fully deploy forces.

Radioactive Waste Management Sites have been operating since 1961 for the disposal of low-level and mixed low-level radioactive waste from U.S. Department of Energy generators. The waste is generated by the environmental cleanup of the country's nuclear weapons complex. The waste includes materials such as soil, construction debris, and used laboratory equipment.

The Environmental Restoration Project is responsible for corrective actions at sites on the NNSS and the Nevada Test and Training Range, to include the Tonopah Test Range. Contaminants at these sites include radioactive materials, oils, solvents, gasoline, heavy metals and unexploded ordnance.

Environmental protection, compliance and monitoring of the air, water, plants, animals, and cultural resources is also conducted at the NNSS. An annual report of these activities is available on-line at <http://www.nv.energy.gov/library/publications/aser.aspx>.

In addition to its contribution to the nation's defense, the NNSS also partners with various educational institutions to provide an outdoor laboratory for research and experiments related to the site's unique environment.



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