

The Evolving Nuclear Weapons Complex

For six decades, nuclear weapons have been the backbone of United States security policy, serving as the ultimate guarantor of our national security.¹ The Department of Energy (DOE) through the National Nuclear Security Administration (NNSA) and in partnership with Department of Defense (DoD) is responsible for ensuring that the United States has a safe, secure, and reliable nuclear deterrent.² To carry out this mission, NNSA manages and operates the nation's Nuclear Weapons Complex (NWC), which consists of eight sites located in seven states. The NWC enables NNSA to design, develop, manufacture, maintain, and work on nuclear weapons; certify their safety, security, and reliability; conduct surveillance on weapons in the stockpile; store Category I/II Special Nuclear Material; and dismantle and disposition retired weapons.³ Major sites within the NWC and their current primary responsibilities are described below:⁴

Sandia National Laboratories (SNL) (Albuquerque, New Mexico; Livermore, California; and other locations)

SNL conducts systems engineering of nuclear weapons; conducts research, design, and development of non-nuclear

components; manufactures non-nuclear weapons components, including neutron generators, for the stockpile; provides safety, security, and reliability assessments of stockpile weapons; and conducts high explosive (HE) research and development (R&D) and environmental testing. The principal laboratory is located in Albuquerque, New Mexico (SNL/NM); a division of the laboratory (SNL/CA) is located in Livermore, California. SNL also operates the Tonopah Test Range (TTR) near Tonopah, Nevada, for flight testing of gravity weapons and the Weapons Evaluation Test Laboratory at Pantex supporting weapons surveillance testing.

Los Alamos National Laboratory (LANL) (Los Alamos, New Mexico)

LANL conducts research, design, and development of nuclear weapons; designs and tests advanced technology concepts; provides safety, security, and reliability assessments and certification of stockpile weapons; maintains production capabilities for limited quantities of plutonium components (i.e., pits) for delivery to the stockpile; manufactures nuclear weapon detonators for the stockpile; conducts plutonium and tritium R&D, hydrotesting, HE R&D, and environmental testing.

Lawrence Livermore National Laboratory (LLNL) (Livermore, California)

LLNL conducts research, design, and development of nuclear weapons; designs and tests advanced technology concepts; provides safety, security, and reliability assessments and certification of stockpile weapons; conducts plutonium and tritium R&D, hydrotesting, HE R&D, and environmental testing.

Y-12 National Security Complex (Y-12) (Oak Ridge, Tennessee)

Y-12 manufactures uranium components for nuclear weapons, cases, and other nuclear weapons components comprising Canned Sub Assemblies; evaluates and tests these components; maintains Category I/II quantities of highly



*Sandia National Laboratories,
New Mexico*



*Sandia National Laboratories,
California*



enriched uranium; conducts component dismantlement, storage, and disposition of their nuclear materials; and supplies highly enriched uranium for use in naval reactors.

Savannah River Site (SRS) (Aiken, South Carolina)

SRS extracts tritium and performs loading, unloading, and surveillance of tritium reservoirs, and conducts tritium R&D.

Pantex Plant (Amarillo, Texas)

Pantex dismantles retired weapons; fabricates HE components and performs HE R&D; assembles HE, nuclear, and non-nuclear components into nuclear weapons; works on and modifies weapons; performs nonintrusive pit modification; and evaluates and performs surveillance of weapons.

Kansas City Plant (KCP) (Kansas City, Missouri)

KCP manufactures and procures non-nuclear weapons components, and evaluates and tests these weapons components.

Nevada Test Site (NTS) (65 miles northwest of Las Vegas, Nevada)

NTS maintains the capability to conduct underground nuclear testing; conducts high-hazard experiments involving nuclear material and HE; provides the capability to disposition a damaged nuclear weapon or improvised nuclear device; conducts non-nuclear experiments; conducts hydrotesting and HE testing; conducts research and training on nuclear safeguards, criticality safety, and emergency response.

The current complex, though effective in the past, is now at a crossroads. As we enter the 21st century, the mission of our deterrent is evolving to address an unpredictable international environment, persistent proliferation dangers, and emerging nuclear capabilities that could threaten vital American interests and international peace and security. The characteristics of our nuclear deterrent will evolve as the world changes, and the Cold War complex of the past must evolve as well.⁵ To address these challenges, NNSA has embarked on an aggressive plan for complex transformation. The vision for the Future Complex is a smaller, safer, and less expensive complex that leverages the scientific and technical capabilities of



In a tunnel 962 feet below the surface of the Nevada Test Site, Gene Ormond prepares the cathode cover of the Sandia-designed, high-intensity flash X-ray system for weapons certification.

our workforce and meets national security requirements.⁶ Over the next 10 years, the NNSA future complex will:

- Meet current Department of Defense requirements and national security needs
- Eliminate redundancies and dramatically improve efficiencies by consolidating missions and capabilities at eight sites beginning in 2008 by:
- Consolidating special nuclear materials to five sites by the end of 2012, with a smaller footprint within those sites by 2017
 - Closing or transferring from weapons activities about 600 buildings or structures, many by 2010
 - Ceasing currently funded weapons testing activities at two major testing sites supporting our laboratories by 2015
 - Reducing footprint of buildings and structures supporting weapons missions by as much as 1/3, going from greater than 35 million to less than 26 million square feet
 - Having 20 to 30% fewer employees directly supporting weapons missions, consistent with a smaller, more efficient complex
 - Dismantling weapons at a significantly faster pace

For more information, contact:

David Corbett, dwcorbe@sandia.gov
505-844-3310

1, 5, 6 Letter and presentation by Thomas P. D'Agostino, Administrator NNSA, "Transforming the Nuclear Weapons Complex to Meet Future Needs and Vision of the Future Complex," December 2007.
2 DOE/NA – 0013 Complex 2030 an Infrastructure Planning Scenario for a Nuclear Weapons Complex Able to Meet the Threats of the 21st Century – Getting the Job Done, October 2006.
3, 4 DOE/EIS-0236-S4 Draft Complex Transformation Supplemental Programmatic Environmental Impact Statement Summary, December 2007.