

BROADER National Security Missions STRATEGIC VISION 2014



Y-12 NATIONAL SECURITY COMPLEX  
Oak Ridge, Tennessee



## Looking to the Future

For 70 years, the Y-12 National Security Complex has transformed in response to changing national security priorities and assigned missions, evolving technological opportunities, and growing concerns regarding health and public safety. As the global security situation has changed, the site has adapted—beginning as a uranium enrichment facility, transforming to a weapons manufacturing facility, and accepting new challenges in today’s nuclear nonproliferation and advanced reactor fuel development efforts. Y-12’s support of the nation’s nuclear stockpile remains a core mission.

We have a clear focus on the future. New challenges to national security have arisen, which our nation must negotiate with confidence. Because of the expertise gained in our nuclear deterrence mission, Y-12 possesses unmatched capabilities in nuclear materials, global security, nuclear forensics and detection, manufacturing and technical services, and special programs.

To foster innovation, we partner with various federal, private, and academic organizations, and we continue to commercialize the award-winning technologies our experts develop.

As the world changes, we will continue to refine our roles and responsibilities in service to America.

### ON THE COVER

Our vision of Y-12’s future footprint, with core operations consolidated into fewer facilities and a reduction of the high-security Protected Area.

*The National Uranium Materials Archive, housed at Y-12, holds forensically significant samples of uranium that are retrieved and analyzed as needed. We use our nuclear materials and forensics expertise to help solve national security challenges.*

**MISSIONS**

- Maintain the safety, security, and effectiveness of the U.S. nuclear weapons stockpile
- Reduce the global threat posed by nuclear proliferation and terrorism
- Provide feedstock to fuel the U.S. nuclear Navy

**VISION**

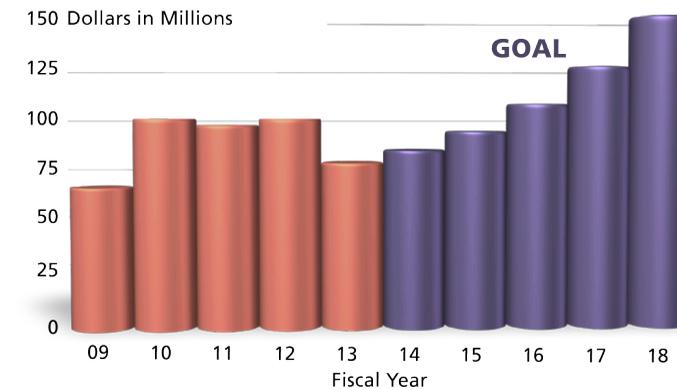
Y-12 is an enduring national asset that consistently provides the most responsive, innovative, and cost-effective solutions to meet its missions for the United States and its allies.

**STRATEGIC VISION FOR BROADER NATIONAL SECURITY MISSIONS**

The Broader National Security Missions at Y-12 diversify our program portfolio by maximizing the use of our core competencies and capabilities while continuing to provide the highest level of performance to the National Nuclear Security Administration.

The 2013 Y-12 program portfolio held ~90% Defense Programs and Uranium Processing Facility work and ~10% Broader National Security Missions work. We're enhancing our focus on nuclear nonproliferation, global security, and other nondefense programs. Growing our Broader National Security Missions portfolio helps ensure that Y-12 remains an enduring national asset while strengthening and sustaining a relevant and productive work force.

**BROADER NATIONAL SECURITY MISSIONS FUNDING FY 2009–2018**



**DEVELOP NEW NATIONAL SECURITY MISSIONS**

Y-12 has achieved measurable success in growing new business areas such as global security training, specialty nuclear fuel fabrication, uranium disposition and supply, and nuclear forensics and detection. These programs also have become established with customers outside NNSA such as the U.S. Department of Homeland Security, the U.S. Department of Defense, and private industry.

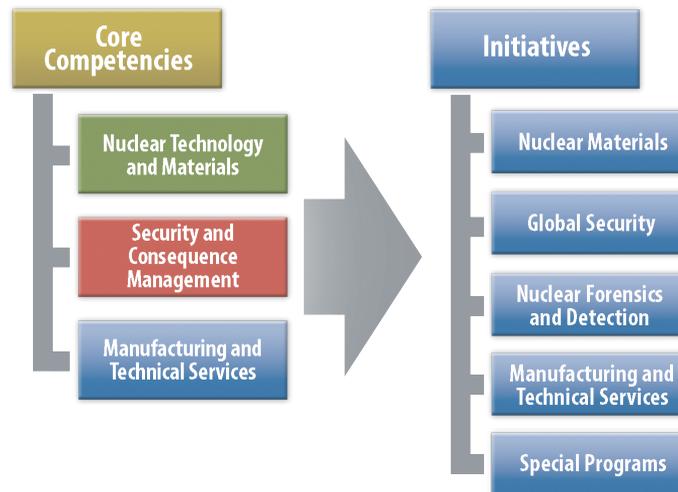
Our significant program experience and proven performance make Y-12 a smart choice for customers and partners seeking solutions in the areas of nuclear technology and materials, global security, and manufacturing and technical services. With our focused strategic plan, we will continue to grow Y-12's role in national security work to further diversify the Y-12 scope and balance the workload.



$UF_4$  (Uranium Tetrafluoride)  
  $UO_4$  (Uranium Peroxide)  
  $U_3O_8$  (Triuranium Octoxide)  
  $UO_2$  (Uranium Dioxide)  
  $UO_2(NO_3)_2$  Uranyl Nitrate  
 Ammonium Uranyl Carbonate  $(NH_4)_2UO_2(CO_3)_4$   
 Uranium Metal (U)  
 Uranium Metal Chips (U)  
 Uranium Trioxide ( $UO_3$ )

**STRATEGIC PROGRAM DEVELOPMENT**

Our disciplined Broader National Security Missions efforts focus on three core competencies—**nuclear technology and materials, security and consequence management, and manufacturing and technical services**—which serve as the foundation of our customer solutions.

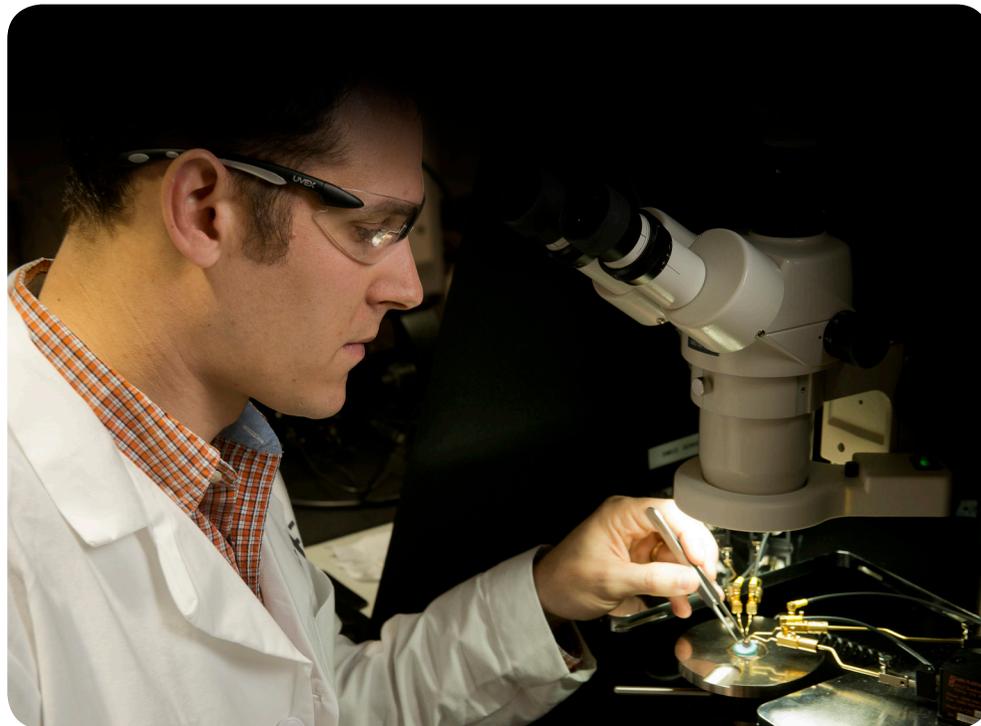


**Nuclear Materials**

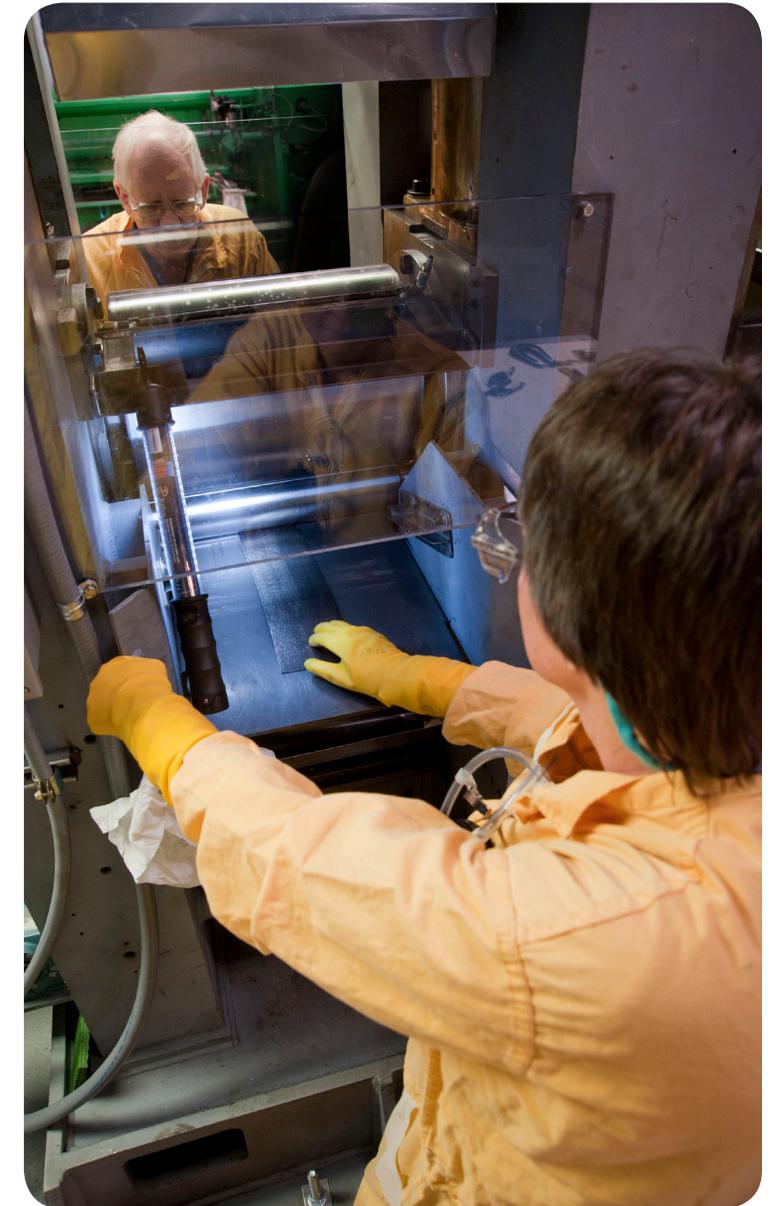
Our unique nuclear deterrence mission experience, infrastructure, and technologies have led to nuclear material capabilities—including uranium processing, disposition, and supply—that only we possess.

Y-12 has a proven record of success producing uranium feedstock for a variety of federal and private customers for use in naval, research, commercial power, and medical-isotope reactors. Our work with TerraPower, LLC, for example, is aiding the development of newer, more efficient reactor designs.

While continuing to focus our efforts on advanced fuel research and development and uranium disposition and supply, we also will seek new avenues to share our expertise with lithium, a critical material in short supply.



*Our Broader National Security Missions initiatives utilize and enhance the unique skills of our knowledgeable work force. We recently received an R&D 100 Award for the development of LISe™, a high-efficiency thermal neutron detector.*



*We work with federal and private entities to research and develop new fabrication techniques for advanced reactor fuels.*

# STRATEGIC INITIATIVES

## Global Security

Y-12's Global Security Initiative capitalizes on the site's facilities, knowledge, and experience to offer unique solutions in three key areas: global security training, security applications, and arms control and verification.

We provide security solutions to federal customers, other countries, commercial entities, academia, law enforcement, and medical institutions. Our expertise covers the complete nuclear security framework—from developing and testing systems designed to prevent nuclear crises to training the personnel who prevent, detect, and respond to such events.

With proven expertise in the handling and protection of nuclear materials, Y-12 provides global leadership in security matters.



*Our experts help remove highly enriched uranium from around the world and supply countries with low-enriched uranium for reactor fuel.*

## Nuclear Forensics and Detection

Our unique history of working with uranium affords us the opportunity to be effective leaders in uranium forensics, detection, and research and development, as well as in training the next generation of nuclear scientists and engineers.

In recent years, we have expanded our forensics and detection capabilities. Our Nuclear Detection and Sensor Testing Center, for example, has helped research groups from national laboratories and universities develop, test, and enhance their nuclear detection equipment.

*We conducted 16 Alarm Response Training courses for 599 first responders from around the world in FY13. Since 2009, our experts have trained more than 3,000 responders through NNSA's Global Threat Reduction Initiative.*



*We partner with academia to advance computational modeling of uranium materials, materials characterization, and radiation detector designs.*

## Manufacturing and Technical Services

We possess unique manufacturing and technical service resources that solve high-risk challenges, protect classified and proprietary data and materials, and develop real-world information technology solutions.

Recently, we developed the Manufacturing Innovation Network concept to enable secure collaboration to enhance innovation in manufacturing. Likewise, our Knowledge Preservation Management system offers capture, management, and access of manufacturing operations information.

Y-12 plays a key role in advancing manufacturing and information security and in developing expert systems that are critical to solving the national security challenges faced by the manufacturing industrial base.



*Our classified manufacturing capabilities help solve national security challenges.*



*We share our unique uranium and lithium expertise with various federal agencies.*

## Special Programs

Y-12 is the primary source of expertise in the applied science and manufacturability of highly enriched uranium and other special materials. As the United States mitigates risks of nuclear proliferation, Y-12's experience, knowledge, and capabilities are vital to the intelligence community.

We have shared our expertise with various federal agencies, providing analytical support to the intelligence community when requested and offering training opportunities to its members.



Our unique operational history is an outstanding platform from which we will continue to develop new intelligence training programs. We also are primed to serve as a venue for systems research, development, testing, and evaluation.

*We provide intelligence analysis and training support to members of the intelligence community.*



**GROW STRATEGIC PARTNERSHIPS**

Y-12 has formed strategically defined partnerships, including one with the University of Tennessee, a premier research institution in close proximity to Y-12. Another partnership is with the Huntsville, Alabama, community, home to a concentration of U.S. government agencies. A third partnership is with other Department of Energy entities, including our neighbors Oak Ridge National Laboratory and Oak Ridge Associated Universities. We enter into contractual agreements with businesses, community organizations, and other federal agencies for a broad variety of projects.

Y-12 has a proven ability to accelerate technology from the laboratory into everyday use. Working with Stanley Healthcare and UT, for example, we formed a team to develop and rapidly transition the use of real-time data acquisition systems from Stanley and advanced decision support systems from UT into real-world application at Y-12.



*In support of STEM education, we hosted middle-school scientists who have developed a proprietary technology to reduce mercury levels in fish.*

*This replica of a Civil War-era USS Monitor propeller illustrates the phases of our unique microwave sintering and bonding technology: The hub and four propeller blades were printed from powdered metal and sintered. The hub and bottom-left/top-right blades were assembled and then infiltrated/bonded with nickel bronze. The top-right propeller was hand-finished and polished. The two remaining sintered blades were positioned for subpart comparison.*



THE NATION'S  
**URANIUM  
PROCESSING  
FACILITY**

Change is vital to growth. For 70 years, Y-12 has consistently embraced change, actively sought improvements in all areas of our business, built relationships, solved weighty technological dilemmas, and moved forward with a solid can-do spirit in serving individual customers, the United States, and the world.

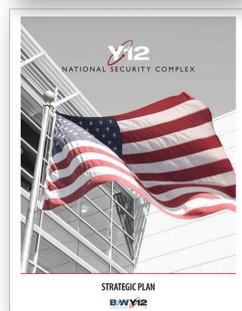
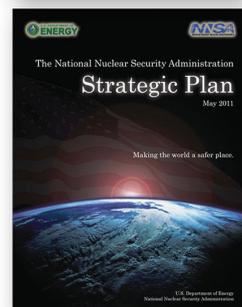
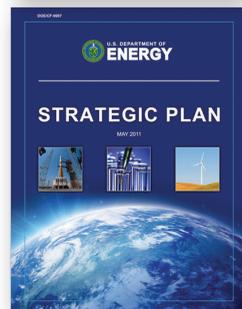
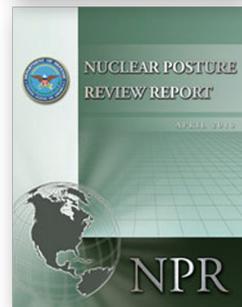
Y-12 stands ready to respond to global security needs, making the world a safer place. Our daily challenge is to reduce nuclear dangers wherever they exist. Our experience, expertise, and unique facilities allow us to anticipate many of those needs for which we have initiated special programs and centers. The new Uranium Processing Facility at Y-12 is essential for maintaining a safe U.S. nuclear weapons stockpile, supplying fuel for the nation's Navy and world's research reactors, securing vulnerable nuclear materials, and performing nuclear forensics and other vital missions. This facility and the other areas of transformation are key to our future. We are addressing Defense Programs needs even as we expand, strengthen, and excel in new areas of national security.

*The Uranium Processing Facility  
will serve many core and Broader  
National Security Missions.*

### ALIGNMENT: STRATEGY TO ACTIONS

Our country's national security strategies have shaped the Y-12 vision for our Broader National Security Missions. These strategies are presented in the National Security Strategy and Nuclear Posture Review and flow into DOE and NNSA strategic plans.

The Broader National Security Missions Strategic Vision seeks and generates new opportunities to engage the tremendous talent and capabilities at Y-12 to tackle new national security challenges. The Broader National Security Missions Strategic Vision also supports the Y-12 Strategic Plan objective to "transform Y-12's technological capabilities and infrastructure to build our leadership and advance our national security missions."





**MAKING THE WORLD SAFER**

**855-Y12-NNSA [855-912-6672]**

**[www.y12.doe.gov](http://www.y12.doe.gov)**

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