

the Y-12 times

A newsletter for employees and friends
of the Y-12 National Security Complex

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Y-12's new rolling mill helps reduce the use of highly enriched uranium in research reactors.

New mill supports nonproliferation

The Y-12 National Security Complex has taken a major step in support of the nation's nuclear nonproliferation agenda with installation of a new cold rolling mill that will support conversion of U.S. High Powered Research Reactors, or HPRRs, from highly enriched uranium to low-enriched uranium.

"Replacing the highly enriched uranium now being used in the HPRRs with low-enriched fuel in the form of U-Mo (uranium-molybdenum) is a giant step in nonproliferation," said Lloyd Jollay, Y-12 manager of nuclear technology and nonproliferation. "It means that we'll be removing vulnerable HEU from commerce and creating the ability to generate medical isotopes using LEU."

The \$1 million machine will enable Y-12 to roll uranium alloys—similar in thickness to aluminum foil—in production runs, maximizing surface area while minimizing the amount of material used. The foils will ultimately fuel the nation's five HPRRs and could also be used for the production of medical isotopes.

"In partnership with the International Atomic Energy Agency, we're also exploring the use of these foils for converting Mo⁹⁹ production at facilities around the world," Jollay said.

The Y-12 thin-rolling process was developed by Applied Technologies, and early production (70 foils) was completed on a mid-1950s mill in the development laboratories. "Organizations have been able to roll the uranium alloy thinly before, but never this thinly," Jollay said. "The fact that we've been able to consistently roll U-Mo at this level on a large scale is a true technological breakthrough."

The mill is expected to process three metric tons of U-Mo a year and 150 kilograms of Mo⁹⁹ target foil a year at full capacity.

It's in the can: documenting container safety

Documenting the safety of a container is not a simple process. As proof, take a look at a 1,000-page Safety Analysis Report for Packaging, or SARP. That's how big the reports can typically be, according to Steve McClanahan, program manager for Packaging in the Directed Stockpile Work program. One point to understand is the U.S. Department of Energy certifies and licenses a package, not just the container. A package is both the container and its payload.

The process of testing, certifying and documenting the design and safety of a Type B package (for radioactive and fissile material) is regulated by the U.S. Department of Transportation and the Nuclear Regulatory Commission. DOE closely monitors contractors to ensure compliance with regulations. There are two primary goals for container packaging: protect the public and environment from any hazardous material and ensure the material arrives at its destination in good condition.

A SARP contains information proving that a package meets all requirements, which ensures the package will withstand normal transport conditions as well as hypothetical accident conditions. Package tests include those for vibration, moisture, dropping, crushing, puncturing and thermal testing.

"We do all the required testing," said McClanahan, "then we document it in the SARP, which goes through a review process with the National Nuclear Security Administration." After more steps in the long process, an off-site transportation certificate is issued by DOE if all requirements are met. Y-12 currently holds 17 certificates for Type B packages, and shipments safely and securely occur routinely between Y-12 and Pantex in Amarillo, Texas.

The 'can'-do experts

When you need help, you go to the experts. In the case of Lawrence Livermore National Laboratory's deinventory efforts, that means the Y-12 National Security Complex. Y-12 is well-known for expertise in container design and licensing and can answer a call for help with the documentation and packaging required for shipping special nuclear material.

LLNL has made a commitment to the National Nuclear Security Administration to remove all its accountable SNM from the site. After successfully helping Los Alamos National Laboratory with a similar deinventory project, Y-12 is now lending a hand to help LLNL staff get the license and containers they need to transport their SNM off-site.

The process is complex: It started with identifying the contents to ship and characterizing the materials. Now Y-12 and LLNL are preparing the safety documentation for review by the U.S. Department of Energy/NNSA. The next step will be to write the procedures and get the license for shipping.

When the license to move the material is granted, Y-12 will provide containers. The containers undergo physical tests and computer modeling to ensure their compliance with regulations.

What happens to the material when it leaves LLNL? According to Steve McClanahan in the Directed Stockpile Work program, "Some of the SNM comes here to Y-12, and some is disposed of elsewhere, such as at the Nevada National Security Site." Overall, the project is expected to take three years.

Expertise and experience make Y-12 the right choice to call for help.



When it comes to shipping special nuclear material, Y-12 is a container design and licensing expert.

MAXIMIZING OPPORTUNITY, MINIMIZING WASTE

When Y-12 was awarded American Recovery and Reinvestment Act funds for seven projects last year, Environmental Management saw opportunity. For one of the projects, Building 9204-4 (Beta 4), a dedicated project team focused on exploring and implementing legacy waste minimization practices, which saved disposition costs.

“Under ordinary circumstances, we would not have been able to invest the time and effort needed to pursue waste minimization for legacy material—it would have been discarded,” said Syreeta Vaughn, Beta 4 legacy material removal team lead. “With Recovery Act funds and our team’s focus only on Beta 4 waste, we were able to transfer materials excessed by Y-12 to other organizations where they will be used for their intended purposes.”

For instance, the team initiated the transfer of a porous metal that converts to a usable metal (titanium sponge) for the U.S. Army to use in the development of lightweight body armor. That transfer saved Y-12 \$12,000 in waste characterization and disposal costs.

Working with Property Management, the team also facilitated the transfer of an idle package monitor—a 12,000-pound piece of equipment used to check items before disposal—to Oak Ridge National Laboratory. The equipment valued at \$56,800 had been on the swap list for reuse for more than two years.

Through a partnership with Environmental Compliance, the team salvaged 1940s terra-cotta bricks and preserved them in accordance with the National Historic Preservation Act.

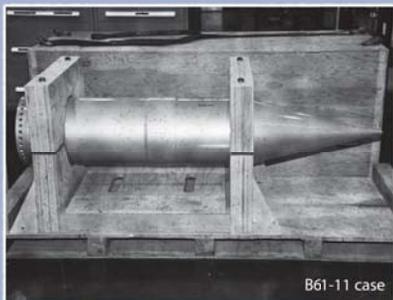
Finally, the team sent 1,620 cubic feet of scrap metal to Roane Metals for recycling and 1,616 cubic feet of radiologically contaminated metal cases to EnergySolutions to be reconfigured for use within U.S. Department of Energy facilities.

While the Recovery Act funded the Beta 4 project, credit for successful implementation of Y-12’s pollution prevention principles goes to the team for its diligence in initiating the process of minimizing waste and maximizing opportunity.



Two roll-off containers filled with scrap metal from Beta 4 were sent to Roane Metals for recycling.

‘THE REAL THINGS’ TO BE ON DISPLAY



“For people to know the story of Y-12, they should see the real things,” said Y-12 historian Ray Smith, referring to an empty B61 Mod 11 case and empty B83 nose cones that will soon be on display in the History Center located at the New Hope Center.

The components were discovered during American Recovery and Reinvestment Act cleanup activities at Building 9204-4 and were saved from being shipped to the Nevada National Security Site landfill. Classification’s John Barton identified the pieces, including the B61-11 case in its original shipping crate. As the empty case had never been shipped, it remained pristine in its crate.

Environment, Safety and Health’s Jennifer Dixon (who is Y-12’s National Historic Preservation Act coordinator) works with Smith to save Y-12 artifacts and then display them at the History Center. “Wayne Gibson is creating a customized display stand to protect these components,” Dixon said.

One of the B83 nose cones that will be on display was drop-tested (as part of a test device) and shows evidence of impacting the ground, nose first. The second B83 nose was never tested.

The many exhibits at the History Center attract local and international visitors curious about Y-12’s history. The Y-12 History Center, located at 601 Scarboro Road, is open to the public 8 a.m. to 5 p.m. Monday through Thursday.



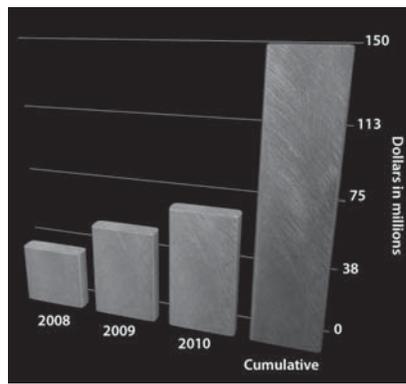
Top Ten 2010

Accomplishments

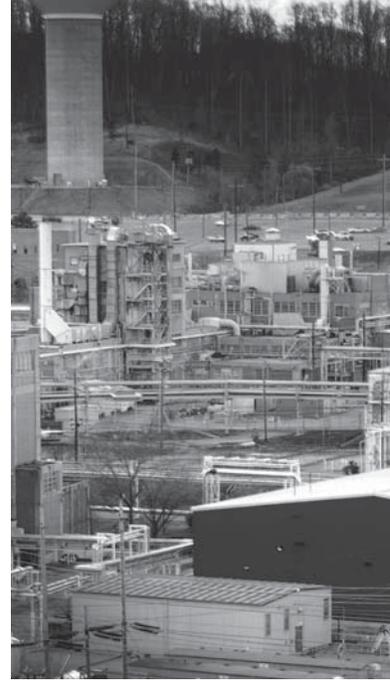


1

Exceeded W76-I Life Extension Program requirements. Suggested a design change and implemented process modifications, enabling production of 10 percent more units. Also, factory improvements enabled 11 percent more dismantlements and 43 percent additional weapon component dispositions within existing funding levels.



2 Validated 378 initiatives and \$68.5 million in savings and efficiencies against an aggressive goal of \$40 million, exceeding last year's "best ever" performance by \$15.7 million. In the past three years, delivered over \$150 million in efficiencies and cost avoidance.



3

Continued American Recovery and Reinvestment Act projects at the same aggressive pace as last year, completing 30 of 30 project milestones on or ahead of schedule. Over \$100 million worth of ARRA-funded projects provided the equivalent of 1,200 new jobs. Received an additional \$29 million of follow-on work because of excellent performance. Achieved a milestone of 1 million safe work hours on ARRA projects without a lost-time injury.



4

Dedicated the Highly Enriched Uranium Materials Facility, Y-12's largest construction project in more than 40 years, with DOE Secretary Dr. Steven Chu as the keynote speaker. Commenced material movement for the HEUMF transition two months ahead of schedule, and finished Building 9720-5 de-inventory 17 days ahead of the 90-day goal with no safety or security concerns. The accelerated plan provided a cost avoidance of \$26 million in safeguards and security costs.

6

Advanced mature technologies to support mission needs and modernization. Implemented the first use of a production microwave caster, accomplished work on the new Non-Destructive Laser Gas Sampling system ahead of target, and procured a cold rolling mill to manufacture foils.



7

Completed the Steam Plant Life Extension project on schedule and under budget, and received Critical Decision-4 approval June 14. In addition, completed the Potable Water System Upgrades project ahead of schedule and under budget, and received CD-4 approval on Sept. 23. These projects are expected to eliminate about \$52 million in deferred maintenance costs.



8

Transformed Y-12 into one of the most effectively protected nuclear sites in the nation by using technology as a force multiplier. Began operating a wireless network to enhance situational awareness by the protective force during a security event and provide real-time information to responders and commanders. As part of these efforts, upgraded the technology capabilities of the armored vehicle fleet.



5

Successfully completed preliminary design and aggressively advanced the overall design for the Uranium Processing Facility. All major milestones were met on time, and the project is poised to begin long-lead procurements and site preparation.

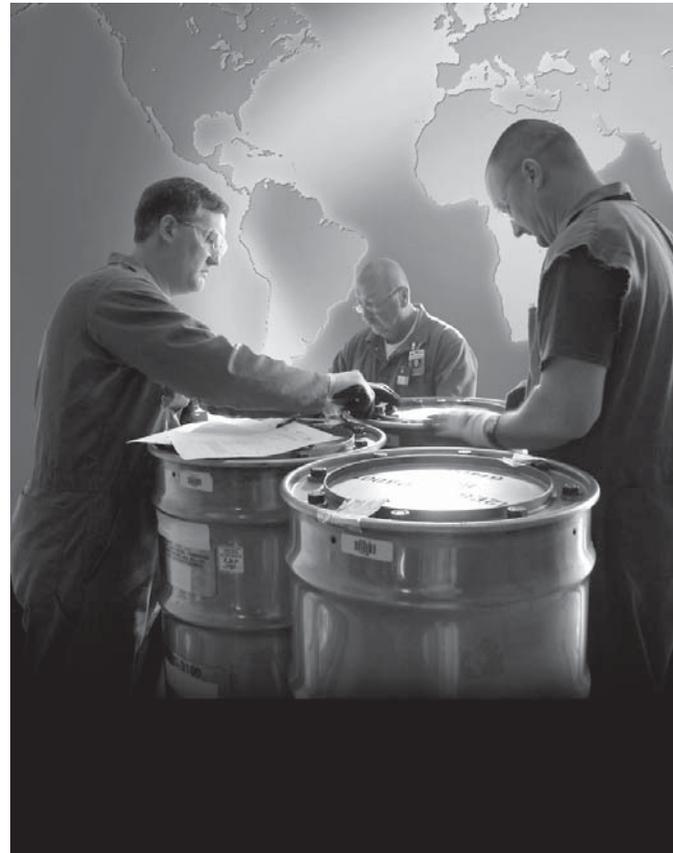


10

Expanded the LiveWise Wellness Program and opened three new Lifestyle Intervention for Employees (LIFE) Centers, providing on-site opportunities for employees to improve health and fitness. The LIFE Centers offer fitness equipment, health education programs, group exercise classes, fitness testing and health risk assessments.

9

Countered threats to global security by removing vulnerable materials, converting highly enriched uranium reactors, upgrading physical protection, providing security training and test devices, and implementing uranium material detection programs around the world.





Y-12 THROUGH THE DECADES

the LATE 1940s

The “Y-12 through the decades” series continues with Y-12’s accomplishments during the late 1940s.

Work slowed down for Y-12 after meeting its Manhattan Project (1942–1946) mission. In December 1946, Y-12 shut down nearly all its calutrons. Change continued in January 1947, when the Atomic Energy Commission took civilian control of the Oak Ridge facilities and operations. Employment began decreasing: Only 1,700 workers of the original 22,482 remained in October 1949.

After meeting its mission, Y-12 was excess property for the AEC. Workers began removing the calutrons from eight of the nine buildings (all except Building 9204-3) in which they were installed. Much of the 14,700 tons of silver borrowed from the U.S. Treasury to create electrical conductors was returned. However, 67 tons of silver were left in the two alpha and two beta calutrons’ magnets located in Building 9731. This building would become the home of the second Y-12 mission.

Building 9731, with its four calutrons, was used to separate isotopes of elements other than uranium. Dr. Chris Keim first separated copper 63 and knew he was on to something important. After obtaining funding, Keim separated other chemical elements, estimating it would take 12 years to get through the known isotopes. Soon, these isotopes were being sent to the Graphite Reactor at the newly emerging Oak Ridge National Laboratory to be irradiated for use in the fast-growing medical radioisotope program.

AEC headquarters ensured this vital work continued; returning the remaining 67 tons of borrowed silver was delayed until 1970.

Next in the series, we will travel with Jack Case, Wimpy Hilton and John Strohecker to Los Alamos as they capture the technology for Y-12’s next mission: the machining of uranium.

For more information on Y-12’s history, visit the Y-12 public website (<http://www.y12.doe.gov/about/history/>).



Silver stored at Y-12



Beta calutrons in Building 9731



Building 9731 (first Y-12 building)



Alpha calutrons in Building 9731

Around Y-12 ...

- Brig. Gen. Garrett Harencak, the principal assistant deputy administrator for military application in the National Nuclear Security Administration's Office of Defense Programs, visited Y-12 Nov. 9 to present the Defense Programs Awards of Excellence for calendar year 2009 to about 200 Y-12 employees. The annual awards recognize significant achievements in quality, productivity, cost savings, safety or creativity in support of the NNSA's nuclear weapons program. "I'll tell you one thing you shouldn't be modest about and that's the work you're doing to help the nuclear security enterprise," Harencak said, saying Y-12 is leading the pack in multiple areas.
- **Congressman-elect Scott DesJarlais visited Y-12 Nov. 10 to get an overview of Y-12.** This visit was the first for DesJarlais, who defeated Congressman Lincoln Davis in the Nov. 2 election. Congressman-elect Chuck Fleischmann, who will fill Congressman Zach Wamp's seat, received a briefing about Y-12 last month.
- **B&W Y-12's R.S. (Bud) Leete Jr. and the Y-12 Site Office's Anna Beard are Defense Programs Employees of the Quarter.** Leete, a Quality Assurance statistician with 41 years of experience, is widely recognized for his statistical work on improving efficiency, product quality and design. Under the leadership of Beard, a senior project manager, two high-priority mission infrastructure projects at Y-12 have been completed recently. The line item projects—Potable Water Supply Upgrade and the Steam Plant Life Extension—were completed on schedule and under budget.
- **Technology 2020's Innovation Valley Technology Council presented its annual Navigator Awards Oct. 27,** at the Entrepreneurial Imperative 2010 Conference. Y-12's Lee Bzorgi, director of the National Security Technology Center, was awarded the Tech Council's inaugural Pathfinder Research Entrepreneur of the Year award.
- **Facilities, Infrastructure and Services made a difference in the lives of 78 families this Thanksgiving as part of the Knox Area Rescue Ministries Baskets of Hope program.** "It started with two boxes and took off from there. Because of the generosity of the people in FI&S, less fortunate families can enjoy a complete Thanksgiving meal this year," said Jennifer Crabtree of FI&S, who coordinated the effort.
- **Construction personnel recently celebrated completion of \$13 million in security projects during fiscal year 2010.** The security projects team met 100 percent of its performance-based incentives for the year, which equated to \$1.5 million in fees. Vice President of Safeguards, Security, and Emergency Services Butch Clements noted, "9/11 showed we had severely underestimated the will and capability of the adversary." He added that visitors from other sites are amazed by the physical changes to the site. Clements thanked the workers for "making our nation secure, our site secure and ensuring our Protective Force can go home at the end of the day."
- **Take time to read product labels—even that fine print—before using chemical products.** At work and at home, we use chemicals that could harm us or our family. Know a product's hazards and, most importantly, what first-aid measures are required in case of accidental contact. Each product procured for use at Y-12 has an accompanying Material Safety Data Sheet, or MSDS, and labeling guide with detailed information regarding specific hazards, personal protective equipment to be used, chemical properties and other important information. Before using a chemical, read its MSDS (look under M in the YSource index).
- **Special Agent in Charge Richard Lambert of the Knoxville Office of the Federal Bureau of Investigation recently reminded employees during a presentation at the New Hope Center of the importance of protecting sensitive information to reduce the threat of domestic and international terrorism.** Lambert noted that the threat to our national security looks different today because "there is no profile." He noted that pre-9/11 the focus was on international terrorists. Homegrown terrorists were miniscule, he said. Today, he said, half of the terrorist threats come from within the U.S. While radical Islamic terrorists are stronger, Lambert said the homegrown terrorists "are learning rapidly from their mistakes."

SERVICE



NNIVERSARIES

DECEMBER

43 years

Engineering: Clark E. Hamilton
Plant Services: Wallace R. Johnson

42 years

Engineering: Robert R. Bigelow
Quality Assurance: Thomas T. Adams
Resource Management: Benny L. Doyle

35 years

Benefits Service Center: Patricia S. Mitchell
Information Technology: Harriet E. Mitchell
Plant Services: Wayne Tarver
Production: Lynn D. Cherry and Dwight W. Porter
Quality Assurance: Ellen S. Carlton and Thomas D. Wilson

30 years

Facility Management and Programs: Francis E. Shirley
Information Technology: Michael A. Bell and James S. Payne
Maintenance Execution: Jerry L. Greene
Material Management: Terri H. Hall
Production: Charles K. Collier, Dennis E. Hackworth, Janice C. Schabot, Charles E. Sloan and Karen J. Turnbill
Resource Management: Elbert H. Cooper, Henry C. King and Alice E. McMillan

25 years

Information Technology: Jeffrey A. Jones and Robert C. Painter Jr.
Production: Gregory L. Baker, Rodger D. Caruthers and Connie J. Wicker

20 years

Maintenance Support: Terri S. Renfro
Nuclear Materials Control and Account: John B. Cuffman Jr. and Brian K. Raines
Quality Assurance: David N. Moncier and Frank E. Denny
Resource Management: Connie D. Steelman
Safety: David W. Neubauer

Y-12 Employees' Society Holiday Parties

Dec. 16, Employees' party
4 to 6:30 p.m.

Jack Case Center cafeteria

Dec. 18, Children's party
2 to 6 p.m.

New Hope Center

Contacts: Lisa Harris, 576.2658
or Rashaun Williams, 241.4210

Inclement Weather

In case of inclement weather, call 241-1212 to find out the B&W Y-12 operating schedule.

See Y73-006, *Inclement Winter Weather Planning, Response, and Recovery*, for more information.

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THE JOURNEY: *Safety for Life*

Y-12 will begin its next journey on the path to zero occupational injuries and illnesses: the journey to become a U.S. Department of Energy Voluntary Protection Program Star-status site. The kick-off celebration is scheduled for Dec. 13 at the New Hope Center.

Garry Whitley, president of the Atomic Trades and Labor Council, is committed to this journey. "It is important to begin the VPP process to identify areas we need to improve and, in addition, to recognize the areas we are doing well. We must work on all areas to raise the bar to VPP standard."

Since 1998, Y-12 has been an Integrated Safety Management site, using this structure to perform work safely.

Many safety tools are available to us: the Job Hazard Analysis process, used to keep our workers safe by involving everyone early in the process; Behavior-Based Safety, which focuses on behavioral aspects; Human Performance Improvement, which focuses on conditions and why the behaviors made sense at the time; and employee teams, where we all have a responsibility to look out for the safety of ourselves and our co-workers.

The next logical step on the journey is to become a DOE-VPP Star-status site. This program promotes safety and health excellence, with the core of VPP being a cooperative effort among labor and management. The program is equivalent to the Occupational Safety and Health Administration's program that recognizes employers and workers who have implemented effective safety and health management systems.

Y-12's champion for VPP, Deputy General Manager Bill Klemm, said, "We have experienced several accidents and injuries over the last few years. While the severity of these has been lowered, we continue to experience them. VPP is a process that will get every employee engaged in improving our operations. At the end of the process, we will have improved our overall safety across the site—through the combined efforts of all employees."

Together, Y-12's management and employees embark on this journey—Safety for Life. Watch YSource for more information.

Y-12's ongoing safety initiatives work together to ensure we have one of the safest sites within the National Nuclear Security Administration/ U.S. Department of Energy Complex.

The logo features the text "Y-12" in a large, bold, white font with a black outline, positioned above "VPP" in a similar but slightly smaller font. A stylized grey orbital path with a black dot at its center loops around the "Y-12" text.

Safety for life