the Y-12 times

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

WHAT'S INSIDE

Volume 12, No. 2
February 2012
www.y12.doe.gov/news/times.php

P.O. Box 2009
Oak Ridge, TN 37831-8245

B&W Technical Services Y-12, LLC, a partnership between Babcock & Wilcox Technical Services Group Inc. and Bechtel National Inc., operates the Y-12 National Security Complex.

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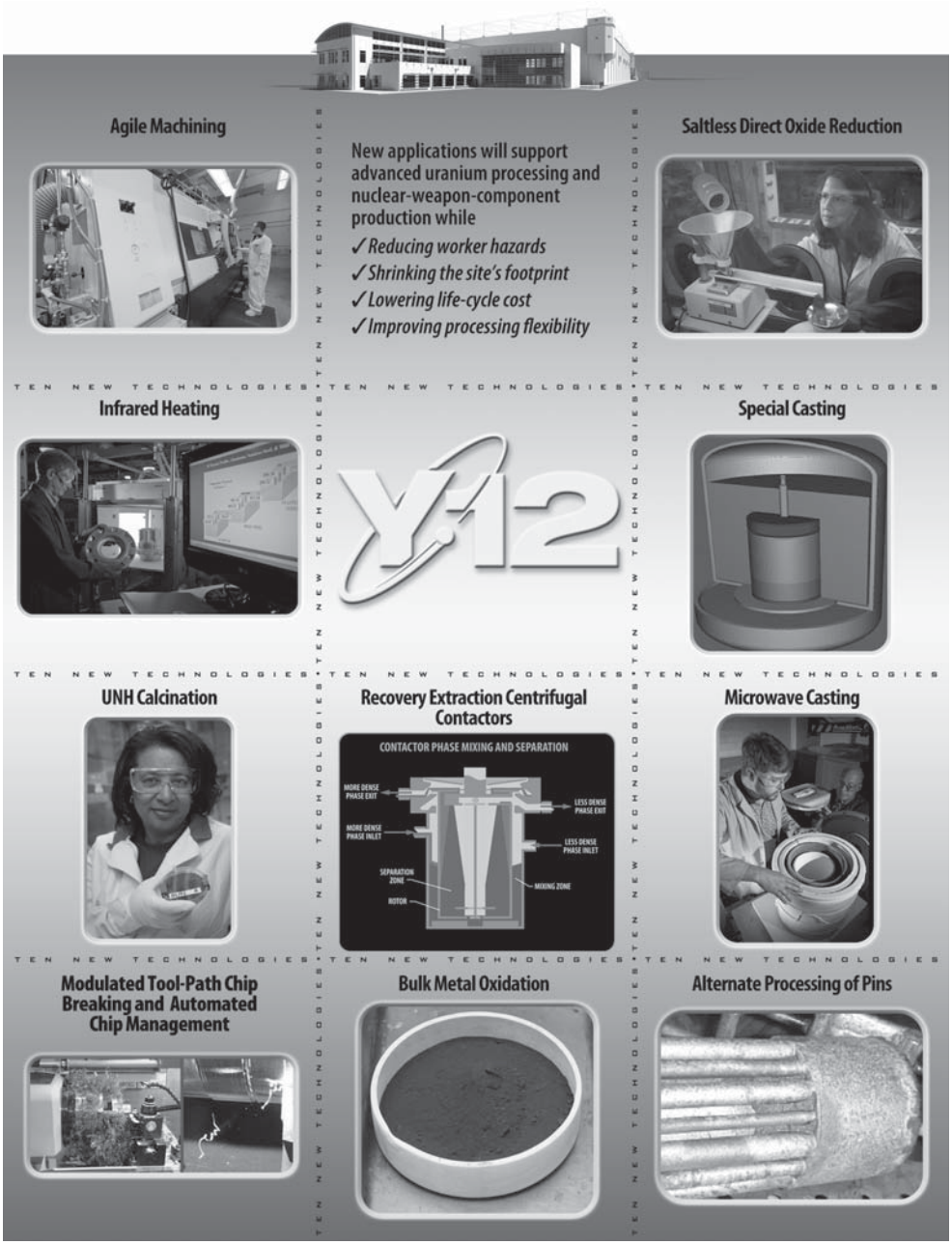


10 new technologies for UPF

Technology applications developed by Y-12 researchers are important elements of the new Uranium Processing Facility. Ten new applications will support advanced uranium processing and nuclear-weapon-component production and provide substantial benefits over increasingly outmoded systems.

UPF will consolidate operations now performed in four Y-12 facilities, eliminating 450,000 square feet of unneeded space, lowering operational and construction costs and enhancing security. The technologies also will reduce worker hazards and improve processing flexibility.

To ensure that UPF technologies are mature in time to be used successfully, the National Nuclear Security Administration established technology maturity requirements for projects. Maturity is measured using Technology Readiness Levels, or TRLs. The system ranges from 1 (basic principles observed) to 9 (total system used successfully in project operations). Before

UPF (cont. on page 2)

UPF (cont. from page 1)

the UPF project is baselined in fiscal 2013, its technologies should be at least at TRL 6 (a prototype is demonstrated in a relevant environment).

"The research and development of these 10 technologies represents the hard work and cooperation of many, many people throughout Y-12," said Y-12 Chief Scientist John Leckey. "Readying 10 technologies is a significant undertaking with many challenges, but everyone is committed to getting it right and getting it done."

"The UPF engineering process leads have collaborated closely with the Development process investigators to validate that all key attributes are included in the engineering design," said Bill Zulliger, UPF Engineering. "The UPF project takes implementation of technology development seriously and requested an independent external team of subject-matter experts to assess the Technology Readiness Levels."

Microwave casting is one technology being prepared for use in UPF.

10 new technologies for UPF

1. **AGILE MACHINING**
   Combines multiple machining operations into a single, automated process. All of the work is performed within a glovebox, minimizing worker exposure to radioactive metal particles.
   Benefits: Improves worker safety, reduces shop-floor footprint, improves cycle time and quality, and may allow a reduction in the number of machining steps required.

2. **ALTERNATE PROCESSING OF PINS**
   Shapes rods with a metalworking tool using a swaging technique to obtain desired metallurgical properties.
   Benefits: Eliminates some processing steps, requires less stringent security, reduces handling of hazardous materials and results in fewer in-process materials to recover.

3. **BULK METAL OXIDATION**
   Converts bulk uranium metal directly to an oxide without machining to chips.
   Benefits: Eliminates intermediate chip machining and cleaning operations and reduces exposure to hazards, such as chip handling.

4. **CHIP MANAGEMENT**
   One of the multiple operations to be performed through agile machining, it reduces operator interactions with machining processes by automatically collecting uranium shavings or chips.
   Benefits: Reduces/eliminates manual chip handling, protects machine operator from hazards and reduces waste.

5. **INFRARED HEATING**
   Preheats and anneals (softens) uranium metal before other processing activities.
   Benefits: Eliminates operational safety issues, 24/7 high-energy consumption, hazardous chemicals and high-maintenance demands; minimizes footprint.

6. **MICROWAVE CASTING**
   Uses microwave energy to melt uranium metal so it can be poured into molds. The process replaces the existing vacuum induction melters for casting.
   Benefits: Reduces impurities, oxide formation, operator exposure and operating costs.

7. **RECOVERY EXTRACTION CENTRIFUGAL CONTACTORS**
   Replaces current technology to extract uranium for purification purposes using solvent extraction.
   Benefits: Substantially reduces chemical inventories, reduces potential fire risk and radiation contamination release, reduces footprint and provides faster response.

8. **SALTLESS DIRECT OXIDE REDUCTION**
   Produces high-purity enriched uranium metal buttons by reducing uranium oxide as opposed to uranium fluoride.
   Benefits: SDOR (pronounced "S door") eliminates use of hazardous hydrogen fluoride; by-products are easily recycled; there are no pressure vessels; imperfect reductions can be easily ground and reduced again.

9. **SPECIAL CASTING**
   A custom process for casting uranium metal. The process employs microwave casting using enhanced safety controls.
   Benefits: Improves nuclear safety and reduces footprint (consolidated operations).

10. **UNH CALCINATION**
    Converts bulk impure uranyl nitrate, or UNH, into a stable, storable oxide.
    Benefits: Eliminates the need for processing and recovery of low-equity, low-assay material through more cumbersome methods; offers a flexible flowsheet with the smallest footprint and reduces processing costs.

Y-12's growing NATIONAL ROLE

Fortune 500 companies, federal agencies and foreign entities are coming to Y-12 for assistance. They're coming for one reason: It's often the only place in the world where they can get what they need.

After nearly 70 years of producing, handling, packaging, transporting and accounting for nuclear material, Y-12 has acquired unique expertise in subjects as varied as machining, prototype construction, metal alloys and physical security. Through the U.S. Department of Energy's Complementary Work for Others Program, Y-12 makes that know-how available to other federal agencies, state and local governments and private-sector companies. Through federal law and international agreements, Y-12 also provides specialized technical services to foreign entities.

Although Complementary Work for Others dollars make up only 3 percent of Y-12's overall funding, the program has seen steady increases over the last six years, growing from more than $20 million in fiscal 2006 to more than $38 million in fiscal 2011. The funding outlook for the next few years is promising, especially growth in non-federal work.

"We expect to grow and diversify our Complementary Work for Others Program," said Gerald DeVault, Y-12's Nuclear Nonproliferation and Global Security Programs lead. "We will expand the value Y-12 adds not only to the National Nuclear Security Administration but also to a wide array of customers who support our nation."

"We want to grow our program so our mix of work is more diversified," Work for Others program administrator Gail Johnson said. "That way, Y-12 will benefit from multiple funding sources."

Through Y-12's Complementary Work for Others Program, Y-12 trained in fiscal 2011 more than 1,000 professionals responsible for counterterrorism, counterproliferation and nuclear threat response.

Team effort cleans up

Y-12 and the Oak Ridge National Laboratory have worked together for the last 25-plus years to make sure life in East Fork Poplar Creek is improving after receiving contamination as a result of nuclear weapons production at Y-12 during the Cold War.

Mick Wiest of Environmental Compliance said, "Over the years, the biological monitoring program has been helpful in restoring the ecological health of the stream and indicating areas where more improvement is needed."

Substantial increases in the number and abundance of fish and other aquatic life, especially those more sensitive to pollution, have been documented recently. This year, a regionally rare fish species, the tangerine darter, was found in the creek. Like discovering the single spotfin chub in East Fork Poplar Creek a few years ago, finding these rare species does not mean that a population will soon be established, but it is one more sign that the overall health of the stream is getting better.

"We're excited the health of the creek continues to improve," said Stacey McNamara, director of Environmental Compliance. "Mark Peterson and his staff at ORNL are the biologists who study the creek results, so this program is one example of Y-12 and ORNL working together."

"The creek improvements are welcome news," Wiest said, "but we still have challenges."

Despite the challenges, continued pollution prevention activities will help ensure environmental gains continue. "We have effective environmental programs at Y-12," McNamara said, "and we expect the future to bring further recovery of the creek."

Oak Ridge National Laboratory's Mark Peterson and his staff collect and test biological samples from East Fork Poplar Creek. Some samples are evaluated in the field; others are taken to the lab, counted, identified and measured.

SAFETY: **top priority**

Y-12 VPP
Safety for life

For a team of Y-12 laundry workers, having safety as top priority is a constant.

"It's a little voice in our minds to keep eyes on task and be mindful of our surroundings," explained Sharon Long of Facilities, Infrastructure and Services.

Y-12's journey to Voluntary Protection Program Star status has reinforced that little voice. Charlie Austin (also of FI&S) said, "VPP has helped bring safety to employees' minds just by reminding us to pay closer attention to our everyday activities and work routines," he said. "No one wants to be hurt or see anyone else get injured."

More than a year ago, Y-12 began its Safety for Life journey. Employees' actions — like those demonstrated by this laundry team — show they are putting VPP into action.

The day started like any other for the laundry crew; they were preparing to load a contractor trailer with laundry buggies.

"I saw that the trailer wasn't one of the usual ones we load," Long said. "The trailer was too high for the ramps we use, and we didn't think we could safely load and unload the buggies. I knew we needed to have a safety pause."

"We did what everyone should always do — question things or circumstances that don't appear to be safe," FI&S's Vicky Perry said. "We saw a hazard that could have resulted in someone getting hurt if we had used the equipment as it was."

VPP Champions Committee member Wade Ray commended the team. "This example shows employees taking ownership of their daily routines and putting safety as their No. 1 priority. They truly are on the journey of safety for life."

Back row from left: Jeff Boshears, Michael Randolph, Charlie Austin and Keith Allison. Front row from left: Vicky Perry and Sharon Long.

Sharon Long and Jeff Boshears keep safety as the top priority when beginning a job.

Changing BENEFITS
What does it mean?

B&W Y-12 offers a very competitive benefits package. It's essential for retaining the skilled work force needed to successfully execute our national security missions. Federal budget constraints cause us to continually evaluate how we manage the escalating cost of these benefits. As a result, the company has announced changes in absence policies and some benefits for salaried employees effective Jan. 1, 2012.

What was once known as sick leave is now included in a total of 40 hours of paid personal leave per year. After using those 40 hours, employees will use monthly balancing or employee convenience, vacation, or personal leave without pay. After 80 hours, employees are eligible for short-term disability. After 13 weeks of short-term disability absence, payments drop from 100 percent of salary to 80 percent.

Employees will continue to benefit from vacation banking — setting aside a significant amount of vacation time for use in an emergency. Beginning this year, new limits have been put in place to control the cost of keeping those hours on the books year after year. Employees with vacation time remaining on Dec. 31, 2011, must use it before July 1, 2012, receive payment for the unused vacation time, or add it to their bank.

Employees can bank up to 160 hours of vacation, down from a current maximum of 240 hours. Employees who currently have banked vacation in excess of 160 hours won't lose any time, but once they withdraw hours and reduce their bank to 160 hours or less, the 160-hour limit will apply.

Supervisors received more detailed information about the changes in January. For more information, see YSource or contact the OneCall Service Center, 574-1500.

Cleaning the clutter, **improving productivity**

Y-12's Recycle Center has undergone a 7S transformation, recently achieving the maximum 4.0 score, proving that even one man's "trash" can be cleaned, organized and stored as if it were treasure.

"It was kind of a process," said Environmental Management's Lisa Branstetter, who manages the Recycle Center and ensures the area maintains compliance with the 7S goals. "You just start doing the 7S and then figure out where to go next."

7S includes seven steps — sort, set in order, shine, standardize, safety, security, and sustain — aimed at improving the overall organization, cleanliness, safety, security and productivity of a given work environment.

For all in-process 7S initiatives, a member of Y-12's Productivity Division or a division's productivity lead performs quarterly assessments, grading the project in each of the seven areas. For the Recycle Center, that productivity lead is John Frost.

"Most 7S projects involve a small work or storage area such as a workstation, closet or single-purpose work area," Frost said. "The Recycle Center involves an entire building and the surrounding grounds — they are dealing with heavy equipment, trailers, drums."

Getting to a 4.0 rating required continued commitment and hard work. The results of that work already are apparent to Branstetter.

"It really does make work easier because you know where everything is," Branstetter said. "It saves time, energy and effort. It also makes things easier for others; if I'm out, someone else can easily figure out what to do."

At its core, 7S is a formal process for cleaning out clutter. But a cleaner workspace is not the end goal. Ultimately, as Y-12's Recycle Center proves, 7S improves productivity.

A sound investment

Y-12 is making a sound investment in the future by building up its technical base in ultrasonics.

Eight Y-12 engineers and technicians recently completed the first session of a class in phased array ultrasonics held in December at Y-12. The class is part of a Plant-Directed Research, Development and Demonstration project to strengthen Y-12's capabilities in using phased array ultrasonic techniques.

Phased array is an advanced ultrasonics technology that uses sound waves to evaluate welds and detect anomalies in metal. The goal of the PDRD project is to prove that the phased array instrument can detect a flaw of 20 mils (0.020 inches).

In industry, phased array has been used to inspect welds up to 3.5 inches thick and evaluate the internal conditions of several feet of metal.

Using a touch screen and a probe, the instrument sends out a beam of sound, manipulates it, and causes it to bounce through the metal like an echo. If the beam strikes a defect, such as a crack, it reflects sound back (similar to radar or sonar), and it is mapped on the instrument's screen to show size and depth, as well as position and severity. Then the material can be evaluated to see if the weld needs to be re-done or discarded.

Thomas Dews (left) and Rob Panero use a probe to test a specimen in a Y-12 class designed to strengthen Y-12's technical base in using phased array ultrasonics.

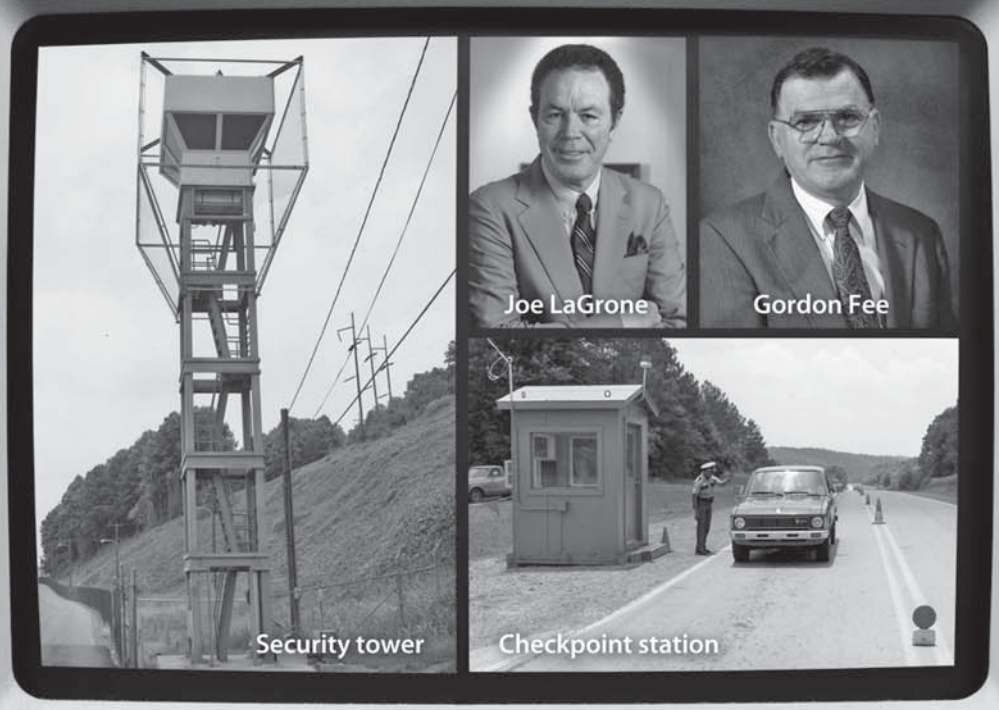
Instructor Mike Davis explained that the technology is advanced but is based on other common technologies. One example is prenatal care. Most often, pregnancies involve ultrasound exams. The sound waves map the shadows caused by different depths to create an image of a baby.

Phased array evaluations can be performed at real time or near real time during a welding operation.

Steve Dekanich, who heads the PDRD project, hopes Y-12 will have a field-deployable modern ultrasonic testing technology for weld inspection that will be ready to use sitewide in the next couple of years.

Y-12 THROUGH THE DECADES

The mid-1980s: Major changes



Major capital improvements to update Y-12's production capabilities and utility systems came to fruition in the 1980s. The projects, which cost an estimated $522 million, were necessary to update aging utilities and production equipment, which were beginning to show appreciable wear and tear from their constant use.

Also in the early 1980s, Y-12 initiated a major physical security system upgrade because of new threat analyses that included terrorism. The improvements included additional security features for the production areas, a comprehensive system of zone fences, barriers, guard posts and a series of towers. Material Access Areas were defined to ensure even tighter control of access to weapons-grade uranium.

In 1982,long-time plant manager Jack Case was replaced by Gordon Fee, who took over a production process intent on meeting the needs of the nation as defined by the six different nuclear weapons systems, including the B61 and B83, being worked simultaneously in support of the Cold War. In 1984, Martin Marietta Energy Systems replaced Union Carbide Nuclear Division as managing contractor at Y-12. It was a time of substantial change on all fronts.

An example of the quickly changing atmosphere came on Thanksgiving eve 1984. That night, Fee got a call from then Department of Energy Oak Ridge Operations Manager Joe LaGrone, who said Y-12's physical security must be tightened immediately because of new threats. Specifically, LaGrone wanted Bear Creek Road sealed off from the public before the next morning. With little time to act, George Evans, who was Y-12's eminently resourceful head of Security, and his staff quickly devised a system using large sand-filled dumpsters to block access to the road. The first fisherman pulling his boat who attempted to use his usual Bear Creek Road shortcut was sure surprised on Thanksgiving morning, but the cheap and highly effective roadblock worked well and was later copied by security forces elsewhere.

Around Y-12 ...

- **Robert "Dino" Herrera has been named acting deputy manager of the National Nuclear Security Administration's Y-12 Site Office.** He replaces Dan Hoag, who has been named acting YSO manager. His assignment to YSO was effective Jan. 4. Herrera has been a member of the Senior Executive Service since 2006 with managerial experience at NNSA Headquarters, the Sandia Site Office, the Los Alamos Site Office and the Albuquerque Operations Office.
- **James R. Haynes recently joined the Y-12 National Security Complex as senior vice president and deputy general manager.** Before joining Y-12, Haynes served as Bechtel's president of Latin America and chief operating officer for its global mining and metals business, based in Santiago, Chile. Haynes earned a B.S. in engineering and political science from the U.S. Naval Academy; a master's degree in public administration from TSU, Europe; and an M.B.A. from the Harvard Business School.
- **East Tennessee PBS is premiering a new series, *A Nuclear Family: Y-12 National Security Complex*.** The four-part series, conceived and produced by Y-12 historian Ray Smith and Y-12 Video Services, will give viewers never-before-seen glimpses into the world-changing work done in Oak Ridge. Check your local listings for air dates. After the series appears on East Tennessee PBS, it will be available on the Y-12 History Center public website.
- **The *Greater Knoxville Business Journal* has named Gina Davis and Abe W. Mathews III, both of B&W Y-12, and J. Travis Howerton of the National Nuclear Security Administration's Y-12 Site Office to its 2011 "40 under 40" list.** The *Knoxville News Sentinel* publication annually compiles a list of individuals under age 40 who are "making an impact on their professions, workplaces and communities."
- **Tech 20/20's Tennessee Valley Technology Council recently recognized Tammy Graham, Y-12's Technology Transfer manager, with a Tech Commercialization Champion of the Year award.** The award was presented at the annual Entrepreneurial Imperative 2011 Conference in Knoxville. Graham, who was one of two recipients of the award, was recognized for her work in creating a streamlined technology transfer process to accelerate the time it takes for businesses to license a Y-12 technology.
- **The Aluminum Beverage Can Committee chose four charities, nominated by Y-12 employees, for its year-end donation in honor of America Recycles Day.** Horse Haven of Tennessee, the Unicorn Fund, Wounded Warrior Project and the Y-12 Employees' Society Angel Tree were chosen from a list of 36 worthwhile organizations. Nominator Jill Jarnigan said, "The Unicorn Fund used the funds to buy Christmas gifts for needy children in Scott and Morgan counties. Thank you for recycling your ABCs!"
- **Nineteen Y-12 employees finished their first semester in the University of Tennessee, Knoxville's new engineering management graduate program.** This master's program, offered in Oak Ridge on Fridays, focuses on technology, leadership, entrepreneurship, project management and organizational psychology. The program is one example of joint Y-12/UT initiatives under way to strengthen ties between the two institutions to accomplish mutual technology, business and research goals.

Don Cook (right), National Nuclear Security Administration deputy administrator for Defense Programs, visited Y-12 Jan. 11 to present Y-12 Site Office Manager Ted Sherry with several awards upon his retirement, including the NNSA Gold Medal, the agency's highest award.

In memoriam

Cris A. Worley of Engineering passed away Dec. 31. He had 16 years of company service.

"Cris was a great team player, of the highest integrity and always willing to do what it took to get the job at hand done," co-worker Ken Keith said. "He made many contributions to nuclear criticality safety."

Co-worker Chris Robinson added, "He will be sorely missed."

Y-12 Service Anniversaries

FEBRUARY

44 years

Engineering: **Douglas E. Bailes**

43 years

Resource Management: **Kenneth E. Jack**

42 years

Information Technology: **James A. Seneker**
Production: **Neal A. Hill**
Quality Assurance: **Cheryl Y. Ellis**

41 years

Resource Management: **Samuel Carmichael, James M. Fowler** and **Wylie C. King**

40 years

Engineering: **Larry M. Greene**

35 years

Analytical Chemistry: **Jetter L. Marshall, Robert W. Smithwick III** and **Stonewall J. Van Hook III**
Budgets: **David W. Liles**
Development: **Richard E. Igou**
Document and Property Management: **Donna R. Lawson**
Engineering: **John A. Vanlandingham** and **Gary L. Ward**
Facilities, Infrastructure and Services: **Allan E. Ladd, Andrew P. Murphy, Harold G. Rutherford, Jackie Williams** and **Linda K. Williams**
Material Management: **Joel C. Boland** and **William B. Stephens Jr.**
Production: **David E. Gibbs** and **Thomas E. Sherrod**
Program Planning: **William G. Hodges**
Quality Assurance: **Alan C. Hamilton**

30 years

Emergency Services: **Teresa D. Lawlor**
Facilities, Infrastructure and Services: **Donnie R. Anderson, Henry Campbell** and **David K. Davidson**
Production: **Carl D. Hill Jr.**

25 years

Engineering: **Alfred L. Roberson**
Material Management: **Byron K. Hawkins**
Procurement Operations: **Gloria D. Mencer**
Production: **Mark B. Foxworth**

20 years

Emergency Services: **Jonathan L. Pack**
Engineering: **Craig H. Dukes**
Facilities, Infrastructure and Services: **Patsy C. Cantwell**
Information Technology: **Richard E. Bell** and **Jeffery D. Walker**
Production: **Gregory A. Gibson** and **Constance G. Pesterfield**
Quality Assurance: **Andrew J. Blotzer**
Radiological Control: **Patricia E. Hodge** and **William K. Oody**

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Y-12 Medic Blood Drive

Feb. 13–16

8 a.m. to 4 p.m.
See YSource for locations

Contact: Zetty Bell
574-0896

Introduce a Girl to Engineering

For girls in grades nine through 12

Feb. 23

1 to 4 p.m.
New Hope Center

Contact: Renee McGhee
574-8072

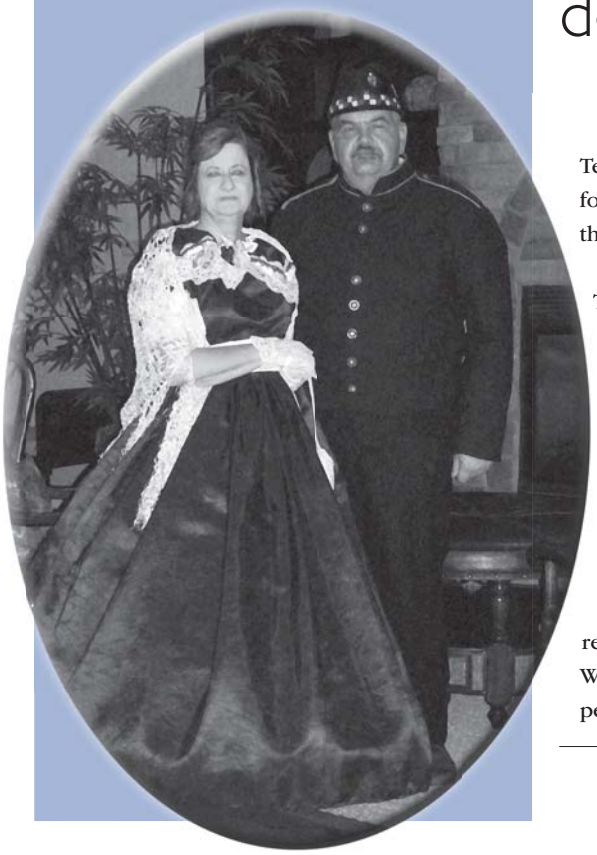
Workshop for Russian delegation has unusual show-and-tell

Inquiring minds at a recent material protection, control and accounting Performance Testing Workshop gave Program Management's Tom Vaselopulos a chance to share his zeal for Civil War history. The attendees were Russian nationals visiting Y-12 to collaborate in the prevention of theft or loss of nuclear material.

Vaselopulos leads the workshop, which was created by Global Security Analysis and Training program manager K.J. Maddux and is funded by the National Nuclear Security Administration's Office of International Material Protection and Emergency Cooperation.

While Vaselopulos' office reveals his fondness of hats, no one will likely see him sporting a glengarry or a forage cap at work. These items are among apparel he dons as a "living historian" when he participates in Civil War reenactment functions. To his latest group of visitors, Vaselopulos explained another commitment would preclude his being present the final day of the workshop. On that day he would be participating in the reenactment of the Battle of Secessionville in Charleston, S.C. The visitors wanted to know more, and Vaselopulos shared his interest in, and items from, the Civil War.

Vaselopulos is the only bona fide Yankee in the 79th New York Highlanders reenactment group based in Knoxville. "I welcomed the opportunity to show my Civil War–era military attire and gear to the Russians. I hope I left the visitors with a unique perspective of this period of American history," he said.



Civil War reenactor Tom Vaselopulos and his wife, Kathy, take a break from dancing at the Boone Hall's Ball at Cotton Dock. Vaselopulos enjoyed sharing his Civil War knowledge with Russian nationals visiting Y-12.