

# the Y-12 times

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

## WHAT'S INSIDE

### Page 2

Dispositioning weapon components in real time

### Page 3

Off to sea

### Page 5

Y-12 through the decades

### Page 6

Catching up with retiree Sue Paulus

### Page 6

Exercise 24/7 on-site

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## Transforming how we work

A casting operator tests a lift assist for loading heavy metal logs into the top of a crucible.



# Operators put UPF design to the test

Uranium Processing Facility designers and operators are already testing equipment. Much of the proposed equipment has been fabricated as mock-ups and is being put through its paces before design is set in stone.

Using mock-ups is especially fitting for UPF because of the integration of gloveboxes into nearly every process. "Either current glovebox designs are being refined, or we're adding them around processes that have until now not been fully enclosed," said Rodney Smith, technical lead for UPF glovebox design. The point is to improve safety by minimizing use of personal protective equipment and limiting radiological exposure.

Recently, Y-12 operators tried out equipment for lifting heavy metal logs at a facility set up for such testing at B&W Clinch River. In the current casting operation, the logs are picked up manually. The new design, which employs a lift assist, shows promise in improving ergonomics.

Bud Henderson, a UPF operations interface team member, said experienced operators and supervisors are an integral part of the mock-up evaluations. "As subject-matter experts, they are able to identify issues with the design and offer valuable suggestions for improvements," he said.

Smith added that the mock-up activity is time well spent. It will pay dividends in the long term by minimizing any redesign and schedule delays.

Testing will continue, and the results will be summarized for designers and operations personnel and incorporated into the final design. At that time, the equipment will be available for training to give workers a head start in preparing to operate UPF.

Operations, Projects, Engineering, and Environment, Safety and Health are some of the organizations playing major roles in the mock-up activity.

## Real-time disposition

The final destination of materials generated from dismantlement activities can vary depending on the weapon system they came from and activities for which they can be used. Some materials are recycled while others are excessed.

In the past, components were often dismantled and stored until they could be safely dispositioned, creating a sizeable backlog of materials.

“Dispositioning weapon components is a challenge most sites face,” said a Directed Stockpile Work program manager. “At Y-12, we’ve spent the past five years reducing the backlog of components not recycled to almost zero and disposing of most components in real time.”

The efforts to disposition materials in real time have resulted in a remarkable feat. More than 250,000 cubic feet of excess materials have been shipped off-site, which totals more than 14,000 55-gallon drums.

To dispose of components in real time, most of the effort is coordinated before the components are dismantled. It requires extensive planning to determine what materials will be dispositioned, the appropriate disposition path, what containers will be needed for disposition and coordination with other sites when materials are sent off-site.

The significant progress made in dispositioning backlogged materials could not have happened without the daily commitment of personnel from many Y-12 departments.

Gary Ward, team leader of the group, said, “It’s impossible to list all the outstanding people who assist with this program. I cannot express how much I depend on their cooperation and foresightedness. We look forward to another productive year in FY 2011.”



Close attention to detail is required in machining samples for quality testing.

## Direct recycle bypasses chemical process, saves money

Y-12 has completed a major innovative and cost-saving project that completely bypasses the “wet” portion of one purification process.

In the old method, breaking down selected parts from the stockpile began by dissolving them to remove surface impurities and aging effects. It was a complicated, time-consuming effort.

Using the new method, operators can clean the part surface by wiping and sanding. After surface cleaning, the components are moved directly to the crushing operation, eliminating nine chemical processing steps.

Much work by Applied Technologies, the operations area, and technical support and funding organizations went into verifying that the new method would meet quality standards. Meticulous machining was needed to prepare samples for physical testing. The tolerances challenged machine capabilities. Then changes had to be made to the processing equipment to handle the material without equipment breakage. As a result, new motors were purchased for the crushers and grinders.

“This improvement is the first one out of the gate in the new suite of transformation technologies Y-12 is evaluating in the effort to get better and smaller,” said Bernard Phifer of Manufacturing.

The change would reduce total manufacturing process cycle time by a factor of two and save more than \$6 million per year. At this point, all purification options remain in place. “The wet chemistry capability is not being eliminated until new technologies are developed,” said Ben Davis, operations manager.

The effort to replace old technologies is funded by the Stockpile Readiness Campaign.

# Y-12ers visit a sea-going air base

Thirty Oak Ridge employees recently visited the Navy's newest aircraft carrier, the *USS George H.W. Bush*. Commissioned in 2009, through its sea trials and now preparing for its first deployment, this maritime giant uses highly enriched uranium to power the two on-board nuclear reactors.

Supplying nuclear material to the Naval Reactors Program is one of Y-12's four core missions. Many Y-12 organizations have a hand in supplying feedstock for Naval Propulsion, and representatives from these groups and the Y-12 Site Office made the trip to Naval Station Norfolk in Virginia, the world's largest Navy base, to see the *Bush* carrier.

Reactors provide steam for propulsion, catapult operations and electric power generation for this sea-going city that provides military protection, a forward presence in the world's oceans, humanitarian assistance, deterrence, sea control and maritime security. "The carrier is magnificent—nearly as long as the Empire State Building is tall," said Y-12's Gary Person, Naval Reactors Program Manager. While visiting Y-12, Admiral Kirkland H. Donald, director of Naval Nuclear Propulsion and deputy administrator of the National Nuclear Security Administration's Naval Reactors Program, extended the invitation for an aircraft carrier visit, and Person followed up on the rare opportunity.

"Being on the carrier certainly gave us a renewed sense of purpose. Seeing the people who rely on the fuel supply brought a new dimension to our work," said Person. Y-12 has had a working relationship with Naval Reactors for more than a decade.

Lt. Mike Boswell (U.S. Navy) fields a question from Mike Glasman on the bridge of the *USS George H.W. Bush* aircraft carrier. Left to right: Jeff Cravens (Y-12 Site Office), Gary Person (Y-12), Glasman (Y-12 Site Office), Boswell and Mike Boles (Y-12).



## Partnership produces dispersion models

Safety Analysis Engineering has received the first modeling deliverable from Y-12's partnership with the SimCenter (National Center for Computational Engineering) at The University of Tennessee–Chattanooga.

The agreement allows Y-12 to take advantage of excellent supercomputing support and to encourage further expansion of the SimCenter's capabilities. Since the SAE group is familiar with advanced simulations, such as Monte Carlo simulations for nuclear criticality safety evaluations, the group was a logical choice to spearhead development of the agreement.

"We're starting off this collaborative effort with some plume dispersion models," said Doug Clark of SAE. "UTC has a lot of experience creating computer simulations in areas like fluid dynamics and thermodynamics, and Y-12 hopes to help expand the center's capabilities in the modeling of chemical reactions."

The 3D computer model UTC prepared shows how airborne releases at Y-12 might disperse. Because it includes realistic interactions with the terrain and buildings, it will serve as a

comparison with Y-12's dispersion model, which is based on very conservative controls. "We expect the UTC model will demonstrate just how conservative our nuclear safety calculations are," said Clark.

The five-year basic ordering agreement with UTC was signed in March 2010, and the kinks were ironed out for the SAE project. Those kinks included issues like complying with Y-12's software quality assurance and information security requirements and protecting UTC proprietary information. To ensure compliance with software quality assurance, the agreement addresses each Y-12 requirement separately.

SAE is considering future work with the SimCenter. "This type of collaboration could be a powerful vehicle for other Y-12 projects as long as people aren't afraid to try it and let go of some day-to-day oversight," said Clark. For an average complexity project, he estimated the cost at around \$50,000, which is about a year's cost of a graduate student with nominal faculty oversight.

Reid Kress of Y-12's National Security Technology Center is a visiting professor at UTC and serves as liaison for the project, which is funded by Plant Directed Research, Development, and Demonstration.

# Now-or-never trip to Watts Bar plant

Bruce Wilson, Y-12 facility safety engineer, escorted newly hired employees Kimberly Allred, Megan Deising, Michael MacDonald and Brittany Wright on a tour of the Watts Bar Unit 2 nuclear power plant in late August.

It was a once-in-a-lifetime opportunity for the facility safety engineers and fire protection engineer to see close up the safety features of the 99 percent complete facility.

“If the unit had been operating, high radioactivity levels would have prevented us from getting into many of the areas,” Wilson said.

The group was fortunate to have former Y-12 Facility Safety Engineering employee Dennis Myers as a guide. Now the construction quality assurance manager for Unit 2, Myers was the perfect person to point out similarities and differences in the requirements for building and operating a commercial nuclear power plant and a nuclear production facility.

All the new hires were impressed with the magnitude of the facility. “The scale was definitely impressive,” said MacDonald, “not just the physical size but also the defense-in-depth layers of safety.”

An important take-away for Deising was the importance of accurate, detailed drawings. “Watts Bar must do walk-downs of the containment—really more like crawl-arounds through the tight spaces,” she said, “and they must record each item, including the nuts and bolts, on engineering drawings. Now I understand better the magnitude and importance of having these items accurately recorded on many designed systems at Y-12.”

Wilson said the visit also emphasized that working at nuclear facilities is not just for nuclear engineers. “At the Tennessee Valley Authority, as well as at Y-12, different types of engineers are needed for essential system and engineering safety work,” he said.

The knowledge and perspective the engineers gained from their firsthand experience at Watts Bar will be put to immediate use as they integrate into nuclear safety work at Y-12.



From left, Kimberly Allred, Megan Deising, Brittany Wright, Michael MacDonald and Dennis Myers in a containment area at Watts Bar nuclear power plant.

# Schaaff named first Y-12 Technology Fellow

The Y-12 National Security Complex recently named T. Gregory Schaaff as its first Technology Fellow. Schaaff's selection follows a five-month competition, which required each Y-12 candidate to submit an extensive proposal, including budget and schedule, and a final competitive presentation.

The Technology Fellowship was established to give Y-12 scientists and engineers the opportunity and budget to work on a two-year project of their choosing, one that would advance technology and science at Y-12, as well as advancing Y-12's reputation in the chosen field. “The fellowship is a response to our understanding that, as we work to transform the face of Y-12, we also have to work to transform how we develop and apply technologies,” said Kevin Finney, deputy manager, Program Management and Business Development.

Schaaff will use his two-year fellowship to work on nonproliferation programs related to nuclear forensics, using Y-12's technical expertise in uranium and uranium processing to advance science in the field. He will rotate from his current position as group leader of advanced technologies for impurity analyses in the Analytical Chemistry Organization.

Schaaff earned his Ph.D. in physical chemistry from Georgia Institute of Technology. His work over the past 15 years has been concentrated in gas-phase chemistry, nanometer-scale phenomena, plasma-based analytical techniques and nuclear forensics. He is the author or co-author of more than 30 papers in his field.



Dr. T. Gregory Schaaff, Y-12's first Technology Fellow, will expand Y-12's nuclear forensics capabilities.



# Y-12 THROUGH THE DECADES

## the 1940s



*The Y-12 Times* and Y-12 historian Ray Smith invite you to reflect on Y-12's history and accomplishments. In an attempt to share the overall significance of Y-12's contributions to the medical isotope program, the Apollo Space Program and other nuclear security accomplishments, the "Y-12 through the decades" series will highlight Y-12's rich heritage. We begin with the 1940s.

You'd expect that the first decade would feature the Manhattan Project years. This topic is commonly known and appreciated by Y-12 employees, families and the community. Y-12's role in the historic and world-changing era of the early to mid-1940s was exceptional. The Y-12 History Center has brought this era to life for visitors to the New Hope Center.

However, Y-12's heritage is not limited to its Manhattan Project history. Did you know, according to legend, the location for Y-12 was selected by Sen. Ken McKellar when he responded to President Roosevelt's request to keep secret the use of funds necessary for the Manhattan Project. McKellar is said to have responded, "Yes, Mr. President, I can do that for you. Just where in Tennessee are you going to put that 'thang?"

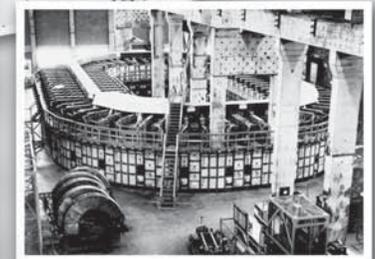
You likely know the rest: Y-12 was built as one of the primary Manhattan Project plants to separate uranium-235 from natural uranium for the first atomic bomb, Little Boy (pictured at right, second from top). This first mission saw 22,482 employees on the payroll on Aug. 21, 1945, which is still the highest number of employees ever to work at Y-12 at one time.

The 1,152 calutrons (pictured bottom right) used to separate the uranium-235 were installed in nine major buildings, still standing today. Two of these early structures have been earmarked for historic preservation.

Building 9731, constructed in March 1943, is the first building completed at Y-12. It houses the sole remaining alpha calutron magnets in the world. This structure is being restored and was opened to the public for the first time in June 2010 during Oak Ridge's Secret City Festival.

Building 9204-3 (Beta 3), the only one of the nine major buildings to continue to house calutrons and which operated those calutrons until 1998, was opened to the public in 2005. We hope to allow access again soon.

Next month, learn about Y-12's significant accomplishments beyond the Manhattan Project and into the 1950s.



# The cabin on the creek



Sue and TJ Paulus at their cabin on Coker Creek. While the Paulus family enjoys resting, gardening and getaways at their “new” modified A-frame, its main purpose is vacation rental, and Sue manages the online marketing herself.

Many people shy away from the stress of even a small home remodeling project. Not Y-12 retiree Sue Paulus. She isn't fazed by lifting a house completely off its foundation. The electrical design engineer/manager, who retired from Engineering in 2004, knows to take a project step by step.

The work began after she and husband TJ fell in love with and bought a cabin on Coker Creek about 10 miles south of Tellico Plains. The fact that it needed major repairs and had been flooded a few years back just presented more opportunities.

First she determined that the flood waters had risen the height of about four cinder blocks. “We figured raising the cabin four feet would prevent flooding in the future,” she said. So she calmly started asking around, “Do you know a house mover?”

Then she called in a mold-elimination expert, who recommended a cleaning solution and adding a fan and some black lights in the crawl space. After that, it was on to the fun part of “visualizing the new kitchen and bathrooms.”

Looking back to the remodeling, she said it was a great way of getting to know people in the area. “Searching out craftspeople and encouraging local artisans was very rewarding,” she said. “From the stone fireplace to the gazebo off the deck to the wrought-iron stair railing, we appreciate them as pieces of art.”

What about the cost of jacking up the cabin and laying a new foundation? “It turned out to be quite reasonable,” she laughed.

# All LIFE Centers up and running 24/7



Front row from left, Jeff Underwood (Y-12 Site Office deputy manager), Travis Baker (Production), Chris Carr (Production) and Bill Klemm (President's Office) cut the ribbon at the opening of the third LIFE Center.

Gone are the days when you would say you didn't exercise because the gym was closed. “It's important to our people that we've got a great program with three LIFE (Lifestyle Intervention For Employees) Centers open 24/7,” President and General Manager Darrel Kohlhorst said at the opening of the West LIFE Center, the last of three on-site fitness centers to open.

“I never thought I would see something like this at Y-12,” said Production's Travis Baker when referring to the West LIFE Center that opened Sept. 20.

“I think the equipment is great,” Baker said. “It's nicer than where I normally work out, and it's great that it's so convenient to a changehouse.”

Employees are encouraged to find the LIFE Center closest to them and check it out. If your badge hasn't been activated for the LIFE Centers, you will need to stop by the LIFE Center in the Jack Case Center.

“I plan to use the center as my schedule allows,” said Chris Carr, also in Production. “In the winter, it will be handy to have access to a treadmill that I can use to run on.”

As wellness coordinator Levette Harris-Bethea said at the ribbon-cutting event, “Mission accomplished.” Now it's up to employees to put the LIFE Centers to use.

# Around Y-12 ...

- Y-12's Sustainability and Stewardship Program received the Tennessee Chamber of Commerce and Industry 2010 Environmental Excellence Award. The program was recognized Oct. 13, at a ceremony in Nashville, for "Y-12's Sustainability and Stewardship Program Transforms Y-12 into a Greener and Leaner Complex."
- The National Nuclear Security Administration announced Sept. 30 that it has awarded B&W Y-12 a one-year extension of the management and operations contract at Y-12, with two three-month options. The one-year extension runs from Oct. 1, 2010, through Sept. 30, 2011. "We're extremely pleased that NNSA has extended our contract. We believe the extension recognizes strong past performance and shows confidence in our ability to continue operating the site safely, effectively and efficiently," said B&W Y-12 President and General Manager Darrel Kohlhorst.
- Darlene Lasley of Industrial Hygiene received a Champion of Excellence Award from the Alliance of Hazardous Materials Professionals. The Alliance of Hazardous Materials Professionals has a membership of more than 4,000 of the nation's leading experts in environmental, health, safety and security management.
- Y-12 launched four of its own social media sites—Facebook, Flickr, Twitter and YouTube. Secretary of Energy Steven Chu launched U.S. Department of Energy social media sites and has encouraged other DOE sites to establish their own social media outlets. Y-12's social media sites are in response to the Secretary's lead and NNSA's expectations. Stay tuned to YSource for more information.
- Open enrollment for 2011 benefits elections continues through 4 p.m. Nov. 16. During this time, employees have the opportunity to (1) enroll in either the dental or medical plans, if not a current participant; (2) choose between the two CIGNA Medical options (Open Access or Point of Service) and dental providers (Delta or MetLife); (3) change pre/post tax election for dental/medical; (4) add or delete dependents for dental/medical and (5) enroll in a Dependent Care or Healthcare Spending Account. (Remember that you must make Dependent Care or Healthcare Spending Account elections each year. They do not automatically continue from year to year.) The changes will be effective Jan. 1, 2011.

## In memoriam

**G**len "Mac" McCrary, a welding inspector in Programs and Quality, passed away Sept. 23. He had 33 years of company service.

"Everyone not only in the welding inspectors group but also in the welding group had great respect for Mac. He covered our work efficiently and made friends with all who were involved. He was extremely knowledgeable about our craft," said co-worker Leisa Pittman.

"Glen was a hard worker and a well-respected leader. He was always there to help anyone and everyone in any possible way," said Joshua Porter, another co-worker.

## In memoriam

**L**arry Monroe of Performance Assurance passed away Oct. 4. He had two years of company service.

"When I think of Larry, I remember his kind, sweet spirit," said Eugene Harmon. "He always had great outlook on life, and even when he was so sick, he still continued to bring joy to those around him. I have lost not only a very competent and loyal co-worker but also a true Christian friend."

Co-worker Charlesetta Latham said, "Larry was an honest man who was loved and respected by many. He touched the lives of everyone around him."

## SERVICE ANNIVERSARIES

### NOVEMBER

#### 42 years

Engineering: Glenn R. Bridges  
Production: Wayne Gibson

#### 41 years

Production: Timothy R. Hill Sr.

#### 40 years

Engineering: Morgan Defenderfer  
Facilities, Infrastructure and Services: Norman L. Smith  
Production: Cas V. Cox and Stephen R. McCarty  
Technical Integration: Larry W. Johnson

#### 35 years

Business Services: Gene C. Davy and William S. Kiser  
Environment, Safety and Health: Donna M. Stokes  
Facilities, Infrastructure and Services: Jacquita D. Wilson  
Occupational Health Services: Patsy M. Shelton  
Production: Kathlene Beatty

#### 30 years

Emergency Services: Michael H. Isaacson and Cheryl M. Womack  
Environment, Safety and Health: Bruce W. Valentine  
Facilities, Infrastructure and Services: Ronald D. Grant, Michael D. McCormack, Stanley T. Smith, Bennie E. Williams and James N. Wyatt  
Production: Robert G. Graham  
Programs and Quality: Robert B. Bonner and Deborah A. Brock  
Program Management: Terryann Nelson

#### 25 years

Business Services: John W. Goan Jr. and Willie L. Henley  
Engineering: Frank J. Sweeney  
Environment, Safety and Health: Samuel F. Lariviere  
Programs and Quality: Mary L. Moore

#### 20 years

Business Services: Linda K. Shaw  
Chief Financial Officer Division: V. Robert Defenderfer and John C. Strader  
Engineering: James J. Yugo  
Environment, Safety and Health: Rebecca W. Ownby  
Performance Assurance and Productivity: Amy P. Duncan  
Projects: Melissa L. Blair

Y-12 Employees' Society Say **YES** to **yes**

Be an angel this holiday season. Volunteer for the Y-12 Employees' Society Angel Tree committee.

Contact Lisa Harris (576-2658) for more information.



## 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

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## Craftspeople: They 'make it happen'

Although Y-12 craftspeople have the skill to help keep things in working order, many are often called on to assist with new inventions as well.

After working in construction for 10 years, at Y-12 for nearly 30 and on personal projects at home, ironworker Bill Aikens has the ability to spot complications early.

"I may see something they don't see," Aikens said. "Someone comes in with an idea of what they need and says, 'Bill, figure this out,' and I can normally come up with something to solve it," he continued, laughing.

Patrick Thomas, a security specialist who recently received much attention for his invention of a fish-hook lock for roll-up-doors, worked with many specialized craftspeople during its initial development.

"I didn't do anything; I drew a sketch," Thomas said. "These people and my management helped me with every step of the process. They deserve the credit."

According to Thomas, if it weren't for the craftspeople here at Y-12, his idea would have stayed on paper. "They just make it happen," he said.

For a single project, there may be any number of welders, painters, locksmiths and carpenters involved. With such a team dynamic, most projects last from a few hours to a week.

"It takes a lot of people to get a job done," said Larry West, supervisor for ironworkers and riggers.

Aikens added there are many changes throughout the process. "There are a lot of back-and-forth conversations," he said. "We look at a project and see what we can do to make it lighter, stronger and easier to use. Sometimes the finished project doesn't even look like it [did when we] started out."



Ironworker Bill Aikens, like many Y-12 craftspeople, helps get things done.