SRS UPDATE

NEWS FROM THE SAVANNAH RIVER SITE • MAY 2005

TVA reactor uses SRS fuel to produce electricity

Blended low-enriched uranium (BLEU) from SRS is now in an Alabama reactor being converted into electricity.

For two years, SRS has been preparing and shipping BLEU to be used in commercial reactors to produce power under a National Nuclear Security Administration (NNSA) nonproliferation program.

The first of the site's BLEU was loaded into a Tennessee Valley Authority (TVA) reactor in March at the Browns Ferry nuclear plant (photo below). In April, the reactor began making electricity from the BLEU.

The SRS BLEU work is part of a nationwide effort by DOE to convert surplus highly enriched uranium (HEU) to BLEU for commercial nuclear power reactor fuel. Converting HEU from the Cold War stockpiles to BLEU makes it no longer useful for nuclear weapons.

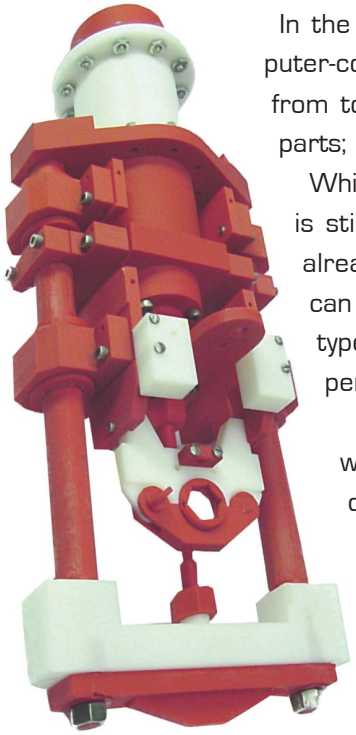
"The arrangement is a win-win opportunity," said Phil Breidenbach, WSRC H-Area Completion Project Manager. "Not only are we making the world a safer place by disposing of the nation's excess nuclear material, we are also providing a valuable and needed energy product, electricity, in the process. I am particularly proud of our Savannah River team, which has done an excellent job achieving this milestone safely and efficiently."

In February 2003, H Canyon began making BLEU. BLEU is produced by blending HEU with natural uranium. To date, 125 BLEU shipments have been made from SRS to the TVA contractor for conversion to fuel.

The SRS BLEU is the first of many tons that will be beneficially dispositioned as fuel rather than waste. The fuel is cheaper than virgin material and gives TVA a cost advantage for plant operations.

This project is estimated to save taxpayers more than $750 million in storage and disposal costs for the surplus uranium. The project will also save TVA about $150 million in uranium costs. In addition, the project supports efforts to reduce dependency on coal-produced electricity.

Rapid fabrication saves time and money



SRNL used rapid fabrication capabilities to produce this scale model of a pinch welder modification.

In the not-too-distant future, industry, stores and even homes could have computer-controlled machines that rapidly produce ready-to-use parts for everything from toys to cars ... no more relying on factories to machine, mold or cast the parts; assemble them into a product; and ship it to a warehouse or store.

While the ability to make a drive shaft for your car in the comfort of your home is still a very long way off, the Savannah River National Laboratory (SRNL) is already using the current generation of rapid fabrication equipment – which can be thought of as 3-D printing machines – to produce low-cost plastic prototypes, parts and complete working models that help their customers reduce personnel and financial risk.

Lee Hamilton of SRNL's Rapid Fabrication Facility says that lab personnel work from the customer's sketch, photo or drawing to create a computer design, which the rapid fabrication equipment uses to produce a three-dimensional plastic part, either a scale model or full-size. Among the most common uses for SRNL's rapid-fabrication products are models to verify the form, fit and function of a piece of equipment; visualization tools for walkdowns, procedure verification or safety analysis; and field-deployed parts, including camera housings, robot frames and equipment housing.

In one project, the laboratory produced a scale model of a pinch welder for Defense Programs, saving approximately $30,000 in labor costs over the cost of producing a metal prototype. The plastic model was used to verify form, fit and function of a planned modification, allowing Defense Programs to identify and correct a problem with the planned design before investing in the actual modification. The model was also used to allow installers to practice assembling the modification safely away from radiation and other hazards.

Housings for SRNL's R&D 100 Award-winning invention, the ALPES particle collection device, were fabricated from parts produced on the rapid fabrication machines. The use of rapid prototyping enabled the design team to try many concepts to optimize the device for manufacturability, usability and weight without the expense of producing molds or dedicated tooling.

Langton honored at American Ceramic Society meeting

Dr. Chris Langton

Dr. Chris Langton was elevated to the status of Fellow of the American Ceramic Society on April 12 at the 107th annual meeting.

Dr. Langton is a graduate of the Pennsylvania State University, University Park, PA, with a B.S. in Geoscience, an M.S. in Geochemistry (High-temperature Phase Equilibria in the System CaO-Al2O3- TiO2-SiO2), and a Ph.D. in Materials Science and Engineering (Hydrothermal Phase Equilibria of Calcium Aluminosilicate and Magnesium Silicate Cemetitious Systems).

She has been a member of the American Ceramic Society since 1981 and is a member of the Cements Division and Nuclear and Environmental Division. In 1988 and 1989, she was an invited participant in ACS technology exchange delegations to Australia and Scandinavia, respectively.

Tritium processing moves to new facility

The team that made the last transfer of tritium from 232-H: From left, Nathan Walker, Craig Reddick, Janice Rice, Warren Whitlock, Dennis Mosley, Johnnie Legree and David Graves.

For nearly 40 years tritium, a radioactive form of hydrogen gas that is a vital component of nuclear weapons, has been processed in the Savannah River Site's 232-H Tritium Facility.

Recently, a team of SRS employees transferred the last tritium from 232-H. Deactivation is scheduled to be completed by Jan. 31, 2006.

The Tritium Facilities Modernization & Consolidation Project completed start-up this spring and replaces the gas purification and processing that took place in 232-H since the 1950s. The tritium extraction processing that took place from 1954 until 1999 in 232-H will eventually be replaced by the improved process in the new Tritium Extraction Facility, which is undergoing start-up testing.

The new facility uses inert atmosphere glovebox technology that significantly reduces the tritium released into the atmosphere. New technologies used in the Tritium Extraction Facility include advanced methods of storing and separating hydrogen.

SRS is the only place in the nation that recycles tritium. At SRS, tritium is loaded into stainless steel containers called reservoirs. Reservoirs are then shipped to the Department of Defense, where they are installed in nuclear weapons. Tritium in the weapons stockpile must be replenished continually because it has a half-life of only 12.3 years.

Girls introduced to engineering

Recently, Savannah River Site engineers took steps to ease the shortage of workers skilled in the engineering disciplines at the annual "Introduce a Girl To Engineering Day."

Held at USC-Aiken's Ruth Patrick Science Center, approximately 50 girls from 25 middle schools in the CSRA interacted with professionals who taught them about careers in engineering.

"Girls this age are not likely to give much thought to engineering as a career option," says Susan Wood, former director, Savannah River National Laboratory, and founding sponsor. "We want to give them a reason to add it to the careers they are considering. If we catch their interest now, they will see a reason to sign up for the math and science courses they need in high school."

The day included interactive, hands-on activities to show them how their natural problem-solving abilities form the basis for many engineering skills.

"Introduce a Girl to Engineering Day" is an offshoot of National Engineers Week.

Interactive activities create an interest in pursuing a career in engineering.

WSRC selects Mini Grant winners

The Westinghouse Savannah River Company (WSRC) Team from the Savannah River Site recently awarded $50,000 to Central Savannah River Area teachers as part of its 2005 Excellence-In-Teaching Mini Grants Program.

The Excellence-In-Teaching Mini Grants Program recognizes and supports excellence in teaching by granting money to enhance public elementary and middle school science, mathematics and technology programs, directly impacting students in the classroom.

WSRC Public Affairs Director Keith Wood (right) presents an award check to Karey Santos of Millbrook Elementary School.

Elementary and middle public school teachers from Aiken, Allendale, Bamberg, Barnwell, Edgefield, Columbia and Richmond counties applied for grants of $500, $750 or $1,000. A team of WSRC employees reviewed 283 grant proposals submitted this year and—without knowledge of the applicant or school—selected 85 to receive funding totaling $50,000. Since the program began in 1989, WSRC has awarded over $676,300 to fund nearly 1,300 projects to over 1,400 teachers in the CSRA.

The grants were distributed at a special ceremony to honor all applicants and excellence in teaching on Thursday, April 21. Nearly 250 attended the event, including Department of Energy staff, WSRC Team personnel, teachers, principals and superintendents.

The Excellence-In-Teaching Mini Grants Program is just one of several initiatives organized through WSRC's Education Outreach Programs Department and is funded by the Community Giving Program.

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