

● NOVEMBER 2018

SAVANNAH RIVER NUCLEAR SOLUTIONS



SRNS Today

Donald Orth Award

Dr. Douglas Hunter
named recipient
of Lifetime
Achievement
Award



This month

Radiological safety • Restoring the aquifer • Honoring veterans • United Way celebration





Stuart MacVean
SRNS President and CEO

Welcome

to the November 2018 edition of

SRNS Today

SRNS is committed to the protection of our people, the environment and the nation, this edition provides a few examples of the way we do that.

When it comes to our people, the best way we have found to improve safety is to turn them loose to find better ways of dealing with the high hazards they work with daily. A new version of gloves to reduce hand exposure, found by the team performing the work in 235-F is a great example of what can be achieved if you engage people to solve tough problems. Utilizing wireless iPads, coupled with detailed and carefully planned work, has reduced whole body radiation exposure at another project.

When it comes to protection of the environment, groundwater is an important asset. Protecting it and cleaning up legacy contaminants are two of the ways we ensure we take care of a vital natural resource.

I was proud and pleased to honor our SRNS veterans this month for Veterans Day. We have found that many veterans want to continue their service to the nation, and we provide a great platform with meaningful work for our country. Whether it is cleaning up legacy problems, being part of our national security work or dispositioning nuclear materials from around the world, SRS is a great place to continue that service.

Savannah River Nuclear Solutions, a Fluor-led company with Newport News Nuclear and Honeywell, is responsible for the management and operations of the Department of Energy's Savannah River Site, including the Savannah River National Laboratory, located near Aiken, S.C. The SRNS corporate and community offices are located in the renovated 1912 "Old Post Office" building in Aiken. The primary initiatives of SRNS are national security, clean energy and environmental stewardship. SRNS Today is published monthly by SRNS Corporate Communications to inform our employees and other stakeholders of the company's operational- and community-related activities. If you have questions or comments, please contact us at 803.952.9584 or visit our website.

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A 235-F Risk Reduction team operator works in a glovebox with specialized gloves to reduce hand exposure.

Reducing Exposure

Workers use 'lessons learned' to improve safety in Building 235-F

SRS employees working in the highly contaminated Plutonium Fuel Form (PuFF) Facility within Building 235-F have applied lessons learned and are using commercially available products to help significantly reduce the worker's exposure to ionizing radiation.

Workers are using a combination of tungsten surgical gloves and lead equivalent sleeves to help reduce radiation exposure to their arms and hands while working inside the gloveboxes in PuFF. The gloves are used to protect surgeons' hands from radiation generated by x-ray machines or procedures involving nuclear medicine, while the lead sleeves protect their arms.

"Earlier in my career, I was working in another area on site and we were faced with the potential for significant exposure to the workers extremities," 235-F Radiation Protection Manager Sean Barr explained. "SRNS encourages us to have a questioning attitude and, with management support, we started doing research. We found that tungsten gloves and lead sleeves were commercially available products that might be able to help us reduce rates for our workers." Testing was conducted by Health Physics Services to evaluate the effectiveness of reducing exposure based on the isotopes involved.

Barr shared those lessons learned in his new role managing radiation protection for the 235-F project. "After the Savannah River National Laboratory was able to give us a more accurate picture of how

much plutonium was leftover in the facility through their analysis, we recognized that workers would need extra protection to their hands and arms," he said. The combination of the gloves, sleeves and the use of lead aprons, reduces the potential for external exposure by 97 percent while working with plutonium (Pu)-238.

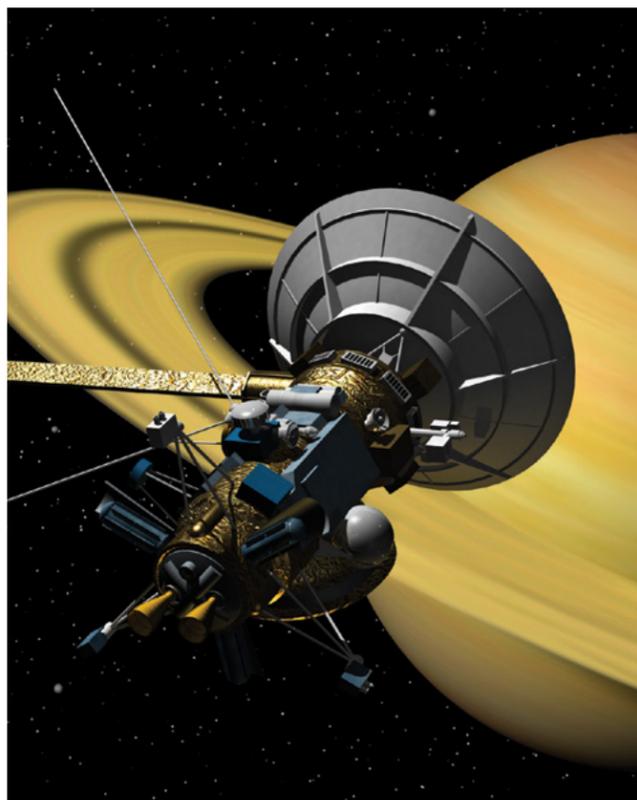
"Our employees are encouraged to find new and/or improved ways of doing their work," said Environmental Management (EM) Operations Senior Vice President Wyatt Clark. "This is a perfect example of how SRNS employees are empowered to find better ways to do work safely and efficiently."

Building 235-F contains a residual amount of Pu-238, which was used as a heat source to power deep space missions. The building is a two-story, blast-resistant, windowless, reinforced concrete building and contains the PuFF Facility, which has been inactive for more than 25 years. PuFF manufactured spheres and pellets out of Pu-238, which were used to provide electric power for deep space missions such as the Galileo space probe to Jupiter, launched from the Space Shuttle Atlantis in October 1989.

Because of the way the spheres and pellets were made, the Pu-238 was left in some cells as a very fine particulate dust that is easily disturbed. Workers are currently removing materials from the PuFF Facility to reduce the risks to workers and the environment from the plutonium.

National Chemical Landmark

American Chemical Society honors SRS for historic role in plutonium-238 production



Pu-238 has been used as heat source material for radioisotope thermoelectric generators, the “nuclear batteries” that have powered early satellites, NASA’s Apollo lunar craft and deep space probes such as Pioneer, Voyager, Galileo, Ulysses, Cassini (illustration above) and New Horizons.

SRS has been designated as one of the nation’s newest “National Historic Chemical Landmarks” by the American Chemical Society (ACS), the world’s largest scientific membership society.

The designation recognizes the SRS role in the production, separation and supply of plutonium-238, a material used to power NASA’s unmanned, deep space exploration craft for more than four decades. SRS was the first site where industrial scale separation of plutonium-238 (Pu-238) occurred, via processing campaigns from 1960 through 1988.

In a ceremony held on Nov. 1, SRS Manager Mike Budney received a commemorative bronze plaque from ACS President Peter K. Dorhout. The event took place in conjunction with the Southeast Regional meeting of the ACS, which was hosted by the Savannah River Section of the society.



Michael Budney, Manager of DOE’s Savannah River Site Operations Office, accepts the ACS commemorative plaque.

“This is humbling and an honor,” said Michael Budney, Manager, DOE Savannah River Operations Office. “To see SRS on a short-list with the likes of Thomas Edison and Joseph Priestly is pretty special. Many people dedicated their working lives to programs like Pu-238 production at SRS. They were never really able to tell their family or friends what they did. I hope this designation allows them to finally say, ‘We did that.’ Forty years later their ideas and processes are still being used to help us explore the bounds of space.”

Production of Pu-238 began at SRS in 1960, using a process developed solely at SRS. The site’s H Area facilities were used to separate neptunium-237 from irradiated enriched uranium, and, ultimately, to separate and purify plutonium-238 from the irradiated neptunium-237 target material.

Most notably, Pu-238 has been used as heat source material for radioisotope thermoelectric generators (RTGs), the “nuclear batteries” that have powered early satellites, NASA’s Apollo lunar craft and deep space probes such as Pioneer, Voyager, Galileo, Ulysses, Cassini and New Horizons. These deep space probes made the United States the first nation to reach every planet in the solar system with a space probe. The RTGs function by converting the decay heat of the radioactive material into electrical energy.

“As someone who has worked with plutonium in order to better understand its fundamental structures and properties, I appreciate the difficulties that the scientists at SRS faced,” says Peter Dorhout, ACS President and Vice President for research at Kansas State University. “Learning new chemistry and developing industrial-scale production of Pu-238 was critical to the success of this program, and ACS recognizes those fundamental advances to improve our exploration of the universe.”

Early TRANSIT satellites powered by Pu-238 also formed the basis of the Global Positioning System (GPS) technology that is commonly employed around the world today for routine navigation.



Dr. Douglas Hunter named recipient of prestigious Orth Award

SRNL Advisory Scientist Dr. Douglas Hunter has been named the 2018 recipient of the Donald Orth Lifetime Achievement Award for being a technical leader in improving the detection capabilities for low levels of noble gases in the atmosphere.

The Orth Award is the highest honor given by the laboratory for technical excellence and leadership. Established in 1993, the award was named for the late Dr. Donald Orth, who retired from SRNL in 1992 after a distinguished 41-year career. The award was established to honor an individual “who by character and leadership best exemplifies Dr. Orth’s character and contributions.”

Dr. Hunter was recognized for consistently translating state-of-the-art research into deployable engineering solutions critical to the nation’s security needs during his distinguished 17-year career at the lab.

As an advisory scientist, he studies the physical-chemical mechanisms or signatures of non-reactive gases for detection in the atmosphere, particularly from nuclear events. Together with SRNL engineers and meteorologists, Dr. Hunter interprets and analyzes measurements of noble gases collected by researchers.

“This award speaks directly to the quality of work that Doug Hunter performs,” said Dr. Vahid Majidi, SRNS Executive Vice President and SRNL Director. “He’s dedicated to innovation and has made a significant impact to the mission work we do at SRNL.”

Most notably, Dr. Hunter has successfully transformed a low-key program into a multimillion dollar research and development program that has established itself as the leader in signatory noble gas collection and detection. He has been recognized by many federal entities including the National Nuclear Security Administration and the Department of Defense.

Hunter said that the Don Orth Award is an embodiment of the excellence of the SRNL research community.

“It is when you look at past recipients, and you begin to realize the common thread between past recipients,” said Hunter. “They all represent the very fabric of what makes the lab a unique and special world class institution. This award is for the entire team of people that I have the pleasure to work with, not just myself.”

Restoring the aquifer



Chemical oxidants used to neutralize waste solvents

Significant progress is being made towards eliminating chemicals in the form of solvents from the groundwater beneath SRS.

During the Cold War era at SRS, these chemicals were used to remove grease from nuclear components being produced to support the creation of plutonium for nuclear defense and, later, NASA deep space missions. Clay bottom ponds, known as basins, were initially used to store this waste, which was the best-known technology at the time.

“Removing or destroying these solvents and restoring the aquifer to its original state is a goal we are effectively working towards,” said Mike Griffith, SRNS Manager, Area Cleanup Projects. “This long-term project has required the synergistic use of several different cleanup methods, processes and specialized equipment — a ‘tool kit’ of groundwater cleanup methods.

“In fact, we’re about 50 percent complete related to a promising new approach developed here at SRS using chemical oxidation to neutralize the solvents targeted in a field-scale test,” he added.

The unique aspect of this process is a two-step injection of different oxidants, specifically designed for the sediments where the contaminated water resides. The portion of the Lost Lake Aquifer below SRS currently being treated has sections that are primarily sand, while other sections are mostly clay. Waste solvents in clay have proven to be difficult to remove.

The first step uses potassium permanganate, a very aggressive oxidant, to clean up the more easily reached contaminants in the sandy zones. Laboratory bench testing performed by SRNL demonstrated that once the solvents have been eliminated from the

sandy portions of the aquifer, solvents in the harder to treat clay zones will naturally diffuse out. Once free from the clay, they can be effectively attacked using sodium persulfate, injected down the same set of wells during the second step. Sodium persulfate also lasts longer, allowing it to seep into the clay to treat more solvent.

According to SRNS geologist Jeff Ross, the data gathered over the first year of monitoring will determine how the formula of chemicals and concentrations should be modified for treatment during a second injection and monitoring campaign to follow one year later.

“Working closely with SRNL during the laboratory testing prior to the start of the campaign has shown the effectiveness of this two-step process and given us a high level of confidence,” said Ross. “One of the nice things about the oxidants we’re using is that they completely destroy the waste solvents,” he added. “The oxidants and solvents react to produce non-toxic byproducts.”

During this project, samples will be frequently taken from a series of groundwater monitoring wells located at various distances up to 500 feet from the injection site, where a recovery well was placed to intentionally draw oxidants through the targeted area of contaminants.

According to Ross, it’s not unusual for potassium permanganate or sodium persulfate to be used to attack degreasing chemicals. However, what is innovative is the use of these oxidants in combination, back to back, to treat hard-to-reach solvents locked in the clay. “This could well be the first time this has been done in the U.S. or possibly in the world,” he said.

Photo: SRNS is using chemical oxidation to neutralize solvents found in groundwater beneath SRS in a field-scale test.

Wireless tablets used to limit operator dose during TRM campaign

Through careful, deliberate work, planning and continuous monitoring, the SRNS Radiological Protection Department (RPD) at SRS is ensuring the safety of workers involved in the Target Residue Material (TRM) liquid highly enriched uranium campaign.

“The TRM poses a significant challenge to the team in designing the processes for safely handling the material, which is shipped in individual stainless-steel containers,” said H Area RPD Facility Manager Johnny Lott. “These containers have significant dose and contamination rates and need to be handled with extra care to ensure the safety of the workers. Our department worked closely with SRNL and the Design Engineering department to devise ways to limit personnel exposure to the containers and provide real-time monitoring when workers did have to interact with the containers.”

One of the most successful methods for limiting personnel exposure is using wireless computer tablets as remote controls, allowing the operators to be removed from the higher dose rate areas.

Another method was performing pre- and post-job reviews to offer a chance for employees to provide suggestions on how to improve the process. One such suggestion was to place the electronic personnel dosimeter on an extended tool, allowing the RPD to qualify dose rates without being in the radiation field.

SRNS honored by S.C. Chamber for workplace diversity

The S.C. Chamber of Commerce has honored SRNS with the Excellence in Workplace Diversity Award, Large Employer, at its 39th Annual Summit held Nov. 27.

“SRNS fosters a teaming environment that values trust and respect for all employees,” said SRNS President and CEO Stuart MacVean. “Diversity is interwoven into all aspects of employment, defines how we do business and provides a model for how we conduct ourselves as a company. We are honored to be the recipient of this award and for the recognition of our commitment to a diverse and inclusive work environment.”

A major component of the SRNS Diversity Program includes the SRNS Diversity Strategic Implementation Plan (DSIP), a programmatic measurement tool that defines the strategy for integrating diversity as a philosophy and practice into the company’s organizational culture and business environment. The DSIP encompasses a diversity program, an educational outreach program, community outreach programs and economic development programs. Examples of these programs include the Compelling Place to Work initiative, which helps boost employee engagement and morale through the implementation of physical changes to the work environment; Special Emphasis Programs, in partnership with DOE, to present and support activities/programs



Radiological Protection Inspector Wanda Patterson gathers information before beginning a radiological survey.

Lastly, RPD applied real-time monitoring to ensure that when workers do have to interact with the containers, their exposure is kept within acceptable levels.

“Because of the team’s commitment to safety, we are seeing significantly less of a dose for our workers than we had anticipated,” said Wyatt Clark, SRNS Vice President of Environmental Management Operations. “Safety is the at the forefront of all we do at SRS, and I congratulate the team on doing what it takes to make this operation as safe as possible for our workers.”



Accepting the award from the S.C. Chamber of Commerce Diversity Committee Chairman Dr. Cynthia Walters (second from left) were (from left) SRNS Manager of Equal Employment Opportunity and Diversity Willie Bell, SRNS Equal Employment Opportunity and Diversity Specialist Judy Spencer, SRNS Director of Business, Technical and Employee Communications Barbara Smoak, and SRNS Office Manager for the Office of the President Rosalind Blocker.

developed to enhance diversity awareness for SRS employees; Education Outreach for nearly 325,000 students near SRS in STEM programs; and the SRNS Small Business Program.



HB Line Deputy Operations Manager Jesus “Zeus” Mancilla gives members tips on successful personal finance.

LEAP-ing into success

Early career professionals attend leadership development event

SRNS early career development organization Leaders Emerging Among Professionals (LEAP) recently hosted the 2018 Leadership Development Conference.

DOE-SR Deputy Manager Thomas Johnson opened the conference by speaking on the day’s theme “LEAP into Success” and gave participants a perspective on lessons he learned while progressing through his career. Johnson also spoke on practicing what you preach, leading by example because people are always watching, the importance of asking questions and believing and recognizing the possibilities that may arise throughout one’s career.

“One of the early lessons that I learned, that I hope you take away with you, is to know where you want to go in your professional career,” said Johnson “Think of where you want to be professionally in five to 10 years in terms of your career and give yourself a goal to constantly work towards.”

Following the keynote speaker, attendees were assigned to two of the three breakout sessions. Manager for Talent Management and

Education Outreach Francine Burroughs taught LEAP members how to break the ice in a professional setting; HB Line Deputy Operations Manager Jesus “Zeus” Mancilla gave members tips for personal finance success; and Project Engineering Manager Roger Duke offered ways on how agile practices and principles can have a positive impact on one’s happiness at work.

LEAP member and Associate Engineer Tia Foster was grateful for the lessons learned at the conference. “As a new employee on site, it was extremely beneficial to hear from Thomas Johnson about the struggles he faced when coming into new leadership roles,” said Foster. “He said that people are always watching from afar. Going forward, I plan to lead by example even when someone may not be watching.”

LEAP is an SRNS early career development organization for full time employees who are less than seven years out of college and have earned at least an associate degree.



SRNS employees and representatives from local United Way agencies celebrated the completion of this year’s campaign on Nov. 14.

\$1.2 million for UW

Employee campaign, corporate match to benefit area communities

SRNS employees gave back to the surrounding communities through another successful United Way campaign, raising over \$1.2 million, which includes employee campaign and corporate match. The SRNS campaign committee invited the participating United Way agencies to a celebration in Aiken, S.C., on Nov. 14.

During the event, Campaign Chair Caroline Reppert and Vice Chair A.D. Bollig presented the donation checks to the United Way agency representatives. Among these representatives was Sharon Rodgers, President, United Way of Aiken County.

“United Way of Aiken County is so very grateful for the faithful support and overwhelming generosity of SRNS employees. SRNS is our largest contributor,” said Rodgers. “As a result of your donations, our 30 partner agencies and 45 critical need programs

will receive funding in 2019. These programs benefit over 200,000 children, seniors, disabled, underemployed and folks in crisis in our community. Thank you for helping us #LightUp Aiken County.”

SRNS has a history of giving. Initially known as the Community Chest, United Way has been a major focus for employees since 1952.

This year’s campaign benefits the following agencies surrounding the Savannah River Site: United Way of Aiken County; United Way of the CSRA; United Way of Edgefield County; United Way of McDuffie County; United Way of the Midlands; United Way of Screven County; United Way of South Carolina, including Bamberg, Colleton, Hampton counties and United Way of the Lowcountry; United Way of Anderson County; and United Way of Barnwell County, including Allendale County.



SRNS President and CEO Stuart MacVean is surrounded by employee veterans during a Nov. 12 celebration.

SRNS honors veterans with recognition celebration

On Nov. 12, SRNS recognized its employees who are past members of the U.S. military with a Veterans Day recognition celebration. The event paid tribute to the men and women who continue their service by working at SRS to keep our nation safe.

“We appreciate you being here and giving service to our country,” said Stuart MacVean, SRNS President and CEO. “It’s a tiny token of time that we are able to provide to you to say thanks for all your service, but you deserve much more. SRNS is a place to be able to continue your service for the country in a place where it really matters.”

Owens Shealy, an employee at Portable Equipment Commodity Management Center Operations and a veteran, attended the celebration. Shealy joined the U.S. National Guard in March 1979 and retired after 23 years of consecutive service in 2002.

“I started working on site in 1987,” said Shealy. “It was great how the site worked with my schedule while I was on leave for annual training, and this event allows me to see other veterans I don’t get to see as often. It’s great that upper management recognizes all veterans across site.”

Samantha Chilton, another SRNS employee veteran, served in the U.S. Army. She was appreciative for the recognition. “It’s great to be recognized by the company,” said Chilton, a K Area Complex Project Support Engineer. “It’s great that SRNS honors employees who served by taking the time to personally thank us for our service and to recognize the sacrifices of veterans.”

SRNS seeks to employ veterans due to their backgrounds and unique skill sets that contribute to the continuation of SRS missions.

Mobility Impaired hunters and Wounded Warriors aim for success during annual SRS deer hunt

The opportunity to participate in a deer hunt at SRS annually lures hunters to the 310-square mile complex; however, none appreciate the privilege more than the 40 physically disabled hunters and Wounded Warriors invited for a special two-day deer hunt each fall.

“This is a special event created to honor our wounded veterans and give them, as well as other hunters with physical disabilities, an opportunity to once again enjoy the thrill of the hunt and the warm satisfaction of comradery gained through shared experience,” said Joe Solesby, SRNS employee and program manager for the site’s deer hunts. “I’m proud of the volunteers who make all of this possible by donating a lot of time and hard work for these hunters who have travelled from as far away as Florida and Virginia this year.”

This is the 19th consecutive year this event has been held at SRS. SRNS manages the mobility impaired and Wounded Warrior hunts and provides sponsorship in conjunction with DOE, the USDA Forest Service-Savannah River and the Wheelin’ Sportsman National Wild Turkey Federation.

According to Solesby, it’s not just deer that may be seen through the gunshots of the hunters. “It’s not unusual for feral hogs to be harvested as well. And, some of them are quite large,” he added. “Not too many hunters can say they’ve taken down a wild hog.”



SRNS employee Allan Mulligan (right) escorts Wounded Warrior Jimmy Price of Gilbert, S.C.

The day of the hunt, the mood shifted from laughter and excitement during a hearty breakfast to serious concentration as the hunters and their volunteer escorts quietly watch and listen for the telltale signs of nearby animals. Hours later during a grilled steak lunch, also provided by volunteers, stories were shared about the five hogs and six deer harvested that morning along with the tales of the huge buck that barely got away.



Associate Curator Derek Berry hangs one of the many photos of relocated communities safeguarded by the SRS Curation Facility.

Images of communities displaced by construction of SRS featured at Augusta Photo Festival

The poignant and historical story of relocating communities from the 300 square miles of what is known today as SRS was recently re-told through photos at the Augusta Photography Festival at the Augusta-Richmond County Public Library.

“We have hundreds of thousands of photos at the SRS Curation Facility,” said Derek Berry, Associate Curator at the facility. “Rebecca Rogers, Director of the festival, encouraged us to pick a topic and participate in this event.”

Berry explained that the relocation of local residents to create the nuclear weapons production site quickly stood out as the best topic.

“Each photo provided a part of a very special and unique story that touched so many lives,” said Berry. “The patriotism exhibited by so many of these people during a time of sacrifice for their country is inspiring.”

According to Andy Albenesius, SRNS Manager, Cold War History Program, the site’s construction and operations were highly secretive from the time it was built in the early 1950s until the end of the Cold War in the late 1980s, but now the stories of this important time in our nation’s history can be told.

During the Cold War, what was then known as the Savannah River Plant, produced plutonium and tritium for nuclear weapons, all part of an arms race with the Soviet Union. SRS no longer produces plutonium.

“Public outreach is a growing focus area of DOE’s Cold War History Program at SRS. As part of our public outreach, DOE’s Cold War History program is supporting the start-up of the SRS Museum in Aiken and connecting with other entities in the CSRA to share the site’s abundant Cold War stories. This photography exhibit is just one of many opportunities we are pursuing to that end, and we are thrilled that the Augusta Photography Festival and Augusta Library invited us to share this part of the story.”



Keanne Boyette, K Area Operations Support and SRS-WIN Professional Development Chair, describes Mod-Sim software at the Women in Nuclear tech talk.

SRNS speakers describe Mod-Sim software at WIN tech talk

SRS Women in Nuclear (WIN) recently held a tech talk event on Mod-Sim (modeling and simulation), a specialized production software package used by employees to advance and accelerate programmatic objectives across SRNS facilities.

Mod-Sim, owned by Huntington Ingalls Industries, has over 600 routes, options and decisions, and calculates every second, running up to 100,000 times more than real time to ensure the best work scope and efficiency.

SRNS employees described the similarities and differences the software has for each mission support area. Guest speakers included Matthew Arnold, EM Programs; Eddie Rains, L Area Operations; and Keanne Boyette, K Area Operations Support and SRS-WIN Professional Development Chair.

“We (SRS-WIN) wanted to hold a tech talk on Mod Sim to demonstrate the program’s abilities across different program areas on site,” said Boyette. “Educating SRS-WIN members and the public about nuclear energy and technologies is one of the SRS-WIN goals and highlighting the Mod Sim software through a tech talk is an example of how we’ve met that goal.”

For H Canyon, L Area and K Area, Mod-Sim is used to provide program logic that includes the flow paths, process steps, required personal and equipment needed, turnover and non-productive time, and planned and unplanned outages.

Mod-Sim considers these variables and creates spreadsheets and graphs to set processing goals both short and long term.

SRS-WIN plans to hold future Tech Talks on nuclear energy and technologies.

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We make the world safer.

safer.