

# 2022-23 Neutrino



**American Nuclear Society**  
Savannah River Section

September 2022 to January 2023 Edition

Web address: <http://local.ans.org/savriv/>

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Young Member: Nuri Sinha

Past Chair: Madeleine Waller

# 2022-23 Neutrino

## Chair and Vice Messages

### Chair

*Question: What's in Store for 2023? – Answer: A 60th Celebration, The Tenth Benjamin Awards and Carbon-Free Energy from Unit 3*

After persevering through more than two years of the pandemic and limited virtual activity, the American Nuclear Society Savannah River Section (ANS SRS) kicked off the 2022-2023 year sprinting toward fully in-person events. As the ANS SRS chair, I am proud of the way we maintained Section activities, stayed well, and integrated new Executive Committee (EC) and at-large members with senior membership to keep us in the forefront on all things nuclear in the Central Savannah River Area throughout this time.

As detailed elsewhere in this edition of the Neutrino, we hosted outstanding technical presentations, student activities and demonstrations that confirm ANS leadership locally, nationally, and internationally in the nuclear science and technology arena. The first three ANS SRS technical dinner meetings included:

- Brittany Williamson sharing with us her experiences at the Chernobyl Nuclear Power Plant and the Exclusion Zone in October 2021. Ms. Williamson recounted her experiences during Radiation Specialist Training in the Exclusion Zone using images and photos of areas that have been under attack by Russian forces during this horrific war. [September 2022]
- Having ANS President Steven Arndt visit key facilities in our region including Vogtle Electric Generating Plant (VEGP or Plant Vogtle), the Savannah River National Laboratory, and key waste management and strategic material non-reactor facilities at the Savannah River Site. Dr. Arndt gave a talk on the evening of October 26 that discussed ANS's role to move several initiatives ahead on the new reactor designs, the current effort to move the industry forward, and some of the challenges associated with new reactors. He called for the larger ANS community to get involved and be active. [October 2022]
- Hearing during the third dinner meeting of the year in January highlights from Savannah River member Bill Wabbersen's and his ANS colleagues' efforts in moving from hands-on educational exhibits and demonstrations in the early 2000s to platform-independent, educational apps developed by USC-Aiken Computer Science application teams. Under Bill's leadership, the Isotope App is now on the ANS website at [isotopes.ans.org/](http://isotopes.ans.org/) after an October launch and the Isotope Discovery Activity App should follow later this year. [January 2023]

Thus far in the 2022-2023 ANS SRS year, Education and Outreach activities included College Night (September), Science Enrichment Education Day (SEED) STEM Festival (October) and the Future City competition (January). All three were held fully in-person for the first time since 2019.

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## Chair Message (Contd)

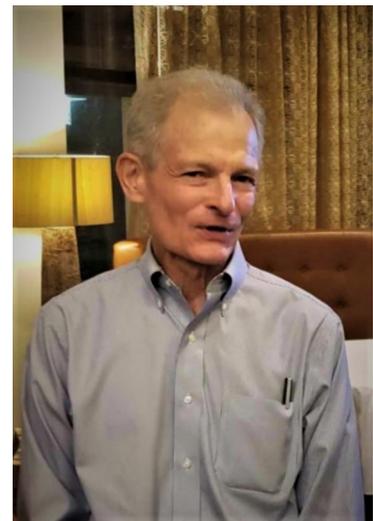
The Section's work was led by Chair Graham Jones with able support from Brent Barnett, Aherial Polite, Michelle Johnson, Bob Eble, Fred Pilot and several others.

The 2023 calendar year will not let us rest, and I ask you to volunteer and support your Section's work to the degree that you're comfortable and able. In particular, three different "watershed" moments are fast approaching in the coming months of 2023 that need your help. These are:

- **ANS Savannah River Section's 60th year** – November 2023 marks sixty years since ANS National granted a team from the Savannah River Laboratory with a charter and authorization to begin Section activities. The first meeting of the Savannah River Section was held the following January in downtown Augusta. We'll mark the occasion with a celebration above our usual fare.
- **Tenth Annual Benjamin Memorial Scholarship Awards** – Benjamin Memorial Awards are competitive financial awards given in memory of Dr. Richard W. Benjamin towards the first year of a four-year Science, Technology, Engineering and Mathematics (STEM) College/University, or either year of a two-year Technical College degree program. ANS Savannah River administers the scholarship and has given over \$40,000 in Benjamin Scholarships in the nine years of recognizing the top graduating high school seniors in the CSRA with 2023 marking the Scholarship's tenth year. A flyer for the 2023 announcement is found elsewhere in this Neutrino on how to apply and the evaluation criteria.
- **Carbon-Free Electricity from VEGP** – Celebrate with us Units 3 and 4 of Vogtle Electric Generating Plant (VEGP) add carbon-free energy to the U.S. energy grid – As this column is being written, Southern Nuclear projects Unit 3 coming online in the first half of 2023 and Unit 4 to be online towards the end of the year. These are the first new build LWRs to be added in the U.S. in nearly 30 years. We'll plan a special event with our colleagues from VEGP when the milestone is achieved. (<https://www.southerncompany.com/innovation/vogtle-3-and-4.html>)

Please feel free to reach out to ANS Savannah River at [ans.savannahriver@gmail.com](mailto:ans.savannahriver@gmail.com) or [kokula52@gmail.com](mailto:kokula52@gmail.com) to explore opportunities to plan, volunteer, and financially support these events and the other important work of the premiere section in ANS for Programs and Section Management, and a leader in all things nuclear.

Come and join us!  
Kevin O'Kula  
ANS SR 2022-2023 Chair  
[kokula52@gmail.com](mailto:kokula52@gmail.com)



# 2022-23 Neutrino

## Vice Chair Message

Welcome to the mid-year Neutrino update!

Hello everyone, my name is Michelle Johnson, and I am the 2022-2023 Vice-Chair of the ANS-SR Section. I am honored to be apart of the chapter this year. We are a strong and vital organization found on being your go-to- professional resource.

Each year, we provide our members with several opportunities on a broad array of substantive tropes. I have always been impressed with the quality and diversity of our programming.

As you read this edition of the Neutrino, you can see that ANS-SR Section is the epicenter of a lot of activity, and perfectly positioned to provide technical leadership and communication with the community. The nuclear industry in the CSRA is represented by SRS, Plant Vogtle, local universities, and technical colleges which translates to a large and diverse group of skilled and talented nuclear professions.

In everything we do, we try to build in the opportunity for you to get to know your colleagues- whether doing a dinner meeting or doing good community service events. Having a strong professional network that you can call on with a difficult question helps you do your job better.

All of the Section's work is focused on enriching your experience as members, so we are always open to feedback on our current services and how we can better serve you. Feel free to reach out to me, or any of our chapter leaders if you have ideas would like to get involved.

Best regards,

Michelle Johnson

ANS-SR Section 2022-2023 Vice Chair



# 2022-23 Neutrino

## Technical Meetings

### September 2022

On September 21 the section met at Newberry Hall for the first technical meeting of the year. Brittany Williamson presented an overview of her time spent in the Chernobyl Nuclear Power Plant and the Exclusion Zone in October 2021. Williamson recounted her stories from her time spent in Radiation Specialist Training in the Exclusion Zone, including in the town of Pripyat, in Reactor 2, the control rooms of Reactors 3 and 4, and inside the New Safe Confinement.

Williamson is a Senior Criticality Safety Engineer for Spectra Tech, Inc., and is contracted to Savannah River Nuclear Solutions for the Savannah River Plutonium Processing Facility. She has spent the majority of her 15-year career in criticality safety for H-Canyon and K-Area at the Savannah River Site. She is a licensed Professional Engineer in South Carolina and Virginia. She earned her bachelor's degree in nuclear and radiological engineering from the Georgia Institute of Technology and her master's degree in nuclear engineering from the University of South Carolina.



Ms. Williamson

### October 2022

On October 26 the section met at the North Augusta Community Center. Dr. Steven Arndt, the current ANS President gave a presentation on "How ANS is Advancing Nuclear Science and Technology and How You Can Help". Dr. Arndt discussed the opportunities presented by the new reactor designs that cut across technologies, sizes, and target applications. He also brought out how the ANS is supporting the advancement of the current effort to move the industry forward as well as some of the challenges associated with the development, licensing, and deployment of new reactors and how the ANS community can help.

Dr. Arndt currently serves as a Distinguished Scientist at the Oak Ridge National Laboratory where his research involves advance reactor design readiness. Previously he spent thirty-one years as a senior scientist with the Nuclear Regulatory



Dr. Arndt

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## Technical Meetings (contd)

Commission, leading key research efforts and providing authoritative advice to NRC management and staff in the areas of digital instrumentation and control, software reliability, emergency response, Cyber security and numerous other technical areas.

More information on ANS President Arndt's tours of Plant Vogtle and the Savannah River Site on October 26-27 is found on page 17.



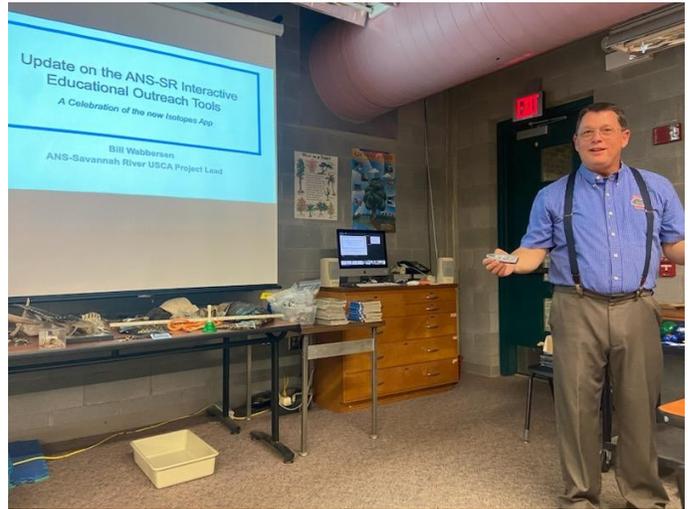
Plant Vogtle Units 1, 2, 3, and 4

# 2022-23 Neutrino

## Technical Meetings (contd)

### January 2023

Bill Wabbersen presented the Isotopes Application at the Ruth Patrick Science Center on January 19. Bill described and demonstrated the Isotopes App, an educational tool developed as a Capstone project by USC-Aiken computer science students and added to the ANS website in October. The early days and development of the ANS-SRS nuclear science and technology hands-on educational tools were described, followed by a summary of the status of current related efforts. He provided a perspective on what comes next in the application development.



Bill Wabbersen



Bill Wabbersen with the USC Aiken Student Development Teams

# 2022-23 Neutrino

## Outreach and Education

### CSRA College Night

CSRA College Night was held on September 15 at the James Brown Arena in downtown Augusta. Over 90 colleges and universities attended and \$10,000 in scholarships were awarded. There were almost 4,000 in attendance. ANS SRS set up a booth and enticed students that came by to consider education in the Nuclear Science field.

Here is a thank you note from the organizers of the the event to the section:

"On behalf of SRNS Education Outreach and the College Night Committee, thank you for your participation at the recent CSRA College Night. It was great to return in person and we hope you each found the event successful for your organization. The attendance was 3,807 and we have heard many positive comments from appreciative parents and students."

Kim Mitchell  
Education Outreach Programs Lead  
Savannah River Nuclear Solutions, LLC Savannah River Site



Graham Jones and Brent Barnett talking to students

# 2022-23 Neutrino

## Outreach and Education (contd)

### SEED STEM Festival

The 37th Annual SEED STEM Festival was a success, with 2756 people in attendance. This event was held October 1 at the Ruth Patrick Science Education Center at USC Aiken. They appreciated the section for being an exhibitor this year. They stated "Thanks for sharing your time with the community. We have had so many wonderful positive comments about this year's festival."



The event included innovations in the areas of STEM (science, technology, engineering, mathematics). Student groups, regional corporations, museums, professional organizations, government agencies, educators, and national labs will join forces to create and present engaging hands-on activities for guests of all ages. The annual event is held to give young learners up close and personal interaction with real-world scientists, engineers, and other technical professionals. The goal is to increase awareness of the role STEM plays in society and that it can also be fun. They recognize that as a society we must continue to excite and engage families about STEM fields.

Highlights from the 2022 SEED STEM Festival included:

- More than 50 hands-on exhibits and activities
- Exhibits from the Aiken County EMS, American Nuclear Society, Savannah River National Lab, SCDNR, USC Aiken, Savannah River Nuclear Solutions, Southern Nuclear, and more
- Demonstrations of technologies and intriguing science including robotics, nuclear power, flight, biology, chemistry, neuroscience, biodiversity, and more

Every year, this event is presented by the Ruth Patrick Science Education Center at USC Aiken working closely with the Aiken County Public School District.

ANS Savannah River team supported our Nuclear Science and Technology exhibit this year. Over five hours, we easily saw 10% of the 2756 students, parents, volunteers and exhibitors that participated.

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## Outreach and Education (contd)

### SEED STEM Festival



Michelle Johnson, Fred Pilot and Bob Eble were in action during the event.

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## Outreach and Education (contd)

### **Furman University Teachers Workshop Event**

On July 20, 2022, Bill Wabbersen and Jon Guy conducted a Teachers Workshop at Furman University in Greenville, SC as part of a partnership with the Citizens for Nuclear Technology Awareness and the South Carolina Academy of Science. The workshop is a nuclear chemistry class for high school teachers. Bill and Jon have conducted this workshop for multiple summers. The workshop is part of the Science Plus Institute and it is used as a professional development class for South Carolina teachers.

This year there were teachers in attendance from high schools all over South Carolina. Teachers from Title I or underserved schools are given preference for the workshop. Many of the teachers were first-time chemistry teachers and they were able to take equipment and materials from the workshop back to their schools for use during the school year.

During the workshop the following topics were presented with a focus on hands-on activities:

- Atomic Fundamentals (hands-on using the marble gold-foil experiment)
- Journey to the Center of the Atom (hands-on using the Isotope Discovery Kit)
- Basics of Radiation (using the cookie analogy)
- Half-life (hands-on using M&Ms)
- Radioactive Decay Chains (hands-on using the Advanced Isotope Discovery Kit)
- Fission (hands-on using the fissioning cookies activity)
- Fission fragment/Spent Fuel discussion (hands-on using the fission fragment activity)
- ALARA discussion (hands-on using sources, detectors, and shielding)
- Energy discussion
- Nuclear Science in SC
- Savannah River Site introduction

The workshop was a very full day, and the reception from the teachers was great. During the workshop there were excellent discussions about the teachers understanding and misconceptions of nuclear. This is expected to become an annual event.

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## Outreach and Education (contd)

### 2022 Furman Teachers Workshop



Furman Teachers' Workshop

### Future City

2023 marks the first year judging the South Carolina region Future City, an annual event put on by USC Aiken wherein middle school students design and model their ideal city of one hundred years from now. The American Nuclear Society Savannah River Section once again sponsored a special award for the Best Energy System which powered these competitors' cities of tomorrow. There was a strong showing of ideas, from redundant fusion reactors inspired by the recent breakthrough in December 2022, of producing a positive net energy at Lawrence Livermore National Laboratory, to a novel idea of mounting solar panels onto wind turbines to diversify how a single plot of land can produce energy.

The winner of the ANS award this year was Dreams Imagination and Gifts (DIG) After School Academy's city, Contraxia. Contraxia receives a base load of power from a fission reactor nestled in a nearby mountain, and supplements it with working wind turbine models, and solar panels on available roofs and fields. The modeled nuclear reactor included a reactor vessel with blue stones representing water, red and blue straws for the hot and cold legs of the reactor, and a functional fan representing a spinning turbine to output the harnessed fission reactions. Contraxia also received a special award for

# 2022-23 Neutrino

## Outreach and Education (contd)

Best City Model by Generac, and third place overall in the competition of eleven participants this year. Even fiercer competition is expected next year as student competitions continue to revert to taking place in physical locations.



2023 Future City Winners

## **Boy Scout Merit Badge**

Since early January 2023, Bill Wabbersen has been conducting Boy Scout Nuclear Science Merit Badge Workshops every Tuesday for Boy Scout Troop 146 in Aiken. This six-week series of workshops will culminate with a tour of Plant Vogtle by the scouts in mid-February. Pictures to follow in the next edition of the Neutrino.



# 2022-23 Neutrino

## Benjamin Memorial Scholarship

The ANS Savannah River Section sponsors a scholarship in memory of Dr. Richard Benjamin. The Benjamin Scholarships are given to help defray first-year college costs for an academic year of study and are provided in the memory of its long-time member, Dr. Richard (Dick) Benjamin (1925-2013). The award is now in its ninth year and is for students expressing academic and career interests in a STEM field, and particularly those wishing to major in a field associated with nuclear science and technology.

Dr. Benjamin was a mentor to many nuclear science and technology professionals in the Aiken-Augusta area for over four decades. He received his B.A. in Engineering from Lamar University, M.S. in Nuclear Engineering from Southern Methodist University, and earned his PhD in Nuclear Physics from the University of Texas in 1965. After a three-year post-doctoral study at the Swiss Federal

Institute of Technology, Dr. Benjamin came to the Aiken-Augusta area in 1968 with the acceptance of employment at the Savannah River Laboratory (now Savannah River National Laboratory). He worked in many technical areas during his Savannah River Site career, most notably the Reactor Physics, Atmospheric Technologies, and Advanced Planning Groups, followed by the Accelerator Production of Tritium Project.

During his long and illustrious ANS career, he was active with two of its divisions, the Fuel Cycle and Waste Management and Environmental Sciences Divisions, and served as a chair for each one at different times. In June 1992, Dr. Benjamin had the honor of representing ANS at the first United Nations Framework Convention on Climate Change held in Rio de Janeiro, Brazil. He served in many ways and held key offices with the Savannah River Section of ANS. Dr. Benjamin was co-director of the local Tasters Guild, a wine and food appreciation society, and was an avid supporter of the Augusta Opera and the Augusta Choral Society. He also enjoyed outdoor activities such as hunting and skiing, and helped found the Aiken Dove Club. He was a co-founder and proprietor of Wine World in North Augusta, where many ANS Savannah River Section Executive Committee meetings were held until its closing in 2019.



Dr. Richard (Dick) and Dick's wife, Sally Benjamin, circa early 2000s.

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Savannah River Section, P.O. Box 7001, Aiken, SC 29804



<http://local.ans.org/savriv/>

## 2023 American Nuclear Society Savannah River Section TENTH ANNUAL BENJAMIN MEMORIAL SCHOLARSHIP



The Benjamin Scholarship is a competitive financial award given in memory of Dr. Richard W. Benjamin towards the first year of a four-year Science, Technology, Engineering and Mathematics STEM College/University, or either year of a two-year Technical College degree program.

➤ **Scholarship Award amounts will be based on number & quality of applications.**

➤ **Seeking students with STEM career goal, potentially interested in a Nuclear Science and Technology career.**

➤ **Current CSRA graduating high school seniors or first-year technical college students are eligible.**

➤ **Application window : January 23 - April 28, 2023**

➤ **Required Application Materials and Evaluation Criteria (%):**

1. Cover letter including name, address, evening phone number, current school, home email address and name of college or technical school to which the Benjamin Memorial Scholarship would be applied. If the school is uncertain, then name the current top choice. Also, at the end of the cover letter, add a one-sentence non-school related fun fact about yourself (10%).

2. A one-page essay (300 words or less) on why a career in science, technology, engineering, and mathematics, and educational is the goal of the student; Highlight what you plan to pursue in college & potential career goals (40%)

3. High school transcripts (seven (7) semesters in the case of current high school seniors); plus first-semester transcripts for applicants who are first-year technical college students, along with their entire high school transcript; (20%)

4. Two (2) letters of recommendation from education institution or community organization individuals (e.g., teachers, coaches, service or religious organization leaders, etc.). Each recommendation is weighted 15%. (30%)

➤ **Submit application materials by: 1) Email with attachments to: [ans.savannahriver@gmail.com](mailto:ans.savannahriver@gmail.com), or 2) U.S. mail to:**

**Benjamin Scholarship, ANS-Savannah River Section, P.O. Box 7001, Aiken, SC 29804**

➤ **Scholarship Award(s) will be announced in June 2023.**

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## **Benjamin Memorial Scholarship (contd)**

### **American Nuclear Society (ANS)**

ANS is a professional and technical society of approximately 10,000 engineers, scientists, education professionals and students worldwide that work to promote the awareness and understanding of applications of nuclear science and technology for the benefit of humankind. The ANS Savannah River Section is a 501(c) 3 organization under IRS guidelines. Donations to ANS are tax deductible as allowed by law.

Donations can be sent to the following address and checks can be made out to ANS Savannah River Section.

ANS Savannah River Section  
PO BOX 7001  
Aiken, SC 29804

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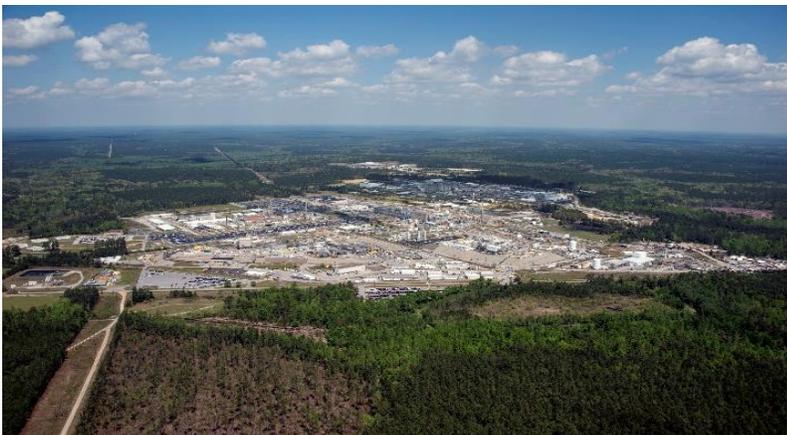
## Other Events

### **ANS President Steven Arndt visits Vogtle Electric Generating Plant and the Savannah River Site**

ANS President Dr. Steven Arndt toured Plant Vogtle 3 and 4 on the afternoon of Wednesday, October 26. The tour was led by Joel Leopard and the ANS Section Vogtle Liaison, Mike McCracken. Mike is the Plant Vogtle Communications Lead at Plant Vogtle.

Following his presentation to ANS Savannah River Section on Wednesday evening, President Arndt was given a Thursday morning tour of the Savannah River National Laboratory (SRNL) and the Savannah River Site (SRS). On this tour, he was provided an overview of the mission of SRNL followed by brief SRS driving tour. At SRNL he saw work the laboratory is doing in keeping the nation's grid secure as well as a mockup facility that is testing equipment and processing to recover rare isotopes from targets stored at SRS. He also saw SRNL's work with visual/artificial reality. He also was given a short driving tour on the site to see large processing facilities in support of management/immobilization of nuclear waste as well as the site's role in maintaining our nation's nuclear deterrent. Hosts, speakers, and coordination of the SRNL/SRS tour included Vahid Majidi, Sharon Marra, Bob Sindelar, Dave Diprete, Harris Eldridge, Alan Busby, Steve Xiao, Matt Folsom, and Bill Bates.

"I had a wonderful time visiting with ANS members both young and more experienced at the university and local sections. Visiting Plant Vogtle and SRNL makes me excited for the future of ANS, our technology and the country," Arndt concluded.



Savannah River Site



Dr. Arndt in front of Unit 3 containment

# 2022-23 Neutrino

## Plant Vogtle Status

Georgia Power announced the completion of cold hydro testing for Vogtle Unit 4 at the nuclear expansion project near Waynesboro, Ga. The completion of cold hydro testing is required to support the last major test remaining for Unit 4, hot functional testing, which is projected to commence by the end of the first quarter of 2023.

“The team at the Vogtle 3 & 4 site continues to make important progress as we move closer to bringing online the first new nuclear units to be built in the country in over 30 years. Completion of cold hydro testing on Unit 4 is another critical milestone along the path to get us there,” said Chris Womack. “These units are a long-term investment for our state and essential to building the future of energy for Georgia. For the next 60 to 80 years, they will help us continue to provide clean, safe, reliable and affordable energy for our customers, serving generations of Georgians as clean, emission-free sources of energy.”

Cold hydro testing on Unit 4 confirmed the reactor’s coolant system functions as designed and verified the welds, joints, pipes and other components of the coolant system and associated high-pressure systems do not leak when under pressure. As part of the testing, the reactor coolant system was filled with water and pressurized above-normal operating conditions, then lowered to normal design pressure while comprehensive inspections were conducted to verify the systems meet design standards.

Other recent milestones for Vogtle Unit 4 include:

- Closed vessel testing (CVT)– Completed in early November, this testing process verified that the pipes and valves in the Unit 4 reactor coolant system are installed as designed and helps ensure safety systems function properly. To carry out CVT on the plant’s passive safety systems, workers installed the reactor vessel head as well as the lower and upper reactor internals and flow restrictors which will be used during hot functional testing to mimic flow through the reactor core.
- Rotation of turbine on turning gear– Also in November, the Unit 4 Turbine was rotated on its turning gear for the first time, demonstrating the turbine was assembled with quality and that integrated oil systems function as designed. The main turbine system consists of one high-pressure turbine and four low-pressure turbines. Rotating the turbines on the turning gear ties in all the oil systems and a significant number of supporting systems in the turbine island, which is a separate structure outside of the unit’s nuclear containment building. Once operational, the turbine will rotate at 1,800 revolutions per minute, propelled by steam produced by the unit’s two steam generators using heat transferred from the nuclear reactor. The turbine blades turn the generator rotor to produce electricity.

Following the safe loading of nuclear fuel for Vogtle Unit 3 in October, teams at the site have continued to advance through various phases of start-up testing. Vogtle Unit 3 is projected to enter service in April 2023.

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## Plant Vogtle Status (contd)

The new Vogtle units are an essential part of Georgia Power's commitment to delivering clean, safe, reliable and affordable energy to its 2.7 million customers. Once operating, the two new units, which will be clean energy sources that produce zero air pollution, are expected to power more than 500,000 homes and businesses. Southern Nuclear will operate the new unit on behalf of the co-owners: Georgia Power, Oglethorpe Power, MEAG Power and Dalton Utilities.



Vogtle Unit 3 Fuel Load



Vogtle Unit 1, 2, 3, and 4

# 2022-23 Neutrino

## Future Events

Fusion Research and Development  
at Savannah River National Laboratory  
Dr. Holly Flynn, SRNL, Bobby's BBQ

February 23, 2023, 6:00 PM

Nuclear trivia event

To be determined

## Awards

The Savannah River Section was recognized as the Best Local Section in ANS for Local Section Management and Meetings & Programs for 2022. These awards are difficult to achieve without a team effort across the EC and amazing supporters. The competition is now among international sections not just the US. Thanks for your many volunteer hours of contributing over a 12-month period (August 2021 – July 2022). The two awards mean \$500 added to our budget.

