

A Day in the Life:



The Nuclear Community at Work



This issue of *Nuclear News* is focused on the individuals who make up our nuclear community.

We invited a small group of those individuals to tell us about their day-to-day work in some of the many occupations and applications of nuclear science and technology, and they responded generously. They were ready to tell us about the part they play, together with colleagues and team members, in supplying clean energy, advancing technology, protecting safety and health, and exploring fundamental science.

In these pages, we see a community that can celebrate both those workdays that record progress moving at a steady pace and the exceptional days when a goal is reached, a briefing is delivered, a contract goes through, a discovery is made, or an unforeseen challenge is overcome.

The *Nuclear News* staff hopes that you enjoy meeting these members of our community—or maybe get reacquainted with friends—through their words and photos.

Kurt Terrani

Director, Transformational Challenge Reactor Program, Oak Ridge National Laboratory



Terrani observing a chemical vapor infiltration furnace during densification of additively manufactured nuclear-grade silicon carbide.

I am the director of the Transformational Challenge Reactor program at Oak Ridge National Laboratory. We are targeting the application of additive manufacturing and augmented intelligence to deliver a better, cost-effective way of building reactors. A typical day involves numerous technical meetings, including one-on-ones with my staff. In a large, multidisciplinary effort, and especially one using an agile approach to move quickly, constant communication is key. The rest of my day goes toward responding to various program and management needs. The fun starts in the late afternoon when I work on publications. Writing journal articles, specifically making plots, is a true passion. It is especially fun when working with data from tests in ORNL's High Flux Isotope Reactor since few people have the privilege to access that beast of a machine and ORNL's other nuclear facilities.

I enjoy a fast-pace work environment, and ORNL does not disappoint. The key is to focus and ensure your work is technically sound. Another favorite activity is asking my team to take on something extraordinarily hard. I remind them that if what we are doing is not really difficult, then we do not belong at a national laboratory. Setting moonshot goals and inspiring a capable and diverse team to deliver is what I live for every day.

José N. Reyes Jr.

Cofounder and Chief Technology Officer, NuScale Power

I lead a diverse team of talented engineers and other experts to bring NuScale's safe, affordable, and reliable small modular reactor—the NuScale Power Module—to the world.

On a typical day, I hold team meetings on one of our exciting research collaborations such as our advanced manufacturing project with the Electric Power Research Institute and the U.S. Department of Energy. Each meeting begins with an industrial and Institute of Nuclear Power Operations safety message, because safety comes second to none at NuScale. From there I might head into a media interview or conduct a presentation for a potential investor or utility customer to discuss the unique features of our SMR technology and its diverse applications.

August 28 was an exceptional day made possible by the dedication and commitment of the entire company: NuScale's SMR became the first-ever to receive U.S. Nuclear Regulatory Commission design approval. Since our founding in 2007, our culture of innovation has helped us grow to over 400 employees, with 550 patents granted or pending in 20 countries. NuScale is advancing its work to provide carbon-free power for the production of electricity, heat, and clean water to improve the quality of life for people around the world.



Reyes at the NuScale Integral System Test (NIST-2) facility in Corvallis, Ore.

Amber McCarthy
Nuclear Criticality Safety
Engineer, Consolidated
Nuclear Security



As a nuclear criticality safety (NCS) engineer at the Y-12 National Security Complex in Oak Ridge, Tenn., I am responsible for helping ensure that fissile materials are safely transported, handled, and stored during normal and credible abnormal production operations. NCS engineers evaluate operations using calculations and Monte Carlo computer codes to demonstrate that processes can be performed safely.

A typical day is balanced between my desk and the plant. It is important that I spend time in production facilities and speak with operations and production representatives to fully understand the process conditions and continuously verify that the NCS analysis reflects the current state. NCS requirements and controls must be compatible with operations. The work done by NCS engineers helps the site deliver its mission, but more important, it



McCarthy (at right), with co-workers Dallas Moser and Marsha Knowles, at an Oak Ridge High School outreach event during Nuclear Science Week in October 2019.

protects the safety of workers. This cannot be achieved without input from multiple disciplines. One of my favorite aspects of the job is getting to work with people with diverse technical backgrounds to solve unique problems. Uranium is handled in very few places in the world, and it is amazing to get to work with one of the world's most valuable resources.

Alyse Huffman
Professional Staff, U.S. House of
Representatives Committee on
Science, Space, and Technology

As professional staff, I spend most of my days studying clean energy research and development policy, keeping up with current events in clean energy and talking to stakeholders and other experts in the field. I also staff Chairwoman Eddie Bernice Johnson and other Democratic members of the committee and work on potential legislative solutions to help advance clean energy in an equitable and environmentally just way. September has been uniquely challenging and memorable because the bulk of the Energy subcommittee's legislative work for the entire Congress was being prepared to head to the floor as part of a clean energy innovation package. If passed into law, this package would be instrumental in making the investments we as a nation need to make to transition to a low-carbon future. It includes a nuclear energy section that would authorize much of the important work done in the Department of Energy's

Office of Nuclear Energy, including an advanced reactor demonstration program, used nuclear fuel research, and research that would prolong the life of the current fleet of reactors in a safe way. Through my work on the Science, Space, and Technology Committee, I feel that I'm doing my part to help combat climate change.



Huffman staffs prior Energy Subcommittee Chairman Conor Lamb (D., Pa) for a House Science, Space, and Technology Committee hearing.

Natalie A. Yonker

Manager, Organizational Effectiveness,
Dominion Energy's Millstone Station



My role oversees the Corrective Action Program, site Safety and Medical, Procedures and Records groups. Lately, much of my time involves the pandemic response. Like all things at Dominion Energy, my day starts with safety. I stop at the Safety Office

to get alignment on safety conditions and compensatory measures that may be in place, plus any lessons learned to share from the fleet to report on at the daily station alignment meeting.



Yonker films a pre-outage safety blitz video.

I work with evaluators of causal investigation. I review all Operating Experience that Millstone communicates to the industry to ensure that the level of detail is sufficient for all to understand. I create initiatives choosing topics based on station trending to bolster station performance emphasizing human performance, elements of leadership, and teamwork attributes, with a focus on self-criticality and continuous learning. I lead the Valued and Engaged Employee team creating engagement activities and celebrations like our cornhole tournament or celebrating 1,000 days of safety success while keeping people safe during a pandemic. I recently met with a shift manager candidate who complimented the value of station engagement activities that were nonexistent before. To hear that what I do makes a difference is extremely motivating.

Spencer Ercanbrack

Undergraduate, Research Reactor Senior
Reactor Operator and Research Assistant,
Idaho State University



A typical morning begins early as I get out of bed to either work out or work on my research project before morning classes begin at 9:30 a.m. Classes ranging from circuit analysis to engineering modeling dominate the rest of the morning. Lunch provides a brief respite, and the rest of the afternoon is spent in my capacity as a research assistant writing code, working on writing a job report and getting a journal article published, and running simulations. When a senior reactor operator is needed at the Nuclear Engineering Laboratory's research reactor, I assist with activities ranging from new reactor operator training to reactor operations and maintenance. The remaining time in the day is spent on additional classes, homework, and, time permitting, Netflix. An exceptional day happened recently when my fellow research assistant and I submitted our 2020 fiscal year job report and presented our work to our employer and sponsors. We received much positive feedback, including interest in applying our work to additional areas in our field of research.



Ercanbrack, holding a boron trifluoride (BF_3) ionization chamber used to provide reactor neutronics information to safety channel number 2 on the reactor control console. The ionization chamber was removed from the reactor to undergo tests.

Matthew Denman

Principal Engineer, Reliability Engineering, Kairos Power



My typical day begins with a cup of coffee, toast, and passing my son, Sam, to his grandmother before walking to my home office. The probabilistic risk assessment (PRA) team is responsible for the risk triplet: what can go wrong, how likely is it, and what are the consequences. Remote work for our team of four has increased the need for clear communication, documentation, version control, peer review, automation, and testing to ensure that we are all progressing in the same direction. This automation includes developing R Markdown templates to facilitate the generation of reports, memos, and internal Web interfaces of our work product, which embraces Kairos Power's iterative approach to reduce development risk. Between these tasks, there is always time to share topical gifs and memes to liven up our days.

One of my PRA tasks was leading a multidisciplinary team over eight months to develop our mechanistic source term methodology. In May, I (virtually) briefed this methodology to the Nuclear Regulatory Commission staff, who have accepted it for review. Extraordinary opportunities to blaze new trails in reactor safety with a talented, committed, and funny team today brings me hope for a bright nuclear-powered tomorrow.

Temí O. Adeyeye

Fluid Systems Engineering, Westinghouse



I currently support fluid systems engineering for AP1000 plants, as well as other major project teams at Westinghouse. My background at Westinghouse is in fluid systems, valves, equipment, and outage services. This background has provided me with opportunities to support and lead efforts from operating plants and engineering services to AP1000 new plant design, construction, commissioning, startup, and licensing. A typical day at Westinghouse for me consists of working with engineering and project teams to implement design and project activities.

In 2018, AP1000 units in China completed initial plant startup testing. I had a lead role in supporting an integrated I&C and mechanical systems team. Startup testing consists of fuel loading, pre-critical testing, initial criticality, and power ascension testing. The effort was extraordinary because it was the first AP1000 plant startup test program.

The integrated I&C, mechanical, and control systems team demonstrated technical excellence and effective communication between Westinghouse, the customer, and other on-site technical roles to support a new generation of nuclear power plants around the world.

Don Williamson

Site Vice President Coordinator, Arkansas Nuclear One, Entergy Nuclear



My day-to-day activities support the site vice president. Whether this means coordinating visits by corporate partners, the Institute of Nuclear Power Operations, the World Association of Nuclear Operators, Entergy Nuclear board members, or Congresspeople, I work to make each visit successful. Work on a daily basis is a challenge, yet each day brings new opportunities and connections across the fleet and industry.

Annually, Entergy Nuclear selects board members to visit the site, meet with employees, and observe the state of the facilities. Part of my responsibilities working for the site vice president at Arkansas Nuclear One requires me to coordinate the tour, badging, and technical briefs. The success of visits depends upon essential skills such as communication and flexibility.

Coordinating each visit requires working across departments to schedule events and tours. During a visit, board members tour our site, meet with employees across multiple departments, visit the control room, and meet with our employee resource groups. We have to be flexible regarding the tour route as interactions can be more detailed than anticipated, requiring on-the-fly fixes to ensure we meet hard timelines.

Continued

Diane Tamai Jackson,
Chief, Nuclear Regulator
Apprenticeship Network Branch,
Nuclear Regulatory Commission

In June, as the U.S. Nuclear Regulatory Commission adapted to the COVID-19 pandemic, we welcomed 23 recently graduated scientists and engineers as the first cohort of our two-year development program, the Nuclear Regulator Apprenticeship Network (NRAN). This diverse group was strategically selected to support the NRC's forecasted skill needs.



My typical day includes leading seminars on regulatory, technical, and organizational knowledge, overseeing training progress, and stretching and assessing the participants' abilities. In the first 15 weeks, I ensured that they gained a broad understanding of the NRC before participating in three or four technical apprenticeships throughout the agency. These opportunities focus on applying their knowledge and gaining experience through on-the-job contributions.

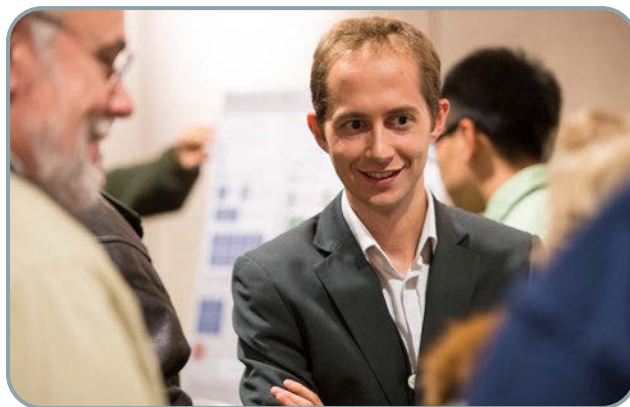
An exceptional day for me was the day that the cohort members led team-building sessions. They split into teams and planned and led activities that related to NRC knowledge and organizational skills. Each team's end-of-day lessons-learned discussion made it clear to me that the cohort was ready to start apprenticeships with a strong foundation and a positive attitude. I am proud to be part of the agency's work to ensure that the NRC will fulfill our safety and security mission today and in the future.



Jackson meets with a small group of NRAN participants.

Nicolas Stauff
Principal Nuclear Engineer,
Argonne National Laboratory

Work starts early to get in a few hours of uninterrupted technical work, such as advancing the design of a new microreactor core concept developed in support of our industrial partners or writing publications (and technical reports if toward the end of the fiscal year). Then, I try to get some fresh air and run in the Argonne



Stauff confers with colleagues.

Katy Huff
Assistant Professor, Department of Nuclear,
Plasma, and Radiological Engineering,
University of Illinois at Urbana-Champaign

In this pandemic, I undertake my research, teaching, and service mostly virtually. While no day is typical, mine usually begins around 6:30 a.m., when I start handling email, getting organized, and even taking meetings with researchers in distant time zones. Around 8:30 a.m., I (virtually) share coffee and discuss the day's tasks with the handful of undergraduate students, 10 graduate students, and one postdoctoral fellow in my research group. I then develop curriculum and teach my reactor physics course. In countless scattered meetings throughout the day, I serve on various committees, advise student groups, and attend administrative meetings. With the time remaining, I guide and direct research, which mostly consists of reading, writing, and reviewing grant proposals, theses, research articles, and software in collaboration with my students and colleagues.





forest before beginning a series of meetings with my teams to discuss various projects that I am leading.

This morning, I focused on economics analyses of nuclear reactors in U.S. grid markets completed to help the Department of Energy, Office of Nuclear Energy understand the challenges encountered by U.S. nuclear power plants, and I investigated policy and technical solutions to help address those challenges. This afternoon, my focus shifted to demonstrating the capability of advanced, high-fidelity multiphysics computation tools developed under the Nuclear Energy Advanced Modeling and Simulation program to design and analyze microreactor concepts developed by industry.

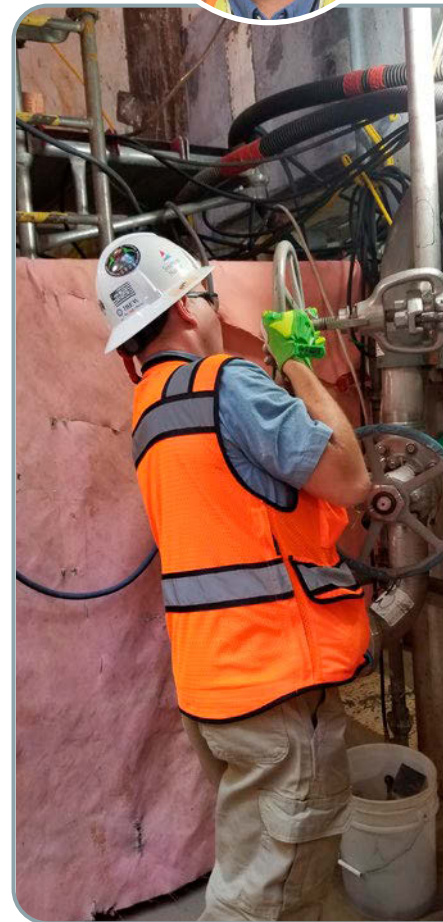
The best part of the job is when I feel I am contributing to advancing nuclear technologies through developing innovative solutions, such as represented by our recently filed patent on advanced moderator modules, to making microreactors cheaper and lighter for easier deployment, even to the moon.

John Denisiuk System Operator, Southern Nuclear's Plant Vogtle

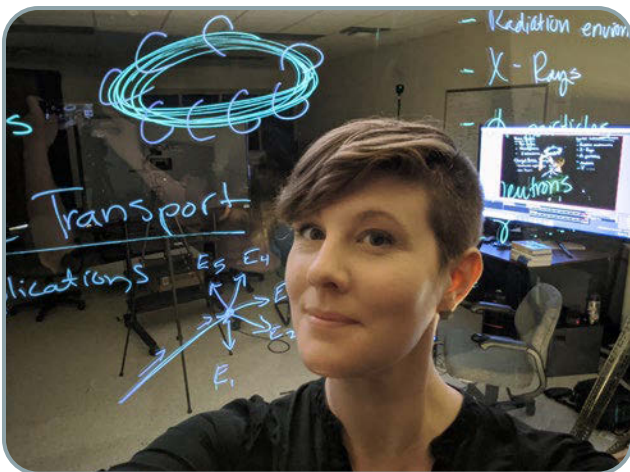
As a system operator at Vogtle-3 and -4, I start my day with a shift brief to discuss the plant status, scheduled tests, and evolutions planned for the shift. Following the brief, I conduct rounds by monitoring all running equipment for my designated watch station, ensuring that the equipment is operating as expected. While conducting rounds, I take time to refresh my system knowledge and preview the upcoming testing activities.

As with any new plant, testing equipment presents its own unique challenges. However, our top priority is personnel safety. As a system operator, some of my most rewarding days are spent developing solutions to challenges that adhere to the highest standards of safety and quality. I enjoy doing my part to help Southern Company build and operate Vogtle-3 and -4 safely.

I'm confident that we can identify and clear any obstacles that would present a challenge for safe and proper testing on any equipment, with an overall goal of safe and reliable operations at Vogtle-3 and -4 in the future.



Denisiuk opens a valve to support testing.



Huff demonstrates her use of a lightboard for virtual lectures.

Recently, my weekends have been quite exceptional, as I've been spending them recording lectures for my course with a very slick-looking device called a lightboard. The transparent, illuminated glass panel allows me to write lecture notes and draw concepts while simultaneously speaking to the camera. With some clever automation arranged by our department's students, I can even start and stop recording without help, which is ideal for the COVID-19 era.

Catherine Percher

Principal Investigator for Critical Experiments, Lawrence Livermore National Laboratory

After earning a nuclear engineering degree in the early 2000s, I started my career in nuclear criticality safety (NCS), a safety discipline whose goal is to avoid an unwanted self-sustaining nuclear chain reaction during fissionable material



Percher adjusts the LLNL uranium training assembly.

operations. My current position designing critical experiments isn't that big of a stretch from NCS. I'm using the same neutronics codes that I used for NCS, except now instead of limiting the system parameters (mass, moderation, etc.) to keep the calculations subcritical, I'm trying to optimize parameters and ensure criticality. As a principal investigator for critical experiments, my job focuses on determining experimental needs (soliciting input from the nuclear data, NCS, and other application communities), writing proposals to get experiments funded, completing neutronics calculations, leading a design team (drafters, other engineers, and safety disciplines), and lots of writing and presenting results (reports, papers, and benchmarks).

One of the best things I get to do as part of my job is to teach part of a hands-on criticality course, combining my NCS and experimental experience. My part of the class uses eight nesting shells of high-enriched uranium metal that can be assembled in multiple configurations to experimentally demonstrate the neutron multiplication effects of mass, moderation, reflection, spacing, and poisons. I really enjoy helping the students make sense of the sometimes confusing neutron data and giving them hands-on experience with real nuclear material. I've found that teaching the class has also been a great way to maintain a link to the next generation of NCS engineers.

Marilyn C. Kray

Vice President, Nuclear Strategy and Development, Exelon Generation



As the vice president of nuclear strategy and development for Exelon, my role is to grow our business by leveraging our expertise gained through operating our fleet of 21 reactors. This means offering operational support services to companies considering owning a nuclear power reactor. In most cases, these potential new

owners are evaluating a small modular reactor or some other advanced design. In many cases, these new owners are outside the United States, which is why it's not rare that my day starts before 7 a.m. eastern to accommodate another time zone. These odd hours are in exchange for the pre-COVID schedule, when I was traveling each week instead.

My next meeting today is in my capacity as chair of the Nuclear Energy Institute Advanced Reactor Working Group, which is the industry forum working with the Nuclear Regulatory Commission to revise the regulatory framework to accommodate the next generation of new reactors. That's followed by a meeting with Exelon's internal government affairs. Even though our immediate focus is state-level policy to keep our current fleet operating, we are also looking at the policy needed for the next generation. Speaking of our current fleet, my late-afternoon meeting is on a project, funded by the Department of Energy, where we will be constructing a hydrogen generation facility at one of our sites to improve its economic performance.

I interface with many different people from different entities. An exceptional day is when the events aren't discrete activities, but they converge and complement each other. One example is having a new owner's needs reflected in a DOE program funded through policy informed by the industry.

Tara Jones

Health Physicist Principal, Energy Northwest's Columbia Generating Station



With the special, unique, and complex characteristics of nuclear energy, one might think that a day in the life of a health physicist at a nuclear power plant is challenging. However, a typical day is actually mostly calm. My

position at the Columbia Generating

Station involves managing the internal/external dosimetry programs and being the subject matter expert for the asset management program that tracks instrumentation and dosimetry. My team often interacts with other departments and regulators who come for assessments and inspections. My job is to ensure that our radiation protection programs are healthy and follow all of the regulations set forth by the Nuclear Regulatory Commission and other agency standards. I help ensure that we remain trustworthy while continuously producing electricity safely and reliably.



Jones refers to a Columbia Generating Station site map.

Even quiet days can be extraordinary, though. An opportunity I had recently was to educate firefighters, emergency medical technicians, and hazmat response members on responding to transportation accidents involving radioactive materials. It was rewarding to be able to teach our heroes that radioactivity doesn't have to be scary, but it still needs to be respected. That is my primary goal in my career—to continuously educate and learn. It is an honor to be in this community.



Heath performs a containment walkdown at a nuclear power plant.

Jermaine Heath

Technical Assistant and Risk and Reliability Analyst, Nuclear Regulatory Commission

I have more than 17 years of experience in nuclear power, including over 13 years in power plant operations, inspections, and oversight. As a technical assistant and risk and reliability analyst at the U.S. Nuclear Regulatory Commission, I advise and provide program support to senior management on complex technical and regulatory issues concerning commercial nuclear reactor safety. Specifically, I provide technical and programmatic support for the evaluation of probabilistic risk assessment (PRA) related issues involving nuclear power plant reactor licensing, operation oversight, accident radiation dose assessment, health physics, and fire protection. Day to day, I support projects involving PRA development relating to internal and external plant events, reactor shutdown, and risk-informed engineering programs. In my role, I perform and support risk evaluations of issues identified during the follow-up of significant operational events that occur at nuclear power plants, using both quantitative and qualitative risk insights to help the NRC inspectors and staff determine the safety significance of degraded conditions at U.S. commercial power plants.



An exceptional day on the job is when I am able to combine my experience in reactor operations with PRA risk information to advise my management during a critical regulatory decision-making that provides reasonable assurance of the adequate protection of public health and safety.

Continued

Brian Dassatti

General Manager, Sciencetech Outage and Fuel Management Solutions, Curtiss-Wright Nuclear Division



As a professional engineer and general manager at Curtiss-Wright Nuclear Division, safety is paramount every day on the job.

Beyond the daily management of operations, I work with our team and customers to deliver products and services that enhance worker safety and ensure component reliability. I am accountable for ensuring that our employees foster a positive nuclear safety culture and carry that culture into the field, along with adherence

Lawrence E. Boing

Manager, D&D Special Projects, Argonne National Laboratory



A typical day for a decommissioning specialist may involve many different activities, such as evaluating technical options for decontaminating or dismantling some equipment or material. Another activity might be sharing past decommissioning work experiences in the training of young

engineers or project managers from operating contractors/licensees, service contractors, and regulators starting work in the nuclear decommissioning field. I also get involved with writing topical reports for the domestic and international communities on some aspects of industry topics that convey project experiences, key lessons learned, and best practices. With my 41 years of decommissioning experience, I have seen or participated in many different examples of various aspects of decommissioning projects. Many of the work experiences are domestic, but some are from the international area, with work in the decommissioning field expanding there every year.

An exceptional day might be a day, or most likely several weeks, when we are teaching a visiting group of either U.S. or international nuclear staff on how the decommissioning process is conducted from start to finish. In this case, the knowledge exchange is actually a two-way process, even though it may appear to only be one way. Always be able to learn more new information.

to all safety protocols. Whether it be our written safety commitment or robust COVID-19 continuity plan, we all own safety and watch out for ourselves and our colleagues.

Since the onset of COVID-19 in March, my days have been far from typical. I am proud to say that we have risen to the occasion as an essential business to meet our customers' needs during a very challenging time. We proactively prepared a COVID-19 continuity plan to comply with all state and federal guidelines, educated our employees on the virus and ways to mitigate its spread, and ensured that all workers were provided the necessary supplies and personal protection equipment. It is my daily goal that we continue to satisfy our customer commitments while ensuring the ongoing safety of our customers and employees.

Jennifer K. Wheeler

Director, Regulatory Affairs and Fuel Production, X-energy



X-energy is developing a TRISO-based uranium fuel facility, TRISO-X, to fabricate 15.5 percent high-assay low-enriched uranium (HALEU) pebble fuel for the Xe-100 pebble bed high-temperature gas reactor, fuels up to 19.75 percent HALEU for other advanced reactor designs, and accident tolerant fuel for the current fleet of light-water reactors. X-energy is currently operating a commercial-scale fabrication line at Oak Ridge National Laboratory that is forming the basis for licensing the TRISO-X facility.

Working on a first-of-a-kind project is exciting and challenging. My best days so far have involved hosting Nuclear Regulatory Commission staff from headquarters and the Region II office for visits to our facilities at ORNL to see fuel development and facility design in action. I lead the development of a license application for submittal to the NRC for a 10 CFR 70 Category II (uranium enriched to 10 percent or more but less than 20 percent) special nuclear material license. A typical day for me involves any of the NRC-required plans and reports, including integrated safety analysis, security, material control and accounting, emergency preparedness, environmental, and decommissioning. I also get to leverage my civil engineering background by participating in planning the layout of the facility.

Yu-Chih Ko

Principal Engineer, Thermal Hydraulics Computations and Plant Simulations, TerraPower



As principal engineer for simulator development at TerraPower, my daily routine consists of checking and ensuring that all the glasstop simulators are working smoothly. I collect and analyze the data from previous simulations on a regular basis. The results from the simulator are then presented at our design integration meetings. Through this type of iteration, our reactor design can be improved and optimized at a much faster speed than traditional approaches. I am responsible for programming the simulator so that it can execute the specific features and functionality to support the design work. Hardware and software maintenance is part of my checklist as well. Presenting the simulator to visitors is always pleasant and interactive. I enjoy sharing our technology and am always inspired by the questions the visitors ask.



Ko collects and analyzes data from TerraPower's glasstop simulators.

In addition to the technical work, I am also managing the company-wide Knowledge Sharing Program (KSP), which provides a platform for all employees to share their knowledge, perspectives, and experience with colleagues. Topics of the KSP range from I&C to disability awareness to treehouse construction. This program has helped us as a company to stay connected on both a professional and personal level, especially during the pandemic this year.

Garrett Holter

Machinist's Mate Nuclear Second Class, U.S. Navy, Nuclear Power Training Unit, Charleston MTS-635

A typical day on the job for me starts with a muster of my crew, where the plan for the day is disseminated. During this time, we are assigned to various watch stations for the day. Because I am a machinist's mate, the watches I stand include Engine Room Supervisor, Engine Room Upper Level, Engine Room Lower Level, Feed Station, and Reactor Mechanic. Unlike most plants, we start up and shut down the reactor several times on most days. Typically, we break up an eight-hour shift into two halves. The first half is a shutdown and the second half is a startup. While standing watch, we have students as our under-instructs. We teach them how to stand each watch station and allow them to operate under our supervision.

I have a collateral duty as a shipyard competent person



for confined space entry and atmospheric testing. This role requires me to test various spaces to ensure that the atmospheric requirements for habitability are met. An exceptional day for me occurs when these conditions are not deemed habitable, and I must get creative and quickly problem solve to ensure everyone's safety.



Holter stands outside the U.S. Navy's Nuclear Power Training Unit near Charleston, S.C.

Alicia Swift

Program Manager and Team Lead for Nonproliferation and Arms Control Programs, Pantex and Y-12



A typical day for me is anything but typical! I am the team lead for our many exciting international nuclear safeguards, nuclear export controls, and arms control/treaty verification research projects at the Pantex Plant and the

Y-12 National Security Complex. I

often lead project meetings, author research papers, or oversee the research program. I also frequently brief policymakers, or host tours of our unique capabilities, in order to inform decision-making on key nonproliferation topics. I enjoy being able to use my technical subject matter expertise in radiation detection, nuclear engineering, and verification technologies to recommend potential solutions to policy and scientific challenges.

One of the best parts of my job is being able to lead or participate in international collaborations. For example, I recently led a six-year bilateral U.S.-U.K. effort that successfully developed and demonstrated a novel portal monitor for arms control applications, called the Portal Monitor for Authentication and Certification. I also have been privileged to serve as a controller for the 2017 Quad Nuclear Verification Partnership's LETTERPRESS exercise in the United Kingdom, as well as an evaluator for the 2019 International Partnership for Nuclear Disarmament Verification's Nuclear Disarmament Verification (NuDiVe) exercise. I thoroughly enjoy working with international partners to solve verification challenges associated with arms control and disarmament.

Consuelo Guzmán-Leong

Principal Engineer and Director, LPI Inc.

I am a principal engineer and director of LPI's Richland, Wash., office.

A typical workday as a principal engineer involves performing fracture mechanics calculations, fatigue evaluations, literature reviews, and report writing, as well as creating project status reports for clients, addressing comments on client reports, and conducting technical reviews (including but not limited to fracture mechanics calculations, structural evaluations, and inspection and maintenance plans).

As the office director, my duties include writing proposals,

conducting and reporting monthly financial forecasts for the office, giving weekly business development updates to LPI management, meeting current and potential clients, and performing staff evaluations. Job assignments also may require on-site visits to perform integrity and corrosion assessments, system walkdowns, and instrument installation for data collection and monitoring purposes.

An awesome day on the job is when project tasks get completed ahead of schedule and below budget, the technical reviewers do not find discrepancies with one's calculations (a huge relief!), the client agrees to one's proposition for resolving report or calculation comments and/or to add scope to the contract, instruments for data collection do not fall off (the extra epoxy/tape pays off!), and when informed that LPI's proposal was selected for contract award.



Guzmán-Leong performs a condition assessment of concrete cooling towers.

Mike McCracken

Communications Coordinator,
Southern Nuclear's Plant Vogtle



My primary role is planning and implementing communications strategies that promote and educate the public about nuclear energy and Plant Vogtle. Prior to COVID-19, that meant near daily programs involving a variety of people—from students to business leaders to elected officials—touring the plant and the Vogtle Energy Education Center.

I'm also directly involved in the community with off-site Vogtle presentations, charitable contributions, and community involvement. Added to that are emergency preparedness responsibilities (including participating in drills at our nearby Joint Information Center) and various types of support for company and site employee communications (i.e., writing articles).

Due to COVID-19 restrictions, I am now conducting much of my work remotely. This includes interactive virtual tours of Plant Vogtle, where we tailor our messages based on the audience. I, along with my communications colleagues at Plant Vogtle, Plant Farley, and Plant Hatch,



Prior to COVID-19, McCracken conducted near daily programs for visitors to the Vogtle Energy Education Center.

am also supporting additional fleet and site employee communications efforts as of late.

What makes my job—and a typical day—special to me is a sense of accomplishment in strengthening public support and understanding of how nuclear energy at Plant Vogtle is used to safely and reliably generate a tremendous amount of electrical power. And, of course, this 24/7 energy is produced affordably and in an environmentally responsible and carbon-free manner. That's important to me.

Stephanie Holbrook Bruffey

Radiochemical Engineer,
Oak Ridge National Laboratory



Working at Oak Ridge National Laboratory as a radiochemical engineer keeps me busy! My specific field of expertise is in the recycle and reuse of nuclear fuel resources, and on any given day you might find me in one of our world-class laboratories performing experiments or in my office working on analyses of current and alternative nuclear fuel cycles. Experimentally, I'm often working on gas-solid adsorption testing, and I love getting involved in all aspects of the project—from hands-on system assembly to data collection, analysis, and reporting. One of the most rewarding aspects of my job is the opportunity to interact with my colleagues. Collaboration with senior researchers teaches me something new every day, and it excites me to be able to share those insights with researchers who are just getting started in their careers.



Bruffey working in a uranium glovebox at ORNL.

Eric Jebsen

Senior Regulatory Engineer,
Exelon Generation



In my career in commercial nuclear power, I've moved from nuclear core analysis outward to the switchyard and now focus on compliance with the North American Electric Reliability Corporation (NERC) standards.

These standards are focused on assurance of supply to the grid, quite different from the focus of the Nuclear Regulatory Commission. During a typical day I may review analysis of geomagnetically induced current impact on our transformers, assess if a plant configuration change impacts the bulk electric system, respond to a "NERC alert" issued to apprise the industry of potential threats to our supply chain, or ensure that the demarcation between NRC and NERC cybersecurity requirements remains clear.

One very satisfying aspect of the job is developing the operating agreements that govern the typical work interactions between Exelon Nuclear as a generator and the connected transmission entities. Understanding the perspective of transmission companies—the dual nature of their retail operations and requirements to maintain voltage to our stations under various dynamic contingencies—and understanding how our generation impacts their operations and how we fit into the wider grid is both challenging and educational. Ultimately coming to agreement on how each party will conduct business while maintaining safety and grid reliability is very rewarding.

Jim Byrne

Consulting Engineer



I started in the nuclear Navy in 1974 following an interview with "the kindly old gentleman," Admiral Rickover, who selected me for his nuclear propulsion program. Five years later in March 1979, the Three Mile Island accident occurred, and as nuclear power plant construction projects started to be canceled, I thought it was time to look around.



Byrne in the control room at TMI-2.

I followed my Navy days with a brief stint at Sargent & Lundy before I started at TMI-2 in August 1980 in Licensing and Regulatory Affairs for the General Public Utilities Corporation (GPU). I worked my way through various roles until the end of the cleanup project in 1993. GPU next turned its attention to decommissioning of the Saxton nuclear reactor in Saxton, Pa., for which I was the engineering, licensing, and quality assurance manager. With the completion of that project in 2005 and turnover of my responsibilities, I retired in 2006.

Retirement did not take, and I continued to consult on various decommissioning projects for a number of years. In 2018 GPU asked me to come back to TMI-2 to help with planning for the closure of TMI-1 and later the sale of TMI-2 to EnergySolutions.

The work of a consulting engineer is not the most physically challenging endeavor; my days are spent writing and reviewing technical reports and studies with the occasional walkdown to make sure I know what I am talking about. It is nice to be back at TMI-2 and helping to plan for its decommissioning, which should start in just a few short years.

Lori Braase

Program Manager, Gateway for Accelerated Innovation in Nuclear (GAIN), Idaho National Laboratory



A typical day working for GAIN involves frequent and dynamic interactions with the GAIN team. As program manager, I organize and implement GAIN's strategic plans, industry-focused workshops, national lab engagement, and internal management activities. I've been in the nuclear field for 29 years and started working with GAIN on opening day in January 2016.

GAIN's mission is to provide the nuclear energy industry with access to cutting-edge R&D, along with the technical, regulatory, and financial support necessary to move innovative nuclear energy technologies toward commercialization in an accelerated and cost-effective fashion.

The GAIN-EPRI-NEI Microreactor Program Virtual



Braase (center) and the rest of the team sport new GAIN hats during an online meeting.

Workshop, held June 18–19, 2019, was a major GAIN highlight. I worked with the planning team to organize and facilitate the two-day event. It was exciting to host over 130 participants at INL to engage on topics covering nuclear energy user/developer needs, supply chain considerations, and national laboratory supporting capabilities. Many connections were developed between national lab personnel and the microreactor industry.

Alireza Haghghat

Professor and Director of Nuclear Engineering Program, Department of Mechanical Engineering, Virginia Tech

My days are occupied by different activities, including meeting with research collaborators here at Virginia Tech and nationally and internationally as well. My current projects include the CHANDLER antineutrino detection system with the VT Physics Department and the RAPID code development and its experimental benchmarking in collaboration with the Jozef Stefan Institute in Slovenia. My work includes weekly group meetings and frequent individual meetings with graduate students via Zoom;



preparing proposals, reports, and papers; serving as a reviewer for conferences and journals; serving on VT and national committees; and, naturally, preparing for my courses, responding to student questions, and grading homework and reports. As director of Virginia Tech's nuclear engineering program, and with help from staff and faculty, I am engaged in student recruitment; our online program and graduate certificate in Nuclear Science, Technology, and Policy; curriculum development; monitoring of our NRC fellowship programs; the organization of a webinar series; new program initiatives; and national and international activities. Much of this work is performed in Zoom meetings and through email communication. ☒