

## Innovation Personified

*Five early to mid-career professionals share why innovation is so critical to delivering on the promise of nuclear power.*

**By Chris Warren**

Innovation can mean different things to different people. For some, it's all about the breakthrough inventions or new technologies fundamentally changing people's lives. Others see innovation in the novel processes people follow to come up with and execute new ideas. Still, others understand that innovation can mean taking an idea others have already demonstrated and applying it to their unique situation.

It really doesn't matter how innovation is defined. A common definition of innovation is less important than recognizing its myriad versions are essential to drive progress. What's more important is to understand that innovation in its myriad forms drives progress. The role and importance of innovation in the nuclear power industry will take center stage at this year's Global Forum for Nuclear [Innovation](#) (GFNI), a three-day event set to take place in June in Miami, Florida,

USA. The aim of the event is both ambitious and simple: to equip participants with the tools, techniques, and mindset necessary to bolster innovation in their organizations and, importantly, to use innovation to turn ambition into action.

The GFNI does this by [redefining](#) what an industry event is; after all, an event devoted to innovation must defy expectations and provide practical tools for attendees to take home and apply in their organizations. These tools will "bottle up" the experience at the event and, when "uncorked," support the actual innovation taking place in the day-to-day work of nuclear professionals around the globe. And there is good news on that front. A new wave of professionals entering the industry brings both a passion for delivering the full potential of nuclear power and an understanding that innovation is a key ingredient to achieving it.

## New Wave of Nuclear Professionals

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## Grace Stanke

Core Design Engineer  
Constellation Energy

After she was crowned Miss America in 2023, Grace Stanke spent the next year almost entirely on the road. There were visits to big-name events, like the Kentucky Derby, as well as trips to conferences, schools, state legislatures, and even overseas journeys to meet presidents.

In her countless meetings, interviews, speeches, and appearances, Stanke focused on one topic. “About 90 to 95 percent of my appearances were related to nuclear science in some capacity,” said Stanke, who recently graduated from the University of Wisconsin-Madison with a degree in nuclear engineering.

*“Innovation is essential. You can’t make progress without it.”*

Stanke’s emphasis on educating people about nuclear power was neither a mistake nor anything new for her. The daughter of a civil engineer, Stanke grew up visiting sites where her father oversaw the construction of bridges. In school, Stanke gravitated to math and science, not only because she had an aptitude for the subjects but also because the subjective nature of classes like English drove her mad. “In seventh grade English I could not get an A on this one paper and the feedback was you’re almost right, you’re almost there,” recalled Stanke. “When I looked at my math classes, I was either right or wrong. There was no in-between.”

It wasn’t until Stanke was touring colleges—Texas A&M, to be precise—that she had any serious exposure to nuclear science. Stanke’s decision to pursue nuclear engineering was solidified when her father told her there was no future in nuclear. “To a 16-year-old girl, that is pure motivation. I got into the field out of spite to prove my father wrong,” Stanke said. “What kept me in the field is when I learned what it provides for the world. A big moment for me was when I sat down in class and learned that nuclear medicine is the reason my dad is a two-time cancer survivor.”



Stanke has been advocating for nuclear power since she began studying nuclear engineering at the University of Wisconsin, visiting schools and Girl Scout troops keen to learn more about nuclear’s potential to power a clean energy future. Now that she has graduated and completed her Miss America duties, Stanke is working for Constellation Energy as a core design engineer and clean energy advocate.

Stanke has spent years communicating the immense value of nuclear power to those who know little about it. But she also has a message for those in the nuclear industry about the importance of innovation. To foster the innovation it needs, Stanke believes the industry needs to become less insular. “Innovation is essential. You can’t make progress without it,” Stanke said. “When it comes to the insularity of nuclear, I think it is a problem because we don’t really branch out all that much.”



Stanke is encouraged to see companies that have not traditionally been in the industry pursuing innovative reactor designs and other advances. She thinks the industry should welcome it and seek to benefit from new technologies, ideas, and mindsets. As she begins her own career in nuclear, Stanke’s approach to innovation is influenced by something her mother told her and her siblings when they were young. “She raised us with the mentality to try something new that scares you every day,” said Stanke. “That leads to some scary things, but it leads to some really incredible things, too.”



## Tatsuya Hisatsugu

General Staff  
Kyushu Electric Power Company

For the past year-plus, Tatsuya Hisatsugu has been working as a resident researcher at EPRI's Charlotte, North Carolina headquarters. Hisatsugu is spending two years away from his Japanese employer, Kyushu Electric Power Company, to research nuclear risk and safety management.

EPRI's Resident Researcher program is designed to promote scientific exchange and facilitate the sharing of technology information among EPRI's membership for the benefit of the global public. The program enhances the value, depth, and quality of EPRI's research while honoring distinguished researchers in the technical field.

*Collaboration and sharing is important for innovation."*

Hisatsugu's time at EPRI has also been devoted to learning about innovations in the global nuclear power industry that could potentially benefit his employer and Japan's domestic nuclear industry. It has been time well spent. "EPRI is doing a lot of research about electric power not just in the U.S. but internationally," Hisatsugu said. "There is research about nuclear power in France and Asia and the Middle East, and there are lots of good insights for me."

To Hisatsugu, the experience has reinforced his understanding that innovation can mean more than just one thing. At one level, Hisatsugu says he has always thought of innovation as the creation of completely new technologies. But now he also sees that innovation can mean applying new ideas that have worked well elsewhere to the nuclear industry in Japan.

"We are now in the process of considering a risk-informed maintenance approach and how that is a benefit, and we have good insights from EPRI and how U.S. utilities do maintenance work and make it effective and reduce costs," Hisatsugu said. "I think we can take many insights and knowledge from utilities to make nuclear power operation safer."

Hisatsugu sees innovation as essential to the future role of nuclear power in Japan. For example, Hisatsugu says that the nuclear supply chain has become more challenging after the Fukushima nuclear accident. "In the future, if we can automate and use AI in manufacturing things like a reactor vessel, we can maintain the supply chain," Hisatsugu said.

Before his stint at EPRI, Hisatsugu's own career trajectory has required the kind of continuous learning and exposure to new ideas that breeds innovation. His first job was in the operations division at Genkai nuclear power plant. He later transitioned to a position in plant maintenance before moving to a corporate position doing regulatory assurance.

Hisatsugu's time at EPRI has only expanded his exposure to new ideas and he hopes to apply what he has learned when he returns full-time to Japan. "The situation in our industry is more difficult than I expected when I was a student," Hisatsugu said. "But after coming to EPRI, I have learned so many insights from different countries and learned about so many technologies and innovations that I wouldn't know if I stayed in Japan. So, I think collaboration and sharing is important for innovation."





## Alice Cunha da Silva

Innovation Project Lead  
Westinghouse Electric Company

Alice Cunha da Silva's parents didn't have much formal education, but they had a lot of wisdom. As a kid growing up in Brazil, Cunha da Silva learned exactly what she needed to do to build a bright future. "A big push from my parents was for their kids to have an education because they knew that was the way to a better life," said Cunha da Silva, whose mother worked as a nurse assistant and whose father was a handyman at a Brazilian air force base.

*"Innovation is a mindset and there are several aspects to that mindset."*

Cunha da Silva took her parents' advice seriously and translated her natural talents in STEM into an accomplished career in the nuclear power industry. Before taking up her current position as Innovation Project Lead at Westinghouse Electric Company in Madrid, Spain, Cunha da Silva earned a nuclear engineering degree at the Federal University of Rio de Janeiro, an MBA at the University of Bordeaux in France, and a long list of awards and committee memberships, including first place in the 2015 Nuclear Olympiad, an international competition organized by the World Nuclear University.

Cunha da Silva's own life has been a series of firsts; not only was she one of the first in her family to graduate college, but she was also the first to travel overseas and learn foreign languages. So, it's no surprise that she is comfortable with innovation. Today, her job at Westinghouse is devoted to driving innovation both within the company and across the nuclear industry. Cunha da Silva believes one way to drive innovation is to define it broadly.



"We often think of innovation as technology development or as a product," Cunha da Silva said. "For me, innovation is more cultural because you can be innovative in business models, and you can be innovative in the way you are doing things. Innovation is a mindset and there are several aspects to that mindset."

Cunha da Silva has been in the nuclear industry long enough to understand the challenges with promoting innovation. A safety-first mindset, she says, encourages strict adherence to established processes. While prioritization of safety will always be paramount, there still needs to be room to try new things. "We need to be an industry that nurtures environments where people can be creative," Cunha da Silva said. "And that's how we actually got here in the beginning. We had scientists and engineers trying different things that got us to the technology that we have today."

Until recently, Cunha da Silva was working to foster innovation at Westinghouse by facilitating collaboration internally and with external partners. The innovation is aimed at goals such as reducing costs and shortening the time-to-market for products. She also uses design thinking to focus innovation on specific problems that need to be solved in the industry. "We want to innovate with purpose," Cunha da Silva said.

Developing a culture that embraces novel solutions and welcomes new ideas is an important aspect of Cunha da Silva's job. Creating that culture involves removing any fear about speaking out. "If you have an organization where people don't feel comfortable sharing ideas, you are going to be less innovative," she said. "As an industry, we all need to create environments where people are comfortable raising their voices."





## Nelly Ngoy Kubelwa

Nuclear Power Engineer  
International Atomic Energy Agency

Nelly Ngoy Kubelwa didn't have to look far for career inspiration. Ngoy Kubelwa's father worked as an engineer in the copper mining industry in the Democratic Republic of Congo, and she always jumped at any chance to visit his office. "I was fascinated by the transformation from rocks to wires and other products," Ngoy Kubelwa said. "My father inspired me a lot."

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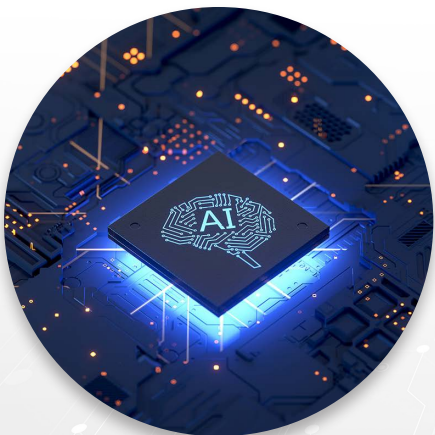
Ngoy Kubelwa acted on that inspiration, helped by the fact that mathematics and physics came easily to her. After initially thinking she wanted to be a medical doctor, Ngoy Kubelwa eventually gravitated to engineering and earned a master's degree in electromechanical engineering from the Free University of Brussels in Belgium. It was only after earning her master's degree that she gravitated to the nuclear power industry, which appealed to her interest in theoretical knowledge and rigorous safety culture.

"I fell in love with the nuclear industry after my master's," Ngoy Kubelwa said. "Continuous, low-carbon and affordable energy supply is vital for human well-being. I really liked the precision and the rigor in the nuclear industry because we have so many standards and codes that we must comply with. I enjoyed the compliance analysis and the review of the different I&C (instrumentation and control) architectures and the defense-in-depth concept. My love for nuclear came from the useful practical applications from the theoretical part of the work."



Today, Ngoy Kubelwa works for the International Atomic Energy Agency (IAEA) in Vienna, Austria. The opportunity to innovate with professionals in the nuclear industry from around the world was a big reason Ngoy Kubelwa wanted to join the IAEA.

In fact, Ngoy Kubelwa has enjoyed working with IAEA staff and members from around the world who naturally cultivate an innovative culture in their work. "I do not believe that innovation is doing something extraordinarily different or something completely new. I think that innovation comes from the combination of different ideas that leads to something new," Ngoy Kubelwa said. "Each Member State has its own preferences and is working in a different way, and I really like to be exposed to those differences because it helps me reconsider my ideas and improve."



For example, Ngoy Kubelwa is leading an IAEA working group to examine the deployment of artificial intelligence (AI) applications in the nuclear industry. This group has been created in the frame of the IAEA International Network on Innovation to Support Operating Nuclear Power Plants (ISOP). "This work is really interesting because the different Member States are not at the same level and do not focus on the same aspects," Ngoy Kubelwa said. "The terminology is not yet standardized."

Rather than considering divergent attitudes and experiences as a roadblock, Ngoy Kubelwa sees the collision or clash of ideas as an opportunity to innovate. And to Ngoy Kubelwa, a focus on innovation is an expectation of the younger generation now entering the industry. "The younger generation thinks differently," she said. "The industry has to adapt a new mentality. When you consider the educational system, they are constantly innovating. For example, looking at another innovative industry, the medical sector, they are introducing new equipment and new components constantly. For nuclear, we also have to always consider which innovations can be used safely and securely."

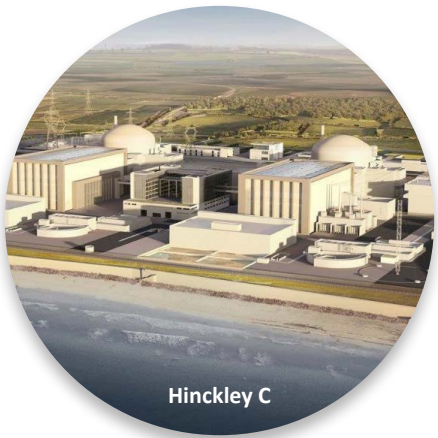


## Jennifer Upton

Commissioning Engineer  
Hinkley Point C

Jennifer Upton doesn't have to think very long to pinpoint the importance of innovation in her day-to-day work. Upton is a commissioning engineer at Hinkley Point C, a twin-unit 3,260 megawatt nuclear power plant that is expected to power six million British homes with carbon-free electricity once it is operational. Hinkley Point C is the first nuclear power plant to be constructed in the United Kingdom since the Sizewell B plant was connected to the grid in 1995 and the first in the nation to use the EPR pressurized water reactor design.

*“Everything we are doing on the commissioning team is complete innovation.”*



“Everything we are doing on the commissioning team is complete innovation because we haven't commissioned anything in the UK for decades,” said Upton, who notes that 3D models and other tools she relies on in her work weren't even available the last time a nuclear power plant was commissioned. “That has challenged me to think of innovation as not just the big technological stuff but it's also when we are doing anything for the first time.”

It's no exaggeration that Upton was convinced she was going to work at Hinkley Point C before she even went to university. The daughter of two schoolteachers—her dad taught geography; her mother taught English—Upton's family always assumed she would go into the arts. But when she was 14, Upton discovered engineering when representatives of a British company named Bloodhound LSR that was seeking to break the world land speed record visited her school.

“They went to lots of different state schools to try and encourage younger children to be interested in science and technology,” said Upton. “I remember looking at their car and thinking, how is that thing going to go 1000 miles an hour? That blew my mind.”

That initial instinct to figure out how something so challenging was possible ultimately led Upton to focus her secondary school studies on math and physics (and English literature for fun) and to also pursue an extracurricular research project about nuclear power, including next generation technologies. The research was so intriguing to Upton that she had a visceral reaction when she heard the news that Hinkley Point C had been approved in 2016. “I turned to my teacher and said this is amazing for me,” said Upton. “I've got four years at university, and when I finish it is going to be 2021 and they'll have finished all the civil works by that point and will be going into mechanical installation. I want to be a mechanical engineer so I'm going to get a job there.”



Which is basically what happened. After graduating university in 2021 with degrees in mechanical engineering and nuclear technology, Upton joined EDF, the company building Hinkley Point C. For her first year at EDF, Upton spent 10 weeks in various parts of the business before settling into her role as a commissioning engineer. For the next two years, Upton will be working in operations before returning to her commissioning role. Upton's career thus far has exceeded the high expectations she had when she was first imagining it in school.

“I genuinely love what I do. And I think what's amazing about my job at the moment is so much of it revolves around learning,” said Upton. “I want to be here because this is the first time that we've ever constructed an EPR (European Pressurized Water Reactor) in the UK and I want to be at the front of it.”