Fourth Symposium on US-Japan Nuclear Energy Research Cooperation
Wednesday, October 21, 2020

Good evening and good morning. It's great to connect with all of you virtually today. I hope everyone is safe and well. Someday I look forward to meeting many of you in person.

I want to thank the Japan Atomic Energy Agency and the U.S. Department of Energy for organizing this event. It goes without saying that the NRC has a strong interest in maintaining a robust U.S.-Japan partnership on nuclear safety and security. To that end, a symposium such as this supports furthering relationships and meaningful technical exchanges between our countries. I appreciate the opportunity to make some remarks at this important forum.

First, I want to congratulate the JAEA on obtaining approval from the Japan Nuclear Regulation Authority for changes to its High Temperature Engineering Test Reactor. This marks the first time such approval has been granted for a gas-cooled reactor in Japan.

The NRC has a longstanding cooperative relationship with our nuclear safety counterparts in Japan. Following the 2011 Fukushima Dai-ichi event, the level of information sharing and cooperation with Japan greatly increased through regular mutual visits, technical meetings, and personnel exchanges.

In particular, the NRC was recently engaged in an extensive multi-year effort to support the development of the Japan Nuclear Regulation Authority's revised reactor oversight program, which was implemented earlier this year. The NRC and our counterparts in Japan have also gotten together to discuss many other topics of interest, including probabilistic risk assessment and risk-informed decision-making, decommissioning oversight, spent fuel storage, public engagement and communication, and security inspection. In 2019 alone we held dozens of bilateral meetings with various Japanese counterparts.

Personnel exchanges have long been a key element to our countries' relationship. The NRC has continuously hosted Japanese assignees from various nuclear safety organizations, since the NRC was established in 1975. The Government of Japan has in turn, hosted a number of NRC staff for assignments with various Japanese nuclear safety organizations, including the JAEA. This robust bilateral relationship built over decades has resulted in enhanced safety in both countries.

It is encouraging to see that Japan is looking at advanced reactors for its future energy needs. To date, our cooperation in reactor safety has primarily focused on large light water reactors. However, the increased interest in advanced reactor technologies presents additional areas for cooperation, and we should continue to look for relevant experience and knowledge bases that can be shared.

Japan has done extensive research related to fast breeder and high temperature gas-cooled reactors. I am personally interested in learning more about Japan's operating experience with the fast reactor program as well as the High Temperature Test Reactor (HTTR). Speaking of the HTTR, I want to congratulate JAEA for recently achieving a significant regulatory milestone with JNRA that concluded the facility design meets the revised regulatory requirements.

With that, I want to share some of my own thoughts on how the NRC is responding to advanced reactors domestically. The reactor design landscape is quite diverse, spanning multiple categories of coolant types, neutron spectrums, fuel types, power levels, and other features. Many companies are actively pursuing development with both private and public funding. Both the Administration and Congress are supportive. Just last week, the Department of Energy awarded TerraPower and X-Energy with initial funding to support deployment of their designs within the next 5 to 7 years. These demonstration projects will require licensing by the NRC and will clearly be a focus area for the agency.

The NRC is currently reviewing a combined license application to build an Oklo microreactor facility at the Idaho National Laboratory, and applications for additional sites are expected in the near term. The NRC is also reviewing multiple topical reports from Kairos Power as part of its pre-application process. Several other companies are engaging the agency in the pre-application phase today, and more are expected in the coming years.

While challenging, the NRC staff has worked hard to ensure it is ready to review advanced reactor applications effectively and efficiently. In recent years, the staff has made significant progress in developing the advanced reactor regulatory infrastructure, such as the principal design criteria for non-light-water reactors, the functional containment performance criteria, a risk-informed performance-based licensing approach, emergency preparedness, and siting guidelines. The staff is also working on a rulemaking, which will formalize the requirements for the varied non-light water reactor designs, including fusion energy systems.

While regulations and guidance provide a framework, effective and efficient reviews will depend on the availability of an adequate knowledge base and independent technical capability, which brings me to the importance of research. Research needs to play a critical role in establishing independent analysis capabilities as well as ensuring an adequate experimental database to demonstrate safe performance of advanced designs.

While working for the United States Senate, I saw first-hand how government facilities provide experimental capabilities to researchers and entrepreneurs to develop and test new products. Facilities like the Advanced Test Reactor in Idaho, the neutron source at Oak Ridge, or multiple advanced light sources all contribute a body of experimental data that is necessary to ensure the safety of advanced nuclear technologies. It is notable to me that new nuclear technologies, such as NuScale, Kairos, and Commonwealth Fusion Systems have come out of university research programs with significant government support.

Given a lack of construction and operational experience with advanced reactors, the right experimental analogues developed through scientific and engineering research are more important than ever.

Our staff's openness to new ideas and approaches is also important as we shift our thinking from the traditional large light water reactor mindset. This has a lot to do with culture, and the agency has been focused on making positive changes in this area through its Transformation efforts. I think we are making progress.

The final point I want to make is that as a government agency and a safety regulator, we are accountable to all our stakeholders. The NRC needs to respond to the reactor applicants in an effective and efficient manner, but in a way that instills public trust. It is imperative that we maintain this public trust by not only ensuring independence and openness in our regulatory approaches, but also recognizing the importance of listening to, and responding to the public's concerns. Explaining new technologies and safety cases that are increasingly risk-informed to the public will pose a challenge. This is especially true with novel ideas like siting advanced reactors in more densely populated areas, determining emergency planning zones, or rethinking security. Clear communication of the safety determinations will be increasingly important, and they need to be supported with a solid technical basis. Which brings me back to the importance of research and data.

I think it is a fascinating time to be in nuclear. I believe rising global interest in advanced nuclear presents opportunities, especially for research and collaboration. Thank you again for the opportunity to speak with you today. I look forward to listening to the rest of the presentations and learning from you.