Official Transcript of Proceedings

NUCLEAR REGULATORY COMMISSION

Title: 33rd Regulatory Information Conference
Technical Session - M4

Docket Number: (n/a)

Location: teleconference

Date: Monday, March 8, 2021

Work Order No.: NRC-1420 Pages 1-61

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NUCLEAR REGULATORY COMMISSION

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33RD REGULATORY INFORMATION CONFERENCE (RIC)

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TECHNICAL SESSION - M4

ADVANCED REACTORS: THE FUTURE IS NOW!

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MONDAY,

MARCH 8, 2021

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The RIC session convened via Video Teleconference, at 1:30 p.m. EST, Robert Taylor, Deputy Director for New Reactors, NRR, presiding.

PRESENT:

ROBERT TAYLOR, Deputy Director for New Reactors, NRR/NRC

ALICE CAPONITI, Deputy Assistant Secretary for Reactor Fleet and Advanced Reactor Deployment, U.S. Department of Energy, Office of Nuclear Energy

ASHLEY FINAN, Director, National Reactor Innovation Center, Idaho National Laboratory

J. CLAY SELL, Chief Executive Officer, X-energy, LLC

CHRIS LEVESQUE, President and Chief Executive Officer, TerraPower, LLC

BRADLEY SAWATZKE, Chief Executive Officer, Energy Northwest

C-O-N-T-E-N-T-S

P R O C E E D I N G S

1:30 p.m.

MR. TAYLOR: Hello, everyone. I'd like to welcome everyone to this virtual session at the 2021 RIC. This is Technical Session M4 entitled, "Advanced Reactors: The Future is Now!"

As we heard this morning from the Chairman, this is one of his A topics for his tenure as Chairman. And as such, we're pleased with the honor and the opportunity here to bring an esteemed panel together to talk to you about these activities. My understanding is that this is one of the most popular sessions at this year's RIC and is reflected by the number of registrants we have for the session. I'm getting feedback.

Can we make sure that the folks are muted here while we present here? I want to make the opening remarks. So our goal is to ensure that this session is informative and engaging and that we welcome your participation to make that happen. Can I get the next slide, please?

First, let's get some formalities out of the way. My name is Rob Taylor, and I'm the Deputy Office Director for New Reactors in the Office of

Nuclear Reactor Regulation. And I will be your Chair for the session today.

We're very excited to be here on the first day of RIC 2021 and to have so many of you able to join -- I'm sorry. I'm getting feedback, so I'm going to adjust just a little bit. Can folks still hear me on the session? Can I get a thumbs up from my panelists to make sure they can still hear me? Good. I'm sorry about that. I was getting some feedback for some reason.

As I said, we're very excited to be here on the first day of RIC 2021 and to have so many of you able to join us for this virtual platform. We've put together a remarkable group of panelists representing nearly all sectors of the advanced reactor community, including the Department of Energy, National Reactor Innovation Center, Advanced Reactor Developers, and the utility representative. Our session is focused on current and future development and deployment of advanced reactors in the United States and how the NRC and DOE are addressing the policy and technical issues related to these challenges to these designs.

Let me start by describing a few details

about the session. This session will follow a moderated panel discussion format. I plan to make a few opening remarks covering NRC activities related to advanced reactors and how we fit into the national framework to enable the safe use of these technologies.

Next, I will forward each of our esteemed panelists the opportunity to provide some opening remarks regarding their role in the deployment of these technologies. After those opening remarks, I will lead a moderated session on some key topics with our goal to bring you a broad range of perspectives on some of the critical issues and challenges related to the near term development and deployment of advanced reactors in the United States. During that discussion, we'll also be using some live polling questions for the audience. Your responses will feed into the discussion that we have today.

Finally, after the panel discussion, we'll have allotted time to take audience questions. So please submit your questions via the Q&A box since there will be no live audience audio, and we'll try to answer as many of your questions as we can. Please submit your questions as early as you can. There's no

need to wait for the Q&A portion of the session. Let me get the next slide, please.

I'd like to start by speaking a little bit about the current environment and some of the activities that the NRC and others are doing to prepare for the licensing and safe deployment of advanced reactors. The environment for the deployment of advanced nuclear technologies has never been stronger. Both federal and state initiatives are spurring greater interest in leveraging these technologies to combat national challenges such as reliable power in remote areas, climate change, and alternative sources of energy.

Over the last few years, Congress and the executive branch have demonstrated bipartisan support for advanced nuclear technologies through enactment of policies and laws such as the Nuclear Energy Innovation and Modernization Act, or NEIMA, and the Nuclear Energy Innovation Capabilities Act, NEICA. Last year, the Department of Energy awarded the first round of funding for the development and deployment of advanced power reactors through the Advanced Reactor Demonstration Program.

For its part, the NRC is executing its

independent mission to develop a technology neutral, risk-informed, and performance-based regulatory framework, also known as Part 53. That in accordance with our principles of good regulation will provide efficiency, clarity, and reliability to our licensing process for these technologies. The NRC has received the first advanced reactor combined license application and is taking a risk-informed approach to its review.

Finally, the NRC recognizes that executing our mission to protect the health and environment requires that we adhere to the principles of the National Environmental Policy Act, or NEPA. However, we recognize that our approach to NEPA must align with the unique design attributes of advanced reactors. Suffice it to say, overall, we're seeing considerable momentum, both within the NRC and across the public-private partnership in this critical area. Next slide, please.

The NRC is strategically transforming and modernizing to prepare for the safe deployment of advanced reactors. Within the NRC's advanced reactor program, we are continuing our transformation journey. We knew that our existing regulatory framework was

built around large light water reactors, and it needed to be adapted to new reactor technologies.

Taking on that challenge, we did not just set out to change our program around the edges. Rather, we want to transform all aspects of it to a modern risk-informed framework. With a critical eye on both the short- and long-term needs, we've taken a holistic approach to this modernization, looking at regulations, tools, processes, personnel and training, codes and standards, and policy issues.

Our modernization vision is to enable the deployment of these new technologies in a safe, secure, and environmentally responsible way. To accomplish the transformation we seek, we developed a roadmap in the form of implementation action plans, and we are deliberately executing these plans which are reflected in the six circles on this slide. We're committed to extensive stakeholder engagement to inform our activities and to provide our work.

Now I'd like to transition to the next part of our session today. Can I have the first polling question put up? So for those on the phone, you should be able to see the polling question on the margins of the panel session. You may have to click

above the Q&A to click on the poll to answer the question. The question is related to, what should the NRC's highest near term priority be to enable deployment of advanced reactor technologies, resolving policy issues within the current regulatory framework, developing guidance, developing a technology-inclusive risk-informed framework, staff readiness, or environmental issues?

Now I'd like to take a few minutes and introduce the panelists that we have with us today. I'm lucky to be joined by such an esteemed group of colleagues and friends. First is Alice Caponiti.

She's a Deputy Assistant Secretary for Reactor Fleet Advanced Reactor Deployment in the Office of Nuclear Energy in the Department of Energy. She leads a diverse portfolio of research, development, and demonstration programs focused on the technical and economic sustainability of the existing U.S. fleet of commercial reactors and the development and deployment of innovative advanced reactors, including small modular reactors and micro-reactors. This is includes the DOE's Advanced Reactor Demonstration Program which we'll hear much more about in this session.

Following Alice will be Dr. Ashley Finan. She's the Director of the National Reactor Innovation Center at Idaho National Laboratory. She's responsible for overseeing initiatives to provide resources to reactor innovators to test, demonstrate, and conduct performance assessments to accelerate the deployment of advanced nuclear technology concepts. NRIC is a national Department of Energy program led by the Idaho National Laboratory allowing collaborators to harness world class capabilities to the U.S. national laboratory system. NRIC is charged with and committed to demonstrating advanced reactors by the end of 2025.

Also, joining our panel today are leaders of two recipients of DOE's Advanced Reactor Demonstration Awards Program, X-energy and TerraPower. Mr. Clay Sell is the CEO of X-energy. He has expertise across many sectors of the international and U.S. energy industry. He has led several -- he has held senior level positions in private sector and the government, most recently 14 years in the U.S. government as Deputy Secretary of Energy under George W. Bush administration.

Joining Clay is Chris Levesque. Chris is

the President and Chief Executive Officer of TerraPower and also serves as a member of the TerraPower Board. He has been CEO of TerraPower since November of 2018 and began his career as a submariner officer in the U.S. Nuclear Navy. He has more than 30 years of experience in the nuclear field.

And finally but also very importantly, Mr. Brad Sawatzke who is the CEO of Energy Northwest since April of 2018 where he previously served also as Chief Operating Officer and Chief Nuclear Officer. He has extensive experience in the operating nuclear power fleet at Prairie Island and Monticello and also serves on the INPO Board of Directors and accrediting board.

For more details on the bios for each of these individuals, you can look on the RIC website to see their full bios and remarks. And now I'd like to hand it off to each of them in series to provide a few opening remarks. Alice, would you like to go first?

MS. CAPONITI: Sure. Thank you, Rob, and good afternoon, everyone. First, I think an important backdrop to this session is the administration's goal to achieve net zero carbon emissions by 2050. And I think we can all agree that advanced nuclear technologies will play a key role in meeting that

initial objective. And I apologize for my background noise.

So I would like to tee up this session by highlighting some of the use cases driving significant private sector investment in advanced nuclear technology. So next slide, please. These graphics developed by Third Way represent just some of the business case applications being pursued by nuclear developers. Looking to the upper left, a fifth of greenhouse gas emissions come from industrial processes, representing a sector that employs more than 10 percent of American workers.

High temperature reactors can provide useful heat to help decarbonize many industrial applications, including desalination and hydrogen production. In the upper right, data from internet servers and other data intensive industries require about 100 billion kilowatt-hours per year or about two and a half percent of America's electricity consumption. Advanced reactors can completely power a data center with reliable, high quality electricity at competitive costs with zero emissions.

Looking to the lower right, transportation is now the largest source of greenhouse gases in the

United States surpassing emissions from electric power production. Advanced nuclear can provide zero carbon electricity to power charging stations, electrified rail lines. And in addition, hydrogen production for industrial applications including transportation are being pursued as economic products for nuclear reactors.

And then in the lower left, remote communities such as in Alaska, fuel to run generators is costly to deliver and electricity prices can be up to 16 times higher than the national average and can consume up to half the income of poorer households. So next slide. In addition to supporting continued operations of the existing fleet, the Office of Nuclear Energy is making strategic investments in bringing the next generation of nuclear technology to the marketplace. These investments include advanced fuel development such as TRISO fuel, advanced modeling and simulation tools to support design and safety analysis, sensors and instrumentation to support advanced design, and advanced materials and manufacturing methods.

Our advanced reactor technologies program is provided cost cutting industry prioritized research

and development for non-light water reactor designs, including micro-reactors. And we continue to provide cost shared private-public funding opportunities to developers with the Advanced Reactor Demonstration Program funding opportunity as being our newest major effort. And so with that, thank you.

MR. TAYLOR: Thank you, Alice. And I apologize to folks. I was getting some feedback early on in the session which we causing me a slight delay as I was speaking. I think I've rectified that situation and we can move forward. And now I'd like to turn it over to Ashley to make a few opening remarks.

MS. FINAN: Right. Thank you very much. Can you hear me okay? Okay. Thank you. So I have a couple minutes here to speak a little about the outlook and the challenges for advanced nuclear, and I appreciate the opportunity to be a part of this session today. And I look forward to the conversation.

From my perspective, the challenges that we see haven't changed very much, but the outlook really has. I think the outlook is bright with some qualifications. As described very aptly by Alice

Caponiti, we have talented and visionary leaders pursuing commercial development of a broad range of technologies.

And now we have the Advanced Reactor Demonstration Program which will help bring those to fruition. In terms of the -- well, those are really big developments, and they're quite positive. And I'm very excited about them.

The challenges haven't changed very much over the last decade. Regulatory modernization is one of them, and we see such encouraging progress there. It's important that that progress continues with strong stakeholder input, but I'm optimistic about that.

Demonstration of the technology is vital to investor and end user confidence so that advanced nuclear can actually serve the key markets that Alice Caponiti described. And the DOE Advanced Reactor Demonstration Program is addressing that with a number of public-private partnerships to support demonstrations and as is the organization that I direct, the National Reactor Innovation Center, or NRIC. NRIC is charged with accelerating advanced reactor demonstrations, and we're committed to doing

that through our mission to inspire stakeholders, empower innovators to test and demonstrate their advanced technologies, and deliver successful outcomes through efficient coordination of partners and resources.

Attracting sufficient investment will be crucial to commercialization and deployment at scale. And that requires technology that's scalable and can be delivered on time and on budget. At NRIC, we're pursuing some key projects to support that, including implementing and open sourcing some digital engineering tools, developing a public-private partnership for demonstrating advanced construction technologies, and also working to demonstrate how advanced reactors can be used in an integrated energy system.

And others are working in this area as well to address construction challenges. So again, I'm optimistic about that as well. We're moving forward. We need to press ahead on all of those challenges, but I think we're doing so.

One area where I have a little bit more concern is that no matter how successful our technological innovation, we must also pursue

sociotechnical innovation, improving the way we consider siting and how nuclear technology interacts with its local and regional stakeholders, and improving our traditional engagement and communication. And NRIC has some activities there, in particular working with University of Michigan's Fastest Path to Zero and some graduate research into siting and environmental justice and other opportunities in that space. But I think that compared with the other challenges, we're seeing less activity. And I hope that as we move forward, we'll see more activity there.

And we've actually seen this issue come to the fore over the past year. The world has executed a moonshot in developing a COVID-19 vaccine a year. But without intense effort to understand how it would be distributed and without intense effort to communicate about that, I think we know it would stumble and potentially fall.

And so that I see as a model for us. We've seen the country execute a moonshot and also we're now seeing really targeted effort to communicate and to think about distribution. And I think we need to do that for nuclear as well. So that's something

I'm looking forward to in the coming years. Thanks very much, though.

MR. TAYLOR: Thank you, Ashley. Appreciate those remarks. Clay, I'd like to give you an opportunity to provide some opening remarks.

PARTICIPANT: Clay, I think you're on mute.

MR. SELL: Thank you very much. It's a pleasure to be on this panel. And someone got to use the phase of 2020 which I'm now making the phrase of '21 which is you're on mute. But I'm very pleased to be on this panel now with such a great group of experts and quite frankly a great group of friends.

Let me tell you a little bit about X-energy. So we are developing a commercial scale high temperature gas cooled reactor using TRISO fuel in a pebble bed configuration. Our optimal configuration has four 80-megawatt electric generator -- I mean, reactor steam generator turbine gen set modules that are combined together in an optimized commercial plant producing 320 megawatts electric.

This is the plant that we propose to demonstrate with our partner, Energy Northwest, and I'm so pleased to be on the panel here with the Energy

Northwest's CEO Brad Sawatzke. Our proposal to the Department of Energy was for a project totaling approximately two and a half billion in expenditures between now and 2027 to achieve three major scopes of work: number one, complete the final design and licensing of the Xe-100 Four Module Plant, number two, to license and construct the first phase of our commercial TRISO fuel fabrication facility, and three, to construct fuel and commission the commercial scale plant at Energy Northwest in Richland, Washington.

Now admittedly, it's a huge task that's in front of us. But it's not just us. It's Energy Northwest. It's our supply chain partners. It's our stakeholder community.

And of course, it's the NRC on both the fuel manufacturing and on the reactor side. And by the way, even while we're doing this, we are contemporaneously moving through the vendor design review process before the Canadian Nuclear Safety Commission because for a lot of reasons, we want to be in a position to deploy there well before the end of the decade. And Canada is truly one of the most exciting markets for advanced reactors anywhere in the world, but back to the U.S.

In my view, the future of advanced reactors that many us have been talking about for over 20 years is here. I mean, it's now. This is the time. This is the time to completely transform the U.S., North American, and global nuclear enterprise.

You're going to be seeing new reactor vendors like Chris' company and myself at our company coming onto the scene, new fuel companies like X-energy coming onto the scene. We're going to need new enrichment technologies to provide the high assay, low enriched uranium that will be required for both TerraPower's reactor and X-energy's reactor. We're going to be developing new business models and perhaps most importantly and the subject of today's session, a new and better regulatory framework.

Now because of the Nuclear Innovation and Modernization Act, we actually have an opportunity to dramatically improve the licensing and regulatory framework to achieve the timeliness, the efficiency, and the predictability to support the largest build-out of nuclear power that perhaps the world has ever seen. And that's the scale and that is the opportunity and that is the challenge that is before us. We are facing the greatest economic and

environmental challenge of our time. That's our view. That's what we believe at X-energy.

And we are designing the technology that must be deployed as scale in conjunction with a modernized regulatory structure here in the United States. This is the future that we see. This is the future that we are working to create. And it's only possible if together with our regulators, with our supply chain, and quite frankly, with everyone on this panel we work together to make it a reality. Thank you, Robert, for the opportunity to make opening remarks.

MR. TAYLOR: Thank you, Clay. Appreciate those remarks. Chris, I'd like to turn it over to you for some opening remarks.

MR. LEVESQUE: Well, thanks, Rob, for leading the panel and good morning, everybody, from the West Coast. And as Clay mentioned, we're among friends here. Clay mentioned the opportunity to demonstrate advanced reactors.

This opportunity didn't just arise when we won our Advanced Reactor Demonstration Awards. It involved support from utility executives like Brad who's partnered with multiple advanced reactor teams.

It involved NRIC's great efforts and actually even before NRIC, Ashley was with an NGO who's been supporting advanced reactors for so many years. And then at DOE, great programs like the advanced reactor concept and GAIN going on at DOE that brought us here today where we have two Advanced Reactor Demonstration Projects.

Briefly, TerraPower's Advanced Reactor Demonstration Project is for our Natrium sodium fast reactor technology that we developed together with GE Hitachi. Two sodium fast reactor companies came together to develop Natrium. And since then, Bechtel's joined the team as our construction partner, and utilities partners, again, Energy Northwest, PacifiCorp, and Duke Energy. So many leaders coming together to make this happen.

But as I mentioned for years, kind of the planets have been aligning to create -- Clay used the word, opportunity, multiple times. This is an opportunity -- today, we sit here with a U.S. industry and U.S. government nuclear community. And I think it's very important to talk about this being a window of opportunity for us.

It's one we didn't have five or ten years

ago. It's one that if we're not successful in getting these seven-year projects on a really successful start, it's an opportunity that might fade away for the U.S. Many have spoken about the U.S. and its loss of nuclear energy leadership in the world.

We can all argue whether that's happened or not. But if we measured it in terms of new builds around the world, certainly we're losing that contest to countries like China and Russia. So when we look at the ARDP, sure, it's a technology demonstration.

It's a way for us to really repeat the history of Shippingport, right? In the late '50s, the U.S. built Shippingport. We showed the world that light water reactor technology could be done economically at grid scale.

It's time to repeat history with these technologies, X-energy's and TerraPower's, and show the world that this technology is ready. And we have had work going on at advanced reactor companies and national labs literally for decades in Gen IV technology development. And if we don't go out and execute demonstration projects, that technology development will really just be sitting on the shelf. So the ARDP is just a great program.

Another thing that came together for us is both parties in Congress supporting advanced nuclear energy. And sure, there's lots of reasons both parties support. Some folks in Congress are more focused on the clean energy aspects, on the waste reduction aspects of our technology. But there's others in Congress who really see this opportunity for the U.S. to renew its leadership in nuclear energy and provide an option to many new countries who will enter the nuclear energy community between now and 2050 and provide a U.S. technology option to those countries.

So since this is an NRC conference, I need to mention I've worked in Europe and in Asia. And so often, I've heard the question, what does the NRC think about a risk-informed EPZ? What does the NRC think about safety analysis? And that's because the NRC around the world is seen as the global standard in safety regulation.

So we have all the right building blocks here to renew our leadership in nuclear energy. We have great innovation companies. We have all this work at the national labs. We have utility leaders who are ready. Oh, and by the way, we have a great market demand for clean energy.

After many years of flat electricity demand, the electrification of transportation in the industrial sector are going to create a great demand for electricity. And we need to go out and demonstrate these plants in the next seven years so that we can show that nuclear can be part of that portfolio. Frankly, if we don't do it, we could be crowded out.

The solutions that are arrived at instead won't be as good for the environment or as good for growing economies. But we could be crowded out. So this seven-year opportunity, this window is really important for us to all follow through together on the great work we've had going on at, again, the national labs and DOE and the NRC. Thanks.

MR. TAYLOR: Thank you, Chris. Greatly appreciate those remarks. And last but not least, it's really important to hear a perspective from a utility who's planning on considering building one of these facilities. So I'd like to open it up to Brad to provide some opening remarks.

MR. SAWATZKE: Thank you, Rob. And again, I appreciate also the opportunity to be on this panel today. So I'm going to start a little bit of talking

about who we are as Energy Northwest which I think will demonstrate why we have an interest in this.

First of all, we're what's known as a joint action agency. We're made up of 27 members here in the Northwest, mostly in Washington State and one of the Public Utility Districts along with a couple of larger cities make our membership. So we are a nonprofit public utility that is here to generate electricity for our members at cost, plain and simple.

So that's our reason for being here. To that end, if you take a look at our portfolio that we have right now, we operate and maintain five hydro plants. We have 100 megawatts of wind farm.

We just recently opened a -- a grand opening of a solar station along with storage as part of that, a five megawatt solar project along with a one megawatt battery storage. So we're very interested in the future of storage. We're also involved in electrical vehicle charging. And also, we're helping to build out electrical vehicle charging stations.

So people feel more secure leaving Seattle and driving east in the state of Washington and get them comfortable with that. So the thing to note

there, and then we are anchored by Columbia Generating Station. That is our 1,200-megawatt electric boiling water reactor.

So the thing to take note of here is we have a carbon footprint. That is our company, carbon footprint. We intend to maintain that. So when we take a look at the future in nuclear, it fits right in to where our portfolio is.

And I'll say also then you got to look at a reason. It was touched on earlier, the environment and NEPA. Washington State specifically two years ago passed legislation known as the Clean Energy Transformation Act. And in a nutshell, what that does is that moves carbon out of the way by 2045. By 2045, all carbon generation should be out of the picture, and at that point, only non-carbon generators.

So what's interesting about that legislation is for several years in Olympia, they tried to pass that legislation which required 100 percent renewables. A couple years ago, we did a lot of work over on the west side with the legislators to try to help them understand from the science perspective of this just renewables, in and of itself, is not going to work. And we were able to talk about

our renewable footprint in our company.

So as you can see, we believe in renewables. We intend to continue to build renewables. We're considering another 300-acre solar project. But we also understand, like all the people on this particular session understand, that's not going to anchor your transmission system. You need that 24/7 base load the Columbia Generating Station provides right now.

So we are very, very excited about this opportunity because as I said of our carbon base, I'll speak personally, and it'll reflect the views many have stated already. I am very personally passionate about decarbonizing for the environment and the climate. I feel it's something for my children and my grandchildren.

And I'm very lucky that I get to show up to work every day at a company where I don't have to hang my morals at the door when I come in. It's aligned with my personal picture of the future and as I've heard several people here indicated. So having said that, as I mentioned, when we saw that legislation pass, we went out and commissioned a study by a group known as E3 to take a look at what

potential future needs were here in the northwest and Washington State as we start to decommission the carbon generators.

And it's no surprise. As I tell people, frankly, any of us could've did that study on the back of an envelope quite honestly. If you're going to retire several gigawatts of carbon-driven generation, you're going to need something to fill that gap.

And frankly, it pointed towards a study of potentially eight gigawatts deficit right now between what we have today and what we're going to need by 2045. And that is going to need to be filled by non-carbon emitting generated sources. So as we took a look at that study and if you looked at the economics around it, renewables played a piece of filling that void, but renewables, in and of themselves, not just from a maintaining the transmission system but from a cost perspective, frankly are not the right answer. The right answer is a mix of renewables integrated with base load new nuclear energy. So that's what got us interested in being involved, both with X-energy and TerraPower, is looking to the future.

We see a definite need here in Washington State, and we believe very clearly the future is

advanced reactors. So we're very excited about this opportunity and the opportunity to work with the two great companies, X-energy and TerraPower. So that's our background. And once again, thanks, Rob, for having me today.

MR. TAYLOR: Thank you, Brad. Greatly appreciated those remarks and that perspective that you're bring to this because, at the end of the day, we can develop all the technologies. But if we don't deploy them and make them available in a safe manner with utilities ready to use, then there's no value to them at the end of the day. We don't get the benefits that everybody is hoping to get.

So with that, I'd like to see if we could bring up the results from the first polling question as we head into the moderated portion of the session and the panel. So could I get the technicians to bring up the results of that polling question so that we can see that as part of the discussion here today? And while we're doing that, I'll tee up the first question for the panelists as well look to get those results up.

Oh, there we go. They're coming up here. I just have to make sure I can see them here as well.

They're a little small for me. So first question, as you look at those results, I want to tee up for Chris and Clay is -- and you touched on it just a little bit, Clay, in your remarks and the opportunity that exists for the NRC and for the nuclear industry is, is the NRC's transformation to a risk-informed, performance-based, and technology-inclusive regulatory framework preparing us to review the new technologies that you and TerraPower and others are bringing to the market?

MR. SELL: Thanks, Rob. I think the answer is yes. I mean, I'm encouraged. I want to say that it's so and I think progress is being made. But I will tell you, on the timeline that we're dealing with on our demonstration project at Energy Northwest, we are not in a position to wait on Part 53.

And so we're going to move forward in advance. And I think a lot of good work has been done, particularly by the Division of Advanced Reactors and Non-Power Production and Utilization Facilities. They produced some white papers. They produced draft guidance.

That's going to be really important for us to truly understand what we need to put in to have a

complete and compliant application. So we're encouraged. But we'll really find out when we start seeing the response in the RAIs and the feedback that we get.

If it's focused truly on the risk-informed questions, then I think we're in a position to make real progress and move through the process in a new and better way. If we retreat to a process where everyone can ask anything and you've got 2,000 experts at NRC, I mean, they're all expert at asking the ultimate question. That's your business, and you're great at it. But if the ultimate questions are asked on things that are not devoted to the most important risk items, then I think the process will slow and will not proceed in the manner that we all hope.

MR. TAYLOR: Thanks, Clay. I think you had a good point with regards to the importance of focusing on the most risk and safety significant elements of those designs and during our reviews as an agency to those elements of the design as we consider how the regulations are met. I want to give Chris an opportunity to weigh in and give his perspectives as another developer.

MR. LEVESQUE: Yeah, certainly the

principles of risk-informed regulation are really important, especially for advanced reactors. Some folks say advanced reactors and departing from light water reactors represents a regulatory risk. I would say it presents an opportunity because instead of having to turn back to decades of regulatory precedent of light water reactors, we can now start fresh looking at what are the safety critical engineering aspects of the plan and really looking at what's important for protecting people and the environment.

We respect the NRC's role in protecting people and the environment. We also know as we move through these licensing processes, we're going to be engaging the public in public meetings and other forums. And risk-informed regulation is -- it's not as straightforward to explain to the public. It's easier to explain a Ten Mile EPZ to the public than the fact that Natrium has a sodium coolant and sodium retains iodine, for example.

So as we move towards risk-informed regulation, Clay's right. Part 53 won't be there in time for the demo. But we can do risk-informed licensing together with the NRC. By the way, we've had great engagement since we won ARDP. We've had

great engagement, and a can-do environment with the NRC.

So we'll approach it that way for the demos. I'm encouraged, and we'll have to be very pragmatic and remember that we have a seven-year schedule and that it's not an infinite window. It's not an infinite window for the U.S. to come together and show that we can lead in nuclear energy technology.

MR. TAYLOR: Greatly appreciate that, Chris. Those are great insights. I'd like to shift maybe a little bit to Alice and Ashley and ask another question that may be on the minds of many of the audience here.

What are your perspectives on the commitment of the new administration to the nuclear power industry and to the advanced reactors going forward? We've had a lot of conversation here today about NEIMA and NEICA. And now with a new administration coming on board and establishing their goals and expectations, is there anything you could share with the audience today?

MS. CAPONITI: Yeah, this is Alice. I can offer you my perspectives on just based on some early

messages that I'm hearing from this new administration. Secretary Granholm has indicated her commitment to taking the actions to achieve net zero carbon emissions by 2050. And she's going to be focused on cutting edge clean technologies.

She recognizes that these technologies are going to create millions of good paying jobs. She's interested in equitable clean energy future. And she has also said that she believes that advanced nuclear technology can be a significant game changing contributor to these goals.

And I noticed as part of her confirmation process, she indicated that she's going to support robust research development and demonstration of advanced nuclear technologies. And she refers to Department of Energy as the solutions department. And so for all of these reasons, I'm very optimistic about support for nuclear to address our climate challenges.

MR. TAYLOR: Appreciate that, Alice. I think that we see DOE as a key role in the federal government activities related to the deployment of advanced reactors and the work that DOE has done over the last year, both with the Advanced Reactor Demonstration Program and in the standup of the

National Research Innovation Council.

So, Ashley, I wanted to give you an opportunity to weigh in and give your perspectives on the support from the administrations in the activities that you're leading and where you're going.

MS. FINAN: Thank you, Rob. And I'll just say I broadly -- I agree with Alice. And I've seen similar statements from the administration which are highly encouraging. And now I think we know there's a commitment to addressing climate change and that the literature broadly shows that the most affordable scenarios for deep decarbonization consistently include firm low-carbon resources like nuclear. And I think it appears that the administration recognizes that and embraces that and wants to try to move us forward towards decarbonization with nuclear as part of the tool kit.

MR. TAYLOR: Excellent. Thank you. We had a second polling question that I'd like to bring up and give the audience an opportunity to weigh in on. So if we could get that question brought up. And while it's coming up, remember you'll have to over in the Q&A portion and there's a poll next to it.

And it's, what presents the most

significant uncertainties in the future development of advanced reactors? And there's five options here: technology development, licensing and NRC readiness, infrastructure, for example, supply chain, public policy, and funding. And we'll come back to this after folks have had an opportunity to provide some perspectives on this.

But while we're doing that, I wanted to move forward with another question that I'd like to pose maybe to Ashley and to Chris a little bit here. What are some critical research and development capabilities under development to support the deployment of advanced reactor technologies? I think there's a lot going on in that area that folks may not be aware of and that maybe you guys could elaborate on as critical to the successful deployment of these technologies.

MS. FINAN: Chris, I'll let you begin if you like.

MR. LEVESQUE: Well, thanks, Ashley. Well, the example I'll give is in Idaho where Ashley works now, TerraPower has been working on our metal fuel technology for the Natrium reactor really since our company was founded 14 years ago. And as a part

of that, we've invested tens of millions of dollars in materials development for metal fuel.

And it turns out the best place to do much of that development was at Idaho National Labs. Innovation companies like TerraPower, we have a really significant laboratory of our own now. It's on 70,000 square feet. But there's great laboratory facilities too at the national labs.

And what we found was INL had a progressive way to contract with us. They have great facilities. We did the proof of manufacturing concept for extruding uranium metal fuel rods. And now we actually have materials in the test reactor at the Advanced Test Reactor at Idaho. So all of this manufacturing development and qualification and testing in facilities like the ATR will be part of our licensing file for our new fuel for the Natrium demo.

MS. FINAN: And Rob, I'll add a couple of things. I think that Chris really laid out very nicely the development that's been taking place in fuels, especially for sodium reactors. There's also a significant amount of work on molten salt fuel development, being able to measure molten salt thermophysical properties once it's been irradiated.

That's something that's new to the lab complex. And at NRIC, we're working to help develop some of those capabilities.

Some of the recent requests that I've had come in relate to component testing. So as we move from doing research and development towards demonstration, we really need to be able to test some of the larger components that will be part of those demonstration reactors. So we see needs that we're working to develop in helium component testing, for example. And so there are a number of others. But I think that those are some of the more exciting R&D opportunities for these advanced reactor demonstrations.

MR. TAYLOR: Thank you, Chris. Thank you, Ashley. Very good insights. I think there is a lot of interest in the research that'll go along with some of these advanced reactor technologies. So I think we need to recognize that many of these technologies, there's been research that's been done over the years and these were considered as technologies decades ago before the light water reactors took off as the primary technology in the United States.

So there's a large database of information

that exists that can be mined and used. And right now, it seems like the focus of the research and development areas is to gather additional information to categorize and understand the uncertainties that may exist in some of that technology. And that'll be critical to making the decisions that you need as developers as well as we need as the regulatory body to make the findings that these technologies can be deployed safely and consistent with our regulatory requirements.

So maybe we can -- while I'm asking the next question, we can pull up the results from that polling question in parallel. So I'd like to pose the next question to Clay and to Brad is, what are the biggest challenges you see in the deployment, development, and innovation related to advanced reactors? What do you see as the challenges you have to overcome to get these technologies built and deployed?

MR. SELL: Brad, do you want to take her, or do you want me to take a first swing? All right. So let me take a run at this. I think the issues are really associated with licensing. Had I gotten to vote on that, I would've voted for licensing and

supply chain.

We talked about licensing and the need for certainty in that. Before I give you my answer on the supply chain, the fun part about this question is so many of the issues that we have talked about for years that we needed to resolve in order to move forward with advanced reactors are no longer there anymore. A lot of issues have been resolved on the demonstration side. The capital markets have a much different view of advanced nuclear than they did even 18 months ago.

What's on the top of my list today is developing enrichment technologies that can ensure the United States is the low cost supplier for high assay LEU for this next generation of advanced reactors. Everyone knows that we're not involved in the front end of the supply chain today, at least for domestic technology. Either Urenco is going to need to expand, Centrus is going to need to bring enrichment technology, or a third party is going to have to come onto the scene to produce HALEU at the volumes that are contemplated for in both Chris' success case and in the X-energy success case. That is challenge number one in my book going forward.

MR. SAWATZKE: Very good. Thank you.

Yeah, so I'm looking at this from a deployment perspective, Rob. And I'm going to start with a quick little story that gets to the heart of what I think is the important piece for deployment.

That is when I talk to people here in the northwest and Washington State and I was talking with my public utility commissioners and talked about the CEDO legislation and what do we need to do for the environment and the climate, everybody is on board. We got to fix the environment. We got to fix the climate. But then they always finish it with just as long as it doesn't cost me one penny more on my rates, Brad. I'm aligned with you.

Or we'll talk honestly and say, well, that's probably not feasible frankly if we're going to get rid of some of this. And there's a lot of us who would look to the fact and say -- and in the story, what I'll tell them is if you think fixing the environment is going to be cost free, we're kidding ourselves. But in the end and for those of us who are passionate about seeing this happen, we have to understand there's a big portion of the population that is still, quite honestly, despite maybe nodding along with the environmental piece is going to be

interested in one thing only and that's what does that mean to me and my rates.

So when we come back to some of the discussion earlier about the regulation piece of this, the predictability of the licensing piece and the regulation as we know is extremely important to the predictability of the cost of this. So when it's all said and done from a deployment perspective, in the end, it's probably going to come down to dollars and cents relative to a lot of our users to convince them to go this way. So for me, the important piece is to be able to be predictable as we work our way through the license, the design and licensing and the billing and implementation. That's going to be key to make the deployment happen, no different than any other technology we've used.

The last piece to look at from deployment is interveners. And if you're like me, I've seen a significant change, if you will, over the last five years or so. We're seeing a number out here in the northwest, a number of environmental groups come around to the understanding that if we're going to actually do something to fix the environment and fix the climate as we know around here, nuclear needs to

be part of that solution.

Otherwise, it's just not going to happen. We're going to pass legislation that makes us feel good. But in the end, we're not going to be able to support that legislation.

So I am not seeing right now a groundswell, and we've been pretty public here about our intentions at Energy Northwest along with our partners, X-energy and TerraPower. And I am not seeing this historical pushback we've seen. But I'm also not naive. There will be pockets out there, I think, who will question what we're trying to do. And I think working with those groups, making sure the environmentalists are on our side will go a long way to helping make this deployment happen.

MR. TAYLOR: Thank you both. I appreciate those perspectives. Those were wonderful. Can we bring the results back up real quick? I think we got them up and then we moved off real quick.

So we see that funding and public policy are two drivers that many in the audience felt were really important. I think we talked about those to a good degree. I think that Clay added some good perspectives and Brad as well with regards to that.

So it's very interesting to see the audience's response to these questions. And this is exactly why we're asking these questions and putting the polling out there folks. So I want to make sure --

MR. SAWATZKE: Rob, this is Brad. Just if I could add one more thing. I apologize.

MR. TAYLOR: Absolutely.

MR. SAWATZKE: You told me before the session started, we could do this and that is helping people who understand the need to -- get them to understand the need we need to act today. Okay? Because that's part of a challenge. People look around and say, well, we've got plenty. That's in the future as we phase that out, right, is helping people understand what it takes to make this happen in the seven-year time frame.

So getting people to move today even though we may not be seeing challenges with our grid system, at least here in the northwest today, by helping them understand we can't wait six years and make this decision. These are decisions that need to be made in the near future so we'll be ready as we phase out some of those carbon generators. Thanks.

MR. TAYLOR: Appreciate it, Brad. As always, interject and add more if you have some good insights or perspectives that you want to add. So I do want to make sure that we leave plenty time for Q&A from the audience because I know we're getting some that are coming in. And there's about 20 minutes or so left in the session here.

So I want to go ahead and get to a few of the questions from the audience. And then if we use those up, I'll get back to some other things. So I'd be remiss if I didn't take on a question from our former chairman on the agency that came in to us.

And it asks about the back end of the cycle and whether we're considering that as part of our activities on the advanced reactor program. And I can -- as I mentioned in (audio interference) my opening remarks that our regulatory preparedness is in the back end of cycle. So, NRR is partnering with its counterparts in the Office of Nuclear Material Safety and Safeguards.

So we are working on those activities to make sure that we are engaged in coordinating on all the things that we need to do relative to that. And Chairman Hansen got a very similar type of question as

it related to Yucca Mountain this morning. And of course, there's an element that goes well beyond the NRC's statutory responsibility and goes to the federal government activities related to that. So I think I'm going to leave that question there.

There's a good question that came in, and I do want to pose it. Hold on. I'm scrolling through here real quick and make sure that I get back to it. A question for Brad, and maybe you already touched on this. But I want to give you the opportunity to elaborate. You stated that advanced reactors are key to your future energy mix. Does this include light water cooled reactors such as SMRs? And if not, why not?

MR. SAWATZKE: It doesn't exclude SMRs. But if you're in our shoes again, if you're looking for us looking out for the best interest of our members up here, the opportunity that we see right now in front of us from the partnerships we have as part of the ARDP and the funding from the Department of Energy, remember, I noted earlier cost is going to ultimately be the decider here frankly, probably the big decision maker when it's said and done. And the opportunity we have for our rate payers, if you will,

with the funding that comes from DOE I think puts us in a unique position with the advanced reactors from a cost perspective, plain and simple.

And I've got a couple of large -- a large customer right now who's looking at the opportunities and potential here. And in the end, they made it clear. They're looking at what is it going to cost me when it's all said and done. That's going to be part of the equation.

So I like to say the legislation out here was technology neutral, if you will, technology agnostic. I will say fundamentally Energy Northwest certainly I could say that. But I'm really looking, for me, from the cost and the position we've been put in here with the DOE and the opportunity we've been given with our partners, x-Energy and TerraPower. Frankly, I think it gives it an advantage at this point.

MR. TAYLOR: Thanks, Brad. And I'll just maybe add from the NRC's perspective. While NEIMA was heavily focused on advanced reactors and historically we've classified advanced reactors as the non-light water reactor technologies, as we think about the framework that we're building within the NRC, that

technology inclusive is something that we take very seriously.

And so we're not excluding SMRs and other technologies from our preparedness activities. And we're actively engaged with a number of SMR developers that are focused on light water technologies in either pre-application activities or early engagement in planning for when they intend to come in. So SMRs we think are part of the mix and that we need to be ready to license safe technologies so that the community and the vendors and the utilities can make the best decision for themselves and their customers as long as we can find the technology safe.

So SMRs are part of that advanced community, even though we tended to treat them just a little bit different in our lexicon over time. But they're not different in the fact that they were advanced in their capabilities and offer potential safety margins over the existing large light water reactors. So there's a question here that I want to pose to folks, and it kind of goes to something we were talking about a little bit more.

And I'll open it up. Maybe Chris and Clay may want to jump on this. It goes to a risk-informed

regulation. And what's the basis for a well-founded risk-informed regulation for advanced and risk-informed regulation on the technology that has no track record? Risk is typically assessed largely on the basis of a system's history. And I'll certainly add to it at the end, but I want to give our panelists an opportunity first.

MR. SELL: Let me take a swing at that. The good news about our high temperature gas cooled reactor technology is it is proven technology. It has been built and operated literally for decades and in both the United States, Germany, and other jurisdictions.

And so I would argue outside of the traditional light water reactor, there's probably no technology that has as an extensive operational pedigree at the commercial scale than high temperature gas cooled reactors. So certainly advanced modeling and new techniques have given us a lot of capability that we certainly didn't have in previous generations. But we do bring a substantial -- at least with our technology, a substantial operational pedigree which should in our judgment shorten the path to deployment.

MR. LEVESQUE: Yeah, thanks for the

question, Rob. It turns out that sodium fast reactors have 400 reactor years of experience around the world. And when it comes to safety analysis on sodium fast reactors, a few things to think about.

One is, as Clay would say, there's many new features. Computer modeling over the last 15 years has enabled us to optimize reactor plant design in a way that couldn't be done, even when we were making those 400 reactor years of experience on these proven platforms. So the computer modeling, the advanced materials, the advanced physics all enables these Gen IV benefits.

But I'd like to just share some -- as a person who's spent most of my career working around pressurized water reactors, I'd like to share some realizations I had when I joined TerraPower and began to learn more about our design and about sodium fast reactors. And I think my first realization was in moving to a sodium coolant from PWRs, I realized, hey, we now have a coolant that operates at atmospheric pressure or just above in more than 200 degrees Centigrade above the boiling point of the coolant. That's just a game changer in a lot of ways.

Light water reactors -- which are very

safe and they're the mainstay of our clean energy in the U.S. and many other countries. Light water reactors are often very focused on that proximity to boiling. And in some technologies like sodium fast reactors just give an incredible margin to that.

And now if you think about the coolant having just a natural ability to retain iodine and cesium, there's another game changer. And that's not even considering things like inherent safety and passive safety. So there are these some time-proven and some totally new safety benefits that come into play.

And I realize regulation is always kind of a mix of the science and engineering and the precedent. I think there's adequate precedent in high temperature gas reactors frankly and sodium fast reactors. There's lots of international precedent out there. And then there's room to bring in new features and go look at the science and go look at the ability to have infinite coping times after an accident. And you put all that together and I think you can really have a compelling safety argument and one that you can explain to the public.

MR. TAYLOR: Thank you. Appreciate that

perspective. And I don't think I can elaborate much more on it. I think I've talked a little bit about the importance of leveraging the research that's already been done and the way, Chris, you just explained it, making sure that we recognize the demonstrated safety margin that some of these may have. And that's the responsibility of the vendors to present that information and that basis to the NRC as it makes its risk-informed decision.

We need to take all those factors into consideration as we focus on what is the most risk and safety significant aspects of the design and where we want to put our resources and attention in demonstrating that the NRC's regulatory requirements to protect health and safety are met and that we're doing our reasonable assurance reviews in the appropriate manner. I got a similar question here that I want to take on. And it's focused on the NRC just a little bit.

Does the NRC's risk-informed approach to regulation include the ability to speed through reviews when there is essentially no possible risk to public health and harm? I can say this. We have a responsibility as an Agency to do our reviews in an

efficient manner consistent with our principles of good regulation.

And NEIMA set expectations for the NRC to establish time frames and a framework for doing our reviews commensurate with certain schedules. And we have posted those generic schedules on our public website. And our intent is to meet those schedules whenever possible, and we have responsibilities to report when we can't meet those schedules. But it's a partnership or a responsibility between the vendor and the NRC for the vendor to provide the necessary information for the NRC to make its regulatory finding and then the NRC to focus on those most important aspects and to conduct its review in an efficient manner.

So hopefully that's a response to that question. I'm going to go to another one here that I think kind of goes to Clay and -- oh, no, there's one here I wanted to get to Ashley that I thought was really good. And Ashley, it asks, what do you see is the major changes needed for advanced reactor siting?

MS. FINAN: Great question. Thank you. And I won't be comprehensive here because of the time and it's a developing field. But two things come to

mind.

So one is a change in our approach from a traditional decide what you want to do, announce it, and then defend it. That approach towards siting I think has been counterproductive in a lot of cases and instead moving towards early engagement, incorporating stakeholder input into the decision process, and using two-way communication as well as more sophisticated consideration of environmental justice characteristics. That's one thing.

And then another one relates to the future deployment model. So the current capabilities for siting and engagement have largely been built up and are housed in traditional nuclear utilities. Mostly independently, they've developed these. Many of them are very, very good at it.

But in the future, if the technology is going to provide secure power in niche markets and scale to address climate change, the owners aren't going to be limited to existing nuclear utilities. So we need a more coherent and modernized approach to siting that is transferable from an existing owner to an owner who may not have experience in the past running nuclear plants. And that deployment model has

implications, not just for engagement and siting, but also, as you know, for regulation and ownership issues that I think will be important to the NRC going forward as well.

MR. TAYLOR: Thank you for that, Ashley. Greatly appreciated. Alice, there's a question here that I think would be in your realm. How important will the deployment of the new versatile test reactor be for the irradiation testing of fuels and materials for advanced reactors?

MS. CAPONITI: Thank you. We see advanced design moving toward demonstration, and these are demonstrations of real commercial products. But these early demonstrations have to rely on the materials and fuels that we have today.

And these may not be the fuels and materials that really achieve the more optimized commercial objectives for these designs. So having materials that have more time on them in high temperatures, enhanced corrosion resistance, more optimized fuel design will require the testing capabilities to develop and demonstrate those important technologies. And that means real neutrons under test with time.

And we need the capability to do that, and that's what the VTR offers. So we're working on getting started with demonstrations. But really to achieve the optimized goals for these designs, we need to be able to test the fuels and materials to support them.

MR. TAYLOR: Thanks, Alice. But maybe I'll offer Clay and Chris an opportunity. I remember Clay talking about the ATR as part of their activities. Do you see a role for VTR in the technologies you're deploying?

MR. SELL: Since we're in the speed round, I will quickly say not for us. And I'll yield the rest of the time to Chris.

MR. LEVESQUE: Yes, so definitely the priority needs to be on demonstration of new technologies. And we're fortunate in the case of sodium fast reactors that there was an existing sodium development program and supplemented with TerraPower's own work over the last 14 years and some of the testing we did. We have fuel for the Natrium demo that we're going to be able to license.

But the VTR is going to support multiple different types of reactors, sodium cooled, salt

cooled. And I think it is an asset that our government should develop -- look what Russia is doing. Russia had a VTR called Bor-60, and they're actually updating it to a plant called MBIR.

And if you think about all of this advanced reactor development, our two companies and others, there are going to be many new fuel types that need -- and component types that need a test platform. And just think of how far LWRs came in the last 50 years, right? The fuel that LWRs started with 50-plus years ago has changed night and day.

And so if you had a facility like VTR running in parallel with our programs, I think it would really enhance things and be a great asset for the government. But the priority definitely needs to be on ARDP and demonstrating these reactors. Again, we have a window of opportunity here that will not be open that long for us as a country. It is really something we need to seize.

MR. TAYLOR: Thanks. I think I can squeeze in one more question before we have to wrap up, and it's one that we -- an area we haven't touched on yet. But I would love to get the perspectives of maybe Alice and Chris and others here is, what are

your perspectives on the need for international collaboration on advanced reactors. How does consistency or lack of consistency in regulatory approaches impact innovation?

MS. CAPONITI: I can get started on that. So first of all, I'll draw on some -- just a couple of examples of how we've really benefitted from some bilateral, multilateral collaborations. One is for Generation IV International Forum, an important multilateral collaboration on non-light water advanced reactors.

Our U.S. programs have directly benefitted from this collaboration. And when we saw the high temperature materials added to the ASME code, we leveraged data sets, not just that we developed but also from our international partners. We provided access to that data to the people on the ASME Board.

And when it came time for NRC to review that data for its own concurrence, we were able to provide NRC access to that data set that we gained through our collaboration. We have international code benchmarking activities. There's very limited experience with advanced reactors. And so to the degree that we can share data sets to support the

benchmarking exercise, it greatly enhances our ability to help validate our own codes.

In the area of regulatory framework, we are actively working with our international partners on regulatory framework approaches for advanced non-light water reactors. So we worked on safety design criteria and guidelines for sodium fast reactors. We're actively working on those same criteria for high temperature reactors in collaboration with IAEA. I know that I'm personally engaged with some international regulators on bringing our risk-informed performance-based regulatory framework to awareness with our international regulatory bodies. So those are just a couple of examples.

MR. LEVESQUE: And I agree with Alice. International cooperation is really important. Once we demonstrate these reactor designs in the U.S., they're going to be deployed globally en masse. And if we can get international regulators more familiar now with the safety analysis, with the supply chain needs of these reactors, all the better.

This is an open discussion with the U.S. government. I won't speak for Clay, but I'll speak for us. If the DOE wanted to -- us to involve

friendly U.S. countries in our ARDP project to let them see how we're approaching things like safety analysis and licensing, that would speed global deployment.

I'll also mention Clay and I are both on the executive committee of the Nuclear Energy Institute, and we have a great ongoing discussion with the administration about international deployment of U.S. technology. And the discussion are really great, and they'll all of the tune of, hey, we are -- it's looking like we're going to be the leaders in advanced technology. So let's take advantage of that as a country. Let's renew that example of Shippingport.

MR. TAYLOR: Sorry. Unmute myself here. I think we have just over three minutes left in the session, so I want to make sure we're respectful of people's time as we do. I want to express my profound appreciation and thanks to the panelists, Alice, Ashley, Clay, Chris, and Brad.

I appreciate the perspectives that you brought. And I think they were enlightening, both to me and probably to our audience at large. The questions that we got from the audience, I truly appreciate. They provided some unique perspectives

and insights of things we need to think about and make sure that we work on going forward.

I do agree that the title of this session is appropriate, The Future is Now! We have a horizon and a window that if these technologies are safe to deploy them and to license them in an appropriate risk-informed manner over the coming years. The Chairman highlighted that this morning in his remarks as an area of focus that he's going to have, and we've already seen it as a staff where he's spending time and the questions that he's asking of the staff.

So we appreciate all of those perspectives related (audio interference) this isn't the end. The dialogue will continue at an every six-week basis for stakeholders to engage and hear perspectives. So we encourage you to attend and ask questions during those sessions.

We've been updating our website for the NRC to be able to track our advanced reactor activities more effectively. So we encourage you to follow our efforts there. And we do have digital exhibits as part of the RIC session this year that you can look at. So if you have any questions, we encourage you to follow up in there.

And I'll end with this. The journey will continue, and we are looking forward to taking it with all of you. So thank you for your time and your attendance at today's session. I truly appreciate the great dialogue that we had. I'd like to close out the session at this point. So thanks, everyone.

(Whereupon, the above-entitled matter went off the record at 2:44 p.m.)