Official Transcript of Proceedings

NUCLEAR REGULATORY COMMISSION

Title: 33rd Regulatory Information Conference
Technical Session - M3

Docket Number: (n/a)

Location: teleconference

Date: Monday, March 8, 2021

Work Order No.: NRC-1420 Pages 1-55

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NUCLEAR REGULATORY COMMISSION

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33RD REGULATORY INFORMATION CONFERENCE (RIC)

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TECHNICAL SESSION - M3

U.S. REGULATORY PREPARATIONS FOR THE EXPORT OF ADVANCED REACTORS

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MONDAY,

MARCH 8, 2021

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The RIC session convened via Video Teleconference, at 10:45 a.m. EST, Peter Habighorst, Chief, Export Controls & Nonproliferation Branch, presiding.

PRESENT:

PETER HABIGHORST, Chief, Export Controls & Nonproliferation Branch, OIP/NRC

LAUREN MAYROS, International Policy Analyst, Export Controls & Nonproliferation Branch, OIP/NRC

MAX POSTMAN, Foreign Affairs Specialist, U.S. Department of Energy/National Nuclear Security Administration, Office of Defense Nuclear Nonproliferation

STEVEN CLAGETT, Director, Nuclear and Missile Division, Bureau of Industry and Security, U.S. Department of Commerce

EVERETT REDMOND, Senior Technical Advisor, Nuclear Energy Institute

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P R O C E E D I N G S

10:45 a.m.

MR. HABIGHORST: Good morning and happy International Women's Day. Welcome to today's session on the U.S. Regulatory Preparations for the Export of Advanced Reactors.

My name is Peter Habighorst and I'm the Branch Chief of the Export Control and Nonproliferation Branch in the Office of International Programs at the U.S. Nuclear Regulatory Commission.

On behalf of the NRC, I would like to welcome the panelists andthe audience to the 33rd Regulatory Information Conference.

We have over 800 participants to this session from the industry, government, and academia, 29 countries represented, and three international organizations.

I look forward to hearing from each of our panelists and anticipating outstanding questions from our audience.

This session will highlight the work of the U.S. agencies responsible for commercial nuclear export control, the NRC, the U.S. Department of

Energy, and the U.S. Department of Commerce as each of these organizations prepare for the export of advanced reactors.

The Nuclear Energy Institute representing the nuclear industry will discuss its own advanced reactor group and its views on the U.S. Government's preparation for exports of these types of facilities, technology, and associated components and materials.

Now for a quick housekeeping item. This panel has three polling questions that are live right now.

For the audience, the polling questions can be found at the right of the video display. To submit a response to the questions, click the poll's link. Just below this link, you can submit a question to any one of the panelists.

We are planning on having a panel discussion and display the results of the poll questions for the next 30 to 45 minutes. After the panel discussions, we will open it up for the audience questions to our panelists.

Now I'd like to introduce our panelists. First, Mr. Steve Clagett, Director of Nuclear and

Missile Technology Division, Bureau of Industry and Security, U.S. Department of Commerce.

Our second panelist is Mr. Max Postman, Foreign Affairs Specialist, National Nuclear Security Administration, Office of Defense Nuclear Nonproliferation, U.S. Department of Energy.

Our third panelist is Ms. Lauren Mayros, International Policy Analyst for the Export Control and Nonproliferation Branch in the Office of International Programs at the U.S. Nuclear Regulatory Commission.

And finally our fourth panelist is Dr. Everett Redmond, II, Senior Technical Advisor, Nuclear Energy Institute.

At this time I would like to ask each of the panelists to briefly describe how each of your organizations are involved in the export control for advanced reactors and how your organization defines advanced reactors.

We will start with Mr. Clagett, then Mr. Postman, Ms. Mayros, and then Dr. Redmond. Thank you.

MR. CLAGETT: The Department of Commerce administers the dual use part of the Nuclear

Suppliers Group so we don't regulate the exporter of reactors but instead those materials, manufacturing equipment, instrumentation related to the production of reactors, as well as we maintain controls on certain nuclear end uses, certain nuclear end users, and as you all may know, the end use as well which became much more prominent for the nuclear field with addition of China General Nuclear a few years back.

With respect to how we defined advanced reactors, I guess we would go along with what the general rest of the crowd is being those reactors which go beyond the current generation of Pressurized Water Reactors, Boiling water Reactors and CANDU type reactors.

But as one can see it, the way our regulations are structured, whether or not it's a convention reactor or an advanced reactor in the future, the regulations are set up to accommodate those changes without having us to do any more. We will, take that into account in the normal review process.

MR. HABIGHORST: Thank you, Steve.

Max?

MR. POSTMAN: Great. So DOE's role is

to administer the regulations at Part 810 of Title 10 of Code of Federal Regulations which I'll refer to it as Part 810.

What Part 810 controls is not physical or tangible items but rather the know how associated with civil nuclear energy.

So things like for example if you were to transfer the blueprints for a nuclear reactor to a foreign entity or provide a training on how to operate a nuclear fuel cycle facility to a foreign company. Those things would be controlled.

In terms of our role on advanced reactor exports, so the Part 810 regulation uses the definition of reactor that applies to both existing reactors and advanced reactors.

That definition is consistent with what the NRC uses in their export control regs and it's also consistent with the Nuclear Suppliers Group Guidelines and so the regulation Part 810 does not include a separate definition for advanced reactors.

I can tell you though that we are quite active in the space of regulating exports of technology and assistance related to advanced reactors. We are already seeing such exports today

under our regulation.

Most of what we're seeing today really falls into one of the two categories. The first is U.S. companies that are transferring relatively small amounts of technical information to perspective foreign customers as part of business development activities.

And then the second category is what we call deemed exports where we've got advanced reactor developers who have foreign national employees and they would like to grant those employees access to export control information and that also is controlled under the regulation.

So there's some examples of advanced reactor export activity we're seeing today under Part 810.

MR. HABIGHORST: Thank you, Max.

Lauren?

MS. MAYROS: I'll go now, yes? Just following up from what Steve and Max highlighted. The Department of Commerce does dual use. Department of Energy and NNSA does technology.

And to round out the rest of the nuclear export jurisdiction in the United States Government,

the NRC's export import regulations cover the export and import of nuclear equipment and materials that are tangible, things that you can see and touch and our regulations are codified in 10 CFR Part 110.

Our jurisdiction for export does apply to advanced reactors and we don't have a definition for advanced reactors beyond the definition in Part 110 that defines reactors which is in line with the Nuclear Suppliers Group Guidelines as Max highlighted and with Part 810.

But we do consider our jurisdiction to apply to advanced reactors. And unlike the Department of Energy, to date, the NRC has not received any applications for any export of an advanced reactor or any associated materials or components.

But as the nuclear industry moves toward the commercialization of advanced reactors, the NRC staff thought it was a good time to look, to do a fundamental review of our regulations in order to ensure that the NRC is prepared to license the export of non-light water reactor technologies and to reduce any regulatory uncertainties associated with deploying new nuclear reactor technologies.

We do not define as I said, advanced reactors but we consider an advanced reactor anything that is non-light water reactor technology.

And our goal with this fundamental review is to ensure that when the time comes and we do receive it, our first application in-house at the NRC for the export of advanced reactor, that we avoid any undue delays in the licensing process due to a lengthy jurisdictional determination or any unforeseen gaps in our regulations.

And the NRC is confident that we are generally ready to license the export of advanced reactors and I'll highlight more of that going forward in our panel today. Thank you.

MR. HABIGHORST: Thank you, Lauren.

Dr. Redmond?

DR. REDMOND: Thank you. And thank you for including me in this panel discussion today. I very much appreciate it.

NEI is the trade association for the commercial nuclear industry and we have members that represent all aspects of the fuel cycle.

So for mining, conversion, enrichment, reactor developers, utilities, supplies, and

companies involved in the back end of the fuel cycle.

We have over 300 members in 17 countries. And specific to advanced reactors, we have over 20 developers of advanced reactors as members of NEI.

Now we consider advanced reactors to be both light water small modular reactors as well as non-light water reactors.

So when we say advanced reactors it encompasses all the technologies, very similar to what the other panelists have said.

We represent the industry on generic issues and interface with various government agencies in many areas including export controls.

We have various working groups and task forces with our members to address the generic issues, policy, technical, regulatory issues.

For example, we have an advanced reactor steering group, advanced reactor forum, and a regulatory working group.

We also have an export controls task force specific to this topic and we are actively engaged with various government agencies, NRC for example, through stakeholder meetings every six to eight weeks, and then also actively engaged with DOE,

Department of State, Department of Commerce, to different forums and actively engaged in Part 810 reform which we'll talk about a little bit later in this session.

And we have worked in the past with Pillsbury Law firm to host export control workshops. So very active in trying to get information out there. Thank you.

MR. HABIGHORST: Thank you, Everett.

Let me just have a quick follow up question. I know that both Lauren and Max, you mentioned the Nuclear Suppliers Group. Could you define that for the audience or at least describe that group to the audience? Either one.

MS. MAYROS: Max, do you want me to take it or do you want to take it?

MR. POSTMAN: You go for it, Lauren. You've been doing a lot longer than I have.

MS. MAYROS: That's true. I've been associated with the NSG since 2005 and the NSG, the Nuclear Suppliers Group, is a group of 48 countries that are able to supply nuclear goods.

And the NSG has two sets of guidelines that it promulgates. The first set of guidelines,

Part 1, is anything nuclear, is anything that has been especially designed or prepared for nuclear end use which is what we typically think of as the things that the NRC controls for export in Part 110, as well, it also includes technology that NNSA controls.

And then the NSG Part 2 Guidelines are your dual use commodities which are controlled for export by the Department of Commerce.

And the NSG, U.S. Government is represented by all the licensing agencies at the NSG. Max, Steve, and myself are all on the delegation to the NSG and we work throughout the year with all of our close trading partners as well as partners that we don't regularly trade with but who are members of NSG to update these guidelines throughout the years to ensure that they are up to date with the developing technology that is currently developing, so including advanced reactors.

So Max, if there is anything else you'd like to add, that is, we'll probably mention the NSG throughout this panel today.

MR. POSTMAN: No, I think that sums it up.

MR. HABIGHORST: Yes, thank you very

much, Lauren.

And thank you, panelists, for the introduction and I appreciate that.

So what I'd like to do is transition now to the first question for the panel. And this will be directed to our panelist members from Department of Energy, NRC, and Department of Commerce.

How can the United States government become positioned to facilitate exports of advanced nuclear technology and hardware while maintaining high standards of nonproliferation control?

I'd like to start with Mr. Postman and then Ms. Mayros and them Mr. Clagett. Thank you.

MR. POSTMAN: Great. Well, I think our existing export control regulations provide a very strong foundation for facilitating advanced reactor exports while maintaining high nonproliferation standards.

The best example of that I think within the Part 810 regulation is what we call the use of generally authorized destinations.

So in that regulation there's a list of 50 destinations to which the Department of Energy has determined that transfers of most kind of Part 810

control technology in the system are the use of the Atomic Energy Act not inimical of the interest of the United States.

And what that means in practice to the nuclear industry is that they can transfer most kinds of nuclear technology controlled under 810 to those destinations without requiring any kind of advanced authorization from the department. They submit a report within 30 days of starting work.

So that provides a very streamlined process for those types of transfers that have already been determined to not pose any risk to the United States.

In terms of advanced reactor technology, most forms of advanced reactor technology are eligible for those general authorizations except advanced reactor designs that involve reprocessing or a fabrication of nuclear fuel containing plutonium or other sensitive aspects of the nuclear fuel cycle.

Those would not be eligible and would require specific authorization.

In addition, you know, as we talk about facilitating exports, for those transfers that do require specific authorization and whether that's

because of the transfer to a destination that's not listed in that list of 50 or any other factor, we are working hard to streamline the process for companies to obtain those specific authorizations.

And in fact, in recent years we've reduced the average processing time to approve specific authorizations under 810 by nearly 50 percent.

MR. HABIGHORST: Thank you, Mr. Postman.

Ms. Mayros?

MS. MAYROS: I think our goal as regulators is to always try to balance nonproliferation controls with legitimate trade.

And part of that is ensuring that we don't over regulate or under regulate items that are under the NRC's export control jurisdiction.

We have been licensing the same technology for the past 40 years and now we are looking at licensing some potentially new technologies that are associated with advanced reactors.

I think it's important to turn our licensing mindset away from solely focusing on light water technologies.

The NRC recognizes that the Part 110 is very much focused on light water reactor technologies.

And so as I mentioned in my previous remarks, the NRC took a holistic review of our regulations and in order to accomplish this forward looking exercise, the staff organized a working group in order to identify any gaps in the regulations and to ensure that there are sufficient controls on the export of nuclear equipment and materials as well as to prevent any future delays or disruptions to the export licensing process when we are looking at advanced reactors.

That working group was comprised of most, many of the program offices here at NRC.

It was comprised of licensing, export licensing experts as well as domestic licensing exports, subject matter exports on advanced reactors.

We also had Max participate from NNSA and Argonne National Laboratory.

And we identified five reactor types and 14 associated designs that we consider that we thought would, we would most likely see in the next five to ten years for export, just based on the

maturity of the design, and whether or not that company had approached NRC to talk about domestic licensing and qualification.

We compared those reactor types to Part 110 and we researched whether or not we thought Part 110 was ready to license these types of facilities.

And the good news story is that we think our regulations as Max pointed out, he thinks 810's generally ready, we think Part 110 is generally ready.

But we did identify some sections in some parts of 110 that are very much focused on light water reactors and we think that it could benefit, the industry could benefit from clarifications.

Whether that's to the regulation itself or whether we issue some kind of regulatory guidance, we think it would be helpful to industry going forward to have some of those clarifications.

And an example of what we identified would be something like, Part 110 specifically mentions zirconium tubes that are used in nuclear fuel cladding for export.

And as we all know, there are many more types of material and many more forms of cladding

that are out there on the market now.

And so we don't want industry to think we only regulate zirconium tubes for use as cladding. We want them to understand that all types of nuclear cladding would fall under the NRC's export jurisdiction in Part 110.

So it's those kinds of things that we identified going forward as we approach this new type of licensing that we want the industry to see that we are taking these things into consideration and hoping that we can provide these clarifications.

But knowing, but know that we are ready to license these and we think Part 110 is also ready to license these types of technologies.

MR. HABIGHORST: Thank you, Ms. Mayros.

Mr. Clagett?

MR. CLAGETT: Yes, the Department of Commerce maintains export controls predominately on a list based not with parameters identifying the items, we don't rely on a specialty design. We have, you know, definite parameters.

So one thing would be just to make sure probably with the nuclear suppliers people that there isn't a new material or something else that's not on

the list. I think we have plenty of time to add it beforehand.

And probably one of the best tools that we will have would be this interaction within industry to determine what are the capabilities of these advanced reactors.

And one thing that we can envision, in the future as reactors get smaller and smaller, some of the things that we never thought about such as the individual location of where a reactor is being built, or is it possible for it to be mobile will have to come into play, whereas now we can think of reactors as large and for lack of better, large industrial facilities that may serve, you know, a vast geographic area for eventual power.

As they become smaller where it may be a very much more centralized applying power to things such as where is being used and who is operating it may become more into play as we look at the nonproliferation or national security implications of those exports.

MR. HABIGHORST: Okay. Thank you, Mr. Clagett.

Just one quick follow-up and for Mr.

Postman. Can you give an example where you mention streamlining the 810 process by reducing the time it took to approve the specific authorization by 50 percent. Could you give a couple examples or one or two examples that contributed to that?

MR. POSTMAN: Absolutely. So one of the big things is in order to approve a Part 810 specific authorization we need to get assurances from the foreign government that would be receiving the technology, what we call nonproliferation assurances.

And the process of obtaining those can be very lengthy right because we're working through a foreign government's bureaucracy to get this response.

One of the changes that we've made in the last few years is that now at the same time that we're waiting on that foreign government response, we're processing the authorization request through as many review steps as we can, instead of in the past you would process what essentially would be on hold while you waited for that foreign government to provide it.

So that's probably the foremost example I would cite. There's been a number of other changes more in the kind of the weeds of the review process

but that's the big one.

MR. HABIGHORST: Thank you, Mr. Postman.

Just one quick follow-up for Mr. Clagett. You mentioned being risk based and if you introduce new components or materials.

How long does it take particularly for Department of Commerce to make an assessment of that type of export and the controls necessary?

MR. CLAGETT: I mean, actually processing a license itself is very quick. We have an executive order timeline. Most licenses, our average processing time is in the, less than 30 days.

As far as adding the materials, traditionally we like to go the multilateral route to the Nuclear Supplier Group so depending on what the new material is.

It could be anywhere between one or two sessions, you know, less than a year to some I've been working on for four or five years. It really depends a lot upon the actual technology and what all is involved.

MR. HABIGHORST: Well, thank you.

Thank you, Mr. Postman, Ms. Mayros, and Mr. Clagett.

Now I'd like to direct a question to Dr. Redmond. How can the U.S. commercial industry be positioned to become an exporter of advanced reactor technology and hardware?

DR. REDMOND: Thank you. Let me start by saying the industry is committed to maintaining high standards of nonproliferation control and safeguards and security. This is something our developers, our community, our suppliers, are focused on.

And I want to thank DOE and NRC and Department of Commerce for all of their efforts in streamlining the various processes, specifically with DOE, the streamlining of the 810 process is a great ongoing effort and I appreciate the comments Lauren made about NRC proactively looking at Part 110 to be prepared for export of advanced reactors so that's fabulous. Appreciate that.

There's still more to be done in this area in terms of improving inefficiency both on the government side as well as the industry side.

And in my perspective both government and industry need to be focused on exporting U.S. advanced reactors.

I want to take a moment and explain why I feel that's the case. I'd note that the U.S. industry is competing in many ways against state owned enterprises who by their very nature are able to leverage the resources of the country that they're from.

And currently nearly two thirds of all nuclear power plants under construction use Chinese or Russian designs. So we are as U.S. industry needing to begin to export technology and export our reactors as quickly as we can to compete.

Now if we contrast this with the privately owned U.S. reactor vendors who currently have no foreign orders in the market, the Department of Commerce has stated in the past that they value that market that may be between 500 and 740 billion over the next ten years.

So it's a huge market out there that we, the industry and the government need to focus on penetrating.

Now as the focus continues to increase on climate change, I expect the demand for reactors to increase overseas and in many countries that do not currently have nuclear power. So again, an effort

to strengthen and push on export controls appropriately is the right thing to do.

Last thing I'd mention is exporting reactors develops a hundred year relationship with the receiving country from the licensing and construction to decades of operation for the machines as well as decommissioning.

And we should all remember that a strong U.S. industry present in global commercial energy markets promotes U.S. standards for nuclear safety security and nonproliferation.

To achieve this, we all must work together to effectively implement nuclear trade controls and I thank everybody here in the different agencies for their efforts in this area.

And the lines of communication, as Steve said, are vitally important in, you know, that engagement, vitally important in proving export controls. Thank you.

MR. HABIGHORST: Thank you, Dr. Redmond.

Just one quick follow-up. As you mentioned, a bulk of the new construction is Chinese or Russian design.

And what would be a couple of suggestions

for the U.S. Government to, from the industry's perspective to try to change the table on that?

DR. REDMOND: So there's a few things. One thing I want to mention, which many people in the audience are probably aware of but maybe not all, we have demonstrations under way in the United States right now.

NRC for example, has an application under review for an advanced reactor, a micro reactor, and they're moving well in that area and NRC is doing a great job of preparing itself for more efficient reviews of advanced reactors.

The Department of Energy has funded through a program called the Advanced Reactor Demonstration Program, two demonstrations to be completed by in about seven years and then funded a number of other technologies to create a pipeline of technologies.

So I think this joint effort and cooperation and partnerships between the industry and the government is helping to get us prepared to export the technologies so that we have machines, we are ready to operate, ready to export, ready to demonstrate, so people can look at them.

So there's actually a lot of stuff going on right now with all of the organizations on this panel.

MR. HABIGHORST: Okay. Thank you, Dr. Redmond.

At this point in time, I would like to see the results of the first polling question and I would like our panelists to share a reaction on those results. So we will wait for those results to be available.

Can the panelists see the results? I see the questions, I do not see any of the results.

MS. MAYROS: No.

MR. POSTMAN: No.

DR. REDMOND: Same. Oh, here we go.

MS. MAYROS: Wow. Oh, wait, wait.

MR. HABIGHORST: Okay. It looks like we might have some difficulty with the poll results. Oh, here we go. Thank you. Okay.

Okay. We have the results. It's actually difficult for me to see. I was wondering if our panelists could actually see those results and there we go. Thank you very much.

So I guess it appears like a majority of

people somewhat agree that the regulations apply to advanced reactors and the clarity it there. Now let's change it.

So, okay. Any reaction to these results? It looks like it's moving around. It looks somewhat even at this point in time. Some would agree and neutral as far as regulations.

So I would ask Ms. Mayros, Mr. Postman, Mr. Clagett, and Dr. Redmond if you have any quick thoughts about the polling results and thank you for the polling results.

MS. MAYROS: I can start. And because I touched upon it earlier about whether or not it was, our regulations were clear that they also applied to advanced reactors to I actually feel a bit encouraged by the results that I'm seeing today on the poll today.

Glad, you know, obviously we want our regulations to be user friendly and we want them to be easily understood.

But we do recognize that we are facing a new world and there's new things coming on the market that it might not necessarily translate into what is currently written or it might not be clear.

And so this to me is encouraging that our licensees and potential licensees are savvy enough to see how they apply to new things that are being developed and coming onto the market today.

And perhaps we are, the conclusions of the NRC's working group are correct, that maybe we just need a few clarifications for industry to be clear that how they apply the advanced reactors.

But I think the question of whether the, where the jurisdiction lies for advanced reactors based on the results, perhaps that is clear to our potential licensees.

MR. HABIGHORST: Okay. Thank you, Ms. Mayros.

Mr. Postman?

MR. POSTMAN: Yes, I share Lauren's view that those results seem positive. Glad to see those results.

I would add that, you know, in the 810 space, we work with companies every day, both on the advanced reactors side and in terms of the existing reactors when there's ambiguities or they have confusion as to how the regulations apply to their activities.

And so I'd strongly encourage any person or organization out there who has questions about how the reg applies to their activities especially in the advanced reactor area, just submit a request for advice to our office. We'll get an action officer to work with you one on one to get you eventually an answer to that question. So certainly encourage people to reach out when they have those questions.

I'd also note that we are both on the part of end key in our broader organization. We're carefully monitoring developments in advanced reactor technology in the industry.

We are prepared to issue additional guidance or even rulemaking revisions if that proves to be necessary in the future.

MR. HABIGHORST: Thank you, Mr. Postman.

Mr. Clagett?

MR. CLAGETT: You know, I think as Lauren alluded to, the broad definition of a nuclear reactor basically encompasses all of the current technologies that we're envisioning as advanced reactors.

Perhaps maybe sometime in the future, probably long after I retire there may be some need for some kind of a future clarification as to, you

know, some kind of a combination hybrid reactor fusion accelerator-driven type system something like that which maybe will require an update to the regulations.

But as far as what we've seen as the advanced reactors they seem to be still thought of the larger rubric of reactor as defined.

MR. HABIGHORST: Thank you, Mr. Clagett.

Dr. Redmond?

DR. REDMOND: I share the views of my colleagues here. I'm pleased to see the results. As Max has said, we've already had companies and companies are already engaging and doing exports of technology. So I think the regulations are in a pretty good place.

Obviously continued improvement is always necessary but I mean specific to advanced reactors I think we're in a pretty good place so pleased to see it.

MR. HABIGHORST: Thank you, Dr. Redmond and thank you, panel.

I would like to then go onto another question for all the panel members and the question is the following.

How important is external outreach to the advanced reactor community, non-government organizations, the public, the vendors, on advanced reactor export controls and what specifically are your organizations accomplishing related to this outreach?

We'll start with Ms. Mayros, and then Mr. Postman, Mr. Clagett, and Dr. Redmond. Thank you.

MS. MAYROS: Yes, outreach is crucial. We've always thought that it's extremely important.

As Max mentioned, first of all, our licensing experts here at NRC are always available for phone call, email, to answer your questions. If you're in doubt, just pick up the phone and call us.

On top of that we do engage in a robust outreach program already. Many times that program involves outreach with the inner agency together so we're very much used to going out as a group.

We call it the road show and we like, we go around the country and we tell people all about our export control regulations and try to answer their questions in person. This year obviously has presented challenges but I think actually virtual meetings have proven to be extremely successful so

the NRC recognizes that.

We want to start concentrating more of our outreach efforts not at the big established companies, not that we did that but we know those companies understand those regulations very well.

And so now we're thinking maybe we need to do more outreach to these emerging advanced reactor vendors. And so we have already connected with NEI in this past year, in 2020 and in 2019, to reach out to NEI's advanced reactor working group.

We've also done outreach to the NRC's advanced reactor stakeholders meetings. We've also done things with the Institute for Nuclear Material Management.

So we're trying to find ways to do outreach this year virtually and probably also in 2022 but we're also contemplating setting up formal workshops that the NRC, or perhaps in conjunction with the DOE we can set those up and we can have one day-long workshop where we, when the world normalizes and we can be face-to-face again.

So we think it's crucial, we think it's very important, and we're trying to continue to do outreach in spite of our, the obvious challenges

we've had this past year.

MR. HABIGHORST: Thank you, Lauren.

Max?

MR. POSTMAN: I agree totally with Lauren that outreach is extremely important in the export control context especially to the advanced reactor industry.

I think one of the things that's really exciting about this industry is one of the things you see are individuals who are coming from outside the nuclear industry or bringing ideas from other fields to the advanced reactor field and there's a lot of interesting things that come out of that.

But I think that does further underscore the need to provide outreach on export control to those organizations because those individuals haven't necessarily worked in nuclear for a long time, aren't necessarily coming in with a preexisting understanding of the regulatory architecture here.

In terms of what we're doing, we have an extensive outreach program. We do live quarterly online trainings on the Part 810 regulation.

We publish training materials on our website and we also like Lauren said, travel to

conferences and do presentations at corporate offices.

To give you an idea of the scope of that, last year we did a total of 18 training presentations to a total audience of nearly 500 people.

Lastly, I want to highlight an outreach initiative that our parent organization, the Office of Defense Nuclear Nonproliferation is spearheading.

That office is working to establish something called U.S. Nuclear Nexus and what that is is a resource for the U.S. nuclear industry to access the extra piece to the National Nuclear Security Administration, to access the systems, related not just to Part 810 export controls but also areas like safeguards by design, security by design, proliferation resistance, some of those things Everett was talking about earlier as key priorities here.

And so Nexus serves as a single point of contact to access National Nuclear Security Administration assistance in those areas.

It's going to include a website and also a human point of contact for one-on-one help and that's something that our office and our organization

are very involved in. It's not limited to the advanced reactor industry but I do think it will be especially useful for the advanced reactor industry.

MR. HABIGHORST: Thank you, Max.

Steve?

MR. CLAGETT: Yes, the Department of Commerce has a very robust outreach program , we have our annual conferences as well as conferences held throughout the country.

Naturally they're all done remotely now but hopefully we'll be back next year as to meet face-to-face.

We've also been very willing to meet with industry on a company by company basis or with larger groups, a participation in such things such as the Pillsbury NEI conference.

And also, it's important for some of these newer companies, some which are very small, to understand the scope of the commerce regulations which though they tend to focus on the 810, 110 type thing but many times whether it's hiring the foreign nationals, artificial intelligence, procuring certain materials, through exporting certain materials, they can come up against the commerce

regulations where they think if they're purely within the 810 scope if there's something that they, something to be aware of that our controls apply as well when you're hiring people to do set up for your factory or doing things like that.

You know, just to be aware. So we are working on awareness. And again, our regulations for the most part apply across the board to everyone.

So even if it's not a small module reactor workshop they'll get something from our standard outreach type activities, just the understanding of where our regulations are and how they apply to the commodities, not so much the industry.

MR. HABIGHORST: Thank you, Steve.

Yes, Everett? Would you like to respond?

DR. REDMOND: Sure, thank you.

External outreach is vital. I cannot agree more with my colleagues here on that.

There are more, many more stakeholders involved besides those represented here today. NEI engages with a number of those folks, many of the other non-government organizations , obviously the industry and the government and it's vital that we

continue to open, maintain open lines of communication.

And I applaud the efforts that have been done by the different agencies here. One thing I'd particularly mention is the Nuclear Nexus Initiative that Max mentioned, I think will be very beneficial and I applaud NNSA for this effort.

They came and spoke at one of our advanced reactor working group meetings back a while ago to kind of introduce the concept to it.

As Lauren mentioned, NRC's been engaged with us. So we provide access to our members from the different agencies. So when you guys have updates to provide, you know, and engage and get some information, great opportunity to do that. We encourage it and our members really appreciate that.

We continue to work with the industry and non-government stakeholders also to try and convey a common message to the administration, Congress, and various government agencies about the need for export controls.

And the last thing I'd mention, kind of a little bit different tune for just a second, DOE's gateway for accelerated innovation and nuclear is

also working to make information available to the advanced reactor community in other stakeholders and is engaging well with both the industry and government agencies.

So the GAIN website is a great place for some generic information to be put there and I think, you know, there'll be a link, a link for example probably between GAIN and the Nuclear Nexus when that's set up. So it's important to kind of keep that in mind as well.

The last thing I'd say is the advanced reactor community is changing rapidly. We have a lot of startup companies, a lot of new folks in this area so this continued engagement is vital. Thank you.

MR. HABIGHORST: And thank you, Everett.

And thank you, panelists.

At this point in time I'd like to look at the results of only polling question number 2. There it is. And it looks like, okay, thank you, overall majority believe that the first export to the United States of an advanced reactor within the next five to ten years.

And I'd ask the panelists for their reaction to that result. We can start with Dr.

Redmond.

DR. REDMOND: Sure. I think I actually agree with this and I think I'm pleased to see that. A couple things I'd say, right now in the United States we're working to deploy at least four advanced reactors before 2030 and numerous companies are already engaged outside the U.S.

Max mentioned that companies are engaging in Part 810 exports. But we have companies engaged in Canada for example, with the nuclear regulator's own vendor design review.

And it's actually quite likely that a micro reactor from a U.S. company will be built there by 2025, and also it's possible that a small modular reactor will be built before 2030 possibly using a U.S. advanced reactor design in Canada, that is, and that could be water cooled or non-water cooled. We'll just have to wait and see.

So I think exports in that time frame are absolutely possible.

The last thing I'd mention is a few of our companies, advanced reactor companies have signed a memorandum of understandings with various countries to explore the deployment of their technology and

then U.S. companies, as everybody knows, regularly compete in international vendors.

MR. HABIGHORST: Thank you, Everett.

Steve, would you like to respond to that result?

MR. CLAGETT: No, I, sounds perfectly good. We hope so, that it'd be nice to have U.S. industry physically exporting reactors within that time frame. Glad to see that industry believes that as well.

MR. HABIGHORST: Okay. Thank you, Steve.

Max, do you have any reaction to that polling question?

MR. POSTMAN: I appreciate the input. It seems like a reasonable assessment. It's viable to me to get that sense of the group here. And I think it's very consistent with what we usually see in Part 810 which is the 810 regulation that's the controlling know how tends to serve as a leading indicator for U.S. trends in the U.S. export market.

So while exports, the physical components may be five to ten years away as said here, as we just discussed, we're seeing those leading indicators

of limited technology transfer under 810 happening in a lot of cases today.

MR. HABIGHORST: Thank you, Max.

Lauren? Any reaction to the polling results?

MS. MAYROS: Yes. I think this is a little more directed towards an NRC type export and again, I am encouraged by it and I think the NRC is working hard to ensure within this time frame there will be no undue regulatory delays because we will have really, like I said, taken a deep dive into our regulations to ensure they're ready.

I will note that, and I get this question a lot, during my outreach initiatives, a lot of companies have come and asked me, well, does my design have to be approved by the NRC before I can export something out of the United States.

And interestingly the answer is no. A company does not need to have a domestic NRC design approval before it can apply and receive an NRC export license.

Now granted, I'm not sure a lot of companies abroad would want to, who knows, maybe they would want to buy a design that hasn't been approved

yet by the NRC but that possibility does exist.

And I recognize that perhaps companies might not be ready to export an entire facility but maybe they're currently working on smaller components that are already ready to be deployed.

So it, in terms of that, you can come to the NRC at any point for an application if you are looking to export your small component abroad.

So of course a whole another conversation is the criteria that these exports have to meet and I'm sure I, maybe perhaps a company wants to ask about that we can hit on that later, but that's just a, I do get that question a lot so I wanted to make sure I said that today.

MR. HABIGHORST: Thank you, Lauren and then you, panelists.

If we could put up the results for our last polling question? Okay. And it looks like a large majority of people felt that allocating limited resources towards internal export control compliance programs and that is the biggest challenge facing companies in terms of their compliance with NRC, Department of Energy, and Department of commerce export control regulations.

And I would ask any of the panelists if you have a reaction to that polling result? We can start with Mr. Clagett.

MR. CLAGETT: The Department of Commerce, we regulate a wide swath of technology. Everything from firearms to jet aircraft to nuclear reactor type power generations.

The thing is I think the most important thing for the industry to understand is what the rules are and what the burden is.

Many times the burden is far less than they, they think it's far more than it really is. We need to find out how that applies to you because again, we deal with some of the largest companies in the country and a lot of one or two person shops and they can all abide by the rules once they understand them.

It should not take, you know, an army of auditors under, in your company once you understand the rules. So I think the crucial thing is to learn the rules and then see. And plenty of times I think the burden will be far less than you really think it is.

MR. HABIGHORST: Okay. Thank you,

Steve.

Max or Lauren?

MR. POSTMAN: Yes, I'll jump in. I, definitely resonated with me the large number of people saying that the limited resource is the challenge.

It's certainly something we see as we're working with reactor developers, that a lot of the advanced reactor developers are smaller organizations.

They don't necessarily have the resources to hire full time export control staff from like larger more staff might be able to do.

I would say, you know, in those cases I believe it's especially important for everybody in the organization, from working level engineers up to senior management, to have a solid understanding of export control requirements.

Doesn't mean everyone has to be an expert or know everything but they should know enough to know when to pause and to go ask for help.

We've actually developed a training called the Part 810 awareness training. It's on our public website. It is specifically aimed at that

kind of working level individual who's not an export control professional but is just dealing with 810 controlled information on a daily basis. It summarizes the regulation, dispels some common misunderstandings.

We deliver that live online every quarter, strongly encourage companies to take that information, incorporate it into their own internal framings if they see fit to do so.

MR. HABIGHORST: Thank you, Max.

Lauren or Everett? And then we can go onto questions from the audience. So any initial reaction, Lauren or Everett, from the response from the polling question?

DR. REDMOND: So --

MS. MAYROS: Well, oh, go ahead, Everett. Go ahead.

DR. REDMOND: I'll jump in. I actually agree very much with what Steven and Max just said which this goes for that early engagement and the continued engagement between companies and, you know, the government here to understand stuff.

I think Max is absolutely right in terms of the Part 810, you know, understanding. I think

it's important that every member of a company have that sort of base understanding and I know we've had briefings at NEI about that as well.

So it's just important to get that companies are, many of these companies are very small but that doesn't mean that they're not committed to, you know, maintaining nonproliferation in export controls. They are. It's just more challenging. Thank you.

MR. HABIGHORST: Yes, thank you.

Lauren, any thoughts?

MS. MAYROS: Yes, I won't take up much more time. Just to echo what my fellow panelists have said about early intervention, about if you have questions please don't hesitate to call us.

Our phone numbers, our email addresses, they're all online and you can reach out to us at any time with your questions.

But I'm also encouraged that companies are seeing that this is a place, perhaps a room for improvement, right, a room for improvement.

Up to this point perhaps they've been very much concentrated on developing their technology and now they're starting to learn, ok, now let's turn

our focus more now to this.

And so I actually find the result encouraging in that they recognize that this is, that there's room for improvement in this area.

MR. HABIGHORST: Well, thank you, panelists, and thank you, Lauren.

At this time, I'm doing a time check and we have about, it looks like around ten to 15 minutes. And I want to start to address some of the questions from the audience.

It looks like we're over 25 questions or Let's see if we can address as many as possible and so let me start here with the first question.

And this is for Lauren and Max and Steve. Will there be harmonization effort in export control regulations from the U.S. with other countries who also embark on advanced reactors development and deployment domestically and for export?

Lauren, do you want to start us out?

MS. MAYROS: Sure. I can just say that I told you that we were going to reference the NSG and I think this is a perfect opportunity to talk about our obligations as a member of the Nuclear Suppliers Group.

And the whole point of promulgating international standards for export control is that we're all going to be playing on the same playing field.

That is our goal as a member of the NSG so know that if the major suppliers of the world are members of the NSG, we're all working off of the same set of international export control standards. And so that work is currently underway in the NSG.

But if any changes are made to the NSG Guidelines, the Part 1 Guidelines, then the NRC makes those corresponding changes to our Part 110 regulations and that ensures that we are playing on the same level of playing field as our international partners.

MR. HABIGHORST: Thank you, Lauren.

Max?

MR. POSTMAN: Lauren covered it. I'm not going to add anything in here.

MR. HABIGHORST: Okay.

Steve, did you want to offer anything?

MR. CLAGETT: I agree with Lauren. Yes, I think in general we'd like to avoid unilateral controls of that whenever possible.

MR. HABIGHORST: Okay. Let me jump to a question for Everett. Do you think the U.S. nuclear industry will ever be able to source large vessel components from the United States companies? Example, large reactor vessels have to be made in South Korea, et cetera.

DR. REDMOND: Yes, it's a good question. One thing I'd note though is with many of the advanced reactor designs that are out there now we're actually moving away from some of these large vessels for just that reason because there is a limited ability to source them.

So many of the advanced reactors, not all designs but many designs, operate at close to atmospheric pressure which means you don't need large vessels.

The advantage of that too means you can source some in different locations. For example, in the U.S. and we're hoping to have more of the supply chain here in the U.S. which then also helps us in terms of the broader export control.

So specific to the question, I don't know about the ability to source large vessels but I know the industry in terms of advanced reactors is trying

to move away from that. Thank you.

MR. HABIGHORST: Thank you, Everett.

Let's take another question from the audience. This one is for Max.

Would you make export of technology subject to nuclear cooperation agreements thus being obligated?

MR. POSTMAN: Yes, this is a great question. And so when we talked about nuclear cooperation agreements in the U.S. context we're talking about agreements for peaceful nuclear cooperation pursuant to Section 123 of the Atomic Energy Act. You probably know them as 123 Agreements.

So the 123 Agreements actually come from a different part of the Atomic Energy Act than the Part 810 regulation.

So when we talk about Part 810 control transfers, for the most part they're actually not made under the auspices of those nuclear cooperation agreements. They're made pursuant to their own separate legal authority.

With that said, a Part 810 authorization, a specific authorization is still issued on the basis

of assurances from the foreign recipient that the U.S. technology they're receiving is only going to be used for peaceful purposes, that the U.S. origin technology's not going to be retransferred without our authorization, and that the entity receiving the tech is authorized to get it.

And so you're going to see those same nonproliferation assurances either way but it is a separate legal mechanism in the United States.

To get to that specific point about being obligated, you know, the conduit of obligation can be complex and can refer to a lot of different things but there are retransfer controls U.S. technology exported pursuant to Part 810.

We would not want to see U.S. civil nuclear technology getting transferred to a third party and then losing all control of that and that third party being able to transfer it to whoever they want even if that retransfer could not cause issues relative to nuclear proliferation concerns or even U.S. economic security.

So that's why we, along with other governments pursuant to the NSG Guidelines, do require those non-retransfer commitments as part of

our exports.

MR. HABIGHORST: Thank you, Max.

This next question will be for everyone. Does one agency have the lead on export? Is there a need for one stop shop or an ombudsman? Is this a function NEI can serve? Why don't we start with Everett?

DR. REDMOND: So I think NEI is in a position to help coordinate as much as we can. At the end of the day the government agencies have to handle their regulatory issues and there are many government agencies involved as we see here.

I think one thing that can be done though is a little bit more of a focus on a single individual within the government that kind of handles that inner agency interaction and that's been recommended actually in a DOE report last year on restoring America's nuclear future as well as an Atlantic Council report.

And in the past there's been the concept of Team USA to kind of help coordinate the agencies all on the same focus of, you know, helping enable efficient exports. So I think that's key.

MR. HABIGHORST: Okay.

Steve, would like to comment on that question?

MR. CLAGETT: I mean, as far as a need for coordination, it's always good that each agency knows what the other agency is doing.

But given our current domestic licensing practices of our exports, I mean, Department of Commerce licenses get reviewed by the Department of Energy and other agencies.

We look at 810 authorizations. As part of the executive branch we look at 110 authorizations. So we do get an idea of what each agency is doing but I think again it's something that when industry comes into us as a group and says, this is what we want to do and pick a country, in Uruguay, then we would say, okay, this at that time this is the 810 authorizations requirements, you may have the 110 requirements and the commerce requirements so we're all aware of the great Uruguayan project at its inception.

So when it comes in, we don't want a case where, you know, DOE authorizes the technology and somehow we can't supply the material to make it or they can't get, you know, 110 components.

That's the one thing we don't want to see where, you know, one agency is actively supporting it and the other two somehow delay it, so.

But I think in general given the long term, the long term-ness for lack of better, of these type of nuclear projects, we have plenty of time to coalesce around a single government approach.

MR. HABIGHORST: Thank you, Steve.

Lauren, do you have any reaction to the single point of contact or one agency?

MS. MAYROS: Yes. I'll just echo what Steve said, is that we don't license in a bubble and I want everyone to understand that we do have, we work very collaboratively and very closely with the inner agency on many, many licensing decisions, almost all of our licensing decisions.

And sometimes those decisions, they depend on an executive branch view before the NRC can move forward in our independent capacity with an export licensing decision.

So I did want that to be clear, that we don't license in a bubble and I don't think any agency does.

Most of the pertinent agencies that are

represented here are very involved in each other's licensing process, whether through, mostly through regulation. Our regulations require us to do that, to perform those functions.

I do recognize the idea of an ombudsman. I mean, just speaking from my own personal, not representing the NRC here but it could be a good idea.

But again, we have regular Team USA meetings, we have regular, there's other types of forums that are stood up in the government currently to coalesce and discuss on a regular basis export licensing, topics, and issues.

So it is happening. It regularly happens. That is an established function so there isn't an official ombudsman but I think overall that is happening and that function is happening in the U.S. government.

MR. HABIGHORST: Thank you, Lauren.

Max, do you have any thoughts with the single point within the U.S.?

MR. POSTMAN: No, I think the other panelists covered it, thank you.

MR. HABIGHORST: Okay. Okay.

Well, I'm looking at my time and it looks

like we have come to the end of our panel. I want to say this concludes our session of the U.S. Regulatory Preparations for the Export of Advanced Reactors.

I want to thank all of the panelists for their thorough and informative perspectives and from their respective agencies.

I also would like to thank NEI for their informative perspectives from the civilian industry.

I want to thank you, the audience, for your interest and questions on this important topic. It looks like at least we have 25 to 30 outstanding questions.

It's our desire at the NRC that we respond to those unanswered questions and if possible, we may consider future public meetings where we can integrate a number of the topics from the outstanding questions that were not covered during this panel.

And finally, please join me in giving our speakers a virtual round of applause and I want to thank all of you for your participation and engagement in this panel. Have a great day.

(Whereupon, the above-entitled matter went off the

record at 11:48 a.m.)