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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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33RD REGULATORY INFORMATION CONFERENCE (RIC)

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TECHNICAL SESSION - W20

LESSONS LEARNED FROM THE IMPLEMENTATION OF RISK-
INFORMED INITIATIVES

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WEDNESDAY,

MARCH 10, 2021

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The RIC session convened via
Videoconference at 1:30 p.m. EST, Julio Lara,
Director, Division of Reactor Safety, presiding.

PRESENT:

JULIO LARA, Director, Division of Reactor Projects,
RIII/NRC

LAURA KOZAK, Senior Reactor Analyst, Division of
Reactor Projects, RIII/NRC

ANTONIOS ZOULIS, Chief, PRA Oversight Branch, Division
of Reactor Assessment, NRR/NRC

VICTORIA ANDERSON, Technical Advisor for Engineering

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and Risk, Nuclear Energy Institute

JAMES PETTY, Director of Site Operations, Braidwood
Nuclear Power Station, Exelon

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| | |
|---|----|
| Welcome and Introduction - Lessons Learned from the Implementation of Risk-Informed Initiatives by Mr. Julio Lara, Director, Division of Reactor Projects, RIII/NRC..... | 4 |
| Presentation by Ms. Victoria Anderson, Technical Advisor for Engineering and Risk, Nuclear Energy Institute | 8 |
| Presentation by Mr. Antonios Zoulis, Chief, PRA Oversight Branch, Division of Risk Assessment, ..NRR/NRC | 11 |
| Presentation by Mr. James Petty, Director of Site Operations, Braidwood Nuclear Power Station, Exelon | 16 |
| Presentation by Ms. Laura Kozak, Senior Reactor Analyst, Division of Reactor Projects, RIII/NRC | 21 |
| Q&A of Panelists..... | 28 |
| Live Poll Questions..... | 35 |

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| | |
|-------------------------|----|
| Audience Questions..... | 37 |
|-------------------------|----|

P R O C E E D I N G S

1:30 p.m.

MR. LARA: Good afternoon, everyone or perhaps it is good morning, depending on where you are joining us from around the globe. Thank you for joining us today. My name is Julio Lara. I am the Division Director for the Division of Reactor Projects in the NRCs Region III Office located in the western suburbs of Chicago, Illinois.

As the DRP Director, I lead our division in the implementation of our region's Resident Inspector Program. I'd like to highlight at this point that the Agency's resident inspectors are the backbone of our oversight program as they perform daily risk-informed inspections and assessments of plant performance. The resident inspector's craft has added value to our mission of reasonable assurance of adequate protection of public health and safety. This could not have been more evident than during the COVID-10 pandemic.

Today I am serving as the session chair

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for the RIC session, Lessons Learned from the Implementation of Risk-Informed Initiatives. Over the past few years, the NRC has approved a variety of risk-informed licensing actions. Proper implementations of these risk-informed initiatives is important for licensees, as well as for the NRC Regional Offices as they conduct oversight inspections of these activities. This session will consist of industry and NRC representatives providing their perspectives on lessons learned and challenges in integrating risk-informed initiatives into plant operations and regulatory oversight activities.

In the next few years and beyond, the Agency anticipates increased licensing actions that incorporate these risk-informed initiatives. These include Risk-Informed Surveillance Frequency Control Program, NFPA-805 risk-informed fire protection, risk-informed completion times, 10 CFR 50.69 risk-informed categorization of structure, assistance, and components, risk-informed in-service inspections, tornado missile risk evaluators, and also integratedly great testing.

With that backdrop, let me begin my introducing our panelists. First, Victoria Anderson.

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Ms. Anderson is a technical advisor for Engineering and Risk at the Nuclear Energy Institute. A role that involves work with risk-informed licensing, risk-informed oversight, fire PRA, risk-informed technical specifications, and many other risk-informed applications. She holds a Bachelor's of Science degrees in Nuclear Engineering and Political Science from the Massachusetts Institute of Technology, as well as a Master's of Science Degree in Nuclear Engineering, also from MIT.

Antonio Zoulis. Mr. Zoulis is currently the Branch Chief for the Probabilistic Risk Assessment Oversight Branch in the Office of Nuclear Reactor Regulation and Division of Risk Assessment. Prior to the NRC, Mr. Zoulis spent 11 years at Entergy Nuclear Northeast as a Senior PRA Engineer and as the Equipment Reliability Lead for the Entergy fleet. He holds a Bachelor's of Science Degree in Mechanical Engineering from Manhattan College, a Master of Science in Mechanical Engineering from Columbia University, and a Master's of Business Administration from Pace University. He is a licensed professional engineer in the state of New York and Maryland.

James Petty. Mr. Petty is currently the

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Director of Side Operations at Exelon's Braidwood Nuclear Power Station. Following SRO License Achievement in 2013, Mr. Perry has served in operating roles with increasing levels of responsibilities, concluding with promotion to his current role as Operations Director in 2020. Mr. Petty obtained a Bachelor's of Science Degree in Nuclear Engineering from the University of Illinois at Urbana-Champaign. And worked as a Nuclear Criticality Safety Engineer at various Department of Energy licensed facilities prior to joining Exelon.

Laura Kozak. Ms. Kozak is currently a Senior Reactor Analyst in the NRC's Region III Office in Lisle, Illinois. Ms. Kozak has been a SRA in Region III for over 15 years, evaluating reactor events and issues using risk-informed approaches and advising staff and managers on risk thinking. Ms. Kozak joined the NRC in 1992 at NRC Headquarters with the former office for the Analysis and Evaluation of Operational Data, EOOD for those who may recall from those days, where she began her career journey in risk-informed regulation. Prior to joining the NRC, Mr. Kozak was an Operation Supervisor at the Savannah River Site in South Carolina. Ms. Kozak has a

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Bachelor's of Science Degree in Nuclear Engineering from the University of Illinois at Urbana-Champaign.

I will note for the audience that we will have live polls during the session. When they are announced, you can access them by clicking on the polls like to the right of the video window. Each of the panelists will make brief presentations. And then we will transition to a conversation, whole questions, and questions from the audience.

So with that backdrop, I'll first start by turning it over to Victoria for her presentation. Victoria.

MS. ANDERSON: Thank you, Julio. So I titled my presentation today, "Beyond Licensing Law (audio interference) Success of Risk-Informed Programs." Because as we've moved through implementation of risk-informed programs, a lot of our focus has been on the licensing process and getting these applications approved at as many sites as possible. And while we needed that focus, that focus is not enough as there is a lot to do once the license amendment is approved by the NRC.

Next slide please. So to prepare for success, we need to recognize the reality of the

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situation of the interface between the licensing process and the implementation process. The reality is that those organizations and personnel that lead the development and approval of risk-informed initiatives usually are not the same organization and personnel that implement them long-term. And that's true both for licensees and for the NRC.

At licensees, you will typically have licensing organizations leading the risk-informed licensing process. And at the NRC, you will typically have the technical branches within NRR leading that process. Once you get to implementation, you will often have for example, Operations leading the implementation. And at the NRC, you have organizations like the regions and the resident inspectors who are really more into the day to day of the implementation.

So the impact of this reality is that we see implementation issues if we don't have a proactive deliberate approach to (audio interference) organizational cooperation well in advance of implementation. The remedy to this is to make sure that we communicate proactively, both early and often with all involved organizations and deliberately foster cross-organizational collaboration throughout

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the development process. That means that we would want to have our operations and other responsible organizations for implementation involved throughout the licensing process so that they can give input and come to an understanding of the program they're going to be taking on.

One example where we saw a disconnect that we fortunately were able to resolve in a favorable manner was when we had some issues with some questions that arose relative to 50.59 when a licensee was implementing TSTF-425 risk-informed tech spec surveillance frequencies. And in that instance, an NRC inspector who didn't have the full background of how the risk-informed Surveillance Frequency Control Program was supposed to work for the licensee and perhaps the licensee who was interfacing -- the personnel for that licensee who were interfacing with that inspector perhaps also didn't fully understand the intension behind the implementation of that program.

Fortunately when we got everybody involved engaged on this topic, the resolution did result in the proper interpretation of the intended implementation. So we've taken some lessons learned

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from that and we've given guidance to licensees on how they can best incorporate their implementation organizations into the licensing development process.

Next slide please. So as I noted, really one of the best practices is that all effective organizations participate in the development of the program even before the licensing process. So in industry, you will often be bringing in your operations and engineering organizations. And in the NRC, that's usually the regions and resident inspectors.

We strongly suggest reviewing the impacts of the program via tabletop exercises in advance of the approval of the license amendment as practical as possible. And we also recommend clear written communication on program expectations and impacts to ensure complete organizational understanding. Having these things in writing helps the whole organization understand how the program implementation will affect them. So some key areas for this might be procedures and training.

These are just some high level suggestions for how licensees can ensure they have a smooth transition to implementing any risk-informed programs

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beyond the licensing process where we have rightfully focused a lot of our energy to ensure that as many licensees as possible can take advantage of these programs. So with that, I will turn it back to Julio for our next presentation.

MR. LARA: Thank you, Victoria. Let's continue on with Antonios. Antonios, begin your presentation please.

MR. ZOULIS: Thanks, Julio. Good afternoon, everyone. As Julio mentioned, my name is Antonios Zoulis. I'm the Branch Chief of the PRA Oversight Group in the Division of Risk Assessment. My branch works closely -- Introductory slide please.

I'm sorry. Thank you. My branch works closely with both licensing branches and Headquarters who review risk-informed initiatives, as well as the regional senior reactor analysts and inspectors in the regions.

And the SRAs being our main interface.

In my branch, I see us as the subject matter experts helping bridge the connection between licensing review and actual implementation at our facilities. And we have a long history of performing that function. With the issuance of the 10 CFR 50.65 or better known as the Maintenance Rule, I see it as

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one of the first risk-informed initiatives. My branch has supported the maintenance rule for many years and we work closely with the SRAs and the inspectors in supporting any questions they may have or issues in oversight of that program, as well as developing inspection and enforcement guidance.

So we see the adoption of risk-informed initiatives as an extension of that function with risk-informed completion times, risk-informed categorization, and other initiatives. In fact, we conduct the presentations to all four regions related to those risk-informed initiatives and developed a dedicated portal under the marked framework for reactor safety to support the staff and inspectors.

Next slide please. So as we progress in developing a modern risk-informed inspection and oversight framework -- I had the throw in those words, sorry -- for these initiatives, it's important to have a common vision or set of expectations. We can always work on the details and that will require working with our internal and external stakeholders, which is important that we at least start from the same shared vision. So as many licensees are in the process of adopting voluntary risk-informed initiatives, they

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provide them flexibility to change their programs using PRA inputs and the energy support of those efforts. Because it supports focusing both licensee and NRC resources on what is the most safety significant.

When properly implemented, the risk-informed initiatives provide licensees with additional operation and flexibility while maintaining safety. As with any licensing control program though, independent verification by NRC provides additional assurance that the program is being implemented correctly and consistent with their license. So through our inspection framework, the NRC monitors that implementation under the reactor oversight process to verify that safety conclusions are drawn during licensing remain valid.

Next slide. So having a common vision is important. Risk-informed initiatives as I said when implemented properly focus NRC and license resource on areas of great safety significance. Now we need to ensure that the inspection framework key principles are consistent with our principles of good regulation.

And the fundamental aspects of the reactor oversight process. We have to trust, but verify. NRC expects

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and assumes that licensees are implementing risk-informed initiatives in accordance with their current licensing basis.

A performance-based inspection is needed to verify our inspection guidance -- is needed to verify that. Our inspection guidance should be consistent with the reactor oversight process bases both technically in its policies and we strive to ensure that the changes to the inspection program promote efficiency without compromising safety while being reliable, open, and clear which are the fundamental principles of good regulations.

And one fundamental aspect of the ROP or the Reactor Oversight Process is performance-based attributes. Performance-based inspections focus on those aspects of risk-informed initiatives that have probably if improperly implemented could lead to increased plant risk. And Laura and I had a very long discussion about that part. It's focusing on what will result in performance. And we want to get those issues identified early on in the process before they become too severe.

Next slide. So we developed some enhanced guidance that became effective January of 2020 to

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enhance our current baseline inspections and to provide inspectors guidance on these risk-informed initiatives as more and more licensees have implemented them. And below we have an example of some of the changes that we made for the Surveillance (audio interference) Program, risk-informed completion time, and risk-informed characterization.

We understand this was a first step and we're continuing to work with the regions, RSRAs, inspectors, our licensing folks and others to incorporate lessons learned from these inspections to continue to improve this guidance. And that's consistent with the continuous improvement nature of the active oversight process. We will strive to improve and take back feedback from inspectors and others to improve process.

The focus of the inspection is to ensure the implementation of these initiatives are done appropriately and the assumptions driving those decisions are consistent with those programs and their licenses. And the inspectors have flexibility in selecting different samples for each of the programs through various updates that we made in the baseline inspection. But again, it's important to note that

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we're still getting information on these and striving to improve them as we go along in the process. And that concludes my formal presentation.

MR. LARA: Thank you, Antonios. Let me turn it over now to James. James.

MR. PETTY: Thank you, Julio. And good afternoon, everyone. I'm waiting for the slides to come up here. So I'm here to provide a little perspective from the licensees' viewpoint on this risk-informed initiative and particularly with the completion times is the topic of this panel. So to do that, I'll go over an overview -- a high level of what risk-informed completion time is and how we implement it. I'll talk a little bit about some of the benefits that come with the program. And then I'll finish with a couple of examples where we've actually used it here at Braidwood and how we've been successful there.

Next slide please. Okay, so TSTF-505 is the travel number assigned to this issue. We did get approval last year in 2020 from Braidwood for our license submittal request. And it added risk-informed completion times into the administrative control section of our tech specs. It's only applicable in modes of 1 and 2, Braidwood or Exelon. (Audio

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interference) deterministic model for shutdown safety, so we don't have shutdown PRA. So it's only applicable in modes 1 and 2 for us.

There's a backstop. So there's a frontstop and a backstop that we talked about with risk-informed completion times. The frontstop is what most of us are used to in ITS for completion time. And then the backstop depends on the issue. But in no case does it exceed 30 days. The calculation itself will get to be the backstop. If you don't complete the LCO by the time you get to the backstop, then you'd follow the normal required action that you're used to with ITS with the frontstops. Not permitted for loss of safety function or if all required safety trains are inoperable, so that's important. And then there are impacts on baseline CDF and LERF that are periodically monitored that you accumulate risk through the year. And that's something that's tracked and tabulated through our PRA engineers.

Next slide please. So some of the benefits, there's an emphasis on risk-significant configurations. So with the best analogy that I've heard with risk-informed completion times is that you're essentially given a bucket of risk and you

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know, you have a time limit so that, that risk is running out. So think of it is as a hole in the bucket that's straining the bucket of risk. And if there's a change in the configuration -- if some other piece of equipment happens to become inoperable, think of it as another hole in the bucket and your risks are to drain out more rapidly. So the emphasis is on risk-significant configurations in the plant.

Some of the other benefits, you avoid shutdowns, avoid safety challenges. So we don't typically see a lot of tech spec required. Shutdowns in the industry anymore with this has the potential to avoid that reduced use of NOED (phonetic). So I would say that, that has the potential to favorably influence or impact the relationship you have with the regulator. And flexibility in scheduling maintenance, you don't necessarily have to schedule some of the things offline anymore that you would normally do in an outage, you can now do them online. So that reduces your outage duration.

Particularly with unplanned windows, there can be such short duration, time stress, time pressure involved there with a work window. So this has the potential to mitigate that error likely situation.

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And then increased plant availability and capacity factors goes along with that.

Next slide please. So some specific example that we've been successful with here at Braidwood, system ox transformer work window. We used that last year in the fall. Normally it's three separate windows and there's a lot that goes into it with starting diesel generators, paralleling them, and swapping power sources. So a lot goes into it. And we were able to reduce this from three separate windows to a single window.

So normally, you know, with one of these qualified electrical circuits, your 72 hour LCO. And with the risk-informed completion times we were able to extend that out to 20 or 21 days. And we were able to complete all the work in a single window. So significantly less equipment manipulations strictly with the diesel generators. So huge success there.

And then earlier this year, we just completed a couple of windows on our -- two of our CC heat exchanges - component cooling heat exchangers. That was work that was originally dedicated to an outage that we were able to move to online work with use of the risk-informed completion time. So

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significant challenges to the shutdown safety profile and shutdown cooling availability during an outage when you remove a CC heat exchanger. So it was evaluated and determined the best place for this to be performed would be online. And we were able to do that on a 12-day work window and saved -- you know, some challenge -- potential challenges with critical path and outage timeframe.

So there's a couple of examples of plant work here at Braidwood. You know, we haven't had the opportunity to use this unfortunately in an unplanned situation for a short term -- short duration shutdown, LCO. But I know that has been utilized in our fleet and that's another great use of the program. Thank you, Julio.

MR. LARA: Thank you, James. And our other panelist, Laura Kozak. I'll turn it over to you.

MS. KOZAK: So thanks, Julio. So I'm going to talk a little bit in my couple of slides about discussing recent regional efforts that we have undertaken to increase our understanding of risk principles. We have been focusing in the last couple of years on advancing our risk thinking throughout the

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inspection and oversight program, really beyond the applications that people are used to in terms of inspection sample, selection, and the SDP. And so as a result of a number of our efforts, some of them have been specifically focused on the risk-informed licensing initiatives that we're talking about here today. Because we see as implementation increases and becomes more widespread that the regions really need to be prepared to conduct effective independent oversight.

So next slide please. So in terms of initiatives that we've undertaken, in 2018, we formed what we called a cross-regional risk-informed decision making panel. It was made up with membership from all four of the regions. And we had a senior executive sponsor, which was Julio. Our group had the benefit of a lot of data that was collected. There were regional online surveys sent to all the staff in the region. And we also conducted what were termed "risk cafes", but are really just small focus groups. And all of that provided a lot of good data and information for our working group to look at and assess and identify.

We were really looking for gaps in

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knowledge and any type of barriers to advancing the use of risk insights in the ROP, whether they be cultural barriers or process barriers. So out of the working group efforts, one of the main items that we suggested was that each of the regions should develop their own region-specific scalable plan. Some of the information from the surveys and the cafes found that the regions were in a little bit different positions in terms of their knowledge and their approach to addressing some of the barriers.

So at this point, all of the regions have developed a region-specific plan. And we got together in what we called a regional risk-informed decision making seminar last fall via TEAMS where each of the regions presented their plans and their activities so we could share information widely. And use other people's tools that they've implemented. Largely a lot of these activities go to various ways of better communicating risk insights and better ways to show how we can explicitly consider risks more broadly in the ROP. So those are some of the cross-regional panel working group activities.

The last couple of items that I note on the slide are a little bit separate from that.

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Regional staff participation in any type of updates to the inspection program and the procedures is critically important to provide that feedback from the people on the ground actually implementing the procedure. And so right now is an example that I highlight here is we have a very active working group associated with improving and updating the procedure that we use for 50.69 inspections. There is some recent experience from the conduct of that procedure last year. And it's really important to get those current insights and the regional perspectives fed back into improve that procedure. That's just one example of the many examples that we have of regional staff participation in improving our programs.

And then the last item -- I tried to highlight here a couple of things that are in the Region III specific plan. Things that we've taken -- done to advance our overall risk thinking and risk knowledge. The first thing is we conducted two tabletop exercises in preparation for utilities in our region getting their risk-informed completion time license amendment. And so we got together in groups and we talked about what are the types of things that we expect to see the licensee do in implementing these

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programs? And then how are we going to address that in an inspection program? What are we going to look at? And so those were very productive tabletop exercises.

Two other things that we've done in the region to advance our risk thinking are some internal communication tools. We just call them one pagers. For important risk-informed decisions, which are typically documented in lengthy reports and documents, we've tried to pull the relevant risk-important insights out and put them in one page. So that we can distribute that widely and people have enough time to take a look at it. And we try to express those risk insights in plain language while we certainly provide quantitative risk information where its available.

And we make sure that people know what the important assumptions are and the important output of that is. The types of things that might make a certain issue more risk important if it was different or even in some cases, less risk important. So it's hopefully a good learning tool that we communicate widely.

And then we also in the last year have revamped one of our weekly reactor issues meeting. We

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call it PRISM, which stands for Power Reactor Safety Issue Meeting. Once a week, everybody involved in the reactor program can get together for open discussion on topics. Prior to that meeting, we have a small group called the PRISM planning meeting that develops the topics that are going to be discussed in PRISM. And one of the very important points about PRISM that we're trying to focus on is always bringing out those risk insights. Again for widespread dissemination across staff and managers having an open conversation, we really think it needs to become part of our day to day discussion.

So next slide please. So out of all of this activity, what are some of the lessons learned that we have -- that we have learned in our region? The formal training that we have on these initiatives is excellent. We have training that's conducted at our technical training center. We have training modules that have been pre-recorded that inspectors and staff can access at any time. We also often have a sort of just in time training before important inspection. And all of that is extremely useful. But it really is not enough. We need to take some ownership in the region together as a group in more

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informal ways again, to make sure that we're talking about these issues and experiences on a day to day basis. It becomes a routine part of our conversation.

The other thing that is important is to further develop our inspection skills. And I don't think that these inspection skills are fundamentally different than the good inspection skills we have in other areas. But the idea of what do we select to look at as an inspection sample? What types of questions do we ask? What's important about the implementation of these initiatives? And then most critically, how do I determine if something isn't quite right and I need to engage the licensee on further conversation? Those are the types of skills that I'm talking about here that will come with developing a very strong knowledge-based and operating experience that as we work together with the other regions, we'll continue to advance.

Another item is this is not just about the inspection staff. This is also about supervisors and managers. And we need to be aligned across the region up and down, understanding what these initiatives are, how they work, and what our oversight is going to look like. I will tell you when we conducted the tabletop

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exercises for risk-informed completion time, we had active participation of our branch chiefs, our supervisors, and even our division level management. And I believe it was very effective in us walking away with an improved advanced common understanding of what the initiatives are and how our oversight process might work.

And then ultimately, I think it comes down to, you know, our inspectors are comfortable with existing techs like LCOs. Now we're extending them in some cases up to 30 days. We have surveillance frequencies that have been around for a lengthy period of time and now many of them are significantly changing. And so we're very comfortable with the -- what we often call the deterministic prescriptive licensing basis. And we're not nearly as comfortable with the risk-informed, performance-based licensing basis.

And so our challenge is to get equally comfortable in those areas to provide independent, effective oversight. And that's the basis for my last comment here about, we're not in Kansas anymore. Meaning that to me it is a different world. It's broadening. These initiatives are more wide ranging

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and we need to all collectively advance our understanding for effective oversight of these risk initiatives. And so that's my remarks. I'll give it back to you, Julio.

MR. LARA: Very good. Thank you, Laura. So I'll let the audience know, we're going to do one round of questions with the panelists and then we will do our first live poll question.

So to start things off on a conversation, I'd like to focus and start with a central theme, which Victoria highlighted in her remarks about preparing for success. So Victoria, you highlighted that the organizations that lead the development of these initiatives are rarely the organizations that implement these procedures. So can you share a little bit about how does NEI bring that experience -- that expertise to the licensees, either of the corporate or the site level to assist them in the licensing and implementation of these initiatives.

MS. ANDERSON: Yes, absolutely. So we ensure that we convey that message to licensees who are pursuing risk-informed programs, that they need to have the implementing organizations involved well in advance of receiving their license amendment. And

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we've expanded some of our risk-informed licensing task forces to include the implementing organizations and cover topics that the implementing organizations can share lessons learned on.

For example, our risk-informed tech spec task force, while originally it really focused on the licensing process, now regularly includes some discussions on surveillance frequency extensions, as well as organizational lessons learned while rolling out the risk-informed completion time program. So that's how we've been able to help licensees cross-pollinate both within themselves and between each other.

MR. LARA: Thanks, Victoria. James, your presentation focused on some Braidwood examples. So could you discuss perhaps the approach or strategies that you employed at the Braidwood site to ensure successful implementation of these risk-informed completion times flexibilities? That is leading up to that critical maintenance window for both those activities, how did you reach alignment, risk awareness across the entire site organization to ensure that you were successful in that regard?

MR. PETTY: Yeah, this really started

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several weeks before and there's a big communication piece. We utilized something called Risk Awareness Newsletters to communicate decisions. We also have an organization that -- a work-controlled organization. In preparing for the window, there's a package that needs to be put together and run through the calculations and PRA and develop what we called RMAs or Risk Mitigation Actions. And we have those in place and they're known ahead of time. So we're able to brief the operators that we'll be executing on those plans, which protect the pathways that are posted significant protected equipment list associated with the windows that we were involved in.

So all that information has to be developed and reviewed ahead of time. Meanwhile we also implemented some of the things that were discussed earlier today, talking about drills. We did do drills with the operating crews on, you know, sort of "what if" scenarios. If some other piece of equipment were to fail while we're in the middle of the window, do they have the proficiency to re-run the model to determine, you know, what has happened to our completion time now -- our backstop? We did legit the operating crews with that.

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Even up-front, the Work Control Organization, they were running "what if" scenarios to understand worse case, you know, if a protected piece of equipment were to become inoperable during the window, what would that do to the backstop? So if there was, you know, any conflicts, any planned work on other equipment had to be reviewed and maybe moved around outside the scheduled window for the components we were working on under the reg. So a lot of up-front work, a lot of communication, a lot of calculation, and then, you know, running it through the operating crew to understand what to do, how to respond for continuances.

MR. LARA: Alright. Thank you, James. Let me pivot over to Antonios. Antonios, Division of Risk Assessment, DRA, has a significant role in the review of these risk-informed license amendment requests. And DRA works with the Division of Reactor Oversight. Combined, you both have a significant role in assisting the regional offices prepared for the oversight. So perhaps, can you discuss a little bit about how the program office, DRA and DRO work together to help translate these licensing actions into regional oversight activities?

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MR. ZOULIS: So I think -- Thanks, Julio.

I think I touched a little bit on my presentation that it's important that we kind of bridge the gap between the licensing folks and the inspectors in the regions. So we see ourselves as -- the subject matter experts for those initiatives working to make sure that any issues or concerns that were identified in the licensing are translated then into inspection items that might be appropriate when these programs are being implemented in the field.

So we worked with our partners in Division of Reactor Oversight to continue to update the inspection procedures and provide a mechanism to take lessons learned and enhance those procedures. Look at how the overall inspection framework -- how can it be focused on the performance-based, performance-monitoring aspect for these initiatives and ensuring that the baseline can capture those concerns and issues. And then also continue to -- as we move further and further down the line away from the issuance of the safety evaluation, how will the configuration control and the main chance of those programs being performed?

And that's an important aspect that we're

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working on right now on how to ensure that our oversight will ensure that those programs will be maintained appropriately? And that's something that we work -- have to work very closely with the Division of Risk -- Direct Oversight and regions and the inspectors. And so it's important again to have those cross-discipline, cross-functional groups come together to share those insights and then execute that by updating the guidance.

And again, understanding that you'll learn something as you implement them. And you have to be flexible as I think we are in incorporating changes necessary to continue updating those procedures. So it's a continuous learning process. I think it's in the nature of the ROP. I think we've always done it and we'll continue to do it in the future.

MR. LARA: Okay. Thanks, Antonios. Let me ask Laura a question. Laura, in your presentation you talked about tabletops and risk-informed completion times and the like and communication tools to assist in getting our staff prepared for an increased oversight role of these initiatives. So more broadly, could you share some thoughts in how the SRA community across all the regions assists the

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inspectors and managers in this regard?

MS. KOZAK: Sure. So let me just highlight for people who may not know, but we actually have SRA support objectives written down in a document. It's part of the inspection manual. And it really describes at a high level more than in the specific tasks that we do, about how we are responsible for helping the region advance our risk-informed thinking and risk-informed decision making. And how we are a resource and a point of contact for all ROP-related -- risk-related topics. And so all SRAs are involved in many sort of undefined tasks in advising staff and managers on any top of issue that might come up.

Some of the more specific activities that we get involved in to do those types of things, we do a lot of training in KM. We have participated in the agency -- you know, NRC sponsored from Headquarters risk-informed thinking workshops for many years to try to bring regional perspective on how to use risk-informed thinking in the oversight process.

We often participate with the Division Directors at their counterpart meeting that occurs twice a year. And we try to discuss topics that are

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important for Division Directors in their decision making. Some of the things that confront us that are difficult in say SDP processes like how to consider uncertainty or what does common cause failure mean? How do we deal with HRA and the uncertainties? So we are often involved in all sorts of activities to just help bring, you know, the average level of understanding up.

We routinely meet with Resident Inspectors before they are permanently reassigned. I think it is even part of their turnover or their qual card. And so we sit down for that particular site. And we have a conversation about what are the plant-specific risk insights that we can provide? And we give advice on how to conduct inspections in the most risk-informed way, taking advantage of all the information that's available.

MR. LARA: Alright. Thanks, Laura. So let's transition to our first live poll question. And in fact, we'll do two questions back to back. So could we call up the first poll question please? So the first -- You should be able to all see it. The first question is very simply how is the NRC doing in its separate to become a modern risk regulator?

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That's been a topic and this question has come up in various sessions. And you can certainly answer it, either looking at it holistically as an agency. Certainly NRR has a big part of that. But other offices as well. It's not just a reactor program, materials program. It's an agency-wide effort for goal. So however you feel comfortable answering that question if you could please.

So I think I will ask our assistant here to -- I cannot see any results on here. So perhaps there will be an -- there we go. Thank you. So changing the numbers are coming in right perhaps somewhere in the middle at a three, it looks like. So three and perhaps a four. Interesting. Okay, that is our goal. That is our challenge as an agency.

So let's pause on the responses for this first question and move on to the second poll question. And then we will continue right after the second poll question into more of the audience questions.

So if we could call up the second poll question please. The question kind of reflects back a little bit on some of the points that Antonios' made and others as well. There's various risk-informed

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programs that are out there. Historically we go back to the maintenance rule. So for those that have implemented these programs or perhaps are thinking about it or perhaps it looks a bit challenging, which of these risk-informed programs do you see as being the most challenging? Is it the maintenance rule, the completion times and all that it brings with it, in-service inspection, NFPA-805 or 50.69, the risk-informed categorization of components?

Yeah, the NFPA-805 as the responses come in, it's a large voluntary initiative, 5048(C) if I remember correctly. And certainly could be a lot of work for some licensees. Certainly of great benefit at others as well. So very interesting responses. So thank you for that.

Let's continue on with some of the questions. Laura, there's a question here for you. Let me see if now I'll find it here. Excuse me, let me start with Antonios. Antonios, there's a general question about the NRC requirements about, does the NRC require that licensees have at power or outage models, EOOS, Equipment Out Of Service models, PRA models? Is that a requirement of licensees to have that at power or at shutdown operations?

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MR. ZOULIS: So that's a great question. The maintenance rule, which really governs the manage and assessment of risk prior to maintenance activities does not require PRA. You can conduct that qualitatively. And in fact, for many shutdown, the outages are really done through qualitative assessment.

Now after the maintenance rule after the individual -- This is very -- We're going back in history now. But when the individual plant examination was first issued and many licensees developed those models, they recognized quickly that those models can be used to support online risk assessment and those activities. And a lot of the licensees transitioned those models to what we call their online risk monitors. And they were used as part of their a(4) risk assessment, which is under the maintenance rule again, which governs the assessment and management of risk. So again, it wasn't a requirement, but it was -- but licensees recognized they had that tool. They used it and there was a benefit for them, and they applied it.

Now as we progressed to these -- what my director likes to call advanced risk-informed

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initiatives, to be able to participate in the risk-informed completion time, they've needed to enhance those models and those are required. You cannot perform a RICT calculation unless your model has been found acceptable through the license review process.

So that's kind of like the evolution of the use of PRA in licensees. And that was a long way of saying no, they're not required. But many licensees have them.

MR. LARA: Thank you. Thank you, Antonios. Here's a general question perhaps Victoria or Laura Kozak or anyone really. There's a general question about PRA acceptability. On the staff guidance on PRA acceptability, is that helping or is that hindering the implementation of risk-informed initiatives? I'll open it up for the nuclear experts in this area. PRA acceptability, is that helping or hindering? What do you guys think?

MR. ZOULIS: Sorry, I hope I'm not monopolizing. But PRA acceptability is actually I think a success in terms of how -- again, I'm not sure people understand that the use of PRA in licensing was an evolutionary process that again started back with the issue of (audio interference) 8810, I think or

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8820, excuse me, with the individual plant examinations. And as more and more licensees were using those risk models, the NRC had to develop a process to be able to assess the acceptability of those models. And we determined that with the implementation of the ANS/ASME PRA standard that we would endorse that standard via Reg Guide 1.200. And that would determine the PRA acceptability and quality if I may dare say that, of the PRA.

And the beauty -- or I think the elegance was in incorporating the peer view process that licensees were using to leverage that to determine the quality of the PRAs. And NRC would then accept that.

And out of any facts or observations that came out of those peer reviews and focused more on the key sources of uncertainty -- key assumptions and sources of uncertainty. So it really streamlined the review -- or that was the intent to streamline the review of these applications as they were being submitted to us -- to the NRC for review.

Understand there was -- it would take a lot more resources for us -- for the Agency to be able to review all the PRAs in totality. So leveraging that peer view process via the Reg Guide 1.200 and

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endorsement of the ASME standard was one of the most efficient approaches -- ways to do that. And I'm interested on Victoria's take on that, whether she agrees on what -- she would probably know better than I. So I think, I don't see it as a hindrance. I see it as a success to balance -- that tricky balance that we have of trusting, but verifying and ensuring the adequacy of those models and not being very perspective and be more performance-based in our reviews and our approaches.

MR. LARA: Victoria?

MS. ANDERSON: I would say I partially agree with Antonios. I do think it at times having Reg Guide 1.2000 as opposed to a full staff review of the PRA spring licensing applications has streamlined the review process. And it has made for a more predictable review process. So in that way, it has been a help.

I do think at times, we've allowed ourselves to become fixated on the -- on the details related to PRA technical adequacy and specific methods and sources of data being used rather than really focusing on the decision being sought in a specific licensing application. And I think there's -- some of

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that's at play on both the licensee side, the industry side, and the NRC side. I think with recent revisions to regulatory Guide 1.200, we're moving away from that. But I do think we need to make sure that we are keeping our attention to the PRA modeling topics at level that's commensurate with how much impact it has on the decision being sought. So I think it's mixed, but it does have the potential to -- if we continue to keep ourselves accountable to that, that we could see it overall being that positive.

MR. LARA: Thanks, Victoria. Laura, do you have thoughts or --

MS. KOZAK: I would only just agree primarily with what Antonios said. You know, in oversight, we're not as involved in that initial review of acceptability. But I only view it at this point as a good thing.

MR. LARA: Okay. I'll continue on to more. There's a question for you, Laura -- I think a general question I think applicable to many of my panel. But I'll start with you, that you know, we talked a lot about risk-informed initiatives. And arguably they're subjective. It's (audio interference) the normal tech spec requirements that a

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number of us have grown into understand the tech spec (audio interference) goal. So why does that -- does that perhaps -- does that create a challenge for us to get past the traditional fixed 72-hour, LCO and start thinking that perhaps that the allowed outage time could be much greater based upon risks. So what are the challenges to help us move further towards fully understanding the licensing action, the basis, and the decision making that goes to allowing those provisions?

MS. KOZAK: Well I think it's a challenge because people have for a long time been taught and grown up to think that, that box is the definition of safety. And so now when you are potentially significantly changing that box using tools that people aren't familiar with, they're just generally uncomfortable. And so it's a challenge to us to explain the background and all of the work that's gone into -- from Headquarters to allow these initiatives to proceed and to explain that to our staffs and get them comfortable enough that it's not a reduction in safety. But we still need to be in our oversight rule focused on the proper implementation.

MR. LARA: Thanks, Laura. So James

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perhaps moving the conversation in your direction at the site. Likewise you and others here at Braidwood for many years -- years have been operating, have been under the same framework that will fix LCO time for (audio interference) testing, for heat exchangers and the like. So has that caused some concern in terms of the implementation of that on part of your operators or your system engineers? Are they comfortable moving in that direction? Or what are the challenges to get people comfortable with that extension of either LCO times or surveillance frequencies for that manner?

MR. PETTY: Yeah, it's certainly a change.

I'd say, you know, the results pyramid model tells us that beliefs are shaped by experiences. And we've had some good experiences with some other risk-informed initiatives here at the plant, particularly with the Surveillance Frequency Control Program, which we've had in place for many years now and 50.69. So I think those experiences have helped shape the belief that, you know, we are able to make these changes to more risk-informed processes all the while maintaining nuclear safety are our foremost priority.

And then I'll add to that, that these are uncertain times in the nuclear industry. There are

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several plants that have been challenged to remain online. We've closed several plants. You know, particularly merchants plants. So anything that we can do to help improve efficiencies and eliminating risks, I think it's easy to get people behind that now. You know, knowing where we're at in the industry and you know, we've got some great examples where we've been able to eliminate risk to the plant and maximize efficiency with this program.

MR. LARA: Thanks, James. Let me go back a little bit to something Victoria started earlier on about some of the challenges. And you cited a particular example where NEI, the industry came in and helped address an issue that was out there. So looking back or perhaps looking forward, any thoughts on how the industry can help, you know, bridge that gap? Further engagement, either we have to do public meetings or other venues to bring that expertise -- that knowledge to the site and across the -- between the NRC and the industry. Is there anything else we can do that perhaps you gleaned from that experience working with the industry, the site, and the region? Any thoughts there?

MS. ANDERSON: I think some of the regular

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meetings that licensees have with the regions to discuss topics of relevance to their site operations, those are a great venue for those kind of discussions.

And occasionally, I know NRC headquarters and corporate licensee personnel can participate in those.

And that can help with that transition through those programs. Having those kind of discussions there and involving those individuals.

MR. LARA: Thanks, Victoria. Laura, let me go back a little bit to some of the things that you shared; lessons learned, best practices perhaps about getting our inspection staff and managers on risk-informed completion times, tabletops and those things.

What does that look like a little bit more across the regions? What level of engagement? Perhaps talk a little bit how the SRA community further perhaps leverages these experiences, these learnings that you have from Region III. Anything more that we can do there?

MS. KOZAK: Well, I think those are the types of things that we're sharing in our plans when we have these seminars that I mentioned. That we had one in September and we're going to have an upcoming one in the spring. That type of discussion continues.

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I don't think that we are by no means the only people getting together with their staffs to prepare them for things like risk-informed completion times. So I don't think it's unique. It may not exactly take the same form of the way we implemented it, but I think in terms of sharing, people are doing similar types of things to get ready.

MR. LARA: Thanks, Laura. Let me pivot over to James a little bit more about, you know, you described the Braidwood examples. I presume other similar type risk-informed completion times at some of your other Exelon sites. So how is that going to happen? How is that -- the sharing of those lessons that you had, how is that being translated? I think Byron is another facility that is moving in that direction. Have you started working in that direction as well?

MR. PETTY: Yeah, actually Braidwood and Byron received approval around the same time. But Calvert Cliffs is one of our other fleet plants -- actually was first with this program. And I was actually part of a benchmark trip over there maybe two years ago to see how they were implementing and gather up lessons learned. So it was very beneficial to, you

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know, have them go through that process first. There's a lot that goes into implementation. A lot of work we had to put in up-front preparing for the LAR approval, including, you know, identifying which population is going to receive the training. We ended up taking a graded approach on the training with license personnel getting all of the infrastructure in place. So that was a great help.

And as far as, you know, lessons learned from our particular uses of the program here, we do conduct critiques and capture that information in our Corrective Action Program for dissemination, not only for us later on, but for the rest of the fleet.

MR. LARA: Thanks, James. Here's a question for the NRC panelists, Antonios and Laura. We talked about -- Antonios talked about how they work with the Division of Reactor Oversight and we have the Inspection Program. The question that comes in is about "cross-pollination". How do we get -- is there anything that is done in that area that is getting perhaps some of the DRA staff perhaps working on some of these inspections or maybe perhaps bringing that regional field experience back to DRA? Is there opportunity there to ensure that as we move forward in

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the oversight, we're fully aligning perhaps to avoid some of the other issues that have come up -- difficulties perhaps?

MR. ZOULIS: Yeah, I could take that first. I think that's critical. We have actually in place an ad hoc working group that involves licensing folks, senior reactor analysts, some inspectors, the Division of Reactor Oversight. And those folks to look at what we're doing -- how can we improve it? And what do we need to do going forward? So we are -- we're currently doing that. The idea of perhaps sending out some of our folks to support inspections, that may be something that we could look at that we've thought about.

We've actually in my branch hired recently two very senior inspectors out of the region. And part of the reason we've done that is to get that experience in-house and leverage their expertise, coupled with obviously the risk experience to get them to be able to better support these activities going forward. So we've taken steps in that direction, but there's always more we can do. Laura, anything?

MS. KOZAK: Well just to add on, I know what Antonios is talking about. And one of our very

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good inspectors just joined his staff and yet is interested and has continued to support some inspections in our region. And that's been very successful. And so I think, you know, more of that down the line is great. You know, we try to attend things like audits when licensing is going on or meetings, so that we can understand and ask questions and work amongst the community. So yeah, that's always helpful as well.

And we certainly have had inspections -- special inspections where we have specifically asked for folks from DRA that are very experienced in the type of event that has occurred, to come out with us on a special inspection. Not as an inspector, because they're not qualified, but as an observer to help us understand the risk insights associated with that particular. So we do some of that. I think there is an opportunity for more of that in the future. And I think it's a great idea.

MR. LARA: Thank you, Laura. There's a question for -- I'll ask Victoria to start with. There's a question on international work -- international sharing. The industry and the NRC have led the way of implementing risk analyses, risk-

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informed decision making. So can you share some of the thoughts about how we're able to harmonize? How we're able to share with our international colleagues who can perhaps take advantage of some of these initiatives or frankly just build good relationships - - good rapport with our international colleagues? What's the work look like in that area?

MS. ANDERSON: Yes, absolutely. We definitely engage with some of our international colleagues who are interested in risk-informed initiatives. And while the American fleet and the NRC have led the way, other countries are starting to look at how they can use risk information to improve their operations. So we share our experience with the applications we've found most beneficial and share lessons learned on implementing those applications so that we can see things go more worldwide.

MR. LARA: Okay, thank you. Let me turn over to -- where's my mute button. There we go. Okay, James. So perhaps what does the future look like if you're able to say in terms of, you know, the risk-informed completion times as initiative? Is that part of the normal way of doing business in the future do you foresee? Or what does that look like? How far

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planning do these initiative go forth in terms of expanding the completion times?

MR. PETTY: One hundred percent part of the plan going forward, you know, our long range plan as a management plan looking at different windows for large pieces of equipment that goes, you know, five, ten years out. So we're constantly looking at that. You know, we have recently implemented 50.69 too. That's going to play into our plans. But yeah, it's not going anywhere. It's certainly nice to have as a -- as a contingency plan for any unplanned inoperabilities. But definitely a huge advantage for planned work. We're looking to include shortening our outage durations.

MR. LARA: Thanks, James. Let me go back a little bit to Victoria. Earlier on in the opening remarks, I highlighted some of the risk-informed initiatives that are coming down that are (audio interference). Are you able to share, what's next? What's coming down the road here in terms of affecting the industry for which engagement with the NRC will be part of that? What else is out there that's coming that we should be aware of?

MS. ANDERSON: I think one of the things

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we've been in discussion with the NRC is how licensees who have sort of what we call the "Big 3", so Risk-Informed Surveillance Frequency Controlled Program, risk-informed completion times, and 50.69 risk-informed special treatment. What kind of synergistic effects are there that licensees can take advantage of and that the NRC could take advantage of?

And one thing we're already seeing is something that Antonios and his colleagues have been working on. The risk-informed process for evaluations, which takes advantage of some of the infrastructure that's there with an approved risk-informed tech spec program, an approved risk-informed special treatment program that will allow licensees to submit evaluations. So either a license vendor request or possibly exemptions and allow the NRC to not have to re-review things and still use risk information to inform their decisions. So I think as we see those kind of things rolling out, I think are sort of going to be the immediate next thing that we're going to be working on is trying to get the benefits of the things we've already implemented. And see if there are more ways we can gain efficiencies.

MR. LARA: Thanks.

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MR. ZOULIS: Thanks for that plug, Victoria. Thank you.

MR. LARA: Yeah. That's where I was going to go to, Antonios to see if there's anything else that you'd like to add in terms of, you know, are we prepared? What are we looking at? And what does work look like for your division?

MR. ZOULIS: Well I think the division is looking into what is next. They're working with Victoria and other stakeholders -- what are the other future initiatives that I see, right, as just a small piece of that. I think there's other things that we could be doing and leveraging the tools that we have.

I think it's important, you know, it's very hard in this virtual form to know the audience and how many people are attending. But the really -- the focus of risk-informed tools is to focus on what's important. And I think people kind of have the idea that a risk is only used to reduce requirements. And I think it's important for us to mention that here is that the NRC supported these initiatives because it does focus on what's important. And it uses both our research and licensees resource on what's most safety significant.

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So I think we mentioned that in our presentation. I think it's important to reiterate that. And that's I think why focus on what's coming down the line, what can we do better in the future is something that we could leverage in other ways. You're right, once these programs are done, what is the next -- what does the future look like? And Division is asking those questions. So thanks for that question, but it's a hard one. I'm not sure, you know, where we're going to go, but we'll see.

MR. LARA: Well that's part of our journey to become a modern risk-informed regulator. So we are pretty much about six minutes before the end of our time. I think this is probably a good place to stop so we can have -- provide an opportunity for the audience to get prepared for the next session.

So thanks to our panelists for sharing their experiences, their insights. Thank you to the audience for sharing your comments and questions. But lastly I don't want to be -- I don't want to remiss. And lastly, I want to acknowledge that this session could not have been successful without the great assistance from Diana Betancourt and Elba Sanchez who have served as coordinators for this session. So they

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did a lot of great work in the background to get us ready for this. So with that, thank you all. Enjoy the rest of the break and have a great afternoon.

(Whereupon, the above-entitled matter went off the record at 2:41 p.m.)