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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 - T10

NUCLEAR REGULATION IN THE TIME OF TRANSFORMATION

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TUESDAY,

MARCH 9, 2021

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The RIC session convened via Videoconference at  
10:45 a.m. EST, Margaret M. Doane, Executive Director for Operations,  
presiding.

PRESENT:

MARGARET M. DOANE, Executive Director for  
Operations, OEDO/NRC

MARK FOY, Chief Nuclear Inspector, United Kingdom  
Office for Nuclear Regulation

OLIVIER GUPTA, Autorite de Surete Nucleaire, France

RAMZI JAMMAL, Executive Vice-President and Chief  
Regulatory Operations Officer, Canadian  
Nuclear Safety Commission

PETTERI TIIPPANA, Director General, Radiation and

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Nuclear Safety Authority, Finland

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## PROCEEDINGS

10:45 a.m.

MS. DOANE: Good morning. Welcome, everybody. I'm Margaret Doane, the Executive Director for Operations at the U.S. Nuclear Regulatory Commission, and I am truly honored to serve as the chair for this Technical Session on Nuclear Regulation in the Time of Transformation.

I'm pleased to be in the company of four distinguished international regulators that have been champions for transformation within their organizations.

As we all know, the current nuclear energy landscape today looks very different than what it did just a few years ago, let alone a half century ago, when many of the world's first nuclear regulatory bodies were created.

The multitude of changes in legislation, advancing technologies, and the transformation going on in the nuclear industry itself requires regulators to stay abreast of cutting-edge technological advancements and remain responsive to new or evolving nuclear safety challenges.

Furthermore, over the last year, we have

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adapted how we carry out some of our regulatory oversight functions due to the pandemic. And this has been cross-cutting across all of our programs.

On another topic, research into organizational development has confirmed that most enduring and successful organizations are able to adapt and evolve in a variety of ways by maintaining an agile posture and an innovative mindset, while not losing focus on their overarching mission.

For many of us, adapting through innovation, it's not a new concept. The United States government agencies, as well as international nuclear regulatory authorities, have adapted over the years, leading to significant organizational changes.

One thing that is different now is that our decision to transform is largely due to external factors requiring us to rethink our approach and consider more innovative ways to carry out our mission.

Before we engage in a discussion centered on how nuclear regulation has been affected by the dynamic and interconnected nature of today's nuclear energy environment and the ongoing public health emergency, I would like to welcome four highly

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esteemed panelists representing the world's most experienced nuclear regulatory bodies.

Each of our guests are impressive leaders in the field of nuclear regulation and come to us with very distinguished backgrounds. I encourage you to check out their full bios on the RIC link for this session, just click on their pictures. I'm not going to read all their bios aloud, because that will give you more time to hear from them in-person, which I know that's what you really want to hear.

So, let me just tell you who they are. Our panelists are Ramzi Jammal, Executive Vice President and Chief Regulatory Operations Officer for the Canadian Nuclear Safety Commission, Olivier Gupta, Director General for the French Nuclear Safety Authority, Petteri Tiippana, Director General for the Radiation and Nuclear Safety Authority in Finland, and, last but not least, and you'll see during our discussion for sure, Mark Foy, Chief Nuclear Inspector for the Office of Nuclear Regulation in the United Kingdom.

They will each provide remarks and then we will open a question and answer session, once all of them are through.

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Okay. But before we start their presentations, let's kick things off with two polling questions. Please bring up the first one.

Okay. So, let me read the first question. Which area should regulatory authorities focus their transformation efforts, given the dynamic nature of the nuclear energy landscape?

So, if you're having trouble seeing where to put the poll, you'll see a box that says Q&A, and then, there will be letters P-O-L-L in white, and you can just tap on the P-O-L-L.

And we'll give the audience a few seconds to continue to put in their results. And then, I would ask that the results just come up when you think we are getting close to having everybody participate.

Let's see. So, I hope our panelists can see how this is developing, and you can tell us whether this is a surprise to you. So, I'm afraid to cut it off, because we're seeing some back and forth here. Maybe we'll stop it at this point. Wow, look at this! Okay. All right. So, maybe we'll stop the poll at this point.

So, let's see where we are. So, preparing to review new nuclear technologies to

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support the global energy demands, seems to be what has been, what got the most votes. Second is risk-informing the decision-making process for licensing and oversight programs. So, I think this is, maybe you can tell me whether this is what you expected.

But there wasn't an insignificant, or maybe there was a significant number of people that also said modernizing the technology and infrastructure of regulatory agencies, is also to be a focus.

So, okay, thank you for that poll question. Can you bring up the next, please?

Okay. So, our next polling question is, as a result of the ongoing COVID-19 public health emergency, where should regulatory authorities focus priorities? So, this is a more continuing during the pandemic, which we hope we are getting to the end of.

So, the choices are, boost the regulatory authority's IT infrastructure to support/promote virtual working capabilities, apply a risk-informing tool into the decision-making for virtual inspections, or augment organizational resiliency to major events.

I think maybe there should have been an

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all above too, but we can talk about that later.

So, we'll wait for a few seconds to see what comes up in the polling. And see if there's any last-minute changes like in the last one. Okay.

So, I think we'll stop the polling there, I think we have pretty much a majority. But it's not so significant, maybe by four percent is IT and then, next, applying risk, and then, augmenting organizational resiliency.

But both of them got, it's almost kind of -- it's statistically different, 27 percent to 38 percent, but it's not -- it does show a lot of interest in actually all three of them.

Okay. With those polling finished, let's bring up our first speaker. Ramzi, you have the floor.

MR. JAMMAL: Thank you very much, Margie, dear colleagues, and friends. And I'm not seeing my slide, but can you please put up the first slide?

It's a great pleasure to be with you, it's probably me on my screen, but regardless, we'll start with my presentation. So, first slide, please. Is it posted? Is it on the screen?

MS. DOANE: I'm not seeing it either.

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MR. JAMMAL: All I'm seeing is just the stages and you, my colleagues, here. Are we -- and the clock has not started yet.

MS. DOANE: Okay. So, Ramzi, maybe, while we work in the background, I think we do see the slide now.

MR. JAMMAL: Okay.

MS. DOANE: The slide's up and the -- can you see it now?

MR. JAMMAL: Yes, I'm --

MS. DOANE: Okay.

MR. JAMMAL: -- ready to go, it's in small corner, but it's good enough for me, I'll go by memory.

The CNSC -- it's great to be with you, colleagues, and next slide, please. I'd like to start with the fact that the CNSC pandemic response, or not, transformation is key, it's an ongoing functionality that we have to put in place.

I'm going to base my presentation on regulatory safety culture and the priorities with respect to the role of the CNSC towards the public for the protection of the environment, workers, and literally look at what we did.

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From our perspective, the work continues, and we started to do site inspections. We don't have an expected date yet for the return to work. However, in continuation of building trust, the Commission proceedings never did stop. So, we moved to the virtual platform. And to date, has been very, very successful.

As part of the transformation and agility, you cannot forget the fact of the human factors and human element to your staff. So, our virtual townhalls with staff to address their concerns and to understand the pressures they're going through are on a frequent basis and they are virtual.

What we've done, in order to update the staff with respect to COVID-19, an intranet dashboard is in place and our licensees have not stopped operations. And, as a matter of fact, they continue refurbishment, and a brief refurbishment is like a new build, taking out, putting in a new build of a core for the reactor. Next slide, please.

So, with respect where we are with regulating under COVID. Regulating under COVID has demonstrated that the agility and the risk-informed

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decision-making for the CNSC was a factor in order for us to adapt.

The pandemic was not an impediment, but it was an opportunity for us to implement our regulatory safety culture and an opportunity to expedite adoption of innovation at the CNSC, adoption at both levels, internal and external.

The government of Canada deemed the COVID-19 to be a workplace hazard. So, hence, we had to establish all kind of protocols. And when I speak to transformation here, it was not just the operations or regulatory perspective, it was whole organization, from our policy, health and safety colleagues.

Our health and safety individuals and the corporate functions of the CNSC took on quite a significant role in order to make sure that safety and regulatory safety culture are being implemented for our staff. Next slide, please.

So, we did reprioritize inspections. We applied both risk-based and risk-informed decision-making process. Our inspections currently are virtual and a hybrid of both virtual, with respect to surveillance and monitoring, remote and site visit.

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I would like to spend a few seconds on this. I met with the inspectors who are doing the inspection. The transformation is not just technical, you have to look at the cultural transformation, where the inspectors always did their jobs by visiting a site, part of their inspection was a site visit.

The cultural change occurred, how can I be as effective, as efficient virtually, when I have boots on the ground on the site? So, that took some changes in the culture element and the role of the executives to provide that safety net and command the work that's being done and support the fact that the inspections have changed, but it's a combination of both virtual and site inspection.

In addition to the safety of our, not just inspectors, but all staff who needed to travel, we put in place specific procedures for COVID-19, taking into consideration public health guidance, instructions, and protocols.

And those were focused on safety, so that our inspectors feel safe as they go and do about their inspections. And we were not alone, we did benchmark internationally with our colleagues. Next slide,

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please.

So, now, innovation. Again, the transformation and the pandemic was a key for us to start to be adaptive and agile.

So, currently, we're looking at advanced manufacturing, 3D printing, as an accessibility for us to look at it from regulatory perspective for regulatory decisions.

Same thing with maintenance, we're using AI, artificial intelligence, and we've accepted remote controlled aircraft as drone inspections in order to render a regulatory decision. Next slide, please.

International collaboration is key. When I say about international collaboration, we have not stopped to look at innovation, we have not stopped to look at collaboration.

More in-depth engagement did take place. Again, it was an opportunity being virtual, travel was not a key factor. Leveraging information and sharing OpEx regarding the best practices.

The international engagement, in our opinion, promotes development of common safety principles and harmonization of regulatory practices.

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Next slide, please.

In conclusion, our risk-informed decision-making and agility as a regulator allowed us to respond to the pandemic, taking into consideration transformation.

The opportunity we receive in transformation, the deployment of IT tools for our staff to do the work, the capacity of establishing virtual inspections, and capability to assure both the public and our staff that the regulatory safety culture has not changed and their work in assuring that the licensees are in compliance continues.

So, we are continuing adapting to innovative technologies, with respect to the oversight and regulation of nuclear activities, and the CNSC is a full-cycle regulator.

And this year, we are celebrating 75 years of existence. And whoever thinks that we are ready to retire, we're not. So, we're just celebrating 75 years of existence with respect to continuing to transform and make sure regulatory oversight.

Part of transformation, you will see the word DIET working group is established. The DIET

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stands for destructive innovative emerging technologies working group that we established in order to start to look in a systematic manner towards our transformation, towards the future.

And we already have subgroups working together in order to start for us to look at the AI as part of the information we need for the determination of regulatory decision or regulatory information based on AI.

So, in other words, we are engaging with industry, licensees, to learn about upcoming innovations, so we are not in isolation. So, the government, industry, and regulatory authorities, all of us here, we cannot leave this stage without any actions for us towards the future.

The pandemic taught us quite a bit. The pandemic has far impacted governments, regulators, industry than any other nuclear events to date. What will be effective for us to continue with lessons learned from the pandemic has occurred for us in transformation.

And we need to take it on the international stage, so that the safety standards discussions at the conventions will take that into

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consideration as part of transformation towards the future and improvement for safety enhancement all along for the rest of the world. And last slide, please.

Thank you for your attention. I'm ready to take any questions. And sorry for the hiccups at the early stages, but I still can't see my slide on the screen. Thank you, Margie.

MS. DOANE: Okay, Ramzi, thank you so much. And, yeah, sorry, in a virtual environment, there's always a little something. So, thank you for -- yes, we did have a miniature screen, so hopefully people could click on it and pin it and could see the slides. And we're hoping that it will be side-by-side, in fact, maybe they just made that change. Okay. All right.

So, now, Olivier, you have the stage.

MR. GUPTA: Thank you, Margie. And this is the advantage of not going first, I have the experience back here on how to display the proper screen. I think we can go to the next slide.

I have three points I want to make here. A few thoughts about modernization and effectiveness of the regulators, how to improve this. Then, I will

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give you an example of the use of an artificial intelligence system to modernize and hopefully make our oversight more efficient.

And I will end with a few comments on the pandemic and showing also how it accelerated some transformations inside ASN, and also how it raises some questions that could be internationally addressed. I think we can go to the next slide now. Yeah.

And, clearly, as a regulator, I would say we have a duty to pay attention to the context, so that we focus our means, our way of regulating on the relevant issues and topics, so that we devote not only our means, but also that the licensees devote their means on the relevant aspects for safety.

So we, in this way, we are trying to reinforce the use and implementation of a graded and efficient approach. And to this end, I want to point, to highlight the interest of having an objective-based, rather than a prescriptive regulation.

This is the case in France. I think this is the case also in most European countries, because we all base our regulations on the WENRA Safety

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Reference Labels. You may know what is, WENRA, it is the association, the independent association of European nuclear regulators.

And we have developed joint safety reference labels, this is how we call them. And these are the basis for harmonizing our regulations. And this basis is clearly goal-oriented, it's not very prescriptive. Which means that it is quite technology-neutral and already fit for purpose, if it would need to be used for new technologies.

In this way, we are focusing our interactions with the licensee not on the law, on checking conformity to the law, but on technical aspects. And we have in all our countries an in-depth technical dialogue, which I think is very fruitful.

And in the poll, I was seeing that the audience was interested about risk-informed activities and I think that this technical dialogue is a way, yeah, to risk-inform our way of controlling, by focusing really our requests on what we think technically is the most important.

I want to say also that we don't base it only on figures, on probabilistic assessment results,

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but also on engineering judgment. We think it's important not only to rely on figures, but also on engineering judgment.

Furthermore, what we are seeing now in France, even in spite of this non-prescriptive regulation, is that maybe we have a tendency to have too many rules. And by rules, I also include the rules from the operators themselves, the internal rules.

And I think we should reflect, even internationally, on this, because it can be an issue to have too many rules. It can have adverse effects to safety. So, we think that if we want to have a modern efficient oversight, it's in interest.

Also, to say, I would say modern and efficient, I would like to, I have highlighted the value of international exchanges with our counterparts. And that's what we are doing in Europe.

And when I say this, obviously, technical dialogue with the licensee, being able to capture what is important versus what is less. This refers to the ability of hiring high level people, skilled people inside the regulator. I think now we can go

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to the next slide.

As an example of modernization, I wanted to put what they are doing currently at ASN with an artificial intelligence system. Basically, the idea is to make use of our more than 20,000 inspection letters and to search in them to identify early tendencies to improve our inspection program, also to prepare for a specific inspection. Next slide.

Where you can see the kind of things you can display in this tool. In this example, you search for diesel generators and you can see how many findings on the territory, on the various sides. Also, depending on the years, how the trend is about these findings.

And that's beginning to be, our inspectors are starting to use this tool to prepare for their inspections and make them more efficient. I think that's it for this item.

And my third and last point was a few thoughts about the pandemic. I won't be very long about the changes in ASN operations, because they are quite similar to what was presented in Canada.

Teleworking, remote inspections, maybe just to say that we have kept the onsite visits for

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those aspects that cannot be seen remotely. But remote inspections were interesting, because they have given the inspectors more time to ask their questions to the licensee. It was appreciated, I think on both sides.

Another thing I want to stress out is that reinforced vigilance that we had on maintenance and operation of nuclear power plants during the general lock-down. And we were quite happy that EDF, our operator, did not, they kept all possible maintenance activities, which was really satisfactory.

And to finish with this, I would like to point out three questions I think that this crisis raises, not only on the health aspect, but also, I think it can be used on our nuclear domain.

The first one is how to improve the preventive measures and investment in public policies we are seeing in many countries that face masks were lacking in the beginning of the crisis? So, I think this can be an experience back also for us.

Also, another aspect is that many experts, many people have been talking during this corona crisis and how to make the institutional voice

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be heard among all these people who are speaking?  
And this is also a question for us.

And, lastly, how to develop and maintain a cultural precaution within the population, how can they accept the restrictive or constraint measures or constraints that we apply, that the government apply in this kind of crisis? I think this can also be rich of learnings for us in the nuclear domain.

Thank you for your attention.

MS. DOANE: Okay. Thank you, Olivier, that was very interesting. I can see, already, we're starting to have some common themes, as I would expect.

So, Petteri, you have the stage.

MR. TIIPPANA: Thank you, Chair. It's great pleasure to be part of this panel with such distinguished colleagues.

Yes, in my remarks, I would like to discuss about the future expectations on us as a regulator in Finland. I will start with a brief introduction to our strategic goals, since these are the instruments for us in meeting the expectations and transforming STUK into a modern regulator.

I would also touch the COVID-19, as the

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previous speakers have also done, particularly on how it has benefitted us on implementing our strategic goals. It has also inspired us to learn from the others, particularly from the medical sector, of what they have done with the COVID-19 vaccine.

And in addition, and I think Olivier also touched upon this, I think we can learn from the management of the pandemic, with regards to radiological emergencies.

I try to be brief on those, since the main issue for me today is to speak about how we want to change our way of regulating the industry in Finland with modern ways and tools, which are there and yet to come as well. Next slide, please.

This is our strategy and the strategic goals in the bottom of the slide. I hope it's visible. You can see our values on the right and our mission in the middle of the slide. And achieving the three pillars of the vision is ensuring Radiation Safe Finland also in the future.

We are now in the fourth year of the strategic period and main drivers behind this strategy, which was established in 2018 are or were, changing competence and resource needs, new ways of

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working, transformation of communications, changes in global security situation, and changes in the Finnish administration.

And while we were preparing this strategy, we realized that we can't meet the expectations of the licensees, of the public, of the society, not even the staff of STUK with the current way of working and regulating.

So, introducing and implementing this strategy course is a necessity for us to survive, I would say, and the transformation is needed.

We conducted a mid-term review of the strategy and the strategic implementation. And we concluded that the main drivers are more or less the same. However, the COVID-19 has expedited the speed of the changes and made some of the changes more significant than they were.

With regards to the strategic goals, I can say that I'm quite pleased with the progress and the implementation status where we are today. However, there is still quite plenty to do with regards to the transformation of our way of regulating, particularly being more risk-informed regulator in a way teaches licensees a safer

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performance and also as customer-oriented digital services for the licensees.

And this last one is a new goal that we established as a result of the mid-term review. Next slide, please.

This is about the COVID-19. I'm sorry about the text, it's a little bit different than what it was in the original version of the slides. But anyhow.

As I said, the COVID-19 has expedited the speed of changes. That was the outcome of our evaluation. Frankly said, it has forced us to be more risk-informed, it has forced us to trust more on the licensees and their self-regulation. And also, it has forced us to innovate and use new tools, new ways of working with modern tools. I think both Ramzi and Olivier have said that as well.

The second point here is about the learning from the medical industry. I think both the regulators and the nuclear industry, nationally and internationally, can learn from the medical industry and what they have done with the development, review, and licensing of the vaccine itself.

It took place in one year and now they

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have the vaccine and it's being used, whereas in the past, it took ten years to develop, review, and license a vaccine.

And I think there is -- you can see an analog here with regards to the development, review, licensing, and construction of the NPP. If it goes well, you can do it maybe in ten years.

And now, with the SMRs, I think the expectation and aim is to make these time spans much shorter than they have been in the past. And I think we should look on what they did with the COVID-19 vaccine.

And to understand it better, I spoke last week with the Finnish medical authorities. And in the EU, they have been applying this so-called rolling review methodology, but the main idea is that not all licensing documents have to be submitted at once, they can submit it in phases in a logical order.

And with this, the regulators have been able to decrease the review time quite significantly. It's now a couple of weeks instead of 210 days, I think in average, what it was in the past. So, this reduction is quite significant.

But they have done something else as

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well, not only the regulators, but the industry. For instance, they have of course made huge investments, the collaboration and cooperation has been something very unique within the funders, researchers, industry, and regulators. And they have also constructed additional production lines.

But anyhow, what they have done, they have changed the paradigm of licensing. And I think that's something that we also should be doing if we want to meet the expectations with the SMRs, for instance, globally. And that's something that we can learn from the medical side.

Then, the last thing about the pandemic is the lessons learned that we can learn from the pandemic for radiological emergencies and preparedness and response. When I have been seeing our institutes for welfare and well-being addressing all these COVID-19 issues, I have imagined STUK in their place, just by replacing COVID-19 with radiation or radiation emergencies.

It's quite analog and I think we can learn many things from that. For instance, how we communicate risks, how do people behave with guidance or with recommendations? I think that this is

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something that Olivier also addressed.

How do we cooperate within the authorities and public decision-making takes place in crisis conditions?

In Finland, we have taken a lead with our Ministry of Social Affairs and Health to collect lessons learned from pandemic, with the aim of enhancing our preparedness and response to radiological emergencies. Let's go to the next slide.

This slide, here, it provides an overview of ongoing efforts at STUK in transforming our oversight activities and way of regulating.

The figure in the middle is an example, a simplified example of one possible point in the future to categorize licensees into four areas. Our goal, of course, is to have all licensees in the green area, which means that they are responsible, they are motivated, and they are knowledgeable.

And our oversight activities are aimed at understanding where they are and based on the results of the oversight, use different instruments in either directing, supporting, or coaching our licensees into the right direction.

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And I would like to open one of these items on the left-hand side, for instance, with risk-informed regulations. We have decided to initiate a full renewal of our regulations and guides with two main goals: being more risk-informed and less prescriptive.

I think in Finland, our regulatory guides are quite prescriptive. And with this, we want to give more leeway to the licensees to find the best way in achieving the required safety level.

In addition, risk-informed regulations aim to ensure that our regulatory activities, requirements, and resources are focused on the most risk-significant areas and also, as such, will help us in managing our workload.

Then, the oversight tools and interactions endorsing licensee's responsibility. Here, we are discussing, for instance, how to interact with the licensees to help them understand our safety requirements without telling them technical solutions.

We aim at getting rid of any regulatory tasks in which STUK could be seen as a continuation of licensees.

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And then, data management enabling performance and risk-informed oversight. This is about getting right data in the correct format and using that data in deciding and focusing our regulatory activities.

If you look, for instance, just the figure in the middle, we need to get data automatically analyzed to support our understanding of a licensee's situation, and based on that, decide what oversight tools to use.

And we are working on this. And if you are interested, please listen to TS26 on Thursday, that will be one of our talents speaking about this more.

Then, digital customer-oriented applications and services. For this, there is a strong push in the Finnish government. One of the aims is to make fulfillment of licensee's obligations as easy as possible, with digital services.

Another objective is to enhance efficiency and effectiveness of our regulatory process. And, again, help focusing our resources on more safety-significant tasks.

This is linked with the item on the

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bottom, regulatory cooperation utilizing common ecosystems. We have initiated a study with a couple of Finnish authorities with which we regulate same licensees.

The goals are to utilize all information available from a licensee. Provide a single window to licensees to interact with regulators. And also, to gain savings in IT system development.

And we believe that this should ensure that we know better the situations of the licensees and also help support them perform better and more responsibly. And also, it will ensure that the remaining work for the STUK and the staff is more meaningful. Last slide, please.

I would like to point out that what we are doing at STUK is not only to change the processes and resources and tools, it's also a cultural change that we are making. I'm not saying that we are currently on the right-hand side, but we are aiming at having a regulator in Finland which represents more the descriptions on the left-hand side.

And finally, just point out that the transformation needs to take place in people's minds and attitudes, it's not only about these processes,

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which we more tend to talk about. Thank you.

MS. DOANE: Okay.

MR. TIIPPANA: Back to you, Chair.

MS. DOANE: Thank you, Petteri. So, now, we will turn to Mark Foy.

MR. FOY: Okay.

MS. DOANE: You have the stage.

MR. FOY: Thank you very much, Margie. Hello, everyone. Next slide, please.

The current COVID-19 pandemic has actually influenced significant transformation in ONR. And it had a similar effect on the industry in the United Kingdom.

The dynamic nature of the pandemic is illustrated in the top right-hand side of this slide, and it shows that exponential in increasing COVID-19 related deaths and how this has varied over time.

It shows two major peaks, with an intervening period of low mortality during the summer months, something that's been experienced elsewhere across the globe, I know. Government protection measures, combined with a well-advanced vaccination program, is now having a major impact on the virus transmission in the U.K., and it appears to be turning

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things around.

But by mentioning this, what I'm trying to illustrate is the environment that we and the operators that we regulate have had to adapt to.

Throughout the pandemic, ONR's priorities have been the health and well-being of our regulatory staff, whilst also gaining the necessary assurances regarding the continued safety and security across the industry.

And to do this, we've had to be responsive to the changing nature of the pandemic, and the national constraints imposed by our government to reduce transmission, but also any local conditions to communities surrounding the licensed sites that we regulate.

This has meant doing things differently, to protect our people whilst also avoiding undue burden on those we regulate while they themselves respond to the pandemic. It's been a notable transformation in how we work and how we regulate.

Our staff, like others have been on before, have been working from home for the last 12 months, and this has been possible because the IT has worked well, including our virtual platforms,

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allowing both domestic and international work to continue. Our regulatory assessment and licensing work has also continued almost unabated.

We've also adopted a balanced approach to inspections, mixing both remote and onsite inspections when we've had to reduce our onsite presence. Indeed, we've had to stop that, I'd say, for all but the most urgent site visits, coincident with the two peaks indicated on the chart on the right, while we had the peaks of virus transmission.

During this time, we've also made use of the operators' internal assurance function. We've also used records to refer to previous inspection results and the known safety culture to inform our priorities.

But throughout, we've required regular provision of information from industry to report on the impact of the pandemic on their sites around operational resilience, emergency preparedness and response, their security plans, and, indeed, the resilience of the supply chain.

This information has enabled us to provide assurance to domestic and international stakeholders, the U.K. government, our public, the

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IAEA and the NEA, and fellow national regulators, many of you present here today.

We've sought to remain flexible and agile at this time, whilst also ensuring that recovery plans are aligned to those of our duty holders. We've not worked in isolation; we've benchmarked and shared with fellow U.K. and international regulators to remain aware of the practice and the challenges elsewhere in the face of the pandemic.

On the bottom of this slide, on the right-hand side, it illustrates ONR's four-step pandemic response plan, and it was implemented at the start of the pandemic, covering what we call the Four R's: respond, re-plan, recover, and reshape.

But because of the dynamic nature of the pandemic, we're now moving to recover. And that's recovering that onsite footprint. We anticipate entering reshape in the summer, which will include the new normal, a blended approach to where and how our people work. Next slide, please.

I've already highlighted that COVID-19 required a transformational response from ONR and the industry. There will be a new normal and new ways of working for all of us in the future, something

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that none of us could have envisaged at the start of 2019.

ONR will be implementing a blending approach to home, office, and site working, supporting a better work-life balance for our people. The cultural resistance that existed in the organization is no longer there, the resistance to that home working. And we're already thinking about how we use our office space and how much we'll need in the future.

But it will also ensure flexibility in our working patterns. Nine-to-five doesn't suit the home life situation of all our people. We recognize the need to be more inclusive, providing flexibility to accommodate the different needs of individuals.

And in line with others, we are also looking to optimize our regulatory approach, making better use of technology.

A recent example at Hinkley Point C, the construction site in the U.K., we inspected the supply chain to confirm the quality of components to the project. That involved inspections done of components in the Czech Republic and Switzerland, using video cameras and CCTV and virtual meetings to

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provide the evidence of adequate assurance.

In relation to modernization, we are already on a modernization journey, similar to others on the call today. Modernizing how we work is a key theme in our five-year strategy out to 2025 and it's not specifically driven by the pandemic.

We've recently completed the major modernization of our information technology systems. During the pandemic, aged hardware and software platforms were replaced for all 625 of our staff, done seamlessly. We distributed the Surface Pros, set them to work, did the training, fully functional systems now with the old kit returned and now being decommissioned.

We also successfully separated all of our digital systems and records from those of another organization that we used to partner with in the past. We're now totally independent of them and we are now cloud-based.

We're currently in the midst of rationalizing and modernizing all our regulatory processes, from inspection to assessment, enforcement, and others, and also our approach to information management.

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A phased rollout has already commenced in the organization and we'll complete the rollout of all the processes to the whole of ONR by the end of 2021. This will improve our information and knowledge management, how we store information, how we retrieve it, the processes that we apply to it, and then, how we present the information to inform our regulatory decision-making. It's actually called our WIRD Project, and called Well Informed Regulatory Decisions.

We consider our enabling philosophy to be a modern approach to regulation. It has, at its heart, early engagement, collaboration, and development of fit for purpose solutions to deliver common, agreed outcomes, all parties working and supporting to overcome barriers to achieving those desired outcomes.

But this enabling approach also extends to innovation. We're establishing an Innovation Cell, made up of free-thinking, open-minded inspectors, providing a safe space for innovators to approach us and to work with us to discuss and test the new, novel, innovative ideas without fear.

We're also considering options for

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innovation in regulation, increasing the use of technology and data use, providing an agile framework, involving cooperation and collaboration between fellow regulators, industry, research organizations, and academia.

It means regulating smarter to assure and influence the safety, security, and safeguard performance of industry and make sure it is where it needs to be.

Key to any organization is its people, and that's especially true of ONR. We aim to be a diverse and inclusive organization, one that is maximizing the benefits of diversity, establishing a bigger talent pool, providing better creativity, and improving our decision-making, this through having new perspectives and alternative challenges coming into the organization.

I will say that we're not there yet. We've started the journey, but we still have a way to go.

With regards to a risk-informed approach to regulation, along with others here today, it's not new to the U.K. It's a fundamental approach to the regulation of health and safety across all industrial

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sectors, including nuclear regulation.

The level of risks or the chance or likelihood harm arising informs how we target our resources and the effort that we put into licensing, assessment, indeed, across all our regulatory functions and purposes. We consider individual and societal risk and ensure that it is as low as reasonably practicable. This is a legal duty in the U.K. and it's for the licensee to demonstrate.

The safety case then demonstrates that the level of risk is as low as reasonably practical and it identifies where improvements are needed to reduce that risk. It's better for us to target our resources at areas of highest risk and ONR's regulation is accordingly targeted and proportionate.

Recognizing also though that there may well be lessons coming out from the current pandemic from other regulators, such as those approving vaccines and how they're approached. Next slide, please.

So, to conclude, just to highlight that our mission is and will continue to be protecting society by securing safe nuclear operations. But for me, continued safety and security in the nuclear

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industry is paramount.

But we need to be responsive to that changing nature of the environment, be it a pandemic, something that's innovative, or any other influence. There's no doubt the future will require us to do things differently, but we must avoid undue burden, while also ensuring safety and security. And I believe that that has been achieved during the current pandemic.

Regulators also must remain current. Change is necessary to ensure that we remain fit for purpose, agile, flexible, able to respond, and be appropriately risk-informed. But I reiterate that diversity and inclusion is an essential part of that modernization.

And finally, just to close, it's also important for regulators and industry to work together to ensure safe and secure outcomes. And picking up on the theme from the survey that was done at the start of this session, that includes preparing for new technologies and working together. Thank you.

MS. DOANE: Okay. Thank you, Mark, that is very informative. I have so many questions

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myself, but this is a chance for the audience to ask questions, so I'm not going to sum up some of the things I've heard yet. Let's turn to the questions that we're getting from the audience.

So, it appears that there are several questions about how you are transforming because of COVID, and particularly about doing remote inspections, that seems to be something that people are picking up on.

So, I'm going to give this question to all of you. Can you talk about if there are any lessons from the past year that will lead to permanent changes in your organization? And people are really, they're interested in specific issues, if you can find any, if you have any you can think of offhand.

And then, also, for ASN, there was a specific question about whether you've seen efficiencies in your remote inspections, for example? So, let me start with you, Olivier, then. And then, maybe we'll just go around.

MR. GUPTA: Okay. Thank you, Margie. I can give two examples about what we are doing and what we continue to do with remote inspections.

The first one is that we've got access

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from the licensee for the main parameters that are in the control room, not fully in real-time, there is a short delay, 30 seconds, something like that. But this is now parameters that we can see from our offices. And I'm sure that we continue when we need to, to check this remotely.

A second experience that I can give is, and it may answer the question that you raised, Margie, obviously, we are gaining efficiency in such a way that that's what I'm telling to the inspectors, when you are going onsite, you should not be in a meeting room, you should be on the facility itself to look what the materials, equipment look like, to see how people are working, in which conditions they are working, and so on.

So, we are refocusing the time onsite on what we can see only onsite. And I think this is very important, because this is the ground of our credibility, to have this contact with the facility.

On the other hand, what we are doing remotely is asking questions to the licensee on the basis of documents. But regarding efficiency, I will say that it takes more time, it takes us more time than what we were doing onsite, because our

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inspectors have a tendency then to, since they have their now offices or at home, they look more deeply into the documents.

MS. DOANE: Yeah, so that's a good thing. But that's an interesting perspective, because they have more data available, they can actually take more time, yeah, that's very interesting.

It's similar in the United States as well, because we're doing both, but we really see a value in what we call boots on the ground in the United States, I don't know if that translates, but just to have that presence and being able to see the facility. So, it's really a combination. But, yeah, we'll carry those things also, we'll carry those forward.

So, who would like to go next? Ramzi, you want to? Okay, great.

MR. JAMMAL: Sure. Thanks, Margie. From the CNSC perspective, we did find efficiencies with respect to the preparation for the inspection. Our collaboration with the technical support organization, which is part of the CNSC, virtually has enhanced quite significantly.

So, you don't have to go to the field and

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then provide request from the technical or the special area experts or the specialists. Though there are some efficiencies in preparation or in the review of the inspection.

And of course, as my colleagues mentioned, we have full access to the licensees' operation. We even attempted, all of the licensees, virtual meetings via connectivity.

So, the ongoing oversight, I'm going to say, continued with modifications, modifications became the CNSC looks at the full sector of nuclear applications in Canada or regulated all of them, from the mining, the medical application, for the small licensee.

So, when we speak of risk-based, we look at the sector itself and the risk-informed, how do you reprioritize your inspections and your resources based on the risk-base with respect to the sector and risk-informed decision-making based on either the individual licensee or performance?

So, the efficiency is presented at two levels, and definitely review of the licensee's documentation. So, hence, when you are going onsite, it becomes very, a sharper focus, but looking at the

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risk elements that you found in the review and remote inspection.

But at the end, you cannot replace one or the other, they have to complement each other. Efficiency can promote perspective, it is the cyclical plans for inspections. I think it was mentioned a little bit by Mark or Petteri, but for us, was just dismantled completely.

I mean, you have to replace, reprioritize based on what you are finding from the remote inspection. So, that cultural change is providing a bit more efficiency.

I can say, the effectiveness dropped a little bit at the early stages, but now we are where we were before, with respect to the effectiveness of the inspections.

But we did not stop at all virtual, our inspectors for small licensees issued a notice to stop operations based on virtual inspections, no boots were on the ground. So, I take pride of the judgment of the inspectors based on what they found virtually, overseeing the performance of the licensee based on documentation review.

So, the point is, it's a journey that we

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will embark upon, but definitely, the cultural change is there. So, that takes a complementary functionality, based on virtual and site inspections.

MS. DOANE: Also really good insights. And I think that cultural piece is an important part, I think all of you mentioned. And maybe, Petteri, you mentioned this specifically, about adaptation of technology, and maybe all of you mentioned it in one way or another.

And I think that's going to be significant, because as we move to find efficiencies, I think that working smarter with new technology will, there will be some less sensitivity to these changes in the future, I think. So, that's interesting.

Okay. So, Petteri, you want to go next and talk about what might be permanent that you've seen since COVID, that you actually developed for COVID?

MR. TIIPPANA: Yes, although the previous speakers have said it very well. I think, now we know better in which areas these remote inspections work and where they don't work.

I think, for the future, fully certain

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that we will be conducting this hybrid inspections, it brings efficiencies with having only just a limited number of people on the site, doing the site inspections, then we can join people from the office for specific parts of the inspections, I think, versus possibly send all of them to the site, which did not make any sense now that we have learned to use these remote tools.

Security area is something that, for the time being, with the current tools, it's difficult to inspect remotely, at least in Finland. What has been easier are the areas where people know each other, the inspection target is fairly simple. Where it's the opposite, it's complicated area to be inspected and people don't know them so well, then it's better to go to the site.

But I think the most efficiencies come from the areas that we don't have to inspect anymore, it's just not needed, you can trust on the licensee, and that's, I think, the best area. I think the trust here is the key, that we have been building during the COVID. Thank you.

MS. DOANE: Yeah, we have an expression in the United States that trust, but verify. And I

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think that that works here, because there's always an opportunity to then go onsite and if there's anything that you want to just check on to make sure that there was a good understanding remotely, that opportunity is there.

So, I think this is a very interesting development, because I think, like Ramzi said, it's a very efficient use of resources, and Olivier too, where you said, you can actually see more. So, I think this is going to be an interesting development.

Mark, I know we've covered a lot of aspects of what's necessary to be on the ground and how we've made these decisions about inspection, but did you want to add anything to the discussion?

MR. FOY: Just quickly, because I know we've probably got a lot of other questions. I think, for me, it's about having a blended approach between remote and onsite presence.

But we've also got to consider that public confidence aspect as well. So, what would the public expect? So, there's a little bit of that that has to come into play here. And also, remote inspections are not a substitute for all aspects of what you would do onsite. And that, then, falls back

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on the public confidence issue.

In terms of being risk-informed, when we went to predominantly remote inspections, we looked at those areas that we thought would be most at risk as a consequence of the pandemic. So, the presence of suitably qualified experienced persons on the site to do those safety, security activities.

And also, looking at maintenance, because of the number of people on the site, which reduced their ability to fulfill that safety-related maintenance would be more likely to be compromised.

So, we did target in that way. And everything that we did was risk-informed.

One benefit that we did find was in relation to transport duty holders. We undertook quite a lot of telephone type, virtual type initial inquiries, seeking some assurances with regards to some of the arrangements they got in place. And it was extremely useful about informing perhaps we needed to do a little bit more in terms of specific duty holders.

MS. DOANE: So, those are very important points, thank you for adding to the discussion. And it is a very special obligation that we have to

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communicate with the public about risk and to continue to hold their trust.

And this is a complicated issue, when you say you're not going to be at the site. So, thank you for highlighting that, Mark, I think you're right, I think that's very important.

Okay. So, I'm going to completely switch our discussion topics now and go to climate change. So, as regulators, we don't promote one type of electric generation over another, we just ensure that nuclear is safe, if that's the decision of the country, of course.

But it is also absolutely true for all of us that the policy in the country of what to use in the future, what kind of generation it will use in the future has an impact on us, because we have to be ready.

And so, I know that you share my thoughts that we, in order to transform in the right way and go in the right direction, we really have to pay attention to what's going on externally.

And one thing that is being discussed extensively in the United States is climate change. It's part of the Biden administration's, some of his

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priorities. And so, I think that the question came in about all of us.

So, how has this, in your countries, how has the discussion of climate change impacting how you're planning for the future or your organization in general? Has this changed? Are you -- is this having an impact or is it something that's just in the external discussions, but not really changing the way that you're working?

So, why don't we start with you, Mark, since we had you go last in the other --

MR. FOY: Okay. Thanks very much, Margie. Yes, U.K. very much recognizes that nuclear has a role to play in the U.K. and we have what is called the Nuclear Sector Deal. And that's a demonstration of the government's understanding of the role that nuclear will play in relation to its net-zero 2050 target for the United Kingdom.

We've recently, just towards the end of last year, had a few papers published, the Energy White Paper for the U.K., also, the Prime Minister's 10-Point Plan and the National Infrastructure Strategy as well, have all indicated and reaffirmed the position of nuclear in terms of our energy mix of

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the future.

And it's also their ambitions not just for gigawatt scale reactors, but also around advanced nuclear technologies, SMRs and AMRs.

We've been involved with governments, in terms of having an understanding of its ambitions, to make sure that we are appropriately prepared in relation to developing the right guidance for our inspectors, but also ensuring that our inspectors themselves have that understanding of the technologies that are potentially going to be coming forward.

So, the U.K. has run a form of competition amongst vendors to identify suitable technologies and there were seven different technologies that went forward as part of this process and we have done high level technical assessments of those technologies and given our view as to how mature they are and where they stand in relation to being options in the future.

A further option was a fusion reactor as well, but we don't regulate that in the U.K. So, we've been very much involved in discussions around those types of technologies and also making sure that

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we are well-prepared to actually regulate them.

There are individuals on the panel today that we've had discussions with to see how we can actually work together to facilitate future harmonization of standards, which would then lead to convergence of designs for specific technologies.

Because I think we all recognize that the slightly subtle differences across different nations does lead to some design changes, which makes it difficult, then, for vendors.

And it's not about having a favorite of one particular technology or another, it's about making sure that we have appropriate standards in place to ensure the safety and security for whatever technology is actually looking to be deployed in that country.

MS. DOANE: Mute button. Okay. Petteri, you want to go? We'll go backwards this time.

MR. TIIPPANA: Thank you. Like Mark said, also in Finland, nuclear energy will be in a really significant role for Finland to meet its climate goals, being carbon neutral, I think was it in 2035 or 2040, so it comes really soon.

There is one NPP now being commissioned

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Olkiluoto 3. I'm happy to report, by the way, that they will soon be entering the fuel rod. One in the construction license phase. So, nuclear will be significant and us, as a regulator, we have to be, of course, ready to regulate and provide a framework where they can operate and do that safely.

Then, the SMRs, also in Finland, there are even organizations planning for developing SMRs and we, as a regulator, we have to be ready to regulate so the regulatory process doesn't unnecessarily delay licensing, review, and construction of these SMRs.

And that's part of the confidence-building that we are doing. And I refer to my remarks, there's something that we need to learn from the medical industry with the COVID vaccine development, review, and licensing and change the paradigm. And it doesn't help if we do it in Finland, we have to do it internationally as well. Thank you.

MS. DOANE: Yeah, that is a really interesting example of looking at what's happening in the medical industry.

And yesterday, as you know, I was speaking to Dr. John Mascola, who is from our NIH and

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was working on the development of the vaccine. And one of the topics we discussed was risk and how to balance the cost and benefits so that you can make decisions efficiently, and especially when so much was at stake.

So, it's very interesting. So, I think you're right, we can learn a lot from the medical field.

Okay. Ramzi, you want to add? And then, maybe really quickly, we're running out of time, and maybe we'll get Olivier to say a few words as well on this one.

MR. JAMMAL: Sure, very quickly. Technically, I mean, just compliment Mark and Petteri.

Definitely, climate change is policy driven. Our job as a regulator to give the trust to the public, that based on the policy, whether it be provincial or federal, that there is a trusted regulator to make sure that safety doesn't become compromised. Whether it be a risk-informed decision-making nationally or international collaboration, those are key elements. So, that's one.

We are talking of what Petteri mentioned

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from the medical end of things, but if you look at the ICAO perspective for certification or licensing, the outcome is not the issue we're trying to push for, it's the process. So, it's not impediment for the well-being of Canadians, Americans, or Finnish, or the U.K., or the French. And that's the key point.

So, collaboration without erosion of trust is key. At the same time, climate change, at both levels, from regulatory perspective for existing facilities, from refurbishment to taking into consideration protective measures against climate change that's going to impact existing operations.

But I will conclude, because of the policy, there should be trusted regulator that the policy of any government would be done safely via the regulatory operation and the regulatory oversight.

MS. DOANE: Yeah, no, very good points. Olivier, did you want to add something very quickly? We have, I think, see we have a minute, but --

MR. GUPTA: Okay. Just two aspects. We have started the discussion at ASN with industry on small modular reactors. And one of the important aspects of the discussion is to see whether we want small modular reactors to achieve higher safety

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levels than Gen 3 reactors. That's my first point.

My second point is to say that we are in a quite peculiar situation in France, because we have 75 percent of electricity which is generated by nuclear power plants. And at the same time, they are closing Fessenheim power plants at ASN.

So, we are warning the government so that the country keeps margins in the electricity production, so that if we need for a safety reason to shut down one or more nuclear power plants, we don't put the whole country in a difficult situation.

MS. DOANE: Yeah, okay. So, very, yeah, very interesting. So, unfortunately, we are out of time. But I have greatly enjoyed hearing all about the different things going on in your countries and I think that, I'm sure that everyone else agrees with that.

And I'd like to also thank the people that have helped behind the scenes, including Sara Mroz and Susan Wittick from the United States and all the RIC supporters and our technology experts. So thanks, everybody and have a nice afternoon.

(Whereupon, the above-entitled matter went off the record at 12:00 p.m.)

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