UNITED STATES

NUCLEAR REGULATORY COMMISSION

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STRATEGIC PROGRAMMATIC OVERVIEW OF THE OPERATING

REACTORS AND NEW REACTORS BUSINESS LINE

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THURSDAY,

OCTOBER 13, 2022

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The Commission met in the Commissioners' Conference Room, First Floor, One White Flint North, Rockville, Maryland, at 9:00 a.m., Christopher T. Hanson, Chair, presiding.

COMMISSION MEMBERS:

CHRISTOPHER T. HANSON, Chair

DAVID A. WRIGHT, Commissioner

ANNIE CAPUTO, Commissioner

BRADLEY R. CROWELL, Commissioner

ALSO PRESENT:

BROOKE P. CLARK, Secretary of the Commission

MARIAN ZOBLER, General Counsel

NRC STAFF:

DARRELL ROBERTS, Deputy Executive Director for Reactor and Preparedness Programs

ANDREA VEIL, Director, Office of Nuclear Reactor Regulation (NRR)

ZACHARY HOLLCRAFT, Senior Reactor Operations Engineer, Reactor Inspection Branch, Divisions of Reactor Oversight, NRR

JAMIE HEISSERER, Deputy Director, Division of Operating Reactor Licensing, NRR

SHILP VASAVADA, Senior Reliability and Risk Analyst, PRA Licensing Branch C, Division of Risk Assessment, NRR

BRIAN KEMKER, Senior Resident Inspector, Vogtle Units 3&4, Region II

MICHELLE HAYES, Branch Chief, Technical Branch 1, Division of Advanced Reactors and Non-Power Production and Utilization Facilities, NRR

HOSSEIN ESMAILI, Branch Chief, Fuel Cycle & Source Term Code Development, Division of Systems Analysis, Office of Nuclear Regulatory Research

P R O C E E D I N G S

(9:00 a.m.)

CHAIR HANSON: Good morning, everyone. Thank you for joining. I convene the Commission's public meeting on the NRC's Strategic Programmatic Overview of the Operating and New Reactor Business Lines.

The Commission is meeting today to get an update from staff and discuss a range of important activities in the reactor business lines supporting our critical safety and security mission. It's great to have this important meeting, with the almost full complement of the Commission.

Of course, we have Commissioner Caputo and Commissioner Crowell. Unfortunately, Commissioner Baran took a quick trip to Canada yesterday and experienced a lot of this kind of post-COVID travel problems. His flight was canceled last night. He's on his way back this morning.

And we hope, fingers crossed -- I'm looking at Brooke -- that he will be able to join us remotely for the second panel. So, we wish him safe travels. I think he's in transit as we speak. And, hopefully, he can join us shortly. So, we'll look forward to that.

We have two staff panels today. We'll begin with the Operating Reactors Business Line panel first, followed by the New Reactor Business Line.

Before we start I'll ask if my colleagues have any remarks they'd like to make? No? Okay. So, with that, we'll begin with Darrell Roberts, our Deputy Executive Director for Reactor and Preparedness

Programs. Darrell, the floor is yours.

MR. ROBERTS: Thank you. And good morning, Chair Hanson and the Commissioners.

Staff in the Operating and New Reactor Business Lines are doing incredible work, which we will be showcasing here today. Since the Commission meeting last year, staff have continued to exhibit exemplary dedication and focus to execute our important safety and security mission through proactive actions to our changing environment, and consistent with the principles of good regulation.

This includes continued improvement of our processes, whether it's through insights from our own self-assessments, the COVID-19 pandemic, Commission direction, or other sources.

For example, we maintain a strong focus on addressing current and future staffing challenges, including an evaluation of our hiring policies to incorporate lessons learned from our experiences with a hybrid work environment.

We are implementing the Commission's direction to reassess how we conduct our subsequent license renewal environmental reviews in accordance with the National Environmental Policy Act, NEPA.

The staff has embarked on a 24-month rulemaking, which is currently on schedule, for these environmental reviews, and continues to seek opportunities to work as efficiently as possible.

As a result of the Office of the Inspector General's event inquiry at Diablo Canyon this year, the staff reviewed our baseline inspection

programs and determined that they continue to provide public health -- protect public health and safety.

Later in the presentation we will highlight some additional enhancements we've initiated as a result of the OIG's audit recommendations in this area, as well as an event inquiry on the NRC's oversight of counterfeit, fraudulent, and suspect items.

Lastly, the staff is proactive in taking steps to understand and prepare for the future of operating new and advanced reactors in the United States through extensive engagements with industry groups, non-governmental organizations, interested members of the public, and through coordination with federal partners such as the Department of Energy.

In addition, the staff in these business lines are supporting multiple international bilateral and multilateral exchanges related to advanced reactors and small modular reactor licensing, inspection practices, digital instrumentation and control, human factors, and probabilistic risk assessment, among other topics.

The staff continues to support the United States Government's response to developments at the Ukraine nuclear power plants based on the changing environment in that area. The staff's expertise has been instrumental in helping other governmental organizations have a better risk assessment and understand possible scenarios there.

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The first panel will be discussing the operating reactors business line and its key role in NRC's mission. This includes work to ensure

several of our agency's enterprise and business line level risks are appropriately managed.

During this panel, Andrea Veil, the Director of the Office of Nuclear Reactor Regulation, or NRR, will talk about the operating reactors business line, strategic priorities, and notable successes, including those that enable our regulation of various technological advancements in the operating reactor fleet.

After Andrea, Zack Hollcraft, a senior reactor operations engineer in NRR's Division of Reactor Oversight, will be describing innovations that have enabled our continuous improvements to the reactor oversight process, or ROP.

Following Zack you will hear from Jamie Heisserer, to my left, currently an NRR Deputy Division Director in the Division of Operating Reactor Licensing, but previously Region III's Deputy Division Director for the Division of Reactor Projects, who will share her experience regarding the regions' resilience during the COVID-19 pandemic, and other inspection program perspectives.

And, finally, to her left is Shilp Vasavada, the Acting Branch Chief for PRA Licensing Branch C, and a senior reliability and risk analyst in NRR's Division of Risk Assessment, will discuss how we are leveraging risk insights to modernize our regulatory activities.

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So, that concludes my opening remarks. And I will turn it over to Andrea Veil.

MS. VEIL: Thank you, Darrell. And good morning Chair and Commissioners.

We are focused on the safety and security of the operating fleet of power reactors, as well as the safety and security of research and test reactors and medical isotope facilities in the U.S. We are closely monitoring the rapid changes in the U.S. energy market. And we will discuss our preparations to provide safe licensing and oversight under various scenarios.

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We demonstrated our dedication to the safe, efficient, and reliable licensing and oversight of research and test reactors, and medical isotope facilities. This past year we made significant process in the review of SHINE operating license application. We are nearing completion of the safety review, and closing a few outstanding technical issues in preparation for December meetings with the Advisory Committee on Reactor Safeguards.

The staff is also in pre-application engagement with Atomic Alchemy for a medical radioisotope production facility.

We continue to monitor the National Institute of Standards and Technology's recovery efforts from the February 2021 fuel melt event.

We are continuing our inspection and oversight activities at the site, as we observe evolutions, such as fuel loading and the important assessment of safety culture enhancements and the licensee's corrective action.

Inspection findings will inform our restart decision, which will be based on our assessment of whether the facility will be operated in a safe

manner with its existing licensing basis.

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We're also evaluating lessons learned from the pandemic in order to identify long-term improvements for future emergencies and non-emergency conditions for our licensing and oversight programs.

Our initial ROP lessons learned report was issued in January 2021. Given the additional experience that we've gained, the staff conducted a follow-on lessons learned activity focused on exploring longer-term impacts from practices utilized during the COVID-19 pandemic. The follow-on effort was broader in scope and included external stakeholder engagement in the identification and development of conclusions and recommendations.

This group recently finalized its work, and made recommendations, and delineated potential next steps. They also prioritized key actions and activities for each of the recommendations, if chosen to be moved forward.

NRR, NSIR, and the Regions will evaluate the recommendations, the prioritization, and the collaborative resources needed to accomplish them, and future discussions, with the goal of increased flexibility in our oversight program.

Our initial licensing COVID-19 lessons learned report was issued in October 2021. We are implementing these lessons learned, particularly in the area of coordination and communication to better prepare for future events and incorporating them into current processes.

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Although the ROP has been in place for more than 20 years and is robust, it has continuously evolved. By design, the ROP has built-in mechanisms to self-assess performance and consider stakeholder feedback while continuously evaluating potential program enhancements.

Zack Hollcraft will discuss the staff activities to update and reevaluate recommended ROP enhancements provided to the Commission in 2018 and 2019, which were subsequently withdrawn.

Four new papers were resubmitted for the items that require Commission approval.

The staff continues to expand its use of risk insights in the ROP. As an example, we've improved our use of processes to evaluate low safety significant issues, often referred to as the very low safety significance issue resolution process, or VLSSIR.

Specifically, we updated guidance to clarify that issues that could potentially receive the lowest severity level of traditional enforcement, and if the licensing basis is also unclear, those specific issues could be documented using the VLSSIR process.

This change enables a more complete picture of a potential importance of an issue being evaluated. In addition, we used risk insight in the selection of two focus engineering inspections for implementation in 2023.

The staff is completing the plan actions in response to the OIG's recommendations on the NRC's oversight of counterfeit, fraudulent, and suspect items, or CFSI. The staff has concluded that there is no immediate

safety concern involved with CFSI at reactor or materials facilities.

But, we're continuing to enhance our awareness of CFSI with development of formal agent -- formal agency definition for CFSI, incorporation of this definition in relevant inspection guidance, and training inspectors on the changes to guidance documents.

In addition, the staff recently issued a charter that details the NRC's objectives, the overall approach, and the strategy associated with regulatory activities related to CFSI.

The charter also defines roles and responsibilities associated with the oversight activities related to CFSI at NRC-regulated entities.

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We're implementing the Commission's direction and continuing subsequent license renewal reviews. We've developed a plan for environmental reviews in accordance with Commission's orders, including how to efficiently complete each of the six affected applications, should they choose to submit site-specific environmental reports.

We also delivered two rulemaking plans and are implementing the Commission's direction on those plans as well.

As we move forward, the safety reviews continue in accordance with the staff schedules, as they are unaffected by the Commission orders, including issuance of safety evaluations, and meetings with the Advisory Committee on Reactor Safeguards.

In parallel, we're engaged with licensees to help ensure

efficient, open, and reliable environmental reviews, and we held a public meeting in August to discuss new processes for these reviews.

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We are focused on the implementation of innovation activities. The continued application of risk-informed decision-making and use of integrated review team process has yielded significant enhancements in both safety and efficiency in licensing reviews.

For example, a review of risk insights identified an operational issue for an ongoing Wolf Creek license amendment request to extend the completion time for an inoperable emergency diesel generator.

In addition, in partnership with the Office of Nuclear Regulatory Research we recently completed an integrated risk-informed decision-making process for emergent issues which examine the potential change and the estimated fire risk associated with high energy arcing faults, or HEAF.

This was a substantial accomplishment where the staff determined that plants continued to operate safely.

This past year we've continued to use technology to enhance access to data for decision-making. EMBARK Venture Studio, our dedicated resource for promoting and shepherding innovation projects across the agency, in partnership with the Office of the Chief Information Officer, is continuing to implement process improvements through the mission analytics portal, or MAP, and also MAP X, our external submission portal.

MAP has enabled the development of high-quality data

dashboards which allow staff and the public to readily access data with less effort.

MAP X currently allows our licensees to submit some data electronically.

The NRC is committed to keeping pace with technological innovations to help ensure the safe and secure use of artificial intelligence, or AI, in NRC-regulated activities. We're partnering with domestic and international counterparts within the nuclear industry and other government agencies to stay abreast of industry activities and plan to deploy AI in identifying potential areas of collaboration.

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For digital instrumentation and controls, we're successfully exercising the enhanced digital I&C infrastructure, we're evaluating lessons learned from implementation of the enhanced infrastructure for the Waterford digital I&C upgrade, and we'll apply these lessons learned to the Turkey Point and Limerick reviews.

In parallel, we recognize that we can continue to make improvements to our infrastructure.

For example, we recently sent a paper to the Commission to allow the consideration of risk-informed approaches to address digital I&C common cause failure challenges.

For accident tolerant fuel, or ATF, we continue our modernization efforts to ensure the agency is prepared to support the industry's goal of batch loads in the late 2020s.

To encourage further engagement, we issued a memo to industry stakeholders providing a generic schedule of review for topical reports and licensing actions for the deployment of ATF concepts, high burn-up, and increased enrichment.

As an example of early engagement, the pre-application meetings for Vogtle Units 1 and 2 were very useful, as we just accepted the first amendment request for lead test assemblies with increased enrichment. The NRC expects to complete the review within one year.

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We are taking deliberate actions to meet the organizational health objectives identified in the NRC's Strategic Plan. In light of a very competitive and challenging job market, there is a robust effort underway to fill critical vacancies.

Through collaboration efforts with the Office of the Chief Information Officer, the hire -- the hashtag, has to be hashtag, sorry, #hirenrc effort with in combination with OCHCO, we implemated -- we implemented innovative methods to recruit more staff.

We are pleased to have successfully hired seven staff from the Nuclear Regulatory Apprenticeship Network, or NRAN, Program in FY '22. This was possible through strong partnerships between our hiring managers and OCHCO.

As we onboard new staff, we recognize the need to engage them in this new hybrid environment, and we developed innovative ways to increase learning activities and leverage in-person interactions.

In addition, we dedicate -- we have dedicated teams working on how to sustain knowledge management, innovation, and diversity and inclusion efforts.

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I'm now happy to turn the presentation over to Zack Hollcraft.

MR. HOLLCRAFT: Thank you, Andrea.

Chair Hanson -- Oh, next slide, please.

Chair Hanson, Commissioners, the staff continues to improve the reactor oversight process, now in its 23rd year of implementation. The Commission approved the staff's recommendation to modify the periodicity of engineering inspections, enabling the replacement of the triennial design basis assurance inspection, with a quadrennial comprehensive engineering team inspection, CETI, combined with focused engineering inspections, FEIs.

The combined CETI and FEIs allow staff to examine an additional engineering area based on risk significance, operating experience, and regulatory framework, while still maintaining the necessary level of oversight. These changes will improve effectiveness and efficiency by providing more risk-significant samples while reducing the number of overall resources needed.

The staff will implement this new inspection program beginning January of 2023.

The staff has several other policy issues at or close to the

Commission for a vote.

First, based on a Be RiskSMART analysis, the staff has recommended maintaining the team inspection portion of Inspection Procedure 71152, problem identification and resolution, at a biennial frequency as the staff incorporates other recommended enhancements identified by the recently-completed comprehensive review of the PI&R program. This provides a prudent approach to implement those recommendations first, in order to assess any impacts to the effectiveness of the PI&R inspection program before considering additional changes.

Next, the staff has recommended two changes in the ROP assessment area.

The first is to delete the requirement that greater-than-green inspection findings must wait at least four quarters before being removed as ROP action matrix inputs upon successful completion of the appropriate supplemental inspection.

The second is to revise the treatment of greater-than-green performance indicators so that they remain action matrix inputs until the appropriate supplemental inspection is successfully completed.

These recommendations are intended to encourage licensees to prepare for supplemental inspections as quickly as possible, and implement more timely corrective actions, while better reflecting real-time licensee performance.

To improve clarity in the ROP and better communicate the relative risks associated with inspection findings, the staff intends to change

the qualitative description of white and yellow significant -- safety significance.

There will be no changes to the description of green or red, nor any of the risk-informed quantitative thresholds.

The NRC staff will include this proposal along with associated changes in the currently planned revision to enforcement policy, with the goal of sending it to the Commission by the end of calendar year 2022.

Lastly, Office of Nuclear Security and Incident Response, NSIR, submitted a recommendation for risk-informed improvements to the Emergency Preparedness Significance Determination Process, and will be recommending to replace the alert and notification system performance indicator with one that considers new technologies.

Also, following initial cybersecurity inspections to verify implementation of new requirements, NSIR worked closely with the regions to establish a biennial, one-week inspection to assess licensee maintenance of their cybersecurity programs.

The implementation of these recommendations will complete the current ROP enhancement efforts. The staff looks forward to monitoring and assessing these changes and taking the next step in our continuous improvement cycle.

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Let's shift focus now from inspections to inspectors.

Recognizing the importance of our boots-on-the-ground experts at each site across the country, we are continuing efforts to improve

our resident inspector recruitment and retention. We have implemented all of the Commission's approved items to improve resident compensation and reimbursement of relocation expenses and are improving our ability to monitor and understand the health of our resident inspector program and the dynamic issues resident inspectors face.

Recently, the internal resident inspector health dashboard went live. This enables managers and staff to monitor the status of key metrics and other information regarding the resident inspector program, providing decision-makers with hard data on program health when determining if action is warranted.

Examples include staffing and training levels, surveys on inspector satisfaction, and promotion statistics.

To ensure that our efforts are persistent, NRR has created a standing committee made up of current and former resident inspectors with representatives from each of the regions.

This group is tasked with monitoring program health, sharing best practices between the regions, and implementing the working group’s other recommendations for improvements, including hiring into the Resident Inspector Development Program, getting residents out to sites, and ensuring there are opportunities available after inspectors complete their tours.

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Another new dashboard that has yielded positive effects was in response to an IdeaScale recommendation.

EMBARK Venture Studios worked with regional staff to modernize and streamline end-of-cycle meetings, making it easier to gather and prepare the necessary information to support these meetings through the visualizations of a dashboard. This new process yielded a 30 percent reduction in end-of-cycle preparation time and received substantial positive feedback from both leadership and staff for its ease of use and the visualization tools it provides.

Piloted this year, it has been unanimously endorsed by the regions for full implementation.

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NRR is partnering with Research and the Chief Information Officer to enhance the ability of stakeholders to submit, search, and trend operating experience documentation. We have updated the MAP X portal with an event notification module. Fuel cycle facilities, nuclear materials licensees, and non-power reactors can submit event notification information to the NRC via MAP X.

We are following that up with a module for licensee event reports.

These modules will improve the agency's ability to quickly and easily analyze and process information.

Recently developed public search tools for event notifications and Part 21 reports for defects and non-compliance will allow internal and external users to perform a full text search of Part 21s. This capability is not currently available to the public and was just recently rolled

out for use by internal stakeholders, including resident inspectors.

Additionally, we are upgrading the existing public licensee event report search tool to add visualizations and enhance search capabilities.

For staff, we are improving our search capabilities for operating experience documents to include the ability to perform a term similarity search rather than simple keyword searches, and filtering by inspection procedure, technical area, and plant system. This will provide relevant advanced search capabilities not available on existing NRC systems.

The tools under development will greatly enhance searches and trending for NRC staff and the public through new functionality, adding more transparency and stakeholder confidence for these processes.

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I will now turn the presentation over to Jamie Heisserer.

MS. HEISSERER: Good morning, Chair and Commissioners.

We are two-and-a-half years into the public health emergency and the resident and region-based inspectors continue to demonstrate resilience day in and day out. And, as always, they do with the utmost focus on safety.

This morning I'm going to highlight some areas of resilience over the past year with respect to COVID, uncertainty with plant closures or potential plant closures, and with staffing.

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With respect to COVID, our inspectors continually show

remarkable flexibility in the implementation of the program, how we leverage technology to complete our inspections more effectively, all while adapting to rapidly-changing COVID policies and conditions and, of course, the personal impacts of COVID.

As they have throughout the past two-and-a-half years, resident inspectors have remained on site, and operator licensing exams and all other operator licensing activities have continued. We did move some inspections and exams, or grant exemptions for emergency preparedness exercises, based on local COVID conditions.

Although challenges were experienced, the regions successfully completed the Baseline Inspection Program in calendar year 2021 and are on track to do so in calendar year 2022.

Force on force and engineering team inspections continued with flexibility based on COVID conditions from site to site. Our inspection teams readily adapted and sought new techniques and approaches to meet inspection objectives in the hybrid work environment.

In addition, the inspection staff has adjusted to rapidly changing COVID policies both within the agency and from site to site. We have also continued to be impacted by the virus, leading to last minute adjustments to team composition, resident inspector support, and increased teamwork if someone was out or unavailable. All regions were resilient in this regard.

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More so than ever, by leveraging technology, the regions

have been able to increase teamwork and efficiency, using software such as OneNote, SharePoint, and Teams.

For example, even in-person teams are using a virtual component with teammates being able to collaboratively edit and review documents and team files in real time.

We've also employed these capabilities to conduct inspections, including licensee interviews, when inspectors are unable to access the site for various reasons that would have made them otherwise unavailable for the inspections.

The resident inspectors continue to effectively leverage licensee network remote access to access plant information real time from home, allowing faster and more convenient assessment of plant status while not on site or during off hours.

Examples of information that can be accessed include control room logs, condition reports, plant parameters, and live camera feeds. And this access varies from site to site.

The staff has also demonstrated exceptional resilience and focus when faced with uncertainty and potential for, or actual plant closures. For our Byron and Dresden teams, our inspection staff remained agile and were prepared for either outcome throughout the summer of 2021.

When the decision was made for Byron and Dresden to continue operation, the inspection teams maintained a laser focus on safety and monitoring licensee re-staffing and safety culture throughout uncertain times.

As Palisades neared closure, our teams monitored safety and plant staff morale closely, and oversaw successful transition to decommissioning.

The bottom line, despite challenges and uncertainty, the regions met the mission and demonstrated extraordinarily -- extraordinary resilience while doing so.

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In Region III, we have externally hired nine highly-talented new inspectors in the operating reactor business line in FY 2022. The experience level of our new staff ranges from entry level to mid-career.

In Region III we supported five NRAN apprenticeships in 2022 and continue to support this important program. And all regions have had success in the support of NRAN.

In Region III we are thrilled to have brought on three apprentices permanently from the last cohort and look forward to hosting more apprenticeships for the current one.

This increase in hiring is such exciting news for the future of all of the regions. It also means increased effort on the part of existing staff who are both conducting inspections and training and mentoring the new staff and members of the team.

It's also critical that we continue to support rotational opportunities to broaden staff and prepare them for future opportunities and growth in the agency. Cross-organizational support has been important for the success of the region and has enabled staff development throughout the

past year.

For example, Region III had support from Region IV for acting senior resident inspector rotations at Byron and Palisades. We had support from multiple offices for the Davis-Besse special inspection team.

Region III supported Region II with resident and senior resident rotations.

Our inspection staff has had developmental and rotational assignments as branch chiefs, technical assistants in program offices, and senior resident inspectors, just to name a few.

Within Region III, we support each other across boundaries as well. For example, our engineering inspectors often support our resident or senior resident backfills or rotations. And our residents or senior residents have participated in or led design basis assurance inspections, and so on.

We fully integrate new employees into the organization through assigning them an ambassador who greets them weeks before entering upon duty, and assigning each employee a coach who is the primary point of contact for their training.

Region III has also established the inspector study group, which both serves a knowledge management function, and establishes bonds and friendships among the new inspector corps. This has led to increased interconnectivity and teamwork throughout the region and inspector support across organizational boundaries.

The challenges encountered over the past two to three years, along with our focus on staffing, have presented opportunities to our

existing staff to support the organization in new ways, and to integrate new talent into the organization, all while focusing on the mission.

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Thank you. That concludes my presentation. I will now turn the presentation over to Shilp Vasavada.

Thank you.

MS. VASAVADA: Thank you, Jamie.

Good morning, Chair and Commissioners.

NRR, in conjunction with our partner offices, is continuing its journey to leverage risk insights, to modernize regulatory activities, under the operating reactor business line.

It is a pleasure to present to you my insights on how the business line is achieving this, consistent with the Be RiskSMART framework.

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Use of risk insights in a manner that complements the defense-in-depth philosophy has helped us achieve flexibility and efficiency, while maintaining our unwavering focus on safety. This morning I will highlight the investments in our people, improvements in our processes, and enhancements of our risk tools.

These three areas enable us to identify and focus our resources on safety-significant issues.

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We continue to make dedicated investments in our people to promote and facilitate a risk-informed mindset and the use of the Be

RiskSMART framework. These investments are aimed at empowering the staff to make risk-informed decisions in their regulatory activities.

As an example, we promoted a common understanding of how to leverage risk insights in regulatory activities by conducting targeted workshops that reached more than 85 percent of NRR staff.

To ensure that the gains made using risk-informed decision-making are sustained, we are taking active steps to achieve positive change management.

An example is the well-attended and interactive Regulatory Information Conference session on leveraging risk insights in regulatory activities for the operating reactor business line.

Another example is a Summer Risk Forum which was organized in August and attended by more than 100 staff. The forum provided case studies where the staff and the business line have successfully leveraged risk insights to make their regulatory decisions.

Our positive change management efforts are aided by formal and on-the-job training on the use of risk-informed decision-making for all staff, including the NRAN cohorts and new hires.

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We are leveraging technology to support operational flexibility through major risk-informed programs. We have successfully employed remote regulatory audits and are looking for opportunities to use hybrid audits.

In part because of our effective use of technology, at the end

of fiscal year 2022, 47 percent of operating reactors will have an approved, risk-informed technical specifications completion time program. 55 percent will have an approved program for risk-informed categorization of structures, systems, and components. And operating reactors will have an approved, risk-informed surveillance frequency control program.

Our efforts to improve processes and procedures, support the increased communication and use of risk insights in our regulatory activities. An example is the staff's use of revised guidance on leveraging risk insights within integral review teams to identify a cross-disciplinary safety concern resulting from asymmetrical loading that led Indian Point 3 to revise a fuel transfer plan design for improved safety and reliability.

As a learning organization, we maintain a feedback loop for further refinement of processes to lessons learned and best practices from their implementation. A recent example is the ongoing effort to capture lessons learned from the first review conducted under the risk-informed process for evaluations, or RIPE, and subsequently enhance the process as necessary.

We continue to proactively expand the use of risk insights to new areas that can benefit from them.

An example is the recent expansion of RIPE to allow its application to license amendments involving a change to technical specifications.

We also stay abreast of industry efforts to expand the use of risk-informed decision-making. Last month the staff were invited to

participate in a workshop organized by the Pressured Water Reactor Owners Group where industry stakeholders discussed their plans and roadmaps to expand risk-informed decision-making to novel areas such as grading the level of reviews for topical reports.

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These tools play an increasingly important role supporting the staff's ability to leverage risk insights. NRR, in collaboration with the Office of Nuclear Regulatory Research, is taking deliberate steps to enhance our level of risk tools.

One of the key reasons for the enhancements is to distill qualitative and quantitative risk insights from these tools to facilitate their use by staff who are not experts in the tools. An example includes the SPAR-DASH project, which was discussed at the June 1st Commission meeting on Transformation at the NRC.

Along with the enhancements, we are increasing the accessibility of available risk tools by the staff. Examples include the agency-wide availability of the Division of Risk Assessments' knowledge transfer portal, and the agency-wide repository of risk insights containing the plant risk information posts.

In addition, graded training options are available to the staff on the risk teams.

I will end my prepared remarks by emphasizing that we are seeing return on our investment in our people, processes, and risk tools through the promotion, sustenance, and expansion of a culture that is open to

the use of risk insights in all our regulatory activities. Maintaining focus in providing positive change management activities for the staff remains a priority for the organization.

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Thank you for your time. I will turn it over to Darrell for his closing remarks.

MR. ROBERTS: Thank you, Shilp. And thanks to all the panelists for showcasing some of the great work that the staff is doing to help ensure the safety and security of our operating nuclear reactors.

As you've heard today, we continue to look for better ways to do our work, using technology and data to improve our processes, and to focus our efforts to those items of greatest importance to our mission.

Thank you, Chair Hanson and Commissioners for the opportunity to present today. And we welcome your questions.

CHAIR HANSON: Thanks, Darrell.

We'll begin this morning with Commissioner Caputo.

COMMISSIONER CAPUTO: Good morning, everyone. Thank you for being here today. Thank you all for preparing. It's wonderful to be here for my first business line meeting after returning to the Commission. So, thank you all for, for your efforts to prepare today.

I'm going to start with a question on problem identification and resolution inspections. So, this will be to Andrea and possibly Zack. But I think it's a high-level question for Andrea.

So, the recent paper the Commission proposed

backtracking on the recommendation to conduct these inspections every three years or revert back to two years. The paper says there's new information that supports the change, but I didn't see any new information in the paper that would explain the change.

So, it sort of creates the impression that NRR changed its mind.

My own recent conversations with resident inspectors during my recent travels reminded me how they often in the course of their duties will review whether or not licensees are adequately capturing items in their corrective action programs, and whether they are resolving those issues in a timely fashion.

So, let me just conclude with our principles of good regulation state final decisions must be based on objective, unbiased assessments of all information, and must be documented with reasons explicitly stated.

So, what new information did NRR find that warranted a reversal of the recommendation to conduct these inspections every three years as opposed to every two?

MS. VEIL: I'll start. And then if you have anything to add, Zack, feel free.

So, when the paper was written back in the 2018-19 time frame, the comprehensive assessment was not done yet. And the comprehensive assessment was kind of in its, maybe, middle phase.

So, because we looked at the new information that came

out of that assessment, it's clear in the paper that that assessment didn't refute or support moving to triennial.

We also looked at the inspect -- resident inspector feedback forms. There were about 28 of those forms. None of those forms had anything to do with changing the frequency of inspections. There were things like improving the assessment of corrective actions, looking at guidance, being more explicit, but there was nothing about moving the frequency and moving the frequency really wouldn't address the effectiveness of the PI&R program.

There was very -- the first paper actually documented this very well. There were lots of differing views on this topic. Some of the views said that two years is not enough for the licensee to implement their corrective actions or there's some overlap in inspection for inspectors if they go out looking at the same areas. Well, that could occur in any periodicity, but that doesn't necessarily mean move it out to, you know, a different frequency.

So, the ROP is always self-assessing. There wasn't information there to say this is going to improve the efficiency, which was the goal in the first place of looking at PI&R. Again, there wasn't anything that refuted it.

So, I didn't see everybody else said kind of assess this, see a strong basis for moving to triennial. But, of course, the ROP is always evolving and assessing information. There wasn't hard and fast data saying moving to triennial is going to get you the effectiveness and efficiency that those 28 feedback forms requested.

COMMISSIONER CAPUTO: But it didn't refute it either.

MS. VEIL: That is correct.

MR. HOLLCRAFT: Yes. That's all correct.

I'll just add, Andrea, on to your point, Commissioner, regarding the resident inspectors, we do receive assessment inputs via the resident inspector daily review, the annual samples that are performed, and the semi-annual samples that are performed all under the inspection procedure.

However, one of the things that was revealed in the comprehensive review and is discussed in our new paper is that -- and this was actually discussed in the previous paper -- that those are all considered mitigations if we went to a three-year frequency.

However, what we discovered is that that two-year evaluation, the actual team inspection that provides, is the tool that provides the meaningful assessment that can be used by regional decisions-makers. And that's one of the reasons why we felt it was appropriate to keep it.

Thank you.

COMMISSIONER CAPUTO: Andrea, I'm going to stay with you because I think this is an issue that affects more than just NRR. It also affects the Rulemaking Center of Expertise in NMSS.

Rulemaking, our process for establishing and revising safety and security requirements, should be an activity where we place a high priority of using data analytics to support decision-making. This would or should be documented in the regulatory analysis., but it seems over the last

few years that quality of regulatory analysis seems to be slipping. And seems as though it's more or less becoming an after-the-fact rationalization of what's being proposed in the rulemaking language rather than being used a tool that shapes the decision.

Are there any efforts underway to improve our use of data analytics in developing the regulatory analysis?

MS. VEIL: So, I'll start with just the beginning process of rulemaking.

There's always a regulatory basis in a rulemaking plan, as you know, that comes up and that may have cost information, cost benefit information. So, that's the before-the-fact activity that starts.

When the proposed rule and final rule comes up, that's when a regulatory analysis is sent up.

So, there's a working group that is formed and there's actually improvements that are already on the table before the Commission. I believe it's in NUREG/BR-0058, and also a 2020 SECY paper that has actual recommendations for improvements to the process.

But there's in-house expertise for doing regulatory analysis. There's data, there's data analytics for doing regulatory analysis.

But there's also a need for surge capacity. When workload increases there may be some contracting help that's needed to do those regulatory analyses.

But the Center of Expertise, along with the Program Office, which is all part of the working group that works together, does use all the

information that they have to try to put together a regulatory analysis that has the appropriate basis.

But the first steps at that point should have been done already in the regulatory basis in the rulemaking plan. The reg analysis is really at the point to put before the Commission for you all to make your decisions.

COMMISSIONER CAPUTO: Okay. Thank you.

Zack, back to you with another question on the ROP.

You mentioned a proposal to delay removing a greater than green input for an objective performance indicator from the inspection -- the action matrix once it has demonstrated a return to green performance, and to delay that until after an inspection verifies that inspectors think a licensee has really actually returned to green.

This appears to supplant objective performance criteria which the agency has found reliable for the last 20 years, with inspection results that can be subjective in nature. Now, I'll admit only having been back for a couple months, I haven't focused on the details of this issue yet but this is feeling like a step back in time for the agency.

The purpose of instituting the ROP was to replace its predecessor, the subjective SOP process of the '90s, with one that was as objective as reasonably possible.

Wouldn't what you've discussed this morning potentially penalize licensees who return to green, green performance, as indicated by their performance indicators?

MR. HOLLCRAFT: Very good question, Commissioner.

As you said, the PIs do, performance indicators do provide objective indicators of safety in particular cornerstones, but they're not able to assess the cause of the reduction in safety or if appropriate corrective actions that are put in place to return the plant to its baseline levels.

Once a degradation is determined by the performance integrator -- or performance indicator, and the licensee transitions from green to white, the program requires an inspection to determine if the cause has been corrected. The licensee is subject to supplemental inspection review of its correction action to address the white PI, exactly the same as for a white inspection finding. That's the way things currently work.

However, if a white PI returns to green once the data is included, it no longer counts as an action matrix input and will no longer aggregate with other greater than green inputs. Even if the licensee is taking no corrective action to address the underlying reasons for that the PI exceeded the green-white threshold.

The licensee remains in Column 2 of the action matrix until they complete -- the completion of the supplemental inspection because there's no white action matrix inputs for aggregation purposes, which can be confusing to stakeholders.

This lack of aggregation makes it possible that the licensee may not move to a higher column in the action matrix if other safety-significant inputs are present. And several quarters may pass before the ROP identifies this decline in performance.

The staff believes that this is a, this is actually contrary to

the principle of good regulation on reliability, and that appropriate regulatory actions may not be promptly administered.

The staff believes that the current process is overly complicated and is inconsistent with the principles of good regulation on clarity and reliability, and does not give licensees a sufficient incentive to address the underlying issues to prepare for a prompt NRC supplemental inspection commensurate with the safety significance of the PI.

Basically, we're trying to align both the PIs and the greater than green inspection findings and keep everything as simple as possible for our stakeholders.

Thank you.

COMMISSIONER CAPUTO: One thing I firmly believe is we need to remain as objective as possible in the ROP. And so, I'm going to be looking at this issue in quite a bit of detail.

I want to understand how data is used to make that decision, how many scenarios were considered, and how previous performance was evaluated in reaching that decision. Because it's my understanding, given the data that was provided, there are a significant number of data points contrary to that recommendation.

So, I will be following up with that closely.

Thank you, Mr. Chairman.

CHAIR HANSON: Thank you, Commissioner Caputo.

Commissioner Crowell.

COMMISSIONER CROWELL: Thank you, Mr. Chair. And

thank you to all of the presenters today. This is an incredibly helpful and informative briefing for me, and I've learned something new as I've read through the materials prior to the meeting and in the discussions today. I'm going to ask probably some more pedestrian questions, and I think that's important for our stakeholders and the public who are following the actions of the NRC probably more closely these days as we embark on a new era of nuclear energy production and operations.

And I wanted to maybe address this first question to Jamie. But whoever can take it, if they like, related to COVID and COVID measures that were implemented.

What COVID adjustments were made that are going to be carried into the future in a post-COVID environment and what's the rationale for doing so?

MS. HEISSERER: Sure. Great question, thank you.

So, one of the major things we identified efficiencies with and benefit from throughout COVID was using technology to streamline how we communicate, to be able to, you know, access information from the licensees in more -- in realtime, off hours, et cetera. We've identified a number of efficiencies from that.

Communications efficiencies between the inspectors and agency experts, and whether in the region or in headquarters, have been enhanced through, you know, as issues are identified and come up. Just being able to hop on a Teams call with the agency expert on a particular valve issue has, has been priceless.

And those are the types of communications enhancements that will absolutely be carried through.

And, yeah, and I would also add that the additional remote capabilities for, for residents to be able to check in on events, you know, in off hours when a call comes in, you know, that will certainly continue.

MR. ROBERTS: Let me just add some perspective, Commissioner Crowell.

You know, the world we live in now compared to the one that was around when I was an inspector is totally different, obviously. And the technology affords our inspectors today to look at parameters far more directly than what I had available to me.

Kind of wish I had some of the tools they have when I was in their shoes, you know, a couple decades ago.

But, for example, laptop technology allows inspectors to access plant data, you know, operating parameters, pump flow rates, pressures, system pressures, all kinds of process information that, you know, once you had to actually go into the plant to see, that you can now leverage just by sitting at your desk and looking at a laptop and accessing the licensee's plant data.

So, that's something that we're, you know, encouraging inspectors to do. And they have that, that tool available to them now.

Likewise, it can also access, you know, documents remotely as they prepare for inspections. You know, there's a number of cross-procedures, drawings, corrective action documents, things of that nature that

are of benefit to our inspectors as they're preparing for an inspection. So, they can do that kind of work at home or work from an office looking at a computer.

All that being said, it's still best that the inspectors have an onsite presence so they can see activities in process or in progress. There's still a huge benefit to having an onsite presence for our inspectors to ensure that they're -- they being the licensee -- are conducting their activities safely and securely and in accordance with their procedures and our regulations.

So, there's a little bit more of a, there's a little bit more of a balance available that we're trying to seek with respect to the available new technology and some of the more traditional means through which we do that oversight function.

COMMISSIONER CROWELL: Thank you. Is it fair to say then that any new or adjusted procedures related to COVID that will be carried forward would represent an overall net safety benefit?

MR. ROBERTS: Yes, yes. The main goal will be to ensure that we continue to provide adequate oversight to provide us with the reasonable assurance of adequate protection and safety. And so any changes that we make to our inspection and oversight programs and the related inspection procedures will have that goal in mind, and there will be, you know, net safety provided from that.

COMMISSIONER CROWELL: Okay. Thank you. I want to touch on their organizational health objectives a little bit. And, Andrea, I don't know if this is best for you, but, again, whoever wants to take it may do

so. Do you feel that the measures related to organizational health objectives are sufficient to meet the near- and medium-term needs of NRR?

MS. VEIL: One of my goals when I came in to NRR is to ensure that the people, I'm very people-centered, that we take care of our people. Our folks are so incredibly dedicated that they're going to rise to the occasion regardless of what's going on. COVID had a big impact. There's a lot of, as Jamie said, there's a lot of personal impact that people have had from COVID and various other things, just life. It comes at you fast, right? So people will get the work done. But for me, it matters how you get there, so we are very, very, very focused on hiring. We're focused on retention and recruitment and also transparency. When I can share things with my people, I do. When I can't, I tell them I can't and I tell them why. But we look at all the things that we have going on, FEVS results, diversity and inclusion, town halls, everything we can do to make the person whole because that's an important part of organizational health. And then we have the productivity that we need because we are embarking on a new generation of a lot more work.

So I'm very focused on the people, making sure we have what we need, both in-house and also what we bring in from new employees and mid-level employees, as well.

COMMISSIONER CROWELL: I appreciate that. I mean, as I get more familiar with the agency, it is clear to me that your portfolio is heavy, so to speak, and I want to make sure you have the tools to do it well.

Along the lines that you just discussed, and I don't know if

this is NRR-specific or maybe NRC broadly specific, but are there efforts to work with industry and academia to make sure that there's a robust talent pipeline out there, and is there anything more that can be done in that regard?

MS. VEIL: Yes, definitely. Our Office of the Chief Human Capital Officer has recruitment activities in place. Several of my folks are ambassadors for universities. There's a grant program that Ray Furstenau oversees that is both for individuals and for academic programs, and we focus on that a lot. We understand that we need to bring people in.

There's a proposal on the table that's not really right for prime time, but I'll kind of just mention it in general, of ways that we can partner more across, of course within legal limitations, that we can partner across the board, and this includes internationally. I was recently on a trip to Poland, and they immediately said we want you to mentor long distance our women in energy, so, of course, I need to talk to Marian about how to do that. But it is a global issue that we're trying to get our hands around because it's a very small community.

COMMISSIONER CROWELL: And, hopefully, Marian helped you find a way to yes for those types of engagements because they're incredibly valuable and important.

MS. VEIL: I haven't talked to her yet. This is her first time hearing this.

COMMISSIONER CROWELL: We'll just talk to each other while she sits between us. Just one more question, a little bit more wonky, and it is probably to you, as well, but, in learning more about the subsequent

license renewal process and the GEIS associated with that, you know, I understand, you know, the Category 1 considerations fall within that, but what's in the Category 2 realm that we need to be, you know, like plant-specific issues that may be addressed differently in subsequent renewals under Category 2?

MS. VEIL: I'm very confident in what the staff has put in place to kind of streamline, and I know streamline is sometimes not the best word to use, but to be more efficient in plant-specific reviews. It could vary, depending on sites. You could have siting considerations. You can have emergency planning considerations. But the box that we put around those Category 2 issues make it a little bit more standardized so that they can be handled in a more efficient way. So we could certainly get you, like, kind of deep dive into the specifics of that in future briefings, if you would like.

COMMISSIONER CROWELL: Yes, I think that would be helpful, specifically on the emergency preparedness and planning efforts. I'll probably ask a few more questions on that during the new reactor discussion. So thank you. I appreciate everyone's help on this.

CHAIR HANSON: Thank you, Commissioner Crowell. Andrea, I think I'll start with you. You know, a number of us noted with some interest the passage of the Inflation Reduction Act and the inclusion in that of the $15 per megawatt hour production tax credit for existing reactors. And that tax credit, just based on my preliminary discussions with licensees during drop-ins, it really has the potential for them to make significant additional plant investments as they look to enhance the economics, continue to enhance the

economics of their operations. And these may include digital I&C upgrades, use of higher enrichment, higher burn-up, and accident tolerant fuel designs. Conversations on uprates, in fact, are also starting to emerge again, and there may be a scenario where licensees propose all of these things in some combination or all at once.

And for us, I think that means providing, you know, clear and predictable regulatory pathways on issues, like 50.46(c), fuel fragmentation, relocation, and dispersal, accident source term. And to do that, we need adequate technical staff, you know, particularly in the reactor systems analyst areas.

So I just wanted you to, I wanted to kind of get your thoughts on, you know, what impediments do you see, if there are any, to us kind of efficiently conducting those reviews and making kind of adequate protection determinations as those amendment requests, I think, potentially, some pretty complex license amendment requests, start to filter in.

MS. VEIL: Yes and yes, I've heard all of those things and more about what could be coming based on the IRA, Inflation Reduction Act. IRA can stand for a lot of different things.

So it goes to what I mentioned earlier: people are prepared to do the work. They will do the work. They have the skills, the knowledge, and ability to do the work, but we need more people. It's a small community. We are competing with a lot of different organizations, some of which, you know, have benefits that we're now allowed to have because of being a government agency. So I am interested in making sure that we have a

pipeline, number one. Also, retain, and I say this every time I have a discussion about recruitment, retain the people that we have, have knowledge management to make sure people have what they need, and that we're passing that information down.

We often get very busy. We're very heads-down in the work that we do. But we make time in our arc to have what we call executive technical, or ET, chats, executive team chats. And there's a specific topic. It could be digital I&C, it could be FFRD, or fuel fragmentation, relocation, and dispersal. It can be these kind of deep dives. And because of Teams, we could have two - three hundred people out of the five-hundred in the office on the line. We have SharePoint sites. We have a big focus on making sure people are ready to do the work that's coming. There's a myriad of work coming, and people are doing all this stuff at the same time.

So we're trying to pull in more people to give relief to some of those folks that are working on some of these activities but also retain the people who have all this knowledge that we don't want to walk out the door and not, you know, share that knowledge with people that are here.

MR. ROBERTS: Can I add something, Chair?

CHAIR HANSON: Please.

MR. ROBERTS: Another impediment I would offer is, you know, our budgeting process is a two-year forward-looking process, and our strategic workforce planning efforts are a little bit broader than that, five years. And often we hear from these utilities and other stakeholders that they've got, you know, five- and ten-year and beyond projections for these things.

And so, you know, fortunately, we had a Project Aim, and we had a transformation effort that gave us signposts and markers, which is a tool that we can use to sort of better forecast the things that might be happening in the industry to better prepare and budget for those things. But I would offer that we're still constrained by our normal processes.

And so we have to make sure that we have the right signposts and markers, for example, that we're looking at the right external factors to better predict what is coming down the pike so that we can budget those things that are in our requests.

CHAIR HANSON: Good, good. Thank you. Yes, that's very helpful. I appreciate that.

Andrea, I'll come back to you again. I want to thank the staff for submitting the recent paper on digital instrument and control common cause failures where the staff recommends updating the 30-year-old policy to expand the use of risk-informed approaches to evaluate digital I&Cs, and, yet, I think the paper still relied pretty substantially on some deterministic and, you know, technology-specific aspects of the current policy, and I guess I'd just like to get some background about kind of what was the staff's thinking relative to how these provisions might apply either, frankly, with the existing fleet or kind of with advanced reactor designs, and, you know, what kind of influence the staff in kind of going a little further on the risk, you know, down the risk-informed path with that paper.

MS. VEIL: Sure. At a high level, both of the 1993 paper and the current paper that's before you has four points. The first three points

were risk informed. The fourth point is also risk-informed, but there's a difference of opinion on how far that risk-informed provision went for point four. So I can kind of clear it up here.

CHAIR HANSON: That's a good, I think that's a fair characterization of the paper.

MS. VEIL: So I can clear it up here. Point four talks about what manual and diverse controls are needed, for example, for control room, right. And the difference of opinion is that the staff is saying that, regardless of whatever risk-informed evaluation is done, that the staff is requiring diverse manual controls, regardless of what the assessment is, so it's not performance based or risk informed. But what the staff is actually saying, and this could be semantics or it could be cleared up in guidance, what the staff is saying is that, for critical safety functions, not just safety functions, critical safety functions, like reactivity control, the reactor coolant inventory, containment isolation, containment integrity, those are the defined -- and there's one more I may be missing. Those are the defined critical safety functions.

So as a result of whatever analysis that a licensee does, for those critical safety functions, then they could use non-safety related controls to actually risk inform and control whatever, you know, manual and diverse. And so I don't think anybody would argue that the critical safety -- they might, but I'm not arguing that the critical safety functions that are just mentioned are ones that are not worthy of diverse manual controls. But, again, it's the result of the evaluation. We're not imposing evaluations on licensees. We're not prescribing how they do it, but there needs to be controls for these critical

safety functions.

That's the source of argument for point four, I think. Most people would tell you, one through three, hey, we're really happy staff has gone further than before in, you know, updating this 1993 policy. Point four is where most of the discussion continues, and it could be we clear it up in guidance.

CHAIR HANSON: Thank you. Very helpful. I just want to use the rest of my time, Shilp, I've got a question for you. I was really glad to get the update on the risk-informed process for evaluations, or RIPE, and I was glad to see, it had been a while since I tuned into the RIPE evolution, and I was glad to see staff kind of continuing to pursue that in the change to tech spec area. And, of course, I think it was in the spring now, it seems like it was just yesterday, that we had the first one for Palo Verde, if I remember correctly.

So what, in your view, has worked well so far with RIPE, and what do you think are kind of the areas for improvement on that?

MR. VASAVADA: Thank you. I think RIPE was successful in demonstrating the underlying purpose, the basis, and the expected outcome of how we handle in a graded manner very low safety-significant issues. We can efficiently dispose them off in a manner that is focused on safety and leave our resources and time for more safety-significant issues.

Based on the review for Palo Verde, we have conducted and are currently conducting a thorough lessons-learned evaluation. My

understanding is that, basically, the vast majority of the lessons learned talk about improving the clarity of the guidance for performing reviews under RIPE. An example is increasing the clarity of the expectations for technical staff in the first step of the process, what's called a no technical objection review. But I have not, to the best of my understanding, seen anything that challenges the underlying basis and purpose of the RIPE process.

CHAIR HANSON: Good. Thank you, yeah, very much. Really appreciate that. Oh, look at that. I'm right on time.

Commissioner Wright.

COMMISSIONER WRIGHT: Thank you, Mr. Chairman, and good morning, everyone. Thank you for your presentations. Personally, I really like the rain outside. It's due.

So there's been a lot covered here this morning, and there's a couple of things that I think I need to address, and I'm going to follow-up a little bit on Commissioner Caputo's questioning and go a little bit deeper and maybe provide a little context, especially for Commissioner Crowell, as well, and for Commissioner Caputo. And this goes to the ROP papers that are before us. This goes back a couple of years, right? It transcends an EDO change. It was really close to when, I think, Ho left the agency and you entered the position here, Andrea. So, you know, that's something that we have to consider when we think about how things have transpired, right?

But, originally, if you remember, the staff approached us and polled the Commissioners about withdrawing the ROP papers. And when asked specifically, I can speak for myself, when asked why that was

happening and what was the purpose, and this was also the explanation we gave Congress when we were asked about it, as well, last year, I guess it was the November - December time frame, but one of the things they asked, one of the answers that we were given was that they wanted to implement things that they already had the authority to do, in their opinion, that were in that paper. So they wanted to remove that, and then there might be some additional items that they wanted to add to the paper. But everything that was in the papers would come back up to us as they were, and that was the reason for me giving approval in my poll to withdraw that. Now, I can't speak for any other commissioner who was polled for their reasoning, but that was my reasoning for it.

And because the PI&R part of it was, it wasn't unanimous, right? The recommendation that was given to us was triennial, I believe, and it also had a differing view attached to it for our consideration. And I was aware, as everyone else that was reading the papers, that it wasn't unanimous among the regional administrators. I think it was three to one, you know, that were favoring the biennial. So there was debate about it; I get that. But we were being asked as a commission, make that policy call. We're throwing that up to you to make that policy call. And so I said, okay, if that's coming back to us, I'm good with it. I gave them my blessing to remove it.

Well, that ain't what's happened here. Okay. The ROP has come back up differently, especially the PI&R. Plus, it's been split up, which that's okay. But the PI&R thing, the reasoning for it, first off, the report -- Zachary, Andrea, you all can, any of you can jump in on this one. The

report doesn't show, when you all refer to that, right, it doesn't give you basis to do one way or the other.

And then based on what I've read so far, the new information, I don't really know what it is. It doesn't really point to again. It's more debate again. We're back in the debate space.

So for me, it's troubling that that change happened the way it happened. Okay. Because we were being asked as a commission to make a policy decision, and that was taken from us. Now, it's back up before us. It's different, you know, which that's the troubling part to me because, going forward, when I'm asked to withdraw papers, I'm going to be looking at it with a little bit of a tainted view, right? So I'm trying to make sure that I understand everything because I think there's more behind this than I'm aware of right now, and, over time, it will come to light. But I didn't even say whether I was for triennial or biennial. You know, nobody knows where I stand on that. But the fact that that was taken from us and it was changed is troubling, but we will make the decision.

Now, having said that, you know, to either Andrea or Zach, can you discuss a little bit more about the types of potential impacts from the PI&R procedure, the changes the staff are looking at, that could affect evaluation of the PI&R team inspection frequency? And as a follow-up, can you describe the staff's plans once the impacts are identified and evaluated?

MS. VEIL: I'll start, and then I'll turn it over to Zach. With regard to withdrawal of the papers, the reason why it took almost a year, when you think about it, for the four to come back up, and the SRM was very clear.

Assess any new information that you have. Inherently, so much time had passed, we had new inspections, we had new samples. The comprehensive assessment was completed in that time.

So we looked at all of that information, including the 28 inspector feedback forms that I mentioned earlier that were provided. And as I said, before the information didn't support or refute moving to triennial. Nothing in those assessments, nothing in the conversation said we will have a more effective PI&R if we move it out to a triennial frequency. And when the end-of-cycle meetings occur with the regions, with, you know, headquarters' involvement, those touchpoints, as Zach mentioned earlier, are important for making those decisions. So, inherently, by the fact that that assessment was done, there are recommendations about procedure improvements, recommendations about making sure that corrective actions are done appropriately.

If we move the program out to triennial while we are assessing all these other things, and you are correct that there are differing views. Some people will say, well, those changes are around the fringes, they're not going to really do anything. But then we are presupposing what the outcomes are going to be instead of using data and information and inspection results to see where we can go.

So if we moved out the frequency while all these other things are going on, we don't have an anchor or a baseline to see what's really happening in this program. And we don't get the touchpoints that we need. The daily inspector touchpoints are not the comprehensive PI&R program.

They're aspects of it.

So, again, the ROP is robust. It's assessed. It's continuously evolving. So we're trying to use that information to determine how to move forward.

COMMISSIONER WRIGHT: So, again, it's troubling because we were asked, we were given a paper to address a policy issue, right? The way that you would respect that policy decision-making process would have been to supplement the existing recommendation with the new information that you have, which I don't really know if it's new information or not. I'm still, you know, I'm going to give you the benefit of the doubt right now; but what I've read so far, it doesn't provide, I don't see a basis for recommendation of the change. That's what I see.

Now, having said that, I haven't made my decision, you know, I don't really know whether I'd go with biennial or triennial. I don't know yet. But that was taken from us, and, to me, as a commissioner in this space up here, that is troubling. And so that would have been, in my opinion, how you should have maybe approached this, but we are where we are and we will make a decision on it, you know.

And I do appreciate you trying to give us the information that we're looking for. So if there is more information, what's referred to as new information that is different than what I'm reading right now, please supplement it and get it up to us so we can use that in our decision-making process.

MR. HOLLCRAFT: I'd only add, you had asked about our

plans going forward and our potential timeline. The goal would be to implement any recommended changes from the comprehensive review in the next year for a start, and the next biennial cycle, which would be January 2024, ideally, we would have a two-year run on that in the next biennial cycle and be able to perform an effectiveness review and then make any determinations for future changes, which could possibly include frequency.

COMMISSIONER WRIGHT: Okay. Thank you. And I've got about a minute. Darrell, do you have anything?

MR. ROBERTS: No, I --

COMMISSIONER WRIGHT: Okay. And we'll go to a different topic here. And I guess in the minute that I've got, I wanted to go to, I guess, Andrea, Darrell, Jamie, look at the resident inspector recruitment retention thing. You had mentioned the health dashboard and the cross region working group, and I think that's a great repository of information. So, Jamie, I'd be interested to hear from you, if you've had an opportunity to use the dashboard in your capacity in Region III and, if so, how did it help you inform your decision-making? I'd also welcome Darrell and Andrea's perspectives, and I'm interested to learn how the dashboard is updated, right, to ensure it remains a good tool to gauge program health.

MS. HEISSERER: Great question. In the regions, we're very excited about the dashboard tool that we have. It offers us data-driven information, as Zach had pointed out, for all aspects of the resident inspector health, from training and hiring to interest in sites.

So as one example in Region III that we used that data over

the summer, we had multiple concurrent senior resident inspector vacancies. One of the pieces of that dashboard is a heat map which, based on survey data from the existing pool of resident inspectors and senior resident inspectors, my director and I were able to look at where was the interest in these sites. We were able to forecast and target where we might have challenges in filling a senior resident vacancy. And even while those vacancy announcements were out and we were awaiting applicants, we were able to strategize what was our plan for backfill, what was our plan for ROP completion, what were our contingencies in case we did not get interest in one particular site, which the data showed that had low interest. So that's one example that we applied the dashboard.

So as far as updating the dashboard, it's critical that, you know, what goes in is the best information we can get, so it's critical that that is updated frequently. So that's based on inspector surveys, and one of the methods that we're doing to make sure that that information is the best that we can is the standing Resident Inspector Committee that will make sure that the surveys are going out at a certain periodicity and that the regions are updating with hiring data, et cetera, to make sure that those are updated periodically.

MR. ROBERTS: Thanks. I'll just add, Commissioner, that an important benefit of these dashboards is the visualization aspect of it. The fact that this information, the information has pretty much been available to us in various forms and fractions and other areas, and this brings them all together and presents them in a way that all people can see it. It makes it

available to not just management but inspectors and others who might be interested in going out to some of these sites. So it takes the guesswork out of, you know, the whole resident inspector health program, not just for us sitting at the table here but for the inspectors that are interested in pursuing an inspection career at one of these sites. They get to see which sites have the heat map impact, that have the, you know, levels of interest that might be conducive to them wanting to take a chance and go out.

COMMISSIONER WRIGHT: Yes. Well, the dashboards are helpful. There's a lot of them, right, and I just hope that we're using them the way they were designed to be used. So I appreciate your answer. Thank you.

CHAIR HANSON: All right. Thank you, everyone. I appreciate all of your contributions to the first panel and the good discussion. We're going to take a break. Let's just call it 10:30 we'll reconvene for the new reactor business line. Thank you.

(Whereupon, the above-entitled matter went off the record at 10:21 a.m. and then went back on the record at 10:30 a.m.)

CHAIR HANSON: All right. Thanks, everyone. We'll now recommence with the second panel on the new reactor business line. Once again, the discussion will be kicked off by our Deputy Executive Director for Reactor and Preparedness Programs, Darrell Roberts.

Darrell.

MR. ROBERTS: All right. Thanks, Chair Hanson and Commissioners.

During this panel, the staff is pleased to provide you with a strategic overview of the new reactors business line. This work includes licensing of new light water reactors and advanced reactors and oversight of the construction of Vogtle Units 3 and 4. Staff recognizes the rapid evolution and strong commercial interest in new and advanced reactors and continues to enhance our programs to prepare for efficient and reliable licensing. We are continuously monitoring indicators, such as the Department of Energy funding, to support new technologies. This ensures we gain accurate insights on the external environment to guide our planning and program development.

Our panelists will describe how we are proactively planning for these changes and using innovative methods to support our licensing reviews and enhance our regulatory infrastructure. They will also discuss how early coordination with other federal agencies, industry, and international organizations is facilitating a more effective and predictable licensing review process for new and advanced technologies.

The advancements we've made this past year have been successful only through the great collaborations of the offices of Nuclear Reactor Regulation, Nuclear Regulatory Research, Nuclear Material Safety and Safeguards, Nuclear Security and Incident Response, the General Counsel, and International Programs.

Now I'd like to introduce the panelists who will provide additional details on staff's activities in this business line. First, you'll hear again from our NRR director, Andrea Veil, who will provide a high-level

overview of the new reactors business line strategic priorities and success.

Next, you will hear from Brian Kemker to my immediate right, senior resident inspector at Vogtle Units 3 and 4 in Region II. He will be discussing how we are applying Vogtle 3 and 4 construction lessons learned and how the staff is preparing for this transition of those units from construction to operations.

Following Brian, Michelle Hayes, a branch chief in NRR's Division of Advanced Reactors and Non-power Production and Utilization Facilities, will provide an update on the staff's activities to strengthen the agency's preparedness for licensing new and advanced reactor technologies.

And, finally, Hossein Esmaili, a branch chief in the Division of Systems Analysis in the Office of Nuclear Regulatory Research, will discuss his office's support for the near-term licensing of new and advanced reactors.

Next slide, please. And that concludes my opening remarks, and I will now turn the presentation over to Andrea.

MS. VEIL: Thank you again for the introduction, Darrell. We continue to prepare for future new and advanced reactor licensing actions through pre-application engagement, developing risk-informed, technology inclusive, and performance-based guidance in rulemaking, and coordination with our federal and international partners. We're ensuring our workforce is prepared for new and advanced reactors through knowledge management, training, recruitment, and retention.

Next slide, please. During this year, we've continued robust pre-application activities to support future licensing. Pre-application

reviews are underway with 15 prospective new and advanced reactor applications, including those that support congressionally-mandated priorities, such as the Advanced Reactor Demonstration Program.

The staff has completed the review of over 50 topical reports and white papers on a variety of technical and licensing matters to support applicants' submittal timelines. The NRC staff has 22 topical reports and over 20 white paper reviews ongoing and is projecting for an additional 70 to be submitted for review over the next few years.

Pre-application activities position, as well, to review near-term small modular reactors and non-light water reactor applications, such as Kairos Hermes test reactor. This is the first demonstration of NRC's enhanced licensing approach for new and advanced reactors, which is focused on more risk-informed safety determinations.

So far, we are seeing substantial success in implementing this enhanced approach. The review is demonstrating our commitment to timely review schedules and cost estimates and achieving those through transformative review approaches all while keeping the focus on issues with the greatest impact on safety.

During the Hermes review, the staff has identified, roughly, 400 questions for the applicant. Working closely with the applicant and leveraging innovative and transparent approaches to address each question, the staff resolved the issues in a timely manner and efficiently documented their safety considerations.

Next slide, please. We are actively engaging stakeholders

to develop risk-informed, technology inclusive, and performance-based guidance to support near-term applicants. To support future advanced reactor applicants, the Technology Inclusive Content of Application Project and the Advanced Reactor Content of Application Project aimed to streamline the development of licensee applications for submission to the NRC are focusing on issues with the greatest potential to impact safety and minimize the documentation necessary for non-safety-significant information.

This will contribute to more reliable, clear, and efficient final safety evaluation reports by the NRC staff. Furthermore, in anticipation of light water reactor construction permit applications within the next few years, the staff developed interim staff guidance to supplement the guidance in the standard review plan. This is expected to be completed by the end of the calendar year.

The staff continues to make significant progress on the Part 53 rulemaking to develop a risk-informed, technology inclusive, and performance-based regulatory framework. Since the July 21st Commission meeting, we continued stakeholder engagement in several public meetings and released consolidated preliminary proposed rule language text to support ACRS interactions this month.

The staff has benefitted greatly from stakeholder input on the draft rule. Most notably, the staff expanded the scope of rulemaking to address stakeholder requests for an alternative to the probabilistic risk assessment-led framework. The alternative aligns with more of a traditional framework and international standards.

This novel approach to rulemaking has also presented its fair share of challenges. For example, stakeholder input has been diverse and sometimes conflicting. The staff, however, continues to consider the feedback and make modifications where appropriate.

Also, the size and complexity of the rule have presented challenges to some stakeholders, including non-governmental organizations. In February 2022, the staff held a public meeting that was specifically focused on receiving feedback from several of those organizations.

Additionally, in June of this year the staff proposed to the Commission a rulemaking often referred to as the Part 50-52 Rule. This rulemaking would amend the regulations related to licensing new nuclear power reactors to ensure consistency, promote a more effective and efficient new reactor licensing process, and reduce the need for exemptions from existing regulations and also licensing amendment requests.

Next slide, please. A large factor in our success to prepare for the future of new and advanced reactor licensing is our coordination with other state, local, federal, and international partners. For example, we're coordinating with the Department of Energy and Department of Defense on multiple national priorities, including the Project Pele Mobile Microreactor and future microreactor at Eielson Air Force Base.

We're performing outreach to state and local governments to consider their needs while developing new and advanced reactor policy and rulemaking. We're also using our state and international partnerships and networks to gain insights on fusion technologies, which will inform the paper

to the Commission to discuss options for regulation commercial fusion facilities, and this paper is scheduled to be issued no later than November.

NRC management and staff members also lead and support several multilateral efforts with the International Atomic Energy Agency (IAEA), and the NRC has also led the SMR Regulators Forum since its inspection and it continues to make invaluable contributions to new and advanced reactor working groups on the Committee on Nuclear Regulatory Activities. Most recently, the IAEA launched an initiative called the Nuclear Harmonization and Standardization Initiative with a goal of establishing an international framework that will enable increased cooperation of regulators during SMR licensing reviews. The NRC will support this initiative and work towards coordinating this with other ongoing efforts. In addition, in her presentation, Michelle Hayes will discuss our cooperative work with the Canadian Nuclear Safety Commission on advanced and small modular technologies.

Next slide, please. The staff's completion of the first ever 10 CFR 52.103(g) finding for Vogtle marks a significant regulatory milestone for the agency. Vogtle Unit 3 is the first Part 52 plant and the first new construction of a commercial nuclear power plant in this country in over 30 years. This milestone is a significant achievement for the NRC, and they should be proud of the accomplishments. It was a multi-agency effort, and it was achieved only through those dedicated and committed actions and activities from countless NRC staff from across the agency. We continue to maintain our safety focus as Unit 3 prepares to load fuel for the first time.

Brian Kemker will share his firsthand on-site experiences as a senior resident inspector at the Vogtle site. He will highlight our openness to innovative methods and risk-informed approaches and our preparations that led to the 10 CFR 52.103(g) finding. He will also discuss how we're preparing for the future, including our ongoing lessons learned effort.

Next slide, please. This concludes my remarks, and I'll turn the presentation over to Brian Kemker.

MR. KEMKER: Thank you, Andrea. And good morning, Chairman and commissioners.

Next slide, please. On August 3rd, the NRC staff issued the 10 CFR 52.103(g) finding for Vogtle Unit 3 based on our determination that all of the inspections, tests, analyses, and acceptance criteria, or ITAAC, in Appendix C of the Vogtle Unit 3 combined license were successfully completed. The finding allows the licensee, Southern Nuclear Operating Company, to load fuel and begin operation of the unit in accordance with the conditions of the combined license. This historic accomplishment was over ten years in the making since initial excavations began on site.

The staff worked diligently over the past several years to ensure a successful transition from the construction reactor oversight process to the operating reactor oversight process after the 103(g) finding. To do that, we developed guidance for the transition and conducted tabletops to address open issues that may have impacted the finding or the transition, including possible hearing requests and late file allegations.

We had in place detailed procedures and conducted

extensive communications with key stakeholders. This facilitated timely preparation of the Commission package that documented the basis for the 103(g) finding, which allowed us to efficiently update the final licensing and inspection documents as ITAAC were complected and verified in our inspection program. This enabled a very smooth and timely 103(g) finding.

A Vogtle 3 and 4 resident inspector office was intentionally staffed with a diverse set of skills and levels of experience to cover the range of construction inspections that needed to be completed and will ensure continuity as Unit 3 and 4 become operation. The licensee will enter the startup testing phase on Unit 3 when it commences initial fuel load. That is expected very soon, possibly as early as this evening. The licensee plans to begin the initial reactor startup later this year and enter commercial operation early next year.

Unit 4 continues with plant construction concurrent with component and pre-operational testing of safety systems. The licensee plans to start high functional testing later this fall, begin initial fuel load next spring, and enter commercial operation later in 2023. To support the Unit 4 103(g) finding, as of this month, we have verified approximately 37 percent of the ITAAC closure notices.

Next slide, please. The Region II Division of Construction Oversight, the NRR Vogtle project office, and the NSIR staff remain well positioned and prepared as Unit 3 enters commercial operation and construction and testing are completed on Unit 4. Maintaining the right number of licensing, technical, and inspection staff, including bench strength

and expertise, is crucial to handle the current and upcoming workload for both units.

We pull from experience with the Watts Bar Unit 2 reactivation in creating the Vogtle Readiness Group. This partnership between the NRC offices, including the involvement of key managers, has given us a highly effective way to communicate issues across the agency and with a broad range of stakeholders to ensure early alignment and problem solving for first-of-a-kind regulatory challenges.

We continue to use the Vogtle readiness group to proactively identify potential inspection or licensing challenges and to streamline issue resolution. To ensure regulatory engagement at all levels and to facilitate a constant dialogue with the licensee and agency partners, NRC executives and the Vogtle Readiness Group continue to meet routinely on-site with licensee management and also meet internally during several standing meetings. Open communications promoting understanding of various technical issues during these meetings have been invaluable in our successful oversight of the Vogtle 3 and 4 project.

As construction inspection work has concluded on Unit 3, the inspection staff have been applying insights gained from Unit 3 construction, inspection, and testing to the remaining Unit 4 activities. For example, from experience, we gained from the inspection of electrical installation quality issues on Unit 3, we are informing our original inspection planning and inspection techniques for electrical inspections on Unit 4. The photos on this slide show three of our highly capable regional inspectors and

the Vogtle Readiness Group.

Next slide, please. The NRC staff is implementing several strategies to ensure we maintain our construction oversight expertise. We want to make sure we retain the talent. Over the last few years, Region II has made it a priority to ensure our inspectors have meaningful assignments at the NRC after the Vogtle construction project is complete. Using a select now, place later approach and focusing on cross-qualification, that is encouraging construction inspectors to qualify for other inspection areas, has enabled us to maintain our experienced staff on the project while setting them up for successful transitions to other important work in the agency later on.

Also, we actively look for opportunities to utilize our construction inspectors on other agency projects that will leverage their experience and expertise. For example, supporting inspection program development for other construction projects, like new fuel facilities or reactors or participating in limited work authorizations or early site permit inspections.

Region II is working closely with NSIR and NRR to stay involved with the planning for future reactor and production facility construction projects which will enable the staff to support the anticipated oversight work related to new small modular reactors, non-light water and advanced reactors, medical isotope production facilities, and fuel cycle facilities.

Region II is also bringing in new talent, most recently through the NRAN, and training some of them in construction oversight and partnering them with experienced construction inspectors. This will promote

the development of new talent for the future. As part of knowledge transfer, you see an example on the photo on this slide where I'm discussing some of the features of the Unit 3 reactor vessel integrated head package during a tour of the containment building with our technical assistant, Joylynn Quinones-Navarro.

Next slide, please. Last summer, we launched a lessons learned initiative to conduct a holistic assessment of the Part 52 Licensing and Construction Oversight Program for the purpose of improving the effectiveness and efficiency of future programs. NRR has initiated efforts which Region II is supporting to assess what construction and operational oversight should look like for new and advanced reactors with potentially enhanced safety profiles. Some of our lessons learned may also be applied to our future oversight of the construction of new fuel cycle facilities.

The Nuclepedia symbol on this slide represents the internal IT platform being used to capture the staff's extensive experiences and show results of the lessons learned effort. This knowledge repository will also be populated by stakeholder outreach and public meetings to gather feedback on what worked well for Vogtle 3 and 4 and where we might be able to find efficiencies.

These inputs will form the basis of a publicly-available summary report that will include specific recommendations to improve the effectiveness of the current construction inspection program, as well as to inform the development of future construction oversight programs. Some early lessons learned involve the success of the Vogtle readiness group that

I mentioned already.

When we were faced with unique challenges, such as translating ITAAC language into safety, we were able to leverage the Vogtle readiness group to build early consensus to make risk-informed decisions. For example, when challenged with cable separation questions, we used a revised technical assistance request process to gain alignment on a path forward that was on solid regulatory ground.

Our lessons learned from construction oversight at Vogtle continue the agency's learning culture and emphasize applying what we have learned from construction over the past decade and informing the future programs for small modular and advanced reactors.

Next slide, please. This concludes my remarks, and I will now turn it over to Michelle Hayes to discuss new and advanced reactor preparedness.

MS. HAYES: Good morning, Chair and Commissioners. It's my pleasure to be here today. Thank you.

Next slide, please. As we transition to the execution phase of the advanced reactor program, we're demonstrating, efficient, timely, and risk-informed evaluations. We began reviewing the construction permit application for Kairos Hermes test reactor last December and, as of today, the safety evaluation is 60-percent complete with several chapters in the approval phase. We are on schedule and budget to complete the final safety evaluation report by next September.

Our ability to meet this aggressive milestone is the direct

result of extensive pre-application engagements with Kairos on 11 separate topical reports and the project team's commitment to a safety-focused review that is appropriately documented. The draft environmental impact statement was streamlined to focus on the most important information needed to show that the National Environmental Policy Act obligations were met and it was issued ahead of schedule.

We received a construction permit application from Abilene Christian University for their molten salt fuel research reactor in August and expect to make an acceptance determination next month. We found performing a pre-application audit of their draft preliminary safety evaluation to be mutually beneficial. It helped the NRC become familiar with the design and enabled Abilene Christian University to incorporate some of NRC's feedback prior to submitting their application.

As Andrea mentioned, we have continued robust pre-application activities with many new and advanced reactor stakeholders. We are excited that so many designers are taking advantage of these engagements because early introduction to the various technology gives us time to identify safety-significant aspects of the design, find the appropriate core team members, and prepare relevant code and analysis tools. As demonstrated with Hermes, addressing technical licensing and policy issues early leads to a timely review.

Pre-application interactions cover a broad range of activities, including the ongoing readiness assessment of the NuScale draft standard design application, safety evaluations for topical reports, and less

formal feedback for white papers. To increase productivity, we are continuously evolving our review strategies to incorporate best practices from past projects. The NuScale design certification lessons learned report was issued in March, and the recommendations have either already been adopted or are in the process of being implemented.

We're also using our experience with Hermes to inform our approach to Abilene Christian University, and we're improving efficiency across all designs by standardizing how we review submittals on the same subject matter.

We've developed and continued to enhance tools that leverage data to optimize execution and communicate review status, such as our internal and external dashboards. The dashboard on the right shows the Kairos Hermes construction permit, the status of the Kairos Hermes construction permit safety environmental reviews and is available to the public through our public website.

We have also established internal design hubs that provide one-stop access to news, schedule, application documents, and status. These efforts enhanced the transparency of the way we do business and promote stakeholder confidence.

Next slide, please. While some projects have been delayed, overall, we've seen an increase in new and advanced reactor licensing work this year and expect to continue in the future. As such, we're continuing our focus to build an agile workforce that can respond to this dynamic environment by taking advantage of various recruitment

opportunities to attract diverse staff, and we're investing in training and knowledge transfer to build capacity.

For example, we've successfully involved staff from around the agency in advanced reactor reviews so that we can introduce them to the new technologies and our risk-informed approach. We were fortunate to have a talented group of NRAN staff create a series of engaging Nuclepedia articles on advanced reactor technologies. We created a knowledge management corner around our internal SharePoint site with links to training material, and we've dedicated resources to updating our external website, recently adding pages on source term and fuel qualification.

Next slide, please. We've continued our efforts to build modern risk-informed approaches to safety and efficiently regulate advanced reactors in the future. Our efforts cover broad regulatory areas, and we've demonstrated progress on key rulemakings, such as the Part 52 rulemaking, emergency preparedness, physical security, and the advanced nuclear reactor generic environmental impact statement.

We're providing the Commission with recommendations to effectively address policy issues, such as fusion and annual fees for non-light water reactors, including microreactors. This year, we've published fuel qualification guidance and are finalizing our endorsement of three consensus codes and standards. We're evolving guidance to support the implementation of new rulemaking, such as Regulatory Guide 4.7, which provides technology inclusive, risk-informed, and performance-based criteria to assess population-related issues in the siting of advanced reactors.

Next slide, please. We are strengthening our readiness for new and advanced reactor licensing through internal and external collaborations. Our partnership with the Office of Nuclear Material Safety and Safeguards ensures our ability to review transportation and storage of high-assay low-enriched uranium fuels and, as Hossein will explain in the next presentation, we work closely with the Office of Nuclear Regulatory Research on numerous activities.

We also regularly meet with our peers in the Department of Energy to share information, data, and knowledge, creating a common understanding of the technical issues impacting safety and allowing us to collaboratively address areas of potential gaps in knowledge. We have several contracts with DOE labs, including one with the Idaho National Laboratory to pilot our fuel qualification guidance on metallic fuel. We are also engaging with industry on their accelerated fuel qualification working group.

We've continued our work with the Canadian Nuclear Safety Commission to help ensure the safe development of new and advanced reactor technologies. Incorporating lessons learned from past efforts, we issued two joint reports this year and initialed a project that, when complete, will establish common regulatory positions on the fuel qualification of tristructural isotropic fuel.

We are strategically planning our next projects, including five-party interactions with the Canadian regulators, GE-Hitachi, the Tennessee Valley Authority, and Ontario Power Generation to support safe

and efficient deployment of the BWR X-300 in the U.S. and Canada.

In conclusion, the new and advanced reactor programs have made great strides in the past year, and we're grateful for the dedicated staff who are making the safe use of nuclear technology possible by performing licensing reviews, creating the framework for the future, and collaborating with internal and external stakeholders.

Next slide, please. I will now turn the presentation over to Hossein Esmaili.

MR. ESMAILI: Thank you, Michelle. Chair Hanson and Commissioners, thank you for giving me the opportunity to discuss the Office of Nuclear Regulatory Research activities and safer readiness to support licensing of new and advanced reactors.

The Office of Research is fully committed to supporting the agency's efforts to license advanced nuclear technologies. Our staff include many internationally-recognized experts who are engaged in research while monitoring the progress made by the industry through periodic stakeholder engagements.

Next slide, please. The mission of our office is to anticipate and conduct research to provide the agency with analysis and information to support resolving technical issues in an efficient and timely manner for risk-informed regulatory decision-making. We routinely engage with other offices to understand their needs for efficient, clear, and reliable licensing reviews by providing our expertise in validated methods and tools.

Our office has been developing detailed plans to build staff

expertise and analytical tools for non-LWRs and light water small modular reactors. These plans take into consideration the need for novel technology-inclusive approaches given the variety of designs.

Our plans identify knowledge gaps, assess their safety and significance, while leveraging and updating existing NRC tools with appropriate investment in resources. We collaborate with stakeholders, including Department of Energy, and international organizations to maintain awareness of the latest advancements. We are leveraging the Nuclear Energy Innovation and Capabilities Act of 2017 and associated memorandum of understanding between NRC and DOE to support our development needs.

The Office of Research organizes cooperative international research programs with participation from more than 25 member nations. The objective is the exchange of data and analysis on experimental and analytical research.

In the next two slides, I would like to give examples of how the Office of Research successfully executes its strategy. I will highlight how we develop a streamlined plan; how we put that plan into action; and, finally, how we adopt it to conduct an efficient and timely review.

Next slide, please. The NRC's a modern risk-informed regulatory using computational tools to identify risk-significant design aspects and resolve potential safety issues. One of our main functions is ensuring the agency is equipped with the necessary tools and up-to-date information for licensing safe operation of new and advanced technologies.

I will showcase our state of practice core development

activities and demonstrate NRC's readiness and its capabilities.

To prepare for non-light water reactor licensing reviews, the NRC documented development plans through a series of five reports, as you can see on this slide. These reports identified key phenomena for various designs and the plans for integrating them into our codes. We then followed with developing reference plan models that would represent the main features of the basic designs and the phenomena we expect.

We also shared the codes and models with our international partners to leverage their expertise.

To show code readiness, we performed simulation with SCALE Neutronics and MELCOR severe accident computer codes. These simulations, the purpose of these simulations is threefold. First is to help NRC staff understand how different systems response and provide insights for regulatory guidance. Second, it's to use those insights to dialogue with stakeholders on NRC's approach. And third is to test the newly-added physics models to identify for safety analysis. These demonstrations also explain how these codes are used to identify system characteristics and uncertainties.

We have conducted five public workshops on advanced reactor designs, including a heat pipe reactor and molten salt-cooled reactor, and a gas-cooled reactor in 2021. In 2022, we conducted two additional workshops for a molten salt-fueled reactor and a sodium fast reactor.

With regard to materials performance, chemistry, and component integrity, staff has made significant progress in accelerating the

readiness to review advanced reactors, including collaborative efforts with DOE, Electric Power Research Institute, and international regulators. Key areas of focus include molten salt compatibility with high-temperature materials, graphite performance and qualification, and endorsement of ASME standard codes.

The Office of Research is also forward looking. Staff has formed partnerships with research organizations and the international community to continue to develop the expertise, tools, and capabilities to enable future applications of artificial intelligence and digital for new and advanced reactor designs.

Next slide, please. So here I want to focus on how NRC can use our tools to support efficient licensing reviews and give examples of our recent accomplishments. So when it comes to light water reactor SMRs, the Office of Research recently completed an analysis of GE-Hitachi BWR X-300 containment performance using our tools that included TRACE thermohydraulics and the MELCOR severe accident code. These tools have been validated and used extensively in the licensing reviews of larger LWRs. The extension to smaller design required relatively little effort and provided NRR technical reviews with timely and useful information.

In some cases, our tools are also used by the industry. For example, NuScale used the MELCOR code to estimate the source term for its safety analysis report.

For advanced reactors, we recently adopted our modeling approach for applications for the review of preliminary safety analysis report

for Kairos Power's Hermes non-power reactor. The modifications were based on information in the construction permit application.

The code readiness strategy and the public workshops facilitated timely performance of the work, and this provided NRR technical reviewers with an understanding of how the reactor operated and informed the development of safety-focused requests for additional information.

The NRC staff issued a trial use regulatory guidance in March 2022 that supports applicants using the probabilistic risk assessment standard for advanced non-LWR nuclear power plants. The agency standardized plant risk or SPAR model for the new Vogtle Units 3 and 4 was issued for use in licensing and oversight in early 2022. Work on the SPAR model for NuScale will begin in FY 23 and will support development of the oversight program for new reactors with lower risk profiles than current plants.

So NRC has been actively working on developing guidance for a new approach to seismic design that is technology inclusive, risk informed, and performance based. In this alternative approach, the safety margins of individual systems' structures and components are designed according to their contribution to the system level and plant level risk. Enhanced review seemed to potentially unnecessarily conservatisms.

So as you can see, the Office of Research has been working hard to anticipate the needs of the regulatory offices through development of analytical tools, staff expertise, and regulatory guidance. When applicants submit applications for a first-of-a-kind reactor design, the NRC will be able to conduct licensing reviews to not only assure public health but to do so in the

most efficient way possible.

This concludes my remarks, and I will turn the presentation over to Darrell Roberts. Thank you.

MR. ROBERTS: Thank you. And as you have heard, commissioners, the staff in the new reactor business line are taking the necessary steps to better regulate the nuclear technologies of both today and of the future. We are also working with our domestic and international partners to ensure our independence is not isolated. It's consistent with the Commission's first principle of good regulation.

In closing, I would like to thank all the panelists today, staff who supported preparations for this meeting, as well as the staff in both the operating and new reactor business lines. Our success would not be possible without the partnerships between the various offices, as I mentioned before, and their continued efforts in the ever-evolving environment.

Thank you again, Chair Hanson and commissioners, for the opportunity to present today, and I welcome your questions.

CHAIR HANSON: Thanks, Darrell. Commissioner Caputo.

COMMISSIONER CAPUTO: Thank you. Once again, I thank the panelists for coming and speaking today. Brian, Michelle, and Hossein, it's wonderful to see you and thank you for the work that went into your presentation.

I think my questions once again are probably largely going to go to Andrea. I'm going to start by quoting the SRM to SECY-89-102,

Implementation of Safety Goals. The Commission stated, quote, it is important to note that the Commission has made it clear in the Advanced Plant and Severe Accident Policy Statements that it expects the advanced designs will reflect the benefits of significant research and development work and experience gained in operating the many power and development reactors and that vendors will achieve higher standards of severe accident safety performance than their prior designs. However, the NRC will not use the industry's design objectives as a basis to establish new requirements.

Since then, the Commission has consistently rejected staff proposals to apply tighter safety standards to advanced reactors than are applied to the existing fleet. It's my understanding that the current version of Part 53 proposes to evaluate severe accidents to a level of five times ten to the minus seven while the existing fleet is evaluated to ten to the minus four.

The staff is proposing to require a tougher regulatory standard for advanced reactors contrary to Commission policy. Isn't this the opposite of risk informing?

MS. VEIL: I'll start with that's not the intent, and then I'll go to explain why. So Framework A is a top-down approach, and it uses the quantitative health objectives, QHOs, as a performance metric to determine what the safety criteria is for various designs. So this is in lieu of the very prescriptive requirements in Part 50 and 52, and the QHOs are just one aspect. We have dose limits. We also have defense-in-depth, and all of that together will help us make a reasonable assurance determination.

So we are using the same QHOs for operating and for new

reactors. The perceived difference is an artifact, and here's why. For operating reactors, the surrogates are being used for QHOs, and that's the five to the minus four. That's the five to the minus four core damage frequency for individual latent cancer fatality risk. But for new reactors, we're actually using the QHO number or proposing that in Part 53, and that's the five to the minus seven individual prompt fatality risk.

So the artifact is because operating reactors are using light water reactors centric surrogates. And, of course a light water reactor surrogate is not going to be technology inclusive for all the various new technologies that we expect to get with Part 53.

So it is confusing, and it does look like, you know, we're using two different things, but we are using the same QHOs for both operating reactors and for new reactors proposed in Part 53.

COMMISSIONER CAPUTO: I'm going to make an observation here that five times ten to the minus seven is actually stricter, it's actually a tighter risk than the jet propulsion laboratories have estimated for an asteroid impact significant enough to consider, to create a global catastrophe, so I think we need to sort of put that in context.

And as for the QHOs, obviously there's been significant discussion about the QHOs, and they aren't currently included in regulation, in regulatory language for the existing fleet. So we're looking at including them in the Part 53 draft.

So for operating reactors with baseline risk, QHOs represent an even lower risk where the difference between the two gives us what we call

the safety margin. But if you take the QHOs and put them into regulatory language, you're now effectively replacing the current standard of what's necessary for adequate protection with the QHOs, which is a tighter standard. I'm kind of struggling with this because we use QHOs as the screening tool to just decide whether or not cost benefit analysis is necessary in a backfit evaluation, and now we're considering using it to redefine adequate protection.

So regulating down to the QHOs without considering the relative cost and benefits might be simpler for the staff, but we're redefining adequate protection down to the level of QHOs. I have to say I feel like this represents a failure to recognize or incentivize the leaps in safety that may be presented in advanced reactor designs. I certainly feel like it runs the risk of being counter to the guidance that Congress gave us in the Nuclear Energy Innovation and Modernization Act to have a risk-informed rulemaking framework.

So how do you reconcile putting QHOs into Part 53 with the Commission's longstanding policy against tightening regulations for advanced reactors?

MS. VEIL: There's a couple of important points here for the QHOs. So as we know, the QHOs are part of the Commission Safety Policy Goal Statement. So we've used QHOs to license Part 52 plants. We've used it as technical basis for reg analysis, and we've used it as a technical basis for Reg Guide 1.174, which is risk-informed decision-making.

So the reason why the QHOs are in Framework A, and I'll

get to Framework B in a minute, is because it is a understood and a robust way to tie making safety determinations, safety categorizations. This was responsive to what industry requested back five, six, seven years ago now. COVID, you know. But this was a long time ago that the industry requested the licensing modernization project. The staff put together Framework A and put together the first iteration of Part 53 based on industry's request.

Fast forward to now with the request to, hey, you know, we want options, there's a spectrum that the industry talked about, either PRA in a lead role, PRA in a supporting role, or no PRA. And I would submit the staff has done an incredible job covering that entire spectrum. Framework B has PRA in that traditional support role where QHOs are not a part of the regulation but are in a supporting role. And there's another part of Framework B called ARE. I'm not going to go through with all that stands for, but there is no PRA if an applicant can meet a certain threshold to not have PRA at all.

So there is a range. There are applicants, I know there's a very steady sound bite that there are no applicants that are going to use Part 53. We hear that a lot, but there are actually indications that people that ask for LMP and want it and then have the basis and have robust PRA are going to use Part 53. Those that don't, there's a full spectrum of ways that an applicant use Part 53 or they could choose to use Part 50 or Part 52.

So I really don't agree with the statements that we are not reaching, you know, we're not implementing what Congress gave us. We actually have a spectrum to do just that.

COMMISSIONER CAPUTO: Well, I guess I would raise a

concern about your statement that the industry asked for this because I think there are a lot of contexts where the industry asks for a lot of things. And if they are requesting something that's inconsistent with our priorities and our policies and our practices, I don't think that that really forms a justification for proceeding with it. I think we have to scrutinize that against what we believe the right answer is.

So I have to disagree with that. And, you know, to the extent that this is the nature of Part 53 when it comes to the Commission, you know, I will obviously be looking very, very closely at this because, at some point, this Commission will have to defend our decisions in rulemaking space to a Congress that very much expects this to be a risk-informed rule, and there will be a lot of scrutiny on that.

I want to have, I'm going to quickly ask one last question. The current draft of Part 53 also incorporates several programs that the existing industry employs but are not currently required or mandated in regulation. By incorporating these programs into the rule, we are, in essence, expecting advanced reactors to address operating lessons learned from the existing industry when the technologies aren't comparable.

If these programs aren't mandated in regulation for the existing fleet, why would we incorporate them into rulemaking and create a mandate on advanced reactors?

MS. VEIL: So Part 53 is structured in a way to try to balance design requirements and also programmatic controls, and the reason we do that because there isn't operating experience with these new

technologies. So I'll give a quick example. Say there's a prediction that is made or an assumption that is made for a reactor that's not built yet. There's programmatic information that comes down the line, operational experience that then can be used to go back and validate those predictions.

So having that balance of operational programs and design controls can actually help address some of the uncertainties that we've heard about in some of the stakeholder comments. These aren't built yet, what about all the uncertainties involved with what you're assuming.

So we are trying to strike a balance, so there are programs in Part 53 that are new, but there are also programs that are in Part 50 and 52 that aren't in Part 53. And there's also another sound bite about the length of Part 53. It's actually 50 percent, if you take each framework on its own, it's 50 percent less than the existing regulations. So we are trying to strike that balance, but we need to have information to then kind of deal with some of the uncertainties that can come with not having operating experience.

COMMISSIONER CAPUTO: If the Chairman will indulge me, I'd like to ask one quick follow-up. So why is it the programs belong in rulemaking language and not in guidance, and don't you run the risk then that every time a program is modified you're going to have to have some sort of adjustment to the rulemaking?

MS. VEIL: Well, one of the things that we were mandated was to have a predictable rule. If we had a rule that was so high level and had a lot in guidance, in particular expensive and very impactful programs, that wouldn't provide the predictability that, as you know, there's a variety of

applicants that are out there.

So we're trying to have that level of stability and reliability in the regulations, and we're writing Part 53 in such a way that we're trying to explain why we're putting it in there, but, of course, we're providing the Commission with the information to make a policy decision.

COMMISSIONER CAPUTO: Thank you, Mr. Chairman.

CHAIR HANSON: Thank you, Commissioner Caputo. Commissioner Crowell.

COMMISSIONER CROWELL: Thank you, Mr. Chairman. Before I dive in on new reactors, Andrea, in the last round, I had asked you a question about NEPA requirements related to subsequent license renewals, and I just wanted to give you an opportunity to clarify on that, if needed.

MS. VEIL: Thank you. So the brain trust has alerted me that I misspoke, and what I want to do is make sure I get the right information on Category 2, the question you asked earlier for license renewal. So what I will propose -- and Brooke doesn't know this yet either. I talked to Marian about it on the break. I will propose that we get a briefing where the brain trust can give the specific information and then also correct the transcript or however we need. You'll figure it out, but I want to make sure I'm giving accurate information. So we'll make all of the Commission offices have the information about what Category 2 entails and what we're doing going forward. Thank you.

COMMISSIONER CROWELL: Okay. I wanted to make sure that everyone knows that we're going to clarify that going forward. I'm

going to take things back up to the 10,000-foot level here for my benefit and, hopefully for others, as well. I don't know which one of you wants to take this question, but what's the difference between an advanced reactor and a new reactor and why is that distinction irrelevant from a regulatory perspective?

MS. VEIL: That's a very, very good question. So we actually have two different divisions even dealing with it. So when I think new reactors, I think of NuScale because it is not so dissimilar from current light water reactors. There was a lot of inherent passive safety features, but it's not so different that we're actually looking at whole new paradigms of how we're going to review it.

When I think of advanced reactors, I think of some these like single-digit megawatt type reactors that are completely different. It may not even have water coolant. You know, molten salt reactors, some are proposing mobile reactors. Some are, you know, things that could be refueled in a factory.

So it's kind of two very different ways of looking at new technologies that are entering into the framework.

COMMISSIONER CROWELL: And so how does that change our regulatory approach to the two different new versus advanced?

MS. VEIL: It could. I'll give you an example. For some of the proposals that are coming, for example, for mobile reactors. We haven't done manufacturing license in, I think, maybe one or something in, you know, I've been here a long time and I can say how long. But I think there's only been one manufacturing license that I can think of.

So it brings in policy issues. There could actually be policy issues surrounding criticality, when do you, you know, look at criticality? In a factory? There could be, there are reactors that are talking about refueling and then replacing. What does that mean for an inspection, tests, analysis, and acceptance criteria? Do you do it for every single one?

So there are some different ways of approaching it and some that will be policy issues that we will need to bring to the Commission that may not be, you know, kind of consistent with the way we've regulated before.

COMMISSIONER CROWELL: And so along those lines, does the current process under Parts 50 and 52 help inform those issues, particularly in the context of trying to put together a Part 53 rule?

MS. VEIL: We are actually trying to do that right now. So there's some inconsistencies between Part 52 and Part 50. We learned lessons from NuScale and other reviews that we've done. We have approved other -- just because they haven't been built doesn't mean we haven't approved them. We've approved other, you know, new and advanced reactor designs. So we've learned from all of those activities, so we have before the Commission the Part 50-52 rule to try to, you know, kind of consistently address that.

So we've looked at issues, for example, when is the best time to revise a design certification, what are implications to standardization? What about TMI lessons learned? What about severe accident, kind of handling of severe accidents.

So we're using all those lessons, so no matter what framework is picked by a licensee, we can make a reasonable assurance of adequate protection determination, regardless of it's Part 50, 52, or 53. So we're trying to have that common thread throughout all the frameworks so that we are set up for whatever an applicant would pick.

COMMISSIONER CROWELL: Yes, easier said then done, and I applaud you and your staff's efforts to do this because it' s not easy. I mean, regulating advanced reactors under Part 50 and 52, which is largely by exemption, is far from ideal. But putting together the Holy Grail of Part 53 is no easy task either, and, given limited resources and bandwidth to do all of those things simultaneously, I just hope we're being, one process is informing the other as much as possible and we're using our resources wisely. So I appreciate that.

So on, I guess, advanced -- well, I don't know if this falls under the advanced or new reactor category, but, for an advanced reactor, whether it's using light water technology or not, if that reactor is paired with energy storage capabilities, what regulatory challenges or hurdles does that pose and how are we thinking about those types of designs?

MS. VEIL: So we focus on the safety determination, so we would approach it the same way. Whatever business decisions are, you know, taken by the applicant, whether they're using the reactor for process heat. Whether they're using it as backup batteries, we approach it the same way. We use the same safety criteria. There may be new technologies that we need to learn about, and we've been very fortunate to get information early,

and there may be kind of new things we need to learn about. But we approach it the same way, but the outcomes could be different. Whatever the outcome is, and, again, processing or whatever, is down the line with a business decision, but we're regulating the actual, you know, whatever the entity is and the safety determination for that entity.

COMMISSIONER CROWELL: I know there's some regulatory jurisdictional lines here, as well but, you know, there's been storage projects paired with renewable energy projects in the past, particularly using molten salt, that haven't performed well. And if we're going to use those storage technologies in association with nuclear power, are you making sure we're aware of those pitfalls, identifying them early, and that one is not going to undermine the other when trying to do nuclear paired with storage. It's just something to keep in mind as we move forward. And maybe that's a research question as much as anything else, but I appreciate that and we'll talk more. Thanks.

CHAIR HANSON: Thank you, Commissioner Crowell. A couple of things here before we dive in. Brian, I just, you know, wanted to give a shout out to you and the rest of the folks down in Region II and who have been on the ground at Vogtle and the substantial work and expertise that you all have brought to bear on that project, processing ITAACs, you know. I think a lot folks thought that we would be the one pulling the tent on closing ITAACs, and we weren't. And it's remarkable, and it's a significant achievement. I think across the industry, certainly for the licensee, but also here in -- I know we'll have some opportunities to celebrate that.

But I have to say, just from my standpoint, I had the opportunity twice in the last six months to bring international visitors down to Vogtle. It was a real point of pride to introduce them to you and the rest of the team down there in Region II and kind of show off, you know, partly from a Team USA standpoint but particularly from a team NRC standpoint, the way we've approached this and the significant accomplishment it represents.

So I just wanted to thank you all again publicly for your work in that area.

Michelle, I think I'll turn to you next. You know, I think it may have been Andrea in her presentation who brought up the TICAP, the Technology Inclusive Content of Application, and then the RCAP, the Advanced Reactor Content of Application for, you know, advanced rector applicants.

But given that we've got some light water reactor technologies that are coming down the pipe, as well, on this, has there been any given thought, and maybe this a question for Andrea too, but has there been any thought given for kind of comparable guidance for light-water SMRs that considers their safety significance or the significance of some of their design features in developing license applications.

MS. HAYES: I have not been involved those conversations. I could take a guess.

CHAIR HANSON: Okay. Okay, all right. Well, I'm sorry. Let me pivot then and --

MS. VEIL: It makes sense. Just come on back over here.

There is lots of guidance that is either in place, in process, or in the near future, and all of the above. So we are constantly trying to put guidance out, where they were talking about SMRs, advanced rectors, Part 53.

So a lot of what we learn is from our international partners with Brian Smith. He was here, but Brian Smith and before him, Anna Bradford, the SMR regulators forum. So we get a lot of products out of that. We have a lot of input to that. But, yes, there's no shortage of guidance on all the aspects of new and advanced reactors that we're moving forward on.

CHAIR HANSON: Okay. Thank you. Hossein, I had a question for you. You know, that I've got a strong interest in kind of, I don't know, working all the angles, beating all the bushes, if you will, to kind of develop data for both the operating fleet and the advanced reactors, new reactors, to kind of fill, you know, kind of key technical information gaps. And I think the Office of Research has really done an admirable job in a lot of ways. I think, you know, FIDES and now FIDES2 are both really good examples of kind of international cooperation where everybody is working together to utilize facilities around the world to fill these gaps and to perform the confirmatory analysis that we need to perform.

And I guess one of the questions I've been interested in lately, and, you know, I had the opportunity, I went to Oak Ridge in June and I was at Idaho National Lab in July, and I've had the opportunity to go to a few universities this year so really feel like I've gotten exposed to how the labs and universities are helping with codes and standards and other kinds of efforts.

But I'm wondering what you might think or some feedback on the idea of leveraging personnel exchanges with the national labs and universities and/or international research organizations where, you know, we send somebody there, they send somebody here, and, you know, we kind of foster -- we have personnel exchanges oftentimes on the regulatory side. We've done this on the ROP with places like Japan and so forth. But, you know, what about it on the research side?

MR. ESMAILI: Thank you for the question. So the short answer is yes. Personnel exchanges are very important for us. They're extremely useful and beneficial for us. We have done in them in the past and we continue to do more right now.

I know firsthand because, when I was the analyst, I worked with some of the exchanges, you know, both international and domestic. And so I know firsthand that it is very important. It's good for us, and it's good for them, you know, because we do collaborate. Even after they leave, we start collaborating with them, and so you get a lot of technical exchanges between.

So we have done exchanges with the national labs before. We are in the process of actually doing two more from national labs to come in and, you know, they're going to help us with some of these advanced nuclear technologies, you know, fuel modeling, ATF, et cetera. And we also had international foreign assignees. You know, the Office of Research, you know, we had foreign assignees who would come for a year or so, you know, like from Japanese, NRA. And right now I think we have a few of them right in the Office of Research.

So, yes, it helps us a lot.

CHAIR HANSON: Okay. Good. Yeah, thank you. No, that's very, very helpful. Thanks.

Andrea, just turning back to you here at the end, you mentioned the significant interest in pre-application activities, right? You said, you know, 22 topical reports and 20-plus white papers. You know, we may have as many as 70 topical reports and white papers, and I guess my question is kind of, I'm really glad. You know, I did a panel on the pre-application process and pre-application interactions at the RIC, so I really do think these things are important for both us and for prospective licensees.

But I'm kind of wondering about staff capacity and how, if necessary, one might go about kind of prioritizing those or, you know, whatever. How do we decide what to work on first?

MS. VEIL: Yes. So we do prioritize them. And, of course, this is all budgeted work that's come in and it's real, right? This is not, you know, kind of theoretical type designs that are coming in.

So we definitely prioritize. We also have core teams, and those core teams are the ones that are like head down, working on these topical reports, these white papers, what have you. They're supplemented by our wonderful technical SMEs, subject matter experts, our wonderful legal experts that helps us. So we reach out when needed, but we're not trying to tie down resources that we don't need.

So the core team, including the project managers, really run these activities, and we give them that autonomy to do that, but it is a

challenge, obviously, which is why we're so focused on hiring and also focused on -- we do have an add/shed process in this organization. It's very tough for us, as you know, the NRC, to shed work. But we figure out those things that can wait, either delay or shed, to make sure that we're focusing on the most important, most impactful, most safety significant issues that we work on. But we absolutely prioritize, and we have a wonderful workload management tool. We meet, I think it's very month. I always have a conflict, so I'm not there a lot. But my deputies are, and I look at all the information, so we do prioritize.

CHAIR HANSON: I know. I appreciate that. But is that part of the communication then with the folks who were sending in topical reports or white papers?

MS. VEIL: Yes.

CHAIR HANSON: Did they kind of understand where they are in the queue and --

MS. VEIL: Absolutely. Yes, no, it has to be, it has to be.

CHAIR HANSON: Okay, all right. I applaud the core team approach. I know that was one of the big lessons learned from NuScale, you know, core team with matrix support I think is important.

So with that, thank you very much. Commissioner Wright.

COMMISSIONER WRIGHT: Thank you, Mr. Chairman. Well, again, to this panel, thank you for your presentations. I mean, it's obvious that you spent a lot of time preparing and the information is very good, well received.

Andrea, I'll just tell you, this is an ever-changing business line and the things that are going on are of ridiculous importance to this agency. I mean, I could compare it years ago to the telecommunication agency because when you were trying to get things adopted and even, I guess, in our business now, the hardware that we're trying to get it installed, it changes before you get it installed, you know. Something new is already down the pike.

So, I mean, this totally evolving thing is something that I know it's hard to manage, Darrell. I know you all are trying to be on top of it and doing the best that you can, and I recognize that, right?

Brian, I don't have a question for you, but I want to, I'm going to pay you back and speak on top of what the Chairman said. I've been down there two or three times here in the last year, and, you know, publicly, I want to tell you and you can share with everybody back at Vogtle. From top to bottom, the professionalism, the passion, and your attention to detail and to safety is, you know, noticed and we're very thankful for what you do. And that goes from Laura all the way down, so please pass that forward.

MR. KEMKER: Thank you, Commissioner and Chairman. I will.

COMMISSIONER WRIGHT: Okay. Thank you. And I'm going to piggyback on the Chairman's question that he just had, Andrea. And, Michelle, this is probably, again, I was going to come to you, too, but obviously you hadn't done that like maybe we thought.

So, you know, you spoke to -- and I guess I'm going to look,

focus, a little bit under 50-52, as well, right? You know, you highlighted the importance of pre-application engagements, the 22 topical reports, the 20 white papers, maybe another 70 on the way. Michelle, you even mentioned, I think, the example of a successful pre-application thing with Abilene Christian, right?

So you've highlighted how effective engagement can be and how it can result in successful technical, safety, and environmental reviews, you know, as we've seen with Kairos, right? But I was wondering if you could speak a bit to the spectrum of pre-application activities and strategies you've observed that help maximize the usefulness of these important engagements. For example, with early movers that are using Part 50 and 52, the importance of establishing regulatory applicability up-front is likely a key aspect, I would assume. And I was wondering if you could speak to any later-term process innovation efforts, such as streamlining management, legal, or maybe even ACRS reviews.

MS. VEIL: Yes. I'm just kidding. So we have a lot of strategies that we use. One, and this is a down-the-line strategy, is virtual audits. And, of course, I need to say, you know, pre-application activities are voluntary. We highly encourage it. We can't mandate it, they're voluntary. But we even have a subset of that called a readiness review, and some applicants have taken advantage of that to see if there are any fatal flaws before they even come in for pre-app. So that's been helpful.

But down the line, the virtual audits. For example, with Kairos, getting our vendor inspectors kind of embedded in these virtual audits

and making sure before there is an in-person audit that these virtual ones have occurred so you can resolve some issues that way. The core team, of course, I can't say enough about having a core team.

And we have streamlined all across the board. If you look at the Kairos schedule, I think Kairos might have requested 18 months, and we have 21. Pretty close. That includes ACRS, that includes OGC, that includes all our partners that we need, the village that it takes to get one of these applications done.

We have a very agile staff. Even though it's matrixed for subject matter experts, sometimes we have to reach out to more people than we intended because, as you review, more issues come up. We are focused on the most safety-significant aspects. This isn't bring me a rock or curiosity questions. But this is tough, you know. It's new, so sometimes we have to expand the team a bit. But all of those strategies have helped us, and we continue to learn each one we do. So the first of a kind may be a little tougher than the nth because we're learning as we're doing them.

COMMISSIONER WRIGHT: Yes. Thank you for that. I'm going to stay with you for a minute. Michelle, do you have anything to add to that at all?

MS. HAYES: I was just going to, like, back to the pre-application engagements, we've seen a wide range of engagements, and we've made them all successful. Just that they want to come in, we do have a white paper, you know, encouraging the topics. Regulatory analysis is a big one, and, you know, we've issued a white paper on that, as well.

COMMISSIONER WRIGHT: Okay.

MS. HAYES: PDC is another big one that we've gotten some of those in, and it's important to lay those out early because everything that comes in after it is going to follow on that.

COMMISSIONER WRIGHT: Thank you. So, Andrea, the staff's efforts to develop a new technology inclusive, risk-informed, and performance-based regulatory framework has been mentioned several times, right, during this panel. And while not the focus of today's meeting per se, I wanted to raise a couple of questions on Part 53.

Since, as you noted, the staff recently issued a draft preliminary proposed rule package to support the ACRS meetings and received substantial stakeholder feedback following the recent public comment period for the proposed rule language, some stakeholders are concerned that the current approach of having two frameworks in Part 53 has resulted in a rather cumbersome rule that may not be used by future applicants, and being usable and used is one of the key things, right? And, accordingly, some stakeholders have expressed that Part 53 is rather large and should be streamlined.

So what's the staff's perspective on that, and could you provide examples where the staff streamlined traditional requirements and moved details into guidance? And then, additionally, how have you addressed directly the feedback and shared these examples with those concerned stakeholders?

MS. VEIL: Okay. So I'll start with the frameworks. So

Framework A, PRA is the central star. Framework B, it's not, it's supporting, and then there's no PRA option.

In order to make that easier, I'm kind of going to flip around what you said. They are self-contained. Instead of trying to do a crosswalk across either current regulations or both frameworks, someone can take Framework A and use it, someone can take Framework B and use it. That's the length. To put them together and say that the rule is a lot bigger than existing, it's not the right framework to think about it because, as I said earlier, they're actually 50-percent less in and of themselves than current regulations.

So some examples of where we put things in guidance. In Framework B, we put fire protection in guidance. We put principle design criteria in guidance. We put codes and standard, in particular 50.55(a) in guidance. We've taken comments that we've gotten about, hey, there's quality assurance all over this rule. We streamlined that and put it all in one place.

The whole Framework B was stakeholder comments. When Part 53 started, it was just PRA centric. There was no Framework A, it was just Part 53. Framework B and the other, you know, more deterministic process, is all stakeholder feedback. And the way that we're -- this is like a big five which, you know, I won't go over. But the way that we're developing this rule to get to you all is here are the things that are really we've gotten the most feedback on, here are some of the reasons why the staff supports this, and it's also important to say that the preliminary rule language when it comes to quantitative health objectives actually says or a surrogate proposed by the

applicant. It doesn't say that the QHO is it. It says this is what we are using to adhere to the Commission Safety Policy Goal Statement because it's robust and we've used it through the years.

So we're trying to make it as a transparent as possible. So I understand, it's a large document. I've been through it a couple of times. It's a large document. No argument there. But when you look at how it's constructed, it is standalone frameworks and some of that language is repeated to make it standalone, so that's where some of the criticism about it's very large comes from.

COMMISSIONER WRIGHT: Indulge me one-half second. So that really doesn't get to what I consider to be really something that's like an elephant in the room here. You're getting comments from stakeholders that it's too cumbersome it's too big, it's not going to be used. They continue to say that, and I guess I'm trying to figure out why are they continuing to say that and what are we doing in order to address that and to kind of understand and remove that, right? So that's what I'm trying to get to, and I think that was something that Commissioner Caputo was kind of referring to, as well.

MS. VEIL: So we have addressed some of those comments. We have put some things in guidance. We have taken comments and removed some items. We've tried to make it as streamlined as possible. But just like you said earlier, there are policy decisions in Part 53. If we took stakeholder comments and took out everything that stakeholders, some stakeholder comments said before we provided to you, then we really are taking away your policy decisions.

So what we're trying to do is one stakeholder says we don't like QHOs, ALARA, or defense-in-depth. Another stakeholder says, well, you need to have those in there to have a robust rule, these are paper reactors that aren't built yet. We are trying to have a balanced approach that we provide to you with the reasons why we think this is the right approach to make it as expeditious and as transparent as possible for you to make your policy decisions.

COMMISSIONER WRIGHT: And I know you all have stakeholder meetings, and I know that you all, there have been presentations and stuff like that. But before it comes up to us, you know, I would hope that you will do, because you cannot, again, this is something you cannot over-communicate with. So try to understand as much was you can before it comes up to us. You know, that's what we would hope, so thank you for listening.

CHAIR HANSON: Okay. Thank you all. Thank you to both panels and to the staff and to your continued professionalism and dedication to the mission. Obviously, the issues we have in front of us are difficult ones. I think we look at a lot of things in this agency and, you know, people will say to us, well, why haven't you done it already, and we'll say, well, look, if it was easy, we would have. And so the substance and the tenor of the discussion today I think reflects that, and I want to thank you all very much for your service. Thanks to my colleagues for your questions and the discussion today, as well. And with that, we are adjourned.

(Whereupon, the above-entitled matter went off the record

at 11:48 a.m.)