UNITED STATES

NUCLEAR REGULATORY COMMISSION

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PUBLIC MEETING ON THE STRATEGIC PROGRAMMATIC OVERVIEW OF THE OPERATING REACTORS AND NEW REACTORS BUSINESS LINES

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THURSDAY,

NOVEMBER 2, 2023

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The Commission met in the Commissioners' Hearing Room, at 9:00 a.m. EDT, Christopher T. Hanson, Chair, presiding.

COMMISSION MEMBERS:

CHRISTOPHER T. HANSON, Chair

DAVID A. WRIGHT, Commissioner

ANNIE CAPUTO, Commissioner

BRADLEY R. CROWELL, Commissioner

ALSO PRESENT:

TOMAS E. HERRERA, Acting Secretary of the Commission

BROOKE P. CLARK, General Counsel

NRC STAFF:

DANIEL DORMAN, Executive Director for Operations

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

WILLIAM ORDERS, Senior Project Manager, Plant Licensing Branch 4, Division of Operating Reactor Licensing, NRR

BRIAN SMITH, Director, Division of New and Renewed Licenses, NRR

PHILIP McKENNA, Branch Chief, Reactor Assessment Branch, Division of Reactor Oversight, NRR

LaDONNA SUGGS, Deputy Director, Division of Reactor Projects, Region II

ROBERT TAYLOR, Deputy Director for New Reactors, NRR

JONATHAN GREIVES, Acting Deputy Director, Division of Advanced Reactors and Non-Power Production and Utilization Facilities (DANU), NRR

JOHN MOSES, Deputy Director, Division of Rulemaking, Environmental, and Financial Support, Office of Nuclear Material Safety and Safeguards (NMSS)

DONNA WILLIAMS, Senior Project Manager, Advanced Reactor Licensing Branch 1, DANU, NRR

LAUREN NIST, Director, Vogtle Project Office, NRR

P-R-O-C-E-E-D-I-N-G-S

(9:00 a.m.)

CHAIR HANSON: Okay, it is the appointed hour. Good morning, everyone. Now, I convene the Commission's Public Meeting on the NRC Strategic Programmatic Overview of the Operating and New Reactor Business Lines. The Commission is meeting today to get an update from the Staff and discuss a range of important activities in the reactor business lines supporting our safety and security mission.

We have two Staff panels today. We'll begin with the operating reactor business line first, followed by the new reactor business line. But before I start, I'll ask my colleagues if they have any remarks to make. No? I would like to point out that we have Commissioner Wright joining us remotely this morning, from no less than Accra, Ghana. Welcome, Commissioner Wright.

COMMISSIONER WRIGHT: Hi there. Let me tell you, the U.S. Embassy came through for us.

(Simultaneous speaking.)

CHAIR HANSON: And there you are in Ghana. As they say, the country closest to the geographic center of the world. So, here we are on the peripheries, I suppose. But it's good to have you with us, and glad that the technology came through this morning. So, without any remarks, I'll hand it over to Dan Dorman, who's going to kick off our first panel. Dan?

MR. DORMAN: Thank you. And good morning, Chair and Commissioners. Staff in the Operating and New Reactor Business Lines are doing substantive work and have continued to exhibit exemplary dedication and focus to execute our important safety and security mission in

a dynamic environment.

This year we continue to make the safe use of nuclear technology possible. We completed the safety evaluation for the SHINE medical isotope facility, which, once operational, will be an important domestic provider of medical isotopes necessary for patient care in the medical industry.

The panel will share additional examples and accomplishments that demonstrate progress in transforming our regulatory approaches, using data and risk-informed tools in innovating our processes.

As we are all aware, hiring and retention continues to be a challenge for the NRC, and the Agency is actively engaged in addressing this challenge. My office and the regional administrators recently conducted a trust huddle with all the resident inspectors, to enhance our mutual trust and fully understand the challenges in the resident inspector program.

The panel will expand on NRR and regional hiring initiatives, knowledge management tools, and retention strategies to ensure that we have the resources and skills to fulfill our mission. The advancements we have made this past year in both business lines have been successful only through the great collaboration of all our business line partners. Next slide, please.

The first panel will be discussing the operating reactor business line and its key role in NRC's mission. This includes work to ensure that several of our Agency's enterprise and business line-level risks are appropriately managed. During this panel, Andrea Veil, our NRR Director, will talk about the operating reactor business line strategic priorities and notable successes, including how we are planning for an expected increase in workload and increased external interests.

After Andrea, Bill Orders, a senior project manager in NRR's

Division of Operating Reactor Licensing, will be describing the NRC's planned actions to prepare for potential power uprate applications.

Following Bill, you'll hear from Brian Smith, the Director of NRR's Division of New and Renewed Licenses, who will share updates and future enhancements on the license renewal program.

Then, Phil McKenna, the Deputy Division Director of NRR's Division of Reactor Oversight, will provide you with our progress and implementation of reactor oversight process enhancements.

And then LaDonna Suggs, the Acting Director of Region II's Division of Reactor Projects, will discuss resident inspector health, including recruitment and retention efforts. Next slide, please.

This concludes my opening remarks and I'll turn the presentation over to Andrea Veil.

MS. VEIL: Thank you, Dan, and good morning Chair and Commissioners. We're 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.

During this year, we have successfully supported emergent licensing actions, including 21 emergency and exigent licensing amendments, and three notices of enforcement discretion, that provided licensees flexibility, while meeting the NRC's safety and security mission.

This past fiscal year we authorized the safe restart of the National Institute of Standards in Technologies' research reactor. We determined that the structures, systems, and components, were unaffected during the event and will perform as designed, and that the licensees' corrective actions and enhancements will preclude recurrence of similar

events.

We have also worked closely with the U.S. Environmental Protection Agency, or EPA, and the U.S. Department of Energy, on the potential impacts of a recent EPA rulemaking. We communicated that the provisions may have adverse effects on nuclear power plants' ability to maintain or replace equipment such as wire and cable insulation needed for continued operation. As a result of our coordination, EPA issued an enforcement discretion statement and announced its intent to extend the compliance date for nuclear power generation facilities, as part of a rulemaking in 2024. Next slide, please.

Recent legislation has demonstrated the substantial interest in nuclear energy in the U.S. and in the NRC's licensing processes. We are strategically planning for an increase in workload, and we're focused on stakeholder confidence. We're leveraging data analytics of historical and current performance to enhance our programs. The NRC's publicly available resource estimator uses data-driven approaches to differentiate and refine the estimates for various types of licensing reviews, to ensure we right-size the level of resources and schedule.

In addition, we continue to leverage the use of technology and data, such as dashboards and metrics, to better focus and communicate the progress of licensing reviews, ensure efficient and predictable use of our resources, and proactively adjust and address any challenges.

In the area of hiring, NRR continues to be a leader in ensuring we have the capability and capacity to address the work ahead of us. NRR led the #HireNRC effort, along with our partners in the Office of the Chief Human Capital Office, and the Office of Administration, which resulted

in innovations in the hiring process, including developing common vacancy announcements across the Agency, substantially participating in an in-person hiring event which resulted in nineteen letters of intent, and NRR and virtual events to share information on the NRC.

NRR had an extremely active summer hire program that included touch points with senior leaders, executive teams, social events, knowledge management sessions, and facility visits. Our efforts to provide an engaging experience have resulted in an 85 percent summer intern retention rate.

To bolster transition of knowledge to new Staff members, NRR has dedicated knowledge management teams. Through their efforts this fiscal year, we've concluded seven knowledge management seminars, developed numerous job aids, and established the first office award for knowledge management to encourage innovation methods and to share knowledge.

Recruitment and retention go hand-in-hand in achieving the desired staffing for the Agency. We are actively supporting the development of our Staff through mentoring, special projects, details, rotational assignments, training, knowledge management activities, and we also use retention tools where appropriate. Next slide, please.

In the area of digital instrumentation and controls, the NRC accepted the first two major digital uprate amendments, which will test our regulatory infrastructure improvements. In addition, we issued an expansion of the current policy on digital instrumentation and control common cause failure, to allow the use of risk-informed approaches, to demonstrate the appropriate level of defense in-depth.

In the area of accident-tolerant fuel, or ATF, we issued amendments to approve the insertion of lead test assemblies for increased enrichment and burn-up, on or ahead of schedule.

We also recently completed a revision to our guidance on expanded source-term applicability, to burn up extensions up to 68 gigawatt days per metric ton, and enrichments up to eight-weight percent uranium-235. The industry noted this as their highest priority to facilitate ATF.

Through collaboration across the Agency, the Staff recently issued the increased enrichment rulemaking regulatory basis for public comment, further preparing a modern and efficient regulatory infrastructure to support predictable ATF licensing. Next slide, please.

I would like to highlight how the staff continues to utilize risk insights to safety resolve technical issues in a timely manner. The NRC has reviewed and approved risk-informed programs for much of the operating fleet. As a result, licensees have seen reductions in personnel dose and planned shutdowns, and plant modifications have resulted in safety improvements. Licensees can complete work while a plant is online, which reduces risk of unnecessary shutdowns.

The Staff is also continuing to use VLSSIR, or the Very Low Safety-Significant Issue Resolution process, which enables inspectors to promptly disposition very low safety-significant issues that do not have a very clear connection to a facility licensing basis.

This year, VLSSIR was used three times, including being used for the first time to resolve a generic issue on in-service inspection and the removal of insulation on containment liners.

NRR recently conducted a risk forum, where Staff engaged

in dialogue on leveraging risk-informed decision-making across the operating new and advanced reactor business lines. The forum provided an opportunity to discuss successful initiatives, and to identify a path forward for expanding the use of risk across the business lines. Next slide, please.

This concludes my remarks and I'd like to turn the presentation over to Bill Orders.

MR. ORDERS: Thank you, Andrea. Good morning Chair, Commissioners. Next slide, please.

A power uprate is the process for increasing the maximum power level at which a commercial nuclear plant can operate, based on analysis that demonstrates the safety of the plant. There are three types of power uprates: measurement uncertainty recapture power uprates are less than two percent power, and are achieved by implementing more precise measurements to reduce the degree of uncertainty in the power level.

Stretch power uprates are typically up to seven percent power and usually involve changes to instrumentation setpoints, without major plant modifications. Extended power uprates are up to 20 percent power and often require significant modifications to major equipment, such as high-pressure turbines, condensate pumps, and main generators. The timeliness review goals of power uprates are shown on this slide.

Although the Staff believes that these timeliness goals are appropriate, additional engagements with industry to better understand the timing and scope of future planned power uprates are needed. Next slide, please.

The incentives provided in the Inflation Reduction Act and the Civil Nuclear Credit Program could result in -- that's a key word, could

result -- in a significant number of power uprate and license renewal applications, as indicated by the chart shown on this slide.

Over 50 percent of sites surveyed recently by NEI indicated that they are planning for one or more power uprates, with a combined capacity equivalent to two large light water reactors. However, no licensee has provided the NRC with definitive plans for power uprate applications in the near future. Thus, the NRC is engaging stakeholders, as we seek to improve our visibility of future uprates and conduct a risk-informed review of our licensing process for uprates to identify process efficiencies.

We will use historical trend analysis, leverage lessons learned from other focused efforts, such as digital instrumentation and controls and ATF, and insights and perspective gained from stakeholders, to ensure a coordinated and efficient approach to the potential influx of submittals. Next slide, please.

This slide is an illustration of our historical uprate data and trends. In the chart, gray is measurement uncertainty uprate capture, orange is stretch, and yellow is extended power uprates.

The NRC has approved over 170 power uprate amendments since 2000, totaling 24,089 megawatts thermal, or 8,030 megawatts electric. This is roughly equivalent to eight large reactors.

We have an established process to conduct these reviews in our internal NRC office instructions, which provide guidance for the coordination of all aspects of power uprate activities and identifies roles and responsibilities for these reviews.

Data presented here also show an increase in the review resources over time, but also periods where there were clusters of reviews

that were done more efficiently. While there's plenty of scatter and several outliers, we can see what can be achieved, and are aiming to replicate some of the successes in the past while improving our approach to the future.

Initial insights indicate that having an established infrastructure for power uprates in our office instruction, identifying staff with the right technical background to perform the reviews, and being ready to deploy a core team concept to handle a large number of similar reviews, can result in improved consistency and efficiency. In addition, we will also look to identify opportunities to be more risk-informed in our approach to making our safety decisions.

In summary, the Staff intends to learn from our past experience with power uprates, leverage its proven processes in modern infrastructure, such as the use of data and enhanced tracking tools for project management, and continue to do outreach with the industry and stakeholders, to further enhance this time frame to be ready for the future reviews. Next slide, please.

I will now turn the presentation over to Brian Smith.

MR. SMITH: Thank you, Bill. Next slide, please.

In a graphic of reactors versus years in service. You can see we have 54 reactors exceeding 40 years of service, the oldest at 54 years.

We have more than 480 reactor years of operation beyond the initial 40 year licenses, demonstrating that continued assurance of adequate protection of public health and safety is achieved through our license renewal and inspection programs. To date, we have issued initial license renewals for 94 reactors, and three more reactors are currently under review.

In addition to the initial license renewals, we have issued three subsequent license renewals, or SLRs, for six reactors, and completed the safety evaluation reports for four more sites covering nine reactors.

Our partners in NMSS are currently reviewing five site-specific environmental reports for SLR that do not rely on the 2013 license renewal generic environmental impact statement, or GEIS, and have issued the draft revised GEIS and proposed rule.

We are currently revising the guidance documents for SLR, including the generic aging lessons learned, SLR guidance, and standard review plan, the drafts of which were issued for comment in July of this year. The revision takes into consideration the experience from the reviews performed so far, and addresses the comments received on the drafts. We plan to issue the final revised guidance in the first quarter of 2025. The license renewal inspection procedures were also revised, to explicitly provide for post-SLR inspections.

Looking ahead, we are preparing to receive four more initial license renewal and SLR applications in the next six months. Next slide, please.

The NRC has been actively involved in domestic and international outreach. We maintain a strong leadership role in assisting countries in their preparations for long-term operation, or LTO, while gaining insights on international operating experience and best-practices.

Recent domestic examples include working with the Office of Research and activities to support license renewal on aging issues, such as harvesting opportunities, reactor pressure vessel integrity, radiation effects on concrete, and conditioned monitoring of electrical cables. The Office of

Research has also provided support in the development of various analytical tools, including probabilistic fracture mechanics codes for piping and reactor pressure vessels.

We've been actively involved with the Department of Energy industry and international counterparts, which includes leveraging research activities of mutual interest at monthly materials research engagements with the DOE on their light water reactor sustainability program, and Electric Power Research Institute on their long-term operation focus area.

Our international activities and outreach include numerous engagements. This summer we hosted a week-long workshop with approximately 30 representatives from five countries and the IAEA, to share U.S. experiences and exchange insights on LTO regulatory reviews.

A few examples of bilateral support include hosting the French operator, to share insights on license renewal reviews and aging issues. We also recently provided support to the Spanish regulator, by participating in a regulatory review and inspection at a plant prior to its entry into LTO.

I also wanted to touch on our involvement with sharing the Steering Committee and supporting the IAEA's international generic aging lessons learned, or IGALL Program, which includes the development of safety guides and the collection of proven practices. The IGALL was developed based on NRC's license renewal guidance, and revised over time to include updates based on operating experiences and developments in the field.

At the Convention on Nuclear Safety this year, the contracting parties identified the establishment of a safety basis for license renewal up to 80 years as a good practice. Finally, we continue to support

various international LTO conferences and seminars. Next slide, please.

Earlier this year, the industry identified that our subsequent license renewal application reviews were taking longer to complete with higher Staff hours than the prior initial license renewal application reviews.

We acknowledged that to be the case and initiated efforts to make improvements in the program. We have implemented several SLR process improvements to increase efficiencies, and we are currently engaged with stakeholders to identify additional means to streamline reviews and further evaluate how to incorporate risk information into reviews and the SLR program.

Since the summer, we have met three times with stakeholders to identify strategies for further efficiencies in the application review process. Through these meetings, we have identified approaches that may be pursued by both industry -- for example, via enhancing applications and updating their guidance, and the NRC through additional process improvements. We're also considering the use of risk information and aging management programs, and in performing the reviews.

We reviewed the Nuclear Energy Institute, or NEI's, proposed reviews to two GALL SLR report aging management programs, to reduce inspection sample sizes and inspection frequencies, based on risk insights, and we provided feedback to NEI as well.

We're also looking into how the use of risk information can help the Staff take a graded approach to reviewing the application. More engagement with stakeholders is planned to further evaluate the use of risk information. With these ongoing process improvements, we estimate an overall reduction in hours for the initial license renewal and SLR applications,

without compromising safety. As a result of these changes, we estimate a reduction of about 4,000 hours for the Perry and VC Summer reviews, relative to a recent SLR review.

As we continue to engage with stakeholders, additional efficiencies are expected to be gained. While we can reduce staff hours, however, for the next years due to the increased number of applications, the schedules are anticipated to be between 20 and 24 months. Next slide, please.

Thank you. That completes my presentation. I'll now turn the presentation over to Phil McKenna.

MR. McKENNA: Thank you, Brian. Next slide, please.

The reactor oversight process, or ROP, is inherently risk-informed. The baseline inspection program was developed using a risk-informed approach to determining a comprehensive list of areas to inspect within each cornerstone of safety. These inspectable areas were selected based on their risk significance.

The scope of inspection within each inspectable area was determined using the same risk-informed approach. The scope of inspection was also modified by the applicability of a performance indicator, or PI. The more fully an indicator measures an area, the less extensive is the scope of inspection.

The baseline inspection program is the minimum inspection every operating reactor licensee receives to give the NRC reasonable assurance of adequate protection, regardless of operational performance. The sample selection of activities and equipment to inspect in each inspectable area is based on risk insights that will be modified by plant-specific

information. The ROP is also constantly evolving, based on operating experience and feedback from internal and external stakeholders.

The 2019 ROP enhancement initiative was a result of 99 recommended changes to the ROP from stakeholders under the transformation umbrella. It was a holistic look at all ROP program areas, inspection performance indicators, significant determination process assessment, security, emergency preparedness, radiation protection, and independent spent fuel storage installation inspection. Next slide, please.

ROP enhancement has assisted in shaping the risk-informed ROP inspection program. In fiscal year 2023, we implemented the new quadrennial engineering inspection cycle, consisting of a comprehensive engineering team inspection, now referred to as CETI, and three different focused engineering inspections over the four-year cycle. This revision reduced inspection hours, while maintaining the same safety focus.

In fiscal year 2023, we also revised the reactor assessment process on treatment of greater-than-green findings and performance indicators. The closure date of licensing greater-than-green findings is now the date of the exit meeting of the successfully completed supplemental inspection. Correspondingly, a greater-than-green performance indicator is now held open until a licensee successfully completes the associated supplemental inspection.

The revision to the problem identification and resolution, or PI&R inspection procedure, will implement recommendations from the comprehensive review completed in 2021, but will not substantially change how a PI&R team inspection is conducted. The inspection procedure revision will include additional assessment guidance for the performance and

documentation of biannual team inspections. The PI&R inspection procedure will remain on two-year cycle.

In addition to the actions discussed above, the Staff is in the process of implementing a new PI for emergency response facility and equipment readiness, to replace the outdated alert and notification system reliability PI. This new PI will provide an alternate means to measure the effectiveness of licensee emergency preparedness, or EP, Staff maintenance activities, and will require changes to the licensee and NRC PI data tracking software, as well as a reasonable period to pilot the new PI prior to implementation.

Additionally, the actions to revise the emergency planning significant determination process, or EPSDP, are also in the process of being implemented by the necessary revisions. These revisions will enhance the EPSDP by aligning the significance of emergency planning inspection findings with the associated risk from the applicable planning standards.

It is projected that the new emergency response facility PI will be implemented by the end of calendar year 2024, and the revised EPSDP will be implemented by the end of the second quarter in 2024. Next slide, please.

NRR continues to optimize the risk-informed ROP inspection program and key element to future adjustments to the ROP through assessment. The ROP self-assessment baseline inspection monitoring program has been revised over the past few years to take advantage of inspection dashboards and monitoring tools, such as data trending session of ROP self-assessment program, and a newly developed end-of-cycle inspection reporting processing and regional technical support group

dashboards.

The annual ROP implementation audit has completed its third year revised procedure, with the completion of the Region II audit in September. One major adjustment to the audit for this year is that since the focus areas are unique for each year's ROP implementation audit, each region that is not the subject of a specific audit, this year's audit, will perform their own self-assessment of those focus areas, and report the results to the Office of the Executive Director for Operations. The self-assessment will greatly assist NRR staff in ensuring regional consistency in the execution of the ROP, as we make any adjustments to the ROP based on audit results.

One consideration in the optimization of the ROP is adjusting the baseline inspection based on industry fact of life changes. For example, the centralization of functions at the corporate level, for companies that have multiple reactor sites. NRR staff plans on investigating if the ROP inspection program can be revised to inspect certain items at a corporate level that satisfy inspection effort that would have been conducted at each individual site.

Assisting the regional inspectors by improving inspection tools, has been another goal for NRR. The operating experience, or OpE Hub, an ROP digital city, continues to grow, with helpful resources that assist inspectors in planning, risk-informing, and executing their inspection samples.

One recent change to the OpE Hub was the addition of the SPAR-app that assists inspectors on using risk insights to complement risk-informed decision-making, and to understand the relative contributions of an inspection issue to overall risk.

Finally, the ROP self-assessment program has program

area assessments, focused assessments, and effectiveness reviews, that allow the program office to assess areas of the ROP, implement any changes to improve the ROP, and then assess the effectiveness of a significant ROP inspection procedure revision, or those revisions that require Commission approval to implement. Next slide, please.

Thank you for your time. I will turn it over to LaDonna Suggs.

MS. SUGGS: Thank you, Phil. Next slide, please.

We collectively acknowledge the indispensable role played by our resident inspectors. They serve as an integral part of our safety framework, maintaining a consistent onsite presence at nuclear facilities. They're highly trained and qualified professionals who diligently observe plant activities, conduct inspections, and remain vigilant to receive allegations and respond promptly to emergent issues and events.

Our resident inspectors continue to excel at their roles. Over the past two years, they have responded to plant events averaging six times per site annually, totaling over 350 occasions Agency-wide. These events encompass unplanned scrams, emergency declarations, plant startups, weather-related incidents like Hurricane Idalia, and activities related to unplanned conditions that could impact continued operations.

Our resident inspectors work tirelessly, not just during traditional business hours, but during nights, weekends, and holidays, supporting routine inspections and responding to emergent events and issues. Their impact to safety is exemplified by instances such as the identification of poor reactivity management practices during a recent plant startup, which nearly resulted in an automatic reactor trip. Next slide, please.

Exemplary performance by our team at the NRC today is only maintained by a diligent and consistent effort to ensure that we have qualified individuals ready to pick up the mantle and protect the health and safety of the American people tomorrow. As such, recruiting and training new resident inspectors is a top priority. While we have celebrated notable successes, it is imperative to continue and fortify our aggressive hiring and training strategies, to maintain a robust pipeline of qualified, diverse professionals within the program.

Over the last two years, we've hired 38 new members into the resident inspector development program, or RIDP across the Agency, representing approximately 40 percent of our overall hiring efforts within the business line across the regions. This concerted effort has led to an increase in the number of resident inspectors selected or placed at resident inspector offices. However, turnover and vacancy rates are high and increasing, the details of which were shared in the June Agency Action Review Meeting, underscoring the critical nature of our recruitment and retention efforts. Next slide, please.

In our pursuit of excellence, we've made significant strides in reducing the time it takes for resident inspectors to reach competency. We've embraced innovative training strategies, such as competency-based qualifications, or CBQ, an enhanced training program, which have yielded remarkable results. Specifically, we have ten new employees matriculating through CBQ, maximizing learning through on-the-job training and individualized interaction with expert mentors. This has allowed us to accelerate the pace of reaching full qualification, with no decrease in quality.

In fact, the pilot for this effort resulted in the two Region II

resident inspectors completing the first Agency CBQ qualifications in April 2023, both achieving full qualification in record time -- ten and fifteen months, respectively, which is far less than the average eighteen to 24 months associated with the traditional approach.

Additionally, in response to the influx of new inspection staff, Region II developed and shared an enhanced inspector training program. This program leverages former senior resident inspectors as dedicated training and mentoring resources. It expedites the qualification process, maintains quality, and provides crucial onsite mentoring, while not adding to the demands of our full-time residents and regional inspection staff.

Our dedication to nurturing talent has also resulted in a notable number of senior resident inspector promotions. We're proud of the career growth opportunities within our program. Next slide, please.

Nonetheless, we must confront considerable challenges that required concerted action and strategic solutions. Several factors, to include attrition, promotions, changes in personal circumstances, and an increasingly competitive job market, create gaps in resident inspector coverage, and complicate the Agency's ability to fulfill its mission. To address this issue, regional offices are using hiring flexibilities to rehire annuitants with strong Resident Inspector experience, and provide flexible long- and short-term backfill support as needed.

Additionally, forward-looking metrics are being employed to forecast known resident inspector vacancies, and plan reassignments well in advance to provide stability and ample planning time for impending relocations.

Our resident inspector surveys and staffing metrics have

revealed that quality-of-life factors and program stressors are negatively impacting job satisfaction. The challenges of mobility requirements for the position and relocation-related challenges are increasingly prominent. We acknowledge the perceived compensation inequities, given the demands of the job and minimal workplace flexibilities.

In response, we're taking action. Regions are implementing relocation incentives up to 50 percent across multiple sites to accommodate significant market and desirability challenges. We are also evaluating options for annual or multi-tour financial retention incentives, to address the unique responsibilities of resident inspectors, and the increasing hardships caused by mandatory relocations. We're actively pursuing recommendations from the resident inspector standing committee and streamlining Agency systems and processes. We're aligning on strategic actions through the Office of the Executive Director for Operations to address current and prospective challenges and we will continue to inform the Commission about the state of the program.

In closing, while we've made substantial progress, we will not be complacent. Immediate actions are needed and underway to incentivize recruitment and retention in the Resident Inspector program.

The Office of the Executive Director for Operations will pursue actions within its authority, and will request Commission approval for specific actions if and when necessary. The Resident Inspector program remains an essential part of our oversight process for operating reactors and emergency response. It demands our unwavering commitment and attention.

Our commitment to recruiting, training, and retaining, top

talent, combined with our dedication to addressing program challenges, is paramount. We remain resolute in our mission to protect public health and safety, and we appreciate your continued support. Next slide, please.

Thank you for your time, and I'll turn it back over to Dan for his closing remarks.

MR. DORMAN: Thank you, LaDonna, and thank you to all the panelists for your remarks. This concludes our Staff remarks for the operating reactor panel. Chair Hanson and Commissioners, we appreciate the opportunity to present on this business line and look forward to your questions.

CHAIR HANSON: All right, thanks, Dan. Thanks to all the presenters. We'll begin questions this morning with Commissioner Caputo.

COMMISSIONER CAPUTO: Good morning. Thank you all for being here. Special welcome to Bill Orders, former staff member of mine. Thrilled to see you again, Bill.

I'm going to focus on several operational issues today that I believe warrant the Commission's attention. One is a recently completed fiscal '23 capacity assessment, which indicates the Agency is facing projected workforce gaps in 2027. The projected gaps in Resident Inspectors and project managers are particularly troubling.

Recruiting and retention challenges, as LaDonna has discussed, they're not new, but it is crucial that we maintain a strong resident workforce. A projected gap for residents in 2027 is projected to be 39 percent. So, given the time it takes to onboard new employees, then train them and qualify them as residents, that gap is just around the corner.

Another projected gap is project managers, with a shortfall

of over 42 percent by 2027. So, for the Agency to be facing gaps of this magnitude in 2027, means smaller gaps are going to manifest in the meantime, and will grow to these levels by 2027. That means our employees are either struggling already, or about to struggle harder and harder to accomplish their workload as these gaps grow.

So, Dan, recognizing the Agency has hired hundreds of new Staff over the last year and the hiring effort continues, what actions is senior management taking to prioritize hiring for these crucial licensing and oversight positions, to ensure the Agency can execute its responsibilities in a timely and predictable manner?

MR. DORMAN: Yeah, thanks for the question, Commissioner. As you noted, we've been aggressively pursuing hiring over the last couple of years and have brought in almost 500 staff in the last two years. And that's not enough.

So, we need to continue to focus on our hiring process and the resources to accomplish the hiring process. So, we're looking both at the resources in the Human Capital Office that support that process, as well as where our challenges are in getting from identified vacancies to staff onboard.

So, that's kind of a general piece. As LaDonna mentioned, Scott Morris, my Deputy, along with the leadership of the regions, had a conversation with the resident staff about a month and a half ago, and really appreciate all the engagement from the resident staff on the challenges they're experiencing and the impacts on recruitment and retention.

And there are a number of specific actions coming out of that conversation. LaDonna alluded to a couple of them that are in process specifically tied to recruitment and retention and how we can improve that part

of the appeal of the program, in recognition of the challenges that those people experience.

And then a third part of that is going to be continuing -- I think the regions have done a good job of hiring in the last couple of years. But as you note, it takes time from onboarding to proficiency. And so, we will continue to work to over-hire into the Resident Inspector development program, to make sure we have a good pipeline.

COMMISSIONER CAPUTO: So, you're talking about hiring in general. What I'm asking about is specifically prioritizing these kinds of positions. Because our Agency only requires a little over 400 FTE to execute its oversight and licensing workload. So, the majority of our employees are not directly engaged in these activities.

So, of the 500 people that we hired, what I'm hoping that you will focus on is prioritizing those positions that are crucial to execute our mission-direct work, rather than mission-indirect. Because given the hundreds of people that we're hiring, we should not be encountering shortages of staffing in these positions. We should be anticipating that before it becomes a problem.

Which takes me to license renewal reviews and the need for improved efficiency and timely reviews there. Obviously, license renewal reviews is getting an increasing amount of scrutiny. I appreciate the remarks that Brian had this morning about actions that are being taken. I understand the Staff had the meeting this week with external stakeholders to discuss license renewal reviews, and I know we also received a letter from Senators Capito and Ricketts yesterday on this issue.

So, looking at some of the recent safety evaluation reviews,

seems that there is significant potential for improvement. The ACRS in a recent letter report noted that 47 of the aging management programs that a licensee needs, 36 of those are existing ones. Those existing aging management programs would have been reviewed in the initial license renewal and subject to oversight under our reactor oversight program.

So, the Agency now has decades of experience, both with reviews and oversight, of the vast majority of these aging management programs. So, this is an area where we should expect to see significant efficiencies in SLR reviews.

So, the extent to which we need to re-review programs that have already been approved and inspected, with ongoing oversight some of them, seems to me, should be very limited. Even aging management programs that changed from the first period of extended operations subsequent period, involves things that we would regularly account for in the reactor oversight program. For example, the adjustment of plant programs to reflect operating experience.

At the end of the day, aging management from year 59 to year 61 doesn't necessarily change much. There will be some unique aspects going forward. But that should be a subset of what we already know and account for, which should lead us to more efficient reviews.

So, Brian, how are you ensuring that the reviews are focused on that subset of issues that are new and unique to SLR, and are appropriately leveraging existing oversight of aging management to gain efficiencies?

MR. SMITH: So, thanks for the question. That is an area that we're looking at now.

I will note that an initial license renewal versus subsequent license renewal, there were a number of changes in the revisions to the guidance for SLR. At least two major revisions to the license renewal guidance, and then now we have the license renewal SLR guidance.

Some of the plants that came in for initial license renewal, came in before the guidance was actually issued. And so, there were some substantial changes that had to be made in those programs, moving into SLR, which requires some of those reviews to take a little bit longer.

That's not always going to be the case. There will be some cases where there's not as much difference as it was moving into SLR. And that is something that we talked about with NEI and the industry on Tuesday. NEI proposed an approach that's looking at consistency in programs between the license renewal program and the SLR program, as well as consistency with the GALL-SLR guidance documents.

Another approach that's being considered is fleet-wide programs. Whenever we review an initial application from a utility --

COMMISSIONER CAPUTO: You mentioned that.

MR. SMITH: -- and then looking at the second application building off of the first one, there's really benefits that we can see taking that approach as well. So, we are looking into those approaches to reviewing applications, to bring more efficiencies into the process.

COMMISSIONER CAPUTO: Well, I'm glad to hear that we're doing it now. These are the kinds of things I would have thought that we would have had in place and prepared for prior to SLRs actually arriving, because it's certainly been expected for years that this wave of applications was going to come.

I'm glad we're doing it now, but it sort of puts us in a position of trying to build a car while we're driving it, which adds to the challenges of trying to manage the influx of work. So, while I'm sure Staff are doing their best to manage the workload, that leaves me kind of concerned that management needs to do better at positioning the Staff for success.

It's a leader's job to recognize when the operating environment is changing. And the operating environment here has clearly changed. And we need to act accordingly.

So, some of these changes couldn't have been anticipated? Such as the last-minute revision to the generic environmental impact statement, as the wave of SLR applications was commencing. That was a year-and-a-half ago. And Congress passed the IRA, but that was a year ago. So, there's been time for us to adjust. And as we already talked about, hundreds of staff have been hired. We ended the fiscal year with 100 million in carryover. So, we've had the ability to staff and resource accordingly, to meet this challenge. And yet, we have an accumulating pattern of delays and increased scrutiny.

So, I believe the Staff should provide the Commission with a roadmap to restore this program to a path of timely and predictable reviews, and achieve the goal of eighteen-month reviews. I believe that roadmap should include action items and deadlines to risk-inform renewal reviews, to leverage operating programs, to leverage previous reviews, and to leverage the Agency's operating agencies and industries operating experience in aging management. It should also include dates for achieving staffing levels appropriate for the workload and request any resource allocation or reallocation necessary that the Commission would need to provide.

So, while our Staff are dedicated professionals and doing the best they can in increasingly difficult circumstances, I think more needs to be done to position them for success and execute this crucial work with dispatch. So, I recognize this is a focus on operations, but I believe this situation warrants the Commission's attention. So, I would put that forward for my colleagues' consideration. Thank you, Mr. Chairman.

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

COMMISSIONER CROWELL: Thank you, Mr. Chair. Thank you to all the presenters today. Very informative, as always, and brought up a lot of questions in my mind. I might not be able to get through all of them.

I'm going to retread a little bit of the area that Commissioner Caputo has, but I would say to Andrea and Dan, just jump in as I ask questions to your Staff here as you see fit. And Bill, if you don't mind, I'm going to start with you on power uprates. And was hoping you'd just kind of give from a bigger-picture perspective, what the most challenging or time-consuming elements of reviewing and approving a power uprate is.

MR. ORDERS: Let me start by saying that it's hard for the Staff to plan when we hear a lot of chatter about power uprates coming in, but we don't know exactly how many or when. We have the processes in place, as you heard, to process them. We've done a lot of them. But it's been a while since we did some. So, one of my colleagues said that what we need to do is get the band back together. Unfortunately, most of the band members look like Keith Richards. So --

COMMISSIONER CROWELL: That cuts both ways.

MR. ORDERS: -- we had to put a band together. We have the processes. We have the people. But I'm not quite sure -- and we're doing the due diligence to determine what it is we need and when.

It looks like from the chatter that the first application that we'll see is about a year from now, and it's going to be for an EP -- extended power uprate. With that being the case, the Staff undertook some revisions to the process of review following a SECY letter in 2002.

And we improved the effectiveness. I think there are opportunities to improve the effectiveness even more now, and to risk-inform what we're doing, and that's really what we're talking about, I think to focus on what's fundamentally necessary, and provide less focus on those things which we've accomplished a long time ago.

So, anyhow, what's most challenging is, to get back to the band theme, is putting the band back together. We just need to come up with a new band. And that's what we're doing. We're trying to identify the people and the process to do all that.

Now, complicating this is we're expecting also, because we've been told the industry may do this, some of these applications may be multi-faceted. You may see a power uprate coupled with an ATF application. And all of these are basically intertwined, if you think about it. The power uprates, the subsequent license renewals, higher burn-up fuel, it's all connected. So, that's an element that we haven't dealt with in the past. But it's a new paradigm now we're going to have to deal with going forward.

COMMISSIONER CROWELL: I appreciate that point because it's kind of where I'm going to lead with some of my other questions, as to how all this interrelates. I'd note that Keith Richards is still putting out

music in rock 'n' roll though, so we'll have to do the same while we build up to the next band.

Brian, I'm going to move to you for a second and start by asking the same question, which is, how would you characterize the most challenging or most time-consuming elements of reviewing and improving subsequent license renewal reviews?

MR. SMITH: For the most part, from a safety review perspective, the review is somewhat straightforward. The guidance is somewhat detailed. A lot of the aging management review items are listed in there for the different types of plants, and it's a checklist basically for the licensees to be able to prepare their applications.

It's when they have site-specific characteristics that are different from the guidance that we have to focus on. Whether they have new materials, or different aging degradation mechanisms, or operating experience that we haven't seen before. It's those areas that become kind of the more challenging aspects of the safety review.

Environmental review right now for SLR, they're having to do the full environmental reviews. Can't rely upon the GEIS until hopefully next fall. And so, that's what's taking the longer time. That and just the larger number of applications that we have in-house right now and expected over the next year.

COMMISSIONER CROWELL: Is that GEIS timeline still within a 24-month period or at least spring of some point next year?

MR. DORMAN: The early spring is actually, I think, a couple of months beyond the 24 months because of the complexity of the comments that we received on the draft GEIS, but the staff is still working

toward getting that to the Commission in the second quarter of this fiscal year.

COMMISSIONER CROWELL: And do you see that as, you know, getting the GEIS in place hopefully as one of the most significant time process improvements that are out there right now that we could do?

MR. SMITH: Yes, I think having the GEIS in place would help facilitate a more timely environmental review. The environmental COE and NMSS has been working to get staffed up. They have increased enough staff now to where they've had to add another branch to facilitate that, and they've also been able to bring in contractors to help with the workload as well. So, I think getting the GEIS next year and the rulemaking in place will help facilitate a more timely environmental review --

COMMISSIONER CROWELL: Okay.

MR. SMITH: -- and hopefully get it back to the 18 months, which was the original goal for SLR.

COMMISSIONER CROWELL: And under the current environment of what you work within for subsequent license renewals, would you say that the issues are more technical? They're technical challenges or staffing challenges? What's the bigger issue from your perspective in the timelines on subsequent license renewals?

MR. SMITH: Looking ahead, I think it's more of a staffing challenge. There is one area that we have identified. They are staffing that up, but in the meantime, we are trying to get a contract in place to help in that area, so staffing.

MS. VEIL: I was looking for the right point to jump in. I wanted to kind of really highlight a point that Brian made in a specific example, without naming the plant, of a complication. If there's operating experience

and it comes through late in our review, we had a case where there was operating experience that we, as the staff, identified. It wasn't identified by the licensee, so that caused a, you know, delay in the schedule, and us having to actually assess that and see how it impacted the overall application. So, that was an example of a delay that caused quite a significant kind of increase to our schedule.

COMMISSIONER CROWELL: Yeah, understood. Phil, turning to you for a second if I could, and kind of get into where I left off with Bill about the interrelatedness of all of these issues, can you just make a few comments as you see appropriate on how the reactor oversight process, you know, having a robust reactor oversight process contributes to timely and efficient license renewal and subsequent license renewals?

MR. McKENNA: So, I would say that, you know, our ROP process with the baseline inspection program. So, we had the inspectors in the field. We had the resident inspectors at the site. So, they're constantly keeping up with the inspection of issues, and they're finding issues that can go into, you know, inspection for license renewal.

The license renewal inspection program is separate from the, you know, the baseline program, and that falls on the Regional Inspectors doing those inspections. So, it's interrelated in that the inspectors are the same from the region doing the regional team inspections on the site for the ROP.

COMMISSIONER CROWELL: Understood, and I guess the point I'm trying to make, and I think Bill was alluding to, is that the success and integrity of each of each of the programs you all do relate to the success, and efficiency, and all of the good things about meeting success in each

other's programs, and ultimately, making Andrea look good.

(Laughter.)

COMMISSIONER CROWELL: I just want to keep that mind because, you know, our successes are interrelated and we want to share best practices, et cetera. One last question, and whoever wants to take this, be it in the ROP process, in the license renewal process, how are we thinking about external hazards going forward, particularly related to climate resilience?

I think that is something that is going to be sensitive going forward, particularly as we look out in license renewal and subsequent license renewal space, as climate impacts increase and those hazards increase, and those hazards can begin far from the plant, 1,500 miles away, but yet still impact a plant, particularly when you look at climate impact on related infrastructure upstream from plants. So, can anyone who wants to make a comment about how we're thinking about those issues in the context of our operating reactors?

MR. DORMAN: I'll start and others can jump in, but I think a key element coming out of our experience and lessons learned from the earthquake and tsunami in Japan is our periodic ongoing assessment of hazard information. So, basically, we're always looking at what USGS is doing in assessing earthquake hazards.

We're looking at updated meteorological information on local intense precipitation issues, hurricane frequency and magnitudes, tornados, and so forth. So, we are monitoring the state-of-the-art in knowledge and modeling of external hazards to understand when there may be a change that warrants a reexamination of a licensing basis. So, I think

from a licensing basis perspective, there's that aspect.

From an ongoing operations perspective, you know, you mentioned license renewal, and it really doesn't -- it's a different time scale in terms of the changes, but I think operationally, when we have indication, obviously, we don't get warning of an earthquake, but we get several days' warning when a hurricane's coming, and licensees have substantial severe weather preparation procedures, and our staff have procedures to verify preparations for anticipated events.

So, that's part of the operational program to make sure that -- and frankly, the licenses contain shutdown conditions associated with, depending on the severity of the weather, to make sure that a plant's in a safe condition when a hurricane actually comes to the plant.

So, there's pieces that are looking generically at climate change impacts to anticipate a need for reconsideration of licensing bases, but on an ongoing basis, we're making sure that the licensees are appropriately preparing for things that we have warning of. Andrea?

MS. VEIL: And the process that Dan mentioned is structured. It's, depending on how you pronounce it, it's either POANHI or POANHI.

MR. DORMAN: I call it Camp POANHI.

MS. VEIL: Oh, okay. Well, there you go. And there's been significant interest, I'd say in the last couple of years, by industry in having more transparency in that process and getting more information from how we assess external standards. So, we've had a lot of interactions in some recent public meetings to talk about the process, and we've put out information, I believe it was a NUREG, explaining it more, so we are looking

at it in a structured way.

COMMISSIONER CROWELL: I know I've gone over my time and I appreciate the Chair indulging me on that. I'd like folks to think about the overlay of climate impacts on aging infrastructure, not at the plant, but in the surrounding community. You know, a hurricane that takes out a levy 75 miles away can have a detrimental impact on a plant far downstream, and that needs to be thought about as well, so thank you.

CHAIR HANSON: Thank you, Commissioner Crowell. Andrea, I'd like to begin with you this morning. And it didn't come up in the presentation, but I think it's related to a lot of the things that we talked about this morning, and that's accident tolerant fuel.

As you know, developing a clear, and effective, and efficient pathway for accident tolerant fuel has been a priority for me, and of course, now we're looking at high enrichment, higher burnup operational modes and fuel types as well that kind of factor into that, and Bill, I appreciated your remarks about how a lot of these things are tied together, and I completely agree.

So, in addition to things like the licensing plan and the topical reports that we've put out, which I think the staff deserves kudos for, we also recently issued, as you know, Reg Guide 1.183, which establishes the approaching for determining the source term for design basis accidents. It's an important document that provides regulatory clarity, and predictability, and adds to the overall framework here that we're talking about, particularly as we move into increased enrichment and increased burnup.

So, Revision 1 was published a couple of weeks ago. Again, I think kudos to the staff. There was a lot of interaction on that. It

expanded the applicability of that Reg Guide to 68 gigawatt-days per metric ton and enrichment up to eight percent, so again, kind of expanding the envelope there of things that are kind of going to be included in that regulatory framework. I think overall, it's a really good step forward.

I wanted to talk about a couple of things. One was kind of process around that and then the second is this kind of substance moving forward. So, as you, I'm sure, have seen, you know, we got some feedback that there were kind of, by external parties, that there were kind of either shortened review times in terms of what came from the staff that went to the ACRS, or there were some parties that felt like maybe their comments weren't incorporated into the new, into this Revision 1. I just wanted to give you an opportunity to kind of respond to that.

MS. VEIL: Yes, this was -- I want to start with commending the staff for the significant amount of work that went into getting this Reg Guide out, and we made very strategic decisions around how we moved forward on this Reg Guide Revision 1 and then the upcoming Revision 2.

So, Revision 1 was stated as the highest priority by industry for us to get out to enable ATF in the time frames the industry is saying, mid to late 2020s. So, as you mentioned, the 68 gigawatt-days per metric ton is critical for moving forward. Our regulations don't allow that right now, so getting that out was our first priority. If we were to incorporate a lot of the other changes that we got from stakeholders -- one example is credit for suppression pool scrubbing.

CHAIR HANSON: Right.

MS. VEIL: That would have taken a significantly longer amount of time to get this out. So, we made the strategic decision to get Rev

1 out. We're immediately rolling into interactions on Rev 2. So, we expect the first public meeting the beginning, like January of 2024, and then to get Rev 2 out in 2025. But we also have kind of a tangential action that's going on, and that is the regulatory basis for the increased enrichment rulemaking. One of the most important, again, components for enabling ATF is control room dose. So, if you look at the reg basis for the increased enrichment rule, it would have a more risk-informed approach to look at control room basis, or control room dose, and then you wouldn't have to use the conservative approach that's in the regulation right now. So, it's kind of a bifurcated effort, but it all together would get industry to what they've asked for is batch loads by the mid-2020s, end of 2020s.

So, we didn't ignore comments. We didn't not engage on comments. We had to make a very strategic decision. Do we make progress now and get Rev 1 out and immediately roll into Rev 2, or do we delay the entire schedule to incorporate all of it? And it also should be noted that there was lots of different comments on both sides of this Reg Guide, so we needed to move forward and get Rev 1 out, and that's what we did.

CHAIR HANSON: Okay, thank you. You've already even kind of moved into the assumptions on this, so I'm -- because that was kind of going to be my next set of questions. I'm really glad to hear that we're just going to dive in and get moving on Rev 2. I think that's really important.

But as we do Rev 2 then, talk to me about how we're going to -- and I want to -- you opened the door on control room dose, so I'm going to get to that too, but talk to me then about how we're going to incorporate kind of the substantial body of knowledge that the agency's accumulated over time and we're going to use that to kind of then risk-inform this second revision of

Reg Guide 1.183.

MS. VEIL: We've actually already started that process. We're going to engage with stakeholders as extensively as we did with Rev 1. So, we're already gathering that knowledge and putting down some of the information that we plan to roll into Rev 2, but the key is the stakeholder interaction.

So, we have ideas about how we can risk-inform going forward. Of course, we want to do that in a public manner, and get feedback and incorporate those things together, and then roll that into Revision 2, but as the example I gave, we already know what some of those activities are because we did have extensive interaction in Rev 1. We just didn't hold up the schedule to incorporate it into this revision.

CHAIR HANSON: Okay, so just to be clear, you are going to be then looking at how to take that body of knowledge that we have and use that to risk-inform the second revision?

MS. VEIL: Yes.

CHAIR HANSON: Okay, great. And then, so since you brought it up, and I know the high enrichment, high burnup rulemaking, which is another key piece of licensing accident tolerant fuel going forward, and I know the reg basis is under development and I, frankly, look forward to getting that proposed rule up to the Commission so we can take a look at it, but then as you mentioned, control room dose is going to be an important element of that. Of course, that's related to the source term in 1.183, so is that kind of the nexus between these things? And given that, you know, Revision 1 is still more on the deterministic side, and we know we need to move in this, then what are the initial thoughts about addressing a more risk-informed approach

to control room dose?

MS. VEIL: It is a nexus between the two. So, if we're able to incorporate what we've pretty much already laid out, then there's more clarity on how to develop the source term. There's more predictability on how to develop the source term, and so it's not just looking at a deterministic regulation and using that value that's in the regulation.

So, this -- guidance is guidance, right? We'll review whatever comes before us, but this would provide some of the flexibility at reducing what needs to be put forward for the ultimate source term, and then satisfying some of the comments that we've heard. It's too conservative. We need a different way of coming up with the alternate source term.

So, that is a nexus between the two, and as you said, there's already been an ACRS meeting on this, so there's already lots of public engagement. A lot of times, we hear you're not interacting with the public. You're not interacting with the public. ACRS is a public meeting.

So, that's one aspect of the interactions we've had, and we will continue to have these engagements. We're not stopping what we're doing now just because we haven't had another public meeting on it, the but the next formal engagement will be at the beginning of 2024.

CHAIR HANSON: Okay, thank you. Well, I look forward to seeing how that progresses. I think this is really important for how the agency engages with our licensees as they look at different operational modes and different fuel types to go in their reactors, so thank you for that.

I just want to use the last couple of comments. LaDonna, thank you for your presentation on the Resident Inspector program. As you know, I think as everybody knows, there's a lot of support for the work that the

Resident Inspectors do here on the Commission, and it's -- and I know all of us, when we go to visit plants are, you know, make it a point to spend time with the Resident Inspectors and hear directly from them about their concerns about the program, what's working and what isn't, et cetera. So, you know, I really want to applaud everybody who participates in that, and also the trust huddle that Scott and others had recently on this.

You know, we talked about some of the things that are under consideration, particularly, you know, monetary or financial incentives that can be put in place, but something a little less tangible that I wanted to share, at least in my travels around the country, was, you know, I think sometimes, at least this is what I've heard is, you know, residents would like a sense of support from the regional offices, and they'd like us to have a program that's robust enough so that they can afford or, you know, both residents can afford to be gone from a plant for a weekend, because they both have maybe family obligations or other kinds of things, and they can really rely on and know that they can count on staff back in the regions to kind of have their, you know, be able to kind of step in.

And given that, you know, regional staff are going to have more work flexibility, right, they've got a hybrid work environment and maybe more flexibility than some of the residents have, I think maybe one of the tradeoffs that we need the emphasize -- and this can be true of headquarters staff as well, right? If we got basic qualified headquarters staff, they can supplement that resident inspector core and provide some flexibility, and relief, and other kinds of things as well.

Sorry, I lost my train of thought as part of this, but it isn't just -- I guess my point is it's not just financial, right, that there's an overall sense

of kind of being part of the team, and being included, and knowing that, whether it's at headquarters or whether in the regional offices, that there's that support system for the residents so that there's backfill and flexibility there when it's needed.

MS. SUGGS: I would agree with you 100 percent. We have that discussion in all of the regional offices on an ongoing basis in terms of how we can cross-support each other, and it goes both ways.

Our residents are in a very unique situation where they are onsite every day, and it is a different dynamic that our Regional Inspectors have when they're in the regional office, but there's a balance there as well because that regional staff is traveling multiple weeks at a time away from their families. So, it's a different challenge, but both present a challenge.

And so, when we're engaging with the staff on some of those discussions, it is from the perspective that there is an expectation that our inspectors are able to, and do, provide backup support, backfill support to our resident staff for the reasons that you just described, both in our Division of Reactor Projects, which we have in Region II, but our senior project engineers or project engineers providing support, but then also our traveling inspectors, our Regional Inspectors, our specialized inspectors also providing support, and we're doing that, and we do have those discussions on a regular basis.

They recognize the tradeoffs as well. And our residents are also training and cross-qualifying to be able to provide support to our Regional Inspectors in different areas. So, that's something that we do want to take into consideration.

The incentives that we're putting in place, the financial incentives that we're putting in place do make a difference. We are being

responsive to what we're hearing from our residents, so we want to make sure that we do that, but it's not the only answer to the challenges that they face, so we do want to make sure that we take a comprehensive approach to how we provide flexibilities to the resident ranks.

CHAIR HANSON: Okay, thank you. Yeah, no, that's good news. I'm really glad to hear that all of that stuff is kind of in process really. Thank you very much.

Commissioner Wright? I'm sorry. I'm well over the end of my time, so I wanted to check in. Commissioner Wright, I believe, if you've got questions, I hope you're still out there.

COMMISSIONER WRIGHT: Thank you so much, Chair. Thank you. So, first, good morning to you, good afternoon from Ghana, and thank you for your presentations. And we look frozen. Are we still going down there?

CHAIR HANSON: We're good. We're still going. We can see you.

COMMISSIONER WRIGHT: Okay.

CHAIR HANSON: You're in motion even if we're frozen.

COMMISSIONER WRIGHT: All right, very good. So, but thank you to your teams for helping prepare you, and the information has been good so far, but as you know, I'm being last, so a lot of stuff's been asked and answered, so I'm going to try to see if I can fill in some gaps for myself here.

Andrea, I'm going to start with you. You know, you mentioned the work being done regarding digital I&C, and I understand there was a public meeting here recently in which some of our external stakeholders mentioned the idea that the industry may be outpacing the NRC in terms of

modernization when it comes to risk informing digital I&C systems, specifically common cause failure. So, why do you think the industry might have that impression and what are we going to do to combat it?

MS. VEIL: Well, I'll start with what we have done. Even moving beyond the, you know, eight to ten years of developing the infrastructure, I want to talk about more recent things that we've done. So, one of the most important things that industry said they needed was a way to deal with commercial grade dedication for digital I&C components, so we got that guidance out.

Another aspect was Waterford digital I&C. I think we forget about Waterford. It seems like it was pre-COVID, so it was a while ago, but we completed the Waterford digital I&C upgrade on time.

So, once we finished that, we moved on to dealing with digital I&C common cause failure and risk informing that particular process, and following Commission guidance, we actually did October 24 -- was that last week? Whenever October 24 was, we got out the implementing guidance to then be able to move forward with the risk-informing of common cause failure, and that's important because it allows licensees to be able to handle and look at defense-in-depth and diversity in a risk-informed way, but not eliminating any of the safety focus.

We also used risk-informed processes to accept the Limerick and Turkey Point digital I&C upgrades, and we've been moving forward expeditiously with that. There have been delays, and the licensees will tell you, on their end, not ours. They've been very clear about that. And we used the risk-informed process for both Turkey Point and Limerick to say we don't need all of your information right now to make our safety

determination. We will be flexible about when we get it.

So, we feel like we have addressed all of the needs that industry asked for in a timely manner, and we are actually on schedule based on what we said we were going to do. So, we're open to more feedback on digital I&C, but we do feel like we've met all of the needs and the requests that industry have asked of us, and this is near term, not going back to years ago when we were developing guidance and infrastructure.

COMMISSIONER WRIGHT: So, can I ask you -- just let me probe on that just a second. And I hear you and I appreciate what you said, that you think that you've addressed everything that industry has put forward. Have you actually like sat down with them or talked to them and said here's what we're thinking? Does this address what you're thinking?

MS. VEIL: Absolutely, and let me get very specific about the comment you made at the beginning, a recent stakeholder meeting where there was some pushback. I believe in that actual meeting, when our folks probed like what is it that you actually need, it became very clear real-time that it wasn't that we weren't keeping pace with digital I&C. I think it was more concerns about staffing, so.

COMMISSIONER WRIGHT: Yeah.

MS. VEIL: It's important to have the facts and know what we're actually done. In real-time during that meeting, they had that discussion, and it became apparent that it really wasn't about us not meeting the needs of digital I&C.

COMMISSIONER WRIGHT: Okay, very good. Thank you. And I'm going to stay with you for another question here. So, in looking at the schedule for revising the non-emergency reporting requirements in

50.72, I guess my question to you is it looks like it's going to take eight years to do that. Why is it going to take eight years? Why that long?

MS. VEIL: So, I'll comment on several aspects, and this is also on behalf of our partners in rulemaking. That rulemaking, actually hats off to the staff for a lot of the upfront work that they've already done. There were lots of comments both for and against that 50.72 rulemaking. That package is going into concurrence imminently, and I expect it to move through in a timely manner because of all of the upfront work that the staff has done.

Right now, that 50.72 rulemaking has a schedule, if I'm recalling correctly, of finalization, I think, in 2026, and that has more to do with the common rulemaking prioritization, and that rule is a medium rule. This is all public information on the website.

It's a medium rule and the prioritization has to do with both principles of good regulation, whether or not there's governmental or external interests, and all of the things that the rulemaking folks look at to prioritize. So, that's a medium rule. But having said all of that, we did not wait for this rulemaking to take action on one of the things that we found out in the regulatory basis for that particular action.

Specifically, we're revising NUREG-1022 to look at degraded and unanalyzed conditions, and we expect that supplement to be out in January of 2024. So, hopefully that's responsive to your questions on timeline.

COMMISSIONER WRIGHT: Okay, thank you. I appreciate just the information. LaDonna, I want to come to you now, and I want to first associate myself with the Chairman's remarks that he made at the end right there.

You know, I love to go around and meet with the residents and, you know, as you know, I've been spending a day at some of the plants solely doing nothing but, you know, shadowing them as a resident, and one of the things that I found, and maybe you all are addressing it in the working groups and stuff that you're doing, but you've got plants that are very hard to get to, like Diablo Canyon. It takes a while for you to get to Diablo Canyon from the region.

So, maybe when we're looking at stuff, especially when we don't have that extra resident in place that can cover, that maybe some priority should be given to some of those far away ones because it appears maybe they're suffering a little bit more because it's just harder to get to, but I totally agree with the Chair on what his concerns were.

And I wanted to ask you -- I'm going to go -- Commissioner Caputo asked you some questions early and I'm going to follow up a little bit because I'm interested in the knowledge management part of this, right? You know, we've seen some churn, and we're all concerned about that, and we're trying to build the pipeline, but I'm worried that we could lose some of that institutional knowledge. And the enhanced inspector training program that leverages former senior resident inspectors, I know that's a great start to address the concern, but could you talk to me a little bit about the plans, if any, to expand those efforts across the regions, or to utilize tools like Nuclepedia, or to capture site-specific knowledge, or any other ways we're capturing and passing along this invaluable knowledge?

MS. SUGGS: Yes, thanks, Commissioner Wright, for the question, and your day-in-the-life tours with the residents are certainly well received. So, specifically on knowledge management and knowledge

transfer, that has been an area focus for the regions, and I think for the agency, for a while, and although we are seeing an increase in the amount of turnover, the fact that we have new inspectors and newer people coming in, and we need to find a way to make sure that we're passing that knowledge on, that aspect is not new.

So, we're continuing some of our efforts that have been in place for a number of years, like our weekly knowledge management sessions, our weekly knowledge transfer sessions. Those have been occurring for a very long time, and we're continuing to do those, and we're maybe emphasizing the types of topics that we place in those with the recognition that we have so many new inspectors or even new senior residents that are new in role.

But in addition to that, we've also -- there have been a couple of things that have happened sort of grassroots, and in Region II specifically, we've started to lead a weekly new inspector training session, and I say grassroots because that was started by inspectors for inspectors. It's not something that the management team mandated, but it was something that the staff identified as a good practice and a need, and those have expanded. It started just with Region II and now it's across all of the regions, and we have headquarters that tune into that session every week.

That has been of tremendous value because it's happening on a weekly basis, so you can tailor the topics pretty easily pretty quickly. So, when we're having inspectors who are new or having experiences out in the field and they have questions, or some of our expert mentors that are working with our staff, when they're identifying gaps in knowledge, they can bring those directly to some of those sessions and have really timely broad training that's

available to our inspectors, so that's been a really good new practice that has grown tremendously.

There's also the new inspector newsletter, or the inspector newsletter, I'm sorry, that gets published. That's an opportunity for us to pass along knowledge sort of in a similar fashion to Nuclepedia. Nuclepedia exists and we're continuing to feed Nuclepedia, but the inspector newsletter gets shared across all of the regional offices and all of the inspectors, both the residents and new inspectors that are in other areas, participate in that.

And then our enhanced training program, that is something that we're really proud of, and in Region II, we have proceduralized that. We now have an Office Instruction that details how that program is going to work, and that's been shared across all of the other regions and it serves a lot of different purposes. One, it really leverages the expert knowledge of our senior residents that have been an asset to the organization in the past. They're close to the site. So, to your point, those sites that are further out, what we're trying to do is target some of those experts to be people that actually live near the plants, so they're able to go and not just provide backfill support, but also provide training and mentoring because they're very close to those sites, so that helps a lot.

And we're using them both for mentoring and for backfill, so that goes to Chair Hanson's earlier question about how are we providing some level of relief to our residents when they have life challenges, whether they need to take some time off because they, you know, had a baby or whatever. We now have a cadre of staff that can help provide some backfill support, and that also helps with our knowledge management efforts.

So, we are taking a pretty robust approach to knowledge

management and knowledge transfer, and then one other point that I'll mention, and I mentioned it in my remarks, but that was related to the competency-based qualification process. That is also an opportunity to provide real hands-on training to our inspectors that's timely, so that is a part of that knowledge transferring. It's happening directly with an expert mentor or a dedicated trainer that's working with them to increase their competencies.

So, we do have, I think, a robust strategy to address knowledge management and knowledge transfer that incorporates things that have worked in the past and some of the new techniques that we are putting in place now given the amount or the surge in new hires that we have.

COMMISSIONER WRIGHT: Sure, thank you so much. And Chair, I'm out of time. Back to you.

CHAIR HANSON: Thank you, Commissioner Wright, very much. Thanks to our first panel. Thanks to my colleagues for their, as usual, insightful questions. We will take a ten-minute break. We'll reconvene at 10:35. Thank you.

(Whereupon, the above-entitled matter went off the record at 10:25 a.m. and resumed at 10:35 a.m.)

CHAIR HANSON: All right, welcome back, everyone. Thank you for waiting. We will now recommence with the second panel on the new reactor business line. Once again, the discussion will be kicked off by our Executive Director for Operations Dan Dorman. Dan, the floor is yours.

MR. DORMAN: Thank you, Chair Hanson and Commissioners on our second panel this morning. We're pleased to provide you with a strategic overview of the new reactors business line.

The staff recognizes the rapid evolution and strong commercial interest in new and advanced reactors, and continues to augment our regulations, guidance, and procedures as evidence of our commitment to efficient and reliable licensing.

At the last new reactor business line commission meeting, we discussed the business line's preparations to license new and advanced reactors, and today the panel will be highlighting how we have transformed in the last six years by building our risk-informed and performance-based regulatory infrastructure to bring the benefits of this preparation to fruition by executing reviews on accelerated timelines and within established budgets, while continuing to accomplish our safety mission.

The panel will provide details on how we achieved our recent milestones, such as the issuance of the Kairos Hermes advanced research and test reactor construction permit safety evaluation, and the acceptance of the NuScale standard design application. The panel will also provide insights on how we are continuing to use our experiences to further improve our processes. Next slide, please?

Now I'd like to introduce the panelists who will provide additional details on activities in this business line. First, you'll hear from Rob Taylor, NRR's Deputy Director for New Reactors, who will provide a high-level overview of the new reactor business line's strategic priorities and successes.

Then you'll hear from John Greives, NRR's Acting Deputy Director in the Division of Advanced Reactors and Non-Power Production and Utilization Facilities, or DANU. He will be discussing the effective and timely review for new and advanced reactors and will also highlight innovation in construction oversight.

Then John Moses, the Deputy Director in the Office of Nuclear Material Safety and Safeguards, Division of Rulemaking, Environmental, and Financial Support will discuss new and advanced reactor environmental review transformation and how we are preparing the agency for the future of environmental reviews.

Next, Donna Williams, the Senior Project Manager in NRR's DANU Division, will discuss our international collaboration on regulating new and advanced reactors, and then we'll conclude with Lauren Nist, the Director of the Vogtle Project Office, who will provide insights on how the staff is leveraging our successes and lessons learned from the Vogtle 3 and 4 projects for future construction projects. Next slide, please? This concludes my opening remarks and I'll turn it over to Rob Taylor.

MR. TAYLOR: Thank you for the introduction, Dan. As Dan mentioned, we've laid the foundation on our executing of revised infrastructure to increase the use of risk-informed, performance-based license approaches, supplemented by project management enhancements to support near-term new and advanced reactor applications. Next slide, please?

The NRC is ready to license new and advanced reactors. This slide provides a synopsis of the progress we've made since 2018. Through the years, the staff has resolved more than 35 technical and policy issues, including the recent Commission decision on the emergency planning zones for small modular reactors, and developed more than 60 guidance documents which will be discussed in more detail by Jonathan Greives.

In addition, the staff is committed to stakeholder engagement, and has held more than 140 public engagements per year on new and advanced reactor-related topics. The NRC staff is in early pre-

application engagement that will enhance the efficiency of future reviews, with more than 15 vendors representing an array of different technologies.

In preparation, NRR has collaborated with the Office of Nuclear Regulatory Research to complete more than ten advanced reactor reference plant models, leveraging enhanced analytical tools and computer codes to conduct efficient, independent assessments for a variety of advanced reactors. Our preparation has enabled us to docket high-quality applications that demonstrate safety with accelerated schedules. The Kairos Hermes test reactor construction permit application review was completed on budget and in 18 months, well ahead of the established schedule and 50 percent faster than the generic schedule goal. Although not highlighted on this graphic, the Kairos Hermes 2 construction permit application schedule is set for 14 months, well ahead of the 36-month generic schedule goal.

Moving forward, NRR, in coordination with the Office of Public Affairs, the Office of Chief Information Officer, and the Office of the Executive Director for Operations, embarked on an advanced reactor readiness initiative. This initiative will allow us to communicate NRC activities that support timely and efficient licensing, NRC's role as part of the national and international processes for timely deployment of new technologies, including our work with federal partners, international regulatory peers, and the nuclear industry, and provide position messaging to ensure stakeholders have timely and accurate information on NRC's performance, initiatives, and priorities. Next slide, please?

The NRC staff is doing things differently to yield timely and cost-effective reviews without compromising safety. The staff is leveraging risk insights in all areas of the review.

For example, in preparation for the submittal of the NuScale standard design application, the staff collected preliminary risk insights from the applicants' probabilistic risk assessment. These risk insights were leveraged by the NRC staff and helped to identify focus areas for review, graded the review scope and schedule, and supported decision-making during acceptance review.

As a result, the staff was able to identify gaps in the application where the applicant needed to provide supplemental information, while also starting the technical review on aspects of the application where there was enough information. As of last month, the staff had completed its risk-informed review of areas identified as low and medium risk in the application, issuing a limited number of requests for additional information or RAIs, while effectively closing the majority of these portions of the review on schedule and budget.

In addition, the staff has developed and is implemented enhanced project management and data analytic tools to enable timely and cost-effective safety reviews. The graded, risk-informed approach to our review is evidence in how we allocate resources and establish our schedules.

The NRC's tools today, as opposed to what we had just a couple of years ago, can allocate resources and monitor performance with more accuracy, allowing us to identify review challenges early and elevate them. This approach enhances accountability and discipline in our reviews. When safety issues arise that affect established schedules and budgets, we proactively discuss them to determine if alternative approaches to reach our reasonable assurance determination are needed.

As we discussed last year, the staff's implementation of core

review teams consisting of eight to ten technical staff per application wherever possible have paid dividends. These core teams permit a sharpened focus on issues and gained efficiencies through continuity of having the same individuals review similar applications. Next slide, please?

Lastly, I'd like to emphasize that we're looking towards the future and are committed to making the safe use of nuclear technology possible. Over the last year, we've seen the desire for nuclear power to be used for applications besides electrical generation such as for processed heat and hydrogen production. We look forward to reviewing these types of applications with a specific focus on reactor safety, which is our mission.

In addition, there has been substantial interest in the potential conversion of previous coal sites or other brownfield sites into nuclear power plants. The staff does not foresee any barriers to the NRC licensing process preventing efficient conversation of previous coal sites into nuclear power plant sites and intends to leverage prior environmental reviews completed by other federal and state agencies to the extent possible for all brownfield sites.

The NRC is using a spectrum of tools to prepare the staff to license future applications. Through our active engagement with potential vendors, industry groups, research organizations, Department of Energy and National Laboratories, and international counterparts, we maintain awareness of new technologies and understand the potential regulatory needs. This information allows us to identify critical skill sets in advance and allows time to hire new staff to fill known gaps and identify national laboratory and contractor expertise for assistance on focused activities. In parallel, we prepare existing staff through seminars to increase awareness and broad

understanding of new technologies and focus training on specific technology applications.

Next slide, please? That concludes my remarks and I'll now turn the presentation over to John Greives.

MR. GREIVES: Thank you, Rob. Next slide, please? The transformation of NRC's approach to new and advanced reactor licensing is built on deliberate preparations and focused executive pre- and post-application submittal, and directly leads to the staff's ability to set and meet aggressive timelines and schedules.

To enhance the readiness of new and advanced reactor applications that come to the NRC, as well as the NRC staff readiness to review them, the NRC engages in pre-application activities. The goal of pre-application engagement is to optimize the application review by identifying, and in some cases resolving, key technical and policy issues early in the process.

Pre-application engagement, as described in NRC guidance, starts with licensing project plans or regulatory engagement plans to facilitate a common understanding of objectives, outcomes, schedule, and resources. In pre-application, NRC staff engages with potential applicants frequently using a variety of tools, including pre-application meetings and audits, to ensure common understanding of the content of applications and to ensure appropriate risk-informed focus on the most important aspects.

These activities have provided tangible and important results. To date, we have completed reviews of over 95 white papers and topical reports. Topical report reviews are being completed in 16 months on average, which is significantly less than the 24-month review metric. Eleven

topical reports we approved for Kairos Hermes 1 during pre-application, addressing many safety-significant topics that streamline the review and significantly contributed to the completion of the safety evaluation.

Pre-application meetings have provided invaluable insights into the designs and deployment models and have helped staff to identify and work to resolve policy issues early in the process. For example, pre-application meetings with microreactor developers highlighted policy issues related to microreactor deployment and led the staff to develop a paper that is nearing submission to the Commission to resolve those policy issues and provide clarity to applicants ahead of planned application submittals. The staff has also used information gathered as part of pre-application meetings to enhance and optimize other areas that support our timely and effective reviews, such as knowledge management efforts, hiring and recruitment, as well as research activities.

Prior to application submittal, readiness assessments are used to identify potential issues with acceptance and/or schedule and resource challenges so that both the applicants and the NRC are ready when the application is tendered. For example, the staff completed readiness assessments and submitted observations, including any technical concerns or major information gaps, to NuScale prior to their standard design approval application submittal and to Abilene Christian University ahead of their construction permit application submittal.

This allowed the applicants to address gaps in their submittals, facilitating our successful acceptance, but also familiarize the staff with their planned submittals to enable identification of challenge areas that warranted heightened staff and management attention early during the review.

Review charters are developed whenever possible that designate the core team for the review, including a lead project manager and lead technical reviewer. Clear expectations are established for review strategy and execution timelines. Integral to the strategy, project leadership applies a graded approach to allocating resources to provide focus on the risk-significant aspects of the review, as well as to ensure discipline and clarity in the technical reviewers, project managers, and management on expected level of effort to make reasonable assurance determinations. Next slide, please?

Once an application is tendered, project managers, technical leaders, and NRC management are focused on execution. Thorough and robust acceptance review allow us to identify significant issues and risks to project success, including strategies to address those risks like the use of requests for supplemental information, partial docketing, and acceptance with communication of significant issues.

Enhanced project management practices like oversight by lead reviewers, frequent core or review team meetings, management engagement, and dashboard monitoring enable early identification of and appropriate attention to issues. This approach includes alignment meetings at the start of projects, as well as executing periodic meetings throughout the review focused on the goals and priorities established in the charter, to ensure we are addressing challenging issues and driving progress.

To support the effort, NRR has developed transformative project management tools to provide near real-time data analytics on project execution. Internal dashboards facilitate clear oversight of resource expenditures in accordance with risk-informed allocations to determine if

projects are progressing as anticipated and allowing for early identification of challenges such that effective management engagement can be used to drive resolution. External dashboards provide applicants and the public with clarity and insight into project progress in accordance with the schedules.

Applicant engagement throughout the review is a priority at all levels. This includes periodic meetings with applicants at the leadership level to enable clear communications, which facilitates resolution of open items. We are additionally focused on leveraging a variety of tools to resolve technical issues in the review, including clarification engagements and audits, both in person and virtual, to minimize the need to use more resource intensive tools, such as RAIs.

Finally, we promote a culture of continuous improvement. To this end, the staff have made significant strides in review execution, and will continue to incorporate lessons learned and best practices as we move forward. For example, we are leveraging internal experience with the design center review approach, in particular for second and later applications. As Rob mentioned previously, this is in part driving a streamline review for Kairos Hermes 2, representing a greater than 30 percent reduction in review schedule and a greater than 40 percent reduction in resources as compared to the Hermes 1 review, while not compromising safety.

Recognizing that staff turnover can have a significant impact on our progress, we incorporate knowledge management practices in our daily work through use of Nuclepedia, staff-developed training, and robust core and review teams, with appropriate backups assigned throughout the review. Despite the fact that both the lead project manager and lead technical reviewer left the agency late in project execution for Kairos Hermes 1, no delay or loss

of progress was experienced. Next slide, please?

While we are executing our vision and strategies in new and advanced reactor licensing reviews, we are also planning for future deployment of new and advanced reactors. One area we are looking at in particular is enhanced and optimized approaches to oversight through development of the Advanced Reactor Construction Oversight Program or ARCOP. As described in a recent SECY, the primary objective of the ARCOP is to provide reasonable assurance that new and advanced reactor plants are built and will operate in accordance with their design and licensing bases, and therefore provide adequate protection of public health and safety. To meet this objective, the vision of the ARCOP is to establish a program that is risk-informed, performance-based, technology-inclusive, scalable, informed by experience, comprehensive, and innovative.

The ARCOP intends to leverage the best features of the operating reactor oversight process or ROP and construction ROP that have served us well, but optimize each to reflect the risk profiles expected for new and advanced reactors, to incorporate additional potential licensing pathways, and to reflect past experience and lessons learned from implementation, including oversight of the construction of the AP1000 plants, the SHINE medical isotope production facility, as well as fuel cycle facilities. Next slide, please?

These concepts are currently being developed in draft inspection manual chapters and inspection procedures which will be informed by data and feedback from both internal and external stakeholders through tabletops and workshops. We are also continuing to explore other ways to increase efficiency of NRC oversight of advanced reactor construction,

including cooperation with international regulators and incorporation of new technology when appropriate.

Throughout its development, we are identifying any issues that require Commission direction and intend to keep the Commission fully informed of our progress. Next slide, please? This concludes my remarks and I will now turn it over to John Moses.

MR. MOSES: Thank you, Jonathan. The fiscal responsibility -- next slide, please? Thank you. The Fiscal Responsibility Act of 2023 substantially amended the National Environmental Policy Act or NEPA. The NEPA amendment set deadlines and page limits for environmental review to ensure timely completion. NEPA amendments also clarified the roles of lead and cooperating agencies, and enabled agencies to use one another's categorical exclusions.

Several of these changes are best practices that the NRC already implements. In addition, the staff are implementing several enhancements to environmental review processes to improve efficiency and effectiveness. For instance, the staff are using a portfolio management approach across all projects, enabling project and schedule tracking, priority setting, and budget formulation. Staff also are applying agile project management techniques supporting rapid responses to changing priorities or external circumstances, redirection of technical expertise, and optimization of schedules and resources.

A novel way in which staff are satisfying NEPA obligations can be seen in the Kairos Hermes 2 molten salt reactor construction permit application. The staff are preparing an environmental assessment or EA to determine if an environmental impact statement or EIS is necessary.

The staff's approach would require exemptions from NRC regulations. Additionally, if the Hermes 2 application environmental review supports a finding of no significant impact or FONSI, the staff intends to publish the draft FONSI for a 30-day public comment period to invite public engagement during the environmental review process.

There are several advantages for pursuing an EA for Hermes 2. First, the staff recently completed an environmental impact statement or EIS for the Hermes 1 CP application. Based on the knowledge gained from the Hermes 1 CP environmental review and an initial reading of the Hermes 2 CP environmental report, it is uncertain that an EIS would be necessary for the Hermes 2 application. Second, an EA would not require as much administrative work as preparing an EIS and could be completed on a shorter timeline. Third, an optimized environmental review schedule is expected to correspond more closely with the estimated time schedule to complete the safety review for Hermes 2. Finally, this approach would provide staff with a unique opportunity to implement a risk-informed approach for environmental review that is commensurate with the risk posed by advanced reactor technology on a well-evaluated site. Next slide, please?

The NRC's Environmental Center of Expertise or ECOE works closely with NRR to coordinate the agency's environmental review with safety reviews. In light of advances in nuclear technology and increasing demand for environmental reviews, the ECOE is being realigned into a more nimble organization comprised of three project management branches and two technical branches.

This restructuring strengthens an enterprise approach, enabling increased capacity for increasing volumes of applications, greater

flexibility to support diverse nuclear technologies, and synergies across disciplines to deepen the bench of technical skills and support career growth. Based on budgeted workload, the staff are expanding the number of ECOE employees and have restructured how we perform environmental reviews.

For instance, despite intense competition from other federal agencies and the private sector, the staff successfully recruited more than ten environmental project managers and environmental scientists in FY2023, representing almost 25 percent of the ECOE's total number of employees. In addition, the staff put in place contracts with national labs to leverage contractual expertise to support the staff's environmental review responsibilities.

Finally, the staff prepared and updated an environmental review-focused qualification program. This program is thorough and concludes with an in-person review board. This summer, our first employee successfully completed his qualification, and nine more ECOE employees are proceeding through the program. Next slide, please?

Staff have enhanced its engagement with federal agencies, tribes, and states. For instance, staff recently put in place a memorandum of understanding or MOU with the Department of Energy, clarifying the NEPA responsibilities on new and advanced reactor technologies that the Department is supporting. This MOU is anticipated to reduce redundancy of NEPA efforts and embodies the lead and cooperating agency concepts that are now part of the NEPA law. In addition, staff are proactively meeting with agencies, tribes, and state and local governments to further cooperation and streamline NEPA and consultation processes while still providing meaningful stakeholder engagement.

Finally, the staff are pursuing new and novel communication channels to explain the agency's NEPA responsibilities and enhance stakeholder confidence. For example, the ECOE is working with the Office of Public Affairs and business line partners to develop and produce new outreach materials, including fact sheets, conference presentations, social media campaigns, and videos to explain NEPA concepts.

Examples of these efforts include the 2023 Regulatory Information Conference, the American Nuclear Society conference, DANU's advanced reactor stakeholder meetings, and the NRC's recent Barbie and Ken social media posting, which leveraged the recent Barbie movie to attract new visitors our social media platforms in a fun way, and introduce talented staff, including the ECOE's Ken Erwin, who leads the New Reactors Environmental Review Branch.

These efforts are just some examples of the ECOE's efforts to improve outreach nationwide, while still ensuring high levels of public engagement through its normal project-specific public meetings during licensing activities. This concludes my remarks and I will turn it over to Donna Williams.

MS. WILLIAMS: Thank you, John. Next slide, please. There is significant worldwide momentum and interest in small modular and advanced reactors. The NRC is actively engaging with international communities and taking a leadership role in developing common regulatory positions and exchanging information on the safety and regulation of these reactors.

As part of the International Atomic Energy Agency Small Modular Reactor Regulator's Forum, we align with other regulators on

important topics, such as fundamental safety functions and defense-in-depth. The position papers produced by this forum and exposure to other regulatory perches allow us to leverage international experience in the development of NRC regulations and guidance.

NRC staff are also collaborating internationally through two newly created working groups under the Nuclear Energy Agency. The Working Group on New Technologies provides a forum for regulators to share their experience from licensing and oversight of nuclear facilities and explore opportunities for the harmonization of licensing standards for new technologies. The staff expects to leverage the information exchanged in this working group to develop positions on novel design features.

The Working Group on Policy and Licensing was formed to develop recommendations for regulatory positions on globally significant policies used affecting safety of reactors and the effectiveness of regulatory activities.

NRC staff are also playing an active role in the IAEAs Nuclear Harmonization and Standardization Initiative. Three working groups support the regulatory track activities of this initiative. The first working group is developing a network to enable regulators to share the information needed to conduct joint reviews. The second working group is developing an international pre-licensing design review. And the third group is working on approaches for regulators to cooperate on reviews and to leverage other countries' reviews. This group is using the experience of the NRC, the Canadian Nuclear Safety Commission bilateral cooperation as a model for ways in which regulators can work together to improve review efficiency. The outcomes of these efforts are expected to lead to more efficient licensing

reviews and standardized designs.

The NRC also plays a leading role in facilitating the safety of new reactors in embarking countries. In this role, the staff assists the regulators of countries embarking on nuclear power programs such as Poland, Romania and Ghana, which I'm sure Commissioner Wright is very familiar with now. This work is coordinated with the Department of State to ensure that we are aligned with the strategic priorities for the U.S. and for these countries.

Next slide, please. The NRC continues to have mutually beneficial engagement with the CNSC to collaboratively address challenging topics in licensing advance reactor and small modular reactor designs. They are under review in both countries. We see tremendous value in our collaboration with CNSC under a Memorandum of Cooperation that was signed in 2019.

We anticipate that the groundwork that we're laying today in pre-application cooperation will enable more effective licensing reviews of these novel designs. We realized tangible benefits from this initiative in the form of joint products that can be utilized in our licensing decisions. We've issued three generic products that provide benefit to a wide range of end users, such as comparisons, the review approaches for safety classification, a report that compares approaches for technology-inclusive and risk-informed reviews, and reports on TRISO fuel qualification.

We have also performed cooperative reviews of white papers and topical reports as part of pre-application interactions for specific reactor designs. We strategically chose products that will support efficient licensing in both countries, being benefits for both regulators and not hinder either regulator in performing timely reviews.

The NRC and CNSC work with vendors as active participants in the collaborative process to reach alignment on a scope of collaboration and establish an understanding on how this collaboration can result in both near-term and long-term useful products.

Today we've issued five joint products for specific designs. For example, we've performed joint reviews of specific technical topics as part of our pre-application engagement on X-energy and TRISO-X advanced reactor designs.

We are currently addressing important regulatory issues for the GE Hitachi BWRX 300 small modular reactor, which is a pre-license in the U.S. and under licensing in Canada. The Tennessee Valley Authority and Ontario Power Generation announced plans to jointly work to deploy the BWRX-300 in Canada and the U.S. and have proposed technical topics for NRC and CNSC to address collaboratively.

We have issued two joint reports to date and are exploring additional areas for collaboration. Our cooperation with CNSC has evolved since the MOC was signed in 2019. Initially, we shared the results of completed evaluations and identified the similarities and differences between our processes and requirements. We used that knowledge to identify where our positions align on specific technical issues and pre-application reviews.

Going forward, we are working to jointly find approaches to address novel technical considerations. And we anticipate applying the collaborative process we've developed to portions of license applications as the project moves into licensing phases.

We continue to seek opportunities to expand the list of vendors and technologies for joint reviews and strategically expand

cooperation in areas of mutual interest, such as construction oversight and vendor inspection. We've also developed criteria for including additional regulators to observe or participate in specific projects without hindering our progress.

Cooperation has enabled us to gain valuable insights into the benefits as well as complexities associated with joint reviews. We are currently identifying lessons learned to improve this first of a kind cooperation, and we expect that successful implementation of this collaboration between the NRC and CNSC can be a model for other regulators to follow.

This concludes my remarks. I will now turn the presentation over to Lauren Nist.

MS. NIST: Thank you, Donna, and next slide, please.

The NRC staff achieved significant regulatory milestones this year for Vogtle Units 3 and 4, which are operated by Southern Nuclear Operating Company, or SNC, and are the first Westinghouse AP1000 Nuclear Power Plants to be built in the United States.

The staff oversaw startup testing at Unit 3, which Southern completed at the end of July. Southern was then authorized to operate Unit 3 continuously at full power, or in other words to commence commercial operation. The staff also issued the 10 CFR 52.103(g) finding for Vogtle Unit 4 on July 28. The staff is overseeing startup testing at Unit 4, and Southern expects to complete the testing and commence commercial operation on Unit 4 early next year.

Notably with the issuance of the 52.103(g) finding, Unit 4 transitioned from the construction reactor oversight process, or the CROP, to the reactor oversight process, or ROP. Consistent with Commission

direction, the staff is implementing a modified ROP for Vogtle Units 3 and 4. Based on the lower risk profile for the AP1000 design, the modified ROP includes reductions in sample sizes and resource estimates for several inspection procedures in the baseline inspection program.

Also this year, the staff continued to successfully resolve unique regulatory challenges. For example, the staff received requests for an exigent license amendment and an emergency license amendment from SNC during startup testing on Unit 3 earlier this year. These amendments allowed SNC to make repairs on Unit 3 without having to take shutdown and cooldown actions and reduce the plan's operating mode. Because Unit 3 had not yet reached initial criticality, those actions were not necessary to make the repairs, and they would have delayed the startup testing schedule without achieving any safety benefit. The staff issued the exigent amendment within the eight-day time frame requested by Southern. And the staff issued the emergency amendment well within the 72 hours requested.

Southern also submitted a license amendment request for Unit 3 earlier this year to help prevent the need for similar exigent or emergency requests. The staff also approved that license amendment and issued it by the date requested by Southern.

Next slide, please. With Vogtle 3 operating commercially for the last several months and Unit 4 expected to reach that milestone in the near-term, the staff is focusing on completing the lessons learned effort and transitioning staff and regulatory activities. The lessons learned effort started over two years ago, and it is being implemented by a working group consisting of staff from Region II, NRR and the Office of Nuclear Security and Incident Response under the leadership of the Vogtle Readiness Group, which is also

known as the VRG.

The purpose of the effort is to perform a holistic assessment of the NRC's licensing and construction oversight program at Vogtle Units 3 and 4 to improve the effectiveness and efficiency of future oversight programs. The working group has developed a Nuclepedia page to capture critical knowledge and lessons learned from the staff on a broad array of topics. The working group also requested and received feedback from external stakeholders, including Southern, for this effort. Additionally, the working group is preparing a summary report. The report is focused on lessons learned related to construction inspection, licensing actions and implementation of the inspections, test, analyses and acceptance criteria, also known as ITAAC, and it also provides recommendations for future programs. The report will be made publicly available and we are planning to issue it by the end of this year.

Additionally, several staff who work on licensing actions and conducted inspections while Vogtle Units 3 and 4 were under construction are now contributing to the development of future programs, including the Advanced Reactor Construction Oversight Program, or ARCOP, which John talked about. This effort is not the only opportunity the staff has taken to identify and implement lessons learned during construction of Vogtle Units 3 and 4. For example, following the issuance of the 52.103(g) finding for Unit 3 in August of 2022, the staff completed a lessons learned audit to identify efficiencies that could be gained during inspections of Unit 4. This effort helped to avoid duplication of inspections between Units 3 and 4 when it was appropriate. And it resulted in fewer resources needing to be devoted to Unit 4 inspection activities.

Finally, the staff's workload associated with the oversight of the construction and startup testing for Vogtle Units 3 and 4 has declined greatly over the last year. As such staff assigned to support the project have begun to transition to other positions in the agency while maintaining the ability to address any emergent issues that may arise from Vogtle Unit 4.

The VRG is effectively coordinating transitions of responsibilities and tasks to the operating reactor business line, including providing annual reports to the Commission for the next several years on any insights, trends, or lessons learned in applying a modified ROP at Vogtle Units 3 and 4.

Next slide, please. This concludes my remarks. And I turn the presentation over to Dan.

MR. DORMAN: Thank you, Lauren, and thank you to all of the panelists for your remarks. This concludes our prepared presentation for the new reactor business line panel.

I also want to extend my thanks to all the staff who helped us prepare both panels for this meeting. That concludes our presentation, and we look forward to your questions.

CHAIR HANSON: Thanks, Dan, and thanks to all our panelists. We will begin again with Commissioner Caputo.

COMMISSIONER CAPUTO: Thank you, everyone, for being here today. And I will start by just congratulating the staff on their accomplishments with Vogtle 3 and 4. That is a longstanding effort that has taken a significant amount of commitment and dedication from our staff and the results, I think, are impressive. So thrilled to see that things have progressed to where they are. And I just really congratulate the staff on the

work that's been done in terms of supporting startup and nearing the end of this very long road with Unit 4. So keep up the good work.

A few months ago, the staff provided the Commission with a paper on the Advanced Reactor Construction Oversight Process, the ARCOP that's already been mentioned. So my understanding of the current construction reactor oversight process is that its objectives are more focused and results driven for combined licenses to provide a sufficient basis to support the finding that acceptance criteria in the license have been met, the ITAAC that Lauren mentioned, but also to develop confidence in the licensee's programmatic controls. I can see a need to adapt the program for advanced reactor applicants that are using a two part licensing process, but I think it's important that we do maintain a results driven focus.

So one principle in many Advanced Reactor Construction Oversight Programs that gives me pause is a seeming desire for comprehensive oversight. And this seems to be a little bit in conflict with how risk information should be used to inform the scope of the instruction program. There could also be other efficiency gains for a construction oversight program if we rely on corollaries to the Reactor Oversight Program performance indicators as the current Construction Reactor Oversight Program has done with regard to ITAAC performed by the licensee.

So, Mr. Taylor or Mr. Grieves, would you provide some insight into how the ongoing lessons learned effort from the oversight of the Vogtle project that Lauren has talked about, how these ongoing lessons learned are being used to inform the initial efforts on the ARCOP framework and any thoughts on how you can make better use of these lessons learned as they come to closure?

MR. TAYLOR: Let me start and then Jon will jump in. But it's an absolutely great question, one we ask ourselves all the time.

So we're taking the best elements of the construction reactor oversight process, right, those things that worked really well for Vogtle. The vision is to take those, plus the lessons learned, and then account for the differences in how these SMRs and advanced reactors are going to be manufactured and constructed to build a program that's focused on the most risk significant and safety-related aspects of those designs.

So comprehensive isn't meant to mean everything about that design. Comprehensive is meant to look at the life-cycle of how that plant is going to be constructed and look at where the best place to perform the right inspections are to satisfy our need. We expect for these SMRs and advanced reactors, they are going to have significantly fewer safety-related systems. So this program doesn't need to touch as much in an SMR and an advanced reactor to give us that same level of reasonable assurance that we might need for a large light-water reactor that has many more safety significant systems. So we're essentially rightsizing the program to look at only those critical elements we have to in an inspection space to have the confidence that the facility has been constructed in accordance with its license.

COMMISSIONER CAPUTO: So the bottom line is if an advanced reactor has significantly fewer safety systems, then you are going to see a significantly more efficient --

MR. TAYLOR: Absolutely.

COMMISSIONER CAPUTO: -- construction oversight.

MR. TAYLOR: Absolutely. The touch we put on it is commensurate -- we don't have the table with us. But the table that we would

show you, that we've kind of mocked up, says what are the risk significant components and safety-related components in that system and which ones do we need to touch and how much do we need to touch them to have confidence in it?

So we're asking ourselves that for each technology as we go forward. So an X-energy will look a little different than a TerraPower, which may look a little different than a Kairos. But it's all rooted in what is the risk significant component in the facility and where is the best place to look at that and how much effort do we really need to spend in inspecting it? Go ahead, Jon.

MR. GREIVES: I was just going to add for -- you know, to build off scalability to a certain degree, you know, what we look at for the first of a kind development may be different than what we look at and the program needs to be scaled such as when you get into some of these micro-reactors, small modular reactor factory fabrication, we develop experience over time.

So the program not only needs to be able to scale to a particular project, but then scale as the project and multiple projects continue to move along so we can continue to realize efficiencies in our inspection and oversight efforts. So we not only need to be able to scale to the risk significance in a risk-informed and performance-based way, but we also need to scale as we develop experience in the program throughout the life cycle of whatever that vendor is using.

MR. TAYLOR: The program would effectively, as Jon said, reward good performance in the inspection space. So if we inspect that first of a kind and see that the QA, which is a cross-cutting element that we are really going to emphasize in this, is high quality and they are doing a very

good job on the construction, subsequent units that are rolled off that manufacturing line would not get the same level of inspection because we would give credit for the work that's already been done. Then we would scale back up if we started to see problems in the inspection space.

COMMISSIONER CAPUTO: Okay. Thank you. I only have one more item that I would like to raise. And that is I was at a conference lately. I got a question from someone on the status of a review and when the decision was scheduled to be made. And not knowing the answer off the top of my head, I thought, oh, I will get right into the website, the public-facing website, because it should be readily apparent. It wasn't. I searched around, searched around, searched around and ultimately couldn't find the answer.

So as someone who spent a fair amount of time earlier in my career reviewing status of applications for 31 reactors that this agency had in the first round of the renaissance, I was a little surprised by that. And so in going back and looking at some of that after the fact, there is information that is available, some that I think is interesting and more useful. But I think the information that is being present is a little uneven. And, you know, there is room, I think, to be a little more comprehensive.

I think there is also room with one notable difference between then and now. There was constantly posted a spreadsheet. One chart that showed all the reviews, the status of those reviews. It was kept up to date. It was foremost very present in the website, easy to find, not something that required sifting down through 10 clicks to get to. And it provided a snapshot of where the agency stood in terms of progress on all the reviews that were pending, and those that we knew and anticipated were

coming in.

So I would just urge you to look at posting that kind of a chart so it's easily digestible for the public to see where we stand with everything that's pending before the Agency in terms of reviews.

MR. TAYLOR: Thank you for that feedback. We're actually in the midst of an update to the website. So we can certainly take that back and incorporate it into the website. And one of the things that we want to make the website do is be much more user-friendly, to take away that needing to drill down multiple layers to find information, which some of you may not be familiar with the website will struggle with. So it's good feedback, and it's very timely, Commissioner.

COMMISSIONER CAPUTO: Thank you.

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

COMMISSIONER CROWELL: Thank you, Mr. Chair. Thank you for everyone's presentation today. As always, it was very informative. I learned a lot. I think about a lot as I hear the presentations.

I am going to burn a little bit of my time here and pick up on the website issue and just say that, you know, I -- Rob and Jonathan and some of your colleagues, you briefed me recently on some of the improvements you're making to the website. And I think you're headed in the right direction.

The blessing and curse of the NRC website as a whole, this is beyond just new reactors, is that it has every bit of information anyone could ever want. But whether you can find it in your lifetime, in a reasonable amount of time with, you know, an average amount of understanding of the topic is a question. And I think that begs a broader conversation at some

point about how we make our website user friendly and think about the user as more of an average person, because I think that's important. And I think it leads directly into some of these new and novel communication channels that you've discussed as well.

On that topic specifically, I think John maybe this goes to you, John Moses. And I don't know if you are going to know this, but obviously this is a public affairs question. But how do we measure what traction we're getting with these new communication channels, whether we're making any progress with new audiences and how it's being received and the interest and edification that comes along with all of this?

Are we just throwing darts and anything is better than our current process or are we really tracking penetration and what's working in terms of reaching new audiences?

MR. MOSES: So my understanding, and I think some of this is an OPA discussion, but from prior experience, I know for the website that we use the American Customer Satisfaction Survey Index, which is a randomized index out of the University of Michigan, that when you click on the website it will ask for feedback on finding things and satisfaction and things like that. That's readily apparent and I know it feeds back into the Office of Public Affairs and other folks who use the website.

I know in terms of some of the work we do, we have other techniques and tools that we use in terms of when we have onsite public meetings. We often have an open house where we meet and greet people in a more informal way so then we can speak to them. At those meetings, we issue comment cards, both for comments kind of in the informal sense, but invariably people will provide you comments whether it's on the action that you

are requesting or sharing information on. Those are two of the different ways I am aware of technically. I know in our social media presence, OPA also tracks that as well. I defer to them for their full answers.

COMMISSIONER CROWELL: Understood. I am going to make a comment, but then I am going to come back to you with a question you can answer.

So I am advanced reactor. I love this new branding stuff, but do you know what this is missing? A website, a bar code, something like that, I don't know what this is. You know, like we don't get -- yeah, we're not getting any QR. We're not getting any -- like there is nowhere for the eyes or the user to go.

John, back to your wheelhouse. In considering whether an EA is appropriate or a more robust EIS is appropriate, beyond whether the site is well-characterized or understood or well-evaluated, what else goes into the consideration of whether to pursue an EA -- begin with an EA versus go right to an EIS?

MR. MOSES: So the agency has specific instructions in its regulations defining what triggers an EIS. Hence, the Hermes 2 is a little bit unusual in that we looked at the site. Based on what we've learned about it, you know, it's moving from -- and it was just two weeks ago that we had the Hermes 1 hearing. It's one molten salt reactor. The Hermes 2 will be literally two of those, with a nominal amount of power coming out. It's at the same site so all the environmental impacts. So we thought that would be an opportune time to kind of stretch and see what we can try.

Under NEPA, you can start with an EA. You don't have to start with an EIS. But our internal regulations, and there is a series of them,

whether it's to start the process and publish it is the Notice of Availability in the *Federal Register*. There is also a series of exemptions. We will be pursuing for that. And we thought that would be a great experience both to learn from and demonstrate that we can do things in a new innovative and expedited manner that's commensurate with both the risk and any understanding of the site.

COMMISSIONER CROWELL: Kairos has the benefit of being a pretty obvious test case here. But I think there is going to be other test cases as well that have a different dynamic. And I just hope we're being thoughtful and responsible about pursuing those test cases. I mean, don't pursue it when it's obviously going to take an EIS, and there is no way around it. But just let's be forward leaning in figuring out where an EA maybe can apply that we haven't used it in the past. Dan?

MR. DORMAN: Yeah. Thanks for that, Commissioner. I just wanted to emphasize that, you know, we have, as John said, in the Commission's regulations things that guide us toward an EIS as a default, and Hermes 2 would have been such a case.

But NEPA doesn't require that. NEPA requires us to evaluate whether it's clear that an EIS is needed or if it's not clear that an EIS is needed, it has the option of an EA. So that's what the staff has put forward here is because it's a technology that we just evaluated on a site that we just very thoroughly evaluated, it is not clear that an EIS is needed in this case.

So I think to your point as we have other opportunities to look at this in the future, that's going to be the driving consideration. If it's clear that an EIS is needed, clearly, we are going to pursue the EIS. But I think that this case is a case where that was not clear. And it gives us an

opportunity to see what that experience will inform in terms of any thoughts on the Commission's regulations in the environment we're going into.

COMMISSIONER CROWELL: Just, so you know, we probably all do have some experience with agencies trying to pursue an EA where it's not appropriate, where it is being used as an inappropriate shortcut, whether the information is too old or stale or not well-characterized. I don't want to get there. But I do want to get into a space, like, where it makes sense and is reasonable. If there is any inclination that it may be possible, let's think strongly about looking into it.

MR. TAYLOR: If I may just real quick?

COMMISSIONER CROWELL: Sure.

MR. TAYLOR: I can imagine we are going to learn a lot by doing this one. And as we look going forward, we are going to need clear criteria to guide us as well as applicants to understand when we think this is appropriate. And I can imagine, given that this is in the Commission's regulations, we're going to need to come to you at some point and explain what those criteria are and how we are going to do this.

So I think we need to put a lot of thought in this. Look at what CEQ has as guidance out there and have a robust process that explains why we are going to start with an EA or why we are going to start with an EIS so that all stakeholders understand how we made our decision.

And it will provide clarity to those applicants in the future because that's a big important factor in the schedules that we set is how long does the environmental review take because on second through nth time, we might end up with the environmental review and the EIS being longer than the safety review.

COMMISSIONER CROWELL: Thanks, Rob, for that clarification because when we do pursue an EA, explaining to stakeholders, particularly in the community, not the more sophisticated stakeholders, but the everyday stakeholders, explaining why we are taking a certain amount is as important as anything else in that consideration.

Donna, I'm going to move over to you for a minute here, and you may want to lifeline to OIP, but I'm going to ask it to you anyway.

So I've recently read some criticism that the NRC is falling behind in our efforts to be prepared for advanced reactors and licensing thereof and specifically that we're being outpaced by Canada. But take an opportunity here to tell me a little bit more about this partnership with Canada and why it's not accurate to say that we are being outpaced by Canada, we're actually working very well in concert with them, and both of us leveraging each other's expertise?

MS. WILLIAMS: Thank you for the question. I am surprised. I haven't heard that feedback. I guess I know in many cases we exchange information.

COMMISSIONER CROWELL: I can send you the article if you would like.

MS. WILLIAMS: Hmm?

COMMISSIONER CROWELL: I can send you the article if you would like.

MS. WILLIAMS: I would. Thank you. I feel like in particular, you know, we have gotten a lot of requests from Canada for support in building their infrastructure and their framework. They continue to reach out to us and we pride our experience.

In particular, you know, talking about the efficiencies that we are gaining from this collaboration, we can't really measure it very well, but we have heard from Canada that when using one of our field qualification reviews, they have been able to shave eight weeks off of one of their reviews. So I think that they do look to us, you know, a lot for building up their infrastructure.

But overall, this collaboration, it's beneficial. We've got products that we can reference in responses to our applicants, actually pre-applicants in this case, in response to topical reports and white papers. And we benefit from, you know, CNSC's technical expertise as well as they benefit from ours to come and try a product that is actually, you know, better than us doing it individually. We can directly reference those.

COMMISSIONER CROWELL: Would you say both countries are moving together more quickly together than they would be individually?

MS. WILLIAMS: Well, I think the product that we get is a better technical product because it has input and perspectives from both agencies. We at this point are not making a review schedule shorter, but we are not making them any longer.

One of the big considerations we have in agreeing to embark on a project is that, you know, we will maintain our same schedules, and we won't let the collaboration slow us down. That being said, we hope that as you move into future phases of the review, maybe we can get more efficient and faster.

What we are doing now is just building the understanding of each other's requirements, building the communication, the processes, and most importantly, getting confidence in the capability of each other so that

when we get to the point where we can maybe take a portion of a licensing review, give part to Canada and give part to us and then merge that together, you know, confirming, of course, what they've done, maybe we can get some efficiencies then.

COMMISSIONER CROWELL: Okay. Thank you. Thank you, Mr. Chair.

MR. TAYLOR: If I can real quick?

COMMISSIONER CROWELL: Sure.

MR. TAYLOR: There are a couple of examples where we are seeing efficiencies. And one is Canada has agreed to accept our review of the fuel for the BWRX-300 because we have so much experience licensing BWR fuel, and this fuel is an approved NRC design. So they have already committed and taken two months off their schedule related to that.

When we go to review the safety strategy for the BWRX-300, it's built on the IAEA safety standards, which are slightly different than ours. So we are going to leverage their expertise on that to help us make a more risk-informed, quicker decision on how does this meet the NRC's regulations, and why is this good enough?

So we are going to see those efficiencies as we progress through these topicals and these pre-licensing for us and their licensing decisions. And they've also engaged us on topics related to shutdown because they have different requirements than we do related to shutdown requirements given their experience with CANDU reactors. And so why do we find it acceptable in the ESBWR?

So we are going to help them be more efficient, and they are going to help us be more efficient. So we are going to see it. We just

don't have as many examples as we would love yet.

COMMISSIONER CROWELL: Thank you, Rob.

CHAIR HANSON: If I could just continue that. You opened the door, and I really appreciate it, Commissioner Crowell, but isn't part of the reason for difference here actually the difference in the readiness of the applicants? Right? That was at the beginning of this whole process was OPG was a good year ahead of TVA.

And we had a long discussion, Rob, I remember you and I and Dan and Ramzi Jammal and others about, okay, how are we going to kind of make this work on this joint review given that OPG was a little farther down the road than TVA was in terms of the licensing process? And certainly part of the topic report review, the white paper review, was a way to kind of get in the same place, schedule-wise on this. Okay. All right. Good.

Now for something completely different: micro-reactors. So the staff has made some near-term progress in the licensing -- in the near-term regulatory options related to fuel loading and operational testing at a factory to support certain micro-reactor commercial deployment models.

You know, I know there was some back and forth in Part 53 about whether or not this ought to go in the rule or not, and ultimately, it wasn't. My view is I think we should be tackling that. But I understand also that the staff has kind of evolved on this as well, has done some additional thinking, developed a white paper. I know we have gotten some feedback on that white paper now from ACRS.

So can you just kind of catch me up on, you know, kind of where we are and summarize for me and the public about how we're thinking? You know, whereas before this may have kind of seemed too hard, too

complicated, too uncertain in either legal or regulatory space to include in Part 53. It sounds like we've really come a long way.

MR. TAYLOR: Yeah. So I will start here is we always wanted to include this in Part 53. The challenge was on the schedule we were working we couldn't get it mature enough to put it into what we were sending to the Commission. We needed more time. And it's because we needed to make sure we got it right in the Atomic Energy Act and what we proposed would ultimately satisfy the law.

So we put a lot of effort into the draft white paper that we are preparing. And it's close. It's close to coming to the Commission as a policy paper with options in it.

The reason we put a question in Part 53 related to micro-reactors was to leave the door open for the logical outgrowth determination, that we could roll this in at the right time into Part 53 and not de-rail the ultimate schedule related to that. So we are going to give the Commission a paper with options and a recommendation on this. And, if we can, we want to fold those ideas together at the right time and make a decision. Because the idea that micro-reactors are completely different and can we load the fuel safely and do low power physics testing? That's an engineering problem we should be able to solve. And the regulations shouldn't get in the way of doing that if it's safe at the end of the day.

And we think we think we have options that give us paths forward. We need the Commission to tell us if you agree on the path forward related to it so that we can roll it in there.

And we have really appreciated the external stakeholders input on this. We needed a lot more information about their business models

and their approaches so that we tackled the right problems and put the right regulatory framework in place. So we've appreciated the great feedback we've got. And we factored a lot of that in. We got a great letter from NEI that gave us insights, and we included it. But we worked really closely with the industry to get that perspective and to include it into the proposal. So we're close. We're close to giving it to you.

CHAIR HANSON: That's really great, Rob. I'm glad to hear it. Do you think, just not to get too far or to peek under the ten too much, but do you think this is primarily a regulatory problem or do you think there's also a statutory issue then that may also need to be addressed by Congress or?

MR. TAYLOR: The issue, so we -- you may remember a paper we sent a while ago with a number of micro-reactor issues we wanted to address. These are the first ones --

CHAIR HANSON: Okay.

MR. TAYLOR: -- we're taking on because the industry has told us these are the most important ones to tackle for their business models.

At this point, we don't see any issues. We think we can make this work within the Atomic Energy Act. Now if we wanted to do different things beyond what we're proposing, then we might need to revisit that and assess whether we can do it within the Atomic Energy Act. But right now we don't see anything that we need to propose going to Congress and having fixed or changed.

CHAIR HANSON: All right, good. Thanks. Jon, we'll try again.

MR. GREIVES: Okay.

CHAIR HANSON: Can you provide an update just on the TI-CAP, ARCAP, which for the public is the Technology-Inclusive Content of Application or the Advanced Reactor Content of Application guidance and kind of general feedback and perspective that we've gotten on the public comment process, you know, the nature of notable comments received, et cetera, and kind of where are we in the process of finalizing that?

MR. GREIVES: Thank you, Chair. And I'm glad you said the acronym so now I can just talk without defining the acronyms.

CHAIR HANSON: No problem.

MR. GREIVES: So the TI-CAP and ACRCAP guidance, we issued draft versions of those in May of this year to provide an opportunity to get stakeholder feedback on those documents. We issued an update in September of this year to the TI-CAP guidance that provided PRA, you know, what would be acceptable as far as scope and depth for a PRA at the CP stage.

As part of that, we received about 300 comments from external stakeholders on all those documents. It's quite a few documents. We're in the process of reviewing those. We also held two public meetings with stakeholders so that they could talk through their comments and make sure we had a clear understanding of where they saw lack of clarity, where they saw duplication of effort between the two, the ARCAP and the TI-CAP. We are in the process of reviewing and resolving those comments and making updates to the guidance as appropriate.

CHAIR HANSON: Okay. Good. And kind of a similar question about Reg. Guide 1.233 and the licensing modernization process -- I'm trying not to use acronyms -- in terms of kind of pre-application interactions

with X-energy and TerraPower. Are we getting lessons learned out of that?

MR. GREIVES: Yes, we are. I mean, as you know both X-Energy and TerraPower are employing at the LMP, the Licensing Modernization Project, as part of their licensing strategy. You know, we are actively engaged with them. They have submitted somewhere around 40 white papers and topical reports. Many of those support implementation of LMP or, you know, are taking, you know, referencing the NEI document and the Reg. Guide 1.233 associated with that.

So, you know, as far as benefits, I think they are certainly seeing benefits and using that risk-informed performance-based methodology. You know, a lot of those benefits will continue to mature as the design matures.

They are both Part 50 licensing pathways. So at the CP stage, you know, their design and their PRA isn't quite as mature as it will be in the operating license. So we expect that they will continue to see the benefits from that process continue to increase as their designs continue to mature.

CHAIR HANSON: Okay. Thank you. John, just one last question for you. I wanted to just ask about - maybe this is a softball. I don't know. But would getting a generic Environmental Impact Statement for the advanced reactors, whether codified or not, how would that kind of help improve the efficiency of environmental reviews for these things going forward? Do you have, like, an estimate of time savings or do you just have a kind of -- is it more qualitative or?

MR. MOSES: So we've looked at this and have estimates at a qualitative level, but we can dig into quantitative savings. It will be pretty

substantial because it would provide a series of exclusions and a whole different kind of framework with the PP -- sorry, the acronyms -- the plant parameter envelopes and the site parameter envelopes. So both those concepts would help us in terms of the advanced reactor technologies that we're seeing. So, yes, it would help us with our environmental reviews pretty dramatically.

CHAIR HANSON: Okay. Great. Thank you. That's all I have. Commissioner Wright, are you still out there?

COMMISSIONER WRIGHT: Yes, we are.

CHAIR HANSON: Excellent.

COMMISSIONER WRIGHT: I'm having a great time listening here.

CHAIR HANSON: All right.

COMMISSIONER WRIGHT: So first off, thank you to each of the panelists for your presentations and tell your people thank you for what they did to support you as well. There is a lot of information being shared today. And, again, being last, there is some questions I just have kind of partially answered, and I don't know that I'm going to plow that ground again.

But I do want to ask a couple of questions in the few minutes that I will use. John, with the Kairos construction permit review that you did, the staff took a risk-informed approach by pursuing the tribal consultation under the National Historic Preservation Act in parallel with the mandatory hearing. Can you give me some thoughts on how that worked out, some lessons learned maybe by pursuing that pathway instead of the more traditional linear approach?

MR. MOSES: So for the Section 106 consultation with the

tribes, so we started the process kind of the traditional way where we notified a variety of different tribal stakeholders. And after the publication of the draft EIS, I think it was within the last few days of the comment period, we received a formal letter from an anonymous tribe that they wanted to pursue something. So that did kind of take us out of the normal process.

I think the lessons learned for us, and we're seeing it in trying to apply for other sites, particularly for some of the advanced reactors, is early engagement in pre-app. The more we can get out there, the sooner and greater understanding we'll have, that's one.

The second, and I mentioned it, was the kind of new techniques or methods to communicate our processes. We are finding some stakeholders may not be familiar with NRC processes, and that's not limited to tribes. That could be other federal agencies as well in a variety of different subsets. So communicating how we do our work and what our roles and responsibilities are.

And I would say probably the third, and it's also lessons learned, but not directly from the interactions, kind of indirect lessons learned, and we're also applying it for Carbon Free Power, TerraPower, et cetera. It's actually entering into MOUs with other federal agencies.

So working with the tribes at a government-to-government level, we may not have an MOU. It would be a programmatic agreement. But those are -- some of the lessons we've learned is basically get early in the process, communicate more clearly roles and responsibilities so we can engage the and understand their concerns faster. So in a nutshell those are our key lessons learned.

MR. TAYLOR: John, can I add one thing?

MR. MOSES: Yes, please.

MR. TAYLOR: It's really important. And the other thing we're seeing is we can give a lot -- we may not control some of these processes because there are other federal agencies and stuff. But the thing we can do is give clarity to licensees and applicants on what are all the permits and consultations you have to do. So we're putting together a guidance that we can to TI-CAP and ARCAP and other places that's like a roadmap of all the things you should be thinking about you need before the NRC can issue a permit or a license.

So that will highlight the things to engage early on with tribes and do outreach with for the Clean Water Act and other things that they will need at the ultimate for us to be able to support the decision.

COMMISSIONER WRIGHT: Yeah, that's real important. Thank you, Rob, for that. I'm going to switch now to Donna, now. So, Donna, on your slide discussing our MOC with Canada, you mentioned that the group has developed criteria for including additional regulators to observe or participate in specific projects without hindering the programs.

Can you talk a little bit more about this? I mean, what are those criteria? And do you think there is a sweet spot maybe in terms of how many regulators should participate in these kinds of MOCs it wants? And maybe further, do they need to speak in like one language or take off their where they are from hat and kind of work more as a team, I guess. Do you see that?

MS. WILLIAMS: Thank you, Commissioner. Yeah, we have worked very carefully the last year on developing the criteria because we recognize that there are benefits for having additional regulators in the

group if they, you know, are at a similar phase, and it can benefit everybody. But there are risks as well.

So the criteria that we've developed, there's just a few high level things. Of course, they have to be reviewing a similar design that the U.S. and Canada is reviewing and be at a similar phase. You know, if we are at the end of our review and they are just beginning, that won't really help very much. They have to have the appropriate agreements with the vendor because a lot of the information we get from the vendors rather than regulator-to-regulator just to avoid issues with exchange of proprietary information so to make sure that the vendor is engaged in their country, is serious about licensing, and they have all he appropriate agreements, and they have all the design information.

And also very important, we want to make sure that they have dedicated resources to participate in the review so they can be an active participant, and they can keep on schedule. And all of these things will ensure that maybe they can jump right in and begin doing collaborative reviews with us without slowing us down. And then there is benefit to everybody because we get more of their technical expertise, and they get ours.

We haven't identified a specific number that would be good. I mean, clearly with the bilateral with us and Canada, it is working very well because we have developed the processes. We understand each other. We know each other's regulations and processes.

And the third one, which we probably will do very soon, we'll see how that works. It will be a learning curve probably. Clearly, the more you get the more difficult it becomes because it's hard to find countries and

regulators that meet all these criteria and are at the exact same phase. That was a little slippery.

COMMISSIONER WRIGHT: Yeah. Let me probe on that a little bit more. So in that regard, do you think that the differences in our regulatory structures, I mean, that's got to be, I guess, important in your mind for sure. But do they have -- how similar do they have to be to either the philosophy in the regulations of the NRC or the CNSC and is it important that the regulatory structure be similar? Is that kind of what you're talking about?

MS. WILLIAMS: Not necessarily. in many cases we're just looking at technical areas, if there is a novel design feature or a technical concern. That's where we can come together and have a combined technical position based on all of the technical experts working together.

Now if there are differences, we expect there will be differences in the regulatory frameworks and our requirements. And the important part there is being able to identify where those are so that we know where we can all -- if everything is very similar, if we have the same requirements, then we can get a joint regulatory position. If we're not, then we understand that those are areas where an applicant or a vendor is going to have to work harder to make it licensable in every country either through changing their safety analysis to accommodate or having exemptions or requests.

COMMISSIONER WRIGHT: Thank you so much. Lauren, I'm going to come to you. I bet Rob is like, he didn't ask me a question yet? So, Lauren, I want to come you.

You know, getting to the commercial operation, the finish line with Vogtle 3 and very soon Vogtle 4, it's a tremendous milestone for the

agency. And with the planned number of new applications we are expecting in the coming years, you know, those muscles we've got to probably be exercising a little more regularly. And there are potentially many different designs beyond the AP1000 that our construction oversight program is going to be looking at, and flexibility there is going to be key, right?

Can you talk a little more about how the ARCAP program will adapt to these various designs or even an intimate kind of a particular design to ensure that we're applying the appropriate level of a rater in each case? You know, how much of a say will the regions have in developing the ARCAP?

MS. NIST: Thank you for the question, Commissioner. So Rob might get an opportunity to weigh in on my response. But before I give him that opportunity, I would like to say -- so one of the key benefits that we have, and one of the assets for the ARCAP program is the staff that has worked on the Vogtle 3 and 4 project from almost through -- yes, including the beginning of construction up until now.

We're talking, you know, combined experience, decades of experience here. A lot of those staff are now a part of the ARCAP working group. So they're taking their lived experience and applying that and making revisions as necessary to what they did before and the lessons learned that they experienced to help make improvements in efficiencies in ARCAP. And that includes staff from the region, not just from the Vogtle project office.

So for the specifics on -- I'm going to let John or Rob weigh in on some of the specific products that the staff is working on coming out of the inspection manual chapter revisions and the tabletop exercises between the region and, well, several offices from the agency. So I'll let you take over.

MR. GREIVES: Thanks, Lauren. And I'll jump in so that Rob can't. So to your point, in developing ARCAP, our regional counterparts are absolutely vital in that effort. We have conducted -- so the team that is foundational in developing some of these concepts, like Lauren mentioned, is made up of folks that were intimately involved in Vogtle and have intimate understanding of the lessons learned. And that includes not only staff that will be transitioning from the Vogtle project office but also partners in Region II's Division of Construction Oversight.

But beyond that, then when we move to internal tabletops, we are bringing in as many stakeholders as we can internally from all four regions from vendor branch, in DRO, from other branches in DRO, from the enforcement staff, so that we can leverage that kind of knowledge as we're developing new solutions to the challenge, to the new landscape that we see.

And we've conducted a number of those tabletops. They have been extremely beneficial. We get a ton out of the experience from inspectors out in the field that can share and kind of go through some of the concepts we're developing and saying, well, you know, when you think about this or this might not work in this instance, and we're incorporating that.

And we're looking forward to as we move forward then expanding that to workshops where we engage external stakeholders, folks that also have a stake in what we are developing to continue to work through those concepts to gain their feedback and continue to make adjustments so that we can eventually get a finished product that will meet all of those things that you mentioned that will kind of meet the moment of the landscape we're seeing with different technologies, with new deployment models. And we think, you know, having that fulsome dialogue internally and externally will help

us get there.

COMMISSIONER WRIGHT: Great. And would the -- I know I'm over -- I just wanted to take a moment --

CHAIR HANSON: No worries.

COMMISSIONER WRIGHT: I wanted to thank SECY, the IT people at the NRC. I want to really thank Maureen Conley here from OIP and CJ and Kim from my office and obviously the U.S. Embassy here in Ghana for their help in allowing me to get live with you today. So a big thank you from me.

CHAIR HANSON: Excellent. Thank you, Commissioner Wright. I think, you know, we've made little historical milestones lately. Certainly, Kairos' mandatory hearing was one. But I think this might be our first not only international, but intercontinental Commission meeting. And so I certainly want to echo our thanks back here in Rockville to all of our friends at U.S. Embassy Ghana for the help and the support. And I hope, Commissioner Wright, you've learned what an enormous celebrity Maureen Conley is in Ghana and other parts of Africa and how much she is valued for delivering NRC expertise.

I want to thank my colleagues today for their questions and how we have really drilled in on so many of the key issues in front of us. I talk often and more and more about the need to create a culture of high trust and high confidence. And I want to make a couple of remarks just as we close up here about the high confidence piece of this, right?

And when I talk about that, what I mean is, confidence in our abilities and confidence in our ability to change. And I think we saw a lot of that this morning. If we go back and look at Vogtle, just we'll take the new

reactor panel here first.

If we go back and look at Vogtle, the opportunities that we've taken and we're continuing to take on lessons learned. If we look at the NuScale, you know, original SDA, and, you know, feedback certainly from the licensee, but our own internal evaluation of that, the project management reforms and other kinds of things that we've done, but then we've taken and not only poured it on to other reviews that are coming down the pike, but actually the other parts of NRR and other parts of the organization where we're continuing to do that and have those core teams and take that concept.

And certainly those project management reforms are responsible for some of the efficiencies that we've gained in other parts of the organization. And then also continuing to think creatively, you know, as we talked about, in the micro-reactor space about what does it really mean to license and do some limited set of power testing in the reactor itself.

Not only that, but we're coming up on our 50th Anniversary here at the NRC. Fifty years of overseeing an incredibly robust and safe nuclear power fleet on behalf of the American people. We've learned a lot there, too. We've learned a lot about what is safety significant. And we can take that, and again, have confidence in our abilities and our ability to change and lean into that as we vouch for the programs and the condition, the safety, of reactors going from 40 to 60 to 80 years looking forward.

So as we like to say here, it's an incredibly dynamic time, and I think we've gotten a lot of good things. There are things that are moving at different paces around here. That's okay. The fact that we are moving forward on so many fronts, I find enormously encouraging.

And I want to thank the staff for all of your participation and

the hard work that went into this meeting and the work that we do every day and with that, we're adjourned.

(Whereupon, the above-entitled matter went off the record at 11:54 a.m.)