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**U.S. Nuclear Regulatory Commission**
**35th Annual Regulatory Information Conference**
**March 14, 2023**
**Commissioner Jeff Baran**
**"Perspectives from Commissioner Baran"**
**(as prepared and not presented)**

Thanks, Ray. Good morning. It's great to be here for our first hybrid RIC. This is a terrific opportunity for face-to-face discussions after a few years of not being able to get together in person. It also offers a convenient way for stakeholders from across the country and around the world to concentrate their RIC participation on their areas of interest without the need for travel. Whether you're participating in person or virtually, this conference is a chance to hear about what's happening at the agency and to discuss current technical and policy issues with thousands of others who are focused on nuclear.

I am excited to welcome our international regulator partners back to the RIC. I think we've all missed this week of engagement in recent times. We are honored to be joined by Chairman Korikov of the State Nuclear Regulatory Inspectorate of Ukraine.

We stand in solidarity with the Ukrainian people and with you and your colleagues who are working every day to ensure nuclear safety under incredibly perilous and stressful conditions.

As I embark on my eighth RIC, I've been reflecting on the major changes I've seen since 2014. A lot has changed. We've seen major shifts in NRC's workload, budget, staff size, hiring, and overall outlook for the future. When I arrived on the Commission, these factors were all on a downward slope. Our workload was shrinking. Our staff and budget were shrinking. We had the Project AIM effort to reduce costs, narrowly avoided layoffs, and essentially had a hiring freeze. Nuclear power plants were shutting down. Back then, there was little talk of new construction beyond Vogtle. There was some interest in small modular reactors, but almost no real discussion of advanced, non-light-water reactors.

Today, we're in a very different situation. Policymakers and the public are increasingly focused on climate change and on dramatically reducing carbon emissions. President Biden has made it a priority to put the United States on a path to eliminate carbon emissions in the electric sector by 2035 and achieve a net-zero economy by 2050. Many states and utilities have adopted similar targets. The urgency and scale of the climate challenge have led to a growing consensus among policymakers that meeting ambitious climate goals will involve nuclear power, including new reactors. The Inflation Reduction Act makes huge investments to drive this transition, including through the Clean Electricity Production Tax Credit and funding for a domestic high-assay low enriched uranium supply chain. Few, if any, nuclear power plants are expected to close

anytime soon. With more potential applications for advanced reactors, small modular reactors, subsequent license renewal, new fuel designs, power uprates, and risk-informed programs expected, NRC's overall workload is increasing.

We're hiring again, and our budget has stabilized, or even expanded a bit, to allow us to do this new work. The outlook for nuclear has markedly changed, and it is an exciting time to be doing our important work.

NRC has a key role to play in tackling the climate crisis. It's our job to ensure the safety and security of nuclear power in the U.S. energy mix. And that means we need to be ready. When utilities and vendors tell us that we should expect numerous new designs and reactor applications, we need to be ready with sufficient resources and the right expertise to review them, and an efficient and effective licensing process that can handle whatever volume comes our way. That's an important NRC responsibility. In this period of change, NRC also needs to be open to – and ready for – new technologies that could improve safety. Whether it's digital instrumentation and control, accident tolerant fuels, sensors, advanced manufacturing techniques, or artificial intelligence, we need to establish a reliable regulatory framework for reviewing these technologies, while ensuring that they are adopted safely without introducing any unacceptable risks.

NRC has the major task of establishing the regulatory framework for the review and safe operation of advanced reactor designs. The most prominent piece of this framework is the Part 53 rulemaking. NRC's current power reactor regulations were written for light-water reactors, so it makes sense to update those requirements to address different technologies. New reactor designs have the potential to be even safer than existing designs. We need to recognize the value of new safety attributes while maintaining a prudent degree of defense-in-depth. Over the course of multiple drafts and countless public meetings, the NRC staff and many of you have been grappling with a range of complex issues, such as the appropriate performance standard, the role of ALARA, the facility safety program, Framework B, and micro-reactors.

We've all discovered together that it isn't easy to create a risk-informed, performance-based, technology-neutral framework that can work for molten salt reactors and high-temperature gas cooled reactors, micro-reactors and gigawatt reactors. The staff has also worked to shape the rule to accommodate applications in which probabilistic risk assessment would play a leading role as well as applications where PRA would not be as central to the safety case. I think it made sense for the staff to take the additional time to develop a more deterministic pathway option. It's good to allow for different types of safety cases. In the end, I think everyone agrees that we need a rule that offers this kind of flexibility while including enough detail to avoid the problem of evaluating custom safety cases in a way that results in uncertainty about what NRC will find acceptable. The Commission has begun reviewing and digesting the draft proposed rule. And I look forward to hearing your views about it.

The Part 53 rulemaking is extremely important. There are, of course, other pieces of the framework for new reactors. Establishing a complete regulatory framework requires the Commission to resolve related policy issues. The Commission recently addressed the question of how proximity to population centers should be considered in siting advanced reactors. We will be looking at other key policy issues, including emergency preparedness, security, and the generic environmental impact statement for advanced reactors.

Many of the early mover applicants are planning to use Part 50 or Part 52 because those regulations are already on the books. There is another important rulemaking underway to get Parts 50 and 52 better prepared for new reactor applications. While keeping two distinct licensing processes that offer different advantages, the rulemaking would more closely align the two regulations so that equivalent design applications submitted for NRC review under Part 50 or 52 would be assessed against consistent technical standards and would yield equivalent demonstrations of safety, security, and environmental protection. In addition, the rule will reflect lessons learned from previous license reviews and reactor construction projects. For example, the draft proposed rule currently before the Commission includes many lessons learned from the AP1000 construction projects on topics like operator licensing, simulators, fitness for duty, and change processes. These kinds of updates are going to improve Parts 50 and 52 for near-term applicants.

Non-power reactors will also play an expanding role in developing and demonstrating advanced reactor technologies. The applications for Kairos's Hermes test reactor and Abilene Christian University's molten salt research reactor are already being reviewed by the NRC staff, and future applications are expected. Another draft final rule under Commission review is focused specifically on non-power utilization facilities, or NPUFs.

The two most significant regulatory changes in the draft final rule are linked. The rule would eliminate license terms for research reactors while requiring all NPUF licensees to submit Final Safety Analysis Report updates to NRC every five years.

Under this approach, research reactors would no longer need to obtain renewed licenses every 20 years but would instead be required to regularly provide FSAR updates to NRC.

I think this new approach will provide an overall safety benefit. Over the years, the NRC staff has found that the license renewal process for research reactors hasn't identified significant aging management issues. Periodic FSAR update submittals, however, should provide substantial safety benefits by ensuring timely licensee documentation of changes to the licensing basis of a facility. This should improve the effectiveness of NRC inspections and licensee training and knowledge management. The NRC staff has found that because NPUFs are frequently located at college campuses, "staff turnover and limited staffing resources at an NPUF often contribute to a lack of historical knowledge of the development of the licensee's FSAR and changes to the FSAR." The final rule's requirement for regular FSAR update submittals will help "maintain continuity of knowledge for both the licensees and NRC."

If you're interested in hearing more about the licensing of non-power advanced reactors, please join me for a session I'm moderating tomorrow at 3:30 pm. We have an impressive line-up of panelists from DOE, NRC, industry, and academia. It should be a great discussion.

When we're talking about the potential of new nuclear technologies to help address climate change, fusion is now part of the conversation. With recent advances in the research and development of fusion energy systems, now is the time to begin establishing a regulatory framework for this technology. Although the precise contours of an operational fusion energy system are still being set, there is broad technical agreement on likely design characteristics and the potential hazards to consider.

Currently proposed fusion energy systems would not use uranium, plutonium, or thorium, would not produce high-level waste, would not present the possibility of a self- sustaining neutron chain reaction, and would shut down on their own during accident scenarios. The NRC staff therefore expects that "the safety focus of fusion energy systems will be on the control, confinement, and shielding of radioactive material present at the site rather than on the performance and control of the device." For these reasons, the NRC staff, Agreement States, international counterpart regulators, and many other stakeholders believe that near-term fusion energy systems are more appropriately regulated under the Part 30 byproduct material framework rather than the Part 50 utilization facility framework used for fission reactors. I agree.

A byproduct material approach will involve a limited-scope rulemaking that would mostly consist of definitions related to fusion energy systems and a description of what is required in a fusion application. The rule could make changes to Part 30 to facilitate fusion reviews or create a new, stand-alone fusion subpart.

The remaining question is whether the rule should also establish decision criteria to determine whether "larger, higher hazard commercial fusion energy systems that differ from the characteristics of near-term facilities" should be licensed under Part 30 or Part 50. The staff recommends this hybrid approach. On the other hand, there is widespread technical agreement that the near-term technologies of the coming years would more appropriately fit in the Part 30 framework. In my view, a substantial drawback of the hybrid option is that it creates regulatory uncertainty for these near- term designs about whether they could unexpectedly end up in the Part 50 framework at the conclusion of the rulemaking. This would dramatically impact the applicable regulatory requirements and even who is doing the regulating, as Agreement States could license fusion energy systems under Part 30 but not Part 50. Rather than have decision criteria as an open question in the limited-scope rulemaking, I think it would be better to focus on what is needed to review near-term designs. I therefore support regulating fusion energy systems under a byproduct material framework.

As you can see, NRC is busy preparing the regulatory framework for new reactors of all types and reviewing applications that have already been submitted. And we need to be ready for much more new reactor work in the coming years. At the same time, NRC will continue to play our long-standing critical role with the current operating fleet. For the operation of existing nuclear power plants now and into the future, NRC's job is to provide strong safety and security standards and rigorous independent oversight. This goes to the very core of the agency's mission. I want to highlight a couple important issues related to the operating fleet this morning.

The first is subsequent license renewal, which allows nuclear power plants to operate for up to 80 years. As I said last year, the review of subsequent license renewal applications has been – and continues to be – a high priority for NRC. To comply with the National Environmental Policy Act and ensure that subsequent license renewal decisions rest on a firm legal foundation, it is essential that NRC update the Generic Environmental Impact Statement to examine the 60–80-year subsequent license renewal period. The license renewal regulation must also be revised so that the GEIS findings can then apply to subsequent license renewal applications. The Commission adopted an aggressive schedule to get this work done. And excellent progress is being made.

The Commission recently approved publication of a proposed rule and accompanying draft GEIS, which take the necessary steps so that NRC can move forward expeditiously with subsequent license renewal reviews. The draft GEIS also includes new analyses of "greenhouse gas impacts on climate change" and "climate change impacts on environmental resources." I look forward to reviewing stakeholder feedback on the proposed rule and draft GEIS and appreciate the NRC staff's diligent work.

NRC is also focused on digital instrumentation and control technologies. In the last few years, the agency has made significant progress in establishing a reliable and predictable regulatory framework for reviewing digital upgrades, while ensuring that digital technology is adopted safely. Addressing the possibility of common-cause failures in digital instrumentation and control systems has proven to be one of the trickier issues to resolve. The staff recently proposed a way forward.

The staff recommended revising the Commission's 1993 policy on common- cause failure in digital instrumentation and control to create a new risk-informed option as an alternative to the existing defense-in-depth and diversity assessment. I agree with the Advisory Committee on Reactor Safeguards that this is a reasonable approach. The staff's proposed changes to the policy will provide additional flexibility in demonstrating that common-cause failure vulnerabilities have been appropriately identified and addressed. This paves the way for fully digital control rooms, such as those included in the AP1000 and NuScale designs.

Another priority at the forefront of NRC's work is the pursuit of environmental justice. Environmental justice is about the fair treatment and meaningful involvement of all people with an interest in NRC's vital public health and safety mission. NRC can best serve the public when it ensures equal access to the agency's decisionmaking process for all stakeholders and avoids disproportionate adverse health and environmental impacts on any communities.

To make meaningful progress on these goals, NRC must be open to the voices of disadvantaged communities. We cannot settle for doing things the way they have always been done. We need to ask tough questions about our programs and procedures to understand if they are serving disadvantaged communities – or instead creating barriers for them to overcome.

Beginning in April 2021, the NRC staff performed a systematic review of NRC's programs, policies, and activities. The staff team engaged a broad range of stakeholders as it developed recommendations to improve how the agency pursues environmental justice. This effort produced several constructive and well-supported recommendations for strengthening NRC's focus on environmental justice. Taken together with some additional steps, I believe the recommendations will put NRC in a position to achieve significant, tangible results on environmental justice.

The staff's first recommendation is to revise the Commission's Policy Statement on Environmental Justice. I agree that a substantial revision is needed. The Policy Statement has not been updated since it was originally issued in 2004. At that time, some stakeholders thought the approach announced by the Policy Statement was too narrow. Nineteen years later, the document's limitations are even more apparent. As the NRC staff explains, "the language and tone are very legal in nature, discussing caselaw, legal requirements, and the limits of the NRC's authority. During its outreach, the staff heard both internally from NRC staff and externally from stakeholders

that the EJ Policy Statement does not use plain language, [and] focuses too much on what the Commission cannot do instead of what it can do."

Similarly, the staff recommends revising NRC's Environmental Justice Strategy. The 1995 Strategy has never been updated. I agree that the NRC staff should provide a proposed updated Environmental Justice Strategy for the Commission's review. I also support the staff's suggestion to revitalize the agency's Environmental Justice Coordinator position, which has not been active for many years. Filling this position will facilitate NRC's future participation in the White House Environmental Justice Interagency Council and attendance at White House Environmental Justice Advisory Committee meetings.

Another key recommendation is for NRC to establish a federal advisory committee for environmental justice. I see this step as critical to implementing the agency's environmental justice initiatives. A representative advisory committee "composed of external EJ professionals and community leaders" would "help identify, shape, and provide advice from an informed, outside perspective, to the NRC on EJ- related programs, policies, and activities." As the staff explained, "many commenters expressed frustration with 'not having a seat at the table' or with not being provided an opportunity or a way to provide meaningful input or participate in the NRC's decisions and affect regulatory outcomes." In fact, the desire for such an advisory committee was "a repeating theme of the comments" from a wide range of stakeholders. I agree with the staff that we should follow other agencies in establishing a federal advisory committee focused on environmental justice.

I also agree with the other staff recommendations, including adoption of "a more comprehensive and robust outreach effort" with a focus "on identifying EJ communities and Tribal nations earlier in the process, identifying the needs of these communities …, and initiating early communication, such as offering further outreach or government-to- government consultation with federally recognized tribes." This would involve new environmental justice outreach positions and improved procedures and guidance.

To build on these valuable efforts and make NRC's environmental justice aspirations a reality, the agency should establish an Office of Tribal Affairs, Environmental Justice, and Public Engagement. This foundational step has been taken by other federal agencies and was suggested by many commenters. The Office would provide information and assistance to stakeholders and help them navigate NRC's resources and processes.

NRC serves the public. To fulfill its mission, the agency must be equally accessible to all communities and provide the same level of protection to everyone. I am confident that the agency's environmental justice initiatives will improve the way the agency operates and benefit all stakeholders.

As NRC does its work, the agency is focused on its workforce. We're facing a significant hiring challenge. We have a large number of employees who are eligible for retirement. With higher employee attrition, the agency's efforts on external hiring are crucial. Significant external hiring is necessary for the agency to do the work we have in front of us now and to be ready for the work ahead of us in the future. Last fiscal year, NRC recruited and brought 270 external hires into the agency's pipeline. The aspirational hiring goal for this fiscal year is 400 external hires. Compared to

the last several years, that is a lot of hiring. It is a formidable task. But it presents a huge opportunity to boost our inclusion efforts by reaching a diverse pool of applicants and welcoming people into the agency who bring a wide variety of backgrounds, experiences, and perspectives.

As you can tell, we have a lot of work ahead of us. And I'm excited about the opportunities to efficiently and effectively review new technologies, to tackle climate change, to promote environmental justice, and to maintain a strong focus on protecting public health and safety.

I'm also enthusiastic about having face-to-face conversations to hear your thoughts and feedback. I've had the chance to visit several plants in recent months. I want to thank those of you who have hosted me at your sites. As always, I look forward to getting out to additional sites during the coming months. With that, I'm happy to answer your questions. Thank you.