UNITED STATES
NUCLEAR REGULATORY COMMISSION
Washington, DC. 20555-0001
www.nrc.gov

Remarks for the Nuclear Energy Security Summit
June 26, 2024
Chair Christopher T. Hanson
(as prepared and not as presented)

INTRODUCTION

Good afternoon, everyone. It's great to be with you today. I want to thank UCAN Power for organizing this event, and especially Jeff Crater for inviting me to speak. It's an exciting time at the NRC and I appreciate the opportunity to share some of the significant work at the agency.

By way of a disclaimer, I'm speaking for myself today and not on behalf of the Commission.

I don't need to remind this audience of the current nuclear landscape. Congress, the administration, and industry continue to invest heavily in the nuclear sector, and there is momentum and interest continues to grow.

I acknowledge the passage of the ADVANCE Act last week with a vote of 88-2. It's another example of strong bipartisan Congressional support that includes a number of provisions for the NRC.

You're also well aware of the administration's goals to combat the climate crisis. President Biden has set an ambitious U.S. goal of achieving a carbon pollution-free power sector by 2035 and net zero emissions economy by no later than 2050.

And the United States is not alone in sensing the importance of carbon-free energy to the future. At the Conference of the Parties 28 in Dubai last December, 22 world leaders, including the United States, signed a declaration to triple nuclear energy by 2050. Alongside climate change - energy independence, national security, human health, and economic development are all drivers for increased global interest. The nuclear industry is evolving at a fast pace to meet this demand and we are seeing significant interest and investment, particularly in small and advanced reactors. And even large reactors are back in talks once again.

The IRS and Treasury recently put out final rules implementing new credit provisions of the Inflation Reduction Act. We expect to see an increase in license amendment requests and power uprate applications as a result.

It's clear that the NRC, as the nation's nuclear safety regulator, will play a key role in the future of nuclear in the United States and abroad. Not only do we need to instill confidence that we're up to the task, but we also need to prove it with our actions.

There are many challenges to deploying new nuclear. I often refer to them as "chicken and egg" problems, take the supply chain, financing, workforce, or our ability to build anything with the word nuclear, on-time and on-budget. Regulatory is just one of those issues but one that I am committed to tackling.

Our mission remains the same—that is, to license and regulate the Nation's civilian use of radioactive materials to provide reasonable assurance of adequate protection of public health and safety, to promote common defense and security, and protect the environment.

But how we achieve reasonable assurance must evolve to address the current environment. The NRC doesn't promote new technologies, but we cannot be an undue impediment to innovation and adoption of new technologies.

To that end, our approaches must be technology-inclusive, risk-informed, and performance-based, while continuing to operate in a manner that instills public confidence. A strong and independent regulator is crucial to a thriving industry and ensuring public trust.

We have adapted and are continuing to adapt, as I will attempt to communicate today.

SUSTAINING SAFE OPERATION OF EXISTING FLEET

I plan to mainly speak about the NRC's work on advanced reactors today, but before that, let me briefly touch on the operating fleet and recognize its sustained, strong safety performance, on which the future of nuclear energy depends.

Even just 5 years ago, it appeared that the number of operating plants would continue to decline, with projected shutdowns and decommissioning becoming a regular part of the discussion. But the tide turned and today we are holding at 94 operating reactors. Two AP1000 units at Vogtle have now entered commercial operation, and for the first time, the NRC is evaluating a request to return a previously shutdown reactor to operation.

Our licensees are working to ensure continued safe and economic operation of there facilities well into future and exploring a range of new technologies and approaches in the areas of fuel and instrumentation and control along with periods of extended operation and power uprates.

For us it means performing effective and efficient reviews in response to industry drivers but also maintaining strong focus on licensee's safety and security performance through our robust, risk-informed reactor oversight process.

While new reactors are getting a lot of attention these days, we cannot forget that public confidence in the safe and secure operation of existing facilities are crucial for progress with any new reactor initiatives.

ADVANCED REACTOR LICENSING DEMAND

With that, let me paint a picture of our current activities in advanced reactors.

We're currently engaged with 17 advanced reactor developers and potential applicants at various stages of the licensing process. Technologies span the gamut, including non-light-water reactors such as liquid metal, gas cooled, and molten salt designs, as well as light water small modular reactors.

As we speak, we are reviewing applications for three construction permits; a standard design approval; and a fuel fabrication facility license.

Over 15 entities are actively engaged in pre-application activities, seeking feedback or finality on various licensing topics through whitepapers and topical reports. We have completed nearly a hundred topical reports and white papers since 2018, and we have 52 topical reports in house for review right now.

We're seeing significant interest in micro-reactors which may produce power up to several tens of megawatts. Designers envision these reactors could be deployed to remote areas or used for disaster relief. Deployment models for some micro-reactors include fabricating and fueling complete reactors in a factory, removing and replacing the entire reactor at a nuclear power plant site, transportation of fueled reactors, and operation without reactor operators.

Also, there is interest in new research and test reactor facilities, which could be used to demonstrate technology feasibility and expand university research, training, and education programs.

Our workload projections are only increasing as we expect vendors currently engaged in pre-application to submit various license applications in the coming years. Over the next three years, we're potentially looking at more than 30 applications for a variety of approvals—spanning early site permits, construction permits, standard design approvals, design certifications, manufacturing license, operating licenses, and combined licenses.

INCREASING LICENSING EFFICIENCY

Given this demand, efficiency will be critical. This means "business as usual" cannot be the way forward. We continue to focus on recruiting and workforce development, but we can't hire our way out of this challenge. We need to be ready for emerging needs and seek opportunities for process improvements.

As I said during my speech at NRC's Regulatory Information Conference earlier this year,

"Reflexively doing things the way we have always done them is not going to work. I expect every leader in the NRC to look closely at the "why" of our policies, processes, and procedures and then develop more efficient and effective ways to accomplish our safety mission while making room for the increased scope of work."

It also means that continuing to risk-inform our regulatory processes. To quote former Chair Stephen Burns: "We should always keep in mind that resources spent on activities with little safety or security benefit are resources that aren't being spent on more important and risk-significant activities."

Risk-informed thinking needs to be baked into everything we do.

To keep pace with the highly dynamic, innovative nuclear landscape in which the NRC operates, the agency must be prepared to regulate emerging technologies and address novel challenges – and we can do this by leveraging the vast licensing experience we've built over the years.

First example is Vogtle Units 3 and 4, where we learned about timely issuance of Combined Operating Licenses and the use of Part 52, a lot about evaluating design changes, a lot about focused construction oversight, and a lot about how to structure efficient reviews for Inspections, Tests, Analyses, and Acceptance Criteria.

From our work on NuScale—the first SMR design certification approved by the NRC—we learned about the importance of robust pre-application engagement in the form of white papers and technical reports and of hands-on project management and stable core team staffing within the agency.

We took all of that experience and applied it to the Kairos Hermes test reactor. Last December, we issued the construction permit for Hermes—the first non-light water reactor construction permit issued in the U.S. in 56 years. And we completed the safety and environmental reviews ahead of schedule and on-budget. Now, we've got the Hermes 2 construction permit application under review on an even shorter, 14-month schedule and all the reports are positive. In fact, the staff is currently on track to issue the final safety evaluation report and the environmental assessment ahead of schedule.

Just last month, we accepted the construction permit application from Terra Power for its Natrium reactor for review—the first large scale Gen-IV commercial advanced reactor construction permit application for the NRC. This is also the first time an applicant is using the technology-inclusive, risk-informed, and performance-based methodology to support its licensing application. And two weeks ago, we announced an aggressive 27-month review schedule in addition to the multiple concurrent topical report reviews. It will be another important learning opportunity for the applicant as well as the agency.

We are working diligently to license these diverse technologies efficiently and ensure they can be constructed and operated in accordance with the highest standards of safety and security.

But applicants need to do their part to help support efficient licensing reviews. We believe robust pre-application engagement is critical to lay the groundwork for a smooth and efficient license application review. It enables the NRC to establish lines of communication with key industry representatives and ask pertinent questions in advance to help ensure that license applications include the information necessary for our staff to perform an efficient and comprehensive review.

We highly encourage the use of topical reports to resolve key technical issues before the license application is submitted. This supports regulatory predictability and efficient reviews.

Finally, it goes without saying, but communication and quality applications are crucial to overall efficiency.

ADVANCED REACTOR REGULATORY INFRASTRUCTURE

Clearly, having the right regulatory infrastructure is also critical. And we continue to place a high priority on developing policies, regulations, and guidance that are appropriately technology-inclusive, risk-informed, and performance-based.

Technology-inclusive—means we are flexible enough to accommodate the wide-ranging reactor designs and technologies.

Risk-informed—means our review approaches are commensurate with the risk-profiles of the facilities. Performance-based—means we specify acceptable standards and outcomes that must be met instead of prescribing detailed requirements on specific methods and approaches.

Over the last several years, the NRC has steadily worked with stakeholders to identify, develop, and implement policies, rulemakings, and guidance, key to efficient and effective licensing and regulation of new technologies.

For decades, we've been focused – successfully – on large light water reactors. Our approaches to these facilities have generally been technology-specific, deterministic, and prescriptive, although we've been making significant strides with operating reactor risk-informed initiatives.

But fundamentally, regulatory approaches were optimized for traditional reactors—safe, but relatively complex facilities with reliance on active safety systems and backup power sources.

For advanced reactors, the designers' approaches to defense-in-depth will likely be significantly different and simpler. It may employ functional containment, a low-pressure design, inherently stable fuel forms, and passive safety features.

Transforming our traditional, deterministic, and large-light water reactor-specific approaches to technology-inclusive, risk-informed, and performance-based methods is at the heart of our regulatory modernization efforts.

Leaning into a future of advanced reactor applications on the near horizon, the Commission issued the Staff Requirements Memorandum for the proposed Part 53 advanced reactor rule earlier this year. This draft proposed rule marks a major evolution in risk-informed regulation. This rulemaking process has been unique, and from the outset the agency recognized the need for transparency during its development. Never before has the agency engaged the public so early and so often.

The proposed rule puts probabilistic risk assessment and risk insights in a leading role, balancing flexibility and predictability while assuring the safety of the public. The rule will give plant designers and plant operators flexibility in determining how their nuclear power plant will meet safety criteria.

Further, it affords designers and operators enhanced flexibility by enabling reactor designs with demonstrated safety to leverage safety margin in gaining operational flexibility in areas such as emergency preparedness, security, operator licensing, and change control.

Part 53 addresses the needed changes from traditional large light water reactor-centric, deterministic regulations, and has the potential to provide considerable flexibility for applicants and licensees while continuing to ensure adequate protection of public health and safety.

The staff is currently implementing the Commission direction and will publish the Part 53 proposed rule for public comment later this year. The final rule is currently expected to be published ahead of the December 2027 due date established by Congress.

The agency is making progress on many other fronts. Late last year we issued the final Emergency Preparedness Rule, which scales emergency planning requirements commensurate with radiological risk, source term, and potential hazards.

We also updated our siting guidance to account for the safety features of new reactor designs. Instead of a one-size-fits-all standard of 20 miles, it specifies a dose-based performance criterion for determining the area within which population density should be evaluated.

In April of this year, the Commission issued its decision on a new Reactor Generic Environmental Impact Statement—which will significantly streamline environmental reviews for new and advanced reactors.

Just last week, the Commission approved the proposed rule for advanced reactor physical security which would provide designers and licensees with flexibility to adopt alternative approaches to physical security for facilities meeting certain consequence-based eligibility criteria.

Our Advanced Reactor Content of Application Project, or ARCAP, is a significant accomplishment for the staff and the industry to help ensure licensing predictability for applicants applying the new Licensing Modernization Project methodology.

The staff recently delivered an options paper to the Commission to provide near-term regulatory clarity related to fuel loading and operational testing of factory-fabricated micro-reactors.

We have a lot going to transform our regulatory infrastructure to ensure it is clear, predictable, risk-informed, and technology inclusive.

With the interest we are seeing in the industry, the time is right to start preparing the agency for what I call “serial deployment” of microreactors and small modular reactors. We are likely to see applications that either have significant similarities, build on one another in an iterative manner, or even seek some form of joint review and approval. The agency has some of the tools in place now but there is more to do. We recognize this and have several important efforts underway.

First, the NRC has embarked on a new initiative focused on standardizing our reviews and giving credit for applicants who standardize their designs and licensing approaches and rely on prior NRC safety and environmental decisions.

Second, NRC has a joint project with the Idaho National Laboratory to look at how small and advanced reactor construction costs intersect with our codes and standards so we can right-size both to better account for the enhanced safety of many designs.

Third, I asked our Office of the General Counsel earlier this year to take a fresh look at uncontested mandatory hearings and provide options for these proceedings going forward. Using the experience we've gained from previous hearings and balancing that with efficiency and clarity will be important as we prepare for potential serial deployment. As part of that tasking, I also asked staff to look at whether procedures for mandatory hearings can or should look different for applications that represent "first of a kind" reviews versus "nth of a kind".

Lastly, I also asked staff to look into how we could potentially use Artificial Intelligence in our internal processes.

INTERNATIONAL

Let me, now, turn briefly to NRC's international efforts. I personally spend a significant amount of time on international partnerships. As I mentioned at the beginning, climate change isn't the only driver. Energy independence, national security, human health, and economic development are all on the table in my discussions around the world.

The fact of the matter is that there is too much going on—financial investment, technological advancement, policy, geopolitics—for any one regulator to tackle alone.

To that end, we are working with like-minded countries to ensure safety and security and develop generic pathways that serve our unique contexts. The ongoing joint effort between the U.S., Canada, and the U.K. on small modular and advanced reactor reviews is just one example of the role the NRC can play in promoting global progress through its role as an independent safety regulator. I am particularly proud of what the NRC and the Canadian Nuclear Safety Commission have been able to accomplish since the signing of the enhanced bilateral cooperation on regulatory reviews of advanced reactor technologies in 2019.

The two agencies have continued to share best practices and experience, and cooperation on these activities expanded to facilitate joint technical reviews including collaboration on several reactor designs as well as technology neutral topics such as TRISO fuel qualification, safety classification, and risk-informed methodology for advanced reactors. I understand the next session will delve into these collaborative activities further.

CULTURE

Finally, before closing, let me share a few thoughts on culture.

Throughout my tenure, I have discussed my vision for building an environment of high trust and high confidence. We are facing a lot of changes at the NRC that are influenced by technology, policy, and demographics.

The NRC needs leaders that staff can trust to navigate through this period. And leaders need to trust that the staff will prioritize the agency's health, safety, and security mission; will innovate in new ways; and will get the job done. And finally, staff need to trust each other; they need to see each other

as essential in their roles to accomplishing the mission; and they need to know they can rely on each other as the agency's workload grows.

The NRC is approaching its 50th anniversary in January 2025. The agency learned a lot over the last five decades to say the least. The agency has learned what is critical for safety and security. And that body of knowledge gives the agency confidence in its technical capabilities at all levels so that we can leverage our vast intellectual capital to make better, smarter, more efficient, and more durable regulatory decisions. As I frequently tell the NRC staff, we need to have confidence in our abilities and confidence in our ability to change.

While confidence in ourselves is important, we also need to build and preserve the confidence of those outside the agency. This starts with maintaining the trust of the public. If the public does not have confidence in our decisions, for whatever reason, then we will ultimately fail. Engaging the public substantively, routinely, and creatively is critical to our position as a trusted regulator.

Further, building external confidence in our agency and our mission is important for the NRC's credibility. Confidence that we can uphold our obligations to the public while also building clear, reliable, and efficient regulatory pathways for not only the variety of technologies under development, but also the volumes at which those technologies may be deployed.

CONCLUSION

We are prepared now to license advanced reactors – and we already have issued licenses in this space. We continue to identify opportunities for streamlining our licensing review processes to support efficient licensing of small modular and advanced reactors – assuring that every area in our regulatory purview is risk-informed and working together. We are evaluating the way we do business, looking for opportunities to leverage the knowledge the agency has gained in its nearly 50 years of public service to do things better. We are looking ahead, anticipating and paying attention to the world around us.

We are doing this by building confidence and trust inside the agency; by cultivating and safeguarding confidence and trust outside the agency; by maintaining our independence while reaching out and bringing in information and perspectives necessary for improvement; and finally, by building on all of this to apply risk insights clearly and reliably to every aspect of our mission to better maintain safety and security.

And I'll leave it there. Thank you for having me today. I look forward to your questions.