



UNITED STATES NUCLEAR REGULATORY COMMISSION

Washington, DC, 20555-0001
www.nrc.gov



No.: S-21-007
Contact: [Office of Public Affairs](#), 301-415-8200

November 4, 2021

U.S. Nuclear Regulatory Commission
Chairman Christopher T. Hanson
Remarks at the National Atomic Energy Agency of Poland (PAA)
(Remarks as prepared)

It is a pleasure to be here during such an exciting time at the PAA. You have made great progress in the development of a safe nuclear program for Poland. I commend each of you for being part of this endeavor. It is incredibly important for a nuclear regulator to be made up of staff who are committed to safety and security. Each of you shares a responsibility to both your country and the world. I am very grateful that I can address you today and congratulate you on choosing to serve in such an essential and honorable position.

As most of you know, the U.S. Nuclear Regulatory Commission and the PAA have a longstanding history of cooperation, which has been further enhanced over the last two years. I have received very positive feedback from the NRC managers and staff who have worked closely with your organization on the technical workshops that have been held recently. Your active and enthusiastic participation in these engagements highlights how committed you are to the PAA's mission of ensuring nuclear safety and security.

The U.S. Nuclear Regulatory Commission remains committed to assisting you in your mission, and I hope that my remarks reinforce the importance the United States places on its diplomatic ties with Poland.

Today, I want to share with you some of the underlying principles that the U.S. NRC's framework is built upon and update you on some of the new and exciting challenges we are currently facing at our own agency. My hope is that you will find value in my remarks. Please feel comfortable engaging me with your questions.

I will start at the beginning and discuss what I call the building blocks of the NRC. These principles and concepts are fundamental to our agency.

Principles of good regulation

The NRC functions through the Principles of Good Regulation. These principles guide our agency's approach to the safe and secure regulation of nuclear material in the United States and our service to the American people. They are Independence, Openness, Efficiency, Clarity, and Reliability. I will speak to independence last, as I find it to be one of the more critical and unique elements of our agency's structure and function.

First, openness by the NRC ensures that the public is aware of and involved in the agency's regulatory processes. To engender public trust, a regulatory agency must assure that its business is conducted in as open and transparent a manner as possible. Further, since the protection of the public is an important element of the NRC's mission, public input into the agency's processes is crucial. This commitment to openness also has close ties to our international relationships, as information sharing and technical assistance is incredibly important to the diplomacy efforts of the United States government.

The next principle is efficiency. As I have mentioned before, the NRC is comprised of civil servants who answer to the American people. In all the regulatory decisions we make, it is important to balance the risk significance of a regulatory action and the resources needed to complete it. By concentrating our use of resources on the most risk significant elements of a review, the NRC can realize efficiency as a regulator.

Clarity is the third important principle in our role as a regulator. Our regulatory framework needs to be clear and easily understandable for licensees, applicants, and the public. Likewise, agency positions on certain technical or policy matters should always be upfront and understandable. Because much of what the agency does is highly technical, we take care to put as much of our information in what we call "plain language." This allows anyone, regardless of familiarity or education to be able to follow agency decisions and processes.

Fourth, the agency must seek reliability. Reliability is important for stability and public trust. All the NRC's decisions must include an adequate justification and be consistent with the regulations in place at the time of the decision. By using the best available knowledge, the NRC produces decisions that are sound and respected by stakeholders. Further, the agency promotes reliability by only changing position or amending regulations after significant consideration and adequate public notice.

Independence

Lastly, I want to focus in on independence, a cornerstone of the NRC's structure. Before the NRC as we know it today was established in 1974, it was part of the Atomic Energy Commission. The AEC had a more expansive role that included funding and promotion of nuclear power. When the agency was reorganized, the promotional function was separated and is now part of a different U.S. agency, the Department of Energy. The Nuclear Regulatory Commission came out of this reorganization with a singular focus—safety—separate and apart from development and promotion of nuclear power.

The basic principle of independence is key to allowing the agency to prioritize the protection of public health and safety and the environment while it oversees the U.S. nuclear fleet. Our agency has no stake in the success or failure of the nuclear projects that we regulate, and that allows us to fulfill our important mission without distraction or bias. Independence from the nuclear industry allows us to maintain public trust, a critical element of a successful regulator.

The NRC's financial structure also allows it to have a significant amount of independence. The agency's funding is separate from that of the promotional arm, the U.S. Department of Energy. We primarily collect fees from licensees and applicants, receiving only a small percentage of our overall budget from the U.S. Congress. This allows the agency to function with reduced opportunities for bias and politicization. Similarly, having a workforce that has relevant technical experience and significant

knowledge in the areas we regulate is crucial to allowing the agency to function independently from outside sources that may have different priorities.

Independence, however, does not mean isolation. We work closely with the Department of Energy and other branches of the U.S. government to maintain awareness of promotional activities and current political and market influences on the nuclear industry. We also coordinate with multiple different stakeholders to gain feedback on our processes and regulatory structure. This allows us to be prepared for changes and adapt when we need to. It also allows us to hear from the nuclear industry and assure we are not creating unnecessary impediments for nuclear development and innovation.

International relationships are also important. As the saying goes, “a nuclear accident anywhere is a nuclear accident everywhere.” Sharing experience and technical information is critical to securing the safe and secure use of radioactive materials worldwide—a mission we are all an important part of.

Safety Culture

In addition to upholding the principles of good regulation within our organization, the NRC also puts a premium on what we call “safety culture.” We define nuclear safety culture as “the core values and behaviors resulting from a collective commitment by leaders and individuals to emphasize safety over competing goals to ensure protection of people and the environment.”

The agency strives to promote a culture of safety with its own staff as well as with regulated entities subject to the agency’s authority. Maintaining a culture that values safety above other interests starts at the top of the organization but requires commitment from every individual.

To promote safety in our own organization the NRC provides opportunities for individuals to raise concerns and has regulations in place to protect those individuals from adverse action or potential retaliation. In fact, the NRC openly solicits the views of its employees and encourages an environment where everyone can feel safe to raise concerns with management and the Commission.

For regulated entities, the NRC’s Safety Culture Policy Statement sets forth the Commission's expectation that individuals and organizations establish and maintain a positive safety culture commensurate with the safety and security significance of their activities and the nature and complexity of their organizations and functions.

Some indicators of a positive safety culture include the following:

- Leaders who demonstrate a commitment to safety in their decisions and behaviors.
- Issues potentially impacting safety are promptly identified, fully evaluated, and promptly addressed and corrected commensurate with their significance.
- All individuals take personal responsibility for safety.
- The process of planning and controlling work activities is implemented so that safety is maintained.
- Opportunities to learn about ways to ensure safety are sought out and implemented.
- Personnel feel free to raise safety concerns without fear of retaliation, intimidation, harassment, or discrimination.
- Communications maintain a focus on safety.

- Trust and respect permeate the organization.
- Individuals avoid complacency and continually challenge existing conditions and activities in order to identify discrepancies that might result in error or inappropriate action.

Each one of us—each of you—is entrusted with an important role in establishing the safe and secure use of nuclear power. A healthy safety culture is not developed overnight, and it must be meticulously evaluated and continuously nurtured. It starts here, with us. We must all recognize safety as not only an organizational imperative, but as a personal responsibility.

The Principles of Good Regulation and Safety Culture form a foundation for all that the NRC does and will do. Now, I will discuss some of the current work at the NRC, and the challenges we have been addressing in recent years.

What is New in the U.S. Nuclear Landscape

The nuclear industry in the U.S. is undergoing major changes. Existing operating reactors continue to see the need to improve plant reliability and struggle to stay economically viable, especially in deregulated electricity markets.

These operators are looking to adopt new technologies such as digital instrumentation and control upgrades and accident tolerant fuel and to use risk-informed approaches to optimize their operations.

Light water reactors in some areas of the country are closing prematurely for economic and other reasons, while state governments provide economic support to keep them operating in other states.

The number of decommissioning plants continues to increase, and new approaches are emerging for decommissioning, including new acquisition models.

On the other hand, the environment for the deployment of advanced nuclear technologies has never been stronger. Federal, state, and international initiatives are spurring greater interest in using these technologies to combat challenges such as a lack of reliable power in remote areas, climate change, and finding alternative sources of energy.

The NRC is modernizing our regulatory approaches and decision making and focusing on agency culture to effectively respond to the evolving nuclear energy landscape, while making sure its safety and security mission comes first.

Operating Reactor Focus Areas:

I want to highlight some of our key regulatory activities at the NRC, starting with operating power reactors.

We continue to focus on ensuring the safety and security of the 93 operating power reactors in the U.S. through our risk-informed, performance-based inspection and oversight program. Our reactor oversight process is a mature and effective oversight program with over two decades of operational

experience and inspection data. We continue to make improvements to further focus our inspection resources on areas of greatest safety significance, taking risk into consideration.

The NRC and industry have made significant progress in developing regulatory guidance for digital instrumentation and controls modifications. Plants have historically implemented digital upgrades for the power generation side of the plant like the turbine and feedwater control systems. Now, several plants are engaging the NRC to upgrade the instrumentation and controls for more safety-significant systems like the reactor protection system and the engineered safety feature actuation system. This will be a focus for us for years to come as these plants extend their licenses beyond 60 years, and these upgrades become more compelling.

The U.S. nuclear industry, assisted by the U.S. Department of Energy, plans to deploy accident tolerant fuel designs, fuels with higher burnup levels, and fuels with enrichment above the current standard of 5 weight percent U-235 on an aggressive timeline (by the mid-2020s). We are committed to enabling the safe use of new technologies, especially those that improve safety. The industry will need to do its part and demonstrate with data that these fuels can be used safely.

The NRC and industry continue to make substantial progress with risk-informed initiatives supported by operating data and advances in probabilistic risk assessment techniques. In my view, properly implemented risk-informed applications improve safety while providing operational flexibility.

Finally, the NRC's subsequent license renewal reviews make safe long-term operation possible, focusing on key technical issues to manage the effects of aging and long-term operations. To date, NRC has approved three subsequent license renewal applications, which allow plants to operate up to 80 years. We currently have four more applications under review and are expecting a number of subsequent license renewal applications in the coming years.

The NRC continues to implement our licensing and oversight functions effectively and efficiently for our nation's operating nuclear power reactors to ensure that all plants operate safely and securely.

New Reactor Focus Areas:

Finally, I want to talk about new reactor activities.

The construction of two new AP1000 units at the Vogtle site in Georgia continues and is of national significance. Although the licensee has encountered some challenges, NRC continues to focus on completing mission critical inspection activities. As of this August, approximately 90% of the planned direct inspection hours have been completed for Unit 3 and approximately 72% for Unit 4. NRC staff recently observed key construction and testing activities including the Unit 3 reactor coolant system hydrostatic testing, containment structural integrity test, and hot functional testing.

On light water small modular reactors, NRC issued its first design approval for the NuScale design in the fall of 2020. With regulations and technical review approaches established for traditional large light water reactors, the NuScale review posed many unique policy and technical issues. Our experience from NuScale will inform future light water small modular reactor reviews such as GE-Hitachi's BWRX-300 and Holtec's SMR-160 design.

On advanced non-light water reactors, the NRC received its first combined license application in March 2020 for the Oklo Aurora microreactor. In addition, Kairos Power just submitted the safety portion of a construction permit application for the Hermes test reactor to be located in Oak Ridge, Tennessee. The test reactor is an advanced non-light water reactor fueled with TRISO pebbles and cooled by molten salt. We are currently reviewing the application for completeness before beginning our detailed technical review. We anticipate receiving many more applications for advanced reactors and new research and test reactors in the coming years.

The NRC is focused on early engagement with prospective applicants and resolving issues that will facilitate timely and efficient licensing when applications are submitted. We are actively engaged in pre-application engagement with multiple companies on topical reports or white papers and holding technical discussions in which we provide feedback on novel aspects of the designs.

Finally, I want to describe the generic regulatory infrastructure activities we are working on so we can review advanced reactor applications effectively and efficiently. It is a fundamental shift from the traditional deterministic approach the NRC uses for large light water reactors. We are modernizing our licensing approach and accommodating a wide range of reactor designs within a consistent framework. A key element will be our endorsement of a new risk-informed, performance-based approach to selecting licensing basis events; categorizing and establishing performance requirements for structures, systems, and components; and evaluating safety margins of advanced designs.

We have also made significant progress in other areas of the advanced reactor regulatory infrastructure, such as emergency preparedness, physical security, and siting guidelines. The staff is working on a rulemaking (10 CFR Part 53), which will formalize the requirements for the varied non-light water reactor designs.

The rule is on an aggressive timeline, and the NRC is working hard to get it right so it can be used by advanced reactor applicants as soon as they are ready to apply.

Question and Answer

I will conclude with a thank you once again for the opportunity to speak with you today. I cannot emphasize the importance of the work you are doing enough. Energy independence is a monumental achievement, and you are all a critical part of bringing that to your country. I look forward to answering any questions you might have.

[Link to slides](#)