



# UNITED STATES NUCLEAR REGULATORY COMMISSION

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## **U.S. Nuclear Regulatory Commission 36<sup>th</sup> Annual Regulatory Information Conference March 13, 2024 Commissioner Bradley R. Crowell (as prepared)**

Good morning, everyone! Welcome to Day Two of NRC’s annual nuclear regulatory information conference. Thank you, Andrea, for introducing me again this year—I’ll see you shortly for Q&A. It is wonderful to be here with my fellow Commissioners (past and present), our international partners and other participants representing 48 countries, and so many other distinguished guests. I’m excited to collaborate with all of you under the very timely theme of this year’s conference— Adapting to a Changing Landscape. Indeed, much has changed over the previous year since my inaugural RIC address as a new Commissioner.

However, the change I am feeling most acutely as I join you today is the atrocious time slot I received for this keynote. For those of you who know me, you likely know I am not a morning person. In fact, from my perspective, the only thing worse than listening to a keynote before 9 a.m. is giving a keynote before 9 a.m.! Ray, John, Andrea, we’ll chat later. Chair Hanson, there are exceptions to everything—your keynote first thing yesterday morning was invigorating! But if I’m honored with the early bird slot again next year, I plan to send my digital twin.

Jokes aside, while the NRC’s Regulatory Information Conference may be the least exotic title possible for an international conference, the reputation and importance of the RIC is well deserved. I am impressed with the diverse array of professionals participating, including NRC senior leaders and staff, other US government agencies, non-governmental organizations, academia, and industry. And equally, if not most importantly, students! I hope my remarks will resonate most with the students and young professionals who will inherit the direction we chart today.

I’d also like to extend a special welcome and “thank you” to our international partners joining the conference this year, especially those who have travelled long distances to be here.

It is a tremendous privilege to address all of you this morning. And while I have you, I will shamelessly plug the technical session I’m moderating this afternoon. We will have a distinguished panel to discuss the changing landscape of environmental reviews. I promise it will be an engaging, informative, and very timely discussion. The session will take place in Ballroom D at 3:45 p.m., shortly after I squeeze in an afternoon power nap to make up for this morning’s early start and for the additional hour we lost this weekend.

Before I dive into my remarks, I’d like to express appreciation to my fellow Commissioners, past and present, for their guidance and insights during my time on the Commission. I also must

thank and introduce my invaluable staff: Jan Lepre, my Executive Assistant, has been with me since Day 1. Two others who joined me soon after I was sworn in are David Brown, my Technical Assistant for Materials; and Maxine Keefe, my Deputy Chief and Legal Counsel. Early this year I was fortunate to add Amy Powell to my team as Chief of Staff, as well as Boyce Travis as my Reactor Technical Assistant. I appreciate each one of you for who you are and for bringing your “A game” to every discussion we have. I couldn’t perform my role as Commissioner without your expertise and your shared commitment to good government, good policy, and good ideas. Each of you are true professionals. I am beyond grateful to have you on my team.

To begin, I would like to share some perspective on why I am honored to serve on the Commission, and my expectations for the remainder of my term. When I was asked to serve on the Commission, I immediately viewed the NRC as offering a unique opportunity, at a crucial time, to enable the safe application of civil nuclear technology to address some of the most challenging and pressing issues facing our country today. Logically, both climate change and energy security quickly came to mind. But there are many other important policy objectives where the safe application of nuclear technologies has the potential to result in significant benefits, including exciting new developments in nuclear medicine and agriculture, just to name a few.

As a life-long public servant, I have always viewed it as my role and responsibility to be mindful of both the specific mission of an agency as well as how a given agency’s mission fits into the bigger picture of government’s overarching responsibility to advance the public good. At the federal level, every agency, no matter how big or small, whether a cabinet department or independent agency, shares in the collective responsibility to the American public for whom we serve. And we must execute this charge with eyes wide open.

So what does that mean for the NRC now and how do we get there? As Commissioner Caputo emphasized in her remarks yesterday, time is of the essence. We must start by ensuring the current fleet of nuclear reactors continues to meet our public health, safety, and security standards. And we must do so in the context of an increasingly complex geopolitical environment and while adapting to the rapidly accelerating impacts of climate change.

Unfortunately, the intensifying and increasingly unpredictable impacts of climate change – affecting our entire energy system – including our energy generation, transmission, and distribution assets—will be with us in the near and medium-term regardless of our collective success in reducing carbon emissions through mid-century. So, just as nuclear energy can help power the future while reducing carbon emissions, our current and future nuclear fleet must prepare to withstand more frequent and intense natural hazards. Nuclear safety and climate resilience are intrinsically linked. While the NRC may not be in the driver’s seat on climate change and energy security or in setting our domestic and international goals and commitments, the NRC still plays an important role in the collective effort to enable success. And at the very least, the NRC must not be a hinderance to success. With that in mind, the NRC must be fully prepared to efficiently review an increasing number of new license applications for advanced reactors, many of which will utilize novel fuels and designs incorporating advanced safety features. Therefore, I believe the NRC has a responsibility to execute its mission with a broader sense of purpose, a purpose that facilitates the safe and resilient siting, construction, and reliable operation of civilian nuclear power.

This is no small task. The amount of truly important work to be done at the NRC cannot be overstated. But I welcome these challenges as tremendous opportunities. And I believe the NRC should embrace the opportunity—or as my colleague Commissioner Wright would say “meet the moment”—in doing its part addressing some of the greatest challenges of our generation. But the NRC’s role is just one piece of the bigger puzzle all of us here today must help solve. I believe the path forward for nuclear energy and addressing climate change must be shared if we are to succeed. Shared domestically here in the U. S. and shared internationally. International cooperation is critical. Cooperation among peaceful nations will benefit us all. As a testament to that, my colleagues and I are leveraging the RIC to meet with many of our regulatory counterparts from around the world to better understand each other's needs and progress, and to identify new opportunities for collaboration. If you are participating in this conference, then you are shoulder to shoulder with us in the collective challenge and responsibility to make progress. To put it more bluntly, we can share in the success of navigating our way to a responsible and safe nuclear future in our respective roles, or we will all share in the failure to do so.

The table has never been better set than it is today for nuclear power to overcome its historic challenges. Policy and financial incentives, political alignment, identified urgent needs, public support, and multi-faceted geopolitical imperatives are all uniquely aligned in favor of dramatically expanding civilian nuclear power generation. But the time is now. Personally, I think it’s now or never. The current confluence of policy, politics, and financial support for nuclear energy is a rare alignment that is unlikely to repeat itself.

As of today, I have approximately 3.5 years remaining on my current term on the Commission or, to be exact, 1,204 days. I plan to use every one of those days to make a difference. To be fair, I would take this approach regardless. But in the context of my current role on the Commission, if the NRC is going to be part the solution, then we must keep apace.

So, what has happened in the 364 days since I last stood before you on this stage? In short, much. My colleagues eloquently spoke about a number of things: the construction permit for the Hermes non-power test reactor, Vogtle 3 starting commercial operations – on my birthday no less. Vogtle 4 is not far behind, as well as a demonstration project for HALEU. All successes since RIC23.

I don’t think my fellow Commissioners, nor myself, envisioned the leaps and bounds being made in fusion energy in the past year. Now I know there is still a long way to go, both technically and economically for fusion, but at the current pace of technical advancement and financial investment, fusion energy systems could start giving fission reactors some healthy competition in the next decade. I applaud the NRC for recognizing these advancements and putting the regulatory wheels in motion to keep apace. Last Spring, the Commission directed NRC staff to create a regulatory framework for fusion energy systems, building on the agency’s existing process for licensing the use of byproduct materials. As a longtime energy watcher, I was excited to see fusion start progressing so quickly. But I also wanted to see it for myself. It had been over a decade since I’d last visited DOE’s National Ignition Facility and I was eager to see how this area of work continues to develop. Last August, I joined Commissioner Wright for visits to Helion and Zap Energy based near Seattle, Washington, and in a few weeks, Ambassador Wright, I mean Commissioner, and I will be heading to Commonwealth Fusion Systems in Massachusetts.

Turning back to fission, also within the last year, the Commission took another step forward in optimizing the NRC's readiness for a new generation of reactors by approving a final rule establishing emergency preparedness requirements for small modular reactors and other new technologies. Our votes are of course public, so as you may have seen, I did not agree with everything in this rule as adopted. And that's ... okay. It is healthy to explore different ideas, experiences, opinions, and expertise when talking through issues with my colleagues. The most important thing is that Commissioners and their staff communicate with one another on a regular basis – including sharing individual viewpoints, but also listening to and understanding differing views and unique insights. Yes, there will still be disagreements, both big and small, but ultimately, better policies result when a diverse body engages in true collaboration. Personally, whether I agree or disagree with one of more of my Commission colleagues on a given topic, I still benefit from forthright, collegial discussions. As a result, I am able to draft more thoughtful and informed votes. I believe this is what Congress intended when establishing the NRC as a Commission-led agency designed to formulate policy as a collegial body rather than establishing a single administrator. Congress takes, and probably deserves, a lot of heat about a lot of things, but I think they got this right. And I hope the Commission can soon return to its full complement of five Commissioners - as Congress prescribed and when the Commission is at its best.

Speaking of collaboration, the Commission recently marked a significant milestone by completing deliberation on the staff's draft rule for advanced reactors that we affectionately call Part 53. Reaching this point in the development of a modernized regulatory framework for new and advanced reactors has been a long time coming. Though I might add, we are still well ahead of the schedule set by Congress. There were highs and lows during this process and many bumps in between. However, I am confident that the proactive approach taken on Part 53 to engage the public was correct. Moving forward, be it in the context of finalizing Part 53 or other noteworthy regulations, I encourage staff make informed process improvements while continuing to employ a collaborative model of early and meaningful engagement with all stakeholders. I also want to echo my colleagues to express my thanks, awe, and gratitude for how we and our respective teams worked together throughout the deliberation and voting process.

Relatedly, the Commission is in the process of advancing two other key rulemakings important for both new, advanced reactors and for the current fleet of operating reactors. Last week, I voted on a proposed rule to establish a generic environmental impact statement for new reactor technologies, which I know is of high interest to many of you. Also last week – we've been busy in my office – I voted on the final rule to establish a complementary generic environmental impact statement specific to license renewal applications for operating reactors. For each rulemaking, I applaud the staff's efforts in taking the approach of generically addressing certain issues and focusing environmental review efforts on site-specific issues, without shortchanging environmental reviews or undermining our NEPA responsibilities. We need this kind of novel-yet-conscientious thinking in our critically important review work as the NRC prepares for scenarios that will seriously challenge our role in ways that we could not have imagined years ago.

Earlier this year, Chair Hanson tasked the NRC's General Counsel with taking a fresh look at the Commission's mandatory hearing process to identify efficiencies for carrying out this statutory requirement. I commend the Chair for taking this step and I look forward to what General

Counsel Clark and her able team will share with us soon. Regular review of current agency practices is essential to our future success in tackling the work ahead of us.

You will hear about more encouraging developments from the NRC staff as you participate in technical sessions and conversations this week. I am confident that you have your own to report. The amount of work to be done is tremendous. We must continue to make timely progress.

I will now turn to other parts of the fuel cycle for a few minutes. If you've heard any of my previous speeches, you know I never miss an opportunity to discuss the front and back end of the fuel cycle. I firmly believe that the NRC's regulatory decisions will have broader and more durable acceptance if we demonstrate to the public that we are considering the entire fuel cycle. And the need to re-assert our attention in this way was made painfully and tangibly clear by the Russian invasion of Ukraine. This dramatically changed the global geopolitics of civilian nuclear energy and technology. In the interest of strengthening our energy security and overall national security, the U.S. must make progress to bolster our domestic uranium milling, conversion, and enrichment capabilities. And we must continue to do so on a timeline commensurate with the progress of new and advanced reactors in this country.

It is my firm belief that it would be irresponsible to utilize nuclear energy to lower emissions and help address climate change if in doing so we knowingly allow nuclear energy to become the harbinger of new multi-generational threats to our public health, safety, and economy, namely in the form of unmanaged spent fuel and nuclear waste or exacerbating the challenges of nuclear proliferation. As my DOE colleague Dr. Katy Huff put it during Congressional testimony earlier this year, "the promise of new advanced reactors can most responsibly be realized in conjunction with progress on the management of their spent nuclear fuel." I could not agree more. And as the NRC moves forward with research, rulemaking, and licensing of new nuclear energy generation technologies, we must not lose focus on the responsible management or reuse of spent fuel inventories coupled with timely advances in nuclear waste storage and disposal strategies. Again, the NRC must keep apace.

We must similarly be thoughtful about how we manage the decommissioning of all types of facilities. The NRC staff recently delivered the draft final rule for decommissioning reactors to the Commission for our deliberation. This is an important rule for many stakeholders, notably the communities that have hosted or will host operating nuclear power plants and have questions about how issues such as site restoration and spent fuel will be addressed when operations cease. With this rule, the NRC will establish the "rules of the road" for these sites, where it could take decades to complete decommissioning. I am coming into this important rulemaking near the final step, but it has my full attention given its long-term impact on communities and our environment.

Whether we are talking about abandoned uranium mines, uranium milling and mill tailings disposal sites, or low-level waste disposal facilities, we have a shared responsibility to enhance the government's social license with respect to responsibly and proactively managing the front and back ends of the fuel cycle. In doing so, we must not repeat the mistakes of the past — as an agency, as a government, as a country.

In his remarks yesterday, Chair Hanson talked about "trust" being a key component for the NRC's success moving forward. I agree wholeheartedly. But trust must first be earned and then

carefully maintained. Although the table appears to be set for success from a policy and political perspective, I don't envision a nuclear renaissance in the United States taking hold without commensurate trust from the public that the NRC—and truly all of us here today, but I'll focus on where I sit—is doing what is in the people's best interest. Public trust and engagement are precursors to everything we hope to achieve as an agency.

During my career in public service, at both the state and federal level, I have been reminded time and time again that nuclear-related issues always garner significant public interest. As such, proactive community engagement must always be an early priority. I have engaged in many conversations and heard from numerous stakeholders over the last year and a half about licensing and regulatory efficiency. And rightfully so. In my mind, in addition to the standard definition of the word, efficiency means that everyone—public citizens, state governments, Tribal governments, industry and beyond—are entitled to a fully transparent and accessible nuclear regulatory framework and associated licensing and oversight. Procedural justice is essential. And taking time on the front end to educate and build relationships with local stakeholders will ultimately result in more efficiency than attempting to skip this vital step.

As former NRC Chair Dale Klein was recently quoted, “trust is hard to gain but easy to lose.” I could not agree more. We must put the work in with the public. Doing so will form the foundation for the public to have confidence in the regulatory process.

Unfortunately, this challenge comes with the following backdrop for the NRC and our federal partners. Whether fair or not, many Americans are increasingly losing faith in government. A Gallup poll late last year found that only 44% of Americans have a great-deal-to-fair amount of trust in the federal government to handle international problems. Only 37% have a great-deal-to-fair amount of trust in the federal government to handle domestic issues. Since the NRC works on issues in both arenas, we've got some serious work to do. But we are not alone. In my view, it is incumbent upon all public officials to work to reverse this trend by maintaining the highest standards of accountability and active engagement with the public, whom we serve.

As Commissioner Wright suggested in his speech, every NRC employee is an ambassador, representing our mission, our service, and what we value. And every NRC employee should help communicate what it is that we do and why it is important. In fact, I think the NRC should use Commissioner Wright's video as a recruiting tool! In all seriousness, while Commissioner Wright's video may have been entertaining, it was effective because it told a part of the NRC experience in terms anyone could understand and appreciate. This is exactly how the NRC needs to introduce or reintroduce itself to the public: by engaging stakeholders at their level, using of plain language, and real-world context. Explaining nuclear power and other nuclear applications, not to mention the regulatory role of the NRC, to average folks is challenging. Personally, I often seek out opportunities to explain exactly what I do as an NRC Commissioner to my family, friends, neighbors, and the occasional Uber driver. It's not always easy. But if I take a moment to assess my audience, I can usually find a way to connect.

I believe we all have a responsibility to do this in our respective roles, but certainly those of us who are employed in public service. And it's not the responsibility of the public to understand nuclear physics, it's our job to explain the peaceful application of nuclear technology to the public in a manner they can understand. I know there are a lot of smart people in this room, and the NRC

has some of the smartest people I've met in my career. But as Albert Einstein said, "If you can't explain it to a six-year-old, you don't understand it yourself." So I issue this challenge to all of you. Engage with your friends and neighbors – especially the younger generation – and tell them what you do and why it's important. If they understand, then you've succeeded. If not, keep trying. I promise you the seeds you sow today will sprout tomorrow.

None of what we have discussed here today or here this week will be possible without the NRC staff—the people power—to do it. We —everyone in this room— need to retain the amazing experts that we all have for as long as we can while preparing and recruiting a new generation to work with us and to continue what we are starting. Engineers, scientists, operators, security specialists, trades and crafts, attorneys, administrative support, and everything in between – we need it all. But I am concerned.

Our experts in all things nuclear-related are also increasingly retirement eligible. On the other end of the career spectrum, there is also good reason to worry about how we refill the talent pool. Earlier this year, a survey of 34 U.S. universities with nuclear engineering programs found that the overall number of nuclear engineering degrees awarded in 2021 and 2022 were at their lowest levels in more than a decade. And data on crafts and trades is not encouraging either, with less than 9 percent of workers ages 19-24 entering the trades. Trends like this fuel my concern.

Despite these trends, I am buoyed when I talk with students studying in fields related to our collective work. Last year, I spent time with students in the ANS chapter at the University of Nevada-Reno and their faculty advisors. If I could have bottled up the enthusiasm in that room and turned it into energy, I am no physicist, but it might bend the carbon curve on its own! They were so engaged, asked good questions, were interested in the policies that surround the science, and want to be a part of making a difference to the planet through their work. While I am clearly biased by my home state experience, I know that other campuses yield encouraging stories as well. Let's do our part to keep that going.

For its part, the NRC is actively working to retain and recruit its workforce for the emerging nuclear energy landscape that will directly affect the agency's work. We recognize that our ability to monitor and proactively address needs within our workforce is essential for turning today's challenges into new opportunities and future successes. As a result, the NRC has the most aggressive hiring goals that we have had in over a decade. Our hiring targets account for attrition, as we too have a workforce that is increasingly retirement eligible AND our talent is being heavily recruited by others who also need the same skills and expertise—and, let's be honest, others with compensation abilities exceeding that of the federal government. But these goals are necessary to accommodate the growing workload. We are leaning hard into meeting our hiring goals, using hiring tools and options left long untouched, recruiting like it's 1999 (glad some of you are laughing), and tapping into flexibility and creativity whenever and wherever possible. And the NRC offers something unique to those who join us—an exciting career in public service with devoted and brilliant colleagues who share a commitment to the NRC's mission and doing big things.

So, to the current NRC staff, thank you for who you are and everything you do. Change is always challenging – and we have had a lot of it. But change is healthy. I implore you to play a positive role in making change. Keep trying novel ways to accomplish our important safety and security work. Continue to find new strategies for engaging and communicating with all

stakeholders. We need you, your expertise, and your mentoring of the next generation of NRCers. I am humbled to work with you and awed by what you accomplish in this difficult arena. I want everyone in the NRC workforce to feel like you are part of a generational opportunity to make lasting change. We are in this together.

I also must acknowledge the important work and role of the Advisory Committee on Reactor Safeguards, or ACRS, which—put simply—is the NRC’s technical conscience and plays a vital independent and indispensable oversight role. When I am preparing to vote on a matter that ACRS has reviewed in full or in part, I want to know their views. I value their expertise, their “outside of the building” look at safety-related issues, and the informed opinions about the staff’s work. As the Commission formulates policy in technical areas never before considered in many cases, I want to know our Advisory Committee’s views on these new technologies and how the NRC is setting expectations and frameworks for their safe use. Everyone under the NRC umbrella is seeking to keep apace and prepare for the myriad of workload scenarios we could face, and the ACRS is likewise adapting its role as well and is critical to our success. We too are in this together.

Each of you play a role in turning this opportunity into our new reality. Thank you all for allowing me to share my perspectives. I will now take my place in the hot seat to answer some questions—arguably the best part of the show.