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U.S. Nuclear Regulatory Commission
37th Annual Regulatory Information Conference
Commissioner Annie Caputo

Good morning. Welcome back from the break. First, let me thank the NRC staff for all the hard work that they put into this conference to allow us to come and have these productive conversations. It's going to be a great week, and it's really a testament to all of their efforts.

I also, similar to the Chairman, want to thank our security officers for watching over us and keeping our safety in the front of their minds this week. I want to give a special thanks to my staff for their help and infinite patience with my last-minute preparations. I seem to follow in Chairman Svinicki's steps in that regard, unfortunately.

I would also like to acknowledge Chairman Stephen Burns, who I saw earlier. I think he's out here somewhere. And Commissioners Jeff Merrifield and Bill Ostendorff, who have long been a source of advice and wisdom to me over the years and I definitely appreciate all their advice.

Lastly, I want to support my family for their love and support. And my quilting buddies that are tuning in remotely. They will get to see what I do the rest of the time.

So Chairman Wright and Chairwoman Capito got us off to a fast pace, so I'm going to try to keep up with that pace. But I'm going to start with just a little story about my personal experience with Chairwoman Capito.

I was with her for her very first tour of a nuclear power plant. And it was a visit to AEP's plant D.C. Cook in Michigan. And she was very candid about being new to nuclear, but she was eager to learn.

And she approached that visit with such energy and such a focus. And for three hours was riveted, seeking every opportunity to learn as much as she could. A constant stream of questions. And you can see, in the way she now leads the Committee and the way she has embraced nuclear issues, that that energy and focus is very much alive and well.

So she was a role model for me when I worked at the Committee and supported her. And she very much continues to be a role model for me today. So, it is both humbling and a bit personally special for me to be following her this morning. So the theme of the RIC this year is charting the course for the next 50 years. Which, as you may be aware, it's already been mentioned this morning, we just commemorated our 50th anniversary. But here today the agency is, again, at a crossroads in how it executes its operations to support the nation.

So much change is unfolding here in the U.S. and around the world and it's only March. On Inauguration Day, President Trump signed an executive order titled, “Unleashing American Energy,” focusing on the need for an abundant and reliable supply of energy to protect our national and economic security.

He also declared a national energy emergency describing how the integrity and expansion of our nation's energy infrastructure from coast-to-coast is an immediate and pressing priority for the protection of the United States national and economic security. This is consistent with assessments coming out of the North American Electric Reliability Corporation, or NERC for short.

NERC's mission is to assure the effective and efficient reduction of risks to reliability and the security of the grid. In 2023, their reliability issues steering committee identified, for the first time, energy policy as a risk to reliability. "Energy policy can drive change in the bulk power system planning and the operations effecting reliability and resilience.” The committee further described how energy policy, including timelines for implementation, can be a risk reliability factor. And that policy implementations should actively consider the ability to ensure energy efficiency.

This past December, NERC released its long-term reliability assessment for 2035 to 2034. In the report, NERC finds that “most of the North American bulk power system faces mounting resource adequacy challenges over the next 10 years as surging demand growth continues and thermal generators announce plans for retirement.”

This growth in demand is being driven by data centers, which we read about almost daily now. But also increased electrification through electric vehicles, heat pumps, and growth and manufacturing.

Peak demand is projected to grow by 151 gigawatts, or 17 percent, by 2034. And in this line, it shows generator retirements are projected to reach 115 gigawatts by 2034. Growth and demand, combined with generator retirements, results in a resource gap of 266 gigawatts. The U.S. share of that being around 248.

The NERC assessment concludes "the trends point to critical reliability challenges facing the industry, including satisfying escalating energy growth, managing generation retirements, and accelerating resource and transmission development."

This map of projected reserve margin shows that more than half of North America is at risk for shortfalls in the next five to 10 years. John Moura, NERC's director of reliability assessments, put it very simply. He said, "simply put, our infrastructure is not being built fast enough to keep up with rising demand." As you'd expect, one of NERC's recommendations is for regulators and policymakers, streamline citing and permitting processes to remove barriers to resource and transmission development.

The nature of how this situation is unfolding and continuing to accelerate provides compelling context for the president's focus on energy abundance. NERC's recommendation for regulators and policy makers validates Congresses strong bipartisan, bipartisan passage, of the ADVANCE Act to revise our mission, instill a sense of urgency, and pursue efficiency wherever possible.

So, let's focus on just our corner of the world. If the U.S. needs 248 gigawatts by 2034, what if nuclear provided only 20 percent of that? Then the NRC would need to license 48 gigawatts over the next six or seven years to allow construction and commencement of operations by 2034.

To put that in context, that would be about 44 Westinghouse AP1000s, 160 GE BWRX-300s, 145 Terrapower natrium reactors, 480 X-Energy 100s, or some combination thereof. But you get the picture? At some point in the near future the scale of our workload is likely to grow significantly.

I was counseled early in my career that nuclear is a small town where everyone knows everyone. And for the vast majority of the agency's history the universe of vendors, utilities, technologies and business plans was well-known and longstanding. Even when things were changing, folks generally gave the agency fair warning to plan accordingly.

However, that is also changing. Over the last 10 years or so we've seen a host of new market entrants to our small town developing a range of technologies we haven't licensed before. And some of those new technologies have new application such as heat, such as process heat or energy storage that the agency hasn't considered before.

As I noted earlier, power demand for data centers and artificial intelligence is a national security imperative and it's bringing big tech companies to our small nuclear town. Oil and gas companies are checking out the neighborhood. Evaluating nuclear energy to power both production and operations to improve their efficiency and reduce their emissions.

Lastly, how about international shipping? This is something I hadn't focused on until lately. International shipping is a $14 trillion a year industry. One ship builder estimates that a large nuclear power container ship could reduce transit time 28 percent and increase capacity five percent. Those numbers create a powerful financial incentive to develop a nuclear solution. And in fact, this effort is already leaving the drawing board.

An experiment to shock test a mock reactor vessel in line with maritime conditions is set to proceed later this year. At this point the biggest hurdle for that effort seems to be sorting out international maritime regulations which, admittedly, is not trivial.

So, to summarize the situation we find ourselves in, our country is experiencing a growing need for electricity that hast been seen for decades. Even if nuclear energy plays only a small role, our workload will grow well beyond what we saw in the 2007 renaissance.

The agency is interacting with companies that are new to nuclear and have varying levels of familiarity with our regulations. Our staff needs to build expertise and licensing capability for a range of technologies.

These technologies will be used in ways we haven't considered before. And there are three multi-trillion-dollar industries with financing capability that dwarves anything the nuclear industry has seen before. And if they jump into this space, will likely do so in a large way that makes first-of-a-kind costs look like a rounding error.

What I just described can feel overwhelming, especially when it's also coming at a time when the administration is driving agencies to reform and focus on efficient delivery. There is angst about what that means for the NRC at the same time that we are trying to become more efficient in line with Congress's direction in the ADVANCE Act.

Some would say the executive orders in the ADVANCE Act are antithetical. I disagree. Consider the example of OMB and OPM's direction to clarify what activities are statutorily mandated and reorganize

accordingly. For the NRC, it's essential that this is a serious, thorough and candid review. Any organization facing a major change in its operating environment would do just that, focus on what's important and shed low priority work or activities that are overtaken by events.

One definition of efficiency is "the ability to accomplish something with the least waste of time and effort. That is what the administration, congress and external stakeholders are expecting of us, efficient, timely licensing decisions.

This doesn't mean cutting corners on safety. And it doesn't mean that activities supporting mission critical work have become unimportant. But it does mean that we need to prioritize mission critical work and streamline other activities wherever possible. We need to pursue process changes and harness technology wherever possible. I am cautiously hopeful that the staff's work to implement the ADVANCE Act and Mirela's initiative to instill project management practices across the agency will yield tangible results.

Chairwoman Capito has made clear that Congress expects tangible results. This cannot be another effort where the agency has some working groups, sends Congress some reports and returns to business as usual.

As our principles of good regulation state, the American taxpayer, the rate-paying consumer and licensees are all entitled to the best possible management and administration of regulatory activities. This effort must create lasting performance improvement, shift our culture and yield real savings. This sets the stage for redirecting resources and reskilling our people to execute the workload that's coming.

Is the agency resourced to be successful? That is a question that is frequently asked. The easy answer is to just say, NRC needs more money. I believe it's far more nuanced than that.

The Nuclear Energy Innovation and Modernization Act, or NEIMA, directs us to estimate the resources we need to execute our licensing work. For 2025 that estimate is eight percent of the agency's total budget.

Our statutory mandate is licensing and related regulatory activities. However, as you can see here, related regulatory activities has grown to dwarf our licensing management and our licensing mandate and consume management focus. If the licensing workload requires more resources, then simply growing the top line of our budget and making the pie bigger does very little to boost funding for licensing work.

Vince Lombardi said, "the measure of who we are is what we do with what we have." For the agency to efficiently execute its licensing responsibilities consistent with our nation’s energy needs we must prioritize licensing work to reflect that critical mission imperative. That means focusing our people and resources accordingly.

To meet future licensing needs, the pie needs to change. Right now it's difficult to predict when and how fast our workload will grow. One thing we can control is shedding low priority work. While this has been talked about before, little has been done to date. Furthermore, a scrub of research is long overdue to ensure projects are safety significant and necessary to support regulatory findings. These examples should be part of a thorough, clear the decks effort that frees up resources to be focused on licensing or captures efficiencies.

With that also comes reskilling our people. We have been operating without a strategic workforce plan and knowledge management plan; our knowledge management effort is fledgling.

Until recently there was no way to track how many of our employees are qualified to conduct licensing and environment reviews. It takes time to train and mentor people to execute this high-quality work. We need a structured approach that prepares our workforce for the workload we know about, but also agility to reassign people if the workload surges beyond our forecast.

The challenge with a two-year federal budgeting cycle is it's tough to anticipate changes that far out. Think about it this way, the 2025 budget was developed in 2023. Think about how the awareness of AI's power needs has grown in just the last year.

Our licensing load is growing. Not just with new plant activities, but license renewals and power uprates for the existing fleet and fuel facility licensing to support all plants. Our current funding level for licensing work must grow to meet that workload. And Congress clearly wants the agency to be appropriately resourced. But I've made a clear case for reprioritizing our existing resources as much as possible before pursuing additional funding.

Another major aspect of efficiency is risk-informing our licensing efforts to ensure that regulatory activities are consistent with the risk reduction they achieve. The ADVANCE Act gets a lot of attention, but I'd like to talk about another law. The law of diminishing returns.

Operating reactors are safe under existing regulations documented improvement since the inception of the reactor oversight process 25 years ago. When we pursue a standard of safety more restrictive than the current fleet, do we get a proportional increase in safety? No.

By definition, pursing smaller risks means any safety gains will also get smaller. However, the regulatory burden grows and demonstrating compliance becomes more difficult.

NRCs state-of-the-art reactor consequence analysis shows that cancer risk from reactor accidents is thousands of times lower than the NRC safety goal of two in every million years. And millions of times lower than the general U.S. cancer fatality risk. To put this in perspective, NASA estimates that once every few million years an object large enough to threaten earth's civilization comes along. The probabilistic risk assessment, or PRA techniques, and computer modeling available today make it tempting to regulate to safety levels below that of an asteroid impact. And this is where the development of our advance reactor licensing framework, Part 53, seems to be headed.

I believe attempting to regulate to such a level is counterproductive and time consuming. It runs afoul of our clarity principle which states, regulations should be coherent, logical and practical. Agency positions should be readily understood and easily applied. It also runs counter to what Congress is seeking to achieve through both NEIMA and the ADVANCE Act.

And what about regulatory stability and predictability? Our reliability principle states regulations should be perceived to be reliable and not unjustifiably in a state of transition. All three of our regulations for licensing reactors are in a state of transition at a time when many companies are drafting applications.

Part 53, I mentioned above. But modifications are also underway to more closely aligning Parts 50 and 52. Are those changes justified? Particularly with regard to Part 50, my conclusion has been no.

Currently, Parts 50 and 52 require different levels of design maturity. This is why so many advance reactor companies are choosing to use Part 50. Imposing Part 52s higher level of design maturity will disadvantage novel technologies that don't yet have the operating experience of more mature designs.

And lastly, for regulator changes to be truly justified, there must be high quality data driven regulatory analysis that is a foundation for reaching that conclusion. In the case of the 50, 52 alignment effort, the regulatory analysis showed that many changes are not actually cost beneficial.

The Commissions longstanding policy statement on PRA states that it should be used in a manner that complements NRC's deterministic approach and supports the NRC's traditional defense-in-depth philosophy. It also directs the use of PRA to reduce unnecessary conservatisms. Notably the policy statement does not suggest codifying regulatory requirement for PRA.

When the PRA requirement was codified in Part 52, there was neither a corresponding reduction in conservatism nor a methodology to seek such a reduction. Thus Part 52 requirement for new plant applications provides that they provide a PRA description for review, represents a stricter set of requirements than the existing fleet.

The current decision to impose this requirement into Part 50 will similarly impose a stricter set of requirements. Some stakeholders, including the Advisory Committee on Reactor Safeguards, have expressed views that a PRA may not be necessary for all designs.

In general, while a PRA requirement may seem like an elegant approach academically, I expect a practical implementation will be cumbersome and the benefits will be illusory in the context of having a regulatory requirement. But it will continue to be a vital tool that informs the work we do.

Regulatory reliability and efficiency depend on sound decision making. Making a good decision and then sticking to it. When the staff makes a decision on a topical report or an application, that provides clarity to other applicants and licensees on what is necessary to meet our requirements. They then factor that information into drafting their own applications.

As such, staff decisions need to be transparent, high quality, well-articulated, and then relied on going forward. The bar for revisiting or reinterpreting our requirements should be set high. And should involve a substantive safety issue to drive such regulatory change.

In the case of pre-application engagement, numerous applicants are spending significant time and resources to understand what is necessary to submit a high-quality application. If the staff's interpretation of regulatory requirements is perceived to be a moving target or in flux with a reassignment of staff, then pre-application engagement loses its value.

Regulatory predictability in this and other licensing areas is crucial to timely decision making and quality applications. Which brings me to the topic of leadership and culture.

I've discussed a lot of change this morning. Jennifer James has a great quote on change. "Learning how to respond to and master the process of change, and even excel at it, is a critical leadership skill for the 21st Century. Constant rapid change will be a fact of life for all of us."

Change isn't something to ignore and hope it goes away because it's not going to. Some changes are beyond our control. Some changes we must manage. And some change we need to create. Mastering the process of change isn't easy. If it was, there wouldn't be so many classes, books, seminars, podcasts, etc. etc., on the topic."

But one of our values is continuous improvement. Leaning into continuous improvement is a very effective way to respond to and master change. But it's also incumbent upon leaders to lead. And walk the talk.

Another great quote from Vince Lombardi, "obstacles are what you see when you take your eye off the goal. Leadership needs to set clear goals and meaningful metrics to guide progress." Without goals, the focus will remain on the obstacles, and without metrics it's impossible to tell if progress is being made.

And this is where I bring up the dreaded A word. Accountability. On multiple plant visits I have encountered something called the accountability ladder. It was too tough to get it up on a slide, so I encourage you, if you haven't seen it before, to look it up.

Our licensees hold themselves, and each other, accountable for shifting from postures of denial, the bottom rung, making excuses, the third rung, to owning a problem at rung number six and implementing a solution, the top of the chart. This isn't about assigning blame, by the way, that's rung number two, it's about engagement and achieving results.

One last quote from Vince Lombardi. "The achievements of an organization are the results of the combined efforts of each individual." Employee engagement is crucial to achieving success.

So in the same vein that admirals often love to tell sea stories, I'm going to wrap up my remarks today with a story and a lesson from my days as a ski instructor. And you're probably wondering why this is relevant but stick with me.

These lights make it difficult for a show of hands, but does anyone here recognize this photo? Give a shout out. Oh, come on. Double bonus points if you've skied it. Isn't it a beautiful site?

From this angle it looks so lovely. It's called the Hanging Valley. It's a big playground for expert skiers in Snowmass Ski Area in Colorado. And while it looks beautiful in the photo, it looks a lot different when you're standing at the top.

This picture is also deceptive because you don't see all of the valley, you see sort of the second half. Before you get there, and to reach those trails you first have to ski either a chute or a headwall. Or if you have more guts than brains, there are other more challenging routes. One is known as the keyhole. I'll let your imagination run with that one. Needless to say, it's rather Darwinian. And if you make it that far then you get to ski through a bunch of trees. Then you find yourself coming out in this photo.

One of the downsides to teaching skiing is also one of the upsides. There are days when you don't get assigned a lesson, and hence you don't get paid. But there you are with your skis on and the day off.

So on one such day, as beautiful as that picture, a handful of us decided to head up to Hanging Valley. The snow was good. We went in via the chute, split up through the trees and congregated at the top of, can't really say area because it's all very fluid, but the top of an area designated as wall two, which is sort of in the right side of the photo.

Where we were the entry was in through a short narrow chute, so we took turns pointing our skis straight down and then hooking a big turn. Slow down, get your bearings, space yourselves out. And I had gone last.

And for those of you that don't ski, one safety point, your boots are attached to your skis with something called bindings and they're designed to release when you fall in the hopes of preventing injury. I was four turns in and I heard a very small click and my stomach clenched up. My body knew what had happened before my brain had processed it. One of my skis had pre-released and come off. I toppled over and started to slide.

One of my colleagues just barely moved out of the way. I tried to use my hands and my remaining ski to arrest my slide. My ski caught on a pile of snow and then flipped me over. So instead of sliding I was now tumbling head over heels. Panic set in. I was terrified my remaining ski would rip my knee to shreds. All of a sudden it was gone.

I realized I was okay so far and that it's best to relax when you're falling, so I tried to relax as I was falling. I started to see a dark blur off to the side and I remembered that the trail narrowed at the bottom with rocks on one side and a bank of trees on the other. More panic sets in.

Somehow, I funneled between them, slide to a stop. My first thought was that my colleagues would all think that I was dead, so I stood up and I waved shouting that I was okay. The next thing I knew I was laying on the snow, looking up at all of my colleagues as they're deciding who is going to ski out to call the ski patrol.

It took a few minutes then I sat up, and then I stood up. As my two remaining colleagues, who were further up the hill, managed somehow to hike up and to retrieve my skis. And I skied out.

But that fall rattled my cage in a very profound way. A couple days later, one of the more senior instructors who had been with me asked if I had adjusted my bindings, yes, and gone back in yet. What's the rush? I had been in there lots of times. What's the big deal? He very firmly said, let's go. You have to do it now or you're never going to regain your confidence. You can't let the mountain win. So, I faced it, palms sweating, heart racing, plenty of nausea.

Afterward I was no longer the same person, and that was a good thing. After panic and fear I had managed to find courage. I had transformed from feeling young and immortal, and my husband would say stupid, I now understood what resilience really meant.

And the importance of health insurance. That bit is from my husband. He hates the story because he can't fathom that I didn't have health insurance at the time. That's the stupid part.

There are times when life knocks us down and tests us. And some of you may be feeling that right now. Particularly given the scope of change facing the agency. But it's in these times when you decide what you're made of. When you make a choice, you gain self-confidence that no one can take away, and that becomes your resilience.

In some ways skiing is like life. It is all about making a series of turns. At the end of a turn you have to commit to the next one, if you don't, your skis won't release the old one and engage for the new one. The steeper the trail, the more important you commit. If you're reluctant and hang back, the next turn is going to be harder, more tiring, less fun.

You don't have to be great to start, but you have to start to be great. And it all starts with committing to that first turn. Once you're moving the next one gets easier. And then you get into a rhythm. And then it begins to come naturally.

This is a metaphor for where we are as an agency. There are so many challenges unfolding, but commit to tackling that first one, the next one will be easier. Then you can develop a rhythm, you'll improve your skills and ability to master change. You'll build confidence and resilience.

Thomas Edison said, if we did all the things we are really capable of doing we literally would astound ourselves. Here we are 50 years later with big changes in store for the agency. A nation needs us to be successful, let's see what we are really capable of doing and we might just astound ourselves along the way.

Thank you.

A. Caputo, Commissioner, RIC 2025 Slides NRC at a Crossroads