

**ANS Utility Working Group Plenary Session Remarks
Commissioner Christopher T. Hanson
August 11, 2020**

Introduction

Good morning. I'm so glad to be with you all. Thanks to Craig, Bob, and Paula and everyone at ANS for pulling this together. Finally, thank you to my fellow panelists—I clearly drew the short straw this morning in having to follow all of you.

So, I'm the new guy. I think this is week 8. I was sworn in about 10 weeks into the pandemic. Let me just note how flexible NRC staff have been during this time. Chairman Svinicki swore me in, the Secretary of the Commission gave me a tour of the electronic systems, they handed me a laptop and sent me home. It really has been a seamless process and I have been incredibly impressed with the professionalism of agency staff during this difficult time.

I know there are similar stories among licensees—from electronic exemption request submittals to flexibility on force-on-force exercises.

I'll take a pause from cheerleading, but only because my time is limited.

For those of you who don't know me, let me talk a bit about my background. Then I'll cover some preliminary observations about transformation activities and risk-informed regulation at the NRC.

I come to the nuclear world largely through the waste and materials side. I started my career as a consultant to state agencies in their collective interactions with the Department of Energy on cleanup of the Cold War

environmental legacy. I learned that so much in the nuclear world is not technical, it's about perceptions of risk and fairness. In a sense, it's political, with a small "p."

I later served as a consultant for a number of government and private clients, focusing mainly on strategy, governance, and finance. For government clients, I oversaw the life-cycle cost estimate and the Nuclear Waste Fund for the Yucca Mountain Project and developed financial and governance models for the Global Nuclear Energy Partnership, which you may recall dealt with closed fuel cycles. I also advised the UK government on the divestiture of UKAEA's cleanup "business."

For private clients in the nuclear arena, key projects included a risk assessment of new nuclear build, a market strategy for a legacy electrical and mechanical parts business, and a strategy review for a fuel cycle company. Even 10 or 15 years ago, during what many of us thought would be a "nuclear renaissance," I gained an appreciation for how close to the financial margins nuclear operates, even amongst very different businesses. I also gained a real appreciation for John Rowe's adage: "Nuclear is a business, not a religion."

In 2009, I joined the Department of Energy's Office of the Chief Financial Officer, with the intention of rounding out my professional experience. I'd had a number of government clients over the years, but never been a federal employee and wanted to understand that perspective. Because of my knowledge of the Department, I migrated to working for Secretary Steven Chu, handling the Department's relationship with the Appropriations Committees on Capitol Hill.

I later had the privilege and pleasure of working for Assistant Secretary for Nuclear Energy (and former NRC Commissioner) Pete Lyons as a senior advisor on waste and fuel cycle issues.

In 2014, I moved to Capitol Hill, where I handled all things nuclear on the Senate Appropriations Committee—cleanup and waste, nuclear energy and fuel cycle, and national security programs—working closely with Senators Feinstein, Alexander, and others.

Through that experience, I internalized something I'd long felt. There's a saying on Capitol Hill—there are Republicans, there are Democrats, and then there are Appropriators. What that means in practice is that whenever possible, good policy and good government come first, then politics. Politics isn't inherently bad—it's how we collectively make decisions among competing priorities and interests. But as a management consultant, later an Appropriations staffer, and now a Commissioner, politics doesn't come first.

I also became intimately familiar with the importance of the deep historical, policy, and technical connections between the civilian nuclear power sector and our national security. Of course, the NRC is interwoven in this history and will have a key role to play in the future.

Among things I'm most proud of from my time on the Hill is building up the Department of Energy's Accident Tolerant Fuel program, which was started by Senator Feinstein after the Fukushima Dai-ichi incident. As Scot mentioned, this is an effort to develop and deploy new cladding materials to improve the performance of fuel under accident conditions. While the

impetus for the program was safety, ATF potentially has the added benefit of improving the economics of operating reactors.

The program was slow to get going and it has faced repeated attempts by DOE to deprioritize it. But with sustained focus and funding from Congress, three utilities have loaded and, I believe, extracted lead test assemblies, national laboratories have provided valuable analytical support, and vendors are examining changes to their facilities to support eventual manufacture and distribution. From the standpoint of both safety and economics this program has the potential to be a win-win.

As I reflect on my career to date, I realize I'm an institutionalist by nature. Institutions—some government, but many not—provide the culture and structure necessary for human flourishing. That doesn't mean I'm rigid or I don't think institutions need to be in a constant process of reform. We are humans after all, and our institutions often reflect back on us our frailties, prejudices, and short-sightedness. Therefore, we must be dedicated to ensuring our institutions live up to our ideals.

So, reform, transformation and innovation, absolutely, yes. But also transparency, predictability, and a commitment to reasonable assurance of adequate protection, so that the benefits we have all enjoyed can be passed on.

And that brings me to some of the ongoing transformation efforts at NRC. You'll hear about this in more detail this afternoon from NRC and utility staff. But let me give you some very preliminary thoughts and observations.

NRC Transformation Accomplishments

I came into the agency at an interesting time, and as I see it, if there hadn't been so much energy behind transformation, in particular modernization, the NRC would not have so seamlessly transitioned to working remotely.

From what I've seen, management and staff have had the mindset from the beginning of the pandemic that we can be flexible and adaptable, and still successfully accomplish our mission.

The agency is working hard to ensure it is a modern, risk-informed regulator ready to meet the challenges presented by a rapidly changing and innovating nuclear industry. It has also been reevaluating the way it does business to optimize its processes and procedures to better serve the American public. The initiatives are taking place both across the agency as well as within offices.

And to leverage innovations developed within individual offices, the agency is encouraging a culture open to sharing ideas and creating tools to easily do that. The Executive Director for Operations has supported crowdsourcing initiatives and even created a challenge campaign to identify alternative and more efficient ways of doing things, and it named winners for best-in-class innovation for agile teams, consolidation of licensee information, and early alignment on Commission papers. These all involve process simplification, which allows the staff to focus its resources where they are most needed.

It's important to encourage and reward creativity. We can't expect every idea to be a homerun, but we need to foster an environment where everyone has the courage to share their ideas so we can occasionally hit one out of the park.

At the office level, Office of Nuclear Reactor Regulation has created Embark Venture Studio dedicated to implementing ideas and turning them into practical tools. They are developing some exciting tools that harness data and put it to work.

I think transforming our business processes is a great way to test our ability to transform our regulatory processes. One example being deployed later this year is an internal tool developed to support workforce planning. Another program with farther-reaching potential is the Mission Analytics Portal, which is already in place for internal processes.

Currently, the Mission Analytics Portal integrates data from different sources to give staff a clear view of useful information. For example, it has dashboards that can show supervisors the distribution of open licensing actions and a comparison of estimated versus actual hours spent on those actions.

In the future, we should be able to use the same tools to mine data from available sources such as inspection reports, so the data can provide insights we wouldn't otherwise see, leading to more transparent and informed decision-making.

As an aside, this approach to transformation is similar to that of Arizona Public Service. As Maria mentioned, APS won NEI's Top Innovative

Practice Award for applying machine learning and automation to business process functions. It's really a fascinating project. NRC is doing the same—focusing initially on business processes—in one case, licensing workflow processes—and then seeing where else these innovations can be applied.

Finally, while these innovations promote efficiency and modernization, they don't get at the risk-informed part of the NRC's ultimate goal of becoming a modern, risk-informed regulator. It is evident to me as a newcomer that the staff is actively striving to risk inform its decision-making. I'm sure you've heard those words, but there's a difference between saying you're going to do something and actually doing it.

The staff has developed the "Be riskSMART" framework, which supports consistency and gives staff confidence to accept well-managed risks without compromising the NRC's essential mission. The framework has recently been used to help assess the risks that covid-19 challenges have introduced to licensees and inspectors. In addition, Embark Studio currently has two initiatives aimed at risk informing exemption requests and subsequent license renewal.

Risk-Informed Regulation

As I wrap up my talk this morning, I want to make one final observation about risk-informed regulation and NRC's move in that direction. I'm very interested in risk-informed regulation, because in my mind, such an approach must rely on empirical data. Ultimately, risk-informed decision-making requires us to adequately characterize uncertainty. And to the maximum extent possible, such characterizations have to be grounded in the material world.

I developed a real appreciation for this area through work in the national security arena while on the Hill. The National Nuclear Security Administration spends on the order of \$1 billion per year performing experiments on all manner of nuclear weapons components and base materials to better understand their properties and behaviors under extreme conditions. They are in a constant process of refining areas of uncertainty as various weapons systems age in order to be able to certify the safety and reliability of our nuclear weapons stockpile. The parallels to the civilian industry are obvious.

Utilizing the 40+ years of observational data NRC, utilities, and others have collected about the performance of safety significant systems and components will be critical to developing and implementing a risk-informed regulatory approach. Likewise, research will be important—whether conducted by NRC, industry, or DOE. Efforts like CASL—the computer modeling effort at Oak Ridge—will also play an important role.

The final ingredient in risk-informed regulation, and maybe the most important in my view, is culture and diversity. I mentioned that risk-informed regulation is really about characterizing uncertainty. There is necessarily a lot of professional and personal judgment implied in that. Data is critical, but we all know data can be interpreted in a wide variety of ways. Having staff of diverse backgrounds and viewpoints helps ensure that uncertainties are fully understood and characterized so NRC can provide reasonable assurance of adequate protection.

Let me be even more clear: risk-informed regulatory approaches not only benefit from diverse viewpoints and backgrounds, they rely on them.

Which is why it is so important to get culture change and therefore diversity initiatives right.

I recently met with our first class of entry-level nuclear regulators in five years. What an impressive group! The 22 members of NRC's Nuclear Regulation Apprenticeship Network, or NRAN, are from 15 different top-notch universities across 14 states. They have diverse professional and cultural backgrounds. They are an enthusiastic bunch and of an entirely different generation than many of us. They are accustomed to flat organizations, open-source data, and "disruption" in a whole range of businesses. They are what I picture when I think about the future of the agency and our evolving approach to regulation.

Conclusion

In conclusion, I want to weave together a couple of threads for how I am approaching my tenure at the NRC.

I'm focused on good policy and good government first. What does that mean? Good policy means reasonable assurance of adequate protection (obviously), transparency in process and outcomes, and durable decisions that stand up over time. Good government means building up NRC's greatest asset—its staff—and ensuring adequate resources to protect people and environment.

I'm focused on laying the groundwork for the long-term future of the institution—risk-informed regulation, a diverse workforce, among other priorities. I want to make sure that NRC has the analytical tools and culture to efficiently and effectively regulate a changing industry:

- To engage with industry at the cutting edge of technology and operations.
- To ensure that our risk-informed regulatory approaches are underpinned with as much empirical data as possible.
- To apply data mining and machine learning techniques to the vast trove of inspection and observation data that NRC and industry have collected.
- To ensure that NRC hires a diverse workforce so that we understand specific risks from as many angles as possible.

Finally, I'm focused on continuous engagement. In other words, I have an open-door policy. I intend to be as accessible at the NRC as I was on the Hill and I look forward to seeing many of you virtually or in person as my tenure progresses.

I appreciate the opportunity to speak with you all this morning. Thanks again to Bob and my fellow panelists.