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**Prepared Remarks of Chairman Allison M. Macfarlane
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Good afternoon, and thank you for the kind introduction. I appreciate the invitation to be here today to talk about the issues on the Nuclear Regulatory Commission's plate and reflect on some of the accomplishments and challenges of my tenure. [Recognize and thank guests]

First, let me review some of our accomplishments and then I'll take a look forward to upcoming issues for the Commission.

First Impressions

When I came to the NRC in 2012, I was eager to work with my colleagues and the NRC staff, but unsure what I would face. The agency was going through a tumultuous time in which relationships within the Commission, and between the staff and the Commission, were strained. It had also been just over a year since the Fukushima Dai-ichi accident, and the staff was moving ahead on pertinent lessons for U.S. industry.

In addition, just weeks before my arrival, the DC Circuit Court of Appeals vacated and remanded a major rule on spent fuel storage at reactor sites, known as the "Waste Confidence Rule," which would require the NRC to undertake a substantial rulemaking and suspend certain licensing actions. I should also mention that the Federal Government as a whole was, in the context of the sequestration debate, experiencing budget challenges. In short, I knew I was walking into an environment where there was a lot of work to do and limited resources with which to do it.

I also had my own priorities and objectives in mind as I began my tenure, and I wanted to use the benefit of my knowledge and prior experience to enhance and strengthen the NRC's important work. From my time on the Blue Ribbon Commission on America's Nuclear Future, which set a new strategy for dealing with the country's nuclear waste, I had seen the benefit of effective public engagement. I was determined to approach my Chairmanship with a commitment to openness and transparency. As a nuclear waste expert, I had long believed that the back end of the nuclear fuel cycle – everything that occurs once spent fuel is removed from a reactor vessel – does not receive the attention and respect it needs. And as an academic, I intended to champion a broad-minded, inclusive approach in the agency's decision-making.

From my first day on the job, the NRC staff impressed me with their technical skill, their commitment to the agency's mission, and their sense of community. After visiting my first few reactors, I was impressed by our Resident Inspectors and their role at the facilities we regulate.

I take great pride in the tremendous work the NRC staff accomplished during the two and a half years that followed.

Fukushima

In the first few months of my tenure as Chairman, I had the opportunity to travel to Fukushima to see first-hand the devastation wrought by a nuclear reactor accident. Traveling through deserted villages, with weeds overtaking parking lots and thick layers of dust settling on artifacts of hastily abandoned lives, I came to better understand the societal costs of these accidents. The site itself emphasized this lesson even more strongly, with debris from the hydrogen explosions still littering the grounds. As a result, I've felt compelled to push for changes at U.S. plants based on the lessons we learned from that accident.

Given all of this, I'm pleased with the progress the NRC and the industry have made in implementing post-Fukushima safety enhancements. Our inspectors are working hard to confirm that plants meet their obligations under NRC orders requiring them to ensure that reactors can cope with a prolonged loss of offsite power, accurately measure the water level in spent fuel pools, and successfully operate containment vents during emergency conditions.

Plants have been acquiring additional equipment such as diesel generators, pumps, piping and cabling, and staging it in earthquake and tornado-proof structures at various locations around their sites. For instance, the Watts Bar plant in Tennessee has completed its response to our mitigating strategies order and awaits our review. This year, two industry response centers – one in Memphis and one in Phoenix – opened their doors. The industry's objective is to be able to provide emergency equipment to a stricken reactor within 24 hours.

Many plants have already put in place instrumentation that measures the water level in spent fuel pools, and are working on installing containment vents that will be operable under the high pressures, temperatures, and radiation fields that would exist during an accident. The NRC staff has also made significant progress in reviewing licensees' seismic and flooding hazard reevaluations, and is working through two significant rulemakings on mitigating hazards and determining filtration strategies at boiling water reactors.

Continued Storage

Now let me talk a little about the back end of the fuel cycle. The staff completed the Continued Storage Rule (formerly known as Waste Confidence) and an accompanying generic environmental impact statement – the work prompted by the appeals court decision I referenced earlier – in just two years, undeterred by the interruption of a government shutdown.

Of particular significance to me, at the Commission's direction, this rulemaking maximized public engagement. The staff conducted 13 meetings in ten states and received more than 33,000 public comments, each of which was reviewed and considered. I believe this successful process should now be a model for how the agency conducts future high-profile rulemakings.

Those of you who track such things will recall that I only gave partial approval to this new rule in my own vote. I was concerned that the staff had not adequately explored what would happen in the event of a potential loss of “institutional controls” – that is, a future where no one is responsible for ensuring that the waste remains in a safe condition indefinitely. I feel strongly that we as a nation not use the assurance of safe interim high-level waste storage as an excuse not to make progress in developing a permanent repository. We must reinvigorate our focus on the permanent disposal of spent fuel.

Yucca Mountain

In terms of the back end, I should also mention Yucca Mountain. As many of you know, in August 2013, the DC Circuit Court of Appeals ordered the NRC to resume review of the Yucca Mountain license application, using its remaining Nuclear Waste Fund resources – about \$13 million.

While we acted to resume work on Yucca Mountain in a timely and transparent way, the work we’re doing now represents only part of a lengthy and complicated licensing process, which is nowhere near completion. At the time the staff’s Yucca Mountain work was suspended in 2010, there were more than 300 contentions challenging the application. The Safety Evaluation Report and the environmental impact statement may trigger additional contentions. Hearings must be conducted and each contention must be resolved by the Licensing Board before the NRC’s review can be considered complete. Only then would the Commission make a final licensing decision.

I want to emphasize that the Department of Energy and the Administration have been clear that they’re not pursuing a license for Yucca Mountain, and Congress hasn’t provided resources for them to do so. Without a willing applicant, the NRC cannot pursue the remaining portion of the licensing process.

International Engagement

In the area of permanent high-level waste disposal, or any of the other technical areas I’ve just discussed, I think there’s a lot to learn from the international community. The NRC engages in significant international work, from collaboration with partner regulators to assistance to newcomer countries. I view all of this work as essential, as it provides the NRC an opportunity to learn from others and helps us ensure nuclear safety and security practices are followed worldwide. I’ve advocated strongly for the NRC’s continued international engagement by maintaining close relationships with my counterparts at regulatory agencies around the world. The NRC works closely with the International Atomic Energy Agency, which has enabled us to engage in multilateral and regional regulatory development assistance and advance our bilateral relationships with developing countries.

I also chaired the Multinational Design Evaluation Program Policy Group, which oversees a framework of regulatory collaboration on new reactor designs. Through this program, regulators around the world who are, or may soon be, licensing and overseeing new reactor construction are leveraging resources and addressing common issues like vendor oversight, quality assurance, and digital instrumentation and controls.

Interagency Engagement

One important theme in my discussions with my international counterparts is regulatory independence. It’s essential that regulatory decisions, in any country, are taken without undue political pressure or industry influence. I’ve been fiercely protective of the NRC’s independence, but I also

recognize that it doesn't equate to isolation. That's why I've pushed for us to be more engaged with the Executive Branch agencies that also deal with nuclear issues; the Department of Energy and the State Department are two of the most significant.

I've established productive and cooperative working relationships with my U.S. Government counterparts. I meet regularly with them to discuss areas of mutual interest and participate in various interagency activities. For example, I chair an interagency task force on radioactive source security. I also helped found and chair a forum of independent and executive branch regulators who share lessons learned on cybersecurity issues that affect the industries we regulate. These activities have enabled me to raise awareness across the Government about who we are, what we do, and why it's so important.

Public Engagement

It's equally important for the general public to have this awareness. I've been a strong proponent of the NRC's public engagement and I'm proud of the progress we've made. We've established a requirement that staff report uniformly on public meetings. We've asked that staff provide training for employees who regularly interact with the public, and also required professional facilitation for some public meetings.

For the NRC to be an effective regulator, I believe public trust is essential. In many cases, the NRC achieves that trust, but in some cases I think we have to work harder. For example, when I came to the NRC, public hearings around the San Onofre nuclear plant had the potential to become highly contentious, and it was clear that significant portions of the public there didn't trust the NRC. I'm happy to say that we've turned that situation around and have held many successful meetings with the public in southern California.

Public engagement is equally important for industry. Having an effective relationship with the local community around a nuclear power plant is essential in both everyday and especially emergency situations. In my discussions with industry, both formal and informal, I've encouraged them to keep an active dialogue with local government and public interest groups, and some have risen to this challenge.

Improving the NRC's Organizational Efficiency

One other aspect of maintaining public trust, in my view, is the assurance that an agency is operating efficiently, using its resources wisely, and prioritizing its work appropriately. In the past few years, the Commission and senior management have had to confront the fact that the future the NRC is facing is different than previously anticipated. The predicted "nuclear renaissance" did not materialize and unplanned work resulting largely from Fukushima and Waste Confidence resulted in resource limitations that had a real impact on the staff's ability to manage its ongoing workload. Sequestration, the government shutdown, and the decision to decommission several reactors before the end of their licensed life also impacted the NRC during my tenure.

In response to this situation, the Commission directed the staff to work to ensure that the NRC is best positioned to continue its important safety and security mission in the coming years regardless of what the future holds. The staff is currently addressing this issue.

So now, let me give you my perspectives on what lies ahead for the NRC. I'd like to address Fukushima, operating reactor performance, new reactors, decommissioning, the back end of the fuel cycle, and the NRC's role internationally.

Fukushima

All told, the post-Fukushima safety enhancements have required tremendous effort and resources both from the NRC and from the industry. Much has been done, but our joint challenge now is to keep up the momentum, maintain our commitment, and ensure that the lessons of Fukushima are memorialized in a sustainable way in our day-to-day work.

The agency needs to continue to work through the remaining recommendations of the Near-Term Task Force. The Tier 2 and Tier 3 priorities include important topics such as consideration of hydrogen mitigation and control during an accident, the need to periodically review external hazards as more is learned about these processes over time, and the consideration of potential enhancements to venting systems in reactor designs other than the Mark I and II boiling water reactors. I believe that complacency is always a threat and the only way to avoid it is to keep the lessons from this tragic accident alive in our nuclear safety practices.

Plant Performance

I also believe we need to continue to focus on nuclear power plant performance. Though the majority of plants in the United States are performing well, we're seeing a few areas of concern. Some of the lowest performing U.S. plants, for example, seem to remain in that category for extended periods, rather than addressing issues quickly to regain higher performance status.

In my time at the NRC visiting plants and observing performance, I've learned the value of good management. Poor management is easy to spot from the lack of safety culture and other persistent problems at plants. I believe that solid leadership from the top – and not just attention to the bottom line – is necessary to ensure consistent plant performance.

In this regard, I'm confident that the combination of a rigorously-implemented reactor oversight process, a highly-qualified workforce, and committed resident inspectors, are protective. Still, our objective must always be to prevent problems. In this regard, the industry's self-regulator, the Institute for Nuclear Power Operations, maintains a strong commitment to safety across the U.S. nuclear fleet. INPO, which formed after the Three Mile Island accident, plays a critical role in fostering effective communication of best practices and lessons learned across the industry.

New Reactors

The staff and the industry are also incorporating post-Fukushima insights into the new reactor construction projects currently underway at Vogtle in Georgia, V.C. Summer in South Carolina, and Watts Bar in Tennessee. I've had the opportunity to see the progress at Vogtle and Watts Bar first-hand. And I can attest to the safety consciousness I observed in both the NRC's construction inspectors and the engineers who are building these large and complex machines.

One challenge we've encountered is that nuclear reactors haven't been constructed in the United States in quite some time. As a result, today's component manufacturers have had to adjust their safety culture practices to accommodate the rigorous, often unique, requirements presented by nuclear construction. Some parts of the industry continue to struggle with these issues.

I believe industry has an essential responsibility in ensuring quality control oversight of vendors and in preventing counterfeit or fraudulent parts from entering the supply chain. This concern is not

unique to the United States or to the nuclear industry, and both the NRC and industry have engaged with foreign counterparts to champion strict adherence to quality control standards.

Reexamining Requirements for Decommissioning

As these reactors are being constructed, others have closed and begun decommissioning. Currently, plants follow operating reactor regulations during decommissioning. That means they may request exemptions from certain requirements that may no longer be necessary once fuel is removed from the reactor core. While I believe that these regulations provide a robust framework for the NRC's operating reactor oversight, I question whether exemptions remain appropriate at a time when multiple plants have entered the decommissioning process. I believe it's time for the NRC to develop regulations specific to the decommissioning of nuclear power plants, both to help utilities through decommissioning and to structure public expectations of the process.

Completing the Fuel Cycle

As I noted earlier, I've long believed that an integrated approach to the nuclear fuel cycle, with sufficient emphasis on the back end, is essential in working with all forms of nuclear energy. In this context, some of my most significant efforts have been directed toward bringing greater focus to matters such as on-site spent nuclear fuel storage and spent fuel transportation and disposal.

As an independent regulator, the NRC doesn't make energy policy for the nation, but we're nonetheless impacted significantly by the decisions of our energy policy-makers. As the Administration and Congress continue to grapple with a path forward for nuclear waste management and disposal in the United States, the NRC must in turn continue to ensure that radioactive waste can be stored safely at nuclear reactor sites until a permanent disposal option becomes available.

This raises a number of issues of particular significance to me. It's important to mention that fuel is typically designed to maximize its performance in the reactor, not in a repository. Considerations on the front end don't always account for how the fuel may behave decades after its use. Another issue is spent fuel transportation. Fuel that's been removed from pools and placed in dry casks may need to be repackaged before its ultimate disposal to account for the design of the disposal site, damaged fuel, or heat considerations. Research on long-term spent fuel integrity, currently underway in the U.S. and elsewhere, will be critical to protecting public health and safety.

I also note that an integrated approach to the nuclear fuel cycle means that we have to address the reality that – as the Blue Ribbon Commission concluded – current and projected spent fuel inventories will require more than one repository. In addition, the Administration is now exploring the potential for deep geologic boreholes for high-level waste emplacement. Since our current siting standards for deep geologic disposal are specific to the Yucca Mountain site, I believe it's appropriate and necessary to begin a rulemaking to address a generic standard.

Enhancing International Assistance

As we continue to learn from other countries' experiences with nuclear waste disposal, new countries are just beginning to consider nuclear power or nuclear applications. I believe that the assistance the NRC provides to these countries to develop their regulatory infrastructure will remain critically important. Nuclear power is viewed in some of these countries as a source of prestige, and often a fledgling regulator has trouble keeping up with its government's ambitious construction plans.

In particular, I'm concerned about nations that seek nuclear power capabilities without building the necessary indigenous expertise and regulatory infrastructure to ensure reactor construction and operations are performed both safely and securely. Heightening my concern is that some companies are marketing a "build, own, operate" approach in which a country need only provide the financing and a foreign entity constructs and operates a nuclear reactor. The option has proven attractive for nations wishing to fast track their nuclear energy development, but I firmly believe that nuclear power operations must be paired with effective safety oversight and accountability by committed and highly trained regulators.

What's Next?

So what's next for me? Beginning January 1, I'll be a Professor of Public Policy at the Elliott School of International Affairs at the George Washington University, and I'll be directing the Center for International Science and Technology Policy. Universities typically bring new staff on board twice a year, which is why I've chosen to leave NRC at this particular moment.

In my new position, I'll have the opportunity to return to research and teaching, and to train a new generation of policy experts. My experience at the NRC will certainly inform my vision for the Center – in particular, I've come to better understand the essential role that regulatory perspectives play in policy-making. I also appreciate the interrelation between nuclear safety and the often more frequently discussed security and safeguards, and the need to consider the three holistically.

It's been an honor and a pleasure to serve my country as Chairman of the NRC for the past two and a half years. I'm grateful to President Obama for nominating me, and I appreciate the talented, hard-working NRC staff more than I can say.

I'm confident that, after I leave, the NRC will maintain its well-deserved reputation as one of the best agencies in the Federal Government. I'm confident that the Commission will continue to function effectively after my departure, and I wish my colleagues well. Their work, together with our dedicated staff, will enable the NRC to remain an effective, independent and trusted regulator.

I greatly appreciate the opportunity to speak to you today. I hope you've enjoyed your lunch, and I'd be happy to take your questions. Thank you.