NRC NEWS

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"The Next 25 Years"

Prepared Remarks of Chairman Allison M. Macfarlane

at the 2013 NRC Regulatory Information Conference (RIC)

Tuesday, March 12, 2013

Intro Slide

Good morning, and thank you, Eric, for the introduction. It's my great pleasure to welcome you to the 25th annual Regulatory Information Conference (RIC). Whether you come every year or are here for the first time, I encourage you to sample the wide variety of the sessions and activities this conference offers. I'd like to extend a special greeting to our international colleagues, who have traveled from more than 30 countries to be here. As I walked around this morning, I was delighted to see many familiar faces and look forward to getting to know more of you during the course of the week. I'd also like to acknowledge the NRC staff for its tremendous effort in making this conference a success year after year.

Slide 2: 1988

When the first RIC was organized in 1988, the nuclear industry was in a state of flux. Just two years earlier, a devastating nuclear power plant accident had occurred at Chernobyl. Here in the United States, we were still unraveling the lessons of Three Mile Island even as we tried to make sense of what had happened halfway around the world. The global nuclear safety community was just beginning to come together on what would become the Convention on Nuclear Safety. I would suspect that the first RIC organizers hoped that their idea would endure as an annual tradition a quarter century later. But it's safe to assume that they would have had difficulty predicting the myriad ways that the agency and the world would change in the 25 years to come. After all, how many of us, squinting into the green glare of a mid-'80s Apple computer, could have anticipated the things we'd be able to do with an iPhone?

The famed physicist Niels Bohr quipped, "prediction is very difficult, especially about the future." As a geologist I've spent a lot of time studying and writing about this subject. Despite the great technological leaps we've made in the past quarter century, it is unwise to think we

can confidently predict what lies ahead. It would have been difficult to imagine in 1988 that just 13 years later, the country would be reeling from a terrorist attack that would directly and permanently impact nearly every aspect of U.S. policy. Likewise, it was statistically improbable, but not impossible, that Japan would witness an earthquake and tsunami of a magnitude not previously seen in a millennium of recorded history. Nonetheless, both events happened, and substantially altered the way we think not only about nuclear safety and security regulation, but about the limits of predictability and certainty.

When I became Chairman eight months ago, I came with some specific leadership objectives that were influenced by my previous years of research. I arrived eager to enhance my understanding of all aspects of the agency's responsibilities in order to serve as an engaged and effective regulator. I am grateful for the support of the diligent and dedicated cadre of NRC management and staff as I moved along this learning curve. While there is still more to learn, I am pleased that the NRC has continued to progress during my transition. Together, we are meeting our regulatory responsibilities.

Since my arrival at NRC, I have joined my colleagues on the Commission in keeping an ambitious schedule. I've traveled to operating plants in various regions of the country, and will visit a site under construction later this month. I've spoken extensively with plant management and NRC resident inspectors as well as state and local government representatives and community groups. I've testified on Capitol Hill and met individually with numerous members of Congress. I've met with my counterparts from regulatory organizations overseas, led a U.S. delegation to a major international nuclear safety conference, and assumed the Chairmanship of the Multinational Design Evaluation Program (MDEP). Inside the White Flint North campus, my fellow Commissioners and I continue to maintain a collegial working relationship, and I've been privileged to get to know many of the NRC staff.

Slide 3: What Do We Know Now?

My objective as Chairman is to lay the groundwork for the agency's continued success in the next quarter century and beyond through addressing what we already understand, and using scientific data to inform our best planning and decision-making.

So what do we know now?

- We are continuing to address lessons learned from Fukushima.
- Our operating reactor fleet is getting older, with approximately half of it slated to enter a period of extended operation by 2017.
- Most of the plants are operating well, while two are in extended shutdown as they address some specific issues.
- Construction is underway on several new reactors, and we're applying our regulations to a new generation of designs.
- We're addressing regulatory issues that span the entire fuel cycle.
- We face evolving security threats from a variety of adversaries.
- We face the challenge of maintaining our core mission in a difficult budget environment.
- And we have a diverse group of parties who follow our work and seek to maintain an open dialogue with us.

As we consider these complex issues, we would be remiss not to draw two important parallels between the first RIC and today. First, we once again find ourselves two years removed from a major nuclear accident, working to understand its lessons and incorporate them

into meaningful, lasting improvements. Second, and more broadly, we must remain committed to the principle of good regulation that led the NRC to conceive of this conference in the first place – that is, a need for clear, consistent communication with those who are affected by our work. This conference has always been open to the public, and draws a broad variety of attendees from industry, federal, state and local government, interest groups, academia, and the international community. Enhancing the NRC's engagement with the public is a high priority for me. I view this conference as a particular source of pride for our agency and I believe our continued commitment to openness and transparency will serve us well as we address the challenges that will shape the agency's next 25 years.

Slide 4: Fukushima Accident

The NRC's efforts to implement lessons learned from the Fukushima accident continue. Several of my colleagues on the Commission and I have had the opportunity to visit the Fukushima site since the accident. My visit there last December was a deeply moving experience for me. On the drive to the plant, we passed villages overgrown with vegetation in a way that's only possible when no one lives in them. Remnants of well established and hastily abandoned communities, like overgrown family gardens and rice paddies, served as reminders of how quickly life changed for the people in the area surrounding the plant. At the site, the Japanese are still contending with debris left over from the tsunami as they are working to decommission the damaged reactors. Taken together, the experience served as a sobering reminder of the fact that we don't know everything about how the Earth behaves, and we must factor this into how we approach nuclear safety. U.S. nuclear power plants have made significant progress in beginning to implement the near-term actions the NRC has identified, and the Commission and staff are working collectively to discuss the longer-priority items. We are committed to maintaining an open dialogue with industry and other interested parties as we move forward with this process.

Slide 5: Operating Reactors

As operating reactors in the United States continue to age, the NRC is committed to ensuring that they continue to operate safely and securely. Despite an established, rigorous regulatory program for aging management, the NRC and industry must contend with unknowns. It is essential that we continue to treat aging management as a dynamic process, and draw upon domestic and international operating experience to further our knowledge and our readiness to address unique challenges if they arise. The U.S. reactors have been operating longer than most others in the world; there is limited experience to draw from to address life beyond 60 years. In the coming years, as we continue to consider these issues, industry will be responsible for demonstrating the continued integrity of plant structures, systems, and components.

In terms of day-to-day plant operations, most plants are performing well. For those few that are experiencing challenges with their safety performance, the NRC maintains a diligent process of oversight, inspection, and follow-through. You will hear more in a moment from our Executive Director for Operations, Mr. Borchardt, on how the NRC is addressing particular plant issues. I can assure you that the NRC will not allow any reactor to operate unless we are satisfied it can do so safely. As always, we expect that licensees will be responsive to the NRC's inquiries and orders and communicate quickly and effectively with the local community.

At all of the sites I've visited, I've been consistently impressed with the work of NRC's resident inspectors. They are a daily presence at the sites and are committed to the mission of

ensuring public health and safety. Their work ensures that plant activities are properly conducted, equipment is properly maintained, and potential concerns are identified and addressed. I've also observed that there is a direct link between strong plant management and plant performance, both from operational and organizational perspectives. I've visited sites where management is responsive to its employees as well as the NRC, and maintains good relationships with the local community, including the local law enforcement that would serve as first outside responders to an emergency. Good management practices, and the effective plant operation that results, should be emulated throughout the industry. Admiral Jim Ellis, the former President and CEO of the Institute for Nuclear Power Operations (INPO), was fond of saying that his organization "promotes excellence, not just regulatory compliance." Common sense dictates that a leadership and management style that promotes openness and excellence and actively seeks opportunities for improvement is in everyone's best interest.

Slide 6: New Reactors

The NRC is also continuing its work in the new reactor area. Last year, we issued Combined Licenses for four new units, two each at Summer and Vogtle. We are now overseeing the construction activities at both sites. I understand that Summer has completed the pouring of first nuclear concrete. They are each making good progress, having worked with us to address some issues that caused early delays. These are the first units licensed under the Part 52 licensing process, and some challenges are to be expected as we navigate this new territory. We will continue to work to ensure that these licensees, and others that may follow, are appropriately constructing their plants as set forth in the licensing basis, according to the combined license process. At this time, the NRC is actively reviewing 10 additional combined license applications for a total of 16 new reactor units. As new reactor construction potentially expands in the years ahead, licensees must maintain responsibility for quality assurance for reactor components as well as oversight of all contractors, subcontractors, and vendors.

In addition to the licensing and oversight of the construction of new plants, the NRC is engaged in reviewing and certifying additional new reactor designs. The agency is nearing completion of the certification of the GE Hitachi design and reviewing the Mitsubishi Heavy Industries and AREVA designs. We're also engaging in discussions with Korea Hydro & Nuclear Power on their design.[1] Further, we are preparing for applications of small modular reactors, including design certifications from Babcock and Wilcox for their mPower design, Westinghouse for their SMR design, and NuScale Power. SMRs represent an evolutionary change for the NRC, in which we apply existing regulations to new concepts.

It's important to note that, regardless of the reactor size or type, the NRC has integrated lessons learned from Fukushima into the new reactor licensing process. Small modular reactors may raise new or different safety questions; their size may lead to a wider range of potential sites, while their designs may be more seismically stable. These reactors may also be of interest in other parts of the world to supply water desalination or enhance electricity generation to support a local or regional grid. Through the IAEA and bilaterally, the NRC is involved in initiatives to address regulatory infrastructure development in countries considering nuclear technology.

[1] GE-Hitachi - Economic Simplified Boiling-Water Reactor (ESBWR); Mitsubishi Heavy Industries - U.S. Advanced pressurized-Water Reactor (US-APWR); AREVA – U.S. European Pressurized Reactor (US-EPR); Korea Hydro & Nuclear Power Advanced Power Reactor 1400 (APR-1400)

Slide 7: Comprehensive Approach to the Fuel Cycle

As we approach our work, it is clear to me that more emphasis is needed both within the NRC and among those we regulate to holistically consider all aspects of the fuel cycle. In general, I believe that a comprehensive approach to the fuel cycle from a public policy perspective will help enhance public confidence that nuclear facilities can operate safely and securely. In addition, it is essential for aspiring countries to approach a new nuclear power program with the ultimate disposal of their spent fuel in mind. The United States and other countries with well-established nuclear programs have an important role to play in advocating this approach.

On the front end of the fuel cycle, issues of public health and safety are not all strictly within NRC's purview. For example, as we seek to evaluate environmental impacts associated with uranium recovery, we must work closely with other Federal government agencies and State and Tribal governments. We've made progress in upgrading our regulatory framework for fuel cycle facilities to further account for shared oversight with other agencies. It's important to remember that the lessons of Fukushima extend beyond power reactors; for example, fuel cycle facilities must also demonstrate that they would be able to withstand seismic events.

The back end of the fuel cycle also requires sustained attention as part of a comprehensive regulatory approach. I believe that it is incumbent upon the U.S. Congress and the Administration to address a long-term solution for high-level waste disposal and management. As the U.S. Government continues its work in this area, the international community can provide valuable insights related to the approaches other countries have taken. Industry also has an important role to play in demonstrating that spent fuel can continue to be stored safely and securely on site until a permanent solution is identified. Space constraints in spent fuel pools are already a challenge for many U.S. sites.[2] Greater focus is being placed on dry cask storage, particularly as plants consider extended operation. In the next ten years, additional independent spent fuel storage installations will undergo license renewal and face aging management requirements. The staff is undertaking research efforts to assure the NRC is prepared to effectively regulate longer-term storage.

Slide 8: Decommissioning

On a related note, the decisions to close the Crystal River Unit 3 and Kewaunee Power Stations have focused attention on decommissioning. NRC regulations provide that decommissioning will be completed within 60 years of permanent cessation of operations, and our regulatory guides outline three options for doing so: (1) immediate dismantlement, or DECON; (2) delayed dismantlement, or SAFSTOR; and (3) permanent encasing on-site, or ENTOMB. While the DECON option allows for the property on which the facility is located to be released for unrestricted use and the NRC license terminated, SAFSTOR permits radioactive material to remain on-site for up to 60 years, and entombment would keep contaminants permanently encased on site. Licensees may also choose to employ a combination of these options, where certain portions of the facility are dismantled and others remain. I believe that the NRC should be examining its decommissioning regulations to ensure they are current and appropriate in preparation for the possibility that other facilities may opt not to renew their licenses. Just as the NRC is preparing for reactor license renewal and new reactor licensing that

[2] http://www.nei.org/resourcesandstats/documentlibrary/nuclearwastedisposal/factsheet/statusofusednuclearfuelstorage/

could result in a possible expansion of the U.S. fleet, we must address this other end of the spectrum. In my view, this re-examination is essential because the 40-year duration of a reactor license and the 60-year duration of the SAFSTOR period both exceed the length of most experts' professional careers. We must ensure that our regulations are sufficiently comprehensive and robust to address issues that will arise long after most of us are retired.

Slide 9: Waste Confidence

Also in the waste area, most of you will recall that last summer, the U.S. Court of Appeals for the D.C. Circuit found that the Commission needed to better address the possibility that there would be no permanent disposal option for spent fuel. The Court cited particular examples of environmental impacts the NRC needed to more fully explain, including the impact of potential spent fuel pool leaks or fires. In September 2012, the Commission unanimously directed the staff to complete an in-depth environmental impact statement and rulemaking on waste confidence. There were several options that the agency could have chosen to go about this, and I'm pleased to say that the selected approach maximizes opportunities for public involvement. The NRC has a dedicated team of expert staff to address this issue full time, and work is well underway. The staff has already organized a number of public meetings and is planning for more extensive engagements after the draft environmental impact statement is issued. Last week, the staff made public its environmental impact statement scoping report. We are committed to taking all views into account as we proceed with our review.

Though an environmental impact statement of this type is new in this area, waste confidence has been a focal issue for the NRC since before the first RIC, and there is a long, rich history from which to draw. The agency is not starting from scratch with this work; rather, there are a number of existing analyses and reports that have already been conducted and considered and now must be included in the agency's response. It is important to note that all license application review activities continue, but the NRC will not issue licenses dependent upon the Waste Confidence Decision or Temporary Storage Rule until these issues are addressed.

Waste confidence is also an issue that has clear relevance across a variety of sectors; we've received thousands of public comments and I'm told it was the second-most popular RIC session in registrations. The resonance of this issue is cross-cutting because it impacts licensing for new reactors, power reactor license renewals, and site-specific licensing and license renewals for independent spent fuel storage installations. We encourage all of you to give us your input as we as we continue our work on these issues.

Slide 10: Nuclear Materials

In the materials area, the NRC continues its broad oversight. With tens of thousands of materials licensees across the United States, it is essential that we continue to work collaboratively with our 37 Agreement State partners to serve as strong, effective regulators. One area of significant interest is the use of radioactive materials for medical purposes. As the United States continues to explore possibilities for domestic production of medical isotopes, the NRC is committed to ensuring that plans for potential production facilities are carefully reviewed. As always, the use of these isotopes remains an important regulatory focus.

The safe and secure regulation of nuclear materials is another area where coordination with other parts of the U.S. Government and our international counterparts is essential. As the agency charged with licensing imports and exports of nuclear materials, and with ensuring the

security of nuclear facilities and materials, the NRC plays an important role in U.S. Government non-proliferation efforts. It is important that we communicate all that the NRC does already in the non-proliferation area.

For the export of high-risk materials, such as highly-enriched uranium, we work closely with the Executive Branch to receive assurances at the highest level from the destination country that the material will be used safely and securely. We also work closely with our foreign regulatory counterparts to ensure that safety and security obligations are well understood. More broadly, we provide a critical perspective within the U.S. Government and abroad on the safe, secure, and independent regulation of these materials for peaceful uses.

The NRC also contributes to other areas of U.S. Government non-proliferation work. A number of our licensed facilities fall under IAEA safeguards, and have hosted safeguards inspectors in recent years. Along with other U.S. Government agencies, we provide reporting required by the IAEA under the Additional Protocol. We remain engaged with the IAEA in this area and are meeting our continued obligations. In addition, recognizing that proliferation concerns are inextricably linked with theft and diversion, we are consistently working to assess, and where appropriate strengthen, our security program to address evolving threats.

Slide 11: Nuclear Security

In the years since 9/11, the NRC has taken a comprehensive approach to security, integrating it into each of our technical programs and ensuring a strong interface between safety and security regulatory activities. Advances in technology – the expanding use of digital instrumentation and controls, for example – bring new dimensions to what constitutes a "threat." Appropriately, cyber security has been receiving a lot of attention. The NRC has been coordinating closely with other Federal agencies to address this persistent, constantly evolving threat. In 2009, the NRC published a Cyber Security Rule for nuclear power reactors. The NRC has reviewed and approved cyber security plans from all of its operating nuclear power plant licensees. The staff is now conducting inspections to confirm security and compliance with the requirements and determine how the licensees are progressing. We're in the process of evaluating the need for cyber security requirements for fuel cycle facilities, non-power reactors, independent spent fuel storage installations, and byproduct materials licensees.

More generally, we've been working to advance our international cooperation on security issues. Last December, for instance, we hosted the first-ever international security regulators conference, which brought together high-level experts from around the world to discuss a variety of issues facing nuclear security regulators. Through this event and other bilateral and multilateral activities, we are developing the international relationships necessary to work effectively toward the prevention and mitigation of security incidents.

Slide 12: International Cooperation

As the security regulators conference demonstrated, international cooperation has never been more important. In her remarks at the 1997 RIC, then-Chairman Shirley Ann Jackson announced the establishment of a new International Nuclear Regulators Association. INRA was intended to promote frank and open discussion among senior regulators from the most established nuclear power programs. Today, INRA is in its 15th year and continues to successfully meet this objective. As I mentioned earlier, I recently assumed the Chairmanship of the Multinational Design Evaluation Program, which has worked to develop harmonized

approaches to new reactor design review and licensing issues. The Fukushima-Daiichi accident clearly reinforced the need for international cooperation to identify and implement lessons learned, do everything possible to prevent another accident, and ensure that optimal emergency response measures are in place everywhere. But the benefits of international cooperation go far beyond this. We must continue to draw upon the wealth of international operating experience and hold regular exchanges with our counterparts to enhance nuclear safety.

Slide 13: Public Engagement

During my time at NRC, I have made improving public communication a priority. I believe that the NRC is doing an excellent job upholding its regulatory responsibilities, but we should strive for continuous improvement in conveying information about that good work to the public. The NRC's public meeting process and social media initiatives such as the NRC Blog and Twitter account are examples of the staff's current efforts to engage the public. It is essential that the public have access to information on NRC's activities in plain language that is clear and easily understood. I believe we also need to create more opportunities for two-way dialogue so that we better understand the views of those who wish to communicate with us. In order for our regulatory process to be successful, we must take a broad range of viewpoints into account. Congress, industry, state, local and tribal governments, non-governmental organizations, and the public should feel confident that we are not only hearing their views, but actively considering them.

I think we must go further in pursuing this. There is a growing body of research – including from the 1990s on nuclear waste management – that suggests a direct link between public involvement, the development of trust between the industry and the public, and safety, within the nuclear field and beyond. A 2012 study conducted for the IAEA concludes that "more engagement with the public in a formal process that accepts and respects the validity of scrutiny from civil society represents an immediate step the nuclear industry can take that provides additional oversight, builds confidence and can contribute to increased safety."[3] The study makes this connection in part by noting that "local knowledge and experience can…identify issues that may otherwise have been neglected or omitted." A common theme in the various studies, regardless of the industries assessed, is that communication must consist not only of the sharing of information, but the creation of the kind of ongoing dialogue I just referenced. I believe that this rings true not only for industry, but for the NRC. I have made an effort to meet with a diverse cross-section of local communities during each of my site visits, and have also hosted interested organizations and individuals at my office. To give greater visibility to my activities, I will be making my meeting calendar public. I believe that increased external engagement is a key element to ensuring NRC's continued success in the coming years.

Slide 14: Budget Challenges

Finally, you may be aware of NRC's recent efforts to preserve the three-building White Flint headquarters campus. Questions have been raised about the need to renew the lease for Two White Flint because of the government-wide efforts to reduce the building space federal agencies occupy. This is a priority issue for me, recognizing that we are most productive when we can all work together and not operate out of satellite facilities. I'm pleased to report that, through our ongoing cooperative efforts with the General Services Administration (GSA), we have made significant progress in developing a plan that maintains the White Flint campus, and

[3] "Public Involvement as a Tool to Enhance Nuclear Safety," IAEA, March 31, 2012

also reduces the agency's footprint. More work is needed, but I am optimistic about our chances for success.

Even as we address the issues I have touched on, our country and many others are operating in challenging economic times. You've undoubtedly been bombarded with reports about the budget challenges the U.S. Government is facing. Despite the cuts the sequestration has prompted, the NRC remains focused on its core mission to protect public health and safety and the environment. Further, we will not furlough any employees. That said, the sequester will impact our agency if it continues. You'll hear more about this from Mr. Borchardt in a moment. I have been extremely impressed by the NRC staff's response to these challenges. Budget limitations do not change the NRC's mission or the public's expectations of us. We will continue to work with the same diligence and high quality regardless of the fiscal constraints within which we must operate.

Slide 15: The Next 25 Years

So what will the next 25 years bring? While we can't predict the future, there are some basic elements of our work that were established when the NRC was created and will endure in the coming decades. The NRC will still be charged with protecting public health and safety, a commitment we will continue to maintain with dedication and integrity whether the focus is on new construction, license renewal, or decommissioning. We will be continuing to apply the lessons of Fukushima and the accidents that preceded it in our efforts to prevent another accident in the United States. We will continue to face down threats and challenges from those who seek to inflict harm on our citizens. And we will have a diverse following of individuals and groups who are interested in, and affected by, our decisions.

Based on our progress on the issues I described earlier, I believe we are pointed in the right direction. We must focus on the following items: We must continue our commitment to effective, open and transparent regulation. We must continue to incorporate the results of peer-reviewed research into our regulatory decision-making, relying as we do now on some of the best technical experts in the field within and outside of the NRC. We must continue the RIC tradition by actively involving the public in our decision-making, communicating with all interested parties in ways they can understand, and ensuring that we consider their perspectives. I believe we must commit to a more integrated approach to the entire fuel cycle and, through our actions, continue to demonstrate the importance of doing so to our licensees, the rest of the U.S. government, and the public. We must continue to serve as leaders and expert resources to the government – and the international regulatory community – while preserving our independence. We must maintain and strengthen our cooperation with our international partners in a global nuclear safety and security network, in which our regulatory approach continues to be regarded as a "gold standard."

I am committed to steering the NRC toward continued excellence. I am proud of our agency, and honored to be its Chairman. And while I still think Niels Bohr was right about the limits of prediction, I anticipate a bright future for the NRC that inspires confidence through exemplary performance. Thank you.