

NATIONAL PRESS CLUB LUNCHEON WITH CHAIRMAN ALLISON MACFARLANE

SUBJECT: SAFETY OF UNITED STATES NUCLEAR POWER PLANTS

MODERATOR: MYRON BELKIND, PRESIDENT OF THE NATIONAL PRESS CLUB

LOCATION: NATIONAL PRESS BALLROOM, WASHINGTON, D.C.

TIME: 1:00 P.M. EDT

DATE: MONDAY, NOVEMBER 17, 2014

(C) COPYRIGHT 2008, NATIONAL PRESS CLUB, 529 14<sup>TH</sup> STREET, WASHINGTON, DC - 20045, USA. ALL RIGHTS RESERVED. ANY REPRODUCTION, REDISTRIBUTION OR RETRANSMISSION IS EXPRESSLY PROHIBITED.

UNAUTHORIZED REPRODUCTION, REDISTRIBUTION OR RETRANSMISSION CONSTITUTES A MISAPPROPRIATION UNDER APPLICABLE UNFAIR COMPETITION LAW, AND THE NATIONAL PRESS CLUB RESERVES THE RIGHT TO PURSUE ALL REMEDIES AVAILABLE TO IT IN RESPECT TO SUCH MISAPPROPRIATION.

FOR INFORMATION ON BECOMING A MEMBER OF THE NATIONAL PRESS CLUB, PLEASE CALL 202-662-7505.

**MYRON BELKIND:** (Sounds gavel.) Good afternoon, and welcome. My name is Myron Belkind. I'm an adjunct professor at the George Washington University School of Media and Public Affairs, a former international bureau chief for the Associated Press, and the 107<sup>th</sup> President of the National Press Club. The National Press Club is the world's leading professional organization for journalists committed to our profession's future through our programming with events such as this while fostering a free press worldwide. For more information about the National Press Club, please visit our website at [Press.org](http://Press.org).

On behalf of our members worldwide, I'd like to welcome our speaker and those of you attending today's event. Our head table includes guests of our speaker as well as working journalists who are Club members. And so if you hear applause in our audience, I'd note that members of the general public are attending and so it's not necessarily evidence of a lack of journalistic objectivity. I'd also like to welcome our C-SPAN and Public Radio audiences. And you can follow the action on Twitter using the hashtag NPCLunch. After our guest's speech concludes, we will have a question and answer period. I will ask as many questions as time permits.

Now, it's time to introduce our head table guests. I'd ask each of you to stand briefly as your name is announced. From your right, Joseph Martin, Washington bureau chief of the *Omaha World Herald* and a member of the National Press Club Board of Governors; Joshua Higgins of Inside Washington Publishers, and a new National Press Club member; Kevin Bogardus of E&E Publishing, and I'm pleased to say another new National Press Club member; Susanne Struglinski of Baker & McKenzie, and a member of the National Press Club Board of Governors; Maureen Wylie, the chief financial

officer of the Nuclear Regulatory Commission, and a guest of our speaker; Commissioner William C. Ostendorff of the NRC and guest of our speaker; Jerry Zremski, the Washington bureau chief of the *Buffalo News*, chair of the Speakers Committee and a former National Press Club president.

Skipping over our speaker for a moment, Rod Kuckro of Energy Wire and the Speakers Committee member who organized today's event. Thank you so much, Rod; Phillip Niedzielski-Eichner, Chief of Staff to Chairman Macfarlane and guest of our speaker; Esther Whieldon of SNL Energy; Jason Fortney of Argus Media; Kieran Greenhouse, Kieran Greenhouse of Plats; Margaret Ryan of Interfax Energy. Thank you all for being at the head table. (Applause)

It's not often that a senior government official relinquishes the reins of power as readily as our speaker today. (Laughter) Allison Macfarlane is just in the third year of her job as the nation's top regulator of the nuclear power industry, but she's leaving in a few weeks to return to academia, her first love, as director of George Washington University's Center for International Science and Technology Policy. With a doctorate in geology, McFarlane is an acknowledged expert on issues surrounding the long-term safe storage of high level nuclear waste.

That level of expertise helped her lead the five member Nuclear Regulatory Commission to begin to implement safety improvements at the nation's one hundred nuclear reactors. The improvements are designed to prevent the type of nuclear disaster that occurred in Japan in 2011 when an earthquake and tsunami resulted in the meltdown of three nuclear reactors.

During McFarlane's tenure, which is cutting short by more than three years, she was not always successful in winning support for other proposals she said would help insure nuclear power safety in the United States. We're interested in her perspective on the future of and safety concerns about nuclear power here and abroad. Ladies and gentlemen, please join me in welcoming to the National Press Club the Chairman of the Nuclear Regulatory Commission, Allison MacFarlane. (Applause)

**CHAIRMAN MACFARLANE:** Good afternoon, welcome, and thank you for the kind introduction, I guess. (Laughter) So I appreciate the invitation to be here, and talk with you today and reflect on some of the issues that the Nuclear Regulatory Commission has on its plate and talk about some of my accomplishments during my tenure at the NRC and some of the challenges we faced as well.

But before I go on, I just want to acknowledge some of the folks in the audience. We have-- I'm really glad that Commissioner Ostendorff could join us as well as our CFO, Maureen Wylie, and my Chief of Staff as well. We have a couple of NRC tables, I think there are three at least; there, there and there. And I want to acknowledge those two in particular because they are my current and former staff. So, thank you for coming. And we also have Assistant Secretary Pete Lyons, I believe, somewhere in the room. There he

is. And as well as the president and CEO of NEI, Marv Fertel. I wonder where Marv went? But we had all of these folks, so wanted to acknowledge all of them.

So first, let me review some of our accomplishments and then I'll take a little while to look forward to upcoming issues for the commission. Let me start with my first impressions. So when I first came to the NRC in 2012, I was eager to work with my colleagues and the NRC staff, but I was unsure of what I would face. The agency was going through a tumultuous time in which relationships within the commission and between the commission and the staff were strained. And it had also been just over a year since the Fukushima Daiichi accident, and the staff was moving ahead with pertinent lessons learned for the U.S. industry.

In addition, just weeks before my arrival, the D.C. Circuit Court of Appeals vacated and remanded a major rule on spent fuel storage at reactor sites, known then as the waste confidence rule, which would require NRC to undertake a substantial rule making and suspend certain licensing actions. I should also mention that at that time, the federal government as a whole was, in the context of sequestration, 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 my mind as I began my tenure, and I wanted to use the benefit of my knowledge and my prior experience to enhance and strengthen the important work at the NRC.

For 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 deserves. And as an academic, I intended to champion a broadminded inclusive approach in the agency's decision making.

For 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 has accomplished in 2 ½ years.

So now let me turn to some of the topics I want to cover; Fukushima. In the first few months of my tenure as chairman, I had the opportunity to travel to Fukushima and 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 nuclear reactor accidents.

The site itself emphasized this lesson even more strongly with debris from hydrogen explosions still littering the grounds. As a result, I felt compelled to push for changes at U.S. plants based on the lessons we learned from that accident. Given all that, I'm pleased with the progress the NRC and the industry has 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 insure that reactors can cope with a prolonged loss of off site power, accurately measure water level in spent fuel pools, and successfully operate containment events during emergency conditions.

Plants have been acquiring additional equipment such as diesel generators, pumps, cabling, and piping, staging it in earthquake proof and tornado proof buildings at various locations around their reactor 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 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 into place instrumentation that measures water levels and spent fuel pools and are working on installing containment vents that will be operable under high pressures, temperatures and radiation fields that would exist during an accident.

The NRC staff has also made significant progress in reviewing licensees, flooding and seismic hazard reevaluations and is working through two significant rule makings on mitigating hazards and determining filtration strategies at boiling water reactors.

Now let me talk a little bit 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 ruling that I mentioned earlier, in just two years undeterred by a government shutdown.

Of particular significance to me, this rulemaking maximized public engagement. The staff conducted 13 meetings in 10 states and received more than 33,000 public comments, each of which was reviewed and considered. I believe the successful process should now be a model for how the agency conducts future high profile rule makings.

To those of you who track such things, you'll 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 what is called institutional controls; that is, a future where no one is responsible for insuring that the waste remains in a safe condition indefinitely. I feel strongly that we as a nation not use the insurance of safe interim high level waste storage as an excuse to not make progress in developing a permanent repository in our permanent disposal of spent fuel.

In terms of the back end, I should also mention Yucca Mountain, or I imagine, you will. As many of you know, in August 2013, the D. C. Circuit Court of Appeals ordered the NRC to resume review of the Yucca Mountain license application using its remaining nuclear waste fund money which amounted to 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 currently not 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 that will be coming out in 2015 may trigger additional contentions. Hearings must be conducted on each contention and 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 currently pursuing a license application for Yucca Mountain, and Congress has not provided them resources to do so. Without a willing applicant, the NRC cannot pursue the remaining portion of the licensing process.

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 insure nuclear safety and security practices are followed worldwide. I've advocated strongly for the NRC's continued international engagement by maintaining close relations 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 what's called-- it's a mouthful-- the multinational design evaluation program 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 control.

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 push for us to be more engaged with the executive branch agencies that also deal with nuclear issues; in particular, the Department of Energy and the State Department.

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 inter-agency activities. For example, I chair an inter-agency 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 cyber security issues that affect the industries they regulate.

These activities have enabled me to raise awareness across the government of who we at the NRC are, what we do and why it's so important. It's equally important for the public to have this kind of awareness. I've been a strong proponent of NRC's public engagement and I'm proud of the progress that we've made. We've established a requirement that the staff report uniformly on public meetings, we've asked the staff to provide training for employees who regularly engage with the public, and we also require professional facilitation for some of our 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 power 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 had many successful meetings in southern California.

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

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 from what was previously anticipated.

The predicted nuclear renaissance did not materialize in the United States, 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 lives, also impacted the NRC during my tenure.

In response to this situation, the commission directed the staff to work to insure 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 turn to give you my perspectives on what lies ahead at the NRC. I'd like to add Fukushima, operating reactor performance, new reactors, decommissioning, the back end of the fuel cycle and the NRC's role internationally, and I'll be brief. So let me start with Fukushima. All told, the post-Fukushima safety enhancements have required tremendous effort and resources from both the NRC and the industry. Much has been done, but our joint challenge is now to keep up the momentum, maintain our commitment and insure 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 that the near-term taskforce provided. The tier two and tier three 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 and reactor designs that are different from the mark one and mark two boiling water reactors that are already being dealt with.

I believe that complacency is always a threat and the only way to avoid it is to keep the lessons learned from this tragic accident alive in our nuclear safety practices. I also believe we need to continue to focus on nuclear power plant performance. Though the majority of nuclear power plants in the United States are performing well, we're seeing a few areas of concern. Some of the lowest performing plants in the U.S., for example, seem to remain in that category for extended periods of time rather than addressing the issues quickly to regain their 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 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 insure 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 self regulator, the Institute for Nuclear Power Operations, maintains a strong commitment to safety across the U.S. fleet. INPO, which is how most of us talk about it, formed after a Three Mile Island accident, plays a critical role in fostering effective communication, a best practices and lessons learned across the industry.

The staff and the industry are also incorporating post-Fukushima insights into the new reactor construction projects currently under way 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 both Vogtle and Watts Bar first hand, and I can attest to the safety

consciousness I observe in both the NRC's construction inspectors and the engineers who are building these large, complex machines. One challenge we've encountered is that nuclear reactors haven't been constructed in the United States for 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 insuring quality control, oversight of vendors, and in preventing counterfeit and fraudulent parts from entering the supply chain. This concern, of course, is not unique to the U.S. or to the nuclear industry and both the NRC and industry have engaged with foreign counterparts to champion strict adherence to quality control standards.

As these reactors are being constructed, others have closed and begun decommissioning, as I mentioned. 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 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 and to structure public expectations of the process.

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

As an independent regulator, the NRC doesn't make energy policy for the nation, but nonetheless we're impacted significantly by decisions of our energy policy makers. As the administration and Congress continue to grapple with the path forward for nuclear waste management and disposal in the United States, the NRC must in turn continue to insure that radioactive waste can be stored safely at nuclear reactor sites until 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 performance in the reactor, not in a repository. Considerations on the front end don't always account for how 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 or damaged fuel or heat considerations.

Research on the long-term spent fuel integrity currently under way 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 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 and placement.

Since our current siting standards for deep geologic disposal are specific to Yucca Mountain, I believe it's appropriate and necessary to begin a rule making to address a generic standard. 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 insure that 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 needs only provide financing and a foreign entity constructs and operates a nuclear reactor. This option has proven attractive for nations that are 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.

So, what's next for me? Beginning January 1<sup>st</sup>, I'll be a professor of public policy at the Elliot School of International Affairs and Director of the Center for International Science and Technology Policy, as you heard. Universities typically bring on new faculty twice during a year, which is once in January, once in July, which is why I've chosen to leave the NRC at this particular moment. In my new position, I'll have the opportunity to continue research and writing, teaching as well, and to train a new cadre 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 policymaking. I also appreciate the interrelation between nuclear safety and often more frequently discussed security and safeguards issues and the need to treat the three holistically.

It's been an honor and a pleasure to serve my country as chairman of the NRC for the past 2 ½ years. I'm grateful to President Obama for nominating me, and I appreciate the talented and hard working staff at the NRC more than I can say. I'm confident that as I leave, and 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 all the best. Their work, together with our dedicated staff, will enable the NRC to remain an effective, independent and trusted regulator.

And I greatly appreciate the opportunity to speak with you all today, and I'm happy now to answer your questions. Thank you. (Applause)

**MR. BELKIND:** Thank you so much, Professor MacFarlane. Do you think the United States nuclear energy industry will ever recover from Fukushima and start growing again? What will make that happen?

**CHAIRMAN MACFARLANE:** Well, I think that I would separate that out. I wouldn't say that the nuclear industry is suffering necessarily because of Fukushima. I think there are larger issues at play here, mostly economic issues. What would help that would probably be some price on carbon. My view.

**MR. BELKIND:** Most U.S. nuclear facilities are more than 40 years old and most want to extend their lives to 60 or even 80 years. How much confidence do you have that they can be extended to that extent and still operate safely?

**CHAIRMAN MACFARLANE:** Well, we've extended the licensed life of 74 reactors to 60 years already. So that's in progress and we've seen a number of reactors go beyond their 40 year life. They have aging management programs in place and we regulate that closely. The issue of going from 60 to 80 years is an issue that is under consideration at the NRC now, and you'll have to ask my colleagues in the future where they're going with that.

**MR. BELKIND:** You've said a new rule is needed for firming up rules for closing reactors. Does that effort have any chance in moving forward in your absence?

**CHAIRMAN MACFARLANE:** I certainly hope so. (Laughter)

**MR. BELKIND:** How much confidence do you have in your foreign counterparts that they are maintaining the highest possible standards for their nuclear plants?

**CHAIRMAN MACFARLANE:** Well, that's a broad question. You know, I have a lot of confidence in many of my foreign counterparts. As I said in my speech, we work very closely together in a number of different fora and there are some great regulators out there, they're operating very safely. There are others that need to probably improve a bit and there are more and more efforts in place these days to help them do that. There is something called the World Association of Nuclear Operators, it's on the industry side, and it is stepping up its game a lot since the Fukushima accident to bring everybody along.

And there are a lot of active discussions within the International Atomic Energy Agency on how to improve as well. But we are really working hard at the NRC to try to insure that we have a big reach out there, too, and we help other countries that need the help.

**MR. BELKIND:** What effect do you think the China/U.S. agreement on climate change will have on the nuclear power industry?

**CHAIRMAN MACFARLANE:** I'm going to pass on that one. I don't know.

**MR. BELKIND:** What role should a carbon tax play in a clean energy future?

**CHAIRMAN MACFARLANE:** Well, this is my view, but I think a carbon tax would be very helpful in readjusting the situation for all those kinds of electricity producers, and not, and we have the transportation side as well. To go forward, those who don't produce carbon, it will give them a boost and that includes the nuclear industry.

**MR. BELKIND:** Can you talk about the fire and explosion at the WIPP, and for those of you either here or out in the C-SPAN audience, WIPP stands for waste isolation pilot plant. So can you talk about the fire and explosion at the WIPP facility in New Mexico in February of 2013 and what this means for the NRC's knowledge about, and process, for licensing storage facilities?

**CHAIRMAN MACFARLANE:** Well, I want to be clear that the NRC does not regulate WIPP, okay? We didn't have a piece of that. And I don't want to say much about the fire and then the subsequent explosion at, or whatever it was, conflagration, at WIPP because, again, it's not an area of my expertise. There are some Department of Energy folks here, you can try to corner them later. Sorry, Pete. And Dave. (Laughter)

But I think there are lessons to be learned from WIPP that are very important for us, not just the Department of Energy but for the NRC, to learn and to examine. And I think we need to wait a little bit until more analysis is done on exactly what happened. But we need to learn a number of lessons on how what best practices should be followed in disposing of waste. It can be disposed of safely, but I think we need to take a step back and see what we learn.

**MR. BELKIND:** What lessons can be learned from the safety issues that the NRC has worked through with the Fort Calhoun plant in Omaha, and what is the future of NRC oversight of that facility?

**CHAIRMAN MACFARLANE:** Well, we're still continuing our oversight of Fort Calhoun and continuing to work hard there. We've put in a lot of hours there and to insure that they are going to be operating safely. They're operating now and we are continuing our oversight and we will reduce our oversight once they have shown us that they're ready for that. And that's how we'll go forward with them.

**MR. BELKIND:** You have opposed the Yucca Mountain site, but support geological storage in general. What bothered you about Yucca Mountain?

**CHAIRMAN MACFARLANE:** You know, I have not looked in detail at Yucca Mountain since 2003 or so. I have not read the Yucca Mountain license application. I have not read a number of the NRC reports on Yucca Mountain, so I don't have a view on Yucca Mountain right now. You know, that was work I did long ago and I right now don't have a view on it.

**MR. BELKIND:** Well, this is a question that you might have just answered, but to be fair to the person who sent it in, what would you say to the new Senate leadership if it makes a move to revive the Yucca Mountain site?

**CHAIRMAN MACFARLANE:** I think Yucca Mountain is not just a technical issue, clearly. It's clearly a political and societal issue and those pieces need to be resolved for any repository. Clearly, the societal and political side has to be resolved as well as the technical side.

**MR. BELKIND:** One last question and you'll come up. An NRC report issued in October said Yucca Mountain is safe. The commission recently voted to support continued long-term storage of nuclear waste at reactors. You had a problem with that. May I ask why?

**CHAIRMAN MACFARLANE:** Well, I basically answered that in my thing-- can I see that question again? It seems to be tying together two separate things. It's tying together Yucca Mountain and the continued storage rule, which I view as totally separate. Yes, the NRC issued volume three of the safety evaluation report in October. It has not issued some of the other volumes yet, so it has not issued a complete safety evaluation report, but we'll be doing that by January, as we promised.

On the continued storage rule, yes I had a problem with part of it. And as I said in my speech, it had to do with the fact that I thought that we should account for indefinitely storing the material and the environmental impacts of that if there are not some kind of institutional measures in place in perpetuity to make sure the stuff remains safe, this material remains safe. So that was one of my problems.

**MR. BELKIND:** Thank you. How long could a licensing process actually take for a new permanent geological storage site? And where should it be?

**CHAIRMAN MACFARLANE:** You know, ever since I started talking about nuclear waste disposal in 1996, everybody says, "Where should you put it?" I don't know. You know, we're blessed in this country, we have an enormous country. Lots of potential sites, so the first part of the question, sorry. I keep asking you to go back. How long could the process take? You know, who knows? I leave that up to you, you're probably more expert on that than me.

**MR. BELKIND:** What happens to money in the nuclear waste fund that has been collected from American electricity consumers?

**CHAIRMAN MACFARLANE:** It's still in the nuclear waste fund. Congress has that, so I suggest you ask Congress.

**MR. BELKIND:** Why did you and the NRC take the lead role on the federal government's interagency cyber security forum?

**CHAIRMAN MACFARLANE:** Well, we have a lot of experience regulating cyber security issues. We've been working-- we've had regulations in place on cyber security since 2009 and were actually been dealing with this issue since the early 2000s, 2003, 2004. So we have probably amongst other government regulatory agencies and executive branch regulators amongst the most experienced on this issue. So it seemed natural for us to take the lead.

**MR. BELKIND:** What role does that effort play into your efforts to boost nuclear facility safety and security?

**CHAIRMAN MACFARLANE:** Well, it's important for nuclear facilities and nuclear reactors to be protected from all the kinds of hacks that you read about. I'm sure you all read the paper today, seeing how you are press people, and you read about the State Department's recent troubles. We don't want that kind of thing happening at a nuclear reactor or a nuclear facility where there are grave implications. And so, that's what we are trying to be protective of.

**MR. BELKIND:** Some of the largest owners of nuclear plants are seeking millions of dollars in subsidies from electricity consumers in states such as Illinois, Ohio and New York, to continue operating their plants. Do you support such subsidies? And if so, why?

**CHAIRMAN MACFARLANE:** We regulate nuclear power reactors, materials. We don't get into the pricing plans, et cetera. So, we don't handle that bit. That's for the state public utility commissions.

**MR. BELKIND:** What didn't you get done during your tenure as NRC chairman?

**CHAIRMAN MACFARLANE:** I don't know where to start. (Laughter) I've been ambitious. I would have liked to see more done with the back end of the nuclear fuel cycle. I think there's a lot more work to be done there to make that front and center in people's minds. That's one piece of it. I'd like to see more done with public engagement as well. So, those are some areas. But I think we've overall accomplished quite a lot in 2 ½ years, so I think we have a lot to be proud of.

**MR. BELKIND:** What are the biggest challenges that your successor at the NRC will face?

**CHAIRMAN MACFARLANE:** Well, as I said, the agency's not facing the future that five years ago people envisioned. Five years ago, seven years ago, the nuclear industry was really expecting to expand and that's what the information we were getting from them. We expanded as well to prepare for license applications. And that started to fall apart as the recession hit, a number of other factors came into play.

And so we have to insure that we have the right agency for the times. That means we need to have the right skill sets, the right resources and manage them appropriately. And that's what we're in the process of figuring out. So the next chairman will have to continue making sure that that process gets complete and that the agency is really well equipped to deal with the future.

**MR. BELKIND:** And following on, what advice would you give to your replacement?

**CHAIRMAN MACFARLANE:** Get a top notch staff. (Laughter) You can't do anything without a top notch staff because you have way too much to do. And to rely a lot on the staff at the NRC. Overall, the staff are fantastic. They have a world of experience and they're the ones who'll help you get things done.

**MR. BELKIND:** Did the White House influence your decision to step down?

**CHAIRMAN MACFARLANE:** Absolutely not. You can ask them, they were probably as surprised as everybody else.

**MR. BELKIND:** What do you think regulations specific to decommissioning reactors should look like? What do you think should be changed?

**CHAIRMAN MACFARLANE:** Well, I think there are a number of issues that need to be dealt with. First of all, as I said, reactors that are decommissioning are regulated under operating reactor regulations. Now, when you take spent fuel out of the core of the reactor, you don't really need to have a guard force surrounding that core. You need to adjust the security, you may need to adjust the emergency planning rules. So, I think those issues are sort of first and foremost. And that's where we're getting a lot of exemption requests, from the plants that are currently decommissioning.

I think there's a discussion about the post-shutdown activities-- P-S-- post-shutdown decommissioning activities report, the PSDAR. I've been trying to get away from acronyms. That's another piece of advice for the next chairman; get rid of the acronyms. This report is something that the power plants provide us, but we don't have any teeth to approve it or disapprove it, and I think this is something that we should consider, whether we need that or not. I think there are a number of issues out there that we need to think about and consider going forward.

**MR. BELKIND:** Some people think that building small modular reactors are the future. Does this technology pose any advantages for licensing them?

**CHAIRMAN MACFARLANE:** Well, we'll see when we get some license applications. We're in the process of waiting for license applications, it sounds like the first ones will come in 2016. But again, we'll see. We had been expecting license applications this past year and the industry walked back a bit on that. So we'll see what happens. I think there's promise in small modular reactors. But again, you know, the proof is in the pudding and I'll let these guys work through the details and they'll find out if there are issues or not.

**MR. BELKIND:** Lot of questions about licensing. As a variety of advanced nuclear reactor designs receive venture capital support as well as press coverage, how will the NRC support the improvement of the licensing process for these designs which may not fit in to the current formula? Rather, into the current framework?

**CHAIRMAN MACFARLANE:** Formula, framework. I think the question refers to generation four designs, non-light water designs. And I think we are prepared to deal with those, but I don't see any coming any time soon. Again, the small modular reactor license applications which are much closer to completion are still not on our plate. And I don't expect these advanced designs will be on the NRC's plate for many years. But as we working with the industry understand that they're getting closer, the NRC will, of course, respond and be prepared to deal with them.

**MR. BELKIND:** What, if anything, can the NRC do to help low performing plants move out of heightened oversight?

**CHAIRMAN MACFARLANE:** Well, we're working closely with low performing plants and, you know, providing them a lot of feedback. Again, I think this is something that the Institute for Nuclear Power Operations, INPO, is focusing on as well because they also don't want to see plants stuck at the low performing level for years and years and years. So, we're working together to try to improve that.

**MR. BELKIND:** Is the NRC staff ready to evaluate new technology like reactors cooled by sodium or lead?

**CHAIRMAN MACFARLANE:** We just had that question on advanced reactors, so.

**MR. BELKIND:** Right, same--

**CHAIRMAN MACFARLANE:** Same answer, yeah. Go ahead.

**MR. BELKIND:** Are there ways to safely reduce the cost of generating a nuclear plant to make them more competitive with natural gas and wind power?

**CHAIRMAN MACFARLANE:** Again, I regulate the plants, I don't construct them or design them or build them. And I leave it to those people who are expert in that to answer that kind of question.

**MR. BELKIND:** As a geologist, do you think fracking is safe, and why or why not?

**CHAIRMAN MACFARLANE:** Well--

**MR. BELKIND:** And let me give you a related question so you can maybe knit it all together.

**CHAIRMAN MACFARLANE:** Right, okay.

**MR. BELKIND:** How has the fracking boom affected the nuclear power industry?

**CHAIRMAN MACFARLANE:** Well, I'll take the latter one first. I think a number of factors have affected the nuclear power industry economically. This is just my point of view, but I think that first of all, the demographic shift from the north to the south and west that has been occurring for more than ten years has reduced demand in the Midwest, in the northern part of the country. The 2008 recession which has hung on in the upper Midwest persistently, has also reduced demand. And, of course, then the low price of natural gas has not contributed to the rosy picture there for nuclear power plants. So I think all of these factors play a part.

In terms of fracking, I am not an expert on this. I will hold forth from saying anything except to say that it appears that fracking, in some cases, does cause earthquakes.

**MR. BELKIND:** Back to Fukushima, which of course, was an overriding issue when you came in, and still is. What incentive do nuclear plant operators have to insure they spend what is needed to keep them safe from the type of catastrophic accident that occurred at Fukushima? And are you confident that they will take appropriate measures to prevent such an accident?

**CHAIRMAN MACFARLANE:** The incentive that nuclear plant operators have to insure that this kind of accident won't happen is they really don't want to lose that asset and they really don't want to deal with the aftermath. And I think they're all on board with that. And they have been very responsive to the orders that we put out. I think we are ahead of quite a few countries in terms of getting that additional equipment on site, at reactors, in safe structures. We will be completed, that will be completed, by 2016 and many plants will be done before then.



So we at the NRC and the industry have worked really hard to try to make that happen. As I said, there's more to do and we have to keep our focus on that going forward, but I think we're in a good place right now.

**MR. BELKIND:** Fracking produces huge quantities of waste. Given how it is stored, how worrisome are the earthquakes that you mentioned?

**CHAIRMAN MACFARLANE:** That was fast. (Laughter) And, you know, I thought we were here talking about nuclear, not fracking. I don't know the answer to that, not being-- it's on the other side-- not being an expert on that. So I will leave that to actual experts on fracking.

**MR. BELKIND:** Increasingly, industry applications to staff include information published, but only available for fees or purchase. Do those costs deny public review of information sources, staff use and review of applications and requests? Is there a mechanism to make all documents used by staff in decision making available to the public?

**CHAIRMAN MACFARLANE:** It depends on the particular situation. I don't think I can be more specific than that. There are some material that is proprietary that we can't share. That's the way it is. So, we make-- you know, compared to many other federal agencies, we make a lot of material available to the public and I have been trying to push for making as much as possible. So, and I think under my tenure there, you have seen that we have been as open as we can be. So we're trying.

**MR. BELKIND:** I anticipate your answer to this one, but I would like to ask it in the interest that we keep our effort to ask as many possible from the audience. Regarding public participation, do you recommend the NRC make materials listed in the federal registry notice for public comment be made available to the public and elected officials for review?

**CHAIRMAN MACFARLANE:** Again, there are materials that we can share and there are a few materials that we cannot share. We make as many materials as possible available to the public.

**MR. BELKIND:** Do you worry that the NRC is becoming a satellite operation for Senator Harry Reid? (Laughter)

**CHAIRMAN MACFARLANE:** Again, I believe that is absolutely essential for the nuclear regulatory commission and other independent commissions, to be just that, independent. To be free from political influence, and industry pressure. It's absolutely essential. Whenever I travel overseas, whenever I give a speech, that is always a mainstay of what I say because it doesn't work. And there are some places, I'm not going to talk about them now, but some places where countries start stepping back on that and that's a real problem. That's a concern to all of us. So it's essential that we remain independent.

**MR. BELKIND:** Is Bill Ostendorff your favorite commissioner? (Laughter)

\_\_\_: Don't answer that.

**CHAIRMAN MACFARLANE:** Of course! I think I embarrassed him. I think it's the first time ever. (Laughter)

**MR. BELKIND:** Just one question before we go into the finale. Are you saying, then, that Harry Reid is to influential?

**CHAIRMAN MACFARLANE:** I'm not saying anything. I'm just saying that the NRC needs to be independent, and is independent, will remain that way.

**MR. BELKIND:** We are almost out of time, but before asking the last question, we have a couple of housekeeping matters to take care of. First of all, I'd like to remind you about our upcoming lunches, and you're welcome to come back, you're a few blocks away. On this Friday, November 21, Dr. Anthony Fauci, Director of the National Institute of Allergy and Infectious Diseases will focus on the ebola outbreak. On December 1<sup>st</sup>, Teresa Sullivan, President of the University of Virginia, will discuss trends in higher education. And on December 5<sup>th</sup>, Gary Bettman, Commissioner of the National Hockey League, and Ted Leonsis, CEO of Monumental Sports and Entertainment, will discuss the growth of the National Hockey League and the 2015 Winter Classic.

Next, I'd like to present our guest with the traditional National Press Club mug. If I happen to walk by your office, I will check to see that you have it there. Please accept it with our thanks.

**CHAIRMAN MACFARLANE:** Thank you. (Applause)

**MR. BELKIND:** And just one last question. Many dentists charge about \$200 for a set of x-rays. Why can't the NRC regulate them?

**CHAIRMAN MACFARLANE:** Thanks.

**MR. BELKIND:** Okay, very good. Thank you all for coming today. I'd also like to thank the National Press Club staff, including its Journalism Institute and Broadcast Center, for organizing today's event. Thank you again, we are adjourned. (Sounds gavel.)

END

