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U.S. Senate Date: Wednesday, December 13, 2017

Committee on Environment
and Public Works Washington, D.C.

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HEARING ON OVERSIGHT OF THE NUCLEAR REGULATORY COMMISSION

WEDNESDAY, DECEMBER 13, 2017

U.S. SENATE

Committee on Environment and Public Works

Washington, D.C.

The committee met, pursuant to notice, at 10:00 a.m. in room 406, Dirksen Senate Building, the Honorable John Barrasso [chairman of the committee] presiding.

Present: Senators Barrasso, Inhofe, Capito, Fischer, Rounds, Carper, Whitehouse, Markey and Duckworth.

STATEMENT OF THE HONORABLE JOHN BARRASSO, A UNITED STATES
SENATOR FROM THE STATE OF WYOMING

Senator Barrasso. Good morning. I call this hearing to order.

Today's oversight hearing will be looking at the Nuclear Regulatory Commission, the NRC. I would like to welcome Chairman Svinicki, Commissioner Baran and Commissioner Burns. I am sad to say that the Commission remains without its full strength of five commissioners. This is a situation I am eager to resolve. I continue to believe that the Commission functions best with all five commissioners in place.

I am a strong supporter of nuclear energy as a vital component of an all of the above approach to American energy. For our Country to continue to benefit from nuclear energy, we need the NRC to be an effective, efficient and predictable regulator.

The NRC's efficiency principle of good regulation states, "The American taxpayer, the rate-paying consumer, and licensees are all entitled to the best possible management and administration of regulatory activities." I agree. It is our committee's responsibility to assess the agency's performance. Where the NRC's safety mission is paramount, the NRC must execute that mission in a fiscally responsible and timely fashion.

My home State of plays a key role in the American nuclear energy supply. It produces more uranium than any other State. I want to commend the Commission for agreeing to extend the duration of uranium recovery licenses from 10 years to 20 years. This is an important recognition that the regulatory burden placed on these facilities is disproportionately high given how the NRC considers their operations to be "low risk."

The growth of this regulatory burden is clear in the monthly report. The NRC is taking far longer to make uranium recovery decisions than it did ten years ago. This general lack of urgency is troubling.

As uranium producers struggle with depressed prices and U.S. uranium production is at levels we have not seen since the early 1950s, the need for timely decision-making from the NRC is greater than ever.

The NRC is also lagging in its progress toward instituting flat fees for routine uranium recovery licensing actions. These would be fees on uranium producers by the NRC that would not increase.

Four years seems to be an inordinate amount of time for the NRC to institute flat fees, given that some of the NRC's agreement States, States that have assumed responsibility for regulating their uranium recovery facilities, already have flat fees in place.

Wyoming is seeking to become an NRC agreement State and assume responsibility for regulating its uranium recovery facilities. While this will be a positive step for Wyoming and its uranium producers, it is also a strong verdict on the need for the NRC to improve its performance.

Improving performance was the goal of the NRC's Project Aim 2020, "to transform the agency over the next five years," it says, "to improve the effectiveness, efficiency and agility of the NRC."

Unfortunately, Project Aim 2020 seems to be ending prematurely. The most recent Project Aim status report indicates the NRC will complete the vast majority of action items early next year and the NRC staff will no longer report on it.

Project Aim 2020 is becoming Project Aim 2018, yet the challenges facing the NRC remain. These include premature closures of nuclear power plants, decreased licensing work at the NRC, and declining new reactor reviews at the NRC.

The NRC must continuously strive to improve its performance. This requires diligent leadership from the Commission. I look forward to having a discussion today with the Commission about these important issues.

Following the opening statement by Ranking Member Carper, we will continue with the committee's practice of a five minute

opening statement from Chairman Svinicki and then two minute statements from each of the Commissioners.

[The prepared statement of Senator Barrasso follows:]

Senator Barrasso. With that, I would now like to turn to the Ranking Member for his statement. Senator Carper.

STATEMENT OF THE HONORABLE TOM CARPER, A UNITED STATES SENATOR
FROM THE STATE OF DELAWARE

Senator Carper. Thanks, Mr. Chairman.

Welcome to the Chairman and the Commissioners this morning.

A special thanks to our Chair for pulling this together. I think it is a timely hearing, one that we need to have. As you know, this industry faces real challenges these days but there are still real opportunities that this industry can help us to address.

The nuclear industry is at something of a crossroads, as we know. The path the industry decides to take will have ramifications not just for the industry but for our Country and for the citizens of our Country, I think, for decades to come.

Let me begin by noting that it is important to examine the benefits as well as the drawbacks of nuclear energy. First and foremost, nuclear power helps curb our Nation's reliance on dirty fossil fuels and reduces our air pollution that threatens our health and our climate.

Second, nuclear energy has been continued to be a real economic driver in many places around the Country. It creates construction jobs, manufacturing jobs, and operations jobs for communities across the Nation.

Despite all the benefits of nuclear power, I would be remiss not to mention some of the potential consequences of

nuclear energy. We have seen from serious incidences in places like Fukushima the damage that nuclear power can cause if the proper safety precautions are not in place, up to date, or not strictly followed.

With nuclear energy, safety has been and must remain a top priority in the operation of nuclear reactors. Let me repeat that. With nuclear energy, safety has been and must remain a top priority in the operation of nuclear reactors.

That is a primary responsibility of this committee, especially the Nuclear Regulatory Subcommittee, of which in the past, I have been a member, for many years actually.

Unfortunately, the cost of safety precautions, along with the cost of construction, operations and maintenance for current nuclear reactors can be expensive, as we know, especially when compared to the cost of other sources of energy such as natural gas.

In fact, some U.S. reactors are retiring sooner than expected due to market forces. At the same time, our Country's nuclear reactors are getting older and will need to be replaced in the years to come.

Building new reactors, as we have seen in Georgia and South Carolina, has proven more difficult than predicted a decade ago. As most of my colleagues know, I often try to see the glass half full. I believe the challenges the nuclear energy faces today

can make it stronger and more efficient tomorrow, and frankly, make our Nation stronger.

If our Country is smart, we will replace our aging nuclear reactors with new technology developed in this Country that is safer, that produces less spent fuel, and is cheaper to build and to operate.

If we seize this opportunity, the U.S. can be a leader in nuclear energy again, as we once were, reaping the economic and clean air benefits that flow from that leadership. In order to do so, we must make sure that the NRC has the resources it needs to review these new technologies and make certain our current nuclear reactor fleet continues to be operated safely.

Since joining this committee, I have worked closely with a number of our colleagues to strengthen the culture of safety within the U.S. nuclear energy industry. In part due to our collective efforts, the NRC leadership, and the Commission's dedicated staff, the NRC continues to be the world's gold standard for nuclear regulatory agencies.

Success at any organization starts with the leadership at the top. I must say I have been quite impressed with the current commissioners at the NRC and its members' ability to work together.

I especially want to applaud Kristine Svinicki, for her leadership, the long membership and service that she has

provided at the NRC, especially as our Chair.

Each commissioner brings a unique set of skills to the Commission which has served the NRC and, I think, our Country very well. These three commissioners have done an excellent job. However, having a full complement of NRC commissioners would be ideal.

As my colleagues know, our committee has reported out several quality NRC nominees, including Jeff Baran's renomination, that await Senate confirmation. I hope we can quickly confirm all three of the NRC nominees, given the nuclear industry critical regulatory certainty at a time when there is much uncertainty in other areas.

An organization also needs a strong and dedicated workforce with the necessary resources in order to be successful. At one time, the NRC year after year ranked as the top place in the Federal Government to work. Now, at number eleven, that is better than a lot of other agencies but it is not number one. Part of what I want us to talk about is how we get the NRC headed back to the top.

Budget cuts and uncertainty in the nuclear industry play a big role in this change and I look forward to hearing from all of you about these issues. Most importantly, I want to hear what more we can do to better retain and recruit a quality workforce at the NRC which is still revered across the globe.

I will close with this thought. Martha and I have two sons. They were both Boy Scouts, probably Eagle Scouts. I used to take them down to the Norfolk Naval Station. I am a retired Navy Captain, former naval flight officer.

I would take them down to the Norfolk Naval Station about every three or four years, 25 or 30 of the Scouts and some of the adult leaders. We would spend the weekend at Norfolk Naval Station and had the opportunity over a weekend to sleep in the barracks, eat in the galley and visit ships, submarines and aircraft carriers.

One morning, we visited the Teddy Roosevelt, one Sunday morning at Norfolk Naval Station. The captain of the ship came to meet with us, took us up on the bridge and addressed our Scouts and the adult leaders.

He said these words, talking to our Scouts, "Boys, when the Teddy Roosevelt goes to sea, it is 1,000 feet long," and the boys went ooh. He said, "Boys, when the Teddy Roosevelt goes to sea, it carries over 5,000 sailors," and the Scouts went ooh. He said, "Boys, when the Teddy Roosevelt goes to sea, it carries onboard 75 aircraft." The boys went ooh. He said, "Boys, when the Teddy Roosevelt goes to sea, it doesn't refuel for 25 years." The adults went ooh. They tell that story again today.

We have challenges with respect to nuclear energy. No

doubt about that, but it is also a great opportunity. That is just one of them. That is just one of them.

I spent many years in the Navy tracking submarines, nuclear submarines, and a lot of nuclear parts on ships. I do not know of a single fatality to the Navy personnel because of failure of the nuclear power plants on those ships, vessels and so forth.

The last thing I want to say is we have real problems and real challenges, although we are making progress, with respect to clean air, emission of sulfur oxide, nitrogen oxide, mercury, CO2 and others. The good thing about nuclear, maybe the best thing about nuclear, is it is our biggest source of clean energy with none of those pollutants, including especially CO2.

For all those reasons I think it is important that we find a way to strengthen the industry and a big part of that is making sure we have a strong NRC with great leadership at the top.

Thanks, Mr. Chairman.

[The prepared statement of Senator Carper follows:]

Senator Barrasso. Thank you very much.

I want to again welcome the witnesses and remind you that your full written testimony will be made a part of the official hearing today. I look forward to hearing your testimony beginning with Chairman Svinicki. Please proceed.

STATEMENT OF KRISTINE SVINICKI, CHAIRMAN, U.S. NUCLEAR
REGULATORY COMMISSION

Ms. Svinicki. Thank you and good morning, Chairman Barrasso, Ranking Member Carper, and distinguished members of the committee.

My colleagues and I appreciate the opportunity to appear before you today to discuss the U.S. NRC's licensing and regulatory actions since our last appearance.

The Commission's continued efforts to improve the agency's efficiency and effectiveness have focused on providing the appropriate level of resources to both corporate and programmatic areas, while continuing to carry out our vital safety and security mission without diminishment.

In June 2014, the NRC established Project Aim to enhance the agency's ability to plan and execute its mission in a more efficient and effective manner. The agency continues to institutionalize the actions related to Project Aim and pursue additional activities that demonstrate the NRC's continuing commitment to effectiveness, agility and efficiency.

Since the initiative began, we have endeavored to forecast our work with greater accuracy and identify changes to our resource needs in this dynamic nuclear environment. In light of the uncertainty in work forecasts, the agency is pursuing activities such as standardizing and centralizing support staff

functions of both our headquarters and regional offices and institutionalizing a common prioritization process to prepare the agency to evaluate emerging work more readily and staff it more efficiently.

We are also implementing an enhanced strategic workforce planning process to improve the training, agility and utilization of our very capable workforce.

In a separate improvement initiative, the NRC has analyzed its fee-setting process to improve transparency, equitability and timeliness. To improve transparency, the agency has engaged with stakeholders over the past two years to better understand their interests associated with how information is presented on invoices.

Based on these engagements, the agency initiated several projects to improve how billable work is tracked and reported.

In our programmatic work, the NRC continues its pursuit of risk-informed regulation through which we strive to put focus on those issues that are most important based on their safety significance.

Currently, the NRC staff is evaluating and updating key risk-informed, decision-making guidance, developing a graded approach for using risk information in licensing reviews, implementing training requirements for agency staff, enhancing communication of risk activities, and advancing other

initiatives across the agency.

The NRC has also taken many steps over the last year to ensure uniform implementation of the agency's back-fitting regulations which govern when the agency can impose additional requirements and are an essential part of the stability of our regulatory framework.

In support of this initiative, the staff is undertaking actions to improve oversight by NRC managers and lead to more consistent identification and treatment of potential back-fitting issues.

The NRC also continues to evolve its licensing process for operating reactors. For example, the nuclear industry is researching advanced fuel designs aimed at improving safety margins under both and postulated accident conditions.

Several vendors are exploring candidate designs which they refer to as accident tolerant fuel. In response, the NRC is developing plans to ensure that we are prepared to effectively and efficiently review these fuels to ensure their proposed use meets our high safety standards.

The NRC has also received four letters of intent to seek subsequent license renewal which would authorize operation of commercial nuclear power reactors for up to 80 years. The NRC has been preparing for these reviews for several years and has published final versions of the documents that provide guidance

for applicants and the NRC technical reviewers respectively.

Regarding NRC's activities associated with new reactors, although the licensees for V.C. Summer Units 2 and 3 decided to discontinue construction of those new units in South Carolina. The NRC's New Reactor Program continues its focus in support of the activities necessary to ensure the safe construction of the two AP1000 units under construction at the Vogtle site in Georgia.

The NRC is also finalizing and testing the regulatory procedures that will be necessary to assess the transition of these plants from the construction phase into their operating status.

We have also docketed the first application for a small modular reactor design and received an application from an early site permit for a small modular reactor in Tennessee. Both of these reviews are progressing on schedule.

We also continue our pre-application engagement with advanced reactor designers and vendors. Significant activity in the area of rulemaking is our rulemaking to improve the efficiency of the decommissioning transition process for operating reactors shutting down in the next few years.

We have published a regulatory basis for the development of the proposed rule and concluded there is sufficient basis to proceed with new and modified regulations addressing emergency

preparedness, physical security, training and financial requirements, among other areas.

We have received the request from the State of Wyoming to achieve agreement State status. We received that application package and are working to complete the assessment of that package. It will be provided to the Commission. The staff targets doing that in September 2018. The State of Vermont has also indicated its intent to pursue agreement State status.

During this active hurricane season, the NRC responded to Hurricanes Harvey, Irma and Maria in accordance with our incident response plans. The NRC dispatched inspectors to the reactors impacted by the hurricanes to provide monitoring of the operator's event response. We worked closely with federal partners such as FEMA.

We will also, consistent with our practice, evaluate both the agency and licensee responses to the hurricanes and implement any lessons learned to further improve our event response going forward.

In closing, the NRC continues to focus on efforts to achieve additional efficiencies without diminishment in our important public health and safety and security missions.

On behalf of the Commission, I thank you for this opportunity to appear before you. We will be pleased to answer your questions at the appropriate time.

Thank you.

[The prepared statement of Ms. Svinicki follows:]

Senator Barrasso. Thank you very much, Chairman Svinicki.

Commissioner Baran.

STATEMENT OF JEFF BARAN, COMMISSIONER, U.S. NUCLEAR REGULATORY
COMMISSION

Mr. Baran. Thank you, Chairman Barrasso, Ranking Member Carper and members of the committee.

Thank you for the invitation to appear today. It is a pleasure to be here with my colleagues to discuss the work of the Commission.

Chairman Svinicki provided an overview of NRC's activities, including the progress the agency is making in implementing Project Aim. I want to briefly highlight a few important efforts now underway at NRC.

NRC remains focused on post-Fukushima safety enhancements and lessons learned. The Commission is currently considering the draft final rule on mitigating beyond design basis events. That rule addresses a number of recommendations of the near term task force and is the culmination of years of work.

Meanwhile, the staff's focus is shifting to oversight and inspection of licensee implementation of several safety enhancements and natural hazard evaluations.

Decommissioning is another key issue for NRC. Since 2013, six U.S. reactors have permanently shut down and seven more have announced plans to close in the coming years. Despite the growing number of affected units, NRC does not currently have regulations specifically tailored for the transition from

operations to decommissioning.

As a result, licensees with reactors transitioning to decommissioning routinely seek exemption from many of the regulations applicable to operating reactors. The decommissioning rulemaking effort that is now underway will address this gap. It will allow us to move away from regulating by exemption in this area. The exemption approach is not very efficient and does not provide for public participation.

The rulemaking also provides a chance for NRC and all of our stakeholders to take a fresh look at our decommissioning process and requirements. States, local governments, non-profit groups and the communities around these plants are very engaged and want to share their views. We need to thoughtfully consider their ideas with an open mind.

Even as some existing plants are decommissioning, there is a lot of interest in new advanced reactors. Five vendors have begun pre-application discussions with the staff and we anticipate additional vendors may reach out in the near term.

We want to make sure that we have an efficient and effective licensing process for non-light water reactors and are ramping up our activities in this area.

We are happy to discuss these and any other issues of interest. Thank you and I look forward to your questions.

[The prepared statement of Mr. Baran follows:]

Senator Barrasso. Thank you, Commissioner Baran.

Commissioner Burns.

STATEMENT OF STEPHEN BURNS, COMMISSIONER, U.S. NUCLEAR
REGULATORY COMMISSION

Mr. Burns. Thank you, Chairman Barrasso, Ranking Member Carper and members of the committee.

It is a pleasure to be here today. I appreciate the opportunity to testify and address our dedication to our safety and security mission, as we focus on ways to carry out that mission in an efficient and cost effective manner.

The Chairman's testimony accurately summarizes, in my view, the agency's significant efforts over the last several years to improve its efficiency and effectiveness, efforts that indeed continue.

I fully supported these efforts during my tenure as Chairman and in my current role as commissioner. The Commission, our senior leadership and our staff have demonstrated a proactive and responsible approach to good government through these efforts.

It is important to not lose sight of the fundamental safety and security mission of the NRC. From its inception, this congressionally-mandated mission has driven the NRC and continues to be the central focus of what we do every day.

Having spent more than 37 years of my professional career with the NRC, I know there are times when we have had to learn from our experience, learn to do better and to improve our

performance as a regulator, but on the whole, I can say without a doubt in my mind, I think we hit the mark the vast majority of the time in achieving a high standard of performance.

Over the past year, we have continued to hold the industry accountable through our inspection and oversight program, ensured the effective implementation of lessons learned from the Fukushima Daiichi accident, focused on cyber security, worked effectively with our partners in the States to ensure the safe and secure use of radioactive material, and sought improved performance by fuel cycle facilities.

At the same time, we have undertaken reviews of the first small modular reactors submitted for design certification and of newly proposed facilities to produce radioisotopes for medical diagnostics and treatment. We prepared strategies to better prepare for the review of advanced reactor designs.

Credit belongs largely to the day-to-day work of our dedicated staff in achieving these accomplishments. I appreciate their day-to-day focus on ensuring adequate protection of the public.

Thank you for the opportunity to appear before you. I will be pleased to answer your questions.

[The prepared statement of Mr. Burns follows:]

Senator Barrasso. Thank you, Commissioner Burns.

Thanks to all three of you for your testimony. I am going to start with a round of questions.

Chairman Svinicki, in 2010, nearly seven years ago, I wrote to President Obama about my concerns about the sale of the U.S. uranium assets of Uranium One, which is a Canadian company, to Rosatom, a Russian state-owned company. I specifically raised concerns about future exports of U.S. uranium by Uranium One.

I believe the Obama Administration's response to my letter was, at best, misleading. Responding on behalf of the President, the former Chairman of the NRC, Chairman Jaczko, stated "In order to export uranium from the United States, Uranium One Inc. or its ARMZ," which was the subsidiary of Rosatom, "would need to apply for and obtain," he said, "a specific NRC license authorizing the export of uranium for use in a nuclear reactor."

We now know this is false. Uranium One did not need a specific NRC license to export U.S. uranium. Instead, Uranium One only needed to be, and later was, listed as a supplier on a transport company's NRC export license. Subsequently, Uranium One uranium has been exported overseas.

On Monday, I sent a letter to the NRC in an effort to find answers to why this response was so inaccurate from former Commission Chairman Jaczko.

Chairman Svinicki, will you commit to providing me a timely and fulsome response?

Ms. Svinicki. Yes, Chairman Barrasso. I and our Commission are in receipt of your letter received yesterday. I would note that as your letter makes clear, the responses you received have not fully depicted the complexity of this issue.

As the NRC, we welcome the opportunity to respond to the fulsome set of questions you have asked. I think it will allow us to depict in context and more accurately than the responses you have received. We look forward to doing that.

Senator Barrasso. Thank you very much.

On another matter, the State of Wyoming is in the process now of becoming an NRC agreement State. This means the State of Wyoming would assume the role as the primary regulator for in situ uranium recovery.

I understand Wyoming submitted its final application to the NRC on November 13, 2017. Wyoming expects that the NRC will be able to sign a formal agreement with Wyoming by September 30, 2018, the end of the fiscal year. Can you commit to meeting that deadline?

Ms. Svinicki. Chairman Barrasso, I am aware that the staff indicates they are on track to prepare a voting matter for the Commission, for our review, in the timeframe you have indicated. I know in the interim, it will be necessary for both the NRC

staff and State of Wyoming officials to continue to work through any issues.

Assuming that goes well, I am not aware of any impediments to that, my objective is to proceed on that timeframe.

Senator Barrasso. Thank you.

Last month, the NRC decided to increase the terms for uranium recovery licenses from 10 years to 20 years. The NRC recognized the low risk nature of the in situ uranium recovery activity. I applaud your leadership and the Commission's decisions on that. This is an issue I first raised a couple of years ago in 2015.

Now that the NRC has made this decision, I would like to know how the Commission plans to implement it. Will the Commission extend the terms of licenses that are currently pending at the NRC or will the NRC act on a case-by-case basis? Will existing licensees need to wait until their licenses are amended or up for renewal to obtain a 20 year term?

Can you go through a little bit of that, what the plans are, and will the NRC be issuing a guidance document? If so, when can we expect to see that document? I would like some clarification, please.

Ms. Svinicki. Yes, thank you for those questions.

This is a fairly recent policy change made by the Commission. Some of the exact implementation you ask about is

probably still under development but let me provide the details as I understand them.

I understand that we have two applications pending right now for renewal. We have contacted those two applicants and told them about the policy change and indicated that if they were to amend their application request, we would receive that.

It would require some work to look at a different timeframe for environmental and safety review. We would have to look at the extended period.

We have not received an indication from those two applicants of whether or not they intend to amend their applications and resubmit. As far as other applications submitted going forward, those would come under the new timeframe.

Senator Barrasso. My final question is in October 2017, the NRC submitted a report to Senate appropriators on the progress made on licensing applications. The NRC's report states, "The NRC staff recently finalized an internal self assessment that identifies possible efficiency improvements within the uranium recovery program."

What can you tell us about these efficiency improvements?

Ms. Svinicki. It is a host of measures. I can give you some examples and perhaps for the record we could respond more fully.

Some of the things are to continue to urge applicants to have a very vigorous pre-application engagement and be able to provide better guidance to applicants on what a complete and full application needs to contain in order to be reviewed very efficiently by the agency.

Also, there will be new guidance for agency reviewers so that they will, as they are developing information requests for applicants, make a connection with the safety findings that need to be made.

I would characterize that many of them have to do with better communication with applicants during and before the application comes in and also improved training and guidance for NRC safety reviewers as they conduct the reviews. That is the nature of the improvements.

Senator Barrasso. Thank you.

Senator Carper.

Senator Carper. Senator Duckworth is on a tight timeline. I am going to yield to her. I will ask my questions in the next round.

Thank you.

Senator Duckworth. Thank you so much, Mr. Chairman. Thank you so much, Ranking Member Carper. That is very generous of you.

As a Senator focused on combating the threat of climate

change, I do believe that nuclear power remains a vital tool in transitioning to a low carbon future. Across our Nation, nuclear power generates more than half of all of our carbon-free electricity and we must make improving the safety of nuclear power plants a national priority if we are to avoid disasters like Fukushima in the future.

Chairwoman Svinicki, the nuclear power industry has a strategic plan entitled, "Delivering the Nuclear Promise," which aims to reduce operating costs by 28 percent. The NRC has a similar plan known as Project Aim whose objective is to reduce fees at NRC.

How are you working to ensure that these programs are addressing efficiency improvements but also not cutting corners when it comes to safety?

Ms. Svinicki. Thank you, Senator Duckworth.

For our Project Aim initiative, as I noted in my opening comments and I think my fellow commissioners testified as well, our vital safety and security mission is priority one. As we look, as an agency and as a regulator, to improve our own efficiency and effectiveness, our number one guiding goal is that not diminish our regulatory capability or in any way distract from our important mission.

The industry's effort is their own, the "Delivering the Nuclear Promise." However, we have been monitoring that

activity along the way. If we or our experts were to determine that anything related to their efficiency expert efforts were to indicate some sort of lack of focus on safety, then we would engage under our regulatory framework with them with our concerns about anything they were proposing to do.

To date, we have not noticed that as far as their efforts, their separate "Delivering the Nuclear Promise" efforts.

Senator Duckworth. Thank you.

Commissioners Baran and Burns, do you have any comments you would like to make on this?

Mr. Baran. I would just add that I agree completely with you and that has to be our focus. I think that is maybe the biggest challenge NRC has right now. In the last couple of years, as a result of Project Aim, we made a lot of good changes and captured a lot of efficiencies, but in that time, we have seen our workforce decline by 12 percent in two years. That is a significant amount of change.

Making sure that we are focused on our safety and security mission and we do not have any weakening of oversight I think is critical as part of that effort.

Senator Duckworth. Thank you.

Mr. Burns. I agree with what my colleagues said. I subscribe to what they said.

Senator Duckworth. Thank you.

I think we can all agree that pinching pennies and saving on security inspections, for example, would not only endanger lives but also the future of the entire nuclear industry. Industry and safety stakeholders across my State have shared that the NRC has a strong track record of intervening in safety issues when they occur at the nuclear power plant sites themselves.

However, I am concerned by NRC's own safety culture within the NRC. Internal data at the NRC indicates the Commission's workforce appears to be uncomfortable raising safety issues.

Mr. Chairman, I would ask unanimous consent to enter for the record this report by the Union of Concerned Scientists, "The Nuclear Regulatory Commission and Safety Culture, Do As I Say, Not As I Do."

Senator Barrasso. Without objection.

[The referenced information follows:]

Senator Duckworth. Thank you.

Chairwoman Svinicki, when management and the workforce have trust and confidence in each other, workers feel free to raise problems. When that trust is broken, poor safety cultures develop.

What steps are you taking to restore a positive safety culture at the NRC because I almost feel like the industry feels better about the NRC than the people within the NRC themselves?

Ms. Svinicki. Thank you for that question.

These are important indicators as we survey our own staff about their comfort in raising issues with their management or through an open door policy. As a matter of fact, all members of our Commission currently adopt an open door policy and have meetings where staff can bring issues and concerns directly to members of our Commission.

We have instituted agency-wide training of having difficult conversations and how do you raise issues. I think we try to monitor best practices across corporate America of how do you have the right culture of people feeling very free to speak out and bring issues forward.

We monitor and look for best practices and benchmarking. We try to bring those lessons, training and culture back to our organization but we monitor that closely. We would, I am sure, want to be the model of having an open and free environment for

people to raise concerns.

Senator Duckworth. Thank you.

We have had disposal leaks in my State. It is extremely important that we have vigorous government oversight over our nuclear plants and that the experts we hire to oversee this work feel empowered at every level to do it well.

I understand that NRC regulations prohibit nuclear power plants from discharging water into rivers that exceed a certain temperature threshold. Chairwoman, how is climate change impacting the ability of nuclear power plants to operate amidst increasing river temperatures? For example, will the NRC seek revision to that current regulation and are current regulations impacting the operations of nuclear power plants today?

Ms. Svinicki. Thank you for that question.

My understanding is the upper bound, the temperature limits you spoke of for discharging water, plant output into other bodies of water are set based on very rigorous safety and environmental analysis.

I think that if the climate were warming, our analysis would still be the same. We would probably encounter more frequent circumstances of plants needing to reduce their power input based on not exceeding that level.

I do not know that we would automatically raise the lowest levels. I think you would see cases where plants more

frequently needed to down power, as we call it. They would need to reduce their power output in order to respect the level.

Senator Duckworth. Thank you.

I am out of time. Thank you, Mr. Chairman.

Senator Barrasso. Thank you very much.

Senator Inhofe.

Senator Inhofe. Thank you, Mr. Chairman.

Chairman Svinicki, we have been doing this for a long time. We have been watching the changes that have taken place. In fact, the Clean Air and Nuclear Safety Subcommittee was the first subcommittee I chaired on this committee 23 years ago.

The mission is a vital one. We want our nuclear plants to be safe and they are safe. For several years, we have increased oversight of the NRC's budget and questioned why the NRC has continued to grow despite a shrinking industry. Seven reactors have announced plans to close and another 20 are at risk of closing prematurely.

We have also raised concerns about the NRC's declining productivity. In 2000, the NRC accomplished more work with fewer resources, as you can see in this chart. In response to this scrutiny, the NRC initiated Project Aim 2020 "to transform the agency over the next five years to improve the effectiveness, efficiency and agility of the NRC."

However, it appears that Project Aim 2020 will end early

this coming year. While progress has been made, I do not think the NRC has really achieved its transformation.

Chairman Svinicki, you and I have had discussions about the right sizing of the agency. I know you have been chairman for only a few months now, but do you agree there is still room for a lot more improvement in this area?

Ms. Svinicki. Thank you, Senator Inhofe.

The agency has made many efforts under Project Aim. I know there have been concerns expressed that Project Aim 2020 is terminating early. I would observe that the agency has institutionalized many of the Project Aim activities. The need now is to develop agency efficiency improvement initiatives for the Office of Management and Budget. I would say that we are now marrying the Project Aim efforts into the broader kind of culture at the agency that says where we can find improvements in efficiency and effectiveness, we are doing that.

I do not observe that we are necessarily winding down the Project Aim early. For example, under Project Aim, we began an enhanced strategic workforce planning initiative. It gets to your concern about right sizing.

This enhanced strategic workforce planning is intended to improve the fidelity of our resourcing, how many people and what kind of expertise do we need to do the forecasted work that we have.

We are piloting it now in three of the offices within the agency. That pilot will conclude in July of 2018. Then we will be looking at agency-wide implementation. Again, this is just one aspect but it is the human resource and right sizing aspect to improve our understanding of the kind of people and capacity that we need.

Senator Inhofe. That is good and I appreciate that.

Let me ask you another question. This is the broad question that I don't have the answer for.

I can remember many years ago, we wanted to enhance the position and our portfolio of energy, of nuclear. We went through a thing with eight years of the Obama Administration. He had his war on fossil fuels, coal, oil and gas, so you would think at that time, he would be wanting to go toward something that did not have the footprint he was trying to avoid. That would be nuclear but he did not want nuclear either.

Now we have a new Administration. The war on fossil fuel has ended but we still are not getting where we need to be in nuclear. Look at France and all the other countries with the proper place for nuclear energy. We are just not getting there.

What seems to be the problem in the United States? I thought maybe when the new Administration came in, maybe the problem was we are now depending more on coal, oil and gas and for that reason, we are not advancing in nuclear.

What is your thinking, or any of the other members? Why aren't we doing what I believe and what I think most members, certainly all the Republicans, believe we should be doing to enhance the position of nuclear in the United States?

Ms. Svinicki. My understanding is that the principal contributors are larger economic and market mechanisms that I know the Department of Energy and the Federal Energy Regulatory Commission would focus on but they fall outside the domain of the Nuclear Regulatory Commission.

I understand those to be the principal contributors to the lack of deployment of additional nuclear in the United States.

Senator Inhofe. You guys, what do you think?

Mr. Baran. I think the Chairman is right. I think low wholesale electricity prices are a significant factor.

Mr. Burns. I would agree with the Chairman as well. Essentially, it is those types of market forces, low price of natural gas, and other types of things like that.

Senator Inhofe. I just want to see that red arrow going the other way.

Thank you, Mr. Chairman.

Senator Barrasso. Thank you, Senator.

Senator Carper.

Senator Carper. Thanks, Mr. Chairman.

Again, I would like to welcome everyone. Thanks for your

attendance, your responses and your service.

At the beginning of his comments, the Chairman mentioned he sent a letter to you asking a number of questions. We have some concern on another front with respect to EPA not responding to questions from our side of the aisle. A number of my colleagues have been very supportive of our efforts to get the information we deserve and need.

I would just like to say, make sure the Majority, particularly the Chairman in this case, gets the information he needs. You don't have to belabor this, but I would like to have some response as to whether you agree to reaffirm your willingness to be responsive to the questions from all of us as we go forth?

Ms. Svinicki. Yes, Senator.

Senator Carper. Thank you.

Mr. Baran. Absolutely.

Mr. Burns. Yes.

Senator Carper. Thanks so much.

I have one other question that kind of relates to the Chairman's letter to you. This would be for Commissioner Burns.

Were you the General Counsel of the NRC at the time Uranium One and RSB license reviews were taking place?

Mr. Burns. If you can refresh me, this was around 2010?

Senator Carper. Yes, I think so.

Mr. Burns. 2010, yes, I was the General Counsel from 2009 until early 2012.

Senator Carper. It is my understanding that unlike nuclear reactors, the Nuclear Regulatory Commission regulations do not prohibit foreign ownership and control of uranium milling operations.

In fact, it is not unusual for these to be partially fully owned by foreign companies. Again, we are talking about milling as opposed to refining. Go ahead.

Mr. Burns. You do not have the prohibition for production and utilization facilities. However, as with all licensing, you have to reach an inimicality finding, that it is not inimical, that is an unfortunate word in the statute, to the common defense and security. That is a finding you have to make in licensing determinations.

Senator Carper. Correct me if I am wrong, I believe it is the NRC career staff, not the commissioners, who make the decisions when it comes to the transfer of the milling NRC license or to an amendment to an export license, is that correct?

Mr. Burns. I think that is generally true. There are circumstances where if you had a contested matter which the Commission, in its adjudicatory role, would have to decide, it would come to but I will have to refresh myself as we prepare to

answer Senator Barrasso's questions.

I don't think that was the case, that there was not a contested or adjudicatory decision that came before the Commission at that time.

Senator Carper. My memory is maybe not what used to be either but if you find you want to add something for the record in response to my questions, that would be fine.

I would also ask you answer for the record, do you believe the NRC staff followed all appropriate regulations and guidance for Uranium One and RSB reviews and decisions? If you want to respond to that now, you may or you may respond for the record.

Mr. Burns. I think I will respond for the record because again, having just seen the letter come in, as I say, I don't have a robust recollection of the particular circumstances at that time. I would appreciate the opportunity to do that.

Senator Carper. All right.

Let us talk a little bit about morale. You used to be at the top of the charts, the Nuclear Regulatory Commission, for many years, number one in terms of morale, down to number 11. I think you went down to 12, maybe up to 11, you are coming back to the right direction. Number 11 with a bullet, I hope, as they say at Billboard.

Commissioner Baran, can you take a minute and tell us about the impact of the recent budget cuts? Do you feel these cuts

have impacted morale and can the NRC still complete the work it needs to do in a timely manner?

Mr. Baran. Thank you for the question.

I think you are right that the Project Aim effort and the budget cuts have had an impact on morale. I think that is primarily because there are few opportunities for promotion, often reduced training and rotational opportunities.

We need to make sure, at the agency, that we retain the tremendous talent that we have. It is really a terrific workforce. It is still a great place to work. I am hopeful that one of the things we can do with strategic workforce planning tools is to help the staff better see if they want to get to a certain position in a few years, what are the particular skills they would need to work on, the training, the rotational opportunities, to get themselves in a position to advance in that position or to move into those positions.

I think that is giving the staff a better sense of what the opportunities are at NRC and what they need to do to get themselves in the position to take advantage of the opportunities. I think that will further help morale. I think we are starting to head in the right direction but it has been a challenging time.

Senator Carper. I have some more questions about new reactors and a couple of other things. Maybe we will have

another round. I am interested in asking some questions concerning advanced reactors.

Thanks for your responses and I will look forward to the responses for the record, Mr. Burns.

Thank you.

Senator Barrasso. Thank you, Senator Carper.

Senator Capito.

Senator Capito. Thank you, Mr. Chairman. Thank you all for being here today.

On March 8, the very same day that we had a legislative hearing on the Bipartisan Nuclear Energy Innovation and Modernization Act, which we have joined together on, the GAO published a report on the NRC's budget structure and justifications.

In my view, one of the things I found troubling in the report was it seems as though the NRC is keeping two sets of books, "one to formulate its budget and another to obligate funds based on its appropriations for Congress."

To put it another way, the NRC creates in its budget a public consumption for Congress but then operates under a separate budget under its internal operations making it tough for authorizers and appropriators, which I am an appropriator and obviously we are the authorizers, to discern how the NRC is actually spending taxpayer dollars.

As an example, according to the NRC's monthly report, the NRC had 3,241 full-time equivalents this past September. The budget justification is for 3,405 FTEs. If you multiply that out, that is about \$25 million in "extra funding." In other words, FTEs that were budgeted for but were not actually filled. I believe Mr. Baran mentioned that the workforce is down 12 percent.

I would like an explanation of where are these extra dollars that were actually appropriated that were not fulfilled by the FTEs who were actually working at the NRC and some fleshing out of where that is? Does that mean your budget request in the future would be lower because you were able to roll over this money? How does that work?

Ms. Svinicki. Thank you for the question, Senator.

If I can supplement this answer for the record, there are a lot of moving parts here. It is true that over the course of the last budget year, we were conducting a reduction in force and we were, through attrition, getting smaller in the area of FTE.

The difference in funding I would forecast probably will or has shown up as carry over money from one budget year to the next. If our staffing levels at the end of the year ended up being lower than the requested budget, some of that would likely materialize as carry over funding into the fiscal 2018, current

fiscal year.

It is difficult, as we develop the agency budget two years in advance since, we are reducing employment levels; it is difficult for us when we submit the budget to forecast the exact difference.

Again, the period you are discussing was a period of continued decline in staffing levels. We probably hit a little bit under the target and had fewer staff at the end of the fiscal year. I think, in general, it is a forecasting error but the money likely would show up as carryover.

Senator Capito. When you say carryover, does that mean you carry over to the next year and then you subtract that from your budget request the upcoming fiscal year?

Ms. Svinicki. I can check for the turnover of the fiscal year this fall but often appropriations clerks will ask us for updated estimates of carryover as we approach the end of the fiscal year.

Sometimes appropriators make an adjustment in the enacted level based on the carryover since we tend to have the enacted levels after the start of the fiscal year.

Senator Capito. Do you know if the NRC treats this carryover or extra amount you have at the end of the year as a fungible line item; does it have to go to FTEs? How do you treat that?

Ms. Svinicki. I am not certain if the treatment is consistent year to year. Could I take that for the record and provide a response?

Senator Capito. Yes, please.

Ms. Svinicki. Thank you.

Senator Capito. I would say anecdotally you are not the only commission or government agency that is falling into this category. I don't know, according to the GAO, it was not a satisfactory way to actually present the reality of where your budget is, where the actual spending is, and what happens to this extra or carryover amount.

I think that needs to be tracked and needs to be accounted for. Any additional information you can provide in written form would be much appreciated.

Ms. Svinicki. I would also add that in response to that GAO report, I know both House and Senate Appropriations have instituted basically additional control points for the execution of our budget.

The monthly report you cited is one of the outgrowths of our monthly reporting to our consistency with those budgetary control points.

Senator Capito. I would even say in October of 2017, you budgeted for 3,293 when in actuality it is 3,137. The pattern is still continuing. Realizing that you cannot get it down to 1

or 2, I get that, but the numbers are significant, I think 156.

With that, I would just ask if we could submit a question or our staff could get with you to get more details on this.

Thank you.

Ms. Svinicki. Yes.

Senator Barrasso. Thank you, Senator Capito.

Senator Markey.

Senator Markey. Thank you, Mr. Chairman.

Commissioner Baran, right now the United States has restarted negotiations with Saudi Arabia on nuclear cooperation. Both during the campaign, it turns out and after becoming Trump's National Security Advisor, General Flynn was seeking to begin that process.

So far, the Administration has refused to meet the legal requirement to keep Congress fully and currently informed of any initiative in negotiations relating to a new and amended agreement as required by the Atomic Energy Act.

Last week, Trump's Energy Secretary, Rick Perry, visited Saudi Arabia to discuss their bids to build new nuclear reactors. It has been reported that these deals may allow for enrichment of uranium which all previous U.S. agreements have prohibited.

The NRC has oversight responsibility over the export of nuclear source materials and technology. Has the NRC been

consulted on the export of these potentially sensitive nuclear technologies?

Mr. Baran. As part of the 123 agreement process, NRC, as you mentioned, has a role. It comes later in the process when there are certain statutory findings the Commission must make in order for the 123 agreement recommendation to go to the President. We are not at that stage yet.

Senator Markey. If the agreement does allow for the enrichment of uranium or reprocessing of plutonium, do you think that could pose a proliferation in safety risks?

Mr. Baran. It is challenging to answer that question without having any sense of what is actually agreed to there.

Senator Markey. Let me ask it another way. Does a Country need to be able to enrich or reprocess in order to have a civilian nuclear power program or can they bring the uranium in?

Mr. Baran. No, it is not necessary.

Senator Markey. Not necessary, okay. Thank you.

The Nuclear Regulatory Commission staff granted the Pilgrim Nuclear Power Station an exemption from the requirement that a seismic probabilistic risk assessment be performed. This is a great concern since Pilgrim saw a bigger increase in seismic risk during its post-Fukushima hazard reevaluation than any other nuclear power plant.

The reevaluation found that Pilgrim has a seismic hazard

that is significantly higher than the plant was designed to withstand. Seismic assessments are very important. These are used to evaluate how safe nuclear sites are from earthquakes and can be used to determine what improvements and changes need to be made to protect the sites and surrounding communities from disaster.

Commissioner Baran, while the NRC staff decided that Pilgrim is not required to do this assessment, do you think that station should voluntarily perform a seismic analysis?

Mr. Baran. This was, as you mentioned, a staff decision. I think the staff, in this case, made the wrong decision. Given the particular set of circumstances at Pilgrim, I think NRC should have required the detailed seismic risk assessment that would have been completed by the end of the year.

Senator Markey. I agree with you. I think that is the position the NRC should be taking.

Since 2015, Pilgrim has been assessed as having multiple, repetitive operational safety violations. Mr. Baran, the NRC is currently undertaking a rulemaking to govern the decommissioning of plants. As Pilgrim moves toward decommissioning in 2019, is there any insight you can provide as to how that rulemaking will take operational and physical safety into account?

Mr. Baran. With regard to Pilgrim, it may be that the rulemaking is complete after Pilgrim has already shut down. It

may not be directly applicable to Pilgrim depending on what the ultimate timing is. I think the staff is aiming to complete a rulemaking package for a draft final rule for Commission review by the end of 2019.

As I mentioned in my opening remarks, I think it is going to be a very good move to move away from the regulation by exemption approach we currently have. I think it makes sense to have, as we do for operating plants, a detailed list of the regulatory requirements, safety and security requirements that apply to a permanently defueled, decommissioned plant.

We don't have that right now. This rulemaking would accomplish that. I think that is a good move.

Senator Markey. I think it is imperative that the new rules on decommissioning emphasize operational and physical safety long after these plants have stopped generating electricity.

I might just say about the state of this industry, obviously Westinghouse went bankrupt trying to complete the local plant. That is not because of any attempt by granola chomping, tree hugging liberals to stop the construction of that plant. It had nothing to do with it.

It had to do with the very fact that it is very hard and very expensive to build nuclear power plants that are safe. They are under tremendous pressure obviously from the wind and

solar industries which is why there is an attempt by the fans of all these alternative energy generating sources to take away the benefits for those competing sources of energy.

I might just say in response to the gentleman from Oklahoma when he talked about the war in the Obama Administration on coal, gas and oil, that there was a dramatic, historic rise in oil and natural gas production during the Obama Administration, a dramatic rise. Amongst other things, the drop in the price of natural gas is what has led to wind and solar, the very difficult economic conditions within which the nuclear power industry is trying to survive.

Thank you, Mr. Chairman.

Senator Barrasso. Thank you, Senator.

Senator Fischer.

Senator Fischer. Thank you, Mr. Chairman.

Madam Chair, as I understand it, Wyoming will likely become an NRC agreement State in 2018. As a result, the State of Wyoming will then begin regulating its uranium recovery facilities in place of the NRC doing that.

Seven of the nine uranium recovery facilities who paid fees to the NRC in 2017 are located in Wyoming. The other two are located in South Dakota and in my home State of Nebraska.

The NRC determines its uranium recovery annual fees by dividing by the number of facilities. How will the NRC maintain

the Uranium Recovery Office to ensure the two remaining licensees are not unfairly burdened with an extreme increase in those regulatory costs?

Ms. Svinicki. Thank you, Senator, for this question.

Although our Commission has not grappled with this, I have been monitoring the potential impact that agreement State status for Wyoming would have in the financial structure of how we recover costs.

I will speak for myself and not for my colleagues that this is a management challenge. I appreciate that you have raised it. Already our director of the relevant office and our chief financial officer are looking at this question.

With Wyoming taking a significant number of the entities now paying fees for uranium recovery regulation, this will be a step change for us. This isn't a small change; this will be something we are going to have to look at the structure of how we are recovering these costs.

I would like to provide a fuller answer to you for the record on exactly where the chief financial officer's examination of the question resides. Again, it is a definite issue but I am confident that we are foreseeing it and looking at it now.

Senator Fischer. I would appreciate you responding for the record. That would be helpful.

I would also appreciate if you could keep our office informed on the progress you are making on that before you announce any decision publicly so that we would be able to have some input and also review with you.

Ms. Svinicki. Yes.

Senator Fischer. Also, Madam Chair, this committee has tasked the GAO with reviewing the NRC's cost estimating practices in the wake of concerns that the NRC significantly under estimated the cost of implementing its filtered vents proposal.

In December of 2014, the GAO released a report that was fairly critical of the NRC's development of cost estimates stating the NRC's procedures "do not adequately support the creation of reliable cost estimates and that the filtered vents cost estimate did not fully or substantially meet any of the four characteristics of a reliable cost estimate."

The GAO recommended that the NRC align its cost estimating procedures with relevant cost estimating best practices identified in the report. However, the NRC staff rejected that advice stating, "The NRC does not believe, however, that the standards used by GAO to assess our program are appropriate."

More recently, for all ten monthly reports to this committee, the NRC has stated "The staff has not yet taken any action to develop specific metrics for assessing the quality of

its cost benefit analysis.”

To summarize, three years have passed. The NRC staff rejected GAO’s advice and there are no metrics in place to assess the quality of the NRC’s cost benefit analysis. My question would be what basis does the NRC have for assessing whether the cost benefit analyses used by the Commission for decision making are, in fact, reliable?

Ms. Svinicki. Thank you for that question.

Our Commission recently requested the staff provide an update to us on the response to the GAO recommendations. I don’t dispute your description of the intervening time period, but we have now been informed by the agency staff that the staff is updating the cost benefit guidance documents.

The changes being incorporated include recommendations from the GAO’s 2014 report findings, including that the agency adopt relevant cost estimating best practices identified in the GAO’s 2009 guide or authoritative best practices that the GAO referred to.

This is the staff’s communication to the Commission of their current activities underway. We will look forward to updating you. I do not have a date for when that would be published. I think it is 2018 but we can provide that answer for the record.

Senator Fischer. I have a couple other questions I would

like to submit for the record, Mr. Chairman.

Thank you.

Senator Barrasso. You are certainly welcome.

When Senator Markey referred to tree hugging and granola crunching individuals, I know that did not apply to any specific member of this committee. With that, let me recognize Senator Whitehouse.

Senator Whitehouse. Mr. Chairman, I resent that remark. I represent that remark.

[Laughter.]

Senator Whitehouse. Welcome, all. Thank you for your work.

I would like to focus with you all for a little bit on the question of advanced reactor licensing. As you know, I have been persistent about trying to open the possibility of next generation advanced nuclear technologies with the ultimate holy grail, if possible, of finding nuclear technologies that can allow us to go through our nuclear waste stockpile and try to turn that into valuable energy rather than leave it lying out there as a massive public health and financial liability.

The bill I have authored and co-sponsored is still in process. We have, I think, considerable support for it. It is very bipartisan. In the meantime, you all received an additional \$5 million appropriation for advanced reactor

licensing.

I wanted to get your sense on how far that \$5 million takes you. Does that take you 1 percent of the way to where you need to be, 2 percent, 10 percent, or can you wrap your hands and say, job done, we are all set with that money?

Let me put it another way. You are not supposed to ask for more money, so let me say if you continue to get that additional \$5 million year after year, what timeframe does that put you on for achieving your goal with respect to advanced reactor licensing?

I know you are responding to all of our concerns about this by doing things administratively. Could you fill me in on what is happening administratively and what the \$5 million does for you in the context of what you are trying to achieve?

Ms. Svinicki. Thank you for that question.

I will start and my colleagues will probably remember some good points that I am not going to remember.

Making sure that NRC is engaged and part of the dialogue that is going on between the Department of Energy, the designers of these new designs, and the National Laboratories is, I think, the most important use we have put that \$5 million to. I think having the regulator in the room is important.

We are bringing to that engagement and have created a strategy document and then a series of implementation plans.

Those are focused towards NRC developing the regulatory capacity. Some of that is knowing different fuel cycles and different material types, what kind of capacity and expertise we need to bring in an informed way to the engagement as the community of designers of these advanced reactors want to push forward.

It is also important that NRC experts be present with the Department of Energy and the National Laboratory experts because I have learned that the researchers that DOE and the National Labs are actually drawing upon are the earliest experiences of the atomic history of the United States because some of the reactor designs are really not entirely new. They are designs this Country did experimental work on or prototyping in the 1960s and 1970s.

Senator Whitehouse. So this \$5 million is generally being used on outreach and connection with other facilities?

Ms. Svinicki. The implementation plans allow us to look at what DOE is doing, what the Labs are bringing to the table, and what the vendors are identifying as the gaps and needs for information that they have.

Our implementation plans are kind of iterative based on the engagement we are going by. We don't want to have total gaps in our expertise and regulatory capacity where we have to throw up our hands and say, we don't know anything about that type of

material, so we are never going to be able to approve its use in a nuclear reactor.

I think going forward, we get to taking that framework and applying it to specific technical issues. From a budgetary standpoint, I think that is where it gets more expensive because then the labs need to be doing things and we need to be weighing in on their testing and data plans and say, if you collect this data, will it be sufficient for us to make a regulatory determination. I think the framework is essential. We have spent the \$5 million on that.

Senator Whitehouse. My time is running out now so let me ask if the other two commissioners could make a joint statement that you all agree on in terms of a response to this being a question for the record? If you would like to add additional thoughts of your own, I would invite you to respond in writing as a question for the record.

In my last moments, I want to say again that to me, it is very disappointing and discouraging to see safe and safely operating nuclear plants that produce carbon-free power have to close down in order to build and run new carbon pollution-generating plants simply because of the market failure of having any value to the carbon-free nature of nuclear power.

I know that is being resolved a bit at the State level. I hope I can continue to work with colleagues to try to get

something done akin to our carbon capture utilization and storage bill to encourage the continued safely operating nuclear fleet not have to be artificially shut down at a time when we could certainly use both the electricity, the jobs in those locations and the carbon-free nature of that power.

Thank you, Mr. Chairman.

Senator Barrasso. Thank you, Senator Whitehouse.

Senator Carper.

Senator Carper. While he is still here in the room munching on a granola bar, I just want to say I approve this message, approve that message. Thank you.

I want to come back to something Senator Whitehouse raised maybe in a little different way. Maybe five or six years ago, I was privileged to go with a member of our staff to France to take a look at what they were doing with respect to efforts to recycle and reprocess spent fuel to see what lessons there were for us.

I know additional work has been done I am sure in France but also here in this Country. Can you talk about that a little bit, looking forward and with a respect to what we need to be doing here on this side of the dais, please? Madam Chair, will you go first and then we will ask the other members to join in.

Ms. Svinicki. On the issue of recycling or reprocessing, early in my service on our Commission I think in 2009, the

agency received some expressions of interest from potential developers of reprocessing capability in the United States.

I would say though in the last number of years since then, as a regulator, we have not heard any expressions of anyone interested in development. In 2009, we were asked by the potential industry developer could we update our old regulations on reprocessing and recycling.

Before we even undertook that effort, I think the business interest in doing it diminished. Other than that, it has been a fairly dormant area for us as a regulator.

Senator Carper. Other members, please?

Mr. Baran. I would just echo the Chairman's remarks. The three years I have been on the Commission, it is not something I have heard anyone propose to move in that direction which may be a reflection of low uranium prices.

Senator Carper. Commissioner Burns?

Mr. Burns. I agree with what my colleagues have said.

Senator Carper. In this regard, is there anything going on in other countries, France or any other countries where they have a fair amount of nuclear that you are aware of?

Ms. Svinicki. I think for the countries that do engage in reprocessing, it is a fairly stable process they have developed. I am not aware of them proposing any dramatic changes to it. It is pretty stable and known. I think the basic process was

developed in the 1970s and I think it has stayed essentially the same.

Senator Carper. Thank you.

Could we turn to Fukushima, lessons learned from Fukushima, lessons we learned from that tragedy and actions we have taken here in our Country with our own nuclear plants? How are we doing in that regard? Just give us an update, please.

Ms. Svinicki. The implementation of the NRC's post-Fukushima set of regulatory actions has effectively been accomplished. There was some mention made to seismic hazard analysis upgrades and the institutionalization for us of routine looking at updating of the safety assessments for the natural hazards for the facilities.

Some of the post-Fukushima actions we have taken will have a very enduring footprint at the operating facilities across the Country because they require a very consistent focus on being prepared for these very extreme, natural events.

As an observer of the events at Fukushima and what countries around the world have done as they have learned lessons from that, I think there has been a strong emphasis on the fact there are human people responsible. You can have the best set of procedures and response and you can have exquisite equipment available, but it is the individual responders at the plants who will need to be able to carry that out. I have seen

a consistent focus on that from the U.S. industry and also U.S. NRC to make sure that training, procedures and exercises will be the essential element to the resiliency going forward.

Senator Carper. Thank you.

Commissioner Baran and Commissioner Burns, would you like to add to that, please?

Mr. Baran. Sure. There has definitely been a lot of progress on the ground in terms of equipment to address certain accident scenarios. I have traveled to plants all across the Country. If you go to a plant, you will see a dome or some other type of structure that is filled with equipment that can be used at any plant in the Country, generators, pumps, hoses that would be extremely useful, I think everyone agrees, in the event of an accident scenario. That is all new equipment since Fukushima. That is a concrete manifestation of the effort. Spent fuel pool instrumentation levels, that was something not previously required that is now in every plant in the Country.

The long-pull intent has been severe accident-capable vents for certain boiling water Mark I and Mark IIs. Those are going to be completed in the 2018-2019 timeframe. Really the only thing else that is kind of outstanding are some of these hazard evaluations which are, in some cases, multiyear efforts.

Senator Carper. All right, thank you.

Commissioner Burns.

Mr. Burns. I would just add that in many respects what the industry has built on from the requirements that we imposed after Fukushima actually had some origin in our thinking after 9/11 in terms of the ability to withstand large explosions and things like that.

There was a baseline due to requirements the agency had adopted after 9/11 that were really built on the Fukushima era.

The other thing I might add is that I have had the opportunity to go to a number of nuclear power plants outside of the United States. For the most part, I think our approach is very similar and what is going on in other countries is very similar to what we have been doing in terms of addressing the type of way to basically prepare for the unexpected, the beyond design basis accident. I think worldwide we are pretty much on the same page.

Senator Carper. Thanks.

When you look at the difficulties we have encountered, they have been encountered in South Carolina and Georgia in the construction of new facilities. I understand in Georgia, they are still under construction and in South Carolina construction, the work has stopped.

Do you have any idea whether or not some of the lessons learned from Fukushima added to the cost of these projects in a way that sort of led to their slowdown and in one case,

stoppage?

Ms. Svinicki. I do not have any rigorous analysis of that. I would be very, very surprised if that played a role. That does not logically follow to me because the types of actions post-Fukushima are all something well contemplated by the new plants.

I do not think in terms of an increment of additional expense, they would not be significant enough to cause a plant cancellation.

Senator Carper. Do the two commissioners agree with that?

Mr. Baran. I agree. I do not think it was the result of anything NRC did.

Mr. Burns. I would agree. As I think the Chairman alluded, the passive designs, that is, in effect, the Generation III+, that is the advantage of the AP1000 and some of the new designs. Those passive designs sort of account for some of those aspects.

Senator Carper. Is the largest factor that led to the decision not to go forward with the South Carolina project and, frankly, decisions around the Country to close or mark for closure a number of nuclear plants, have more to do with the very low cost of natural gas? Is that a bigger factor?

Ms. Svinicki. I know that the South Carolina Public Utility Commission and the State legislature are conducting a

series of hearings. I suspect that when all the analyses are done, there will be multiple contributors to why the project was abandoned.

I think some of them will revolve around project management aspects. Others will be perhaps the Westinghouse bankruptcy as a complicating factor and others, but I suspect there will be multiple contributors to why the project did go through to completion. I know the State is looking closely at that.

Senator Carper. All right. Gentlemen, anything?

Mr. Baran. I don't know that I have anything to add to that other than I think putting aside the Summer plant, I think that is a factor obviously utilities are looking at if they have a combined license to build a new plant, what are the wholesale electricity prices and are they sufficient to support construction of a new plant? I do think that is a key factor.

Senator Carper. Our colleagues from Georgia have been supportive of including in tax reform legislation a provision dealing with the section of the Code called 45J, the investment tax credit provision. Are you familiar with that? Do you have any views on that?

Ms. Svinicki. I am certainly not expert but I have read the same comments from the constructors of the Vogel Units who thought the continuation or extension of certain favorable tax treatment is an underlying part of their business case for

completing the Vogel Units but again, I don't have separate expertise on that. I have just read the same statements by the constructors of the plan.

Senator Carper. Gentlemen?

Mr. Baran. No.

Mr. Burns. No.

Senator Carper. Lastly, I like to ask people who have been married a long time what is the secret to being married a long time? I get great and really funny answers. I ask people who have been together 50, 60 or 70 years.

One of my favorite answers is, I explain the two C's, communicate and compromise. In Delaware, we have added two more C's, civility and collaboration. I think that is not just the secret for a long union between two people; it is also the secret for a vibrant democracy and effective leadership.

I said to the Chairman before we started that in the past, I remembered gathering here for oversight hearings with the Commissioners and they were not happy chapters in your lives or ours. There was a time when the Commission really struggled at working together.

I would just ask the three of you, with respect to the four C's, communicate, compromise, civility and collaboration, how are you doing?

Ms. Svinicki. Again, I feel very privileged to serve with

the two gentlemen who are here with me. We always welcome new colleagues. I think I have had four chairmen and a lot of different colleagues during my nearly ten years on our Commission.

Again, Commissioner Burns was so gracious in assisting me in taking over the chairmanship. I am very grateful. I continue to consult with him on matters and say, how did you handle this as chairman.

I would say we are doing very well. I think the secret to getting along is respect. It does not mean you agree on everything.

Senator Carper. How do you spell that, r-e-s-p-e-c-t?

Ms. Svinicki. I think it is something Senator Duckworth mentioned, our own safety culture and the willingness to raise concerns. Part of the training in having difficult conversations with colleagues or with your boss is that respect element. That is some of what we emphasize there. I think as a commission, we try to model that.

Senator Carper. Commissioner Burns, are you going to sit there and let her say that, get away with that?

Mr. Burns. Absolutely. Having just reached my 40th wedding anniversary this year, I agree with your characterization of what is successful. I am sure my wife will too.

Senator Carper. Mr. Baran.

Mr. Baran. I agree with my colleagues. The three of us work very well together. We do not always agree on policy matters and that is fine. That is the idea behind a commission. You have people with different views and different experiences. Sometimes they agree, sometimes they do not. We try to persuade each other.

We are always excited if we can persuade each other. We often find common ground and compromise. We have a lot of decisions where we are 3-0. I think it has worked well and I am very happy with the colleagues I have.

Senator Carper. Thanks.

Mr. Chairman, I know I said I only had one more. Could I ask a question with respect to cyber attacks?

Senator Barrasso. Yes, please do.

Senator Carper. Earlier this year, there were reports of possible cyber attacks on some of our nuclear reactors, as you know. I would like to ask how is coordination going with the other relevant federal agencies? There are a number of them including the Department of Homeland Security. How is that coordination going as we help defend our reactors from these kinds of attacks in the future?

Ms. Svinicki. Our commission of the Nuclear Regulatory Commission and our direct commissioner involvement, I think has

a really strong track record. In the entirety of my service on the Commission, we conducted twice a year meetings where we go into the appropriate setting with a representative sampling of our federal partners who monitor these events very, very closely.

I am not aware that other commissions have that as a routine practice. It allows us to hear directly from intelligence analysts from throughout the government. I think as a result our confidence in our regulatory response to cyber security is raised because we monitor this very frequently and very directly.

We have our own experts as well and they are in the room, but I think to invite interagency partners to come and sit with us as political appointees is very important. I am very proud that we do that.

Senator Carper. Good.

Gentlemen?

Mr. Baran. I agree.

Mr. Burns. I agree. It has been very useful. I think it helps our thinking and our preparation as well as for our staff because it is something that is not going to go away. We need to continue to be vigilant about it.

Senator Carper. Madam Chairman, do you have any advice for us to enable you to do your jobs better, a couple words? A lot

of times, I ask a question and people say more oversight. They say more oversight, which is interesting. Any advice for us?

Ms. Svinicki. I do think the consistent engagement that you have with our commission as a committee and the staffs that support you and the work that you do allows the committee staff, because of the consistency of your interest, to be able to have the time to develop the knowledge and expertise on our issues as an agency.

I think that really benefits us because I know Senators, and their staffs as a result, are pulled in many different directions on any given day. I think the opportunity for your staff to work with us more directly and develop kind of a long term observation of our agency's achievement, progress and challenges is a helpful back and forth engagement we have.

Senator Carper. All right.

Gentlemen.

Mr. Baran. I agree. I appreciate that in my time on the Commission, the three years here, we have had so many constructive hearings where we go through both management-type issues and budget-type issues, but also more policy-focused issues. I have found it to be very constructive and very useful.

It sounds hokey but really that oversight is important. We appreciate it and as someone who worked for the House of

Representatives doing oversight work, it is extremely valuable.

Senator Carper. Commissioner Burns.

Mr. Burns. I would agree. As I think the Chairman alluded, for us as commissioners and that is our day-to-day work, they are not easy issues so the engagement with the staff as well as engagement with you directly, I think, helps us all understand the challenges we have, the concerns you have and how we can work through them.

Senator Carper. Thank you all very much.

Senator Barrasso. There are two final questions and then we will conclude this.

Chairman Svinicki, Mick Mulvaney, Director of OMB, had a memorandum sent out to the heads of departments of agencies in July of this past year. In the memorandum, he provided guidance for the development of the fiscal year 2019 budget.

He specifically highlighted how and said, "The fiscal year 2019 budget process will give special consideration to bold reform or reorganization proposals that have the potential to dramatically improve effectiveness and efficiency of government operations."

Is the NRC considering any proposals that might align with what he is recommending in his guidance?

Ms. Svinicki. Of course our engagement with OMB is in advance of the President's budget roll out in February of next

year. There are, of course, sensitivities but as a general matter, we have been engaging with OMB in the development of our fiscal 2019 budget.

An element of that, as you mentioned, are these reform initiatives and proposals. We have engaged our examiner. She has come back and asked us additional questions. We have been in the process of developing our agency proposals to accompany the President's fiscal 2019 budget.

That engagement has been going on. I understand there may be some additional feedback that we receive in the coming months prior to the budget roll out. When we appear before the committee next year in support of our budget, we can speak of those specifics at that time.

Senator Barrasso. For the final question, I called on the NRC to consider implementing the flat fee structure for routine uranium recovery licensing actions. To date, the NRC has taken multiple years, as I mentioned, to establish a pilot program for a sector with only 11 licensees.

I am just concerned the NRC is taking too long to get the program up and running. The agreement States like Texas and Utah already have flat fees in place for routine uranium recovery licensing actions.

Can you talk a bit about the cause of delay and why the NRC cannot use programs already put in place like Texas and Utah as

maybe templates for your own program?

Ms. Svinicki. I agree, Chairman Barrasso, it does seem like a prolonged period but I have come to understand from the NRC staff a couple of things that persuaded me.

The first is uranium recovery is a pilot for flat fee. I think the agency is intrigued about the potential use of flat fees beyond uranium recovery and other areas. As a result, the NRC staff really wants the pilot to be successful.

In order for it to be successful, they need to develop the flat fee estimates with a certain level of fidelity. The best way I could describe this, and the staff has not corrected me, so I hope I am right about this, is we know what recent uranium recovery fees have been but we do not have a good understanding on what to attribute.

If one cost x million dollars and another cost y , we don't just want to average x and y and say that is the flat fee because what if the one that was higher had a lot of complexity? It is not going to be an equitable and realistic flat fee estimate.

I know it seems like a very prolonged period. With the parallel development of Wyoming's agreement State agreement, it may be this was not the best area to pilot given other events.

I think the agency is very committed to exploring flat fees because we think they have promise for other types of licensees

as well. Our commitment is to doing a pilot that will demonstrate that and doesn't just fail maybe for reasons that we did not prepare it properly.

Senator Barrasso. Members may submit additional questions, as you know, for the record. The hearing record will remain open for two weeks.

I want to thank the witnesses for your time and your testimony today.

The hearing is adjourned.

[Whereupon, at 11:30 a.m., the committee was adjourned.]