

HEARING ON OVERSIGHT OF THE NUCLEAR REGULATORY COMMISSION

WEDNESDAY, MARCH 21, 2018

U.S. SENATE

Committee on Environment and Public Works

Washington, D.C.

The committee met, pursuant to notice, at 10:05 a.m. in room 406, Dirksen Senate Building, the Honorable John Barrasso [chairman of the committee] presiding.

Present: Senators Barrasso, Inhofe, Capito, Boozman, Wicker, Ernst, Carper, Cardin, Whitehouse, Gillibrand, Booker, Markey, Duckworth and Van Hollen.

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. Thank you very much.

I am sad to say that the Commission remains without its full strength of five commissioners. I believe that the Commission functions best with all five commissioners in place. I continue to work to resolve this situation.

If we don't make progress shortly, the NRC will lose its three-member quorum at the end of June. The Senate cannot let that happen. Since Congress established the NRC in 1974, the agency has lost its quorum only once. That took place over a seven-month period in 1995 and 1996.

During that time, the Commission delegated its authority to Chairman Shirley Jackson. Not surprisingly, anti-nuclear activists then challenged that delegation of authority. If the NRC loses its quorum in June, I fully expect those same forces to once again challenge the NRC's authority and ability to act. We simply cannot allow our Nation's nuclear safety regulator to lose its quorum.

I will now turn to the NRC's budget request for fiscal year

2019. Last month, the NRC requested about \$971 million to support the work of 3,247 full-time equivalents in terms of employees.

The Nuclear Reactor Safety Program, which includes the NRC's efforts to license, regulate, and oversee civilian nuclear power, would account for about \$475 million and 1,925 full-time equivalents. The Nuclear Materials and Waste Safety Program, which includes the NRC's efforts to license, regulate, and oversee nuclear materials and waste, would account for about \$184 million and 650 full-time equivalents.

Under federal law, the NRC must recover 90 percent of its budget through fees that the agency levies on licensees. I believe the key question that Congress needs to ask is: Does the NRC's expected workload in 2019 justify licensees paying for a budget increase?

I ask this because at the end of fiscal year 2017, the NRC had over budgeted by \$31 million. For years, the NRC's workload has been decreasing. Once again, the agency is requesting a budget increase.

For example, in fiscal year 2019, three of the Nation's 99 nuclear power plants are scheduled to close. This includes Oyster Creek Power Station, which Exelon recently announced would close one year ahead of schedule.

Nonetheless, the NRC is asking for an increase in funding

to oversee our Nation's decreasing civilian nuclear fleet. The NRC's workload on licensing activities for fuel facilities is also expected to decrease in fiscal year 2019. Last year, the number of fuel facilities declined from nine to seven. Still, the NRC is asking for an increase in funding for its fuel facilities program. I continue to believe Congress must ensure that the NRC's budget accurately reflects the agency's workload.

Finally, I would like to say a few words about the dire situation that our Nation's uranium producers are facing. In 2017, the U.S. produced uranium at the lowest level since 1950, before our Country had commercial nuclear power reactors.

Despite the rich uranium resources in Wyoming, Nebraska, and other western States, America's uranium producers now supply less than 5 percent of America's nuclear fuel. Instead, we import 90 percent of our fuel. Forty percent of these imports come from Russia, Kazakhstan and Uzbekistan.

In January, two U.S. uranium producers filed a petition with the Department of Commerce asking for an investigation into the unfair trade practices of these countries. I understand some utilities are asking the Department to reject this petition. I find that deeply troubling.

For years, these utilities have complained that the market undervalues their product, electricity generated from nuclear power. These utilities have lobbied Congress and State

legislatures for help to keep their plants open.

Now, Russia and its satellites are trying to put America's uranium producers out of business. Some of these same utilities are fighting efforts to prevent that. I find their position profoundly shortsighted.

Nuclear fuel production is vital to our national security and I call on the Commerce Department to begin an investigation.

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

[The prepared statement of Senator Barrasso follows:]

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

Senator Carper. Thanks, Mr. Chairman.

One and all, welcome. We are glad to see you, appreciate your service and you joining us today for this important hearing. As the Chairman said, we are here today to continue our oversight of the Nuclear Regulatory Commission and to hear more about the President's budget proposal for fiscal year 2019.

Since joining the Environment and Public Works Committee in 2001, I have worked closely with my colleagues to try to strengthen the culture of safety within the U.S. nuclear energy industry. I am proud of the work we have done together.

In part, due to our collective efforts, thanks to the NRC leadership and the Commission's dedicated staff, some of whom are here today, the NRC continues to be the world's gold standard for nuclear regulatory agencies. We are proud of that.

A successful organization also needs a strong and dedicated workforce with the necessary resources for it to be successful. At one time, employees ranked the NRC as the top place to work in the entire Federal Government.

However, today, the NRC has dropped to 11 in the rankings. Budget cuts and uncertainty in the nuclear industry probably play a big role in how NRC employees view and rank their workplace.

As someone who has made it a priority to get better results for less money across the Federal Government, I believe there are smart ways we can save federal money without crippling an agency's mission or morale. We can, and we must, save money across federal agencies without taking away peoples' healthcare, eliminating protections for our environment, public health or cutting programs that communities rely on. That is especially true for the NRC.

I support improving the NRC's efficiency and its flexibility to respond to changes in the nuclear industry. However, we cannot cut just for the sake of cutting. We must ensure that NRC has adequate funding to continue to attract the best and brightest talent so that the agency continues to be the global standard for safety.

Today, I am interested in hearing if the President's budget, which I believe falls short in a number of areas, will provide the NRC enough funding to protect the public and be responsive to the industry's needs as well. Beyond the budget, I am particularly interested in hearing more about what the NRC is doing to protect our nuclear reactors from cyber attacks and with respect to the evolution of advanced reactors and advanced fuels.

As many in this room know, the nuclear industry is facing a growing list of challenges. I believe there is still hope for

carbon-free technology. The decisions we make today will affect the industry for generations to come.

If our Country is smart, and I think we are, we will replace older nuclear technology with new technology developed right here in America that is safer, produces less spent fuel, is cheaper to build and operate. That way we can reap the economic and clean air benefits of a new advanced nuclear generation. In order to do so, we must make sure the NRC has the resources it needs to review these new technologies and ensure our current nuclear reactor fleet remains safe.

Before I conclude, Mr. Chairman and allow you to introduce our witnesses, I want to take sort of a bittersweet moment as we pause to say goodbye to Gabrielle Batkin. Gabrielle Batkin has signed to play for the Detroit Tigers, my all-time favorite baseball team, so I started to follow her career. Actually, she is going to work in the private sector and has a great opportunity. We are happy for her.

Mr. Chairman, you and I and our colleagues on the committee get together almost every week for hearings like this. While I know that we usually make it look easy, there are so many staff members who put in a lot of time and hard work to make sure we can hear from smart people like those before us today and get to the bottom of important issues for the American people.

One of the key staffers in our committee, for both sides of

the aisle, is Gabrielle Batkin. While she will be a bit uncomfortable with what I am doing right now, she deserves to be recognized today for more than 20 years of service not just to the Senate but also to our Country. She started at the age of 12 and has hung in there ever since. Gabrielle, who serves as Staff Director for our team on this committee, has sat through a lot of committee hearings during her time in the Senate from the Senate Budget Committee to the Appropriations Committee, to Homeland Security and Governmental Affairs, and now at EPW.

You name the policy and I would bet you that Gabrielle has worked on it. All the members she has advised over these years, starting with Frank Lautenberg, maybe the first, but others including Barbara Mikulski and myself, have reaped the benefits because Gabrielle was doing the lion's share of the work behind each of us.

She helped lead my team first on the Senate Homeland Security Committee and then on the Governmental Affairs Committee starting in 2014 when I was chairman and seamlessly transitioned to her current role on this committee a little more than a year ago. All of my colleagues know what a professional Gabrielle is, as do the NRC commissioners before us today.

I am sad to say that after more than two decades, this will be her final hearing as a Senate staffer unless she comes begging back to be readmitted to the team, which probably is not

going to happen. I am immensely grateful for her service, not just to this institution, but to the American people and for her dispensable counsel over the past four years I have been fortunate to work, my script says "work with her," but work for her. She has been a great boss.

I am also excited for her new adventures to come. She will be starting as Vice President for Legislative Affairs at Northrop Grumman. We wish her family: her husband, Josh; three boys, Henry, Will, Charlie, all the best in this new chapter of their lives.

Every now and then we meet people in our lives and sometimes we are fortunate to work with them, who are just a joy to be with. They make our days brighter and our workload lighter. Gabrielle is just that kind of person.

We did not steal her from Barbara Mikulski but we inherited her from Barbara Mikulski. For two years after that, Barbara never spoke to me, which is a mixed blessing. Gabrielle is not a mixed blessing. She is a true blessing, has been for as long as I have known her. I am going to miss her hugely. We wish her and her family all the best. If she does ever get tired and bored with what is on the outside, we will warmly welcome her back.

Gabrielle, we will leave the light on for as long as it takes.

Thank you so much. I yield back my time.

[The prepared statement of Senator Carper follows:]

Senator Barrasso. Thank you very much, Senator Carper.

Everyone on both sides of the aisle will certainly miss Gabrielle. If she does go to play for the Detroit Tigers, as you said, your favorite team, former Senator Jim Bunning played for and was a pitcher for that team. If she is pitching the ball, I know she is going to be different than Senator Bunning because I think he had the record for bean balls in the major leagues, both the American and National Leagues.

She has never thrown a bean ball in her life, never pitched it in the dirt, and always pitched it straight down the middle, sometimes a fast ball but always straight down the middle. As a fielder, I expect she would be a Golden Glover and at the bat, there will be one home run after another. From both sides of the aisle, we wish her every success.

Senator Carper. Jim Bunning was my childhood hero growing up. We both ended up being in the House of Representatives. I loved the Tigers growing up and I still love the Tigers. We played against each other in the congressional baseball game. My first at bat against him, he tries to hit me.

Senator Inhofe. Did he hit you?

Senator Carper. Missed me. Unfortunately, I missed his pitch too.

Senator Barrasso. He said that at a prayer breakfast, he said he never hit, well, we will leave it at that.

Senator Carper. Fortunately, although Gabrielle is leaving, Mary Frances Repco is here as our deputy to step up and take on this leadership role. We are blessed. Gabrielle has put together a wonderful team. We are lucky she is here to carry the load and help us go forth.

Senator Barrasso. We will now turn to our witnesses. We will continue the committee's practice of a five-minute opening statement by Chairman Svinicki and two-minute statements from each of the Commissioners.

I will note that Commissioner Burns will be with us until 11:00 a.m. this morning at which point he needs to depart for a previous family obligation.

I want to remind the witnesses, your full written testimony will be made a part of the official hearing record today.

Chairman Svinicki, please proceed.

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

Ms. Svinicki. Thank you, Chairman Barrasso. Good morning also to 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 fiscal year 2019 budget requests.

I would note that my oral statement was a summary at a high level of the budget. Chairman Barrasso, you have already described that in your opening statement. I will just further summarize by stating that the funding we are requesting for fiscal year 2019 we are confident provides the resources necessary to accomplish our mission to license and regulate the civilian use of radioactive materials, to ensure adequate protection of public health and safety and to promote the common defense and security.

One of the very significant changes to our budget is the requested increase in resources tied to proposed activities related to the license application for the Yucca Mountain deep geologic repository. Additional funding is also requested to further the development of a regulatory infrastructure needed to review advanced nuclear reactor technologies. We also have an increment of funding for development of advanced or accident-tolerant fuels.

I have not coordinated with my colleagues but I will go out on a limb to say that over the years, our Commission has really valued our relationship with the highly professional staff of this committee. I know we wish Gabrielle well. To all the members of your very, very capable staff, thank you for the hard work you do in support of the important work of the U.S. Nuclear Regulatory Commission.

Thank you.

[The prepared statement of Ms. Svinicki follows:]

Senator Barrasso. Commissioner Baran.

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

Mr. Baran. Chairman Barrasso, Ranking Member Carper and members of the committee, thank you for the opportunity to testify today. It is great to be here with my colleagues to discuss NRC's fiscal year 2019 budget request and the work of the Commission.

Chairman Svinicki provided an overview of NRC's budget request. I want to briefly highlight a few related efforts underway at NRC.

I will start with Project AIM. Our multiyear efforts take a hard look at what work the agency is doing and how we are doing that work. The goals have been to become more efficient and agile and to prepare for the future.

The result of Project AIM and our very limited external hiring has been dramatic. In just two years, NRC's workforce has declined by more than 12 percent. The agency started the current fiscal year with around 3,200 employees, about the same staffing level as in 2006 before NRC started a ramp-up for the anticipated wave of new reactor applications.

When Project Aim got underway in 2015, the NRC staff envisioned that it would take until 2020 to match the agency's resources to its workload but NRC was able to make progress much more quickly in getting to the right staffing level for our

current and expected workload.

Going forward, we need to internalize an enduring focus on efficiency. For the agency's long-term health, we also need a stable pipeline of new talent through external hiring and an emphasis on maintaining the NRC staff's core technical capabilities and safety inspection activities.

The NRC staff has launched a transformation initiative to identify any steps the agency should take to improve its approach for reviewing new and novel technologies such as advanced reactors, accident-tolerant fuel and digital instrumentation and controls. I think that is a good focus for the transformation team and appreciate that the team is doing a lot of outreach to stakeholders. I look forward to hearing their thoughts and recommendations.

There are many other important activities underway at NRC including implementation of post-Fukushima safety enhancements, the power reactor decommissioning rulemaking, review of the first small modular reactor design application and oversight of construction at the Vogtle site. We are happy to discuss these and any other issues of interest. Thank you. I look forward to your questions.

[The prepared statement of Mr. Baran follows:]

Senator Barrasso. Thank you very much, Commissioner Baran.
Commissioner Burns.

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

Mr. Burns. Chairman Barrasso, Ranking Member Carper and distinguished members of the committee, I appreciate the opportunity to testify before you today on our fiscal year 2019 budget proposal. I support the Chairman's testimony and agree that the funding we are requesting provides the resources necessary to accomplish our safety and security mission while continuing to improve our efficiency and effectiveness.

As you know, the NRC has undertaken significant efforts over the last few years to improve its efficiency and effectiveness. Project Aim was a part of those efforts but by no means, the only part. Additional improvements were also implemented to the NRC's rulemaking processes, its budget formulation, fee calculations and billing, and also agency staffing and workforce planning.

While the vast majority of the specific tasks under Project Aim have been completed, its spirit still endures. It is important not to lose sight of the fundamental safety and security mission of the NRC.

From its inception, the NRC has continued to have a central focus on safety and security in what we do every day. We can always strive to perform better in our mission and better risk-inform our decisions but safety and security must always be the

central focus.

About 40 years ago this year, I began my professional career with the NRC. I know there were times when we have had to learn from our experience, learn to do better and improve our performance as a regulator, but on the whole, I can say I think we hit the mark the vast majority of the time in achieving a high standard of performance. Over the past year, we 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 and the States to ensure the safe and secure use of radioactive material.

At the same time, we have undertaken reviews of the first small modular reactors. We are implementing strategies to be better prepared for the licensing and review of advance reactor design. Again, I think the credit belongs to the staff for much of the effort today with the Commission's leadership.

I appreciate the committee's willingness to accommodate my departure today at 11:00 a.m. I am off to Colorado for my niece's wedding and am looking forward to that.

Thank you very much.

[The prepared statement of Mr. Burns follows:]

Senator Barrasso. Best wishes to your niece and safe travels to you. We appreciate it.

We will go to some rounds of questions. I will start with Chairman Svinicki.

The State of Wyoming is currently in the process of becoming an NRC-agreement State. That means Wyoming is going to assume the role of the primary regulator of in situ uranium recovery. I understand Wyoming submitted its application to the NRC on November 13, 2017.

We expect to be able to sign a final agreement with the NRC by September 30, 2018, at the end of this federal fiscal year. Do you know if the NRC is on track to meet the deadlines?

Ms. Svinicki. Yes, Chairman Barrasso. The staff is on track to present the voting matter to the Commission in September. I would acknowledge the practical realities of the turnover of the fiscal year would make it desirable for the Commission to act in a timely way.

I have served on the Commission for other agreements and State agreements. Assuming the NRC staff in Wyoming do careful work, if the agreement is presented to us in accordance with the requirements, my experience is the deliberation is not overly long and it is merely a verification that the needed elements are there.

Senator Barrasso. Terrific. I know the NRC's most recent

monthly report indicates the agency is currently reviewing I think four major uranium recovery proposals in Wyoming. Specifically, the NRC is considering two renewals of existing uranium recovery licenses and two expansions of existing uranium recovery licenses.

I understand the NRC anticipates completing its review of these proposals by the end of September 2018. That is when Wyoming is expected to become the agreement-State. It is important for the NRC to complete its review of these four uranium recovery proposals by September in order to have a smooth transition to Wyoming as the new regulatory authority.

Will you please commit to informing my staff immediately if the NRC does not think it can complete its review of these four proposals by the end of the fiscal year?

Ms. Svinicki. Yes, we will inform you. Again, my past experience is it benefits both, the NRC, the agreement-State and the licensees, if we can have the most orderly transfer of responsibility. Sometimes that includes realizing what pending actions are before us and the timely completion of those.

Senator Barrasso. Now, I would like to turn to the topic of cyber attacks. Senator Carper raised the issue in his opening comments as well.

Last week, the Department of Homeland Security and the FBI issued a joint alert stating "Since at least March of 2016,

Russian government cyber actors targeted government entities and multiple U.S. critical infrastructure sectors, including the energy, nuclear, commercial facilities, water, aviation and critical manufacturing sectors.”

I understand that these cyber attacks have penetrated some corporate networks but have not infiltrated the critical safety, security and control systems of nuclear power plants. Is that correct?

Ms. Svinicki. That is accurate. Respecting the public setting, I would also note that the nature of the things declassified and released by the FBI last week are issues we have been monitoring very, very closely with the interagency. Yes, there were penetrations and probing of corporate systems, but there was not successful penetration on the operational side.

Senator Barrasso. If that situation changes and the NRC learns of a successful penetration of critical nuclear plant systems, will you commit to immediately briefing this committee?

Ms. Svinicki. Yes.

Senator Barrasso. Thank you.

I would now like to ask a question and have you answer it not in your role as NRC Chairman but based on your personal experience in the nuclear field. Prior to your service on the Commission, you served as a professional staff member of the

Senate Armed Services Committee where you were responsible for nuclear issues. Before your tenure in the Senate, you worked at the Department of Energy's Office of Nuclear Energy. You, of course, are a nuclear engineer.

Do you think maintaining uranium production in the U.S. is critical to our national security?

Ms. Svinicki. I appreciate you are making a distinction between my role as NRC Chairman. Of course, our Commission is policy neutral. I know there are pending actions before the Commerce Department and other trade matters.

You asked me this at a time when last week, I had responsibility as NRC Chairman to sign the extension of a cooperation agreement with a Ukrainian regulator. He also brought along the Ukrainian Ambassador to the U.S. It was an opportunity to hear from a country that overnight found itself somewhat hostage to a country for energy and nuclear fuel supply. The practical realities of that are a very complicated matter for the Ukraine.

The broad principle of having some energy security and diversity, sitting with my colleagues from Ukraine, I will say that went from a conceptual conversation to a very real conversation as they described what they face there. Again, last week, I had the opportunity to see what it is to not have domestic production or supply and depending on the actions of

other countries, it can be an overnight problem for your Country.

Senator Barrasso. Thank you very much, Madam Chairman.

Senator Carper.

Senator Carper. The questions from our Chairman with respect to cyber security and your comments about the misdeeds of the Russians in that regard lead me to ask for clarification. Is there anything to the report I heard that the Commissioners are planning on sending a congratulatory letter to the President of Russia for his reelection? I hope that is not true. Is it? Can you confirm that is not true?

Ms. Svinicki. It is not. No, we have no planned communications of that nature.

Senator Carper. That is good.

On a serious note, I have a question, if I could, for Commissioner Baran. Earlier, I mentioned morale. I served with some of my colleagues on Homeland Security and Governmental Affairs for years. I served on this committee with my colleagues and the NRC had the best morale of all federal employees.

Over at the Department of Homeland Security, they suffered the worst. Now what is happening there is after years of trying to raise morale, it is coming up which is very encouraging. We are seeing sort of the opposite happening with the Nuclear

Regulatory Commission.

I would just ask Commissioner Baran, just briefly, are we at a point where budget cuts to the NRC are affecting morale, the ability to recruit the kind of people we need and the ability to complete work in a timely manner? If we are not at that point, are we getting close to that point?

Mr. Baran. I think the answer is we are getting close to that point and maybe, to some extent, at that point. It is hard to know exactly what drives morale one way or the other, but my sense is that because we have had significant cuts over the last few years, there are fewer promotional opportunities, fewer training opportunities and it is hard to move around within the agency, which is one of the things that made the agency so great over the years.

I think that does affect folks. I think people want to know there is a long-term future for them at the agency. There was a period when, on the corporate support side, we were looking at a potential reduction in force. That is a scary thing for employees. We were able to avoid that but it takes a toll.

I am hopeful we are heading in the right direction with the staff and morale. I know there is a lot of focus from our senior managers on keeping folks engaged on the mission and their jobs, focusing on their potential to have really good,

long careers at NRC and the opportunities available to them.

I am hopeful we are going to be climbing back in the ranks again. I do think most of the reductions we have had over the last few years have made a lot of sense. I think we have done a good job bringing our budget in line with the workload we have and the anticipated workload.

Reductions like 12 percent of FTE in two years are not something that is sustainable going forward from my point of view. I think we are at a point where we should be leveling off.

Senator Carper. Good. Thanks so much.

This will be a question for the full panel. On a more serious note, I want to come back to cyber security and ask you to discuss, if you will, the status of our nuclear reactors with respect to cyber security, do you support providing cyber security requirements and what more could we be doing, the Federal Government, including us, to protect our commercial fleet? Do you want to lead that off, Madam Chairman?

Ms. Svinicki. Cyber security is a very dynamic threat environment, so it is not the kind of area where you can put something forward and say this is going to be the enduring set of understandings for all times.

I would depict it as a very active area of our oversight, not only in the implementation and inspection of the cyber

security arrangements we have already put in place, but we continue to work, in closed session, with members of the U.S. intelligence community on what they currently see and over the horizon in terms of increasing capability of the threat actors against the United States. We bring a lot of attention to this matter.

We have written our regulations in a way that they are robust going forward. They basically say the security outcome you need to achieve instead of the exact methods of how you do it. As adversaries become more capable, our regulations still are written to say what the end state of a secure system looks like.

Senator Carper. I am going to go next to Commissioner Burns before I run out of time.

Mr. Burns. I would agree with what the Chairman said. One of the things we put in place about ten years ago was cyber requirements and cyber regulations. The utilities have been implementing that.

We are in a phase now where we are doing further inspections to get lessons learned. I think a lot of that early on helped shake out what was important. As the Chairman said, ultimately, this is sort of a performance-based type of requirement.

I think we had some good discussions with the industry of

what makes sense and from our standpoint, what made sense in terms of providing that high level of protection for the critical systems.

Senator Carper. Mr. Baran, would you briefly comment, just some sense very briefly?

Mr. Baran. I agree with everything my colleagues said. I would just note on the reactor side, NRC has been very forward-leaning on cyber security. We are also now at the point of looking at cyber security requirements for the fuel cycle facilities.

Senator Carper. Good. Thanks.

Senator Barrasso. Thank you, Senator Carper.

Senator Boozman.

Senator Boozman. Thank you, Mr. Chairman.

Thank you all for being here. We really do appreciate your hard work.

Commissioner Baran, I would like to talk a bit about the question on the principle of good regulations reliability. Under this principle, regulatory actions should be fairly administered so as to lend stability to the nuclear operational and planning processes.

The NRC recently announced an increase in fees for licensees, including fees for those licensees to pay to the NRC for inspection and assessment of their performance. There also

has been an increase in inspection hours and therefore, cost to licensees attributed to the 95001 inspections where licensees have to redo these inspections due to localized NRC interpretation of the standards for successfully passing those inspections.

These inspections are either performed for white findings that have low to moderate safety significance or for white performance indicators which represent performance outside an expected range of nominal utility performance but related to cornerstone objectives still being met. In other words, these inspections are intended to be the lowest of supplemental oversight provided to licensees. In the repeat inspections, there is often diminishing safety returns and unnecessary expenditure of resources by both the NRC and licensees.

I guess the question is what is senior NRC leadership doing to improve the clarity of the standards for passing 95001 inspections and providing oversight to the regions to ensure consistency of application for those standards such that there is fidelity to the reactor oversight processing corresponding adherence to the principles of good regulation?

Mr. Baran. There is a great deal of coordination that goes on between our headquarters and the four regional administrators and the regional offices. As you pointed out, a lot of the inspection activities are done either by resident inspectors we

have on the sites or by the regional offices.

In recent years, there has been a lot of focus, not just in this area on the particular inspection you referred to, but more broadly on making sure we are taking a holistic look and having a lot of focus on consistency across the regions.

I think one of the very good things about the reactor oversight process is it is a staged process where, to the extent NRC inspectors are finding issues at a plant, the more issues they find, the higher the column a plant is in, or the increase in oversight that we see from the NRC staff.

As you point out, the 95001 is really between column 1 where everything is working fine and your column 2 where we have seen some issues. If you are stepping up and there have been more issues, those inspections get more and more focused and comprehensive. There is a lot of coordination that goes on to focus on inspections really at all those levels.

Senator Boozman. Very good.

Chairman Svinicki, every year licensees pay the NRC hundreds of millions of dollars in fees. Licensees often express the desire for more timely reviews and scheduled transparency particularly for licensing actions.

Yesterday, the GAO released a report clearly stating without more transparency, the licensee does not know how much work remains and cannot budget for future expenses. The NRC's

efficiency principle states "The American taxpayer, the rate-paying consumer and licensee are all entitled to the best possible management and administration of regulatory activities."

I guess the question is, don't you think the situation demonstrates room for improvement for fulfilling the principle? Given that licensees and applicants must fund 90 percent of the NRC's budget, don't you think it would be fair to give them additional scheduled transparency? Don't you think improving scheduled discipline and transparency is a necessary foundation for implementing any transformation initiatives to address new technologies?

Ms. Svinicki. Thank you, Senator.

Of course, we knew of the GAO findings and recommendations in that report since they do coordinate. The report contains the agency's response that we take no exception to the issues they raised.

We do have plans, in many cases already underway, to address the areas on greater billing transparency the GAO has noticed and brought to our attention. Some of that work, the GAO suggested we needed to have project plans so that people would have an understanding of when some of the billing improvements would be put in place. I know our Chief Financial Officer is working on putting together that project plan.

On your broader question about greater scheduled transparency, that is an objective of the agency. Project managers are assigned to various licensing matters. They are instructed to be in routine communication with licensees about pending matters, giving them information about the status of the review and how it is going.

Again, we are always looking to improve efficiency and doing that but I do think we do make strong efforts now in that regard.

Senator Boozman. Thank you very much.

Senator Barrasso. Thank you, Senator Boozman.

Senator Whitehouse.

Senator Whitehouse. Thank you, Mr. Chairman.

Welcome all. I appreciate your being here.

Chairman Svinicki, from your opening statement, it sounds like the NRC is already preparing for having an expanded role consistent with pieces of legislation working their way through or have worked their way through the Senate.

I specifically refer to my legislation with Senator Crapo which has passed the Senate which puts the Nuclear Regulatory Commission with the Department of Energy and our National Labs, into a new process for next generation technology innovation with the private sector and the bill that passed with overwhelming bipartisan support, thanks to the support of

Chairman Barrasso and Senators Capito, Fischer and Rounds, and a number of Democrats as well, that requires the NRC to begin putting together new approval pathways for new nuclear technologies.

When people in Rhode Island ask me about this, my simple-minded explanation is that it is like asking your Tesla to go through the carburetor test at the DMV. It does not have one; it is a different technology. You need to come up with different tests.

Could you fill me in a little bit on to what extent your existing budget, what you are proposing and defending here, reflects additional effort in those two areas, supporting the private sector innovation and also trying to make sure that you have appropriate safety screening pathways in place for different technologies?

Ms. Svinicki. Thank you, Senator.

As you acknowledge, we agree that the current framework, although it can be bent and modified and we could review an advanced reactor technology, it is not the most efficient approach for those technologies. A number of provisions would simply not be relevant and that is not efficient.

The fiscal year 2019 budget, based on input from advanced reactor developers, contemplates that fiscal 2019 is the earliest we might see an official submittal of an advanced

reactor design for review.

There is money requested in the budget on what we call the fee base meaning part of the fee recoverable work that we do for potential engagement with one or maybe two advanced reactor developers. That is a very fluid situation, as you know, so they will only submit if they are prepared. That would be a very concrete licensing review that would begin, so there is something genuinely new in the fiscal 2019 budget.

In fiscal year 2018, we continue activities to engage broadly with advanced reactor designers in advance of them submitting anything for review. The Congress has provided to us off fee based-funding meaning we are able to do generic engagement with the advanced reactor community on how the licensing process can best meet their technology development schedules. We can do that without having to send them an invoice every time they talk to us.

I think that created a regulatory efficiency that these developers do not have an obstacle to coming in and getting a regulatory reaction to aspects of their designs. I appreciate that Congress has supported that activity.

We see the activity growing in terms of breadth but also growing in terms of depth in fiscal year 2019 and beyond.

Senator Whitehouse. Those efforts are reflected in your budget request?

Ms. Svinicki. They are, yes.

Senator Whitehouse. Could you give us a quick update on where the pre-licensing conversations are with New Scale and Oklo, I think are the companies. Without getting into the details of their individual applications, how is that pre-regulatory, pre-conversation process going?

Ms. Svinicki. It continues to be very active as you have described. New Scale, of course, has submitted their design and we have docketed that for review. As a small reactor design in the truly novel and advanced reactor community, Oklo does continue to be kind of a first mover. They appear to be moving out of the pack with some serious intent to submit a design in the coming years.

I would say there are may be one or two others that are in serious and detailed pre-application engagement. Beyond that, the field is kind of a spectrum where some are candidly little beyond a PowerPoint presentation but others are getting into some meat of the actual design.

Senator Whitehouse. On your side, are you satisfied with your ability to be effective in those pre-licensing conversations?

Ms. Svinicki. We continue to solicit feedback about what is working most effectively. What the advanced reactor community prefers sometimes surprises me. Right now, they want

us to keep a very fluid process. They have said, in terms of getting investment, it benefits them if our system can accommodate their technology development.

Also, they appreciate we are giving them dedicated project teams so that they do not have to re-introduce their technology to new NRC experts every time they come in.

Senator Whitehouse. Thank you very much.

Mr. Chairman, I failed to acknowledge that our colleague, Senator Booker, was the original co-sponsor of the nuclear innovation bill that just passed. I went down your side of the column on the other bill but not my side of the column on that bill. I apologize to Senator Booker for that oversight and yield back my time.

Senator Booker. I would just like to point out again my conclusion that of the 100 Senators, I am the Rodney Dangerfield, so no respect.

Senator Barrasso. Senator Capito.

Senator Capito. Thank you, Mr. Chairman.

I thank all of you.

Chairwoman Svinicki, I want to visit a topic we have talked about in the past. If it has already been covered in the questions, I apologize. I just came in a little late.

In the December hearing, I noted that your fiscal year 2018 budget requested more FTEs than the NRC was actually going to

have which resulted in a \$37 million carryover. I understand that was taken into consideration in the appropriations process.

In fiscal year 2016, there was a \$23 million carryover and in fiscal year 2017, there was a \$31 million carryover. I guess a pattern is developing that we might see in fiscal year 2019 because you are expecting 3,090 FTEs which is 157 fewer than you actually budgeted.

I think a significant portion of this hiring increase is slated for the Yucca Mountain nuclear waste storage license review. My question is, unless the appropriators adjust accordingly, the NRC's licensees are forced to pay for these resources, is that correct?

Ms. Svinicki. It is correct that they are recovered in one year, although they may be offset by the fees that get set the following year, but it is imperfect, as you acknowledged, because they are billed in years. There is essentially an over-recovery from them. We do true that up and adjust that in a subsequent year but there is probably some inequity created in that process.

Senator Capito. My understanding is that this is part of the reason that the licensees will see a 6.5 increase for this coming year to cover this?

Ms. Svinicki. I would need to check that precise figure but yes, for fiscal year 2018, we have gone out with a fee rule.

We had to make a strategic choice there. Since this is an estimate for them, our feedback was bill payers would prefer to get an estimated fee that is the highest their invoice would be, knowing when we get to the final fee rule, if we have enacted levels for fiscal year 2018, we could possibly adjust those numbers.

We decided do they want to see the case that is a lower bill but then ultimately, when we have an enacted level, it might be higher? Their preference was to know the highest level their bill might be. That is the way it has moved forward.

Senator Capito. Yes. I wanted to ask a question about the small modular reactors. You mentioned New Scale in your statement. We had one of the TVA nominees here yesterday and talked about the full spectrum of energy resources they use at the TVA.

I noticed that TVA has submitted some prospects of two or more modules. Is that correct? Could you talk about that?

Ms. Svinicki. Yes. It is called an early site permit. It is a notification that they contemplate constructing an SMR at a particular site. What they have identified is the Clinch River site. It is under review.

Senator Capito. Is there an existing facility there?

Ms. Svinicki. There is not, but there is quite a lot of history. At one point, the United States was going to build, I

believe, a breeder reactor at that site in the 1960s or 1970s. It has been a TVA property that has a bit of a nuclear history but there is not currently a nuclear plant there.

Senator Capito. I am going to wade into something that I do not know the answer to, which is always dangerous.

What is the status of the Yucca Mountain nuclear waste site storage license review? What can we expect to see in the next five years on this nuclear waste storage issue?

Ms. Svinicki. Right now, the activities NRC has been carrying out are with previously-appropriated nuclear waste fund monies, as you well know. All activities related to this particular Yucca Mountain development must be appropriated and executed with that particular color of money so that it is not something in these invoices we send to the utilities. It is a separate nuclear waste fund under the Nuclear Waste Policy Act.

We had suspended our activities in 2010. That was challenged in court. The court then directed the NRC and the Department of Energy to expend the remaining money previously appropriated.

Under the court's remand, we completed the safety evaluation report. The staff's safety review was completed. Their conclusion was they identified no obstacles to the issuance of a construction permit, absent the fact that DOE did not have title to the land at Yucca Mountain and did not have

the water rights. Those were two legal obstacles, but the staff did not identify any safety obstacles.

If funding were to be enacted this week under the fiscal year 2018, we would work to build the infrastructure, to resume the licensing proceeding and that would mean restarting the adjudicatory hearings and reestablishing the document library that would support the evidentiary hearings that would be necessary.

Senator Capito. Thank you very much.

Senator Barrasso. Thank you, Senator Capito.

Senator Markey.

Senator Markey. Thank you very much, Mr. Chairman.

Madam Chair, I remain deeply concerned by reports that the Trump Administration is attempting to negotiate a civil nuclear 123 agreement with Saudi Arabia that may compromise on important nuclear nonproliferation controls as it tries to secure a commercial deal to sell American nuclear reactors.

Madam Chair, has anyone from the Nuclear Regulatory Commission, including staff, participated in meetings with representatives from or acting on behalf of the Kingdom of Saudi Arabia to discuss a Saudi 123 agreement?

Ms. Svinicki. In the development of 123 agreements under the Atomic Energy Act, the NRC experts are asked to review provisions of a draft arrangement to make certain that our

export licensing framework responsibilities could be executed and that the provisions of law necessary are there. The NRC's involvement in draft agreements is limited to those export licensing provisions.

Senator Markey. Have you been in meetings, has the Nuclear Regulatory Commission staff been in meetings, with the Saudis on this agreement?

Ms. Svinicki. I am not aware that they have been. They have been in meetings in the interagency but not with the foreign governments, I don't believe.

Senator Markey. Was the NRC staff part of Secretary Perry's recent delegation to London to meet with the Saudis?

Ms. Svinicki. I don't believe we had any staff as part of that delegation. If I am wrong about that, may I respond for the record?

Senator Markey. You may respond for the record but honestly, I think you should know the answer to that. There can be no more important thing you are going to be doing this year than reviewing the 123 agreement and know whether or not your staff is in a meeting with the Saudis on this type of agreement. I think that is absolutely essential.

Ms. Svinicki. I am sorry. I have been informed that we did have one expert counsel there on the export arrangement.

Senator Markey. That is good to know.

During those meetings, was there any discussion by any party of a 123 agreement permitting Saudi to enrich uranium or reprocess plutonium?

Ms. Svinicki. We are not participating on the broader negotiation of the arrangement, Senator.

Senator Markey. Do you know if, during the meeting your staff was in, the subject of uranium enrichment or plutonium reprocessing was raised?

Ms. Svinicki. I do not, but that is not the scope of their expertise or their participation.

Senator Markey. The reason this issue is so important to me is that, of course, the Atomic Energy Act requires the President to keep the Senate "fully and currently informed of any initiative or negotiations relating to a new or amended agreement for peaceful nuclear cooperation." Yet, the Energy Secretary leading a delegation to London to discuss a 123 agreement with the Saudis so far has not, in any way, been given as a brief to any member of the Senate, which is in violation of the 2008 law.

To the extent to which the NRC was in the meeting, the Department of Energy was in the meeting, the Department of State was in the meeting, and we still have not been briefed, that is not acceptable. The reason it is not acceptable is that the Saudi crown prince said in an interview just in the last few

days, "Saudi Arabia does not want to acquire any nuclear bomb but without a doubt, if Iran developed a nuclear bomb, we will follow suit as soon as possible."

Well, President Trump is now saying that he is likely to end the Iran nuclear deal. As a result, if we put in place an agreement that allowed for uranium enrichment or plutonium reprocessing on the land of Saudi Arabia, it would be potentially disastrous because the Saudi prince is making it quite clear what they are interested in, what the Saudi nuclear envisions as the prince has expressed, are more about megatons than megawatts. They don't need nuclear power in Saudi Arabia. They are more solar than they know what to do with. It is two cents a kilowatt hour in Mexico right now.

This is about a clandestine nuclear weapons program on their ground. It is extremely dangerous. From my perspective, it is something the Administration has a responsibility to give immediate briefings to the Congress on what is happening in the United States right now, meetings with the Saudi prince in anticipation of a pull out of the Iran deal.

We are putting ourselves in the middle of the Iran-Saudi Arabia proxy wars that could quickly escalate to nuclear wars if we are not careful. This has to have a full and open debate in our Country.

Each and every part of the Trump Administration has a

responsibility to give Congress frequent updates with regard to the progress of those negotiations. That is my view. The NRC plays a role and so do other agencies. Right now, the Senate is in the dark. That is wrong.

We are looking at a Shia-Sunni standoff. It is escalating in proxy battles across the Middle East. We do not need nuclear weapons to become part of the situation.

Thank you, Mr. Chairman.

Senator Barrasso. Thank you, Senator.

Senator Cardin.

Senator Cardin. Mr. Chairman, first, let me thank you for your leadership on this issue and our committee in our oversight role on nuclear power. I also want to acknowledge up front the tremendous work of Senator Booker on this issue.

I want to raise two issues and get your response. I think they are related. I am very proud of the men and women who work at the Nuclear Regulatory Commission, particularly those who are from Maryland and your headquarters in Rockville. I am concerned about their ability moving forward to regulate safe nuclear energy considering that you have an aging workforce. You have lost a lot of the more senior employees of the agency and they have not really been replenished. I am concerned about the workforce issues at NRC and getting the support you need to carry out your critically important nuclear energy safety

function.

The second thing that concerns me is the economics of nuclear energy today. We depend upon nuclear energy, 20 percent of our total power and 60 percent of our carbon free. It is an important part of energy security here in America, yet the economics of it is becoming more and more difficult.

We have an aging fleet of nuclear reactors that need attention. The economics of modernizing that fleet is not very bright at this particular moment.

Looking at our commitment to maintaining our nuclear capacity for energy, how do you see your roles in facilitating America's needs, also recognizing the workforce issues moving forward? How do we guarantee the people of this Nation that your work will be done putting safety first?

Ms. Svinicki. I will begin. I appreciate your support for, and acknowledgement of, the NRC's very capable workforce. Commissioner Baran commented earlier that when the agency was growing substantially, there was a lot of energy and excitement in the workforce because opportunity was so much more readily available.

Under the declining workforce we have had and the hiring controls we have had in place for a number of years now where we look specifically at needed capability as employees depart or retire and making sure that we have the core competencies, there

isn't the vibrancy of the growth and opportunity the agency had in previous years.

I think that requires us to bring our best thinking and our skill sets, in terms of ways to motivate and keep employees engaged in the agency even as it gets smaller. I think the agency's innovation forum and transformation initiative are ways I hope employees can get excited about creating the NRC of the future of which they want to be a part. It is of concern though that our workforce demographic is getting older and we have very senior employees. We try to make targeted entry level hires to make sure we have experts of the future coming into the pipeline but it is a challenge, as you note.

Senator Cardin. On that issue, let me underscore a point. It would be helpful if Congress would not do things that harm public service. Some of our attacks on the federal workforce have an impact on your ability to attract the very best in your field who are very highly skilled individuals. Secondly, if you need more from us in that regard, please let us know.

Ms. Svinicki. Thank you for that.

On the broader economic headwinds for nuclear, I would note that falls more squarely in the jurisdiction of the Federal Energy Regulatory Commission. I know Secretary Perry and that commission have kind of an invigorated dialogue about that.

We are not an economic regulator as FERC is. I think we

take on board having the most efficient regulatory framework that we can. That would be something that maybe would be an aspect of the economic issues.

In the strictest sense, it appears there are a lot of market forces and things at play in terms of units being profitable or not. That falls outside our jurisdiction. I don't know if Commissioner Baran would like to add to that.

Commissioner Baran. I agree with everything the Chairman said. I would just note part of our job as a safety and security regulator is to make sure we are focused on adapting to new technologies.

One of the things you talked about was modernizing plants for the future, for example, digital instrumentation and controls. If you go to a control room today in most nuclear power plants, it is largely analog. It has worked very well over the decades but there are obsolescence and reliability issues.

If you could move to more digital technology, I think there is broad agreement that is a safety improvement and probably also an economic improvement for the operator. However, we are focused on the safety piece. One of the things we are trying to do is really focus on those issues which have been tough, resolving how you make sure we do not add any unacceptable risks by going to digital, whether cyber security or other things.

We also want to make sure we have a framework in place so if you have a utility which wants to make an upgrade because they think the plant is going to be there 2040 or 2050, into the future, how do we make sure we have a reliable regulatory framework to make that a reasonable proposition?

Senator Cardin. Let me respond in 15 seconds, if I might.

I acknowledge that your principal responsibility is not the economics but if you have to regulate outdated reactors because of the economics of it, your job is much more challenging and difficult. I do believe there is a role for the NRC to play in making sure we have the most efficient fleet possible. That is also involved in the economics of the field.

Thank you, Mr. Chairman.

Senator Barrasso. Senator Booker.

Senator Booker. Thank you very much, Mr. Chairman.

Chairman, I want to thank you for being here. I really appreciate your answers for the record from our last hearing in response to my questions about NRC readiness to review advanced reactors.

You wrote that the NRC has aligned its readiness activities to support the Department of Energy's identified deployment goal of having at least two non-light water reactor designs reviewed by the NRC and ready for construction by the early 2030s. To keep pace with DOE's stated goals, the NRC plans to achieve its

strategic goal of readiness to effectively and efficiently review and regulate non-light water reactors by no later than 2025.

The challenge I am facing is companies are telling me they are ready to apply a lot sooner than that. That is the tension. In your testimony today, you even stated you anticipate beginning one or more advanced reactor application reviews in the next two to four years.

I am troubled that the NRC seems to be placing much higher importance on the DOE schedule than on the intentions of the actual applicants represented in the private sector. The first group of applicants with new technologies will have the highest costs and are depending on private capital for funding and face challenges therein. An inefficient NRC review process would cause them serious harm as I am sure you understand.

Can the Commission, in any way, speed up its timeline for the readiness to review advanced reactors given the expectation that you will receive private sector applications long before the DOE's stated goal?

Ms. Svinicki. Thank you, Senator.

We are hearing the same feedback from the technology developers as well. As soon as we kind of hooked ourselves to that DOE schedule, we got feedback that by the time we publish that, it is probably not timely.

I think the most beneficial thing we are doing is continuing to be in very broad engagement with individual technology developers. Of course, we are engaging kind of the direction of the enterprise as a whole.

One thing that the advanced reactor technology developers are telling me is very positive is we are developing what we call these regulatory engagement plans. It is a generic term. Oklo calls theirs a licensing project plan.

It is something a developer brings in and updates for the NRC. They are telling us when they think they would come into NRC to seek a regulatory reaction on perhaps a design attribute all the way up to submitting a full design for review.

I will not call them a contract but it is kind of an understanding between the NRC and an individual technology developer of what they would like us to react to when. The one thing they want to preserve is the flexibility. They have been able to take that to the financing community and others and say, this is the general understanding we have with the regulator.

They tell me that is breeding confidence about the predictability of the regulatory framework. They like that it is very stylized and tailored to their individual development pace.

Senator Booker. Okay. In terms of budgetary concerns, how far do you anticipate the increased budget will get NRC towards

the readiness to process these applications?

Ms. Svinicki. I think as we continue to get into deeper and deeper technical engagement with the developers, the individual issues that come up are likely to require some funding in order to resolve. Say it is a new material and we would like to do some confirmatory research or working with DOE, we would like to suggest they do some confirmatory research, it is really hard to estimate because the designs are in all different stages of finality.

We do not want to begin to invest and if for a materials issue, they can just choose a different material and we would not need to do as much background, that is the kind of feedback they tell me they most benefit from, saying this alloy is really complicated for you, NRC, how about if we used one with which you are more familiar. That is the benefit of this pre-application engagement.

Senator Booker. Thank you very much.

Mr. Baran, I feel bad for you sitting there without being grilled as much. The NRC has now formally docketed an application by Holtec Inc. to construct and operate consolidated interim storage facilities for spent fuel. Do you believe the NRC currently has sufficient staffing and funding to review this application in a timely manner?

Mr. Baran. We have current funding to do two applications,

the Holtec application for New Mexico and if it is restarted at the request of the applicant, the Texas application. The 2019 budget includes funding for both of those projects.

Senator Booker. Thank you very much, sir.

Just for the record, do you have respect and reverence for the State of New Jersey?

Mr. Baran. I do, indeed.

Senator Booker. Thank you, sir.

Senator Barrasso. That is one.

Senator Carper.

Senator Carper. I want to play off some of what Senator Booker said. I want to talk a little bit about accident tolerant fuels. Maybe, Chairman Svinicki, you can take a shot at this and others if you like.

Accident tolerant fuel is not something I have heard a lot about in the past but I am hearing more about it now. I understand it is advanced fuel technology that can be, if I am not mistaken, retrofitted into our current fleet, is that right?

Ms. Svinicki. Yes. I characterize the origin of accident tolerant fuel as the industry, after Fukushima, looking at opportunity to innovate in fuel for current reactors saying, couldn't we advance the technology and if there were some sort of nuclear plant event or accident, the fuel could actually withstand extreme conditions much better. They knew there was

opportunity there but frankly, did not have the motivation.

Senator Carper. You said they knew. Who are they?

Ms. Svinicki. The industry knew there was an opportunity to improve the fuels. They had not really had a motivation to do it though.

Senator Carper. Let us drill down on that a bit. This technology can make fuel a lot safer?

Ms. Svinicki. We have yet to see the face of the safety improvement but yes, conceptually, it would better withstand an accident and therefore, would retain what we call the fission product. The bad stuff would be more likely to be retained in the core.

Senator Carper. What is the effect on life? Would the fuel rods last longer?

Ms. Svinicki. Again, although we would not look at the economics, I do understand it could cause improved operating cycles for reactor operators, meaning they might get more power out of the fuel per element. There is an economic benefit which candidly is why they are pursuing it.

Senator Carper. Commissioner Baran, do you agree with anything she said?

Commissioner Baran. I agree with everything she said. All I would add is there are a number of fuel vendors with a number of designs, some of them pretty evolutionary, some of them more

significant departures from what we have seen in the past. I think the answer to some of these questions will depend on the specific design.

Senator Carper. Is it possible that this technology could serve as a bridge to advanced reactors?

Ms. Svinicki. Some of the advanced reactor types are so different from the current operating reactors that there may not be that much of a benefit. I do think one of the benefits of NRC looking at qualifying new fuel types is we get to exercise our ability to look at something new and novel. I think that prepares us to bring innovative regulatory approaches to advanced reactors. It maybe there is a benefit on our side.

Mr. Baran. The fuel for advanced reactors, in some ways, may be the long pole in the tent. To the extent that some of the advanced reactor designs involve very different fuel than has been approved by NRC in the past, that is something, from a regulatory point of view, that could be the most challenging or time-consuming element.

Senator Carper. If the NRC can smoothly process licenses for accident tolerant fuel, is it possible that could serve as a signal from the NRC that we can find a way to process advanced reactors?

Someone told me you may have issued a draft project plan in December 2017 on how the NRC plans on licensing accident

tolerant fuel. You may have mentioned this, but is that true?

Ms. Svinicki. Yes, we did. I believe we are receiving comment on that plan. Again, it was to create transparency around the process steps we would take.

Senator Carper. You are getting some comment. How would you characterize the comments you are getting?

Ms. Svinicki. I think it may be available for comment right now. I think the draft might have been published at the end of 2017 and we are getting comment on it. I may be thinking of something else. If I am incorrect about that, I will clarify.

Mr. Baran. The Commission is also going to have a public commission meeting next month in April on accident tolerant fuel. That will be an opportunity to directly hear from some of the vendors, from the Department of Energy and others involved in this to get a better sense of their timing, what changes, if any, to our regulatory framework they think might make sense, their schedules and the resources we would need to be ready for that.

Senator Carper. Does the NRC currently have the staff you need to process transformation of technology?

Mr. Baran. Recently, the staff established an innovation team that is looking at this very issue. I think it is a great focus for the team to stay focused on how the agency adapts to

and prepares for new technologies whether it is accident tolerant fuel or advanced reactors, and we talked about digital instrumentation and control.

Sometimes these new technology areas are the more challenging ones for the agency to make sure our regulatory framework is more suited for that. There is no question, for example, on advanced reactors where the entire existing fleet is light water reactors.

We are going to have to look at some changes there to accommodate non-light water technology. I think that is a good focus for that group on the transformational side.

Senator Carper. Thank you both.

Senator Barrasso. Senator Gillibrand, you are next.

Senator Gillibrand. Chairman Svinicki, I would like to build off the questions Senator Carper asked earlier in this hearing on the topic of cyber security. As you know, last week, the Administration again confirmed that Russian government cyber actors have targeted our critical infrastructure sectors, including the energy sector and nuclear power plants, in particular.

These cyber attacks on nuclear companies and facilities are deeply alarming. I think everyone here recognizes the potentially devastating consequences if these malicious actors are able to compromise the critical safety functions of a

nuclear power plant in the United States.

The NRC cyber security rule requires all licensees to submit a cyber security plan designed to meet your requirements. Are licensees required to update those plans to respond to new or emerging cyber threats? If so, how and how often?

Ms. Svinicki. Thank you, Senator Gillibrand.

Our cyber security regulations are what we call performance-based, meaning they describe the objective of securing a system against cyber threats. As the cyber threat changes and becomes more severe, our regulations are written to the outcome of that protected system so they do not, in the strictest sense, require modification based on evolution in the threat.

Senator Gillibrand. What steps has the NRC's cyber security directorate taken in response to these cyber attacks?

Ms. Svinicki. We closely participate with the FBI, the intelligence community and our experts are engaged in monitoring the threat. The information that the FBI released last week was activities we were aware of and engaged in the interagency monitoring of that threat.

Senator Gillibrand. Are there any additional steps that should be taken to improve information sharing and reporting of cyber threats to the nuclear industry?

Ms. Svinicki. I would characterize there is not as much

stovepiping as there has been historically. I think this is a very dynamic area and the interagency is working closely to make sure entities who need this information, including clearances for cyber experts at the utilities themselves, I would characterize there is greater information flow than there had been historically.

Senator Gillibrand. Are there any changes proposed in the fiscal year 2019 budget request that would impact the NRC cyber security activities?

Ms. Svinicki. I am not aware of any. If there are any, I will provide that for the record.

Senator Gillibrand. Thank you.

As you know, Indian Point Units 2 and 3 are scheduled to shut down in 2020 and 2021 respectively. My office is closely monitoring the decommissioning rulemaking the NRC is currently undertaking which aims to set a new regulatory framework for plants after they shut down.

I am concerned that the regulatory analysis published by the NRC in January 2018 proposes to relieve licensees of the regulatory burden of providing site specific analysis or determining when a decommissioning plant is no longer subjected to a number of emergency preparedness requirements. These include the removal of the emergency planning zone, the public alert and notification system, and the reduction of emergency

response personnel. I am very concerned that the NRC is intent on moving forward in a one-size fits all approach to decommissioning in an effort to make the process easier for the industry and not adequately balancing the concerns raised by stakeholders who have real concerns about the safety of the sites when there is still spent fuel sitting in spent fuel pools for years.

What would be the safety rationale for not requiring sites specific analysis when allowing a decommissioning plant to significantly reduce its emergency preparedness activities? That would be for both of you.

Ms. Svinicki. Senator, the status of that rulemaking is that the staff has published a regulatory basis which includes some of the elements you have described. They have received comment on that and are now in the process of developing the proposed rule that would come before our commission later this year.

I know all members of our commission will look closely at the public comment that has been received and also the proposed rule will go out for comment as well. I will not pre-judge the outcome of that rulemaking process.

Senator Gillibrand. Just to add to your answer, Jeffrey, how do you intend to ensure the final decommissioning rule is balanced and addresses the concerns of stakeholders outside of

the nuclear industry?

Mr. Baran. Thank you. I appreciate the concerns you have expressed. We have had two public comment periods so far in the early part of this rulemaking. We got 200 public comments from States, local governments, non-profit groups, and communities, a lot of them raising concerns similar to the ones you just raised.

I read all 200 of those comments. There are a lot of good ideas there. From my point of view, as an agency, we have to make sure we are looking thoughtfully at all the stakeholder comments we are getting with an open mind. We should be aiming to produce a balanced rule that addresses the concerns of a broad range of stakeholders.

Senator Gillibrand. Thank you. You are committed as well to have a balanced rulemaking?

Ms. Svinicki. Yes, very much so, and to examine the public comment.

Senator Gillibrand. Thank you so much.

Thank you, Mr. Chairman.

Senator Barrasso. Thank you, Senator Gillibrand.

Senator Van Hollen.

Senator Van Hollen. Thank you, Mr. Chairman.

I thank both of you for being here.

Madam Chairman, I think Senator Cardin covered some of the

questions I was going to ask about the need to recruit more people, younger, talented people, into the NRC.

I am going to ask sort of the other side of the question because workforce stability, of course, is important to the mission of the NRC. We are proud to have the NRC in Rockville, Maryland. It is also obviously important to the folks in the surrounding area who are committed federal employees.

In the last two years, my understanding is the overall workforce at the NRC has declined and dropped by about 12 percent, is that correct?

Ms. Svinicki. That is correct.

Senator Van Hollen. Only for the second time in history, the NRC delivered RIF notices to employees, is that correct?

Ms. Svinicki. That is correct. Through attrition, we were able to find positions and were able to place the employees, so we did not involuntarily separate any of the employees in the RIF category.

Senator Van Hollen. I appreciate the way that was managed under the circumstances.

Do you anticipate any further RIFs going forward?

Ms. Svinicki. No, and Senator, I appreciate the opportunity to clarify. The budget request for fiscal year 2019 does indicate a decrease in positions. That has to do with our ability to request positions for work we anticipate. However,

the budget does not anticipate the need for involuntary separations, even though some areas of work are more active and some areas of work are less active.

Senator Van Hollen. Great. I am pleased to hear that.

I wanted to follow up on a couple of questions I understand Senator Markey asked regarding Saudi Arabia's interest in purchasing nuclear reactors and the possibility the United States would be a part of that. Westinghouse is obviously interested in going forward.

What exactly is the role of the NRC when it comes to reviewing an overseas nuclear agreement?

Ms. Svinicki. Thank you for the opportunity to clarify.

Under the Atomic Energy Act, Section 123, which is why they are called 123 agreements, the NRC's role is very specific. It has to do with providing expert review of the narrow provisions of a broader 123 that have to do with export licensing which is a unique authority of the U.S. NRC. We provide just expert input to make certain that the few provisions of a 123 that affect our export licensing framework are accurately represented and they can basically be implemented and effectuated under our regulatory framework.

The broader political arrangements and discussions are well outside the scope of our participation in the 123. The Atomic Energy Act also stipulates that when the Secretaries of State

and Energy convey a completed negotiated agreement to the President, the views of our commission go in a separate letter that is sent that we attest to this narrow responsibility we have under the Atomic Energy Act. We are involved in the broader discussions.

Senator Van Hollen. I understand you are not the lead negotiator but you have a statutory role within this process. I understand you are responsible for authorizing licenses to export U.S. technology to foreign countries.

The 123 agreement we signed with UAE, I assume the NRC participated in that the way you said, right?

Ms. Svinicki. Yes.

Senator Van Hollen. That is considered the gold standard in terms of preventing non-proliferation, isn't that right?

Ms. Svinicki. Yes. Again, our views to the President certify that the role we have under the Atomic Energy Act is accommodated in the arrangement. We do not take a policy view on the broader non-proliferation aspect. On the UAE 123, I am not remembering that there was any opining on the gold standard or anything related to that. It is a brief letter that speaks to our narrow role under the Atomic Energy Act.

Senator Van Hollen. I appreciate that.

Mr. Chairman, I just want to say that this question may be coming before the Senate. I do think on the policy ground, we

need to be very vigilant in making sure that any sale of U.S. nuclear reactors meets the gold standard requirements to prevent nuclear proliferation. I am very concerned about a lot of the reporting in the newspapers suggesting that Saudi Arabia would not adhere to the same requirements as we apply to the UAE in that nuclear agreement.

Thank you, Mr. Chairman.

Senator Barrasso. Thank you, Senator Van Hollen.

Senator Duckworth.

Senator Duckworth. Thank you, Mr. Chairman.

Chairwoman Svinicki, it is so good to see you again.

During our last hearing, we began a conversation on how you are working to improve the safety culture at the NRC. At that time, you outlined NRC's goals of creating a positive environment for raising concerns, promoting a culture of fairness and empowerment and establishing expectations and accountability for leadership.

However, since our conversation, a recent study developed by NRC's Office of Enforcement at the Commission found that reprisal issues remain a concern. It appears that in passing the 2005 Energy Policy Act, Congress amended the definition of employer under the Energy Reorganization Act to include DOE, NRC and NRC contractors and subcontractors.

However, a recent administrative law opinion issued by the

Department of Labor last year found because the 2005 amendments did not explicitly waive sovereign immunity for whistleblower actions under the ERA, NRC employees still do not have whistleblower protections under that specific law. Right now, this interpretation of an unclear law is being appealed to the Administrative Review Board and that decision could be appealed to a Federal Court of Appeals. This litigation could take years and cost thousands if not millions in taxpayer dollars.

Would you agree with me that Congress could save taxpayer dollars and save the Federal Government time and energy by simply passing a technical fix that clarifies under the Energy Reorganization Act, NRC and DOE employees, contractors and subcontractors are actually, in fact, entitled to the law's whistleblower protections?

Ms. Svinicki. Thank you, Senator Duckworth, for your attention to this matter.

We share the view that any suggestions or concerns about reprisal are something our Commission and senior agency executives take very seriously. As you have noted, there is ongoing litigation. Our agency is one of the relevant agencies in that litigation so I want to be very careful in not speaking outside the framework of that ongoing litigation matter.

Specifics of the legislation that you describe, I have not looked closely at what a fix or modification of that would do.

If I could respond for the record, I think I could acquaint myself more fully with the proposal.

Senator Duckworth. That would be great. If you could do that for the record, that would be very helpful. We are happy to help you with that legislation.

I would also like to continue our conversation on force on force testing. As you know, the NRC regularly conducts force on force testing at nuclear power plants which are critical to ensuring that we understand what our security vulnerabilities are at these facilities.

We have 13 of them in Illinois. Over the past decade, the results have been fairly consistent with one field exercise per year for the past decade. I am concerned that the NRC is considering reducing the number of force on force exercises they conduct in favor of exercises planned and conducted by the licensee as opposed to those done by the NRC.

I understand the NRC is reviewing staff recommendations now on this very issue. Can you reassure me that safety and safety alone will determine the outcome of this decision and not the cost of the testing itself?

Ms. Svinicki. Yes, I can assure you of that. I am certain that our commission broadly takes that same perspective. We would not want to see a diminishment in our expectation on the security levels and standards at U.S. nuclear power plants.

Senator Duckworth. Commissioner Baran, would you like to comment on that?

Mr. Baran. Thank you. I would just add that you pointed out there was a recommendation to from two force-on-force exercises to one and to have an NRC inspection of a licensee conducted force on force in lieu of NRC conducting that force on force.

I voted on this matter. So far, we are still voting as a commission on it. I do not support that approach. I think that would not enhance the effectiveness of our physical security inspection program or our force on force program.

The only potential benefit there would be to reduce cost. That is actually far from certain because if you do just one force on force and you get something other than a positive result, it leads you to a situation where you have to contemplate perhaps rescheduling and replanning a second force on force at an even bigger cost than you would have had originally if you had just planned for two right off the bat.

I have significant concerns with going in that direction. It is not something I support.

Senator Duckworth. Thank you.

Chairwoman Svinicki, I understand that the NRC has rules governing cyber protection safeguards. I know Chairman Barrasso has mentioned Russian hackers have been targeting U.S. nuclear

power plants and other critical facilities.

Can the rules the NRC has now be strengthened to mitigate our vulnerability to these types of attacks?

Ms. Svinicki. We will always be looking at the cyber threat against U.S. infrastructure as it evolves. At the present moment, although we maintain a constant look at this, we think our regulations are written in a way that describes more the objective than the how. It does allow the measures to be adapted to the threat as it evolves without requiring a change in the regulations themselves.

Senator Duckworth. Thank you.

Senator Barrasso. Thank you, Senator Duckworth, for following up on my questions on cyber security. I appreciate it. We are finished with the testimony. I see Senator Markey has returned; if you would like a question or two.

Senator Markey. Thank you so much, Mr. Chairman.

I want to follow down this cyber trail because obviously the Department of Homeland Security has, in fact, released a report showing the Russians hacked into our power infrastructure including nuclear power plants. That is a massive threat to our Country.

Let me ask you this, Commissioner Baran. Are the American nuclear power plants prepared to deal with Russian attacks on our power plant system?

Mr. Baran. I think NRC's cyber security regulations have been very forward looking. Long before I arrived on the scene, they were in place and are being implemented. I think the cyber security posture at our power plants is really quite good.

Senator Markey. What grade would you give it right now?

Mr. Baran. I do not know if I could give it a grade.

Senator Markey. I asked Joe Tucci, the CEO of EMC which has RSA as one of its components and Dell has now purchased EMC, but RSA is pretty much the state of the art in terms of cyber, and I asked him, how come there are so many successful cyber attacks in America?

He said, well, honestly, company CEOs just do not want to continually have to spend the money to have the highest possible standard in place. It is a constantly evolving process to make sure they keep buying our state of the art to protect because we are constantly upgrading but they do not want to spend the money.

Do you find any resistance from nuclear utility executives to constantly spending the money to have the update to ensure the plants have the state of the art, March 2018, cyber security built into their nukes?

Mr. Baran. I think the way we get around it is we require it. It is not an option.

Senator Markey. I know you require it but do they, in

fact, comply, in your opinion? Do they do it?

Mr. Baran. We expect their compliance. I have not heard of any concerns our cyber security inspectors have had in that regard.

Senator Markey. It is your opinion that the nuclear power plant operators in America are, in fact, using the state of the art cyber protections? You are saying you think those 98 plants, or whatever, are?

Mr. Baran. The way our regulations are set up, we identify the end state, as the Chairman mentioned, that you need to achieve. It is a performance-based requirement. We do not say you have to use this widget or this technique; we say you need to be protected. That is the regulatory requirement.

Senator Markey. No, I appreciate that. Let me ask you this. Are you familiar with the pathways which the Russians used to try to penetrate our nuclear power plants? Have you looked at those reports?

Mr. Baran. Our cyber security experts and those in other agencies have looked at that issue, yes.

Senator Markey. Do you think, in fact, those pathways that they were trying to penetrate are secure?

Mr. Baran. The penetrations that occurred were to corporate accounts, which are separate from the operating reactor systems. That separation is key to the defense of those

systems.

Senator Markey. Do you have records of attacks or attempts to penetrate into the nuclear facilities themselves? Do you have reports of that you review in terms of the pathways we used and the security uniformly across the industry that has been adopted in order to preclude success?

Mr. Baran. I guess the piece I could point to there is in recent years, in the last couple of years, NRC has established a regulatory requirement for power plant licensees to send a notification to NRC in certain circumstances if a cyber attack, for example, were effective. We have not received a notification of that kind.

Senator Markey. Okay. How often are the Russians or others trying to penetrate the nuclear power facilities themselves? In the course of a year, how many times do you think that would occur?

Mr. Baran. I do not know the specific number.

Senator Markey. Are we talking handful, dozens or more in terms of the totality of all nuclear power plants in the Country?

Mr. Baran. I want to be careful about how specific we get but there are a lot of threats and there are a lot of attempts. It is not just in the context of Russia. Cyber security is an evolving threat and an active threat. It is not a handful of

issues each year.

Senator Markey. It is not a handful?

Mr. Baran. It is not.

Senator Markey. It is many more than a handful?

Mr. Baran. That is right.

Senator Markey. Okay. I think that is important to understand. How do you actually give a grade to the company in terms of whether or not their upgrading of the cyber protections, which they are purchasing from the private sector in order to have them installed, how do you evaluate that? Who does that?

Mr. Baran. We do not assign a letter grade but our inspectors, our cyber security inspectors at NRC, who are expert in this area, will inspect them against our regulatory requirements to ensure they are in compliance.

Senator Markey. Are you going to have the same standard for the nuclear fuels cycle facilities as you have for nuclear power plants?

Mr. Baran. We are working on that right now.

Senator Markey. Will it be the same standard?

Mr. Baran. I do not know that it will be identical because the facilities are not identical. But I feel strongly that we need to have strong, effective cyber security requirements for our fuel cycle facilities as well.

Senator Markey. What I learned from RSA is the whole key is you have to spend the money. These companies do not like to. They want to hire Wackenhut to do the force on force and have a self grade. They do not like spending money, I found, on security, nuclear power plant operators in general.

I will be coming back to you. I just want to know what the frequency is with which they have to upgrade and buy the new state of the art cyber technologies to protect. There has to be some standard they are constantly being given to make sure they can pass.

Thank you, Mr. Chairman.

Senator Barrasso. Thank you very much.

Thank you very much for being here to testify today.

Members may submit follow up written questions for the record.

The hearing record will remain open for two weeks.

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

The hearing is adjourned.

[Whereupon, at 11:36 a.m., the committee was adjourned.]