ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR FISCAL YEAR 2018

WEDNESDAY, JUNE 7, 2017

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 2:32 p.m., in room SD–138, Dirksen Senate Office Building, Hon. Lamar Alexander (chairman) presiding.

Present: Senators Alexander, Kennedy, Feinstein, and Tester.

NUCLEAR REGULATORY COMMISSION

STATEMENT OF HON. KRISTINE SVINICKI, CHAIRMAN

OPENING STATEMENT OF SENATOR LAMAR ALEXANDER

Senator ALEXANDER. The Subcommittee on Energy and Water Development will please come to order.

Today's hearing will review the Administration's fiscal year 2018 budget request for the U.S. Nuclear Regulatory Commission. It's the first of the subcommittee's four budget hearings this year. We'll have three more this month.

Senator Feinstein and I will each have an opening statement. I'll then recognize each Senator for up to 5 minutes for an opening statement.

We'll then turn to Chairman Kristine Svinicki to present testimony on behalf of the Nuclear Regulatory Commission. Then I'll invite Commissioner Baran and Commission Burns an opportunity to make a brief statement, if they'd like to do that. And then at the conclusion of that, I'll recognize Senators for 5 minutes of questions going back and forth.

First, I'd like to thank our witnesses for being here. And let me say at the outset, thank you for working so well together and working so well with me and our staff, and I think that's true of Senator Feinstein as well, although I won't try to speak for her.

There was a time a few years ago when there was dissension at the Nuclear Regulatory Commission, and it spilled over into our hearings and made life a little difficult, but I don't notice any of that now, and I appreciate the professionalism with which you have, that you demonstrate in your jobs, and the professionalism that you demonstrate in response to our oversight and our questions.

And, of course, it almost goes without saying, but I don't want to go without it, what a privilege it is to serve with Senator Fein-

stein. She knows the subject, she has firm opinions, and she's effective in the work that she does, and having been a mayor, she knows how to make a decision.

So we've been able to work very well together, and the best evidence of that, I think, was the fiscal year 2017 Energy and Water Appropriation bill, which in the midst of a swirl of partisanship and some budget issues, we were able to provide a record level of funding for the Office of Science and for the Corps of Engineers to continue to support supercomputing, to maintain our Nation's nuclear weapons, and to cut wasteful spending.

So I simply want to express to Senator Feinstein once again what a privilege it is to have a chance to work with her as a partner in leading this committee.

Senator FEINSTEIN. Thank you.

Senator ALEXANDER. Our witnesses today include Kristine Svinicki in her first appearance before this Committee, as Chairman of the Commission. I want to mention President Trump nominated her to another term as Chairman. He's also nominated individuals to serve in the two remaining positions on the Commission. I hope they'll all be confirmed as soon as possible.

Commissioner Jeff Baran is here. We welcome you, Commissioner Baran.

And Commissioner Stephen Burns is here. We welcome you, Commissioner Burns.

We're here to review the Administration's fiscal year 2018 budget request for the U.S. Nuclear Regulatory Commission, the independent Federal agency response for regulating the safety of our Nation's commercial nuclear power plants and other civilian uses of nuclear material. The Nuclear Regulatory Commission's job is very important. It oversees our 99 nuclear reactors, which provide 20 percent of our Nation's electricity, and more than 60 percent of our carbon-free electricity.

In my view, nuclear power is our best source of inexpensive, reliable, carbon-free base load power, and it is crucially important for our national security and competitiveness. My goal is to make sure that 5, 10, 25 years from now, we have an environment in which nuclear reactors can continue to be an important source of electricity for our country.

The budget request for the Nuclear Regulatory Commission is $952 million. This is an increase of about 12 million from fiscal year 2017. This amount is offset by $814 million in fees paid by utilities and other facilities licensed to possess and use nuclear materials.

To ensure nuclear power will continue to play a significant role in our Nation's electricity generation, I'll focus my questions, when I get to those, on four main areas. One, licensing facilities for used nuclear fuel and solving the nuclear waste stalemate. There's no issue that Senator Feinstein and I are united more on than solving the nuclear waste stalemate. Two, safely extending licenses for existing reactors. Three, licensing small modular and advanced reactors. And, four, making sure that the Commission's operating efficiently.

NUCLEAR WASTE STALEMATE

Taking those one by one, to ensure that nuclear power has a strong future, we've got to solve the 25-year-old stalemate on what to do with used nuclear fuel from our reactors. We need to find places to build geologic repositories and temporary storage facilities so the Federal Government can finally meet its legal obligation to dispose of nuclear waste safely and permanently. This year's budget request for the Nuclear Regulatory Commission includes 30 million, to restart the review of the Department of Energy's license application for the Yucca Mountain repository.

I'll be asking the Commission to give us more detail on their plans for this proposed funding.

I believe that Yucca Mountain can and should be part of the solution to the nuclear waste stalemate. Federal law designates Yucca Mountain as the Nation's repository for used nuclear fuel. And the Commission's own scientists have told us that we can safely store nuclear waste there for up to 1 million years. But even if we had Yucca Mountain open today, we would still need to look for another permanent repository. We have more than enough used fuel to fill Yucca Mountain to its legal capacity.

So Senator Feinstein and I, along with leaders of the Committee on Energy and Natural Resources, Senator Murkowski, and then Senators Bingaman and Wyden, and now Senator Cantwell, have proposed to build and implement the recommendations of the President's Blue Ribbon Commission on America's Nuclear Future, which we're working to reintroduce this year.

This legislation contemplates Yucca Mountain, and would create a new Federal agency to find additional permanent repositories and temporary facilities for used nuclear fuel. But the quickest and probably the least expensive way for the Federal Government to start to meet its used nuclear fuel obligations is for the Department of Energy to contract with a private storage facility for used nuclear fuel.

The former Secretary of Energy, Secretary Moniz, told this subcommittee last year that the Department of Energy has existing authority to take title to used fuel and contract with a private company to store it. We'll have a conversation later this month with Secretary Perry about that issue, and we'll have it at the budget hearing on the Department of Energy.

I understand two private companies have submitted applications to the Commission for consolidated storage facilities, one in Texas, one in New Mexico. I'll be asking some questions about that today, and I want to make sure that you have the resources that you need in fiscal year 2018 to review these applications.

SUBSEQUENT LICENSE RENEWAL

Number two, safely extending licenses for existing reactors. Instead of just building windmills, which only produce 17 percent of our carbon-free electricity, or solar farms, which only produce 3 percent, the best way to make sure the United States has a reliable source of inexpensive, efficient, carbon-free electricity is to extend the licenses of the nuclear reactors that are already operating when it is safe to do so. Most of our 99 reactors have already ex-

tended their operating licenses from 40 to 60 years, and some utilities are planning to begin the process to extend these licenses from 60 to 80 years.

Last year the Commission told the subcommittee that it has developed the framework to examine applications to safely extend licenses beyond 60 years. I want to make sure you have the resources that you need to review any applications during 2018.

NEW REACTOR LICENSING

Third, licensing new reactors. In addition to the reactors we already have, the Commission also needs to be ready to review applications for new reactors, particularly small modular reactors and advanced reactors. These new technologies could represent the future of nuclear power. In 2017, we provided enough funding to complete the small modular reactor program at the Department of Energy, and NuScale, which was one of the technologies selected in that program, has now filed an application for design certification of a small reactor with the Commission.

A utility group has been working with the Idaho National Laboratory to site a small modular reactor there. And the Tennessee Valley Authority has also submitted an application to the Commission for a permit at the Clinch River site for a small modular reactor. In addition to being ready to review applications for small modular reactors, I want to make sure the Commission is ready to review applications for advanced reactors.

Fiscal year 2017 included $5 million to develop a regulatory infrastructure for advanced reactor designs, but the Commission didn't request funding for that in fiscal 2018. I'd like to know what the Commission plans to do with the funding Congress specifically provided for this effort, and why this year's budget request does not include any funding, if there's additional work to do.

EFFICIENT OPERATION OF THE COMMISSION

And, finally, making sure that the Commission's running efficiently, one of the Nuclear Regulatory Commission's challenges is ensuring that the agency is running effectively and focusing on the right goals. I'd like to thank the Commission for working so closely with Senator Feinstein and me over the past few years to reduce the Commission's budget to more closely reflect its actual workload, while maintaining its gold standard of safety.

In fact, between fiscal year 2014 and 2017, we reduced the Commission's overall budget by $103 million, which represents about a 10 percent reduction. These savings are important because they lower the fees utilities must pay the Commission, and these savings can be passed on to the utilities' customers. These reductions haven't been arbitrary. In fact, the appropriations committee has only reduced the Commission's budget in areas that the Commission has identified as unnecessary to its important safety mission.

While there's still more to be done, the Commission deserves credit for the important steps that you have taken to manage the agency more efficiently while maintaining safety. And I'd like to ask today if you plan to continue these efforts. I also look forward to working with the Commission as we've been putting together our Energy and Water Appropriations bill for fiscal year 2018.

I now turn to Senator Feinstein for her opening statement.

STATEMENT OF SENATOR DIANNE FEINSTEIN

Senator FEINSTEIN. Thanks very much, Mr. Chairman.

First of all, as you know, it's a great treat and pleasure and honor for me to work with you. I forget how many years we've been doing this, going back and forth, but it's been a very special relationship for me, and I want you to know that. And we've managed to work together and work out differences, and I've always felt that's the way the Senate should function. So I thank you for your partnership.

My statement is a little bit different. We have in California two big nuclear facilities. One is run by Southern California Edison, a very large provider of power in Southern California, and the other by Pacific Gas and Electric up North. They are both decommissioning 40—each one, 4,400 megawatts of nuclear power. And the Southern California Edison's was over problems with a steam generator, and these problems metastasized so that they thought the best course of action was to decommission. So, today, about 3,300 plutonium rods sit in spent fuel pools, some of them going into dry casks, but with nowhere—no place to really put them safely. Southern California Edison is a little bit different. It set a time several years ahead, and it's going to slowly—it's not going to apply for relicensing, and it's going to decommission its reactors as well.

That, to me, was sort of a clue to take a look around the nuclear industry in America. And I just want to relay what we find.

A bit of history, first.

Ten years ago, this subcommittee was preparing for a Renaissance of nuclear power in the United States, and between 2005 and 2010, we funded the $600 million nuclear power 2010 program. The program took two reactor designs to the NRC (Nuclear Regulatory Commission) for licensing. And, today, there are four reactors being built in South Carolina and Georgia using one of those designs.

Between 2005 and 2013, the subcommittee funded the $700 million Next Generation Nuclear Plant Program that ended when industry didn't come forward with its cost share. In 2005, Congress authorized, and in 2007, first funded, the Loan Guarantee Program that is now being used to fund the construction of two reactors in Georgia.

In 2008, the subcommittee began to significantly increase the Nuclear Regulatory Commission's budget, so as to accommodate the expected filing of 20 or more nuclear power plant construction applications. Today, only five such licenses have been granted. All of this was done with the strong support of the nuclear power industry.

We can all look back on this history and marvel at how a technological breakthrough in natural gas extraction caused markets to shift so much that it killed the nuclear Renaissance. But the problems facing nuclear power are much more than the cheap cost of natural gas. Today, the nuclear power industry faces numerous plant closures, staggering cost overruns, and bankruptcy filings. It all leads me to wonder about the future of nuclear power. It used to be that an operating nuclear power plant was tremendously profitable. In the deregulated markets, that's no longer the case.

The abundance of natural gas and renewable generation leave existing plants apparently unable to compete.

It is my understanding that Exelon, the mass—the largest nuclear operator of plants, is insisting that their existing nuclear plants need subsidies or they will close them. And the company is seeking subsidies for its Three Mile Island plant in Pennsylvania. We now have 19 shut down reactors in this country. Another six will be shut down in the next 2 to 3 years. The industry claims that even more will close without taxpayer subsidies.

In the regulated markets, in places like Georgia and South Carolina, nuclear power appears to be too expensive to build. It's my understanding the Southern company and other utilities building two new reactors in Georgia now face schedule delays of 3 years and cost increases of more than three billion. Westinghouse, the main contractor on this project, has filed for bankruptcy because of the increases and delays.

The utilities must now decide if they can complete construction of these nuclear power plants. The Georgia Public Service Commission must decide how much more burden can be put on ratepayers due to this poorly managed project.

It's not just nuclear power projects, though, in Georgia and South Carolina that are behind schedule and massively over budget. This problem plagues other projects in the United States and also in foreign countries. In South Carolina, we have the MOX project. And you and I have talked about that for years, about its cost, that we were always going to do something, and so far we haven't. But that plant is designed to convert weapons grade plutonium into fuel for commercial nuclear power plants. This project was originally estimated to cost $4.7 billion, and be completed by last year. But the Department of Energy has already spent more than $5 billion. And the most recent cost estimate, the costs have ballooned to $17 billion, with a completion date in the late 2020s.

And here's our problem: At current funding levels, $335 million in fiscal year 2017, the Department of Energy says, this project will never be completed. So what are we going to do?

Also, the French nuclear giant, AREVA, is building a nuclear reactor based in Finland. It's now expected to be completed 9 years late, at a cost three times its original three billion Euro estimate.

So here we are today, the nuclear Renaissance has failed to materialize, and the future of the industry, I think, is highly questionable. So I would be most interested in any comments from the Nuclear Regulatory Commission about this, because what I see is now, as the Chairman has indicated, there's going to be a transition to modern small modular reactors, again, probably for reasons of efficiency and cost, needing to be gathered together at at least five in a place. And what happens to the waste? Where does the waste go? They're underground. What happens with the waste?

So today we have 78 sites, and no place for nuclear waste. Now, maybe that's a symptom of what's happening to the industry. We don't seem to be able to get together. Give you an example. We work for years on a nuclear waste policy. Money is being collected, a lot of money, to be able to be helpful out there. Can't be spent. So we work with the Chairman and Ranking of the Energy Com-

mittee, three chairs now, we have a bill. It is all voluntary. And the NEI (Nuclear Energy Institute) doesn't support it.

So I am increasingly coming to the position that what are we going to do? Is this going to be a failing industry? Is everybody just going to sit there and let it happen? Is there really no role? I have been to our plants in California. They're big plants, both PG&E and Southern California Edison, and they're going to be shutting down. And so we will be left with three places where we need to put nuclear waste.

I talked to the new chairman of PG&E, and he says, "Well, we're going to put everything in transportation casks because we hope you'll find a place for us to put the waste." And somehow, I mean, I don't understand, because what I see is a deterioration. What I see is a big downhill slope for the industry. And to some extent, by not cooperating, by not trying to work out problems so they're solutions, in my view, the industry is bringing it on themselves. And so I just decided after all these years of struggling, and you know how I feel about the small nuclear reactors, and I've acceded to you, and we've gone ahead with at least one area, but if we can't pass a nuclear waste bill, if we can't get an alternative for Yucca, when Nevada still remains opposed, and the House won't let us pass any pilot project, what happens is stasis.

Now, I don't know whether that stasis affects this industry out there, but I would suspect it does. And it's very discouraging when you sit here year after year and you want to work with people, and you want to solve problems, and you think you're doing a good thing by putting together a nuclear waste bill that will enable the money that's been collected and being held—how much is it?

VOICE. $34 billion.

Senator FEINSTEIN. $34 billion?

$34 billion, be able to spend it.

And so I guess what you see is my frustration, being overwhelmed, because if I look out there, I don't see anything changing. And maybe it's clear that we can't have a good situation for nuclear waste, if we can't enable it to be built properly, if we can't handle the waste properly, if we can't see that timelines are kept.

So I guess I have reached, Mr. Chairman, a level of real frustration. This is unlike any committee that I serve on, and you know I like it and I believe in it, and I believe in you. But, somehow, this industry has got to work with us to solve these problems and enable us, if we can't use Yucca, to find some place that we can, and have a place to put the waste and have policies that enable nuclear to have a role in this future, which I think is going to be a big future for low carbon power.

So, anyway, I wanted to say these things, and I thank you.

Senator ALEXANDER. Thank you, Senator Feinstein.

We'll now recognize Chairman Kristine Svinicki to provide her testimony on behalf of the Nuclear Regulatory Commission. We'll then turn to Commission Baran and Commission Burns for any statement they wish to make. And then Senator Feinstein and I will have some questions, and there may be other Senators who come who wish to do that, too.

Chairman Svinicki.

SUMMARY STATEMENT OF HON. KRISTINE SVINICKI

Ms. SVINICKI. Good afternoon, Chairman Alexander and Ranking Member Senator Feinstein.

We have submitted a longer statement that I would ask be made part of the record, which I will summarize very briefly.

SUMMARY OF FISCAL YEAR 2018 BUDGET REQUEST

My colleagues and I appreciate the opportunity to appear before you today to discuss the U.S. Nuclear Regulatory Commission's fiscal year 2018 budget request. The NRC's mission is to license and regulate the civilian use of radioactive materials in the United States, to ensure adequate protection of public health and safety, and to promote the common defense and security. The resources we are requesting for fiscal year 2018 fully support that mission. The NRC's 2018 budget request is $952 million, and 3,284 full-time equivalent employees or FTE. This request represents an increase from the fiscal year 2017 enacted budget, due to the inclusion of $30 million for Yucca Mountain activities. At the same time, the NRC's fiscal year 2018 budget request represents a decrease of 48.3 million, including 311 fewer FTE when compared to the fiscal year 2017 annualized continuing resolution budget. Consistent with the Omnibus Budget Reconciliation Act of 1990, the NRC plans to recover $814 million of this budget request from fees assessed to NRC licensees.

PROJECT AIM 2020

Since we last appeared before you, the NRC has continued its efforts to further enhance the efficiency of agency processes. Chief among these efforts is Project Aim 2020. In June of 2014, the NRC established Project Aim 2020 to enhance the agency's ability to plan and execute its mission in a more effective and efficient manner. The agency's efforts have resulted in reduction to the agency's budget through Commission-approved work activities that can be shed, deferred, or completed with fewer resources. Through these actions, the agency has decreased its size by more than 500 FTEs since 2014 and is working on the implementation of additional actions to make these improvement efforts durable in the years beyond 2018.

ADDITIONAL EFFICIENCY EFFORTS

Other efforts to improve efficiency and effectiveness, include establishing centers of expertise to increase our ability to respond quickly and effectively to current, emerging, and unanticipated work, ensuring Commission involvement early on in the rulemaking process before significant resources are expended, and continuous evaluation of the agency's internal structure as evidenced by the Commission's approval of the reorganization plan and the business case for the proposed merger of our Office of Nuclear Reactor Regulation and our Office of New Reactors by September 30 of 2020. These and other similar initiatives are evidence of our commitment to operate in the most efficient and effective manner possible.

I would now like to highlight just two portions of the NRC's fiscal year 2018 request.

NUCLEAR REACTOR SAFETY PROGRAM

The request for the Nuclear Reactor Safety Program, which is our largest budget item and includes both our operating reactors and new reactors programs, is approximately $467 million, reflecting a decrease of $53 million, including a decrease of 214 FTE when compared to the 2017 annualized CR (continuing resolution). These requested resources reflect the completion of much of the agency's Fukushima related work and provide for the anticipated continued review of NuScale Power's design certification application for their small modular reactor, which is a first of a kind submission for our agency.

NUCLEAR MATERIALS AND WASTE SAFETY PROGRAMS

The fiscal year 2018 budget request for the agency's Nuclear Materials and Waste Safety Programs, which includes Fuel Facilities, Nuclear Materials Users, Spent Fuel Storage and Transportation, Decommissioning and Low-Level Waste, and High-Level Waste Programs, is $171 million, reflecting an increase of $22 million, including an increase of 19 FTE when compared to the fiscal year 2017 annualized CR budget. This increase is due to resources requested for the High-Level Waste Program, for activities associated with the proposed Yucca Mountain geologic repository. These resources total $30 million, including 71 FTE.

In closing, this budget request reflects our continuing efforts to achieve additional efficiencies while maintaining at the forefront public health and safety and the security of our Nation.

On behalf of the Commission, I thank you for this opportunity and for your support of the vital mission of the NRC. And, Chairman Alexander, I appreciate and thank you for your acknowledgment of the collegiality with which we operate as a Commission. While we don't always agree, I think that we view collegiality as very separate and distinct from agreeing on any particular matter, and I would like to just thank both of my colleagues for working together so well in the abrupt change in chairmanship that we experienced earlier this year. I couldn't be joined by two finer colleagues, so thank you. And we're pleased to answer your questions.

[The statement follows:]

PREPARED STATEMENT OF HON. KRISTINE L. SVINICKI

Good afternoon, Chairman Alexander, Ranking Member Feinstein, and distinguished members of the Subcommittee. My colleagues and I appreciate the opportunity to appear before you today to discuss the U.S Nuclear Regulatory Commission's (NRC) fiscal year 2018 budget request.

We appeared before this Committee in February of 2016, and committed to efficiencies in both corporate and programmatic areas. Today, I will focus on our accomplishments since then, including an update on our Project Aim initiative and ongoing efforts to improve the agency's rulemaking process.

The NRC is an independent Federal agency established to regulate commercial nuclear power plants; research, test, and training reactors; nuclear fuel cycle facilities; and radioactive materials used in medicine, academia, and for industrial purposes. The agency also regulates the transport, storage, and disposal of radioactive materials and waste and the export or import of radioactive materials. The NRC regulates industries within the United States and works with agencies around the world to enhance global nuclear safety and security.

The agency's statutory mission is to license and regulate the civilian use of radioactive materials in the United States, to ensure adequate protection of public health and safety, and to promote the common defense and security. The resources we are requesting for fiscal year 2018 fully support the NRC's mission while achieving resource savings and improving the agency's efficiency and effectiveness. The NRC's fiscal year 2018 budget request, including requested resources for the Office of the Inspector General (OIG), is $952 million and 3,284 full-time equivalent (FTE) employees. This request represents an increase from the fiscal year 2017 enacted budget, due to the inclusion of $30 million for Yucca Mountain activities. At the same time, the NRC's fiscal year 2018 budget request represents a decrease of $48.3 million, including 311 fewer FTE, as compared to the fiscal year 2017 Annualized Continuing Resolution (CR) budget.

The NRC's fiscal year 2017 total budget authority, excluding OIG resources, totals $928 million. This includes $905 million for Salaries & Expenses, plus direction to use $23 million in carryover. It does not include resources for Yucca Mountain activities.

Reductions achieved through efficiency and effectiveness efforts are, however, partially offset by the cost of the budgeted FTE rate to accommodate salaries and benefits costs, including government wide pay and benefits increases. Despite a declining budget and staffing levels, the fiscal year 2018 budget fully supports the NRC's safety and security programs, and the agency's primary focus continues to be protecting public health and ensuring the long-term safety and security of nuclear materials and facilities.

In fiscal year 2018, the NRC plans to recover $814 million of the fiscal year 2018 budget from fees assessed to NRC licensees. This would result in a net appropriation of $138 million, which is an increase of $19 million in net appropriations when compared with the fiscal year 2017 annualized CR budget. The increase in the net appropriation is primarily due to the addition of $30 million for Yucca Mountain, which is excluded from fee recovery, and which requires an appropriation from the Nuclear Waste Fund.

Before I discuss the specifics of the NRC's fiscal year 2018 budget request, please allow me to address the efforts that the agency has undertaken to improve our processes.

Project Aim

The budget request reflects significant efficiencies initiated through Project Aim. In June 2014, the NRC established Project Aim to enhance the agency's ability to plan and execute its mission in a more effective and efficient manner. The Project Aim Report included 19 tasks related to planning, processes, and personnel, with a goal to prepare the agency for the future. The agency has achieved a significant milestone by completing the major deliverables for each of the 19 Project Aim tasks.

The agency's efforts have resulted in reductions to the agency's budget through the Commission approved work activities that can be shed, deferred, or completed with fewer resources.

The agency is institutionalizing a common prioritization process to more readily prepare the agency to evaluate emerging work and is implementing an enhanced strategic workforce plan to reshape the workforce to meet current and future needs. As we proceed, the agency remains mindful of the importance of its highly skilled technical staff and the need to maintain our expertise. We must keep a focus on knowledge management as senior staff retire and new experts take their place, while we remain cognizant that the success of the agency is due to the quality and dedication of the agency's people.

Through these actions, the agency continues to focus on resources while decreasing its size by more than 500 FTE since 2014. The fiscal year 2018 budget request reflects reductions of $48 million, including 185 FTE, as a result of NRC's rebaselining efforts under Project Aim. In addition, it reflects reductions resulting from longer-term efficiencies and improvement projects, including savings in corporate support services.

The agency is working on the implementation of additional actions to achieve longer-term efficiencies beyond fiscal year 2018, and the staff is implementing process efficiencies that will yield resource reductions through standardization or centralization of specific regional support staff functions. This includes a review of mission support functions to assess standardization and centralization opportunities. The agency has also made significant reductions in agency-wide supervisory resources and programmatic mission support resources.

The agency will continue to enhance its effectiveness and efficiency beyond the completion of Project Aim tasks. The agency established Centers of Expertise (COE) within the agency's organizational structure to increase our ability to respond quick-

ly and effectively to current, emerging, and unanticipated work. In addition, the Commission approved staff recommendations to implement process enhancements and re-baselining initiatives for its materials programs.

The staff has also completed improvements to operating reactors licensing processes to enhance the predictability and efficiency of reviews while maintaining their effectiveness and quality. Furthermore, while several offices have completed internal restructuring to become more efficient and effective, the Commission approved the reorganization plan and the business case for the proposed merger of the Office of Nuclear Reactor Regulation and the Office of New Reactors by September 30, 2020.

Rulemaking

The Commission has considered the agency's rulemaking program and has taken steps to ensure Commission involvement early on in the rulemaking process, before significant resources are expended.

To accomplish this, the staff submits a rulemaking plan to the Commission for review and approval before the staff initiates activity on a rulemaking, apart from those rulemaking activities that are explicitly delegated to the staff.

Each year the agency reviews ongoing and planned rulemaking activities to develop rulemaking program budget estimates and to determine the relative priority of these rulemaking activities. As part of this review, the agency may identify rulemakings that may no longer be needed to meet our key strategic goals of safety and security. For example, in May 2016, the Commission approved discontinuing 7 rulemaking activities and deferring 2 rulemakings that were in the early stages of development.

The discontinued rulemakings covered a variety of topics, and the basis to discontinue was different for each rulemaking. For example, one rule the Commission voted to discontinue was related to entombment, one of the decommissioning options available to commercial power reactors. Rather than conduct a separate rulemaking only for entombment, the Commission determined staff should conduct a single rulemaking to make the decommissioning process more efficient, open, and predictable by reducing the reliance on licensing actions, including license amendments and exemptions, to achieve a long-term regulatory framework that defines the requirements and decommissioning options for reactors.

In March 2017, the NRC deployed a centralized tracking and reporting tool that provides real- time updates on all NRC rulemaking activities. Current rulemaking data is posted to the NRC website on our rulemaking pages.

Congressional Budget Justification Improvements

The fiscal year 2018 Congressional Budget Justification reflects the NRC's efforts to improve the presentation of the budget request and to simplify comparisons between budget years. This document also demonstrates the agency's commitment to fee transparency. The chapter for each business line includes supplemental content such as workload tables and schedules to better align the budget and the resulting impact on fees. Content has also been expanded to include a synopsis of the agency's overall estimated fee recovery calculations to more clearly show the budget's impact on fee recovery.

Fiscal Year 2018 Budget Request

I would now like to highlight specific portions of the fiscal year 2018 budget request.

NUCLEAR REACTOR SAFETY

The Nuclear Reactor Safety Program encompasses licensing, regulating, and overseeing civilian nuclear power reactors, research, test, and training reactors, and medical isotope production facilities in a manner that adequately protects public health and safety and includes international and research activities. Resources for the Nuclear Reactor Safety Program decreased by $53.3 million, including a decrease of 214.5 FTE, when compared to the fiscal year 2017 annualized CR.

Operating Reactors

The Operating Reactors Business Line encompasses the regulation of 99 operating civilian nuclear power reactors and 31 research, test, and training reactors. The NRC is requesting $368.1 million for operating reactors, including 1,546 FTE, which represents an overall funding decrease of $34.9 million, including 155.5 FTE, from the fiscal year 2017 annualized CR. The decrease is the result of, for example, Project Aim activities as well as declines in the staff's Fukushima Near-Term Task Force Tier 1 work related to the Mitigating Strategies Order, flooding hazard re-

evaluations, and seismic hazard reevaluations, and the completion of Tier 2 and 3 work.

New Reactors

The New Reactors Business Line is responsible for the regulatory activities associated with siting, licensing, and overseeing construction of new nuclear power reactors as well as addressing policy issues associated with small modular reactors and non-light water reactors.

The fiscal year 2018 budget request for new reactors is $98.6 million, including 432 FTE, which represents a funding decrease of $18.5 million, including 59 FTE, when compared with the fiscal year 2017 annualized CR. This decrease is a result of Project Aim activities and the projected completion of the review of two combined license applications for Turkey Point and North Anna. In early January 2017, NuScale Power submitted the first design certification application for a small modular reactor. The agency has been in communication with NuScale since it completed a cooperative agreement for funding from the U.S. Department of Energy in 2014. In addition, to prepare for the future review of non-light water reactor applications, we have developed a vision and strategy document, which was most recently updated and made publicly available in December 2016.

NUCLEAR MATERIALS AND WASTE SAFETY

The Nuclear Materials and Waste Safety Program is responsible for licensing, regulating, and overseeing nuclear materials in a manner that adequately protects the public health and safety. Through this program, the NRC regulates uranium processing and fuel facilities, research and pilot facilities, and nuclear materials users such as medical, industrial, research, and academic uses. Additionally, through this program, the NRC regulates spent fuel storage, spent fuel and material transportation and packaging, decontamination and decommissioning of facilities, and low-level and high-level radioactive waste activities. The fiscal year 2018 budget request for this program is $171.1million, including 627 FTE. This funding level represents an overall funding increase of $22.4 million, including an increase of 19.5 FTE, when compared with the fiscal year 2017 annualized CR budget. This increase is due to resources for the proposed Yucca Mountain deep geologic repository for spent nuclear fuel and other high-level radioactive waste—$30 million, including 71 FTE—that was not included in fiscal year 2017.

Fuel Facilities

The Fuel Facilities Business Line is responsible for ensuring that fuel cycle facilities are licensed and operated in a manner that adequately protects public health and safety and promotes the common defense and security. The fiscal year 2018 budget request for fuel facilities is $25.2 million, including 114 FTE, which represents an overall funding decrease of $4.1 million, including 22 FTE, when compared with the fiscal year 2017 annualized CR. This decrease represents savings from Project Aim activities.

Nuclear Materials Users

The Nuclear Materials Users Business Line supports the licensing and oversight necessary to ensure the safe and secure processing and handling of nuclear materials. The fiscal year 2018 budget request for nuclear materials users is $61.7 million, including 223 FTE, which represents a funding decrease of $3.5 million and 21 FTE when compared with the fiscal year 2017 annualized CR. The decrease is a result of Project Aim activities and additional process enhancements.

Spent Fuel Storage and Transportation

The Spent Fuel Storage and Transportation Business Line supports the safe and secure storage of spent fuel, and the safe and secure transport of radioactive materials. These activities include licensing, oversight, rulemaking, international activities, research, and generic homeland security.

The fiscal year 2018 budget request for spent fuel and transportation is $26.2 million, including 103 FTE, which represents a funding increase of $1.9 million and a FTE decrease of 4.0 when compared with the fiscal year 2017 annualized CR. Overall proposed resources increase in fiscal year 2018, and are partially offset by the agency's rebaselining of resources as part of Project Aim. In particular, a modest increase in resources is needed in fiscal year 2018 to support the safety, security, emergency preparedness, and environmental reviews for two applications for consolidated interim storage facilities.

Decommissioning and Low-Level Waste

The Decommissioning and Low-Level Waste Business Line supports licensing and oversight associated with the safe and secure operation of uranium recovery facilities, decommissioning of nuclear facilities, and disposition of low-level radioactive waste from all civilian sources. The Fiscal year 2018 budget request for decommissioning and low-level waste is $28 million, including 116 FTE, which represents an overall funding decrease of $1.9 million and 4.5 FTE when compared with the fiscal year 2017 annualized CR. The decrease largely reflects Project Aim activities.

High-Level Waste

The High-Level Waste Business Line supports the NRC's activities for the proposed Yucca Mountain deep geologic repository for the disposal of spent nuclear fuel and other high-level radioactive waste using appropriations from the Nuclear Waste Fund. The fiscal year 2018 budget request for high-level waste is $30 million, including 71 FTE. Resources would support continuation of the licensing proceeding, which would primarily consist of restarting the adjudication.

Corporate Support

The NRC's corporate support involves centrally managed activities that are necessary for agency programs to operate and achieve goals more efficiently and effectively and includes acquisitions, administrative services, financial management, human resource management, information technology and information management, training, outreach, and policy support. As part of the agency's efforts to be more efficient, we have looked for ways to reduce costs associated with the delivery of corporate support services. The fiscal year 2018 budget requests $301.4 million and 616 FTE for Corporate Support, which is a reduction of $3 million, including 116 FTE, compared to the fiscal year 2017 annualized CR. As with all business lines, reductions are offset in fiscal year 2018 to accommodate actual salaries and benefits costs for the remaining FTE. In addition to absorbing an increase for salaries and benefits, the reductions are also offset by increases for rent escalations; operations and maintenance for core IT systems and infrastructure; targeted investments in development and modernization efforts; and for support of a full five member Commission.

Office of Inspector General

The OIG's component of the fiscal year 2018 proposed budget is $12.9 million, of which $11.8 million is for auditing and investigation activities for NRC programs and $1.1 million is for the auditing and investigation activities of the Defense Nuclear Facilities Safety Board (DNFSB). These resources allow for the OIG to carry out the mission to independently and objectively conduct audits and investigations to ensure the efficiency and integrity of NRC and DNFSB programs and operations; to promote cost-effective management and to prevent and detect fraud, waste, and abuse.

CLOSING

In closing, this budget request reflects our continuing efforts to achieve additional efficiencies without sacrificing public health and safety, or the security of our Nation. Chairman Alexander, Ranking Member Feinstein and distinguished Members of the Subcommittee, this concludes my formal testimony. On behalf of the Commission, I thank you for the opportunity to appear before you. Thank you also for your support of the vital mission of the NRC. I would be pleased to respond to your questions. Thank you.

Senator ALEXANDER. Commission Baran, would you like to make a statement?

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

Mr. BARAN. Just briefly, if that's okay.

Chairman Alexander, Ranking Member Feinstein, members of the subcommittee, thank you for the invitation to appear today. It's a pleasure to be here with my colleagues to discuss NRC's fiscal year 2018 budget request and the work of the Commission.

Chairman Svinicki described the progress the agency is making in implementing Project Aim, which is our effort to take a hard look at what work the agency is doing and how we are doing that

work. Last year, the NRC staff generated a list of 151 proposals to reduce costs. The Commission approved nearly all of these proposals. Combined with declining workloads in some areas and extremely limited external hiring, these efforts have reduced our full-time employee levels by more than 12 percent in just 2 years. We now have fewer employees than we did back in 2007, when the agency was in the midst of ramping up for the expected wave of new reactor applications.

Some of the Project Aim cost reductions will be realized during fiscal year 2018 and 2019, including some further reductions in corporate support, but I think there's a strong case to be made that the agency will soon be correctly sized for our workload. We still have more work to do to ensure that we have the right skill sets in the right places and to internalize an enduring focus on efficiency. But I think we're approaching the right staffing level for the agency. When we level off, I think it is important for NRC to have sufficient resources to maintain NRC's core technical capabilities and a surge capacity so that we can handle significant unexpected work like the potential resumption of new reactor construction at Bellefonte.

There are also many significant safety efforts underway at NRC, such as continued implementation of post-Fukushima safety enhancements, the decommissioning reactor rulemaking, and the exploration of options to increase the accountability of Category 3 sources. In addition, we have the staff's review of the NuScale small modular reactor design application, the docketing review of a license application for a consolidated interim storage facility in New Mexico, and the safety and environmental review of a separate application for a consolidated interim storage facility in Texas, which is temporarily on hold at the request of the applicant.

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

Senator ALEXANDER. Thank you, Commissioner Baran.

Commissioner Burns.

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

Mr. BURNS. Thank you, Chairman Alexander and Ranking Member Feinstein, and other members of the subcommittee. I'm very appreciative of the opportunity to appear before you today with my colleagues to discuss our fiscal 2018 budget request. I fully support the Chairman's testimony on behalf of the Commission today.

I want to express my appreciation of the Committee for their support during my tenure as Chairman from January 2015 to earlier this year in January 2017. I think we had a very supportive and cooperative relationship during that time, and I think the Committee's input to us was invaluable. I also want to acknowledge the committee staff for their great efforts to work collaboratively with the agency and to communicate their concerns and feedback in a productive way.

The fiscal 2018 budget proposal is, in my view, a continuation of our multi-year effort to conduct a meaningful reassessment of ourselves and to be responsible in executing our mission and our use of resources.

As the Chairman has already indicated, the NRC has achieved a great many accomplishments since last year with respect to effectiveness and efficiency and improvements gained in our regulatory programs, corporate support, and rulemaking activities. And I think the 2018 budget reflects the fruits of those efforts, but a continuation going on.

And I just have a final note, appreciation of the Chairman, her mention of the collegiality of the Commission. I think that's well evidenced by I think the fairly smooth handoff we had in the chairmanship earlier this year. And I've appreciated the opportunity to continue to support her in the leadership of this agency.

Thank you again for the opportunity to appear before you, and I look forward to answering any questions you have. Thank you.

Senator ALEXANDER. Thank you, Commissioner.

Now we'll begin a round of 5-minute questions, and we'll have as many Senators who would like. We welcome Senator Kennedy, we're glad he's here today, and Senator Tester I think will be coming back. There may be others.

SPENT NUCLEAR FUEL

Let me pick up where Senator Feinstein left off. I think she gave a pretty—we don't exactly agree on nuclear power, but I think her survey history sounded right to me. I mean, we've—and one of the problems we need to solve that we agree we need to solve is where to put used nuclear fuel. Now, there's $30 million in the President's budget to move ahead with Yucca Mountain, and I want to get back to that probably in a second round of questions, but my examination of the options that we have, to move spent fuel out of California, or wherever it is, to some other place, suggests to me, that the fastest, least expensive place to do it would be in a private site, licensed by the Nuclear Regulatory Commission.

I understand that—now, the spirit of the President's Commission, Blue Ribbon Commission on Nuclear Power, was that we should move ahead on all fronts. And so Senator Feinstein came up with the idea of an interim storage facility, and put it in the appropriations bill we did together, and we've done it three or four times now. The problem is the Senate will not approve new funding for Yucca Mountain, and the House won't approve new funding for anything else, and so we have a stalemate. So that's partly our fault. But we need support from the nuclear industry, for example, as Senator Feinstein says, for the position which we think is correct, which is that we should move ahead on all fronts. And if we can't move ahead temporarily on one, we should move ahead on the other, and keep trying on the one.

PRIVATE STORAGE OF SPENT FUEL

So the one that I've got my eye on is the private—the two applications from private companies, to store used nuclear fuel from commercial sites around the country. One of these is in West Texas, one is in New Mexico. These would be temporary repositories until a permanent repository could be available to receive the waste.

I understand these facilities can be licensed under your existing regulation, but the review process could take up to 3 years. So let

me ask you, Chairman Svinicki, how long will it take you to review these applications? And where are they today?

Ms. SVINICKI. Thank you, Chairman Alexander.

The two applications are both pending before our agency. The application for the facility in Texas is submitted by Waste Control Specialists, or WCS. The WCS application was under review by our agency, when the applicant requested that we suspend work on that. It's not attributable to anything to do with our review. They have underway a business, I think an acquisition or a merger with another company, and they asked that we temporarily suspend our review activities. That's for the facility in Texas. The other facility in New Mexico is an application from Holtec. They submitted their application, but we are still in the phase of determining the docketing or adequacy of the completeness of the application for its review.

We do as an agency stand by the estimate of 3 years. That is informed by one other private application of a similar nature, which was for a facility in Utah, and I believe that the environmental and safety review of that application took about the same amount of time. So that's the basis for our time estimate.

Senator ALEXANDER. Is the result of your review, if you approve it, does that mean they have a license?

Ms. SVINICKI. It means that they would have a license to receive and store spent nuclear fuel at those locations.

Senator ALEXANDER. So that would mean that as soon as they have a license to do that, they can—if the department—then their relationship moves to the Department of Energy, right? And the Department of Energy then takes title to fuel in California and puts it in the private facility; is that correct? Or is there some other interim step?

Ms. SVINICKI. It's not clear, and it's not a component of our safety review, the mechanisms of the business relationships that would provide for the movement of the fuel to the facility. I believe the holders of the fuel could reach arrangements to pay for the storage. There is also legislation, I believe, that's been introduced in the House of Representatives that would provide for DOE (Department of Energy) to have some role in funding the storage of the fuel, but that isn't a policy that's before our Commission.

Senator ALEXANDER. But, fundamentally, when you finish your work, if you approve the license, we then have a licensed facility ready to receive used nuclear fuel; is that correct?

Ms. SVINICKI. Yes.

Senator ALEXANDER. Right. And your job after that is, what? Monitoring for safety?

Ms. SVINICKI. Yes, of the operations there, and of its ultimate decommissioning at some point in the future.

Senator ALEXANDER. Do you have sufficient funds in your budget to do what you need to do if you—on both of these applications, should—this year?

Ms. SVINICKI. Yes. The fiscal year 2018 budget provides for the review of two such applications, and in the current fiscal year we had only budgeted for one review. With the suspension now, we have adequate funds. Should WCS come in and request that we lift the suspension of the review, and there are few remaining months

in this fiscal year, we would reallocate resources to begin those activities again.

Senator ALEXANDER. So the answer would be yes——

Ms. SVINICKI. Yes.

Senator ALEXANDER [continuing]. To both of them——

Ms. SVINICKI. Yes.

Senator ALEXANDER [continuing]. Should both of them be available.

Do you have any—so 3 years? Do you believe that we would be able to place used nuclear fuel in a private consolidated storage site more quickly than we would be able to place it in Yucca Mountain?

Ms. SVINICKI. I don't believe I can answer that question based on what we know today. It's uncertain what kind of legal challenges through a licensing adjudication might be posed to the consolidated storage facility. And I think that there are uncertainties that make it difficult for me to have a projection on which one would be quicker than the other.

YUCCA MOUNTAIN LICENSING

Senator ALEXANDER. You have $30 million in your budget for Yucca Mountain. What are the next steps on Yucca Mountain?

Ms. SVINICKI. There are three central pieces well described by the Government Accountability Office in their report in April for either DOE or NRC to reconstitute a capability should funds be provided to restart activities. I think of them as people, process, and infrastructure. In the case of NRC, a central question would be, are experts that worked on it previously available. If not, how can the human resource to support the expertise needed be reconstituted. That's the people aspect.

The infrastructure aspect is whether or not the NRC would reconstitute a hearing facility in Nevada in order to conduct the adjudicatory proceeding. It is the policy of this Commission to conduct licensing adjudications near to the communities that are impacted. So in this case that would be perhaps a reconstitution of the hearing facility. That's one infrastructure piece. Another infrastructure consideration is the document collection that we referred to as the licensing support network. It is, in essence, the collection that is available to all parties to this adjudicatory proceeding. For the discovery phase and the evidentiary hearings, there's a common document collection.

That was in this licensing support network. The documents have been captured by the Nuclear Regulatory Commission, but a question that would need to be addressed is, how do we reconstitute the system that is adequate for, I believe there's 17 or 18 parties to this licensing proceeding, four States, multiple Indian Tribes, and then impacted counties in both California and Nevada. So we would need as an infrastructure piece to understand how to get an equivalent system available as we begin discovery and then move into the evidentiary hearing phase. That's the process part, is the adjudication itself.

Senator ALEXANDER. I'm out of time, but let me conclude my question this way: You said a moment ago that you would stand

by your estimate of about 3 years to review the application for a license for the private facilities in Texas and in New Mexico.

What you just described about Yucca Mountain is also toward the end of obtaining a license to operate Yucca Mountain; is that correct?

Ms. SVINICKI. These are the pieces and steps that would be needed to resume the process, and would lead up to a licensing decision for Yucca Mountain, yes.

Senator ALEXANDER. Do you have an estimate of how long it would take between here and the license for Yucca Mountain?

Ms. SVINICKI. Our staff provided an estimate of between 3 and 5 years.

Senator ALEXANDER. Okay. Do you believe that's correct?

Ms. SVINICKI. It seems reasonable to me. If my colleagues have a view, they can weigh in. But the staff's estimate, it seems reasonable.

Senator ALEXANDER. Okay. Senator Feinstein.

Mr. BURNS. The one thing I would add, though, Senator, is that authorization would be for a construction authorization for the repository, which is the phase that under the Nuclear Waste Policy Act, that's in effect. That's what's pending and has been suspended, except for the staff work so far. So that is essentially the authorization at the end of that hearing process, assume it was favorable, would be for a construction authorization. It wouldn't be at that point an operation of the facility.

Senator ALEXANDER. The private facility at the end of 3 years, it would be a license to operate; is that correct?

Mr. BURNS. It would be—yes, my understanding would be to construct a facility, storage facility, plus proceed toward operation of it.

Senator ALEXANDER. So it would also be to construct and operate in the private facility?

Mr. BURNS. For the private facility.

Senator ALEXANDER. After 3 years, is what you said.

Mr. BURNS. Yes.

Senator ALEXANDER. And you say the same thing would be 3 to 5 years at Yucca Mountain, to construct and operate?

Mr. BURNS. For a construction authorization, because the Act provides for a separate operational determination. There would be a second process, go to operation after the repository——

Senator ALEXANDER. I understand.

Mr. BURNS. I just wanted to be clear on that.

Senator ALEXANDER. I appreciate your being clear.

Let me go to Senator Feinstein.

Senator FEINSTEIN. I want to just point out that our nuclear waste bill, which we still need to introduce in this new session, is all voluntary. It takes approval from a governor, from a legislature, so that it's all voluntary. And I think what you were showing in these two facilities really is that there is room and there will be acceptance in parts of the country for facilities.

I have two Yucca questions.

In the safety evaluation, NRC identified the need for land control and water permits as conditions for licensing Yucca. Can you say more about these conditions and why they're important? And what

if the Department of Energy cannot meet these conditions? And then what other issues or necessary conditions do you foresee?

Ms. SVINICKI. Thank you, Senator Feinstein.

I'll be a bit cautious in my answer because issues related to the water rights and the withdrawal of the land are some of the 300 legal challenges that have been filed in the adjudicatory proceeding. Our Commission, of course, has a role, a quasi-judicial role in that proceeding.

But you are accurate in your description that the NRC staff safety evaluation report noted that those two aspects, both the acquisition of water rights for the site, and either ownership of the site or permanent withdrawal of the land for this purpose are regulatory prerequisites to the issuance of the construction authorization license, and the staff's safety evaluation made note of that.

Senator FEINSTEIN. Okay. It's my understanding that you furnished an environmental impact statement, finding that long-term radioactive risk to groundwater would not exceed environmental standards over the next million years. And I understand there have been more than 200 lawsuits challenging this and other conclusions about the long-term ability to safely isolate radioactive spent fuel.

Can you describe the NRC's conclusions about long-term safety? And how can you have confidence in predictions about what will happen in the next million years?

Ms. SVINICKI. Thank you, Senator.

It is correct that a significant number of the legal challenges or what we call contentions in the adjudicatory proceeding do revolve around these long-term performance questions that you raise. Again, this is something that our Commission in its adjudicatory capacity would sit in a quasi-judicial role over that, should the adjudicatory proceeding be resumed, and it would be the NRC staff experts who in that proceeding would have to provide the evidence and testimony to defend their safety conclusions. It would not be the Commission's role. We would sit in ultimate judgment of whether or not they had satisfied the legal challenge.

Senator FEINSTEIN. Yes, I guess my question goes to, the heart of it is, if you have to do it for a million years, how does the Commission feel equipped to know what would happen in a million years?

Ms. SVINICKI. Again, as part of the adjudicatory proceeding, we would have an evidentiary record that would ultimately be built and, yes, at the end, the licensing determination is whether or not these questions have been satisfied. But that decision has not been made yet.

CONTINUED STORAGE OF SPENT FUEL

Senator FEINSTEIN. Okay. In 2014 you issued a rule on the environmental effects of continued spent fuel storage at nuclear plants. This concerns me greatly. You found that—not you, but the Commission found that spent fuel could be safely stored indefinitely at reactor sites.

Now, essentially, it seems to me that NRC is saying that a permanent repository, or efforts to construct one, are not really necessary.

Here's the question: How can the NRC be confident about the safety of waste stored 100 or 1,000 years from now at 78 reactor sites across 33 States?

Ms. SVINICKI. Senator, the continued storage rule you describe was accompanied by a generic environmental impact statement. And in our statement of considerations that we publish with this regulation, we attempted to be very clear as a Commission that it did not express a policy preference or in any way endorse the desirability of extended storage of spent fuel at reactor sites.

In order to meet our obligations under the National Environmental Policy Act, we are required or were required under a court decision to look at long-term and indefinite storage of the material. So I would characterize our conclusion over the very long timeframes to be it either is safe or we have all of the regulatory authority to require the measures for observation or potential repackaging to assure its safety over the long period, but to the extent that it created an impression that we don't think that disposal is important, that would not be consistent with what we were trying to communicate.

I don't know if my colleagues have a different view.

Mr. BURNS. I would agree with the Chairman on that.

Senator FEINSTEIN. Well, I have serious concern over Southern California Edison site, which as you know is on a bluff, slash, cliff in a bay on the ocean, and six million people live right around it.

Now, to say permanently that you're going to have all of that hot waste in casks or in a pool, it just defies credulity to me, the safety, the attack potential, the earthquake potential. California is a big earthquake prone State. And I think everywhere you go, at least within five miles, you run into a fault. It's a real, real issue.

So I don't quite understand how the NRC could say that you can just keep it at the site, and it can be safe for "X" years.

Ms. SVINICKI. Again, Senator, we were evaluating what I'll perhaps term a bounding analysis, over very long timeframes, whether or not our regulations provided a framework adequate for the storage to be safe over the long-term. And it was the assessment of our staff and subsequently the Commission that the framework is adequate to provide that assurance over these longer time periods.

Senator FEINSTEIN. And what is that framework that can provide it for a thousand years? That's not the longest time, that's a relatively short time.

Ms. SVINICKI. It's the continuous monitoring of the casks themselves. There is continuous oversight and stewardship over the sites. There's monitoring of any degradation of the packaging over the longer-term timeframes. And should it be necessary, there's the power to compel repackaging or something that would, you know, if the packages are not holding up over the long timeframes, we have the authority to compel repackaging, should it be necessary.

Senator FEINSTEIN. Madam Chairman, let me ask you this: Did your staff take a look at earthquake probability in that area?

Ms. SVINICKI. The——

Senator FEINSTEIN. It's high.

Ms. SVINICKI. Yes.

Senator FEINSTEIN. And big earthquake probability is up. So, I mean, I wouldn't be content with my staff coming out with some-

thing that says they know what's going to happen, even 50 years from now, with respect to an earthquake. And I think—I mean, something like that, based on what I know, I sure don't think that's safety, or safe. And I would ask you to think about it because, you know, if we can't guarantee that we can get waste out of plants, and secured, why are we going to do advanced modular small nuclear reactors? Then we have them in thousands of places all over. I mean, it makes no sense to me.

Sorry. Thank you.

NUCLEAR WASTE STALEMATE

Senator ALEXANDER. Thank you, Senator Feinstein.

We are either going to have to persuade the Senate to move ahead with Yucca Mountain or the House to move ahead with interim storage.

Senator FEINSTEIN. Yes. We've got to do something.

Senator ALEXANDER. So maybe we'll get that done.

Senator FEINSTEIN. It's been 24 years we've been doing this.

Senator ALEXANDER. Well, you and I haven't. But our country has.

Senator FEINSTEIN. Yes, well.

Senator ALEXANDER. No, you're right. This is an unacceptable stalemate, and it is a symptom of—and in my own view, and, obviously, Senator Feinstein's expressed herself, it makes no sense to me for us to take the view that if we can't move on one, we can't move on anything. Because we've proved that we have a stalemate on Yucca Mountain. It might continue for a while, even though I support it, even though President Trump supports it, even though there's money in the budget, and even though you are going to move ahead on it this next few years.

If we can move ahead more quickly on an interim storage site authorized by the legislation that Senator Feinstein and Murkowski and I and Cantwell will introduce, or if we can move ahead more quickly with a properly licensed private site in Texas or New Mexico or somewhere else, then we should, in my view.

SMALL MODULAR REACTORS

May I move on to small modular reactors? And I am going to put 7 minutes on here since we're the only two here.

Senator FEINSTEIN. Yes. Go ahead.

Senator ALEXANDER. And then we'll take whatever time you would like, Senator Feinstein, when your time—when I finish here.

Senator Feinstein mentioned small modular reactors, and she and I have had extensive discussions about that, about that lately, over the last several years.

The next step for the commercialization of small modular reactors is approval of a design certification; am I correct about that?

Ms. SVINICKI. Yes.

Senator ALEXANDER. And NuScale, which is developing such a reactor, submitted a design certification in December of 2016, correct?

Ms. SVINICKI. That's correct.

Senator ALEXANDER. And when will you complete your review of the reactor design?

Ms. SVINICKI. The NRC staff has completed its review of the application package and has found it complete to begin the review process. The staff has communicated to NuScale an estimated schedule of 42 months.

Senator ALEXANDER. 42 months from this date, or total?

Ms. SVINICKI. I think it is from the date of docketing of the application, which occurred, I think in the last few months.

Senator ALEXANDER. Well, that would be December 2016; is that——

Ms. SVINICKI. That's when the application was submitted. We do take the time to review to make sure that the application is complete prior to docketing.

Senator ALEXANDER. So three, three and a half years to review the design certification. Then once there's a design certification, what happens next?

Ms. SVINICKI. Well, the design application is valid to be referred to in a combined license application from an applicant, and they reference it. What I mean by that is that they come in and propose a specific site where that approved design would be constructed, and that is what we call a combined license application review.

We don't currently have any combined license applications pending for NuScale. And, again, that can proceed concurrent with the review of the NuScale application. I believe you mentioned them as being in series. There can be some overlap in these reviews, but in order to reference a design, in order to approve the combined license application, the design certification needs to be approved by the end of that process.

We do have an early site permit request that has come in from the Tennessee Valley Authority for the construction of potentially I believe it is two modules of a small modular reactor at the Clinch River site in Tennessee.

Senator ALEXANDER. Can that be considered concurrently with the other parts of the applications that would come before you?

Ms. SVINICKI. Yes. It can, and the staff is able to use basically parameters and bounding conditions in order to move forward. If changes are made to the design as the review of that is proceeding, the review of the early site permit, that process can accommodate that because they're looking at more envelope parameters for the design.

Senator ALEXANDER. Now, these are not advanced reactors, these are light-water reactor designs? The Commission is accustomed to dealing with light-water reactor applications, correct?

Ms. SVINICKI. Yes. A small modular reactor does not pose the uniquenesses of a truly advanced reactor design.

Senator ALEXANDER. I would think, though, it is an opportunity, since you are already familiar with this kind of reactor, to review your application process and look for ways, while maintaining your gold standard safety requirements, of streamlining your application or making sure that it moves along as rapid as it can, consistent with safety standards.

Is there an opportunity for a fresh look at how you go about these different applications?

Ms. SVINICKI. Yes. And as the review proceeds, it's my memory that the staff has, in communicating the 42-month schedule, also

communicated to the applicant that as the review proceeds, the NRC staff will look for opportunities within that schedule. So the NRC staff has made that commitment.

Senator ALEXANDER. So within that 42 months, an applicant could also apply for a license, and also apply for a site; is that correct?

Ms. SVINICKI. Yes. For example, the reactors under construction now in South Carolina and Georgia, the review of the combined license applications proceeded concurrent with the design certification review for the AP 1000, which is the reactor being constructed there. However, it is not possible to conclude the combined license review until the design certification is approved.

Senator ALEXANDER. In a recent discussion with Secretary Perry, he and I talked about forming a small working group of relevant agencies to identify the remaining challenges to bringing small modular reactors to market in the United States.

Would the Commission be willing to appoint a representative to provide the Commission's perspective from that group, if Secretary Perry and this committee and other relevant agencies were involved?

Ms. SVINICKI. Certainly, our Commission would be responsive to any congressional direction or establishment of a group such as that. I would note that the NRC's experts are engaging beyond NuScale. They have what we call pre-application engagement with other reactor designers. So we aren't exclusive to having engagement only when we receive something for review. Our experts are out and about in the community I think engaging on these topics.

LICENSING SMALL MODULAR REACTORS AND ADVANCED REACTORS

Senator ALEXANDER. Are you referring to advanced reactors or small reactors?

Ms. SVINICKI. Both.

Senator ALEXANDER. Both.

Mr. BURNS. Senator, what I'd like to add is that the NRC staff and the Department of Energy have held three joint workshops for the community that's interested in advanced reactor development, the most recent one I think in April, and over the last about 18 months or so. And the idea was to get folks together to talk about issues, about process, as well as in terms of differences in the acceptance criteria. And the staff has done a number of things to publish, again, working off of some interactions we've had with the Department of Energy on both framework, but also things like what changes might be appropriate to our general design criteria, which are primarily applicable to light-water reactors, but we're looking at those types of things. So there is some of this work that has been ongoing, and we've also taken advantage of learning of information from DOE research and the like.

Senator ALEXANDER. Senator Feinstein, I just have one more question, and then I can turn it over to you to ask whatever questions you would like to ask.

Senator FEINSTEIN. I just have a couple, and that's it.

REGULATORY INFRASTRUCTURE FOR ADVANCED REACTORS

Senator ALEXANDER. I just wanted to ask, last year we provided $5 million to you for evaluating advanced reactors. You didn't ask for that money this year. How'd you use the $5 million, or are you planning to use it in the future?

Ms. SVINICKI. To build on Commission Burns' answer, in addition to the workshops and other criteria and standard review plans that we have under development, the NRC developed what we called a strategy document, and then we developed a series of what we call implementation action plans on the specific topic of advanced reactors, to identify the ways in which we needed to develop a more detailed framework for the potential licensing of advanced reactors. So some of the funding in the current fiscal year is being used for that process and the action plans.

I would note that for fiscal year 2018, although the request does not include any money, as we call it, off the fee base, meaning the type of money that was provided by the Committee in the current fiscal year, it would be our budgetary intention to continue to use fee recoverable money to engage with developers of advanced reactors. So that would be fee billable work. So although we don't have off fee-based work, we would intend to continue a small amount of activity engaging with advanced reactor designers as they might want to bring us things for our reaction.

Senator ALEXANDER. Thank you.

Senator Feinstein.

Senator FEINSTEIN. Thanks, Mr. Chairman.

Doesn't take long answers.

CONSOLIDATED INTERIM STORAGE

San Onofre, all of nearly 4,000 used fuel assemblies will have been transferred to dry casks by 2019. As I understand it, these are already licensed, not only for storage, but for transportation.

If a consolidated waste storage facility were available, what other steps would need to be taken by the Commission to allow waste to be moved from San Onofre and other closed sites?

Ms. SVINICKI. Senator, I'm not familiar with the exact storage technology. If I am wrong about it being certified for transport——

Senator FEINSTEIN. Can we get that answer in writing?

Ms. SVINICKI. Yes, absolutely.

[The information follows:]

If a consolidated waste storage facility were available, NRC would not need to take additional steps or actions to allow waste to be moved from San Onofre or other sites. NRC approved storage and transportation cask designs that could be used by licensees to move spent fuel are currently available. The NRC would follow its current regulatory framework to perform licensing and oversight activities to ensure the safe and secure operation of the storage facility including inspections during loading and unloading operations, as well as periodic inspections of the storage facility.

Senator FEINSTEIN. Appreciate it.

And here's the second question: Can existing storage casks be transported and then used again for continuing storage?

So your staff can answer that in writing. I'd appreciate it.

[The information follows:]

Some of the cask designs can be used for both storage and transportation. However, in general, individual storage canisters are designed to be removed from a dry cask storage system and then transferred into a transportation package for shipment. These casks can be placed back into storage at a new location, provided the licensee meets the applicable requirements. Specifically, prior to placing the cask back into storage, the licensee must ensure the storage cask will continue to meet the conditions set forth in the Certificate of Compliance for that cask design. The NRC has the regulatory framework and oversight in place to ensure the protection of public health and safety during these operations.

Senator FEINSTEIN. I understand at least two companies are pursuing the licensing of spent fuel storage facilities, capable of taking fuel from commercial reactors. Both have now submitted license applications to you, though I understand one has temporarily delayed consideration of its application.

What are the steps in evaluating such an application?

Ms. SVINICKI. The NRC's review has two fundamental elements. One is a safety determination against our regulations. There's a series of safety cases or safety justifications that need to be developed by the submitter of the application. The staff will do confirmatory analyses and perhaps ask for follow-up analyses or ask for further justification for the safety conclusions that need to be reached.

The other significant prong is there is an environmental consideration that goes on under the National Environmental Policy Act. So it is safety and environmental are the two big elements.

Senator FEINSTEIN. Is there a timeframe for these to happen?

Ms. SVINICKI. Yes. We estimate it would be a 3-year review.

Senator FEINSTEIN. Okay.

Mr. BARAN. Senator, can I just add, just for the point of clarification.

Senator FEINSTEIN. Yes.

Mr. BARAN. So the safety and environmental reviews would be going on at the same time, and the staff estimates that would take 3 years. Just so we're clear from the earlier conversation, it is possible that someone would bring an adjudicatory challenge to anything that was done in the safety. And that would be beyond the 3-year plan.

OVERSIGHT OF DECOMMISSIONING PLANTS

Senator FEINSTEIN. I understand. Yes. Thank you.

It's my understanding that one of the objectives of your Project Aim is to right size the agency after hiring increases for the nuclear Renaissance that didn't come to pass. However, there are now 19 shutdown reactors in the United States, with at least another 8 over the next several years. All told, that's roughly the same number, as the once expected number of new reactors.

Won't this surge in shutdowns necessitate more staff to oversee utilities' decommissioning?

Ms. SVINICKI. Senator, our experience is that when a reactor moves from operating status to decommissioning status, we see a slight diminishment in the number of resources that we need to provide for its oversight. There's a slight shifting in expertise because we go from the operating reactor experts to the decommissioning experts. We are working that into our budget and resourcing forecasts, those shutdowns, so we are making those shifts and adjustments.

Senator FEINSTEIN. Okay. Thank you.

SMALL MODULAR REACTORS

One SMR (Small Modular Reactors), while the Chairman's here, question. I understand that the design under consideration at NRC has the reactors and the spent fuel pools underground. Is this aspect considered to be a safety feature of the design, to put the spent fuel pools underground?

Ms. SVINICKI. Our NRC staff may have, for the record, a better answer than this, but——

Senator FEINSTEIN. Could someone answer it, if they're here?

Ms. SVINICKI. I don't think we have the relevant experts, but my sense of this as a safety attribute is that it provides both challenges for our conforming safety analysis and positive attributes. The positive attributes about an underground nature is that if you were to have an aircraft impact or some sort of event, or an extreme natural hazard, facilities that are a little bit underground or underground provide some barrier then to—and mitigate a bit of an extreme natural event. But you do also then need to look at the integrity of the structure itself.

Senator FEINSTEIN. How about leaks? Or in California, for example, you have an earthquake fault virtually every five miles away. Anywhere you stand, there's some kind of fault.

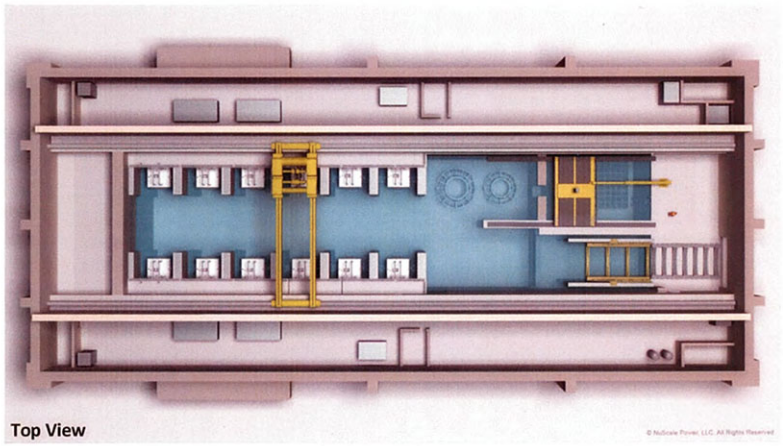
Ms. SVINICKI. So for the safety analysts, they're looking at both, I would say, the plus and the minus. Having some part of the structure underground is enhancing under certain accident scenarios, but it also then must—we must assure ourselves of the integrity of the structure for the issues that you describe.

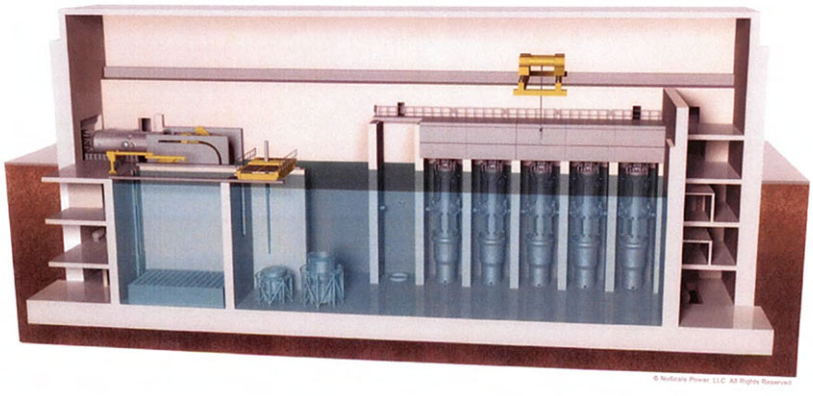
Senator FEINSTEIN. Well, so you could open these spent fuel pools that are underground?

Ms. SVINICKI. It might be better if we provided a diagram or a description for the record, but my understanding is they're accessible.

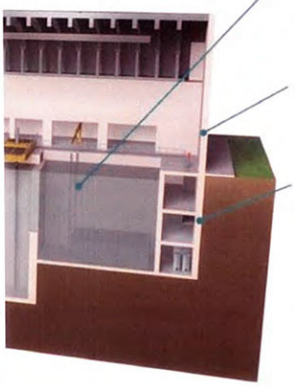
[The graphics follow:]

NuScale Reactor Building
(Diagrams are from NuScale's website)





NuScale Spent Fuel Pool
(Diagram is from NuScale's website)



Increased Cooling Capacity

- *More water volume for cooling per fuel assembly* than current designs
- Redundant, cross-connectable reactor and refueling pool heat exchangers provide full back-up cooling to spent fuel pool.

External Coolant Supply Connections

- Auxiliary *external water supply connections are easily accessible* to plant personnel and away from potential high radiation zones (current problem in Japan).

Below Ground, Robust Deep-Earth Structure

- Below ground spent fuel pool is housed in a *seismically robust reactor building.*
- Stainless steel refueling *pool liners are independent from concrete structure to retain integrity.*
- Pool wall located underground is *shielded from tsunami wave impact and damage.*
- *Construction of structure below ground in engineered soil limits the potential for any leakage.*

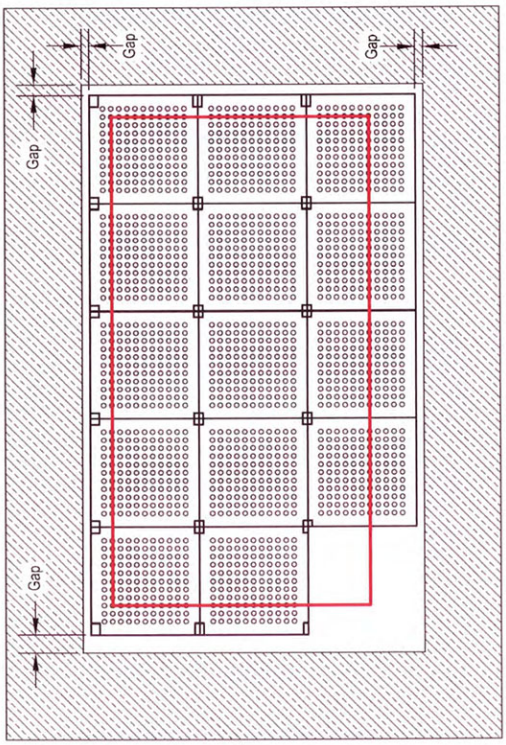


Figure 9.1.2-1: Spent Fuel Pool General Arrangement of Racks

Notes:
1. Drawing is not to scale.
2. Red outline illustrates the travel limitation of fuel handling machine.
3. Gaps are greater than needed to ensure no contact between the racks and SFP walls during safe shutdown earthquake.

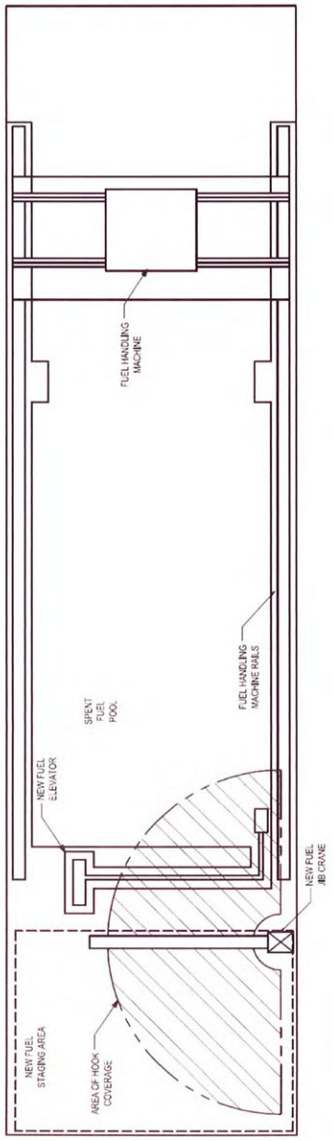


Figure 9.1.4-1: Refueling Floor Layout

Senator FEINSTEIN. We will have these modulators, and I, for one, would really like to know what kind of jeopardy they present. And, you know, everybody's saying, well, put it underground, it's great. Well, what's underground isn't seen. And what isn't seen is generally not dealt with. And that's a problem.

Ms. SVINICKI. I think these areas are completely accessible, it is just that the structure is constructed to partially be below the ground level. That's my understanding. But we can certainly provide a greater design description for the record.

Senator FEINSTEIN. Yes, because my understanding is that you have to have, to be cost—to be economic, you're going to have to group five of them together. And if that's the case, you've got five spent fuel pools in the area.

Mr. BARAN. Senator, can I just add, when we're talking about, you know, for a particular design certification application a 42-month review, the safety review and the environmental review, that three-and-a-half year review is going to be looking at safety questions exactly like the ones you're raising, right? Those are going to be questions that——

Senator FEINSTEIN. Okay.

Mr. BARAN [continuing]. The NRC staff would look at.

Senator FEINSTEIN. So you're saying nothing's going to be approved until the review is complete?

Mr. BARAN. Absolutely.

Senator FEINSTEIN. Okay. Good.

Mr. BURNS. The thing I would add is all of our reviews, one of the key areas in our review process is to look at things like seismology, geology, and hydrology. Because as you indicate, one of the things we need to be careful about is what are the consequences.

Senator FEINSTEIN. Yes.

Mr. BURNS. What are the extra barriers and those types of things. So that is part of the review that my colleagues have tried to discuss.

SAN ONOFRE NUCLEAR GENERATING STATION DECOMMISSIONING

Senator FEINSTEIN. Let me just go to San Onofre decommissioning. I understand they are moving ahead with expanding their dry spent fuel storage area, and their plans include demolishing the reactor buildings on an expedited timeframe, potentially concluding work in 2027. It's my understanding that NRC has issued all necessary approvals, and the utilities have selected contractors. Physical dismantlement, I'm told, could begin soon.

Would you confirm that the NRC will continue to inspect the site and oversee the decommissioning program to ensure safety?

Ms. SVINICKI. Yes, Senator.

Senator FEINSTEIN. What are the biggest risks, in your view, to completing the decommissioning process in a safe and timely manner?

Ms. SVINICKI. I would note that you used a date of 2027 for the demolishment of facilities. I had prepared for me the date of 2030.

Senator FEINSTEIN. Concluding it.

Ms. SVINICKI. So could we respond, for the record——

Senator FEINSTEIN. Yes.

Ms. SVINICKI [continuing]. Because it is slightly different than the date that was given to me.

VOICE. The difference is the finishing of the decommissioning and the building, and then the finishing of the final paving over of the surface. So 2030 is fine.

Senator FEINSTEIN. My staffer was saying 2030 is fine. The difference is in the time to complete certain things.

Ms. SVINICKI. In terms of the potential things that would jeopardize that schedule, it's difficult to say. There are a lot of private contractors that are utilized to perform this work. Some of the schedule uncertainty I think would arise from business aspects of the decommissioning more than the technical work. There have been decommissionings that have been, of course, successfully completed in the United States. So I don't identify, as I sit here today, technical barriers to the nature of the work. It has been done at other sites, even at Humboldt Bay in California, is a site that is more substantially decommissioned.

THREE MILE ISLAND

Senator FEINSTEIN. Yes. I would like, if I could, to give you the copy of a paper, the title of which is Possible Correlation Shown Between Three Mile Island Nuclear Accident and Thyroid Cancers. And I'd just like you to take a look at it. And there's no definitive proof, but the geography makes it worth looking at.

I just—we've got so many people living in such a close proximity to these two big reactors. I want to do everything I can to see that this decommissioning is without a hitch. You know, I think what the company went through with the two new steam generators, which weren't like for like, but supposedly improved the steam generators, effectively did not, and they had one reactor, which had a lot of holes, and then the second reactor began.

And there was some radioactivity released, not a lot, thank God. But I really want to see that decommissioning go in the safest possible way for the people in the area.

Ms. SVINICKI. Senator, on the study that relates to Three Mile Island and thyroid cancer, that was very recently released, but our NRC experts have that under review at the current time.

Senator FEINSTEIN. Oh, good.

Ms. SVINICKI. But we're happy to take anything that you want us to look at. But the study itself we are looking at.

Senator FEINSTEIN. Well, maybe take this, and if you could, make your findings available to us. We'd appreciate it very much.

Ms. SVINICKI. Yes, Senator. Thank you.

Senator FEINSTEIN. Thank you.

Thank you, Mr. Chairman.

Senator ALEXANDER. Thank you, Senator Feinstein.I will hand this to you, but may I ask this question: The Commission has almost continuously monitored the Three Mile Island area since the accident 40 years ago; is that correct?

Ms. SVINICKI. I don't know that we have our own NRC monitoring, but we have—there have been a series of studies that have been conducted by like the University of Pittsburgh and other medical centers, and we certainly have engaged on all of those studies, so that's why we have this study under review.

Senator ALEXANDER. Let me ask this way: Have those studies found that anyone was hurt as a result of the Three Mile Island accident?

Ms. SVINICKI. The studies that have been done, and they're principally epidemiological studies in public health institutes, have not shown a correlation between populations who resided around Three Mile Island at the time of the accident, and they have not shown any correlation with increased thyroid cancer. That's why we're giving this a careful look.

Senator ALEXANDER. Okay. Thank you.

I want to thank the Commissioners for being here today.

Thanks, Senator Feinstein.

The hearing record will remain open for 10 days. Members may submit additional information or questions for the record within that time, if they would like.

Subcommittee requests, all responses to questions for the record be provided within 30 days of receipt.

SUBCOMMITTEE RECESS

Thanks very much for being here. The Committee will stand adjourned.

[Whereupon, at 3:54 p.m., Wednesday, June 7, the subcommittee was recessed, to reconvene subject to the call of the Chair.]