

WRITTEN STATEMENT
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UNITED STATES NUCLEAR REGULATORY COMMISSION
TO THE
SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
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Good afternoon, Chairman Barrasso, Ranking Member Carper, and distinguished members of the Committee. My colleagues and I appreciate the opportunity to appear before you today to discuss the U.S. Nuclear Regulatory Commission's (NRC) licensing and regulatory actions since our last appearance before this Committee in April of 2016. At that time, we committed to improving the agency's efficiency and effectiveness in both corporate and programmatic areas while ensuring the safety and security of regulatory activities. Today, I will focus on these ongoing efforts, as well as other significant licensing and regulatory activities.

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 carries out its responsibilities in 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 Commission's continued efforts to improve the agency's efficiency and effectiveness have focused on providing the appropriate level of resources to both corporate and programmatic areas and continuing to uphold our important safety and security mission. We continue to institutionalize the lessons learned from Project

Aim. We also have initiated other efforts including several related to the increased use of risk information in our regulatory activities and decision making.

The Commission appreciates the Committee's consistent support of the NRC's work to protect public health and safety. We have received the October 31, 2017, letter signed jointly by Chairman Barrasso and Senator Capito, addressing revisions to the agency's monthly report provided to this Committee. As requested in the letter, the reports for September and October 2017 continued to utilize the existing format and beginning with the report for the month of November 2017, we will start addressing the additional information requested.

NRC's Ongoing Focus on the Agency's Efficiency and Effectiveness

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. Through Project Aim, the NRC has made significant strides, including approximately \$48 million in reductions as a result of completing 148 of the 150 specific re-baselining activities approved by the Commission.

During 2017, Project Aim achieved another significant milestone by completing the major deliverables for each of the 19 discrete Project Aim tasks. These efforts addressed the NRC's need to improve efficiency and flexibility to right-size the agency, while retaining employees with the appropriate skills to accomplish its mission and streamline processes.

The agency continues to institutionalize the actions related to Project Aim, which will shape the NRC's organization going forward. The NRC also is pursuing additional activities such as standardizing and centralizing support staff functions of NRC headquarters and regional offices

and institutionalizing a common prioritization process to prepare the agency to evaluate emerging work more readily. We are also implementing an enhanced strategic workforce planning process to improve workforce management. These activities were not originally part of Project Aim, but demonstrate the NRC's continuing commitment to effectiveness, efficiency, and agility.

The agency has also undertaken organizational changes to make our efficiency improvements more durable. For example, we have established Centers of Expertise within the agency's organizational structure to increase our ability to respond quickly 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 reactor licensing processes to enhance the predictability and efficiency of reviews while maintaining their effectiveness, quality, and focus on safety. 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.

With the nuclear industry undergoing significant change, it remains a challenge to ensure the NRC is appropriately resourced to manage shifts in the nature of its existing and anticipated workload effectively. Since the Project Aim initiative began, we have endeavored to forecast our work with greater accuracy and identify changes to our budget needs in a dynamic regulatory environment. We are making progress in our ability to adapt our organizational

structure and workforce to the agency's current and projected workload. I would like to highlight two specific examples of strict position management actions we have taken to respond to changing workload requirements.

We recently implemented an organizational change in the Office of Nuclear Reactor Regulation to sunset the stand-alone organization formed in November 2011 to implement the agency's response to the Fukushima Dai-ichi Accident. The Japan Lessons-Learned Directorate, which led many of the regulatory initiatives to enhance the safety of commercial nuclear facilities in the United States following the accident in Japan, has been reconsolidated back into the Office's Division of Licensing Projects.

Also, we identified additional ways to reduce costs associated with the delivery of corporate support services and our FY 2018 budget request included a reduction of \$3 million and 116 Full-time Equivalents. To reduce our corporate support staff size to match this decrease in workload and budget, we successfully used tools such as voluntary early retirement authority and voluntary separation incentive pay programs. Although these voluntary efforts to balance our workforce moved us significantly closer to achieve our human capital goals, we recognized that voluntary actions alone may not be adequate, and the NRC prepared for a reduction in force (RIF) to right-size our corporate resources. In September 2017, the agency issued RIF notices to a number of staff in the corporate support area and indicated that to the extent feasible, we would continue our efforts to place the impacted individuals into vacant positions within the agency that required additional resources to meet workload demands. As a result of these efforts, as well as the willingness of affected individuals to accept these new positions and take on new and different responsibilities, it will not be necessary to issue any involuntary separations.

The NRC developed a Strategic Workforce Plan that is focused on having the right people, with the right skills and competencies, at the right time and place to achieve the agency's health and safety mission. As part of our efforts to institutionalize Project Aim, we are continuing to refine this plan to ensure that NRC's workforce planning efforts are timely and responsive to changes in workload, while the agency retains and develops the skills needed to support our mission.

As another initiative, the NRC analyzed its fee-setting process to improve transparency, equitability, and timeliness of communications with our licensees and stakeholders. The NRC developed a comprehensive list of activities that include essential improvements to the agency's license-fee website, invoicing, and the Congressional Budget Justification (CBJ). The NRC implemented performance measures that it will use to gauge success in meeting the agency's goals of increased transparency, equitability, and timeliness, and the NRC will also monitor planned activities and compare results with established performance measures.

The performance measures for the transparency and equitability goals include the percentage of improvement activities completed each year (goal of 80%), conducting an annual public fee rule meeting with stakeholders, and holding two informal meetings with stakeholders. The measure for the timeliness goal will be the date that the proposed and final fee rules are published. Additional metrics will be considered for each goal as the agency gains experience with these enhancements.

The NRC also continues its progress in the area of fee-setting improvements. Activities including adding information to the CBJ to present the alignment of budget and fees, explaining our international activities in more detail, developing a new internal report to streamline the

development of the fee schedule, adding a section to the fee rule for a future class of licensees, and posting cost estimates for licensing and inspection actions on the agency's public website were all completed as planned in FY 2017.

To further improve transparency, the agency has engaged with stakeholders over the past few years to better understand their interests associated with how information is presented on invoices and reports. Based on these engagements, the agency initiated several projects to revise how billable work is tracked and reported. Starting next month, invoices will contain an additional level of detail that will improve transparency to the work being billed. The invoice will show each unique activity charge, and the name of a staff member or contractor who performed the work. The agency continues to work with stakeholders to identify and implement improvements to ensure transparency and accuracy of charges for the billable work.

The Commission has also taken steps to ensure Commission involvement early on in the rulemaking process, before significant resources are expended. To accomplish this, for those rulemaking activities that are not explicitly delegated to the staff, the staff now submits a rulemaking plan to the Commission for review and approval before the staff initiates activity on a rulemaking.

Each year the agency reviews ongoing and planned rulemaking activities to develop 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 seven rulemaking activities and deferring two 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 could address related issues in the broader Commission-directed rulemaking to make the power reactor 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.

In addition to these efforts, the NRC continues its pursuit of risk-informed regulation, through which we strive to put focus on those issues that are the most important based on their risk significance. The NRC has a long history of initiatives related to risk informing our regulatory framework including the development of agency-wide risk-informed and performance-based plans. As recently as May 2017, the Commission provided direction to the staff to increase the use of risk-informed decision making by identifying current challenges and strategies needed to overcome those challenges. This initiative has resulted in staff efforts to evaluate and update key risk-informed decision-making guidance, develop a graded approach for using risk information in licensing reviews, institute training requirements related to risk-informed decision-making for managers and staff, enhance communication on risk-informed activities, and

advance other risk-informed initiatives. Consistent with this history, the NRC will continue to look for ways to improve the use of risk information within our regulatory activities as we move forward.

In addition, the NRC has taken many steps over the last year to ensure uniform implementation of the agency's backfitting regulations, which govern when the agency can impose additional requirements and are an essential part of the NRC being a reliable regulator. Earlier this year, the NRC staff conducted a comprehensive review of the NRC's backfitting guidance, training, and knowledge management. In light of this review, the staff is undertaking 20 related actions, which are well underway, to improve oversight by NRC managers and lead to more consistent identification and treatment of potential backfitting issues. Of particular note is the current training initiative, which refreshes staff on both licensing-basis and backfitting concepts and reinforces the importance of following our processes with fidelity. All NRC staff with responsibilities involving backfit are expected to complete this training by the end of January. In addition, the Commission anticipates receiving the staff's updated backfitting guidance, which also reflects additional Commission direction on the compliance exception to the backfit rule, in April 2018, for review and approval.

I would now like to highlight a number of other noteworthy licensing and regulatory activities accomplished over the past year in the areas of Operating Reactors, New Reactors, and Nuclear Materials and Waste.

Operating Reactors

The NRC continues to refine its licensing process for operating reactors. Through the use of controls and metrics, we are currently meeting our congressionally reported metrics for the quantity of licensing actions reviewed annually, and the percentage of actions completed within one year.

In order to continue improving in this area, the NRC staff is developing enhanced guidance to improve the efficiency and consistency of reviews. We are also piloting a screening tool to better determine areas of focus in individual reviews, and conducting periodic audits of the Request for Additional Information (RAI) process. Our continual efforts in this area have significantly improved the NRC's ability to monitor work and improve predictability.

In cooperation with the Department of Energy (DOE), the nuclear industry is researching advanced fuel designs aimed at improving safety margins under both normal and postulated accident conditions, when compared to the fuel types that are in use today. Several vendors are exploring candidate designs, which are collectively referred to as Accident Tolerant Fuel, or ATF.

In response, the NRC is developing a detailed plan to ensure that we are prepared to effectively and efficiently review ATF designs and ensure that their proposed use meets our safety standards. The plan addresses a spectrum of ATF-related issues, including the design, testing, fabrication, shipping, operation, and storage of ATF. To support this work, we have identified infrastructure needs, including staff training and enhancements of computer codes. The draft

plan is scheduled to be available to the public later this month for comment. The staff intends to finalize the plan by April 2018.

The NRC staff has had extensive engagement with DOE, and other stakeholders, in preparing the ATF project plan. The interaction with DOE allows NRC to explore opportunities to leverage experimental and computational work already conducted by DOE. We have also engaged international organizations. For example, the NRC staff recently met with representatives from the Organisation for Economic Cooperation and Development's Nuclear Energy Agency to understand how the international community is considering innovations such as ATF.

The NRC has recently received four letters of intent to seek subsequent license renewal, which would authorize operation of a commercial power reactor for up to 80 years. The NRC has been preparing for these reviews for several years and has published final versions of the "Generic Aging Lessons Learned for Subsequent License Renewal" and the "Standard Review Plan for Review of Subsequent License Renewal Applications for Nuclear Power Plants." These documents provide guidance for applicants and NRC technical reviewers respectively. The guidance was developed with the benefit of experiences from the first round of license renewal applications.

The NRC responded to Hurricanes Harvey, Irma, and Maria in accordance with our Incident Response Plans. Specifically, the NRC dispatched inspectors to the facilities impacted by the hurricanes to provide around-the-clock onsite monitoring of our licensees' responses. The NRC also staffed its Incident Response Centers in the affected Regional Offices to monitor the storms and their effects. The NRC dispatched Regional State Liaison officers to affected states to support the response to the hurricane's impact on NRC-licensed facilities. The NRC worked

closely with its Federal partners, including the Federal Emergency Management Agency (FEMA), and provided updates to the U.S. interagency response. While some licensees suspended facility operations as a result of the storm impacts, none experienced safety or security events.

At the conclusion of any event, the NRC evaluates potential lessons learned that could improve the NRC's future performance. In this instance, the response to the recent hurricanes identified potential improvements related to determining the condition of offsite response capabilities. In addition, the NRC, FEMA, and the nuclear industry are working to identify how communications during and after hurricane events may be further enhanced.

New Reactors

The NRC's new reactor program includes 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 (non-LWR).

On July 31, 2017, South Carolina Electric and Gas Co. and Santee Cooper, the licensees for V.C. Summer Units 2 and 3, announced their decision to discontinue construction on Units 2 and 3, and asked the NRC to discontinue our licensing and construction oversight work. With the discontinuation of the V.C. Summer project, the NRC's new reactor program continues its diligent work to support the activities necessary to ensure the safe construction and operational readiness of the two AP1000 units under construction at the Vogtle site in Georgia, the first of which currently plans to begin loading fuel in 2020. These activities include reviewing license amendments, Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) closure

notifications, performing construction inspections and inspections of the initial test programs, and preparing for the eventual transition of the plants to the operational phase.

Through the consistent application of lessons-learned, the NRC has been timely in its review of license amendment requests. To achieve this, the NRC has developed new internal metrics to better track the timeliness related to the review of license amendment requests supporting Vogtle licensing efforts, and initiated quarterly management meetings with the licensee to align on expectations and priorities.

The NRC has also implemented enhancements to our operator licensing program and made improvements to the ITAAC closure notifications process in anticipation of the surge in ITAAC closure notifications near the end of construction. The NRC is preparing the regulatory procedures necessary to transition the plants from the construction phase into operating status. To do so, the NRC developed an integrated plan that identified all regulatory functions necessary to support the transition. In November, the NRC issued an implementation plan clarifying responsibilities and establishing the process to complete the transfer of regulatory oversight and licensing for the AP1000 design center. To date, 10 of the 29 recommendations are complete, and another 16 will be completed in fiscal year 2018.

Over the past year, the NRC also completed several milestones in its ongoing large, light water reactor design reviews, including completing the technical reviews for all of the active combined license applications. Yesterday, the Commission held a hearing for the last active combined license application, for the potential construction of two AP1000 units at the Turkey Point site in Florida.

In March of this year, the NRC docketed the first application for a small modular reactor (SMR) design certification submitted by NuScale Power. The staff's strategy for completing this review within the projected 42 months relies on the use of technical audits early in the review schedule, alignment of the request for additional information process with the required regulatory findings, and resolution of challenging technical and regulatory issues as soon as they are identified. To date, the staff has identified nearly two dozen significant technical issues that are unique to the NuScale SMR design, and the staff has developed a review plan for each of these issues. At this time, the overall regulatory review is progressing on the established schedule.

In May of 2016, the NRC received an application from the Tennessee Valley Authority (TVA) for an early site permit for small modular reactors at the Clinch River Nuclear Site in Tennessee. The staff's environmental and technical review is progressing on schedule. We have been notified that we may receive additional applications from TVA and Utah Associated Municipal Power Systems for combined licenses in the next few years.

With respect to advanced reactor designs, the NRC staff has developed a multi-part strategy to prepare for the review of non-LWR technologies. In December of last year, the agency staff issued its strategy, entitled, "NRC Vision and Strategy: Safely Achieving Effective and Efficient Non-Light Water Reactor Mission Readiness." The strategy has three objectives: enhancing technical readiness; optimizing regulatory readiness; and optimizing communication. To achieve these objectives, the NRC staff has identified specific activities that it will conduct in the near-term (within five years), mid-term (five to-10 years), and long-term (beyond 10 years) timeframes and has made significant progress in activities related to all of the near-term strategies. These efforts are being performed with regular engagement with DOE and external stakeholders. The NRC has made progress to prepare for potential near-term applications.

Based on stakeholder feedback, the agency has put a priority on advancing risk-informed and performance-based approaches and resolving key policy issues.

A total of five non-LWR developers have expressed their intent to start regulatory interactions with the NRC, and the staff started formal pre-application interactions with Oklo, Inc. in November 2016 regarding its compact fast reactor design. The staff is implementing a flexible and staged regulatory review process to engage with Oklo to align the NRC's activities with the developer's pace of activity. In addition, the agency is implementing transformational change by using a "small core team" to support cost-effective non-LWR reviews. The core review team concept provides stability and consistency to the developer while ensuring efficient and agile use of available NRC resources. The agency anticipates starting additional pre-application reviews in fiscal year 2018 and 2019, and beginning one or more advanced reactor application reviews in the next two to four years.

Nuclear Materials and Waste Safety

The Commission continues to provide monthly updates to Congress on its efforts to address the decision issued by the U.S. Court of Appeals for the District of Columbia Circuit in *In re Aiken County*, focusing on our efforts to most effectively spend the limited remaining available Nuclear Waste Funds to continue with the licensing process for Yucca Mountain. As reflected in agency monthly reports, the Commission previously directed the staff to complete its safety evaluation report, develop a supplemental environmental impact statement, and make documents related to the licensing proceeding publicly available. Upon completion of these activities, the Commission directed agency staff to hold a virtual meeting of the Licensing Support Network (LSN) Advisory Review Panel to provide information to, and gather input from, advisory panel

members and the public regarding possible reconstitution of the LSN or a suitable replacement system. The Commission also approved gathering preliminary information regarding potential adjudicatory hearing venues.

In 2014, the Commission directed the staff to proceed with an integrated rulemaking on power reactor decommissioning to improve the efficiency of the decommissioning transition process and to address other key issues. This rulemaking will account for the reduction in radiological risk for plants transitioning from operating to decommissioning and will reduce the need for exemption and license amendment requests by licensees in the process of decommissioning. The staff issued an Advance Notice of Proposed Rulemaking and a draft regulatory basis for public comment in November 2015 and March 2017, respectively. The staff considered the comments submitted on both documents in finalizing the regulatory basis that the staff published in November 2017.

In the regulatory basis, the staff concluded that there is sufficient justification to proceed with new regulations in several areas, including emergency preparedness, physical security, cyber security, drug and alcohol testing, training requirements for certified fuel handlers, decommissioning trust funds, financial protection requirements and indemnity agreements, and application of the backfit rule. The staff recommended addressing other topics, such as the role of state and local governments in the decommissioning process and aging management, via updated guidance or inspection procedures in lieu of rulemaking.

The staff plans to provide the draft proposed rule to the Commission in the spring of 2018. After incorporating Commission direction, the staff plans to issue the proposed rule and draft implementation guidance for a 75-day public comment period. The staff's goal is to submit the

draft final rule to the Commission in the fall of 2019. Concurrent with the rulemaking process, the staff continues to conduct timely reviews of decommissioning exemption and amendment requests for those sites currently undergoing decommissioning.

There are currently 37 Agreement States that have entered into formal agreements with the NRC, pursuant to Section 274 of the Atomic Energy Act of 1954, as amended (AEA), to regulate certain quantities of AEA material at facilities located within their borders. Over the last several years, the NRC has been in discussions with the State of Wyoming to become the next Agreement State and more recently the State of Vermont has expressed interest in becoming an Agreement State. On October 4, 2017, the Commission approved the State of Wyoming's proposed approach for a limited Section 274b. agreement for source material involved in the extraction or concentration of uranium or thorium milling, and the management and disposal of byproduct material. On November 14, 2017, NRC staff received the State of Wyoming's final application for the limited Section 274b. agreement and is working to complete its assessment.

In March of 2017, the NRC's Executive Director for Operations testified before this Committee that the Commission was in the process of analyzing the possibility of changing the current 10-year duration of uranium recovery licenses to a longer term, such as 20 years. Subsequently, on November 9, 2017, the Commission approved the staff's recommendation to implement a maximum license term of 20 years for new applications and license renewals for uranium recovery facilities. The staff based its recommendation on the relatively low level of risk involved in the current operations of these facilities, and their historical performance, and concluded that issuing license terms for a maximum of 20 years will not adversely impact the protection of public health and safety.

Closing

In closing, the NRC continues to focus on efforts to achieve additional efficiencies without diminishment of its public health and safety, and security missions. Chairman Barrasso, Ranking Member Carper, and distinguished Members of the Committee, this concludes my written 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.