Protecting People and the Environment

SEMIANNUAL STATUS REPORT ON THE LICENSING ACTIVITIES AND REGULATORY DUTIES OF THE U.S. NUCLEAR REGULATORY COMMISSION

April 2020–September 2020

Note: The period of performance covered by this report includes activities that occurred from the first day of April 2020 to the last day of September 2020. The transmittal letter to Congress accompanying this report provides additional information to keep Congress fully informed of the current licensing and regulatory activities of the U.S. Nuclear Regulatory Commission.

Enclosure

CONTENTS

I. Reactor Oversight Process

The U.S. Nuclear Regulatory Commission (NRC) uses the Reactor Oversight Process (ROP) to assess the performance of operating power reactor licensees and to guide the assignment of inspection resources. Using inputs from both agency self-assessments and independent evaluations, the NRC adjusts the ROP on an ongoing basis to enhance its effectiveness and efficiency. The NRC staff meets with interested stakeholders periodically to collect feedback on the effectiveness of the process and considers this feedback when making improvements to the ROP.

The agency's most recent performance assessments indicate that all operating power reactor plants continue to operate safely. The staff conducts assessment reviews, communicates changes in licensee performance quarterly, and issues end-of-cycle assessment letters. The NRC issued annual assessment letters to licensees in March 2020. The NRC Website reflects the latest power reactor plant performance assessments as of March of calendar year (CY) 2020.

At the onset of the Coronavirus Disease 2019 (COVID-19) Public Health Emergency (PHE), the Office of Nuclear Reactor Regulation (NRR) issued guidance for remote inspection of operating power reactors while at the same time, maintaining an onsite resident inspector presence during the PHE. This guidance balanced protecting the health and safety of NRC and licensee staff with the need to conduct effective oversight that supports NRC's critical safety mission, including inspectors' ability to respond to onsite emergency events. The initial inspector guidance was issued in a March 19, 2020, memorandum, and later modified on April 6, 2020, "Resident Office Site Coverage and Baseline Inspection During Maximum Teleworking for COVID-19" (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20097E538). Regional Administrators have the flexibility to balance local health conditions against plant risk profiles to determine when resident inspectors should be present onsite.

All operating reactor licensees provided the assigned resident inspectors remote access to plant data and information. This allowed inspectors to maintain awareness of reactor safety performance, such as plant conditions and planned activities, while working remotely.

The ROP provides the NRC staff with the flexibility to adjust the baseline inspections, as needed, to focus on safety significant issues during the PHE. NRR began an effort in April 2020 to evaluate all aspects of the ROP to determine if modifications to the baseline inspections were necessary to complete the ROP in 2020 due to the COVID-19 PHE. As a result of this effort, the NRC staff issued "Inspection Guidance During Transition from COVID-19 Mandatory Telework" (ADAMS Accession No. ML20141L766) on May 28, 2020, to allow the agency to complete the ROP in CY 2020. The guidance established the goal for the CY 2020 ROP to be completed with sufficient inspection samples for the baseline inspection program at each site. This memorandum also provided the Regions guidelines in transitioning the inspection efforts from mandatory telework to more onsite inspection activities during the COVID-19 PHE.

The NRC continues to have a modified onsite inspection presence at the sites, while maintaining oversight that fulfills our mission. As of September 30, 2020, the ROP completion percentage of minimum inspection samples was 80 percent and the baseline inspection program is on track for completion for CY 2020.

II. Implementing Risk-Informed and Performance-Based Regulations

In 1995, the NRC issued the Probabilistic Risk Assessment (PRA) Policy Statement (Volume 60 of the *Federal Register* (FR), page 42622; August 16, 1995), which formalized the Commission's commitment to risk-informed regulation through the expanded use of PRA. The use of PRA in regulatory decisionmaking and licensing activities for U.S. light-water reactors (LWRs) has increased in recent years, and licensees continue to adopt many risk-informed initiatives. PRAs provide licensees with risk insights that allow increased flexibility in plant operations. They also enable both licensees and the NRC to better identify and focus on more safety-significant issues. The NRC staff continues to work with industry to support risk-informed and performance-based initiatives.

The licensees for 46 operating nuclear power reactors have committed to transitioning to the risk-informed, performance-based fire protection licensing basis permitted under Title 10 of the *Code of Federal Regulations* (10 CFR) 50.48(c), using National Fire Protection Association (NFPA) Standard 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants." As of the end of the third quarter of fiscal year (FY) 2020, all 46 reactor units have received license amendments and have transitioned or are transitioning to the NFPA 805 licensing basis.

The industry has communicated plans to continue to submit applications for adoption of 10 CFR 50.69, "Risk-informed categorization and treatment of structures, systems and components for nuclear power reactors." This would allow licensees to establish a more risk- informed program for the treatment of structures, systems, and components (SSCs). In 2014, the NRC approved the pilot application of 10 CFR 50.69 for Vogtle Electric Generating Plant. Since completion of the pilot, the industry has submitted 22 applications to adopt 10 CFR 50.69. The NRC staff has approved 15 applications and is currently reviewing the remaining seven applications. The NRC anticipates receiving two additional applications by the end of CY 2020.

The industry has also communicated plans to submit applications to adopt the Risk-Informed Technical Specifications (RITS) Initiative 4b. This initiative allows licensees to temporarily extend certain technical specification completion times up to 30 days, based on plant configuration and a real-time risk calculation. This approach maintains and improves safety through the incorporation of risk assessment and management techniques into a plant's technical specifications, while reducing unnecessary regulatory burden. To date, the industry has submitted 16 applications to adopt RITS Initiative 4b. The NRC staff has approved nine applications, is currently reviewing the remaining seven applications, and anticipates receiving an additional two applications by the end of CY 2020.

Following the March 2011 accident at the Fukushima Dai-ichi nuclear power plant in Japan, the NRC issued orders (now codified in 10 CFR 50.155, "Mitigation of beyond-design-basis events") to require enhanced mitigation strategies for maintaining or restoring core cooling, containment, and spent fuel pool cooling capabilities in the event of a beyond-design-basis external event. While initially designed to address extreme external events, those strategies (referred to as FLEX) could be effective in mitigating other risks, such as those which could be experienced during complex refueling outage operations. The NRC staff continues to interact with industry on ways that FLEX could be used in such applications. For example, the staff participated in a FLEX Summit between September 1–10, 2020, with the Nuclear Energy Institute (NEI) and other industry stakeholders. The summit covered several topics, including FLEX operating experience, the expanded use of FLEX to support plant operations, modeling FLEX in PRAs,

and crediting of FLEX equipment in NRC licensing and oversight activities. Participants exchanged information and agreed to engage in further dialogue in the coming months to continue to discuss how to address any outstanding issues associated with the treatment of FLEX in licensing and oversight.

In addition, the NRC implemented the Very Low Safety Significance Issue Resolution (VLSSIR) process in January 2020. The process was developed based on suggestions from both internal and external stakeholders to improve NRC processes to promptly resolve issues pertaining to a facility's licensing basis that are of very low safety significance. The process is documented in revised inspection guidance, which allows inspectors to close very low safety significance issues early in the inspection process if there is a question as to whether an issue is within the licensing basis and if that question cannot be resolved without a significant level of effort. The revised guidance includes criteria for when the VLSSIR process may be used and the required documentation for the inspection reports. It also includes required documentation for the inspection report when a very low safety significance issue is closed using that process.

During the first quarter of CY 2020, the VLSSIR process was used to close four issues that had been open for a significant amount of time. In the second quarter of CY 2020, one issue was closed using the process. As part of the VLSSIR initiative, the NRC staff is also developing guidance to resolve very low safety significance compliance issues commensurate with their risk significance. The NRC staff plans to issue this guidance by the end of CY 2020.

III. Status of Issues Tracked in the Reactor Generic Issues Program

During this reporting period, the NRC staff closed one generic issue (GI) and continued its evaluation of one open GI and one potential GI.

In conjunction with efforts in response to the lessons learned from the Fukushima Dai-ichi accident, the NRC staff completed the evaluations on the impacts of flooding on all nuclear power plants that will continue operation until their licenses expire. The NRC has determined that no additional regulatory actions related to the flooding hazards are needed. Upon receiving confirmation from NRR that all licensing activities were completed and verified by the NRC staff, the Director of the Office of Nuclear Regulatory Research (RES) issued a memorandum officially closing out GI-204, "Flooding of Nuclear Power Plant Sites Following Upstream Dam Failure," on September 22, 2020 (ADAMS Accession No. ML20260H122).

For the potential GI related to the effects of high-energy arcing faults (HEAF) involving aluminum at nuclear power plants, the staff continued to assess whether the issue should proceed to the implementation stage of the GI process. To accomplish this, the NRC has established an expert working group with the Electric Power Research Institute (EPRI) under a memorandum of understanding to research the safety significance of the issue and make technical recommendations. The NRC and EPRI have assembled a group of experts and formed a working group to study this issue. The working group is currently reviewing operating experience and test data to develop improved aluminum HEAF zones of influence and improved PRA methods needed to accurately analyze the potential hazard. Results from a recent industry survey will be used to guide these tasks.

The NRC provides information on the status of open GIs at https://www.nrc.gov/about-nrc/regulatory/gen-issues/dashboard.html. A summary of the remaining active GI, GI-199, is provided below.

GI-199, "Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States on Existing Plants"

This GI addresses how current estimates of the seismic hazard level at some nuclear power plant sites in the central and eastern United States might be higher than the assessments used in their original designs and previous evaluations. The NRC staff later expanded the scope of this GI to include plants in the western United States. Following collaboration with EPRI, in September 2010, the NRC staff issued a safety/risk assessment report, "Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States on Existing Plants." The NRC staff also issued Information Notice 2010-18, "Generic Issue 199, 'Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States on Existing Plants,'" dated September 2, 2010. After the March 2011 accident at the Fukushima Dai-ichi nuclear power plant, the NRC incorporated GI-199 into its work in response to the accident, which is discussed further in Section X of this report.

During this reporting period, the NRC staff completed the final three evaluations of licensees' seismic probabilistic risk assessments (SPRAs). With this effort, all required SPRA evaluations are now complete. The NRC has completed its review of the seismic hazard information and determined that no additional regulatory actions related to the seismic hazards are needed.

IV. Licensing Actions and Other Licensing Tasks

Licensing actions related to operating power reactors include orders, license amendments, exemptions from regulations, relief from inspection or component testing, topical reports submitted on a plant-specific basis, or other actions requiring NRC review and approval before licensees can carry out certain activities.

Other licensing tasks for operating power reactors include the following:

- licensees' responses to NRC requests for information through generic letters or bulletins;
- NRC review of generic topical reports;
- updates to final safety analysis reports; and
- other licensee actions that do not require NRC review and approval before licensees can carry them out.

The NRC's "Congressional Budget Justification [CBJ] Fiscal Year 2021" incorporates three output measures (performance indicators) related to the age of the inventory of licensing actions, the age of the inventory of other licensing tasks, and the timely completion of final safety evaluations. Starting in FY 2020, the performance indicators for the number of licensing actions and other licensing tasks were discontinued. In addition, beginning in FY 2021, the indicators for the percentage of licensing actions and other licensing tasks completed in 1 year or less were discontinued and consolidated into the new FY 2021 indicator for timely completion of final safety evaluations.[1] The indicator for the percentage of licensing actions completed in

[1] Prior to FY 2021, the following four separate performance indicators were provided for the age of the inventory of licensing actions and age of the inventory of other licensing tasks: the percentage of licensing actions completed in 1 year or less, the percentage of other licensing tasks completed in 1 year or less, the percentage of licensing actions completed in 2 years or less, and the percentage of other licensing tasks completed in 2 years or less.

2 years or less was revised to only apply to licensing actions accepted or initiated prior to July 13, 2019. Also, for FY 2021, a new performance indicator was added for the percentage of timely completion of final safety evaluations by the Generic Milestone Date and replaces the discontinued 1-year indicators. This new performance indicator includes the timeliness of all "requested activities of the Commission," as defined by the Nuclear Energy Innovation and Modernization Act (NEIMA) in the Operating Reactor Business Line that involve a final safety evaluation for all actions accepted or initiated after July 13, 2019.

Table 1 shows the actual FY 2017 through FY 2020 results to date and the FY 2021 goal for NRC performance indicators for operating power reactor licensing actions and other licensing tasks.

The agency continues to communicate with licensees about planned licensing submittals. The NRC's senior management remains fully engaged in monitoring the licensing action workload to maintain both the staff's safety focus and target performance goals.

Table 1 Results and FY 2021 Goal for the NRC's Congressional Budget Justification Performance Indicators[1]

Output Measure	FY 2017 Actual	FY 2018 Actual	FY 2019 Actual	FY 2020 Actual	FY 2021 Goal
Licensing Actions	967	861	847	Discontinued	Not Applicable
Age of inventory of licensing actions	96% ≤1 year 99% ≤2 year	98% ≤1 year 100% ≤2 year	95% ≤1 year 100% ≤2 year	99% ≤1 year 100% ≤2 year	100% ≤2 year
Other licensing tasks completed per year	644	362	337	Discontinued	Not Applicable
Age of inventory of other licensing tasks	100% ≤1 year 100% ≤2 year	98% ≤1 year 100% ≤2 year	98% ≤1 year 100% ≤2 year	96% ≤1 year 100% ≤2 year	100% ≤2 year
Timely completion of final safety evaluations	Not Applicable	Not Applicable	Not Applicable	Not Applicable	≤24 months

The NRC has been responding to challenges facing licensees due to the COVID-19 PHE. Through strong communication between the NRC staff and the licensees, negative impacts to NRC licensing activities and regulatory duties during this reporting period have been mitigated. To maintain transparency and openness, the NRC staff conducted nine virtual public meetings to engage stakeholders and discuss changes necessary due to the PHE. There was a high level of participation at these virtual meetings, with over 600 at one of the meetings. The NRC leveraged these interactions to gain perspectives from the public as well as to communicate our planned actions. To address areas where regulatory relief was determined to be warranted, the NRC staff issued the following letters explaining when the agency would provide expedited reviews for certain PHE-related exemptions and relief requests:

- A March 18, 2020, letter outlined when the NRC will provide expedited review of exemption requests from the work hour controls requirements specified in 10 CFR 26.205(d)(1) – (d)(7) (ADAMS Accession No. ML20087P237). An addendum issued on April 8, 2020, provided several administrative corrections, but did not affect the process outlined in the original letter (ADAMS Accession No. ML20098B333).

- An April 9, 2020, letter outlined when the NRC will provide expedited review of deferral requests for submission of Owners Activity Reports consistent with 10 CFR 50.55a(z)(2) "Alternatives to codes and standards requirements" (ADAMS Accession No. ML20098D975).

- An April 14, 2020, letter outlined when the NRC will provide expedited review of exemption requests from 10 CFR Part 55 requirements related to the 24-month requalification program, research and test reactors proficiency, and biennial medical examinations (ADAMS Accession No. ML20104C071).

- An April 20, 2020, letter outlined when the NRC will provide expedited review of exemption requests from security training requirements specified in 10 CFR 73, Appendix B, Section VI (ADAMS Accession No. ML20105A483).

- An April 27, 2020, letter outlined when the NRC will provide expedited review of exemption requests from the medical evaluation frequency and respirator fit-testing frequency requirements specified in 10 CFR 20.1703(c)(5)(iii) and 10 CFR 20.1703(c)(6) (ADAMS Accession No. ML20099G757).

- A May 14, 2020, letter outlined when the NRC will provide expedited review of exemption requests from fire brigade annual medical exams, quarterly drills, and annual live fire training requirement specified in 10 CFR 50.48 (ADAMS Accession No. ML20122A022).

- A May 14, 2020, letter outlined when the NRC will provide expedited review of exemption requests from the biennial emergency plan exercise requirements specified in 10 CFR 30.32(i)(3)(xii), 10 CFR 40.31(j)(3)(xii), 10 CFR Part 50, Appendix E.IV.F, 10 CFR 70.22(i)(3)(xii), and 10 CFR 72.32(a)(12)(i) and (ii), in accordance with the NRC's regulations in 10 CFR 30.11, 10 CFR 40.14, 10 CFR 50.12(a), 10 CFR 52.7, 10 CFR 70.17, and 10 CFR 72.7. An addendum issued on September 2, 2020, provided clarification and additional information to power reactor licensees submitting exemption requests from the conduct of the CY 2020 offsite biennial exercise required by Section IV.F.2.c of Appendix E to 10 CFR Part 50 (ADAMS Accession No. ML20223A152).

During this reporting period, the NRC staff completed 246 licensing actions for both power and non-power reactors related to the COVID-19 PHE, with an average completion time of 26 days. As the pandemic progresses, and new and continuing challenges to NRC-licensed activities emerge, the NRC will continue to closely monitor the nuclear power industry to ensure adequate protection of public health and safety. Future reports will include additional actions NRC has taken in response to the COVID-19 PHE.

V. Status of License Renewal Activities

The staff did not review any initial license renewals during this reporting period. On August 24, 2020, Dominion Energy submitted a subsequent license renewal (SLR) application for North Anna, Units 1 and 2 (ADAMS Accession Nos. ML20246G696 and ML20246G698). Additionally, the staff completed the safety reviews for the Surry Power Station SLR application, but the final decision on issuing the SLR is delayed due to an ongoing issue related to the environmental review.

Surry Power Station, Units 1 and 2

The NRC staff has completed the safety review, issuing the final safety evaluation report (SER) on March 9, 2020 (ADAMS Accession No. ML20052F520). The SER was discussed at an April 8, 2020, meeting with the ACRS Full Committee.

One ongoing issue in the environmental review relates to Dominion's obligations under the Federal Coastal Zone Management Act (CZMA). Under the CZMA, Dominion must demonstrate that the proposed license renewal is consistent with and complies with enforceable policies of the Virginia Coastal Zone Management Program before the NRC can issue a renewed license. The staff issued a request for additional information (RAI) on this issue on April 11, 2019, and noted the issue in its October 17, 2019, draft Supplemental Environmental Impact Statement. On February 5, 2020, the staff issued another RAI requesting information about actions taken by Dominion to fulfill its CZMA obligations. Dominion plans to submit a revised CZMA consistency determination letter to support the environmental review of Surry SLR application. On April 6, 2020, the staff published the final Supplemental Environmental Impact Statement and noted that the CZMA issue was not resolved but that Dominion would provide a status update.

On October 8, 2020, Dominion submitted a letter to the NRC (ADAMS Accession No. ML20282A538), requesting a 90-day extension to the RAI response from October 15, 2020, to January 15, 2021. In the interim, Dominion continues to provide the NRC staff with periodic updates on the issue. Once Dominion fulfills its CZMA obligations, the NRC will proceed with its environmental review of the application.

The NRC anticipates that it may be able to complete its review of the application within 4 weeks of receipt of the revised CZMA consistency determination letter, but the actual time needed to review depends on the information received. Upon receipt of the CZMA consistency determination letter, the NRC will be able to provide a revised estimated decision date. As a result of this delay, the original 18-month target date of June 2020 was not met.

North Anna, Units 1 and 2

On August 24, 2020, Dominion Energy submitted its subsequent license renewal application (SLRA) (ADAMS Accession Nos. ML20246G696 and ML20246G698) for North Anna, Units 1 and 2. On October 13, 2020, the NRC staff accepted the SLRA and it is now under review (ADAMS Accession No. ML20258A284). The staff has established an 18-month target schedule for this review.

VI. Summary of Reactor Enforcement Actions

The reactor enforcement statistics in the following tables are arranged by region, half FY, FY, and two previous FYs for comparison. These tables provide the nonescalated and escalated reactor enforcement data, as well as the escalated enforcement data associated with traditional enforcement and the ROP. The severity level assigned to a violation (i.e., traditional enforcement) generally reflects the significance of a violation. However, for most violations, the significance is assessed using the significance determination process under the ROP, which uses risk insights, as appropriate, to assist the NRC staff in determining the safety or security significance of inspection findings identified within the ROP.

Brief descriptions of the escalated reactor enforcement actions associated with traditional enforcement and the ROP (as well as any other significant actions) taken during the applicable fiscal half-year follow the tables.

Table 2 Nonescalated Reactor Enforcement Actions*

NONESCALATED REACTOR ENFORCEMENT ACTIONS						
		Region I	Region II	Region III	Region IV	TOTAL
Cited Severity Level IV or Green	1st Half FY 20	2	2	0	0	4
	2nd Half FY 20	0	2	0	1	3
	FY 20 Total	2	4	0	1	7
	FY 19 Total	1	0	0	1	2
	FY 18 Total	2	4	0	3	9
Noncited Severity Level IV or Green	1st Half FY 20	26	18	45	58	147
	2nd Half FY 20	26	28	17	50	121
	FY 20 Total	52	46	62	108	268
	FY 19 Total	88	76	86	112	362
	FY 18 Total	101	69	108	144	422
TOTAL Cited and Noncited Severity Level IV or Green	1st Half FY 20	28	20	45	58	151
	2nd Half FY 20	26	30	17	51	124
	FY 20 Total	54	50	62	109	275
	FY 19 Total	89	76	86	113	364
	FY 18 Total	103	73	108	147	431

* The nonescalated enforcement data reflect the cited and noncited violations either categorized at Severity Level IV (the lowest level) or associated with Green findings during the indicated time periods. The numbers of cited violations are based on Enforcement Action Tracking System data that may be subject to minor changes following verification. These data do not include Green findings that do not have associated violations.

Table 3 Escalated Reactor Enforcement Actions Associated with Traditional Enforcement*

ESCALATED REACTOR ENFORCEMENT ACTIONS ASSOCIATED WITH TRADITIONAL						
		Region I	Region II	Region III	Region IV	TOTAL
Severity Level I	1st Half FY 20	0	0	0	0	0
	2nd Half FY 20	0	2	0	0	2
	FY 20 Total	0	2	0	0	2
	FY 19 Total	0	0	0	0	0
	FY 18 Total	0	0	0	0	0
Severity Level II	1st Half FY 20	0	0	0	0	0
	2nd Half FY 20	0	2	0	0	2
	FY 20 Total	0	2	0	0	2
	FY 19 Total	0	1	0	2	3
	FY 18 Total	0	0	0	0	0
Severity Level III	1st Half FY 20	0	1	0	0	1
	2nd Half FY 20	0	0	0	1	1
	FY 20 Total	0	1	0	1	2
	FY 19 Total	0	0	0	4	4
	FY 18 Total	0	1	0	0	1
TOTAL Violations Cited at Severity Level I, II, or III	1st Half FY 20	0	1	0	0	1
	2nd Half FY 20	0	4	0	1	5
	FY 20 Total	0	5	0	1	6
	FY 19 Total	0	1	0	6	7
	FY 18 Total	0	1	0	0	1

* The escalated enforcement data reflect the Severity Level I, II, or III violations or problems cited during the indicated time periods.

Table 4 Escalated Reactor Enforcement Actions Associated with the Reactor Oversight Process*

ESCALATED REACTOR ENFORCEMENT ACTIONS ASSOCIATED WITH THE REACTOR OVERSIGHT PROCESS						
		Region	Region II	Region III	Region IV	TOTAL
Violations Related to Red Findings	1st Half FY 20	0	0	0	0	0
	2nd Half FY 20	0	0	0	0	0
	FY 20 Total	0	0	0	0	0
	FY 19 Total	0	0	0	0	0
	FY 18 Total	0	0	0	0	0
Violations Related to Yellow Findings	1st Half FY 20	0	0	0	0	0
	2nd Half FY 20	0	0	0	0	0
	FY 20 Total	0	0	0	0	0
	FY 19 Total	0	0	0	0	0
	FY 18 Total	0	0	0	0	0
Violations Related to White Findings	1st Half FY 20	0	1	0	0	1
	2nd Half FY 20	0	1	0	0	1
	FY 20 Total	0	2	0	0	2
	FY 19 Total	1	1	1	0	3
	FY 18 Total	0	1	3	0	4
TOTAL Related to Red, Yellow, or White Findings	1st Half FY 20	0	1	0	0	1
	2nd Half FY 20	0	1	0	0	1
	FY 20 Total	0	2	0	0	2
	FY 19 Total	1	1	1	0	3
	FY 18 Total	0	1	3	0	4

* The escalated enforcement data reflect the violations or problems cited during the indicated time periods that were associated with either Red, Yellow, or White findings. These data do not include Red, Yellow, or White findings that do not have associated violations.

Reactor Escalated Enforcement Actions and Other Significant Actions

Entergy Operations, Inc. (Arkansas Nuclear One) EA-20-018

On September 23, 2020, the NRC issued a notice of violation to Entergy Operations, Inc. (licensee), Arkansas Nuclear One, for a Severity Level III violation. The violation involved the deliberate failure of several contractor employee supervisors to notify the licensee's security organization upon discovering prohibited items (unauthorized ammunition) in the protected area (PA). The NRC's regulations at 10 CFR 73.55(a)(3) state, in part, that the licensee is responsible for maintaining the onsite physical protection program in accordance with

Commission regulations through the implementation of written security implementing procedures. The licensee's procedures require, in part, that all plant personnel report to security prohibited items found in their area of work or suspected on the person of any individual in the PA. On or about October 10, 2018, the licensee failed to maintain the onsite physical protection program in accordance with Commission's regulations through the implementation of written security implementing procedures when four contractor employee supervisors deliberately did not to inform security of the discovery of prohibited items in the PA.

Tennessee Valley Authority (Browns Ferry, Sequoyah, Watts Bar) EA-20-006 and EA-20-007

On August 24, 2020, the NRC issued a notice of violation and proposed imposition of civil penalty in the amount of $606,942 to the Tennessee Valley Authority for a Severity Level I problem, with two violations, and a Severity Level II problem, with two violations, involving failure to implement 10 CFR 50.7, "Employee Protection." Specifically, according to the notice of violation, on March 9, 2018, the Tennessee Valley Authority discriminated against a former Sequoyah employee for engaging in protected activity. The former Sequoyah employee raised concerns regarding a chilled work environment, filed complaints with the Employee Concerns Program, and raised concerns regarding the response to two noncited violations. After becoming aware of this activity, the former Director of Corporate Nuclear Licensing filed a formal complaint against the former employee. The filing of a formal complaint triggered an investigation by the Tennessee Valley Authority's Office of the General Counsel. According to the notice of violation, this action was based, at least in part, on the former employee engaging in protected activity. On May 25, 2018, following the investigation, the former employee was placed on paid administrative leave until the former employee resigned in August 2018.

In addition, the notice of violation states that on March 9, 2018, the Tennessee Valley Authority discriminated against a former corporate employee for engaging in protected activity. The former corporate employee raised concerns of a chilled work environment. After becoming aware of the activity, the former Director of Corporate Nuclear Licensing filed a formal complaint against the former employee. The filing of a formal complaint triggered an investigation by the Tennessee Valley Authority's Office of the General Counsel. According to the notice of violation, this action was based, at least in part, on the former employee engaging in a protected activity. On January 14, 2019, following the investigation, the former Vice President of Regulatory Affairs played a significant role in the decisionmaking process to place the former employee on paid administrative leave and terminate the former employee.

Virginia Electric and Power Company (Surry Power Station) EA-20-057

On July 30, 2020, the NRC issued a notice of violation to Virginia Electric and Power Company (licensee), associated with a White significance determination process finding. The White finding, an issue of low to moderate safety significance, involved the failure of the Surry Power Station Unit 2 turbine-driven auxiliary feedwater (TDAFW) pump discharge check valve during surveillance testing. Specifically, from November 23, 2005, to November 20, 2019, the licensee did not analyze common failure or maintenance patterns to determine their significance and to identify potential failure mechanisms of the valve when establishing its check valve condition monitoring program in accordance with the 2004 American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants, Mandatory Appendix II, as required by 10 CFR Part 50.55a(f)(4). As a result, all three Unit 2 auxiliary feedwater pumps were declared inoperable, and the safety function was considered lost until the TDAFW line was isolated.

DTE Energy Company (Fermi Nuclear Plant) EA-19-138

On July 15, 2020, a notice of violation was issued to DTE Energy Company, for a violation associated with an escalated enforcement finding at the Fermi Nuclear Plant. The details of the finding are official use only – security-related information.

Entergy Operations, Inc. (Waterford Steam Electric Station, Unit 3) EA-19-129

On April 9, 2020, a notice of violation was issued to Entergy Operations, Inc., for a violation associated with an escalated enforcement finding at the Waterford Steam Electric Station, Unit 3. The details of the finding are official use only – security-related information.

VII. Security and Emergency Preparedness and Incident Response Activities

The NRC continues to maintain an appropriate regulatory infrastructure to ensure adequate protection of public health and safety and promote the common defense and security while implementing risk-informed strategies and improving the realism of NRC licensing and oversight activities. The NRC's security and emergency preparedness and incident response programs contribute to these goals.

Security

Under normal circumstances, the NRC conducts force-on-force (FOF) inspections at each nuclear power reactor and Category I fuel cycle facility on a regular 3-year cycle. Each FOF inspection at a nuclear power reactor includes both tabletop drills and exercises that simulate combat between a mock adversary force and the licensee's security force. These inspections assess the ability of power reactor and Category I fuel cycle facility licensees to defend against the design-basis threat (DBT) for radiological sabotage. For Category I fuel cycle facilities, the NRC uses FOF inspections to evaluate the effectiveness of licensees' protective strategies against an additional DBT—theft or diversion of special nuclear material. FOF inspections, along with the other inspections that comprise the NRC's security baseline inspection program, provide valuable insights that enable the NRC to evaluate the effectiveness of licensees' security programs.

Due to the health and safety concerns related to conducting full FOF exercises during the COVID-19 PHE, the NRC developed a new Inspection Procedure (IP), IP 92707, "Security Inspection of Facilities Impacted by a Local, State, or Federal Emergency Where the NRC's Ability to Conduct Triennial Force-on-Force Exercises is Limited,"[2] (ADAMS Accession No. ML20182A668). The NRC implemented this procedure to allow the conduct of limited-scope inspections of operating reactor licensees during the ongoing special circumstances associated with the PHE.

In Staff Requirements Memorandum (SRM)-SECY-17-0010, "Staff Requirements—SECY-17-0100—Security Baseline Inspection Program Assessment Results and Recommendations for Program Efficiencies," dated October 9, 2018 (ADAMS Accession No. ML18283A072), the Commission directed the staff to identify options to give credit for a broader set of operator actions, including the use of FLEX equipment, and to give credit for response by Federal, State, and local law enforcement in the security inspection program. In response, on

[2] This document is not publicly available.

July 30, 2020, the staff submitted an approach to the Commission in SECY-20-0070, "Technical Evaluation of the Security Bounding Time Concept for Operating Nuclear Power Plants," (ADAMS Accession No. ML20126G265),[3] for crediting operator actions, including the use of FLEX equipment, and law enforcement response that recognizes the existing layers of protection (both security and safety) available to sites, and presents two risk-informed concepts for how the NRC and licensees can apply these layered protections. The concepts introduced in SECY-20-0070 for Commission consideration are: (1) the Reasonable Assurance of Protection Time (RAPT), which is a commitment in the paper; and (2) a site-specific Security Bounding Time (SBT), which is a recommendation for Commission consideration. The RAPT concept recognizes the existing layers of protection available at nuclear power plants and acknowledges that beyond 8 hours from the recognition of an attack, licensees will have additional resources, such as law enforcement and/or recalled off-duty personnel, to support the licensee's continued defense against the DBT. The SBT concept builds on the RAPT to allow licensees to define site-specific SBTs of less than 8 hours if they can demonstrate a sufficient basis, such as enhanced security force recall programs, or enhanced coordination with local law enforcement. This staff proposal is currently with the Commission for a decision.

Cyber Security

Under 10 CFR 73.54, "Protection of digital computer and communication systems and networks," the NRC requires nuclear power plant licensees and new license applicants to provide high assurance that digital computer and communication systems and networks are adequately protected against cyber attacks. These licensees must implement a cyber security program to ensure that safety, important-to-safety, security, and emergency preparedness functions are protected from cyber attacks.

The NRC has developed an oversight program for cyber security that includes an inspection program, inspector training, and a process for evaluating the significance of inspection findings. The agency developed this program in collaboration with stakeholders, including members of industry and representatives from the U.S. Department of Homeland Security, the Federal Energy Regulatory Commission, and the National Institute of Standards and Technology.

As of the end of September 2020, the agency had completed 48 cyber security program full implementation inspections. The initial round of full implementation inspections is planned to be completed by June 2021. The NRC is developing a further performance-informed inspection program that is scheduled to be implemented in CY 2021 following completion of the full implementation inspection program.

Emergency Preparedness and Incident Response

In June 2020, the NRC staff issued its second acceptance review of a licensee alert and notification system (ANS) design report change to include the Integrated Public Alert and Warning System (IPAWS) as either a primary or secondary ANS. The South Texas Nuclear Generating Station now uses IPAWS as a secondary ANS. In July 2020, the NRC staff received its third ANS-related request from the Federal Emergency Management Agency (FEMA), for formal review of the Beaver Valley Nuclear Power Station (BVPS) design report; BVPS intends to use IPAWS as the backup ANS system by activating the Wireless Emergency Alert system. NRC staff is currently reviewing the BVPS submittal.

[3] This SECY is not publicly available.

The NRC staff continues to review proposed licensing submittals to implement enhancements to emergency response organization (ERO) staffing and response/augmentation times in Revision 2 to NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," as well as efforts by licensees to re-baseline emergency plans to remove unnecessary details from those plans to allow greater flexibility in implementing changes under 10 CFR 50.54(q)(3). As a result, on June 30, 2020, and further supplemented on August 11, 2020, the NRC staff received a license amendment request from Southern Nuclear Operating Company (eight units total) to revise the sites' emergency plans to change the ERO staffing composition and extend staff augmentation. Additionally, on March 30, 2020, and September 3, 2020, the NRC staff received license amendment requests from South Texas Project and Duke Energy (11 units total), respectively, to re-baseline their emergency plans.

As discussed further in Section IX of this report, on May 12, 2020,[4] the NRC staff published for public comment the proposed rule and draft regulatory guidance on emergency preparedness (EP) for small modular reactors and other new technologies. The public comment period closed on September 25, 2020.

The NRC continues to work with the U.S. Department of Health and Human Services to provide States a replenishment of potassium iodide supplies for use as a supplement to public protective actions within the 10-mile emergency planning zones around nuclear power plants. By September 2020, the NRC had provided 10.6 million potassium iodide tablets to replenish the expiring supplies for 15 States.

All licensing reviews under the physical security and EP program for new power reactor applications remain on schedule. The NRC staff is using its established licensing process to ensure that the safety and environmental reviews meet all milestones and provide opportunities for stakeholder input.

During the COVID-19 PHE, the NRC issued guidance and granted exemptions from EP regulations. Soon after the COVID-19 PHE declaration, the NRC and FEMA issued a joint letter[5] to licensees and offsite response organizations to provide guidance on the postponement of required radiological EP exercises in CY 2020. On May 14, 2020, the NRC staff issued a letter[6] indicating that the NRC was prepared to provide expedited review of exemption requests from the biennial emergency plan exercise requirements specified in 10 CFR 30.32(i)(3)(xii), 10 CFR 40.31(j)(3)(xii), 10 CFR Part 50, Appendix E.IV.F, 10 CFR 70.22(i)(3)(xii), and 10 CFR 72.32(a)(12)(i) and (ii), in under 10 CFR 30.11, 10 CFR 40.14, 10 CFR 50.12(a), 10 CFR 52.7, 10 CFR 70.17, 10 CFR 72.7. On May 27, 2020, the NRC staff issued guidance[7] on dispositioning a licensee's use of temporary compensatory actions or contingency plans that maintained the effectiveness of its emergency response readiness. On September 2, 2020, the NRC staff issued an addendum to provide clarification and additional information to power reactor licensees submitting exemption requests from the conduct of the CY 2020 offsite biennial exercise required by Section IV.F.2.c of Appendix E to 10 CFR Part 50,[8] such that the next State and local evaluated exercise would be conducted by 2022. To date, the NRC staff has granted two exemptions to defer onsite biennial EP exercises and three exemptions to defer

[4] 92 FR 28436
[5] ADAMS Accession No. ML20085F705
[6] ADAMS Accession No. ML20120A003
[7] ADAMS Accession No. ML20143A066
[8] ADAMS Accession No. ML20223A152

offsite biennial EP exercises. The NRC anticipates that licensees will continue to request exemptions during the PHE.

The NRC staff completed its annual review of the agency's continuity of operations program on June 26, 2020. The updates and related ongoing planning efforts ensure that NRC emergency plans remain up to date and that the NRC continues to be prepared to respond to a wide variety of potential emergency situations including impacts of the COVID-19 PHE.

VIII. Power Uprates

Since the 1970s, licensees have applied for and implemented power uprates as a way to increase the output of their plants. The NRC staff has reviewed and approved 164 power uprates to date. Existing plants have gained approximately 23,664 megawatts thermal (MWth) or 7,921 megawatts electric in electric generating capacity (the equivalent of about seven large nuclear power plant units) through power uprates. The NRC currently has 6 measurement uncertainty recapture power uprates under review, totaling approximately 266 MWth.

IX. New Reactor Licensing

The NRC's new reactor program is (1) focusing on licensing and construction oversight activities for large LWRs and small modular LWRs and (2) continuing to develop the specific regulatory framework and infrastructure for advanced reactors (non-LWRs). In addition, the NRC is actively engaged in several international cooperative initiatives to improve safety reviews of new reactor designs and improve the effectiveness and efficiency of inspections and the collection and sharing of construction experience.

Reviews of Applications for Large and Small Modular Light-Water Reactors

During this reporting period, the NRC staff completed its safety review of a design certification application for a small modular LWR submitted under 10 CFR Part 52, "Licenses, certifications, and approvals for nuclear power plants."

Design Certification Reviews

NuScale Power, LLC, (NuScale) Small Modular Reactor Design Certification Application

Following the NRC staff's completion of the Phase 4 review, NuScale identified an issue with the emergency core cooling system actuating later than expected and resulting in higher containment water level accumulation than previously determined. The NRC staff evaluated the emergent design changes proposed by NuScale in May 2020. After completing this evaluation, the staff was able to finish the Final Safety Evaluation Report (ADAMS Accession No. ML20231A804). The staff also issued NuScale a Standard Design Approval on September 11, 2020 (ADAMS Accession No. ML20247J564). The staff is now preparing the draft proposed rule to certify the design and anticipates publishing the proposed rule for public comment in February 2021.

Design Certification Renewals

Advanced Boiling-Water Reactor Renewal (General Electric-Hitachi)

On March 30, 2020, the NRC staff completed its technical review of the General Electric-Hitachi (GEH) Advanced Boiling-Water Reactor (ABWR) DC renewal application. The NRC staff started rulemaking activities to certify the design renewal in November 2019. The NRC anticipates publishing the direct final rule, with the companion proposed rule for public comment, by December 28, 2020.

Construction Oversight under 10 CFR Part 52

During the reporting period, the NRC shifted primarily to remote operations in response to the COVID-19 PHE. Construction inspections and licensing activities continued with only minor interruptions due to the successful application of technology for telework and remote access to licensee information. NRC inspectors conducted activities at the Vogtle site in limited numbers to support mission critical onsite inspections.

As a result of the COVID-19 PHE and the dynamic nature of the Vogtle construction project, on August 20, 2020 (ADAMS Accession No. ML20233A401), the licensee altered its public milestone for initial fuel loading of Vogtle Unit 3 from November 23, 2020, to April 30, 2021. The NRC staff continues to engage in construction oversight activities, and the revised schedule has not impacted the agency's ability to conduct timely inspections. Consistent with its plan to make a 10 CFR 52.103(g) finding, the Vogtle Readiness Group (VRG) has increased its meeting frequency to assess NRC activities and schedule changes and to proactively identify any regulatory challenges that may impact this decision to allow the transition to operations. VRG meetings ensure that all NRC organizations are coordinating on issues related to the new units at Vogtle, that NRC senior management is aware of any significant issues, and that there are consistent communications with the licensee's management.

The NRC continues to implement activities necessary to oversee the construction and operational readiness of the two AP1000® units under construction at the Vogtle site to ensure safety. The NRC's Region II office implements the construction inspection program to verify compliance with the agency's regulations and to ensure that the new plants are built in accordance with their combined licenses (COLs).

Construction oversight at Vogtle is performed within the regulatory framework of the Construction Reactor Oversight Process (cROP). The cROP ensures safety and security through objective, risk-informed, transparent, and predictable NRC oversight during new reactor construction. The agency's most recent performance assessments demonstrate that the reactors are being constructed safely and both units are performing well against the cROP criteria. Plant assessments and the latest cROP-related information are publicly available on the NRC Web site: https://www.nrc.gov/reactors/new-reactors/oversight/crop.html.

The Vogtle Project Office (VPO) within NRR is charged with coordination of the licensing and oversight activities for Vogtle Units 3 and 4 and facilitation of the safe transition of these units from construction to operation. Focusing solely on the Vogtle Units 3 and 4 project, VPO has demonstrated agility in decisionmaking and responding to technical and programmatic issues.

Highlights of the licensing and construction activities at Vogtle 3 and 4 during the reporting period include:

- The NRC published a notice of the licensee's intent to operate Vogtle 3 in the *Federal Register* on February 12, 2020, and announced the opportunity for the public to request a hearing on the licensee's conformance with acceptance criteria in the COL. The NRC received a petition for public hearing from Nuclear Watch South on April 20, 2020 (ADAMS Accession No. ML20111C447). The Commission denied the petition in a Memorandum and Order dated June 15, 2020 (ADAMS Accession No. ML20167A267).

- The NRC conducted a virtual public meeting to discuss the 2019 cROP annual assessment on April 21, 2020. The annual assessment letter and meeting summary can be found at ADAMS Accession Nos. ML20063L605 and ML20154K727, respectively.

- The NRC provided an information paper to the Commission describing planned changes to the baseline inspection program for the AP1000 reactor design on June 2, 2020 (ADAMS Accession No. ML20058F491).

- The NRC held a virtual public meeting to share the role and activities of the VRG on June 18, 2020 (ADAMS Accession No. ML20190A018).

- The NRC developed an AP1000 Transition Plan that details the current NRC plan for the transition of Vogtle Unit 3 from the cROP to the operating reactor oversight process on August 14, 2020 (ADAMS Accession Nos. ML20191A383 and ML20191A398).

- The NRC issued a memorandum to the Commission regarding the status of Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) closure, inspection, and licensing activities for Unit 3 on September 24, 2020 (ADAMS Accession No. ML20183A090).

- The NRC's Region II staff conducted mission critical onsite ITAAC, initial test program and operational program inspections, including the containment structural integrity and integrated leak rate tests.

- To date, all construction inspection findings for Vogtle Units 3 and 4 are of low safety significance, and the licensee has addressed these issues.

Vendor Inspections

The NRC staff uses the Vendor Inspection Program to confirm that reactor applicants and licensees are fulfilling their regulatory obligations to oversee the supply chain. The NRC staff conducts inspections to verify the implementation of vendor quality assurance programs to ensure the quality of materials, equipment, and services supplied to the commercial nuclear industry. These inspections ensure that vendors maintain an effective system for reporting defects under 10 CFR Part 21, "Reporting of defects and noncompliance," and verify the use of commercial-grade dedication programs for safety-related materials, equipment, and services. Other activities conducted by the vendor inspection staff include ensuring that counterfeit items are removed and prevented from use in safety-related applications, participating in international cooperation efforts and the development of industry consensus standards. Focus areas for new

reactors include integrated system validation for the control room simulators, digital instrumentation and control systems, modular fabrication, safety-related valves, and reactor coolant pumps. Focus areas for operating reactors includes replacement components, commercial-grade dedication, reverse engineering, software, and fuel fabrication.

For FY 2020, the NRC had planned to perform approximately 20 vendor inspections. However, in response to the COVID-19 PHE, the NRC halted all inspection activities at the vendor facilities in March 2020 and developed vendor inspection strategy modifications to adjust to travel restrictions and vendor facility access restrictions. The revised strategy considered the safety significance of the vendor activities to be inspected. In addition, the strategy considered the COVID-19 cases and exposure at the vendor facility, changes in testing schedules due to availability of vendor staff, availability of vendors to support inspections at their facility, social distancing controls in place at the vendor facility, an evaluation of the feasibility for a remote inspection and the absolute need to technically validate onsite activities. In July 2020, the NRC resumed limited scope vendor inspections, both remotely and at the vendors' facilities. As a result, NRC completed 14 out of 20 vendor inspections in FY 2020.

The NRC staff conducted its 7th Workshop on Vendor Oversight virtually from June 23 to June 25, 2020. The workshop included presentations on issues such as oversight of the supply chain under exigent conditions, industry guidance for commercial-grade dedication, 10 CFR Part 21 requirements and new guidance, Safety Culture and Safety Conscious Work Environment, critical manufacturing sector and how to qualify a supplier under the requirements of the ASME. The audience of approximately 500 represented companies and organizations from 15 countries including vendors, industry groups, government regulatory agencies, and both foreign and domestic utilities.

Operator Licensing

The NRC issues operator licenses to reactor operators and senior operators, and inspects operator licensing activities across a combination of regulatory requirements: initial licensing activities, including written examinations and operating tests, medical requirements, and eligibility; oversight of requalification examinations, simulator performance, and industry training accreditation; and enforcement of the conditions of operator licenses. In July 2020, the NRC's Region II office issued the first set of licenses to 62 operators at Vogtle 3.

The staff continued preparations for operator licensing activities for projects such as NuScale, including initial discussion on a knowledge and abilities catalog from which the licensing examinations are generated, and concept development on an examination process for future NuScale licensed operator applicants.

Non-Light-Water Reactors

The staff continues to make significant progress executing its vision and strategy for advanced reactor readiness and meeting the requirements in Section 103 of NEIMA. Recent accomplishments include:

- Issued Final Regulatory Guide (RG) 1.233, "Guidance for a Technology-Inclusive, Risk-Informed, and Performance-Based Methodology to Inform the Licensing Basis and Content of Applications for Licenses, Certifications, and Approvals for Non-Light- Water Reactors" (ADAMS Accession No. ML20091L698).

- Published proposed rule for emergency preparedness for small modular reactors and other new technologies in the *Federal Register* (ADAMS Accession No. ML20041C665).

- Developed proposed policy on population-related siting considerations for advanced reactors and issued SECY-20-0045, "Population Related Siting Considerations for Advanced Reactors," for Commission consideration (ADAMS Package No. ML19262H055).

- Issued rulemaking plan for technology-inclusive regulatory framework for optional use by applicants for new commercial advanced reactor licensees (ADAMS Accession No. ML19340A056), which was approved by the Commission in SRM-SECY-20-0032, "Rulemaking Plan on Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors" (ADAMS Accession No. ML20276A293).

- Issued Scoping Summary Report for the Advanced Nuclear Reactor Generic Environmental Impact Statement (GEIS) (ADAMS Accession No. ML20260H180). In response to stakeholder feedback, the staff is developing a plant parameter envelope that would better maximize the range of technologies that can reference the GEIS and largely eliminate the explicit reliance of power level for many areas within the environmental evaluation.

- Issued final safety evaluation approving Topical Report EPRI-AR-1, "Uranium Oxycarbide (UCO) Tristructural Isotropic (TRISO) Coated Particle Fuel Performance," (ADAMS Accession No. ML20216A323).

- Issued white paper with proposed fuel qualification methodology to provide guidance for non-LWR developers on qualification of fuel under NEIMA (ADAMS Accession No. ML20191A259).

- Issued report on non-LWR source terms guidance in "Risk-Informed, Performance-Based, Technology-Inclusive Regulatory Infrastructure: Technology-Inclusive Determination of Mechanistic Source Terms for Offsite Dose-Related Assessments for Advanced Nuclear Reactor Facilities" prepared by Idaho National Laboratory (ADAMS Accession No. ML20192A250).

- Developed guidance on fuel qualification criteria for Molten Salt Reactors by Oak Ridge National Laboratory (ADAMS Accession No. ML20197A257).

- Developed proposed Guidance for Preparing and Reviewing a Molten Salt Non-Power Reactor Application (ADAMS Accession No. ML20219A771).

- Developed report on technical and licensing considerations for micro-reactors by Sandia National Laboratory (SNL) (ADAMS Accession No. ML20156A101).

- Developed report on remote and autonomous operations of advanced reactors by SNL (ADAMS Accession No. ML20175A117).

- Developed guidance for the assessment of tritium and strategies for its detection and control in molten salt reactors and fluoride salt-cooled high temperature reactors prepared by Argonne National Laboratory (ADAMS Accession No. ML20157A155).

- Issued draft Non-LWR Code Assessment Report, Volume 4, describing the NRC's planned code development activities for a suite of radiation protection and dose assessment codes (ADAMS Accession No. ML20028F255).

- Held multiple meetings with stakeholders on non-LWR topics.

- Chaired two meetings of the Nuclear Energy Agency's Working Group on the Safety of Advanced Reactors

With regard to non-LWR licensing activities, on March 11, 2020, Oklo Power LLC, a subsidiary of Oklo Inc., submitted a COL application for the Aurora reactor design proposed to be constructed and operated at the Idaho National Laboratory. This is the first COL application for a non-LWR submitted to the NRC (ADAMS Accession No ML20075A000). The design is a non- LWR micro-reactor using metallic fuel to produce about 1.5 megawatts of electrical power. On June 5, 2020, the NRC issued a letter to Oklo (ADAMS Accession No. ML20149K616) indicating that the staff plans to complete the review in a two-step process.

As part of the first step, the NRC staff is engaging Oklo in public meetings, conducting regulatory audits, and issuing requests for additional information in order to reach an understanding on four key safety and design aspects of the Aurora licensing basis. These include: 1) the maximum credible accident analyses; 2) the classification of SSCs; 3) the applicability of particular NRC regulations to the Aurora design; and 4) the Quality Assurance Program scope. Once the first step is completed, the NRC staff will establish the review schedule for the full application.

The staff also continues to implement flexible and staged non-LWR regulatory review processes to engage with developers, including X-Energy, LLC, on its pebble bed, high-temperature gas-cooled reactor; Kairos Power on its pebble-fueled, molten-fluoride-cooled reactor; Terrestrial Energy on its molten salt, molten fuel reactor; and TerraPower on its sodium-cooled fast reactor. The staff also continued preapplication engagement with X-Energy, LLC, for a planned fuel fabrication facility to produce TRISO fuel.

Regulatory Infrastructure

The NRC continues to work on its regulatory infrastructure to meet its goals of improving the planning, licensing, and oversight of future new reactor applications; making timely and effective policy decisions; and updating regulatory guidance for large LWRs, small modular reactors, and non-LWRs. The NRC also continues to review its internal processes to ensure that the safety and environmental reviews are effective and efficient. As part of the NRC's commitment to openness, the staff continues to provide opportunities for external stakeholder input as part of the agency's processes. The agency also rigorously assesses licensing and oversight performance and uses the results to inform these regulatory infrastructure activities.

The previous section discussed infrastructure activities that are largely for non-LWRs. The sections below describe other infrastructure activities conducted during the reporting period.

Draft Regulatory Guide 1321

Draft regulatory guide (DG) 1321, "Guidance for Changes During Construction for New Nuclear Power Plants Licenses Under 10 CFR Part 52," reiterates 10 CFR 52.98(c) requirements for the

implementation of changes to the design of a facility under construction[9] under a COL. The staff issued DG-1321 for a 60-day public comment period in April 2020. The draft guidance proposes to retain discussion of the current regulatory requirements that licensees must meet before placing any SSCs into operation, but it proposes to provide additional flexibility for identified milestones for the notification of ITAAC closure. In addition, the draft guidance proposes to provide COL holders with options for meeting the regulations and the flexibility to construct SSCs in a plant that is being built without first obtaining a license amendment and any associated exemption. Furthermore, this draft guidance also proposes to harmonize the staff's treatment of changes to the design of a facility under construction under a COL with the staff's treatment of changes to the design of a facility operating under 10 CFR Part 50, "Domestic licensing of production and utilization facilities."

NUREG-0800

The NRC staff began an effort to revise NUREG-0800, "Standard Review Plan [SRP] for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition." The SRP is used to support the staff's reviews of applications for COLs, design certifications, and ESPs; limited work authorization requests; and license amendment requests. The SRP originally focused on large LWR design reviews. The NRC staff recognized the need to incorporate future small and large LWR applications into the NRC's licensing process. The SRP update will focus the staff's review on the regulatory requirements and associated acceptance criteria that determine whether there is reasonable assurance of adequate protection. In addition, the updated SRP will leverage the improved use of risk insights to inform the staff's review.

Environmental Guidance Updates

The NRC staff noticed issuance of Revision 3 of RG 4.2, "Preparation of Environmental Reports for Nuclear Power Stations," in the *Federal Register* on September 24, 2018. This was the first update to RG 4.2 since July 1976. The staff is currently evaluating a path forward for updating NUREG-1555, "Standard Review Plans for Environmental Reviews for Nuclear Power Plants: Environmental Standard Review Plan," last revised in July 2007. The proposed update will reflect changes in NRC policy and regulations and will incorporate streamlined processes based on experience gained through completed environmental reviews. The update will also reflect statutory and Executive Order direction, judicial developments, and agency administrative decisions, and will consider, as appropriate and in coordination with a potential NRC rulemaking, the new environmental regulations issued by the Council on Environmental Quality.

Given the extensive changes in the environmental review area, the NRC has paused its plan to publish a draft of the revised NUREG-1555 for public comment. In the interim, the NRC continues to conduct environmental reviews in accordance with current NRC regulations and applicable existing and interim staff guidance, while still considering best practices and lessons learned from past reviews.

[9] Construction, as defined in 10 CFR 50.10, "License required; limited work authorization," is, in part, the in-place assembly, erection, fabrication, or testing for specified SSCs.

X. Response to Lessons Learned from the Fukushima Dai-ichi Accident in Japan throughout the Second Half of Fiscal Year 2020

The NRC staff continues to make progress toward completing the regulatory actions undertaken after the accident at Fukushima Dai-ichi. Licensees have completed all safety improvements associated with the orders for mitigating strategies, spent fuel pool instrumentation, and severe-accident-capable hardened containment vent systems (HCVSs). All operating power reactors have reported compliance with these orders. The NRC has completed all the onsite inspections to verify licensees' compliance with the orders for mitigating strategies and spent fuel pool instrumentation and the final applicable sites informed the NRC that they are in full compliance with the HCVS order. The NRC has completed 14 onsite HCVS[10] inspections to date to verify compliance with the HCVS order.

The staff expects to complete two of the three remaining onsite HCVS inspections this year. The final HCVS inspection has been postponed until CY 2021 due to the ongoing COVID-19 PHE.

One year after the Fukushima Dai-ichi accident, the NRC issued a formal request for information under 10 CFR 50.54(f) to each operating power reactor licensee to reevaluate the potential seismic and flooding hazards at its site, using present-day methods and guidance, and to identify any actions planned or taken to address plant-specific vulnerabilities. Operating power reactor licensees had completed the assessments and submitted all required information (or have approved deferrals) associated with the 10 CFR 50.54(f) request. The NRC has completed its review of the seismic and flooding hazard information and determined that no additional regulatory action related to the seismic and flooding hazards are needed.

XI. Planned Rulemaking Activities

The attached report lists the status of NRC rulemaking activities as of October 5, 2020, including their priorities and schedules. Of the 86 rulemaking activities, 64 rulemakings are planned activities. The NRC is also reviewing 22 petitions for rulemaking. The 64 planned rulemaking activities include 8 proposals in response to industry requests, 17 that could reduce or clarify existing requirements, 23 that are required by statute or are needed to conform NRC regulations to other agency requirements or to international treaties or agreements, and 16 that could establish new requirements. The NRC uses a single tracking and reporting system to provide real-time updates on all NRC rulemaking activities. Members of the public can access the NRC's rulemaking activity information at https://www.nrc.gov/about-nrc/regulatory/rulemaking/rules-petitions.html.

At the time of publication, each proposed and final rule includes a statement that addresses actions taken to meet applicable backfitting and issue finality requirements, including which, if any, backfitting and issue finality requirements apply and how the NRC staff evaluated the rule with respect to those requirements.

[10] This order only applies to boiling-water reactors with Mark I or Mark II containment designs, for which there are 17 sites total.