



*Protecting People and the Environment*

---

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

**October 2021–March 2022**

Note: The period of performance covered by this report includes activities that occurred from the first day of October 2021 to the last day of March 2022. 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 .....	1
II.	Implementing Risk-Informed and Performance-Based Regulations.....	1
III.	Status of Issues Tracked in the Reactor Generic Issues Program .....	3
IV.	Licensing Actions and Other Licensing Tasks .....	4
V.	Status of License Renewal Activities .....	5
VI.	Summary of Reactor Enforcement Actions.....	6
VII.	Security and Emergency Preparedness and Incident Response Activities .....	11
VIII.	Power Uprates .....	13
IX.	New Reactor Licensing .....	13
X.	Response to Lessons Learned from the Fukushima Dai-ichi Accident in Japan .....	21
XI.	Planned Rulemaking Activities .....	22

## 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 determine the most effective use 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 NRC 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 2022. The NRC Web site reflects the latest power reactor plant performance assessments.

The NRC staff continues to implement the baseline inspection program and initial operator licensing examinations, while taking precautions recommended by the Centers for Disease Control and Prevention (CDC) to minimize exposure to COVID-19. The Office of Nuclear Reactor Regulation (NRR) issued guidance on implementation of inspection programs following re-entry from the public health emergency on November 2, 2021 (ADAMS Accession No. [ML21295A302](#)). The staff completed the baseline inspection program for Calendar Year (CY) 2021 and again has the goal of completing the nominal inspection sample sizes at all units for CY 2022.

The NRC staff conducted a Comprehensive Baseline Inspection Program Review as part of the annual ROP self-assessment process. The objective of the Comprehensive Baseline Inspection Program Review was to recommend revisions to the inspection program based on lessons learned from the COVID-19 pandemic. The review was completed in November 2021 and is documented in "Comprehensive Baseline Inspection Program Review – Calendar year 2021" (ADAMS Accession No. [ML21252A154](#)). The results of the review are being evaluated to identify whether there are any revisions to certain ROP inspection procedures.

The NRC began a follow-on review to the "Initial Report on Challenges, Lessons Learned and Best Practices from the 2020 COVID-19 Public Health Emergency – Focus on Regulatory Oversight of Operating Nuclear Reactors (ADAMS Accession No. [ML20308A389](#)). The initial report was internally focused and, although some recommended actions are still open, the agency recognized that, a follow-on review would be needed and should include outreach to licensees and other stakeholders. The follow-on review began in November 2021 with the issuance of the charter (ADAMS Accession No. [ML21322A259](#)) and is scheduled to be complete in August 2022. Also during this reporting period, the NRC issued the NRR operating reactor licensing COVID-19 coordination team initial lessons learned report (ADAMS Accession No. [ML21252A070](#)). This report highlights actions that contributed to the effectiveness of program implementation and enhancements for future activities. The NRC will continue to adapt to the pandemic by modernizing processes and tools while engaging the industry to identify potential regulatory relief needs.

## II. Implementing Risk-Informed and Performance-Based Regulations

In 1995, the NRC issued the Probabilistic Risk Assessment (PRA) Policy Statement in the *Federal Register* ([60 FR 42622](#)), which formalized the Commission's commitment to risk-informed regulation through the expanded use of PRA. The use of PRA in regulatory decision-making 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 industry has communicated plans to continue to submit applications for adoption of Title 10 of the *Code of Federal Regulations* (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 32 applications to adopt 10 CFR 50.69. The NRC staff has approved 26 applications and is currently reviewing the remaining 6 applications. The NRC anticipates completing the review of the 6 remaining applications by the end of fiscal year (FY) 2022.

The industry also continues to communicate 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 27 applications to adopt RITS Initiative 4b. The NRC staff has approved 17 applications, is currently reviewing the remaining 10 applications, and anticipates receiving an additional 7 applications by the end of FY 2022.

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 including on topics such as 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. The industry has indicated that it plans to incorporate lessons learned associated with the treatment of FLEX in licensing and oversight into appropriate guidance documents.

In June 2020, the NRC staff issued enhanced guidance associated with the use of risk insights in the review of licensing actions, “Integrated Risk-Informed Decision-Making for Licensing Reviews” (ADAMS Accession No. [ML19263A645](#)). The objective of the enhanced guidance is to more effectively support the NRC staff in considering risk insights in licensing reviews through the establishment of integrated review teams, where risk analysts work together with traditional deterministic reviewers to complete these technical evaluations. The enhanced guidance also provides Risk-Informed Decision-Making (RIDM) implementation guidance to technical reviewers as well as other resources to support these reviews. The staff has been promoting greater awareness and use of this guidance to educate the staff on applying the guidance to risk-inform safety evaluations of licensing actions. Improved tracking of the use of risk insights for license amendment reviews has been implemented within an existing agency-wide tool. These efforts are expected to result in greater consistency and transparency in the staff’s use of risk insights as part of the basis for reaching regulatory decisions and making safety conclusions. A report summarizing NRC staff’s efforts to increase the use of RIDM and provide recommendations for the

next phase of implementation was issued on March 30, 2022 (ADAMS Accession No. [ML22090A108](#)).

The Very Low Safety Significance Issue Resolution (VLSSIR) process, implemented in January 2020, is a framework to review, assess, and disposition issues of very low safety significance that are not clearly within a plant's licensing basis. This is discussed in "Results of a Calendar Year 2020 Reactor Oversight Process Self-Assessment Effectiveness Review of the Very Low Safety Significance Issue Resolution Process," dated March 2, 2021 (ADAMS Accession No. [ML21070A334](#)), which documented the results of the CY 2020 VLSSIR self-assessment effectiveness review. The process is used regularly and resulted in the closure of four issues in CY 2021.

As part of the VLSSIR initiative, the NRC also developed the Risk-Informed Process for Evaluations (RIPE) to resolve very low safety significance compliance issues commensurate with their risk significance using existing regulations under 10 CFR 50.12 or 10 CFR 50.90 and risk information. RIPE guidance was approved for use on January 7, 2021 (ADAMS Accession No. [ML21006A324](#)). If a licensee elects to use RIPE to resolve a non-compliance issue, it would characterize the risk associated with the proposed exemption or amendment and submit a request to the NRC for approval. If the conditions described in the RIPE guidance are met, then the NRC would apply a streamlined process to review the request. To utilize RIPE, a licensee must demonstrate that it has a robust process for assessing risk of the plant and evaluating the other key risk-informed decision-making principles of defense-in-depth and safety margins. Licensees can use RIPE to justify plant-specific licensing requests without being unduly burdensome. RIPE was expanded on June 30, 2021, to allow licensees with additional approved risk-informed initiatives to use the process (ADAMS Accession No. [ML21180A011](#)).

On January 14, 2022, Arizona Public Service Company (APS) submitted a request for an exemption from 10 CFR 50.62(c)(1) to remove the Diverse Auxiliary Feedwater Actuation System from the Palo Verde licensing basis for all three units. This was the first application submitted by a licensee using the NRC's RIPE. The NRC issued an exemption to APS on March 23, 2022 (ADAMS Accession No. [ML22054A004](#)). Consistent with the RIPE streamlined review process, the staff successfully completed its review ahead of its timeliness goal of 13 weeks. The staff continues to evaluate other opportunities to use risk insights for very low safety significant issues, such as expanding the use of RIPE to include technical specification license amendment requests. The staff plans to issue updated guidance to reflect this expansion by June 2022.

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

#### *Emergency Diesel Generator Protective Trips Being Bypassed During LOOP Conditions*

On February 7, 2022, an NRC staff member submitted a concern related to the bypass of mechanical and electrical protective trip functions during loss of offsite power (LOOP) conditions for emergency diesel generators at nuclear power plants. In accordance with the GI Program, the staff completed an evaluation and determined that there is no immediate safety concern. The staff will now apply the criteria of the GI program to assess the suitability of it to address the concern. These determinations are expected to be completed by May 2022. Should the issue exit the GI Program, the possible outcomes include: no action, further research, transfer to appropriate regulatory programs, or possible industry initiative.

The NRC provides information on the status of open GIs at <https://www.nrc.gov/about-nrc/regulatory/gen-issues/dashboard.html>.

#### **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 licensees' responses to NRC requests for information through generic letters or bulletins, NRC review of generic topical reports, and other licensee actions or reports that do not require NRC review and approval before licensees can carry them out.

For FY 2022, the indicators related to the age of the inventory of licensing actions and the age of the inventory of other licensing tasks were discontinued, but the indicator for timely completion of final safety evaluations by the generic milestone date introduced in FY 2021 was retained. In FY 2022, two new performance indicators were also added, specifically the percentage of reviews completed within resource estimates and the average percentage of time allotted used in the established schedule. These performance indicators are applicable to 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.

Table 1 shows the actual FY 2019 through FY 2022 results to date and the FY 2022 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 2022 Goals for the NRC’s Congressional Budget  
Justification Performance Indicators**

<b>Output Measure</b>	<b>FY 2019 Actual</b>	<b>FY 2020 Actual</b>	<b>FY 2021 Actual</b>	<b>FY 2022 Current</b>	<b>FY 2022 Goal</b>
<b>Licensing Actions</b>	847	Discontinued	Not Applicable	Not Applicable	Not Applicable
<b>Age of inventory of licensing actions</b>	95% ≤1 year 100% ≤2 year	99% ≤1 year 100% ≤2 year	100% ≤2 year	Discontinued	Discontinued
<b>Other licensing tasks completed per year</b>	337	Discontinued	Not Applicable	Not Applicable	Not Applicable
<b>Age of inventory of other licensing tasks</b>	98% ≤1 year 100% ≤2 year	96% ≤1 year 100% ≤2 year	97% ≤2 year	Discontinued	Discontinued
<b>Timely completion of final safety evaluations</b>	Not Applicable	Not Applicable	100% ≤24 months	99% ≤24 months <sup>1</sup>	100% ≤24 months
<b>Average Percentage of Time Allotted Used in the Established Schedule</b>	Not Applicable	Not Applicable	Not Applicable	83.75%	≤115 or ≥75
<b>Percentage of Reviews Completed within Resource Estimates</b>	Not Applicable	Not Applicable	Not Applicable	96.8%	80%

During this reporting period, the NRC staff completed 18 licensing actions for both power and non-power reactors related to the COVID-19 pandemic, with an average completion time of 5 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 provide reasonable assurance of adequate protection of public health and safety. The NRC continues to evaluate and document lessons learned to identify long-term improvements to oversight and licensing programs.

**V. Status of License Renewal Activities**

The staff did not complete its review of any initial license renewal applications during this reporting period.

On February 22, 2022, the Commission issued orders CLI-22-02, CLI-22-03, and CLI-22-04 (ADAMS Accession Nos. [ML22055A496](#), [ML22055A533](#), [ML22055A557](#), respectively) regarding the agency’s National Environmental Policy Act review of subsequent license renewal (SLR)

<sup>1</sup> To date in FY 2022, one final safety evaluation was not issued within the NRC’s established generic milestone schedule due to a delay in the applicant’s response to NRC’s request for additional information.

applications. Also on February 22, 2022, the Commission issued SRM-SECY-21-0066 “Rulemaking Plan for Renewing Nuclear Power Plant Operating Licenses – Environmental Review” (ADAMS Accession No. [ML22053A308](#)), directing the staff to develop a rulemaking plan that aligns with the Commission orders. In the SRM, the Commission directed the staff to develop two new rulemaking plans (1) to fully evaluate the environmental impacts of reactor SLR in NUREG-1437 (License Renewal Generic Environmental Impact Statement (GEIS)) within 30 days; and (2) address the 10-year License Renewal GEIS review cycle within 60 days, respectively.

On March 25, 2022, the staff provided to the Commission for its consideration SECY-22-0024, “Rulemaking Plan for Renewing Nuclear Power Plant Operating Licenses – Environmental Review” (ADAMS Accession No. [ML22062B592](#)), which recommended that a dedicated team of staff complete the rulemaking within two years. This proposed rule would remove the word “initial” from 10 CFR 51.53(c)(3) and revise the License Renewal GEIS, Table B–1, and associated guidance to apply to one 20-year term of SLR. Just after the end of the reporting period, the Commission issued a Staff Requirements Memorandum to the NRC staff on April 5, 2022 (ADAMS Accession No. [ML22096A035](#)) approving the staff’s recommendations, and directing the staff to continue to seek opportunities to accelerate the schedule, working as efficiently as possible while still maintaining the integrity of the review.

## **VI. Summary of Reactor Enforcement Actions**

The reactor enforcement statistics in the tables below are arranged by region, half FY, FY, and two previous FYs for comparison purposes. These tables provide the non-escalated 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 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 Non-escalated Reactor Enforcement Actions\***

<b>NON-ESCALATED REACTOR ENFORCEMENT ACTIONS</b>						
		Region I	Region II	Region III	Region IV	TOTAL
Cited Severity Level IV or Green	1 <sup>st</sup> Half FY 22	0	3	0	2	5
	2 <sup>nd</sup> Half FY 22	0	0	0	0	0
	FY 22 YTD Total	0	3	0	2	5
	FY 21 Total	0	6	0	4	10
	FY 20 Total	2	4	0	1	7
Non-cited Severity Level IV or Green	1 <sup>st</sup> Half FY 22	46	24	34	36	140
	2 <sup>nd</sup> Half FY 22	0	0	0	0	0
	FY 22 YTD Total	46	24	34	36	140
	FY 21 Total	48	53	39	78	218
	FY 20 Total	52	46	62	108	268
<b>TOTAL Cited and Non-cited Severity Level IV or Green</b>	1 <sup>st</sup> Half FY 22	46	27	34	38	145
	2 <sup>nd</sup> Half FY 22	0	0	0	0	0
	FY 22 YTD Total	46	27	34	38	145
	FY 21 Total	48	59	39	82	228
	FY 20 Total	54	50	62	109	275

\* The non-escalated enforcement data reflect the cited and non-cited 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\***

<b>ESCALATED REACTOR ENFORCEMENT ACTIONS ASSOCIATED WITH TRADITIONAL ENFORCEMENT</b>						
		Region	Region	Region	Region	TOTAL
Severity Level I	1 <sup>st</sup> Half FY 22	0	0	0	0	0
	2 <sup>nd</sup> Half FY 22	0	0	0	0	0
	FY 22 YTD Total	0	0	0	0	0
	FY 21 Total	0	0	0	0	0
	FY 20 Total	0	2	0	0	2
Severity Level II	1 <sup>st</sup> Half FY 22	0	0	0	0	0
	2 <sup>nd</sup> Half FY 22	0	0	0	0	0
	FY 22 YTD Total	0	0	0	0	0
	FY 21 Total	0	1	0	0	1
	FY 20 Total	0	2	0	0	2
Severity Level III	1 <sup>st</sup> Half FY 22	0	1	0	1	2
	2 <sup>nd</sup> Half FY 22	0	0	0	0	0
	FY 22 YTD Total	0	1	0	1	2
	FY 21 Total	0	4	0	4	8
	FY 20 Total	0	1	0	1	2
<b>TOTAL Violations Cited at Severity Level I, II, or III</b>	1 <sup>st</sup> Half FY 22	0	1	0	1	2
	2 <sup>nd</sup> Half FY 22	0	0	0	0	0
	FY 22 YTD Total	0	1	0	1	2
	FY 21 Total	0	5	0	4	9
	FY 20 Total	0	5	0	1	6

\* 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\***

<b>ESCALATED REACTOR ENFORCEMENT ACTIONS ASSOCIATED WITH THE REACTOR OVERSIGHT PROCESS</b>						
		Region I	Region II	Region III	Region IV	TOTAL
Violations Related to Red Findings	1 <sup>st</sup> Half FY 22	0	0	0	0	0
	2 <sup>nd</sup> Half FY 22	0	0	0	0	0
	FY 22 YTD	0	0	0	0	0
	FY 21 Total	0	0	0	0	0
	FY 20 Total	0	0	0	0	0
Violations Related to Yellow Findings	1 <sup>st</sup> Half FY 22	0	0	0	0	0
	2 <sup>nd</sup> Half FY 22	0	0	0	0	0
	FY 22 YTD	0	0	0	0	0
	FY 21 Total	0	0	0	0	0
	FY 20 Total	0	0	0	0	0
Violations Related to White Findings	1 <sup>st</sup> Half FY 22	0	2	1	0	3
	2 <sup>nd</sup> Half FY 22	0	0	0	0	0
	FY 22 YTD	0	2	1	0	3
	FY 21 Total	1	0	0	0	1
	FY 20 Total	0	2	0	0	2
<b>TOTAL Related to Red, Yellow, or White Findings</b>	1 <sup>st</sup> Half FY 22	0	2	1	0	3
	2 <sup>nd</sup> Half FY 22	0	0	0	0	0
	FY 22 YTD	0	2	1	0	3
	FY 21 Total	1	0	0	0	1
	FY 20 Total	0	2	0	0	2

\* 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 and may not reflect security violations, which are considered official use only.

**Reactor Escalated Enforcement Actions and Other Significant Actions**

*Energy Harbor Nuclear Corporation (Davis-Besse Nuclear Power Station) EA-21-155*

On March 1, 2022, the NRC issued a notice of violation associated with a White Significance Determination Process finding to Energy Harbor Nuclear Corporation (licensee) Davis-Besse Nuclear Power Station. The White finding, an issue of low to moderate safety significance, involved the licensee’s failure to establish the required voltage specifications for emergency diesel generator (EDG) speed control switches as required by 10 CFR Part 50, Appendix B,

Criterion III, "Design Control." As a result, on May 27, 2021, the Division 1 EDG failed to reach required voltage and frequency during surveillance testing.

*Energy Harbor Nuclear Corporation (Davis-Besse Nuclear Power Station) EA-21-105*

On January 31, 2022, the NRC issued a notice of violation to Energy Harbor Nuclear Corporation, for a violation associated with a Greater-than-Green Significance Determination Process finding at the Davis-Besse Nuclear Power Station. The details of the finding are official use only – security-related information.

*Holtec Decommissioning International, LLC (Oyster Creek Nuclear Station) EA-21-041*

On January 26, 2022, the NRC issued a confirmatory order (CO) to Holtec Decommissioning International, LLC (HDI) memorializing commitments reached during an alternative dispute resolution (ADR) mediation session held on October 14, 2021. The ADR session was associated with apparent violations of 10 CFR Part 73, Appendix B, Criterion VI.G, "Weapons, Personal Equipment, and Maintenance," and 10 CFR 50.9, "Completeness and Accuracy of Information." The apparent violations involved a (now-former) training superintendent at Oyster Creek Nuclear Generating Station, who was also responsible for performing armorer duties, who deliberately failed to perform firearms maintenance activities and falsified records related to those activities. As a result of the CO, HDI agreed to complete wide-ranging corrective actions (CA) and enhancements that are expected to improve the security program. In consideration of the CA and commitments described in the CO, the NRC agreed to (1) reduce the civil penalty to \$50,000.00, (2) not issue a separate notice of violation in addition to the CO, and (3) not consider the issuance of the CO as escalated enforcement for future civil penalty assessment purposes consistent with the NRC Enforcement Policy.

*Southern Nuclear Operating Company (Vogtle Electric Generating Plant, Units 1 and 2) EA-21-026*

On January 4, 2022, the NRC issued a Severity Level III notice of violation to Southern Nuclear Operating Company's Vogtle Electric Generating Plant, Units 1 and 2, for a violation of 10 CFR Parts 50.9(a) and 55.27 for the failure to maintain complete and accurate medical qualification records for a senior reactor operator.

*Holtec Decommissioning International, LLC (Oyster Creek Nuclear Station) EA-21-093*

On December 21, 2021, a notice of violation with a civil penalty was issued to Holtec Decommissioning International, LLC, for violations of NRC requirements at the Oyster Creek Nuclear Generating Station that resulted in an escalated enforcement action. The details of the circumstances related to the escalated enforcement action are official use only – security-related information.

*Entergy Operations, Inc. (Grand Gulf Nuclear Station) EA-20-125*

On December 15, 2021, the NRC issued a Severity Level III notice of violation of 10 CFR 50.120 requirements to Entergy Operations, Inc. (Grand Gulf 1) for an exam proctor willfully providing inappropriate assistance to engineering students during the administration of engineering support qualification examinations.

On November 17, 2021, the NRC issued a notice of violation associated with two White Significance Determination Process findings to the Southern Nuclear Operating Company's (SNC) Vogtle Electric Generating Plant, Unit 3. In one finding SNC failed to (1) promptly identify and correct conditions adverse to quality associated with Class 1E cables and related raceways; (2) promptly identify widespread deficiencies in installation of seismic supports and structural components; and (3) correct these issues in a timely manner as required by 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action." In the other finding SNC failed to provide the required separation between Class 1E and non-Class 1E division cables for several reactor trip switchgear and reactor coolant pump switchgear cabinets as required by 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," and specification APP-G1-V8-01, Section B2, "Separation and Segregation Spacing Requirements."

## **VII. Security and Emergency Preparedness and Incident Response Activities**

The NRC continues to maintain an appropriate regulatory infrastructure to provide reasonable assurance of adequate protection of public health and safety and to 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.

### Physical 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 of 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 pandemic, 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" (ADAMS Accession No. ML21019A452).<sup>2</sup> The NRC implemented this IP during CY 2020 to allow the conduct of limited-scope inspections of operating reactor licensees during the special circumstances associated with the pandemic.

For CY 2021, the NRC developed another option that modified the pre-pandemic FOF procedure to minimize COVID-19 exposure by adding interim guidance to IP 71130.03, "Contingency Response – Force-on-Force Testing" (ADAMS Accession No. ML21012A329).<sup>3</sup> This interim guidance has been in use since its issuance on February 8, 2021. This interim guidance places

---

<sup>2</sup> This document is not publicly available.

<sup>3</sup> This document is not publicly available.

an emphasis on safety protocols related to COVID-19 mitigation measures and involves only the minimum resources for both the licensee and the NRC in conducting the inspection activity. Building on the information gained from the implementation of IP 92707 in CY 2020, the staff revised IP 92707 to add elements that allow the inspection to satisfy the contingency response attributes of the baseline inspection program. The NRC developed temporary staff guidance, TSG-NSIR-2021-01, “Additional Guidance for Force-on-Force Inspections During the Public Health Emergency,” issued on February 26, 2021 (ADAMS Accession No. [ML21043A259](#)), to provide a consistent methodology to evaluate hardship conditions associated with COVID-19 at licensee sites. NRC staff used the temporary staff guidance to approve four hardship requests for IP 92707 inspections in July and August 2021 because of surges in COVID-19 infection rates.

Starting in CY 2022, the NRC staff reimplemented the full IP 71130.03 “Contingency Response – Force-on-Force Testing,” for licensees that are not experiencing adverse COVID conditions and can safely conduct full FOF exercises. The staff is maintaining the CY 2021 interim guidance in IP 71130.03 and IP 92707 as tiered measures for FOF inspections if the licensee’s on-site COVID conditions prevent the conduct of full FOF exercises.

### 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. In conjunction, the NRC has developed an oversight program for power reactor cyber security that includes an inspection program, inspector training, and a process for evaluating the significance of inspection findings.

In June 2021, the agency completed the cyber security program full implementation inspections of all operating nuclear power plant licensees. The inspections at 63 sites verified that the facilities had fully implemented their cyber security requirements. In February 2022, the staff began inspecting licensees’ maintenance of implemented cyber security programs at their facilities as part of the Reactor Oversight Process using IP 71130.10, “Cybersecurity” (ADAMS Accession No. [ML21271A106](#)) to ensure continued compliance.

In February 2022, the agency issued a draft Regulatory Guide (RG) 5.71 Revision 1, “Cyber Security Programs For Nuclear Power Reactors,” (i.e., DG-5061, Rev. 1) (ADAMS Accession No. [ML21095A329](#)) to solicit public comment. This RG provides an approach that the NRC staff considers acceptable for complying with the requirements in 10 CFR 73.54. The RG 5.71 revisions are intended to reflect the lessons learned from the cyber security program implementation including guidance for implementing a risk-informed cyber security program.

### Emergency Preparedness and Incident Response

On May 12, 2020, the NRC staff published for public comment a proposed rule and draft regulatory guidance on emergency preparedness (EP) for small modular reactors and other new technologies ([92 FR 28436](#)). The NRC staff provided the draft final rule to the Commission for its consideration on January 3, 2022 (ADAMS Accession No. [ML21200A055](#)).

During the COVID-19 pandemic, the NRC issued guidance and granted exemptions from certain EP regulations. From October 2021 to March 2022, the NRC staff granted seven

exemptions to defer onsite and/or offsite biennial EP exercises.

## VIII. Power Uprates

Since the 1970s, licensees have applied for and implemented power uprates to increase the output of their plants. The NRC staff has reviewed and approved 170 power uprates to date. Existing plants have gained approximately 24,089 megawatts thermal (MWth) or 8,030 megawatts electric in electric generating capacity (the equivalent of about eight large nuclear power plant units) through power uprates. During this reporting period, one power uprate for Millstone Power Station, Unit 3 was approved by the NRC staff (ADAMS Accession No. [ML21262A001](#)). The NRC currently has no power uprate applications under review.

## 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.

### Design Certification Reviews

#### *NuScale Power, LLC, Small Modular Reactor Design Certification Application*

The NRC staff completed the final SER on August 28, 2020 (ADAMS Accession No. [ML20023A318](#)), and issued a standard design approval to NuScale Power, LLC, on September 11, 2020 (ADAMS Accession No. [ML20247J564](#)). On January 14, 2021 (ADAMS Accession No. [ML19353A003](#)), the staff provided to the Commission for its consideration a draft proposed rule that would propose certifying the design. On May 6, 2021, the Commission approved the publication of the proposed rule (ADAMS Package No. [ML21126A153](#)). The NRC published the proposed rule on July 1, 2021 ([86 FR 34999](#)), for public comment. During the public comment period, the staff received a request to extend the public comment period for the proposed rule by an additional 90 days (ADAMS Accession No. [ML21209A763](#)). The NRC evaluated this request and subsequently extended the public comment period by an additional 45 days to allow more time for members of the public to develop and submit their comments; the public comment period closed on October 14, 2021 ([86 FR 47251](#)). The NRC staff was scheduled to provide the draft final rule to the Commission for consideration in March 2022. However, due to additional time needed to resolve technical comments, the schedule for providing the draft final rule to the Commission is being revised.

### Construction Oversight under 10 CFR Part 52

As a result of the COVID-19 pandemic and the dynamic nature of the Vogtle construction project, the licensee altered its public target schedule. The licensee now projects the start of commercial operations for Vogtle Unit 3 in the fourth quarter of FY 2022 or the first quarter of FY 2023. The licensee projects Vogtle Unit 4 would begin commercial operations in the third or fourth quarter of FY 2023. The NRC staff continues to engage in construction oversight and licensing activities, and the revised target schedule has not impacted the agency's ability to conduct timely inspections and licensing reviews. Consistent with its plan to make a 10 CFR 52.103(g) finding (i.e., the finding to confirm whether all inspections, tests, analyses, and acceptance criteria

(ITAAC) have been successfully completed), the NRC's Vogtle Readiness Group (VRG) continues to meet monthly 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.

During this reporting period, the NRC staff focused on the licensee's response to quality issues, in particular those associated with installation of electrical components. The NRC staff issued two White findings, which are of low to moderate safety significance, in a letter dated November 17, 2021 (ADAMS Accession No. [ML21312A412](#)). The first White finding was for the failure to identify and correct conditions adverse to quality for the installation of safety-related cables and associated raceways. The second White finding was for the failure to adequately separate safety-related electrical systems. The NRC staff conducted a supplemental inspection in March 2022 to ensure that SNC had taken adequate corrective actions to resolve those issues. On April 19, 2022 (ADAMS Accession No. [ML22108A153](#)), the NRC staff documented the results of that inspection in a publicly available report and determined that SNC's completed or planned corrective actions were sufficient to address and preclude repetition of the performance issues and closed the White findings.

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. Plant assessments and the latest cROP information are publicly available on the NRC's website at <https://www.nrc.gov/reactors/new-reactors/oversight/crop.html>.

Other highlights related to licensing and construction activities at Vogtle Units 3 and 4 during the reporting period include:

- The NRC published a notice of the licensee's intent to operate Vogtle Unit 4 in the *Federal Register*, announcing the opportunity for the public to request a hearing on the licensee's conformance with acceptance criteria in the combined license (COL) ([87 FR 5851](#)). The opportunity to request a hearing closed on April 4, 2022; no petitions were filed.
- The NRC approved an alternative to the American Society of Mechanical Engineers Code associated with remediation of supports that had been inappropriately welded to the Unit 3 containment vessel (ADAMS Accession No. [ML21203A317](#)).
- The NRC issued a license amendment to revise certain ITAAC associated with inspection of components that cannot be placed in their final location until after fuel is loaded into the core (ADAMS Accession No. [ML21237A205](#)).
- The NRC issued an exemption to enable 72 Vogtle Unit 3 licensed reactors operators who have already successfully completed a written examination and an operating test on a standard AP1000 plant, to obtain their licenses for Unit 4 without the need for an additional written examination or operating test (ADAMS Accession No. [ML21279A185](#)).
- The NRC issued an exemption to allow the licensee to implement physical protection and personnel access authorization requirements after the 10 CFR 52.103(g) finding, but prior to initial fuel load (ADAMS Accession No. [ML21320A041](#)).
- The NRC issued an exemption to allow the licensee to establish the full fitness for duty program after the 10 CFR 52.103(g) finding, but prior to initial fuel load (ADAMS Accession



No. [ML21334A417](#)).

- The NRC staff conducted mission critical onsite ITAAC, initial test program, and operational program inspections, including inspections related to spent fuel pool construction, electrical raceway installation, equipment qualification, and fire protection.
- On December 2, 2021, the NRC staff held a public meeting to discuss Vogtle Readiness Group activities (ADAMS Accession No. [ML21337A003](#)).

### 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, participation in international cooperation efforts, and the development of industry consensus standards. Focus areas for operating reactors include replacement components, commercial-grade dedication, reverse engineering, software, digital instrumentation and control systems, and fuel fabrication.

For FY 2022, the NRC plans to perform approximately 20 vendor inspections. During this reporting period, the NRC continued to perform vendor inspections both virtually and onsite based on local conditions and vendor facility access restrictions while taking precautions recommended by the CDC to minimize exposure to COVID-19. As such, the NRC uses a vendor inspection modification strategy to plan upcoming inspection activities that consider the safety significance of the vendor activities to be inspected. Additionally, the strategy considers the COVID-19 cases and transmission rate at the vendor facility, changes in component 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 need to technically validate onsite activities.

In addition to conducting vendor inspections, the NRC staff is planning its virtual 8th biennial Regulatory Workshop on Vendor Oversight, which is tentatively scheduled on June 1-2, 2022. The purpose of the workshop is to engage the nuclear industry on the NRC's vendor inspection and quality assurance activities to foster communication between the NRC and the nuclear industry, discuss any current issues of importance to the nuclear industry, and provide guidance and clarification, as necessary. Preliminary topics include issuance or revision of a generic communication or regulatory guidance and inspection findings and safety evaluation reports that may be of generic interest to the nuclear industry. The NRC has also solicited input for topics from external stakeholders.

On February 9, 2022, the Office of the Inspector General (OIG) published OIG Case No. 20-022, "Special Inquiry into Counterfeit, Fraudulent, and Suspect Items in Operating Nuclear Power Plants" (ADAMS Accession No. [ML22040A111](#)) and OIG-22-A-06, "Audit of the Nuclear Regulatory Commission's Oversight of Counterfeit, Fraudulent, and Suspect Items at Nuclear Power Reactors," dated February 9, 2022 (ADAMS Accession No. [ML22040A058](#)). On March 4, 2022, the staff completed a review of the information presented in the OIG reports and determined that there is no evidence that counterfeit, fraudulent, and suspect items (CFSIs) have

adversely challenged the safety of reactor facilities; that defense-in-depth measures at reactor facilities are adequate to mitigate potential failures introduced by CFSIs; and that failures introduced from any potential CFSIs in systems, structures, and components would have an overall small increase in risk, minimal impact of safety margin, and negligible impact to the public health and safety (ADAMS Accession No. [ML22060A153](#)). On April 4, 2022, the NRC completed an additional assessment and determined that the NRC's regulatory framework which incorporates risk-informed approaches and defense-in-depth principles, and the implementation of a comprehensive oversight program provides confidence that licensees and certificate of compliance holders have adequately prevented or mitigated risks posed by CFSI (ADAMS Accession No. [ML22080A111](#)). Some aspects of the OIG reports provided opportunities for the agency to make improvements to the implementation of existing programs and processes. Most of these proposed enhancements are encompassed by the actions already planned and underway as described in the staff's response (ADAMS Accession No. [ML22077A775](#)) to OIG-22-A-06.

### Operator Licensing

The NRC staff continued preparations for operator licensing activities involving advanced reactors as part of the development of the risk-informed, technology-inclusive regulatory framework for advanced reactors associated with 10 CFR Part 53 rulemaking. The staff introduced stakeholders to a technology-inclusive operator licensing approach where examination scope and testing methods could be tailored to a specific advanced reactor design based on the role of operators. The staff is also working with Idaho National Laboratory to assist in developing guidance for examinations that would be administered to operator applicants at advanced reactors that provides flexibility and incorporates comprehensive testing and competency assessment principles.

On February 2, 2022, the NRC staff briefed the Advisory Committee on Reactor Safeguards (ACRS) Full Committee on the 10 CFR Part 53 preliminary rule language in Subpart F related to staffing, personnel qualifications, training, and human factors. The ACRS wrote a letter report on this topic with five conclusions and recommendations (ADAMS Accession No. [ML22040A361](#)). The ACRS recommended that applicants justify why a Shift Technical Advisor (STA) is not needed on a case-by-case basis rather than include a blanket elimination of the position in the rulemaking, and that the NRC staff not pursue the concept of non-licensed, certified operators. In response to this letter, the NRC staff stated, in part, that it agrees that a blanket elimination of STA-level capabilities on shift is not prudent and intends to add a performance-based requirement in the preliminary proposed 10 CFR Part 53 rule language for adequate engineering expertise to be available to operating personnel, and that the staff continues to evaluate a range of options and criteria to determine appropriate operator qualification, training, and licensing (ADAMS Accession No. [ML22063A012](#)). In March 2022, the staff held a workshop for sharing best practices in testing and examination development for qualifying workers to perform jobs that can significantly affect public safety. Participants from multiple government agencies, academia, and a variety of industries, both within the U.S. and internationally, attended.

### 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. The staff issued SECY-22-0018, "Advanced Reactor Program Status," on January 31, 2022 (ADAMS Accession No. [ML21337A377](#)). This information paper provides the status of the staff's activities related to advanced reactors and describes the path forward on its advanced reactor licensing and

readiness activities such as the resolution of key technology-inclusive policy issues, development of risk-informed and performance-based licensing approaches, and interactions with prospective applicants and other stakeholders. Additional information on the status of advanced reactor readiness and activities is available on the NRC's public Web site at <https://www.nrc.gov/reactors/new-reactors/advanced.html>.

Consistent with NEIMA Section 103(a)(4), the staff is prioritizing a rulemaking to establish a technology-inclusive, risk-informed, and performance-based regulatory framework and associated guidance for advanced reactors. This rulemaking would create 10 CFR Part 53, "Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors." The staff is continuing extensive stakeholder engagement, including holding public meetings to engage stakeholders and the ACRS in the development of a draft proposed rule. The staff is implementing a novel approach of releasing preliminary proposed rule language to facilitate public discussion. The staff has received a diverse set of stakeholder views that are being considered in the development of the proposed rule. The staff is planning to provide the proposed and final rules to the Commission on a schedule that would allow for publication of the final rule significantly ahead of the NEIMA deadline of December 2027.

Other recent accomplishments include:

- The NRC staff continued to hold periodic public meetings with stakeholders on numerous non-LWR topics.
- The NRC staff made public a preliminary draft version of RG 1.247 on the acceptability of non-LWR probabilistic risk assessments and presented it to the Advisory Committee on Reactor Safeguards (ACRS) (ADAMS Accession No. [ML21246A216](#)).
- The NRC staff issued a scalable human factors engineering technical review strategy report by Brookhaven National Laboratory (under contract with the NRC) (ADAMS Accession No. [ML21287A088](#)).
- The NRC staff issued several draft white papers on specific chapters or topics of information to be included in an advanced reactor application to support the Advanced Reactor Content of Application (ARCAP) (ADAMS Accession Nos. [ML21294A266](#) and [ML21309A020](#)).
- The NRC staff issued an updated draft white paper on the ARCAP guidance regarding the content of an advanced reactor application and a roadmap to support NRC staff review (ADAMS Accession No. [ML21336A702](#)).
- The NRC staff issued an updated draft white paper regarding use of the industry-led Technology-inclusive Content of Application Project (TICAP) guidance to inform specific portions of the safety analysis report included as part of an advanced reactor license application (ADAMS Accession No. [ML21336A697](#)).
- The NRC staff issued a final safety evaluation for Kairos' topical report on quality assurance (ADAMS Accession No. [ML21308A599](#)).
- The NRC staff issued a final safety evaluation to TerraPower for its topical report on quality assurance program description (ADAMS Accession No. [ML22018A301](#)).

- The NRC staff issued consolidated preliminary proposed rule language for 10 CFR Part 53 technical requirements (ADAMS Accession No. [ML22024A066](#)).
- The NRC staff issued a final safety evaluation to Abilene Christian University for its topical report on quality assurance program description (ADAMS Accession No. [ML22031A078](#)).
- The NRC staff issued a technical letter report documenting the technical basis for potential endorsement of American Society of Mechanical Engineers (ASME) Section III, Division 5 Code Cases N-872 and N-898 for Alloy 617 (ADAMS Accession No. [ML22031A137](#)).
- The NRC staff submitted a paper to the Commission providing the Emergency Preparedness Requirements for Small Modular Reactors and Other New Technologies draft final rule for its consideration (ADAMS Accession No. [ML21200A055](#)).
- The NRC staff issued a report by the Center for Nuclear Waste Regulatory Analyses under contract with NRC addressing information gaps and potential information needs associated with transportation and storage of fresh and spent advanced reactor fuel types (ADAMS Accession No. [ML21349A914](#)).
- The NRC staff published Revision 1 to draft Regulatory Guide DG-1380 for potential endorsement of ASME Section III, Division 5 Code Cases N-872 and N-898 for Alloy 617 (ADAMS Accession No. [ML22026A517](#)).
- The NRC staff published final NUREG-2246, "Fuel Qualification for Advanced Reactors," with fuel qualification methodology to provide guidance for non-LWR developers on qualification of fuel under NEIMA (ADAMS Accession No. [ML22063A131](#)).
- The NRC completed development of the draft generic environmental impact statement for advanced nuclear reactors. The staff provided the draft GEIS and the associated draft proposed rule to the Commission (SECY-21-0098) for its consideration on November 29, 2021 (ADAMS Accession No. [ML21222A044](#)).

With regard to non-LWR licensing activities, on January 6, 2022, the NRC staff informed Oklo of the decision to deny, without prejudice, the custom combined license (COL) application for the Aurora micro-reactor pursuant to the requirements of 10 CFR Section 2.108, "Denial of application for failure to supply information" (ADAMS Accession No. [ML21357A034](#)). The application had been submitted on March 11, 2020, for a micro-reactor design proposed to be constructed and operated at the Idaho National Laboratory site (ADAMS Accession No. [ML20075A000](#)). The denial decision was based on Oklo's failure, on multiple occasions, to provide necessary technical information to support developing a review schedule or reaching findings on the safety of the facility that the NRC must make before issuing a license. The NRC staff ceased all review activities on the Aurora custom COL application and made no findings regarding the safety of the design. The NRC staff's denial of the Aurora custom COL application was without prejudice and does not preclude Oklo from addressing the information gaps that the NRC staff identified and submitting a revised license application for the Aurora in the future.

Kairos Power, LLC, submitted a construction permit application for its Hermes test reactor on September 29, 2021 (the Preliminary Safety Analysis Report and supporting technical reports) (ADAMS Accession No. [ML21272A376](#)) and October 31, 2021 (the Environmental Report) (ADAMS Accession No. [ML21306A132](#)). The Hermes reactor is a 35 MW thermal fluoride salt-cooled high temperature reactor (FHR) proposed to be built at its East Tennessee Technology Park site near Oak Ridge, TN. The Hermes reactor will use a high-temperature graphite-matrix coated tri-structural isotropic (TRISO) particle fuel and a chemically stable, low-pressure molten fluoride salt coolant and is an integral part of Kairos Power's technology development in support of a commercial nuclear power reactor. The NRC staff reviewed the construction permit application for completeness and accepted and docketed the application on November 29, 2021 (ADAMS Accession No. [ML21319A254](#)). The Hermes application review will be the first time that the NRC staff has evaluated TRISO fuel and molten salt coolant for a license or permit. Because of Kairos Power's extensive pre-application engagement with the NRC, the NRC staff developed an accelerated 21-month schedule for preparation of the Safety Evaluation Report (SER) and the Final Environmental Impact Statement (FEIS) (ADAMS Accession No. [ML21343A214](#)). After completion of the SER and the FEIS, a Commission hearing would be required before issuance of a construction permit.

The staff continues to implement flexible and staged non-LWR regulatory review processes and preapplication engagement with potential applicants and vendors, including X-energy, LLC, on its pebble-bed, high-temperature gas-cooled reactor; Kairos Power on its TRISO fuel, molten-fluoride-cooled power reactor; Terrestrial Energy on its molten salt coolant, molten salt fuel reactor; TerraPower on its sodium-cooled fast reactor; and Westinghouse Electric Company on its high temperature heat pipe microreactor. The staff is engaged in preapplication efforts related to University of Illinois, Urbana-Champaign's plan to submit an application for a power-generating TRISO fuel test reactor and Abilene Christian University's plan to submit an application for a molten salt (liquid fueled) non-power research reactor. The staff continues preapplication engagement with X-energy, LLC, and Oklo on potential fuel fabrication facilities for their reactors.

### Regulatory Infrastructure

The NRC continues to enhance 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.

### *Environmental Reviews for Advanced Nuclear Reactors*

The staff developed a draft GEIS and proposed rulemaking for the environmental review process for the construction and operation of advanced nuclear reactors as described in SECY-20-0020, "Results of Exploratory Process for Developing a Generic Environmental Impact Statement for the Construction and Operation of Advanced Nuclear Reactors," (ADAMS Accession No. [ML20052D029](#)). This GEIS would use a technology-neutral regulatory framework and

performance-based assumptions to determine generic environmental impacts for new commercial advanced nuclear reactors. On September 21, 2020, in SRM-SECY-20-0020 ([ADAMS Accession No. ML20265A112](#)), the Commission directed the staff to initiate rulemaking to codify the GEIS. The staff provided this draft GEIS and proposed rule to the Commission on November 29, 2021 (ADAMS Accession No. [ML21222A044](#)) for its consideration. Additional information about this rulemaking is available at: <https://www.nrc.gov/reading-rm/doc-collections/rulemaking-ruleforum/active/ruledetails.html?id=1139>. The staff also continues to conduct preapplication activities for the X-Energy and Terrapower advanced nuclear reactors, as well as the TVA Clinch River Nuclear Site Advanced Nuclear Technology Park Draft Programmatic Environment Impact Statement.

#### *Alignment of Licensing Processes and Lessons Learned from New Reactor Licensing*

The NRC staff is working on a rulemaking to address the alignment of licensing requirements of 10 CFR Part 50 and 10 CFR Part 52. The Commission directed the NRC staff to pursue rulemaking to incorporate lessons learned from recent new power reactor licensing reviews. This rulemaking would help ensure consistency in new reactor licensing reviews, regardless of whether an applicant chooses to use the Part 50 or Part 52 licensing process.

The NRC published the regulatory basis for initiating the rulemaking effort in the *Federal Register* on January 29, 2021 ([86 FR 7513](#)). The NRC has requested public comment on the recommendations made in the regulatory basis and asked specific questions about other possible revisions of the NRC's requirements. The NRC staff received seven public comment submissions on the regulatory basis, which are being considered in its formulation of the draft proposed rule. The NRC staff anticipates providing the draft proposed rule to the Commission for its consideration in May 2022.

#### *Draft Interim Staff Guidance for New Reactor Construction Permit Reviews*

The draft interim staff guidance focuses on the safety review of power reactor construction permit applications for any LWR design, including designs similar to those reviewed recently under 10 CFR Part 52. This guidance is being developed because the existing guidance for LWR construction permit applications, contained in RG 1.70, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants (LWR Edition)" dates from the 1970s (ADAMS Accession No. [ML011340122](#)). This document, and the more recent LWR application guidance in RG 1.206, "Applications for Nuclear Power Plants" (ADAMS Accession No. [ML18131A181](#)), for 10 CFR Part 52 applications (which does not include construction permit applications), provides additional insights on the level of detail needed to support an LWR construction permit application review. The draft interim staff guidance discusses the regulatory requirements for a construction permit and provides insights on the level of detail required for a preliminary safety analysis report. It includes an appendix that provides clarifying and supplemental guidance to the Standard Review Plan ([NUREG-0800](#)) for certain sections that combined construction permit and operating license review guidance, or where more information on the approach for reviewing preliminary design information is needed. The staff issued the draft interim staff guidance on December 14, 2021 in a *Federal Register* notice ([86 FR 71101](#)) requesting public comment. The 45-day comment period ended on January 28, 2022. Three comment submissions were received that resulted in 17 unique comments. Staff is working to develop responses to the submissions as well as clarifying some information for the final internal staff guidance (ISG). The staff anticipates issuing the final ISG before the end of CY 2022.

### *Standard Review Plan Modernization (NUREG-0800)*

The NRC staff continued its effort to modernize NUREG-0800<sup>4</sup>, “Standard Review Plan [SRP] for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition.” The objective of the SRP modernization effort is to help the staff focus its 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 reviews. The NRC staff held a public meeting on March 31, 2021 (ADAMS Accession No. [ML21077A161](#)), to obtain external stakeholder feedback on the SRP modernization effort and to keep all interested stakeholders informed on the progress of this effort. During this reporting period, the staff drafted 13 modernized SRP sections which are expected to be issued for public comment by mid-CY 2022.

### *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 ([83 FR 48346](#)) (ADAMS Accession No. [ML18071A400](#)). 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.<sup>5</sup> 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 requirements, applicable Executive Orders, judicial developments, and agency administrative decisions and will consider, as appropriate and in coordination with a potential NRC rulemaking, any new environmental regulations issued by the Council on Environmental Quality. Further, as directed by the Commission in an April 23, 2021, Staff Requirements Memorandum M210218B (ADAMS Accession No. [ML21113A070](#)), the staff conducted a systematic review of how the agency’s programs, policies, and activities address environmental justice. On March 29, 2022 (ADAMS Accession No. [ML22031A063](#)), the staff submitted the results of its review and recommendations to the Commission for its consideration.

In the SRM for SECY-22-0024, dated April 5, 2022, (ADAMS Accession No. [ML22096A035](#)), the Commission directed the staff to complete a rulemaking in 24 months for renewing nuclear power plants operating licenses environmental reviews and update associated guidance for consistency (e.g., NUREG-1555). 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.

## **X. Response to Lessons Learned from the Fukushima Dai-ichi Accident in Japan**

As previously reported, the NRC staff has completed the regulatory actions undertaken after the accident at Fukushima Dai-ichi. All applicable licensees have completed the safety improvements associated with the orders for mitigating strategies, spent fuel pool instrumentation, and severe-accident-capable hardened containment vent systems (HCVSs). All applicable operating power reactors have reported compliance with these orders. The NRC has completed

---

<sup>4</sup> The SRP is available online at <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0800/index.html>.

<sup>5</sup> The SRP is available online at <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1555/updates.html>.

all the onsite inspections to verify licensees' compliance with the orders for mitigating strategies, spent fuel pool instrumentation, and HCVSSs.<sup>6</sup>

Also as previously reported, 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. One seismic evaluation is associated with a site that has an approved due date deferral beyond its announced permanent shutdown date<sup>7</sup>, and therefore, is not expected to complete the evaluation.

The NRC does not currently plan to include this section in this report moving forward.

## **XI. Planned Rulemaking Activities**

The attached report lists the status of NRC rulemaking activities as of April 1, 2022, including their priorities and schedules. Of the 65 rulemaking activities, 59 rulemakings are planned activities. The NRC is also reviewing 6 petitions for rulemaking. The 59 planned rulemaking activities include 5 proposals in response to industry requests, 15 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.

---

<sup>6</sup> This order only applies to boiling-water reactors with Mark I or Mark II containment designs, for which there are 17 sites total.

<sup>7</sup> Palisades Nuclear Generating Station is scheduled to cease operations by the end of May 2022.