

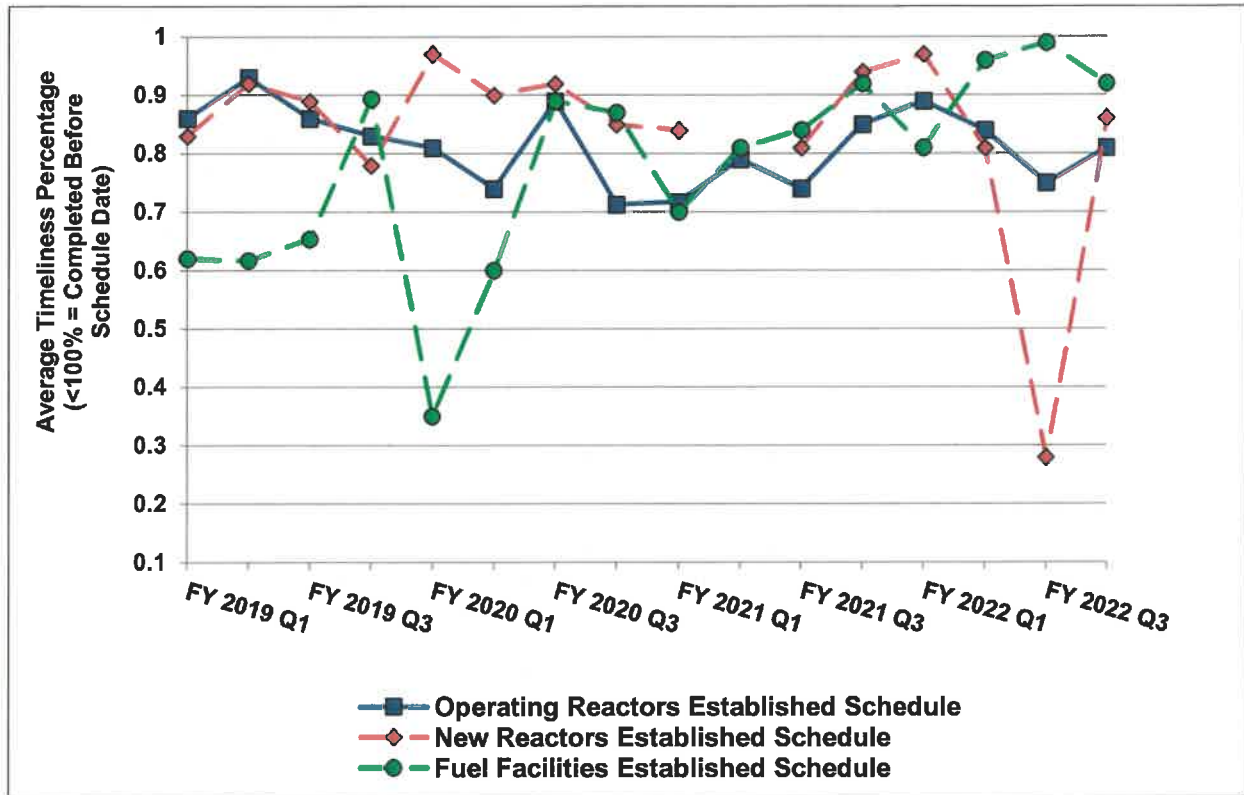
**STATUS REPORT ON THE LICENSING ACTIVITIES
AND REGULATORY DUTIES OF THE
U.S. NUCLEAR REGULATORY COMMISSION**
For the Reporting Period of July 1, 2022 through September 30, 2022

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Enclosure 1 – High Level Summary

Average Timeliness Percentage for Licensing Actions Categorized Under the Nuclear Energy Innovation and Modernization Act

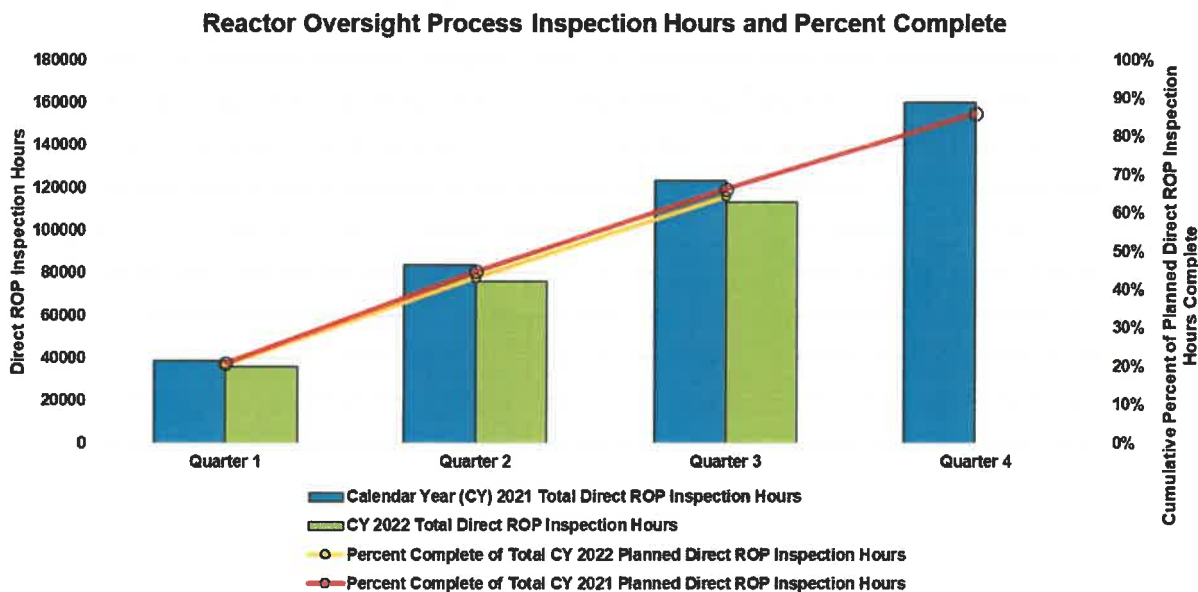


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¹ No licensing actions categorized under the Nuclear Energy Innovation and Modernization Act were completed in Quarter (Q) 2 fiscal year (FY) 2021 for the new reactor business line.

² There was one activity completed in Q3 FY 2022 for the new reactor business line, and it was completed significantly ahead of the established schedule. Because the one activity was completed in 28 percent of the established schedule, this resulted in the Q3 FY 2022 average timeliness percentage for the new reactor business line being 28 percent.

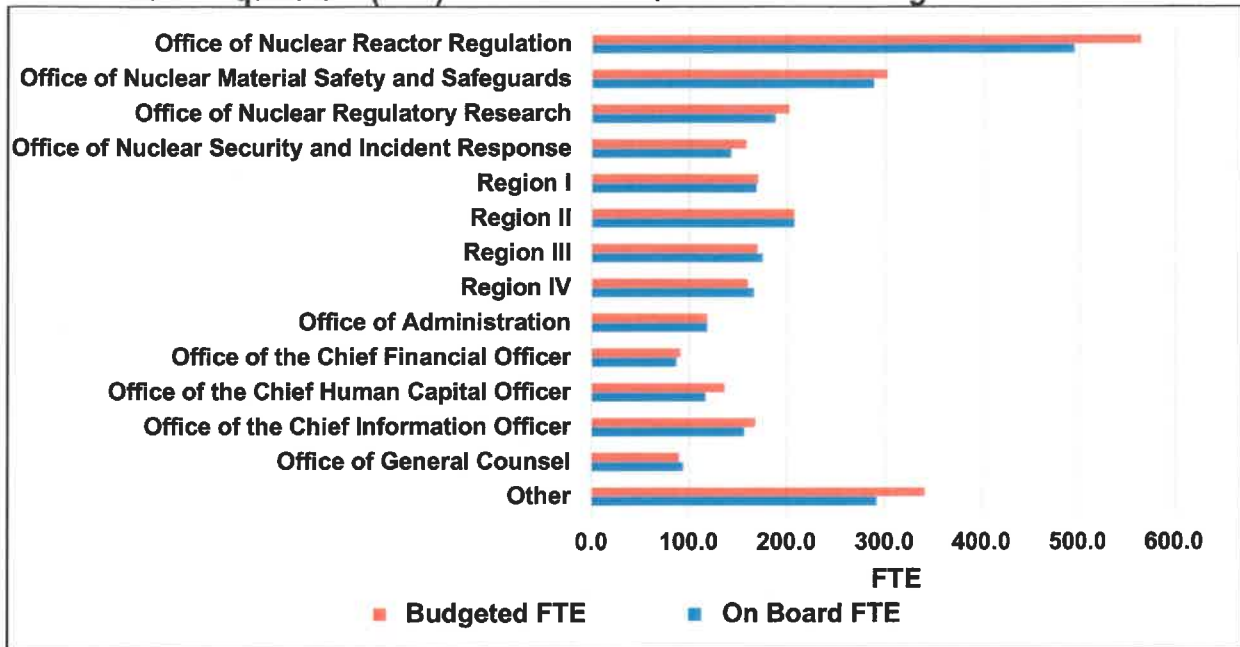
1-2 Reactor Oversight Process (ROP) Inspection Hours and Percent Complete



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³ “Planned direct ROP inspection hours” refers to the number of hours associated with completion of the U.S. Nuclear Regulatory Commission’s (NRC’s) “nominal” number of inspection samples established for the baseline inspection program, which is a conservative target. This contrasts with the “minimum” number of hours that would be necessary to complete the set of inspection activities that constitutes completion of the ROP baseline inspection program for the CY.

1-3 Full-time Equivalent (FTE) at the End of Q4 FY 2022 vs. Budgeted FTE



1-4 Budget Authority, FTE Utilization, and Fees

NRC FY 2022 Budget Authority September 30, 2022 (Dollars in Thousands)

Fund Sources	FY 2022 Budget ⁴	Percent Obligated	Percent Expended
Advanced Reactors	\$23,000	91%	62%
Commission Funds	\$14,936	37%	37%
Fee-Based Funds	\$846,923	96%	77%
General Funds ⁵	\$1,295	75%	52%
International Activities	\$16,635	98%	84%
University Nuclear Leadership Program	\$29,649	49%	2%
Official Representation	\$37	71%	34%
Total	\$932,475	94%	74%
NRC Control Points	FY 2022 Budget	Percent Obligated	Percent Expended
Nuclear Reactor Safety	\$478,520	92%	80%
Nuclear Materials and Waste Safety	\$109,286	100%	85%
Decommissioning and Low-Level Waste	\$23,156	93%	82%
Corporate Support	\$291,863	98%	67%

⁴ FY 2022 Budget reflects the enactment of the Consolidated Appropriations Act, 2022 and includes the enacted budget and carryover allocated.

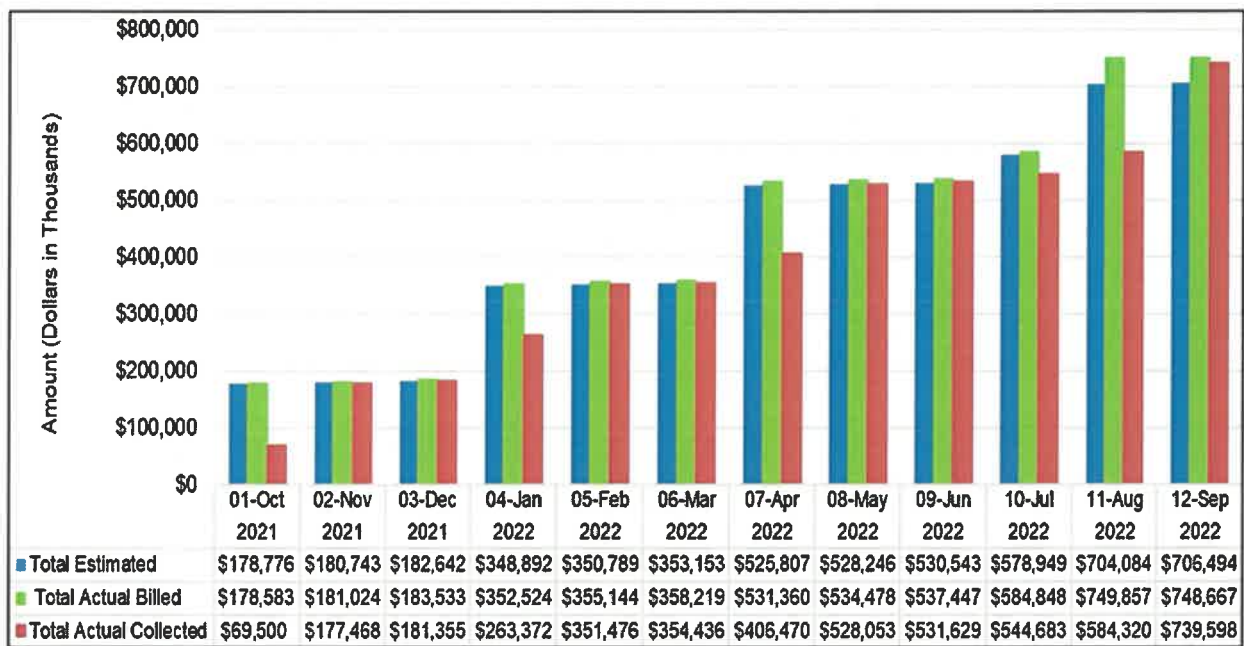
⁵ Consistent with previous reports, this row represents waste incidental to reprocessing activities excluded from the fee-recovery requirement.

Fund Sources	FY 2022 Budget ⁴	Percent Obligated	Percent Expended
University Nuclear Leadership Program ⁶	\$29,649	49%	2%
Total ⁷	\$932,475	94%	74%

FTE Utilization, Hiring, and Attrition

Total Year-to-Date (YTD) FTE Utilization	Projected End of Year FTE Total Utilization	Quarter 4 Hiring	Quarter 4 Attrition	YTD Hiring	YTD Attrition
2705.3	2705.3	89	47	207	244

FY 2022 Fees Estimated, Fees Billed, and Fees Collected Through Q4



Total for Title 10 of the Code of Federal Regulations (10 CFR) Part 170, "Fees for Facilities, Materials, Import and Export Licenses, and Other Regulatory Services Under the Atomic Energy Act of 1954, As Amended," Fees Billed (Dollars in Millions)

FY 2020	FY 2021	FY 2022 Q1-Q4
\$205.7	\$183.9	\$190.7

⁶ The FY 2022 Explanatory Statement identified this control point as the "Integrated University Program." Division Z of the Consolidated Appropriations Act, 2021 replaced the Integrated University Program with the University Nuclear Leadership Program.

⁷ Numbers might not add due to rounding.

Enclosure 2 – Status of Specific Items of Interest

Enclosure 2 provides the status of specific items of interest including a summary of the item, the activities planned and accomplished under each item within the reporting period, and projected activities under each item for the next two reporting periods.

2-1 Transformation

The U.S. Nuclear Regulatory Commission (NRC) is becoming a more modern, risk-informed regulator, open to new technologies and ways of implementing our safety and security mission. The NRC continues to make progress in four focus areas: (1) recruiting, developing, and retaining a strong workforce; (2) improving decision-making through the acceptance of an appropriate level of risk without compromising the NRC’s mission; (3) establishing a culture that embraces innovation; and (4) adopting new and existing information technology resources. The agency has completed all but one of our initial agencywide initiatives associated with the four focus areas.

To sustain progress and meet the agency’s transformation goals, the NRC will use a variety of tools, including “objectives and key results” that relate to the current four focus areas (i.e., Our People, Be riskSMART, Using Technology, and Innovation). The NRC continues to leverage available technologies, increase opportunities for staff to gain new skills, attract talented new staff, and foster a culture of safety and innovation that accounts for differing viewpoints and risk insights in our decision-making. Planned future activities will focus on incorporating positive transformational changes into the agency’s culture and processes.

Activities Planned and Completed for the Reporting Period (Quarter (Q) 4 fiscal year (FY) 2022)

Transformation Activities	Projected Completion Date	Completion Date
Implement a staff-led effort to recognize NRC employees who make notable and innovative contributions towards attaining agency goals through business improvements, applying risk insights, using data in decision-making, realizing culture, enhancing the work environment, or advancing knowledge management practices.	07/31/22	08/08/22 ⁸

Projected Activities for the Next Two Reporting Periods (Q1 and Q2 FY 2023)

Projected Transformation Activities	Projected Completion Date
Update transformation webpages on the NRC’s public website to include information regarding sustaining transformational progress.	12/31/22 ⁹
Launch a follow-on survey of external stakeholder views on NRC transformation activities.	01/31/23

⁸ Senior leaders reviewed the staff ideas and selected winners for the Innovation Success of the Year (iSOFTY) 2022 award. Staff winners were announced for the iSOFTY 2022 award on August 8, 2022.

⁹ The projected completion date was modified from October 31, 2022, to December 31, 2022, to allow additional time for staff to review information related to organizational health activities.

Projected Transformation Activities	Projected Completion Date
Conduct first-line supervisor and senior leader sessions on "Organizational Health: Sustaining Transformational Progress in a Hybrid Environment."	03/31/23
Conduct a full reassessment of the agency's cultural norms and behaviors to ensure the agency is sustaining transformational progress.	03/31/23 ¹⁰

2-2 Workforce Development and Management

Each fiscal year, the NRC engages in a five-step Strategic Workforce Planning (SWP) process to improve workforce development to meet its near- and long-term work demands. The first step in this process is an Agency Environmental Scan that projects the amount and type of work anticipated in the next five years and identifies the workforce needs in order to perform that work. By analyzing the current workforce and comparing it to future needs, skill gaps can be identified. In the final step of the process, both short- and long-term strategies are developed to enable the agency to recruit, retain, and develop a skilled and diverse workforce with the competencies and agility to address both current and emerging needs and workload fluctuations.

During the reporting period, the agency continued implementing a strategy to recruit approximately 300 new employees during FY 2022, to conduct mission-critical work identified through the SWP process. This recruitment effort, which will continue in subsequent years, will position the agency to fulfill its important safety and security mission well into the future.

Activities Planned and Completed for the Reporting Period (Q4 FY 2022)

Workforce Development and Management Activities	Projected Completion Date	Completion Date
Discussed FY 2022 SWP High Priority Critical Skill Gaps and associated Strategies and Key Activities, as well as potential improvements to the SWP process, at the Semi-annual Strategic Alignment Meeting with senior leaders to address the gaps and further integrate SWP with related agency processes.	09/30/22	08/17/22
Onboarded final Summer 2022 intern as well as 25 recent graduates for the Nuclear Regulator Apprenticeship Network (NRAN) cohort. In addition, 75% of the Student Interns who participated in summer internships converted to the Co-Op Program, accepted an offer for a second internship, or received an offer for an entry-level position after graduation.	09/30/22 ¹¹	09/30/22

¹⁰ The projected completion date was modified from December 31, 2022, to March 31, 2023, due to additional time needed for the agency to review and implement Federal Employee Viewpoint Survey 2022 results.

¹¹ In the previous report, the projected completion date to onboard 1 additional Summer 2022 student intern and 25 recent graduates who will form the 2022 NRAN cohort was July 29, 2022. The on boarding of all these employees was completed by September 30, 2022. Additional information is provided regarding Summer Interns continuing service with the NRC.

Workforce Development and Management Activities	Projected Completion Date	Completion Date
Continued implementation of the recruitment strategy, onboarding a total of 207 new employees during FY 2022. An additional 78 individuals are expected to onboard in Q1 FY 2023, following completion of background investigations. ¹²	09/30/22	09/30/22

Projected Activities for the Next Two Reporting Periods (Q1 and Q2 FY 2023)

Projected Workforce Development and Management Activities	Projected Completion Date
Complete SWP Step 1, Agency Environmental Scan FY 2023 – FY 2028.	12/31/22
Conduct recruitment activities and make selections for the Summer 2023 Internship Program.	12/31/22
Conduct an evaluation of the SWP process for effectiveness and efficiency improvements as identified in the NRC’s Annual Evaluation Plan for FY 2023 . The FY 2023 SWP cycle will initiate following the incorporation of approved recommendations from the evaluation.	03/31/23
Finalize security clearance reviews and prepare for Summer 2023 Student Intern onboarding.	03/31/23

2-3 Accident Tolerant Fuel

While the NRC is ready to review and license Accident Tolerant Fuel (ATF), higher burnup, and increased enrichment submittals under the current regulatory framework, the NRC continues to take steps to make agency processes more efficient and effective. The NRC staff is executing the ATF project plan (Agencywide Documents Access and Management System Accession No. [ML21243A298](#)), which was revised to include an increased focus on higher burnup and increased enrichment fuels.

During this reporting period, the NRC did not receive any additional ATF fuel vendor topical reports, ATF operating reactor licensing actions, or ATF transportation package applications. The NRC staff continues to review the eight ATF fuel vendor topical reports and ATF applications that were previously submitted.

The NRC expects to receive additional certificate of compliance amendment applications and license amendment requests (LARs) in CY 2022 from transportation package vendors and fuel fabricators, respectively. The NRC expects that these submittals will request approval for enrichment levels up to 8 weight-percent uranium-235.

¹² While the goal to hire approximately 300 new employees in FY 2022 was not met, the NRC will continue its hiring efforts into FY 2023.

Activities Planned and Completed for the Reporting Period (Q4 FY 2022)

ATF Activities	Projected Completion Date	Completion Date
Held the third Higher Burnup workshop (ML22235A740). At this workshop, the NRC staff and representatives from industry discussed the state of development of higher burnup and increased enrichment technical and regulatory issues. The workshop also provided a public forum for discussions between the NRC, industry, and other stakeholders.	09/30/22	08/24/22

Projected Activities for the Next Two Reporting Periods (Q1 and Q2 FY 2023)

Projected ATF Activities	Projected Completion Date
Complete review of the DN30-X transportation package that, if approved, would be used to transport uranium hexafluoride with an enrichment up to 20 weight-percent uranium-235 (ML21181A001).	12/30/22
Participate in the NRC Regulatory Information Conference (RIC) to provide stakeholders an opportunity to learn about the progress of ATF licensing activities and technologies to date and the activities that support efficient licensing of ATF concepts. Through participation at the RIC, the NRC staff will communicate about ATF readiness activities, planned stakeholder engagements, the NRC's projected licensing timelines, and any challenges to ATF deployment timelines.	03/14/23
Hold a Commission meeting to provide an update on the status and issues associated with the path to licensing ATF concepts.	03/31/23

2-4 Digital Instrumentation and Control

The NRC staff continues to complete digital instrumentation and control (I&C) infrastructure improvements to address commercial grade dedication of digital equipment and protection against common cause failure (CCF). While some infrastructure improvement activities continue, the staff is transitioning to using the improved infrastructure to support the review of licensees' digital I&C modernization LARs. These activities support the NRC's vision to establish a modern, risk-informed regulatory structure with reduced uncertainty that will enable the expanded safe use of digital technologies.

During the reporting period, the NRC staff issued Regulatory Guide 1.250, "Dedication of Commercial-Grade Digital Instrumentation and Control Items for Use in Nuclear Power Plants ([ML22153A408](#)). RG 1.250 is a new regulatory guide which endorses, with clarifications, Nuclear Energy Institute (NEI) 17-06, "Guidance on Using IEC 61508 SIL Certification to Support the Acceptance of Commercial Grade Digital Equipment for Nuclear Safety Related Applications," Revision 1, issued December 2021 ([ML21337A380](#)). The NRC staff also continued the development of DG-1374 to consider endorsement of Institute of Electrical and Electronics Engineers Standard 7-4.3.2, "Criteria for Programmable Digital Devices in Safety Systems of Nuclear Power Generating Stations." DG-1374, if finalized, will be issued as Revision 4 to RG 1.152, "Criteria for Use of Computers in Safety Systems of Nuclear Power

Plants.” In addition, the NRC staff issued SECY-22-0076, “Expansion of Current Policy on Potential Common-Cause Failures in Digital Instrumentation and Control Systems” ([ML22164B003](#)), for the Commission’s consideration concerning new approaches to address digital I&C CCF to better accommodate risk-informed approaches in the digital I&C policy contained in the Staff Requirements Memorandum (SRM) to SECY-93-087 ([ML003708056](#)).

Several licensees are planning for digital upgrades. On July 30, 2022 ([ML22213A045](#)), Florida Power & Light Company (FPL) submitted LARs for Turkey Point Nuclear Plant, Units 3 and 4 (Turkey Point). The LARs, if approved, would permit the use of digital I&C for the reactor protection system, engineered safety features actuation system, and nuclear instrumentation system at Turkey Point. The NRC staff conducted an acceptance review of the Turkey Point LARs. The acceptance review was completed on October 13, 2022 ([ML22280A108](#)).

In addition, on September 26, 2022 ([ML22269A569](#)), Constellation Energy Generation, LLC submitted LARs for Limerick Generating Station, Units 1 and 2 (Limerick) to revise the licensing and design basis to incorporate proposed digital modifications. The LARs also request other changes to plant functions and the reactivity control system. The NRC staff is conducting an acceptance review of the Limerick LARs. The acceptance review is currently scheduled to be completed by the end of November 2022.

Activities Planned and Completed for the Reporting Period (Q4 FY 2022)

Digital I&C Activities	Projected Completion Date	Completion Date
Review NEI 17-06, “Guidance on Using IEC 61508 SIL Certification to Support the Acceptance of Commercial Grade Digital Equipment for Nuclear Safety Related Applications,” and consider endorsement through issuance of an RG.		
<ul style="list-style-type: none"> Briefed Advisory Committee on Reactor Safeguards (ACRS) Subcommittee on Digital I&C on DG-1402. 	07/22/22	07/21/22
<ul style="list-style-type: none"> Briefed ACRS full committee on RG 1.250 (formally DG-1402). 	N/A ¹³	09/07/22
<ul style="list-style-type: none"> Issued RG 1.250, “Dedication of Commercial-Grade Digital Instrumentation and Control Items for Use in Nuclear Power Plants.” (ML22153A408) 	12/30/22	10/25/22
Consideration of Current CCF Policy in SRM to SECY-93-087		
<ul style="list-style-type: none"> Submitted SECY paper to the Commission for its consideration (SECY-22-0076) (ML22164B003) 	07/26/22	08/10/22 ¹⁴
Digital Modernization LAR Using the Improved Digital Regulatory Infrastructure ¹⁵		

¹³ This activity was not identified as a projected activity in the previous report because the ACRS had not yet decided whether a full committee meeting on the RG was necessary.

¹⁴ The activity was completed on August 10, 2022, rather than the projected completion date of July 26, 2022, to allow additional time for staff review.

¹⁵ Activities reported in this section are related to planned or submitted digital changes for which the licensee is using some portion of the modernized digital regulatory infrastructure.

Digital I&C Activities	Projected Completion Date	Completion Date
<ul style="list-style-type: none"> Conducted ninth pre-application meeting with Constellation on the planned digital I&C LAR for Limerick Generating Station, Units 1 and 2. 	08/31/2022	09/08/22 ¹⁶
<ul style="list-style-type: none"> Issued a staff decision on acceptability for review of the NextEra/FPL LAR for digital modernization project at Turkey Point Units 3 and 4 within 60 days of submission by licensee. 	10/15/22 ¹⁷	10/13/2022

Projected Activities for the Next Two Reporting Periods (Q1 and Q2 FY 2023)

Projected Digital I&C Activities	Projected Completion Date
DG-1374 (Revision 4 to RG 1.152, "Criteria for Use of Computers in Safety Systems of Nuclear Power Plants")	
<ul style="list-style-type: none"> Brief ACRS Subcommittee on Digital I&C to discuss DG-1374. 	11/17/22 ¹⁸
Digital Modernization LAR Using the Improved Digital Regulatory Infrastructure ¹⁹	
<ul style="list-style-type: none"> Issue a staff decision on acceptability for review of the Constellation LAR for digital modernization project at Limerick Units 1 and 2 within 60 days of submission by licensee. 	11/30/22 ²⁰

2-5 Vogtle Electric Generating Plant Units 3 and 4

The NRC issued two combined licenses (COLs) to Southern Nuclear Operating Company (SNC) and its financial partners on February 10, 2012, for two AP1000 units to be built and operated at the Vogtle site near Augusta, GA. SNC projects the start of commercial operations for Vogtle Unit 3 in Q1 FY 2023. SNC projects Vogtle Unit 4 to begin commercial operations in Q4 FY 2023. The NRC staff adjusted the agency's activities and associated milestone dates to reflect the revised schedule.

On August 3, 2022, the NRC issued Title 10 of the *Code of Federal Regulations* (10 CFR) 52.103(g), "Operation under a combined license," finding for Vogtle Unit 3 ([ML20290A282](#)). This was the first such finding for a Part 52 licensee. It allows SNC to load fuel and operate Vogtle Unit 3 in accordance with the terms and conditions of the COL. The NRC issued the finding after verifying that all the acceptance criteria in the inspections, tests,

¹⁶ The activity was completed on September 8, 2022, rather than the projected completion date of August 31, 2022, because the licensee asked that the meeting be moved from August to September.

¹⁷ The projected completion date provided in the previous report was an estimate. The projected completion date was changed from September 30, 2022, to October 15, 2022, after the NRC staff determined that supplemental information was necessary as documented in a letter to the licensee issued on September 15, 2022 ([ML22255A050](#)).

¹⁸ The projected completion date was modified from October 21, 2022, to November 17, 2022, to accommodate ACRS availability.

¹⁹ Activities reported in this section are related to planned or submitted digital changes for which the licensee is using some portion of the modernized digital regulatory infrastructure.

²⁰ The projected completion date is an estimate and assumes that the licensee will not supplement the LAR during the acceptance review.

analyses, and acceptance criteria (ITAAC) in the Vogtle Unit 3 COL were met. The NRC describes the basis for this finding in the 10 CFR 52.103(g) basis document ([ML20290A276](#)). Upon the issuance of this finding, the NRC’s oversight of Vogtle Unit 3 transitioned from the Construction Reactor Oversight Process to the Reactor Oversight Process (ROP). The NRC placed Vogtle Unit 3 in the Licensee Response Column of the ROP’s Action Matrix. In October 2022, SNC completed Vogtle Unit 3 fuel load. NRC will continue to provide oversight for Vogtle Unit 3. For Vogtle Unit 4, the NRC continues to perform ITAAC inspections and review ITAAC closure notifications.

Activities Planned and Completed for the Reporting Period (Q4 FY 2022)

Vogtle Electric Generating Plant Units 3 and 4 Activities	Projected Completion Date	Completion Date
Issued a letter regarding Vogtle Unit 3’s transition to the operating reactor assessment program (ML22188A171).	08/31/22	07/29/22
Issued a finding in accordance with 10 CFR 52.103(g), which allows the licensee to operate Vogtle Unit 3 in accordance with the terms and conditions of the license, after the NRC found that all the acceptance criteria in the Vogtle Unit 3 COL were met (ML20290A282).	08/31/22	08/03/22
Completed the SE of a request from SNC to adopt an alternative to the requirements associated with testing of main turbine system valves for Vogtle Units 3 and 4 (VEGP 3&4-IST-ALT-02) (ML22098A144).	10/08/22	09/14/22

Projected Activities for the Next Two Reporting Periods (Q1 and Q2 FY 2023)

Projected Vogtle Electric Generating Plant Units 3 and 4 Activities	Projected Completion Date
Complete the review of a LAR and exemption request for Vogtle Unit 4 to eliminate and consolidate electrical ITAAC based on lessons learned from Vogtle Unit 3 (LAR 22-003).	01/07/23

A COL allows a licensee to construct a plant and to operate it once construction is complete if certain standards identified in the COL are satisfied. These standards are called ITAAC. The majority of ITAAC are from the design certification for the particular reactor technology that a plant uses. Throughout the construction process, NRC inspectors will perform inspections based on [Inspection Manual Chapter 2503](#), “Construction Inspection Program: Inspections of Inspections, Tests, Analyses and Acceptance Criteria (ITAAC) Related Work,” and the NRC’s [Construction Inspection Program](#) at the plant site to confirm that the licensee has successfully completed the ITAAC.

Additional information on the ITAAC process as well as closure for Vogtle Units 3 and 4 is available at <https://www.nrc.gov/reactors/new-reactors/oversight/itaac.html>.

Unit	Number of ITAAC Remaining Requiring Inspection	Total Inspections Completed ²¹	ITAAC Inspected ²²	ITAAC Inspections Closed ²³
Vogtle 3	0	10	1	9
Vogtle 4	115	13	8	9

ITAAC Reviews Completed for the Reporting Period (Q4 FY 2022)²⁴

The table below provides ITAAC closure notification reviews completed during the reporting period for Vogtle Units 3 and 4, including the date when the NRC received the ITAAC closure notice and the date when the review was completed.

Unit	ITAAC No.	Received Date	Approval Date ²⁵
Vogtle 3	2.2.01.05.i	06/17/22	06/21/22
Vogtle 3	3.3.00.07c.ii.a	05/19/22	06/21/22
Vogtle 3	3.2.00.01e	06/03/22	06/21/22
Vogtle 3	3.3.00.07ac	06/17/22	06/21/22
Vogtle 3	3.3.00.07bc	06/17/22	06/21/22
Vogtle 3	3.3.00.07c.i.b	06/17/22	06/21/22
Vogtle 3	2.5.02.08b.ii	06/15/22	06/22/22
Vogtle 3	3.3.00.07d.ii.c	06/17/22	06/22/22
Vogtle 4	2.3.10.02a	06/24/22	06/27/22
Vogtle 3	2.6.03.02.i	06/23/22	06/27/22
Vogtle 3	2.5.02.06a.ii	06/23/22	06/29/22
Vogtle 4	2.2.03.09a.ii	07/01/22	07/05/22
Vogtle 4	2.5.02.08b.i	07/05/22	07/06/22
Vogtle 4	2.3.04.11	07/06/22	07/07/22
Vogtle 4	2.1.02.08d.v	07/08/22	07/11/22
Vogtle 3	3.3.00.07d.iv.b	07/15/22	07/19/22
Vogtle 4	3.3.00.02f	07/15/22	07/20/22
Vogtle 4	2.2.01.07.i	07/14/22	07/25/22
Vogtle 3	3.3.00.07bb	07/20/22	07/26/22
Vogtle 3	3.3.00.07c.i.a	07/20/22	07/26/22

²¹ This column includes all inspections related to Vogtle Units 3 and 4 completed during the reporting period; the column is not limited to ITAAC (e.g., quality assurance inspections).

²² "ITAAC Inspected" refers to the number of ITAAC that were inspected as part of ongoing inspections and does not indicate that all inspections were completed for those ITAAC. Only "targeted ITAAC" – ITAAC selected for inspection by the NRC staff – are included in this count.

²³ "ITAAC Inspection Closed" refers to the number of ITAAC for which all associated inspections have been completed during the reporting period.

²⁴ This table accounts for the total number of ITAAC that SNC provided closure notifications for and that the NRC verified. This includes both ITAAC that were selected for inspection by the NRC staff (targeted ITAAC) and ITAAC that were not selected for inspection by the NRC staff (non-targeted ITAAC). This differs from the previous table, where the "ITAAC Inspected" column is the number of targeted ITAAC that were inspected during the designated reporting period.

²⁵ Several ITAAC Closure Notification Reviews completed in June 2022 were inadvertently not included in the last report and are included in this report for completeness.

Vogtle 3	3.3.00.07ab	07/20/22	07/26/22
Vogtle 3	3.3.00.07ba	07/21/22	07/26/22
Vogtle 3	3.3.00.07aa	07/21/22	07/26/22
Vogtle 4	3.2.00.02	07/22/22	07/27/22
Vogtle 3	3.3.00.07d.ii.b	07/28/22	07/28/22
Vogtle 4	2.2.01.11a.i	07/15/22	07/28/22
Vogtle 3	3.3.00.07d.iii.b	07/28/22	07/29/22
Vogtle 3	3.3.00.07d.iii.a	07/29/22	07/29/22
Vogtle 3	3.3.00.07d.ii.a	07/29/22	07/29/22
Vogtle 4	2.3.07.07b.i	07/29/22	08/01/22
Vogtle 4	2.3.07.07b.vii	07/29/22	08/01/22
Vogtle 4	2.6.05.03.i	08/02/22	08/03/22
Vogtle 4	2.2.02.07a.iii	08/05/22	08/08/22
Vogtle 4	2.3.15.03	08/12/22	08/15/22
Vogtle 4	2.5.01.03a	08/12/22	08/15/22
Vogtle 4	2.5.04.01	08/17/22	08/18/22
Vogtle 4	2.3.04.04.i	08/18/22	08/19/22
Vogtle 4	2.2.03.08c.iii	08/18/22	08/19/22
Vogtle 4	2.3.06.12a.i	08/18/22	08/19/22
Vogtle 4	2.5.01.03e	08/18/22	08/19/22
Vogtle 4	2.2.02.05c	08/26/22	08/30/22
Vogtle 4	2.6.09.13c	08/12/22	09/01/22
Vogtle 4	2.3.04.02.i	09/01/22	09/02/22
Vogtle 4	3.3.00.02a.ii.e	09/02/22	09/06/22
Vogtle 4	2.2.03.08c.vi.03	09/07/22	09/09/22
Vogtle 4	2.5.01.04	09/01/22	09/12/22
Vogtle 4	3.3.00.07e	09/02/22	09/22/22
Vogtle 4	E.3.9.05.01.04	09/26/22	09/28/22

Vogtle Units 3 and 4 LAR Reviews Completed (Q4 FY 2022)

Number of LAR Reviews Forecast to be Completed in the Reporting Period	Number of LAR Reviews that Were Completed in the Reporting Period
0	0

2-6 NuScale Small Modular Reactor (SMR) Design Certification

On March 15, 2017, the NRC accepted the NuScale Power, LLC (NuScale) application for a SMR design certification review. The NRC staff completed the final SE Report on August 28, 2020 ([ML20023A318](#)), and issued a standard design approval to NuScale on September 11, 2020 ([ML20247J564](#)). The draft final rule was provided to the Commission on July 1, 2022, for its consideration ([ML22004A002](#)). On July 29, 2022, the Commission directed the staff to issue a final rule that certifies NuScale’s SMR design for use in the United States ([ML22210A158](#)). The staff expects the final rule will be published in the *Federal Register* (FR)

by November 25, 2022. The design certification’s effective date is 30 days after the publication of the final rule in the FR.

Activities Planned and Completed for the Reporting Period (Q4 FY 2022)

NuScale SMR Design Certification Activities	Projected Completion Date	Completion Date
Provided the Commission the draft final rule for its consideration (ML22004A002).	N/A ²⁶	07/01/22

Projected Activities for the Next Two Reporting Periods (Q1 and Q2 FY 2023)

Projected NuScale SMR Design Certification Activities	Projected Completion Date
Publish final rule in the FR.	11/25/22

2-7 Advanced Nuclear Reactor Technologies

The NRC continues to make significant progress in preparation for reviewing non-light-water-reactor (non-LWR) designs, consistent with the NRC staff’s vision and strategy ([ML16356A670](#)) and implementation action plans to achieve non-LWR safety review readiness.²⁷ During this reporting period, the NRC staff continued its extensive stakeholder engagement, including holding several public meetings and workshops regarding various advanced reactor topics, development of Framework A (the probabilistic risk assessment (PRA)-led licensing approach) and Framework B (the licensing approach where risk insights are used in a supporting role) of 10 CFR Part 53, “Risk Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors,” preliminary proposed rule, and development of guidance for the content of advanced reactor licensing applications.

The NRC staff released the draft proposed rule package for 10 CFR Part 53 ([ML22272A034](#)) on September 29, 2022, to support the ACRS Regulatory Rulemaking, Policies and Practices: Part 53 Subcommittee (formerly the Future Plant Designs Subcommittee) meeting scheduled for October 18-19, 2022, and the ACRS full committee meeting scheduled for the first week of November 2022.

On July 21, 2022, the Commission held a briefing on 10 CFR Part 53 Licensing and Regulation of Advanced Nuclear Reactors consisting of a diverse external panel and an NRC staff panel ([ML22196A025](#)). In addition, the NRC staff continued to engage stakeholders on portions of the 10 CFR Part 53 preliminary proposed rule language, including technical, licensing, and administrative requirements during public meetings conducted by the staff on July 28, 2022, and August 18, 2022 ([ML22195A005](#) and [ML22229A507](#)). The NRC staff continues to assess and consider diverse stakeholder feedback received throughout the public comment period on the preliminary proposed rule language, which closed on August 31, 2022.

In addition, the NRC staff briefed the ACRS full committee on Part 53 Framework B and Subpart F of Framework A on July 6, 2022. On August 2, 2022, the ACRS issued their fourth

²⁶ In the Q2 FY 2022 report, the projected completion date for this activity was to be determined as the schedule for providing the draft final rule to the Commission was being revised to resolve technical comments.

²⁷ The NRC’s public website lists the implementation action plans and is updated periodically to show the status of these activities (<https://www.nrc.gov/reactors/new-reactors/advanced/details.html#visStrat>).

interim letter on 10 CFR Part 53 ([ML22196A292](#)), which included eight conclusions and recommendations. The NRC staff issued a response to the ACRS letter to address the ACRS recommendations ([ML22249A073](#)). Details of this and previous ACRS meetings can be found on the NRC's public website (<https://www.nrc.gov/reading-rm/doc-collections/acrs/agenda/index.html>).

The NRC staff is scheduled to provide the Commission the Part 53 draft proposed rule package by February 2023 for its consideration. Once the Commission votes, the resulting proposed rule will be issued for public comment. After the staff addresses the public comments, the draft final rule package, including key guidance, will then be submitted to the Commission for consideration by December 2024. The NRC staff's goal is to issue the final rule by July 2025. Further details about the Part 53 rulemaking schedule can be found on the NRC's public website (<https://www.nrc.gov/reactors/new-reactors/advanced/rulemaking-and-guidance/part-53.html>).

The NRC holds periodic stakeholder meetings to discuss non-LWR topics of interest. A list of the meetings that the NRC has conducted to date can be found on the NRC's public website (<https://www.nrc.gov/reactors/new-reactors/advanced/details.html#stakeholder>). The NRC also holds frequent public meetings regarding the Advanced Reactor Content of Application Project (ARCAP). A list of these meetings and related preliminary draft guidance documents to support the meetings can be found on the NRC's public website (<https://www.nrc.gov/reactors/new-reactors/advanced/details.html#advRxContentAppProj>).

Additionally, the NRC staff is preparing, through early interactions with reactor designers, to review specific advanced reactor designs. These pre-application interactions provide predictability in the licensing process through early identification and resolution of technical and policy issues that could affect licensing. Information on the reactor designers that have formally notified the NRC of their intent to engage in regulatory interactions can be found on the NRC's public website (<https://www.nrc.gov/reactors/new-reactors/advanced/ongoing-licensing-activities/pre-application-activities.html>).

This section also discusses the NRC staff's pre-application interactions and review activities before an application is accepted and docketed by the NRC staff. On August 12, 2022, Abilene Christian University (ACU) submitted an application to the NRC for a construction permit for a molten salt research reactor (MSRR) (less than 1 megawatt thermal power) to be located on the ACU campus in Abilene, TX ([ML22227A201](#)). On September 27, 2022, the NRC staff notified ACU that it was pausing the acceptance review of the construction permit application to allow the applicant to provide supplemental technical information prior to making an acceptance determination on the application ([ML22270A170](#)). ACU intends for the purpose of the MSRR to accelerate the development and deployment of molten salt reactor systems through foundational research while also developing a new pipeline to a nuclear-qualified workforce. The MSRR is a single-region, graphite-moderated core, loop-type, thermal-spectrum reactor with a fluoride-based fuel salt flowing through a fuel circuit made from stainless steel. If this application is accepted and docketed, future application review activities will be discussed in section 2-8 of this report.

Activities Planned and Completed for the Reporting Period (Q4 FY 2022)

Advanced Nuclear Reactor Technologies Activities	Projected Completion Date	Completion Date
Submitted draft proposed rule providing the alternative physical security requirements for advanced reactors to the Commission for its consideration (ML21334A003).	07/29/22	08/02/22 ²⁸
Issued final SE to X-energy for its topical report on risk-informed performance-based approach (ML22187A271).	08/01/22	08/04/22 ²⁹
Released draft proposed rule package for 10 CFR Part 53 to support stakeholder and ACRS interactions in October 2022 (ML22272A034).	09/30/22	09/29/22 ³⁰

Projected Activities for the Next Two Reporting Periods (Q1 and Q2 FY 2023)

Projected Advanced Nuclear Reactor Technologies Activities	Projected Completion Date
Release a pre-decisional draft RG on technology-inclusive, risk-informed, and performance-based methodology for seismic design of advanced reactors and seismically isolated nuclear power plants to support stakeholder engagement at a public meeting.	10/31/22
Issue draft RG (DG-1404) for potential endorsement of industry-led NEI 21-07, "Technology Inclusive Guidance for Non-Light Water Reactors," and nine NRC-led ARCAP interim staff guidance for public comment.	11/30/22 ³¹
Complete acceptance review for ACU MSRR construction permit application.	11/30/22
Publish the final RG (RG 1.246) for potential endorsement of the ASME Boiler and Pressure Vessel Code Section XI, Division 2, Reliability and Integrity Management standard.	11/30/22 ³²
Release draft interim staff guidance on material compatibility to support stakeholder engagement.	11/30/22
Release draft interim staff guidance on facility training programs to support stakeholder engagement.	11/30/22
Issue final SE to Kairos for its topical report on metallic material qualification program.	11/30/22

²⁸ The activity was completed on August 2, 2022, rather than the projected completion date of July 29, 2022, to support the development of comprehensive draft guidance and completion of the draft proposed rule package.

²⁹ The activity was completed on August 4, 2022, rather than the projected completion date of August 1, 2022, to allow additional time for staff review.

³⁰ This activity was inadvertently omitted as a projected activity in the previous report.

³¹ The projected completion date was extended from August 31, 2022, to November 30, 2022, due to prioritization of the development of Part 53 draft preliminary proposed rule text.

³² The projected completion date was extended from September 30, 2022, to November 30, 2022, to coincide with the projected publication of the 2019-2020 ASME Code final rule. The NRC's endorsement of the ASME Boiler and Pressure Vessel Code Section XI, Division 2, is dependent on the endorsement and conditions for the 2019 edition of ASME Boiler and Pressure Vessel Code Section XI, Division 1 via the 2019-2020 ASME Code final rule.

Projected Advanced Nuclear Reactor Technologies Activities	Projected Completion Date
Issue final SE to Kairos for its topical report on graphite materials qualification.	11/30/22
Publish the final RG (RG 1.87, Revision 2) for potential endorsement of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section III, Division 5, High Temperature Reactors.	12/30/22
Issue final SE to Kairos for its topical report on fuel qualification methodology.	12/30/22
Issue NUREG/CR on Fuel Qualification for Molten Salt Reactors.	12/30/22
Submit SECY paper on options for a fusion regulatory framework to the Commission for its consideration.	12/30/22
Issue final SE to X-energy for its topical report on transient and safety analysis methodologies framework.	01/20/23
Submit draft proposed rule providing the 10 CFR Part 53 requirements for advanced reactors to the Commission for its consideration.	02/23/23
Issue final SE to X-energy for its topical report on pebble fuel qualification methodology.	02/24/23
Issue draft interim staff guidance on non-LWR PRA standard applicability for initial licensing for public comment.	02/28/23 ³³
Issue final SE to X-energy for its topical report on control room staffing analysis methodology.	03/25/23

2-8 Advanced Reactor Licensing Reviews

Kairos Hermes Construction Permit Application Review

Kairos Power LLC (Kairos) submitted an application for a construction permit for the Kairos Power Fluoride Salt-Cooled, High Temperature Non-Power Reactor (Hermes). Kairos submitted applications documents to the NRC by letters dated September 29, 2021 (submitting the Preliminary Safety Analysis Report) ([ML21272A375](#)), and October 31, 2021 (submitting the Environmental Report) ([ML21306A131](#)).

The NRC staff performed an acceptance review of the Hermes construction permit application and docketed the application on November 29, 2021 ([ML21319A354](#)). On December 15, 2021, the staff issued a letter to Kairos ([ML21343A214](#)) providing the schedule and resource estimates for the review. The NRC staff is currently conducting a detailed technical review of the safety of the Hermes design, which will lead to a SE report. The NRC staff performed a review of the effects of the Hermes design on the environment and issued a draft environmental impact statement ([ML22259A126](#)) for public comment on September 29, 2022 ([87 FR 59124](#)). Application documents and information on the review are available on the NRC's public website (<https://www.nrc.gov/reactors/non-power/hermes-kairos.html>).

³³ This activity has been revised from the previous report to clarify the staff's plans. The projected completion date has also been adjusted from the previous report to allow additional time for staff review.

Activities Planned and Completed for the Reporting Period (Q4 FY 2022)

Advanced Reactor Licensing Review Activities	Projected Completion Date	Completion Date
Issued the Hermes draft environmental impact statement for public comment (ML22259A126).	10/28/22	9/29/22

Projected Activities for the Next Two Reporting Periods (Q1 and Q2 FY 2023)

Projected Advanced Reactor Licensing Review Activities	Projected Completion Date
Complete regulatory audits and evaluate any additional docketed information necessary for the preparation of the SE report.	11/15/22
Release draft SE report for the Hermes construction permit application to support engagement with the ACRS.	02/23/23

2-9 Reactor Oversight Process

The ROP is a risk-informed, performance-based oversight program that contains provisions for continuous self-assessment and improvement. The NRC staff developed recommendations for proposed changes to the ROP in SECY-18-0113, “Recommendations for Modifying the Reactor Oversight Process Engineering Inspections” ([ML18144A567](#)), and SECY-19-0067, “Recommendations for Enhancing the Reactor Oversight Process” ([ML19070A050](#)). The staff requested to withdraw these papers, and on August 5, 2021, the Commission approved the staff’s proposed withdrawal ([ML21217A284](#)). During this reporting period, the staff submitted several SECY papers revisiting the recommendations in these withdrawn papers ([ML22188A221](#), [ML22145A448](#), and [ML22189A201](#)); the staff’s plan to revisit these recommendations by the end of FY 2022 was discussed with external stakeholders at the January, March, May and July ROP bi-monthly public meetings.³⁴ The staff also continues to assess and improve the ROP as part of its normal work practices through the NRC’s transformation activities, stakeholder correspondence, feedback from ROP public meetings, and the ROP self-assessment program. The staff will seek Commission approval of changes to the ROP, or provide the Commission with notification of changes, in accordance with Management Directive/Directive Handbook 8.13, “Reactor Oversight Process” ([ML17347B670](#)).

Activities Planned and Completed for the Reporting Period (Q4 FY 2022)

ROP Activities	Projected Completion Date	Completion Date
Submitted a paper to the Commission recommending that the minimum four quarter requirement for Greater-Than-Green findings, coupled with a revision to the treatment of Greater-Than-Green performance indicators, should be eliminated (ML22188A221).	09/30/22	09/16/22

³⁴ The ROP bi-monthly public meeting summaries are available at [ML22034A766](#), [ML22091A184](#), [ML22159A212](#), and [ML22221A224](#).

ROP Activities	Projected Completion Date	Completion Date
Submitted a paper to the Commission with options for the frequency of problem identification and resolution team inspections (ML22145A448).	08/19/22	09/20/22 ³⁵
Submitted a paper to the Commission recommending that a revision should be made to the emergency preparedness significance determination process (SDP) (ML22189A201).	08/31/22	09/22/22 ³⁶

Projected Activities for the Next Two Reporting Periods (Q1 and Q2 FY 2023)

Projected ROP Activities	Projected Completion Date
Complete a ROP program area evaluation on the SDP timeliness.	11/30/22 ³⁷
Complete an effectiveness review of the incorporation of safety culture oversight into the ROP.	12/15/22 ³⁸
Submit a paper to the Commission recommending whether the Alert and Notification System Performance Indicator should be eliminated.	12/30/22

2-10 Backfit

The NRC's backfitting rules are codified in 10 CFR 50.109, "Backfitting," 70.76, "Backfitting," 72.62, "Backfitting," and 76.76, "Backfitting." The backfitting rules define backfitting "as the modification of or addition to systems, structures, components, or design of a facility; or the design approval or manufacturing license for a facility; or the procedures or organization required to design, construct or operate a facility; any of which may result from a new or amended provision in the Commission's regulations or the imposition of a regulatory staff position interpreting the Commission's regulations that is either new or different from a previously applicable staff position..."³⁹ The rules require, in the absence of an applicable exception, an analysis showing that the backfit would result in a substantial increase in the overall protection of the public health and safety or the common defense and security and that the increased protection warrants the direct and indirect costs of implementation. There are similar requirements, referred to as "issue finality," that apply when there are new or amended requirements for licenses, permits, and design approvals and certifications issued under 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants."

The Commission changed its backfitting and issue finality policy as well as its policy on "forward fits," which it defined as requirements or staff interpretations of requirements imposed as a

³⁵ The activity was completed on September 20, 2022, rather than the projected completion date of August 19, 2022, to allow additional time for staff review.

³⁶ The activity was completed on September 22, 2022, rather than the projected completion date of August 31, 2022, to allow additional time for staff review.

³⁷ The projected completion date was extended from September 30, 2022, to November 30, 2022, due to prioritization of the ROP enhancement papers.

³⁸ The projected completion date was extended from September 30, 2022, to December 15, 2022, due to prioritization of the ROP enhancement papers.

³⁹ 10 CFR 50.109(a)(1). Substantially similar definitions are provided in § 70.76, "Backfitting," § 72.62, "Backfitting," and § 76.76, "Backfitting," for non-reactor facilities.

condition of agency approval of a licensee request that result in the modification of or addition to systems, structures, components, or design of a facility, in NRC Management Directive 8.4, “Management of Backfitting, Forward Fitting, Issue Finality, and Information Requests” ([ML18093B087](#)). The NRC completed draft NUREG-1409, “Backfitting Guidelines,” Revision 1, in March 2020 and issued a notice of availability in the FR for public comment ([ML18109A498](#)). This revision would provide additional guidance for the NRC staff on how to implement the Commission’s backfitting and issue finality regulations and policies and forward fitting policy, including how to process violations that are contested based on claims of unjustified backfitting. The NRC received approximately 250 individual comments from members of the public, licensees, and industry representatives. The NRC staff evaluated the comments, updated the draft NUREG, and provided the Commission with the staff’s proposed NUREG-1409, Revision 1 (Final Report) ([ML21006A431](#)). This revised document is currently before the Commission for its consideration.

Activities Planned and Completed for the Reporting Period (Q4 FY 2022)

Backfit Activities	Projected Completion Date	Completion Date
None.		

Projected Activities for the Next Two Reporting Periods (Q1 and Q2 FY 2023)

Projected Backfit Activities	Projected Completion Date
Issue the Fitness-for-Duty Drug Testing Requirements Final Rule, which will constitute backfitting.	12/29/22 ⁴⁰

2-11 Risk-informed Activities

The NRC staff continues to make progress to advance the use of risk insights more broadly to inform decision-making. There are numerous activities ranging in scope from agencywide initiatives, such as the “Be riskSMART” initiative, which is part of the transformation efforts discussed in section 2-1, to the advanced reactor risk-informed activities listed in section 2-7, to individual undertakings in program and corporate offices.⁴¹ The NRC staff continues to implement and track the use of the agencywide Be riskSMART risk-informed decision-making framework to inform a broad range of decisions spanning technical, legal, and corporate arenas. For example, the NRC staff continues to review and approve applications to adopt advanced risk management programs such as 10 CFR 50.69, “Risk-informed categorization and treatment of structures, systems and components for nuclear power reactors,” and Risk-Informed Technical Specifications Initiative 4b,⁴² that provide for operational flexibilities that enhance safety by ensuring that power reactor licensees and the NRC prioritize the most risk significant issues. In addition, the staff has successfully completed its reviews and approved the

⁴⁰ The Commission approved an extension request from October 31, 2022, to December 29, 2022, to allow for procedural reviews.

⁴¹ The NRC maintains a listing of risk-informed activities that is updated annually at <https://www.nrc.gov/about-nrc/regulatory/risk-informed/rpp.html>.

⁴² A description of these and other operating reactors risk-informed initiatives is available at <https://www.nrc.gov/about-nrc/regulatory/risk-informed/rpp/reactor-safety-operating.html>. To date, the NRC has approved 28 and 19 applications enabling licensees to adopt 10 CFR 50.69 and Risk-Informed Technical Specifications Initiative 4b, respectively.

applications submitted by all operating reactor licensees to adopt a risk-informed surveillance frequency control program, Risk-Informed Technical Specifications Initiative 5b.

Activities Planned and Completed for the Reporting Period (Q4 FY 2022)

Risk-Informed Activities	Projected Completion Date	Completion Date
Completed LIC-504 assessment of the risk significance of high energy arcing faults (HEAF). Issued report concluding that there is no significant increase in total HEAF risk warranting the need for any additional regulatory requirements. In addition, evaluated various communication options that would enable the staff to share its insights with external stakeholders for licensee consideration to implement effective steps to further reduce and/or mitigate HEAF risks (ML22200A272).	07/22/22	07/22/22
Developed an Assessments and Observations report on early lessons learned during acceptance reviews from the pilot program for the Risk Tool to risk-inform technical reviews for spent nuclear fuel dry storage.	09/30/22	08/03/22
Completed Be riskSMART evaluation of Inspection Procedure (IP) 71152, "Problem Identification and Resolution," team inspection periodicity and submitted a paper to the Commission (ML22145A448).	08/19/22	09/20/22 ⁴³
Submitted a paper to the Commission recommending whether to revise the Emergency Preparedness Significance Determination Process Failure to Comply assessment methodology to risk-inform areas susceptible to Greater-Than-Green inspection findings (ML22189A201).	08/31/22 ⁴⁴	09/22/22

⁴³ The activity was completed on September 20, 2022, rather than the projected completion date of August 19, 2022, to allow additional time for staff review.

⁴⁴ The previous report erroneously included September 30, 2022, as the projected completion date for this activity.

Projected Activities for the Next Two Reporting Periods (Q1 and Q2 FY 2023)

Projected Risk-Informed Activities	Projected Completion Date
Complete the revision of four materials IPs associated with Inspection Manual Chapter 2800 (specifically, IP 87121, "Industrial Radiography Programs"; IP 87122, "Irradiator Programs"; IP 87125, "Materials Processor/Manufacturer Programs"; and IP 87127, "Radiopharmacy Programs"). The NRC staff is developing risk modules in each IP, with each module focusing on the risks of the relevant types of radioactive materials and their usage.	12/30/22
Develop a seminar for new staff to provide an overview of the Risk Tool and its use to risk-inform technical reviews for spent nuclear fuel dry storage.	12/30/22

2-12 Coronavirus Disease (COVID-19) Pandemic

The NRC continues to develop and implement precautionary measures in response to the pandemic to help protect the health and safety of our workforce consistent with guidance provided by the Federal Government, including the Centers for Disease Control and Prevention (CDC), as well as considerations of State and local conditions around NRC facilities. The NRC is monitoring the effects of the COVID-19 pandemic on NRC-licensed activities as well as actions taken in response to State, local, and site-specific conditions. The NRC is poised to take additional steps as warranted without compromising its public health and safety mission.

NRC Occupancy of Facilities

During this reporting period, the NRC continued to operate in a hybrid work environment at all locations, combining telework and in-office staff presence. The guidance for inspection program implementation remains in effect in accordance with memorandum, "Implementation of Inspection Programs Following Re-Entry from the Public Health Emergency for the Reactor Safety Program" ([ML21295A302](#)). The agency continues to closely monitor guidance from the Federal Government's Safer Federal Workforce Taskforce, the CDC, and the Occupational Safety and Health Administration to facilitate a healthy and safe physical workspace.

Licensing and Oversight Items of Interest

The NRC staff took steps to identify areas of our regulations that proved challenging during the pandemic, and the areas where temporary flexibilities, such as exemptions, would not compromise the ability of licensees to maintain the safe and secure operation of NRC-licensed facilities. The NRC staff has communicated the processes available to licensees for requesting these flexibilities in a transparent way through public communications, such as teleconferences, webcasts, and letters. In addition, these processes and the approved flexibilities are posted and updated on the NRC public website (<https://www.nrc.gov/about-nrc/covid-19/>).

The NRC has also developed portions of its website devoted to the regulatory activities taken in response to the COVID-19 pandemic. Specific posts related to [nuclear power plant licensees](#), [nuclear materials licensees](#), and [security and emergency preparedness](#) are available to keep the public informed on how the NRC adapted its regulatory approach during the pandemic. Between July 1 and September 30, 2022, the NRC did not receive any requests for COVID-19-related flexibilities from nuclear materials or nuclear reactor licensees. A complete list of

licensing requests approved by the NRC in response to the COVID-19 pandemic is available on the NRC public website at <https://www.nrc.gov/about-nrc/covid-19/>.

Regulatory Activities Taken in Response to the COVID-19 Pandemic During the Reporting Period

Licensee Type	Number of COVID-19 Requests Approved During the Reporting Period	Average Number of Days to Review COVID-19 Requests⁴⁵
Power Reactor	0	N/A
Non-Power Reactor	0	N/A
Other (e.g., topical reports)	0	N/A
Decommissioning of Nuclear Facilities and Uranium Recovery	0	N/A
Storage and Transportation of Spent Nuclear Fuel	0	N/A
Fuel Cycle Facilities	0	N/A
Medical, Industrial and Academic Uses of Nuclear Materials and Agreement States	0	N/A

⁴⁵ This average is calculated based on the dates the request is received and the review is completed; review time may be longer in cases where a supplement to a request is received after the initial submission date.

Enclosure 3 – Summary of Activities

3-1 Reactor Oversight Process (ROP) Findings

The table below provides the calendar year (CY) ROP findings for the year-to-date and 3-year rolling metrics.⁴⁶

Location	Number of Findings	CY 2019	CY 2020	CY 2021	CY 2022
Nationally	Total	440	291	278	265 ⁴⁷
Region I	Green	95	50	61	60
	White	0	0	1	0
	Yellow	0	0	0	0
	Red	0	0	0	0
	Greater-Than-Green Security	0	0	0	0
	Total	95	50	62	60
	No. of Units Operating During CY	24	22 ⁴⁸	21 ⁴⁹	20 ⁵⁰
Region II	Green	110	77	69	59
	White	1	2	0	0
	Yellow	0	0	0	0
	Red	0	0	0	0
	Greater-Than-Green Security	0	1	0	0
	Total	111	80	69	59
	No. of Units Operating During CY	33	33	33	33
Region III	Green	96	51	65	51
	White	1	0	0	1
	Yellow	0	0	0	0
	Red	0	0	0	0
	Greater-Than-Green Security	0	0	1	1
	Total	97	51	66	53
	No. of Units Operating During CY	23	22 ⁵¹	22	22

⁴⁶ For the purposes of this report, the total number of findings per CY is based on the year in which an inspection report was issued instead of the year in which a finding was identified. The latter approach was used to describe the inspection finding trend in SECY-22-0029, "Reactor Oversight Process Self-Assessment for Calendar Year 2021" (ML22033A288), which shows the first year-over-year increase in green inspection findings since CY 2011.

⁴⁷ The inspection reports for the third quarter of CY 2022 will continue to be finalized through November 15, 2022. The report for the next reporting period will be updated to include any additional findings from the third quarter of CY 2022.

⁴⁸ The reduction of two units for CY 2020 reflects the permanent shutdown of Pilgrim Nuclear Station on May 31, 2019 and Three Mile Island Unit 1 on September 20, 2019.

⁴⁹ The reduction of one unit for CY 2021 reflects the permanent shutdown of Indian Point Nuclear Generating Unit 2 on April 30, 2020.

⁵⁰ The reduction of one unit for CY 2022 reflects the permanent shutdown of Indian Point Nuclear Generating Unit 3 on April 30, 2021.

⁵¹ The reduction of one unit for CY 2020 reflects the permanent shutdown of Duane Arnold on August 10, 2020.

Location	Number of Findings	CY 2019	CY 2020	CY 2021	CY 2022
Region IV	Green	137	110	81	92
	White	0	0	0	1
	Yellow	0	0	0	0
	Red	0	0	0	0
	Greater-Than-Green Security	0	0	0	0
	Total	137	110	81	93
	No. of Units Operating During CY	18	18	18	18

3-2 Licensing Actions

The tables below provide the status of licensing actions organized by licensing program. Consistent with Section 102(c) of the Nuclear Energy Innovation and Modernization Act (NEIMA), the licensing actions referenced in this section include “requested activities of the Commission” for which the U.S. Nuclear Regulatory Commission (NRC) staff issues a final safety evaluation (SE). These totals do not include license amendment requests (LARs), as they are addressed separately in section 3-3. “Total Inventory” refers to the total number of licensing actions that are open and accepted by the NRC at the end of the quarter. “Licensing Actions Initiated During the Reporting Period” are the number of licensing actions (regardless of acceptance) that are received by the NRC during the reporting period.

Operating Reactors

Reporting Period	Total Inventory	Licensing Actions Initiated During the Reporting Period	Licensing Actions Completed During the Reporting Period	Percentage of Licensing Actions Completed Prior to the Generic Milestone Schedule	Percentage of Licensing Actions Completed Prior to the Established Schedule ⁵²
Quarter (Q) 1 fiscal year (FY) 2022	132	33	107	100%	94%
Q2 FY 2022	144	103	93	100%	95%
Q3 FY 2022	136	41	43	100%	100%
Q4 FY 2022	124	28	32	100%	81% ⁵³

⁵² The “established schedule” is the schedule communicated to the licensee and made publicly available at the completion of the acceptance review.

⁵³ This percentage is due to a smaller number of actions in the quarter and the disproportionate weight of a Dominion Fleet request involving six actions that required verification of referenced topical reports.

New Reactors

Reporting Period	Total Inventory	Licensing Actions Initiated During the Reporting Period	Licensing Actions Completed During the Reporting Period	Percentage of Licensing Actions Completed Prior to the Generic Milestone Schedule	Percentage of Licensing Actions Completed Prior to the Established Schedule
Q1 FY 2022	2	3	3	100%	100%
Q2 FY 2022	1	0	1 ⁵⁴	N/A	N/A
Q3 FY 2022	1 ⁵⁵	1	1	100%	100%
Q4 FY 2022	1	1	1	100%	100%

Fuel Facilities

Reporting Period	Total Inventory	Licensing Actions Initiated During the Reporting Period	Licensing Actions Completed During the Reporting Period	Percentage of Licensing Actions Completed Prior to the Generic Milestone Schedule	Percentage of Licensing Actions Completed Prior to the Established Schedule
Q1 FY 2022	2	11	13	100%	92% ⁵⁶
Q2 FY 2022	6	8	4	100%	75% ⁵⁷
Q3 FY 2022	6	6	6	100%	100%
Q4 FY 2022	8	8	6	100%	60% ⁵⁸

3-3 Licensing Amendment Request Reviews

The tables below provide the status of LARs organized by licensing program. Consistent with Section 102(c) of NEIMA, the LARs referenced in this section include “requested activities of the Commission” for which the NRC staff issues a final SE. The total inventory is the number of open LARs at the end of the quarter. LARs are included in the total inventory after they have been accepted by the NRC (the acceptance review period is generally 30 days after the application is submitted).

⁵⁴ During the reporting period, the NRC staff denied, without prejudice, the Oklo Aurora combined license application and terminated all review activities.

⁵⁵ The total inventory was erroneously reported as 2 instead of 1 in the previous report.

⁵⁶ One licensing action was complex due to security issues, which resulted in it exceeding the established schedule by 17 days.

⁵⁷ One licensing action exceeded the established schedule by 82 days due to additional time needed for the licensee to obtain signed financial documents from a third party.

⁵⁸ Two fuel cycle licensing actions exceeded the established schedule by approximately one month due to a need to prioritize other work.

Operating Reactors

Reporting Period	Total Inventory	LARs Submitted During the Reporting Period	LAR Reviews Completed During the Reporting Period	Percentage of LAR Reviews Completed Prior to the Generic Milestone Schedule	Percentage of LAR Reviews Completed Prior to the Established Schedule ⁵⁹
Q1 FY 2022	317	105	81	99%	95% ⁶⁰
Q2 FY 2022	304	72	94	100%	99%
Q3 FY 2022	289	78	93	100%	91%
Q4 FY 2022	269	65	84	100%	93%

New Reactors

Reporting Period	Total Inventory	LARs Submitted During the Reporting Period	LAR Reviews Completed During the Reporting Period	Percentage of LAR Reviews Completed Prior to the Generic Milestone Schedule	Percentage of LAR Reviews Completed Prior to the Established Schedule
Q1 FY 2022	0	0	1	100%	100%
Q2 FY 2022	0	0	0	N/A	N/A
Q3 FY 2022	0	0	0	N/A	N/A
Q4 FY 2022	1	1	0	N/A	N/A

Fuel Facilities

Reporting Period	Total Inventory	LARs Submitted During the Reporting Period	LAR Reviews Completed During the Reporting Period	Percentage of LAR Reviews Completed Prior to the Generic Milestone Schedule	Percentage of LAR Reviews Completed Prior to the Established Schedule
Q1 FY 2022	5	5	13	100%	100%
Q2 FY 2022	11	12	7	100%	100%
Q3 FY 2022	10	4	5	100%	60% ⁶¹
Q4 FY 2022	7	1	4	100%	75% ⁶²

⁵⁹ The “established schedule” is the schedule communicated to the licensee and made publicly available at the completion of the acceptance review.

⁶⁰ One review of an LAR that proposed a first-of-a-kind design exceeded the established schedule by 180 days. The NRC staff identified an issue that resulted in the licensee submitting an update that expanded the licensee’s proposed submission and extended the staff’s review. The staff issued the SE on February 28, 2022.

⁶¹ Reviews for two LARs exceeded the established schedule, one by 5 days and the other by 7 days, due to a need to prioritize other work.

⁶² One review of an LAR exceeded the established schedule by 26 days due to a need to prioritize other work.

3-4 Research Activities⁶³

Summary of New Research Projects

During the reporting period, the Office of Nuclear Regulatory Research (RES) initiated research on or substantially revised the following projects:

Support in the Development and Enhancement of NRC Risk Analysis Tools (NRR-2022-001)	
Importance to the NRC Mission	<p>This research program update supports NRC capabilities and maintenance of risk tools used in the NRC's ROP and supports advancements in the use of risk insights in oversight and licensing activities. These research activities will enhance the NRC's capabilities in applying risk assessment to risk-informed regulatory programs, including the Significance Determination Process (SDP), the Accident Sequence Precursor program, and the Incident Investigation Program, and in evaluating Notices of Enforcement Discretion. The work performed under this research project is a critical element of the ROP as it provides the independent method to model risk for operating reactors and address performance deficiencies and assess operating events. In addition, updated Standardized Plant Analysis Risk (SPAR) models will be used in ongoing or emerging risk assessment activities; SPAR model development and enhancements for new reactors is intended to support the implementation of the ROP as the reactors transition from design approval or certification into construction and operation or from construction to operation through the issuance of an operating license. The closure and results from the prior program plan are provided in the Summary of Completed Research Projects below (Office of Nuclear Reactor Regulation (NRR)-2015-009).</p>
Planned Activities	<p><u>Maintaining and updating SPAR models:</u> RES maintains and updates SPAR models. SPAR models will be modified, documented, tested, and reviewed in accordance with the appropriate guidance. Currently, six to eight SPAR models are updated per year. The goal is to slowly progress toward 12 SPAR model updates per year. The goal of 12 SPAR model updates per year is to increase SPAR model readiness, which in turn increases SDP efficiency by having the best available information. This task is a continuation of the previous program plan and is intended to meet the goal of 12 SPAR model updates per year by incorporating plant modifications, operating experience, state-of-the-art methods, and applicable internal and external hazards to reflect the current as-built, as operated plants.</p> <p><u>Developing and enhancing SPAR models for new reactors:</u> This task applies to development of and future enhancements to SPAR models for new reactors, while the first task above applies to SPAR models for operating reactors. This is a new task that will develop SPAR models for new reactors to support implementation of the ROP as the reactors</p>

⁶³ This section provides information about projects that were started or completed during the reporting period that exceeded 300 staff hours or \$500K of program support for the total duration of the project.

transition from design approval or certification into construction and operation or from the construction to operation through issuance of an operating license.

Maintaining and enhancing SAPHIRE⁶⁴: RES will update SAPHIRE biannually or more frequently based on software compatibility, security patches, or user input. RES will communicate updates to all active users and make the software available through the developer website. This task is a continuation of the previous program plan intended to maintain the SAPHIRE program by fixing software bugs and enhancing it to include the latest capabilities and probabilistic risk assessment (PRA) methods.

Developing risk assessment guidance: The objectives of this task are to develop guidance for the application of new or enhanced risk tools and methods and clarify or expand existing guidance based on lessons learned from field use. This task is a continuation of the previous program plan and will update existing guidance and will concentrate in the development of new guidance in risk assessment to provide consistent performance of risk assessment, model development, and knowledge management.

Level 3 PRA Project knowledge management and transfer: RES will support knowledge management activities, including the transfer of knowledge on methods, models, and data used for the Level 3 PRA project. RES will leverage the Level 3 PRA model and risk insights to apply to new risk applications and research projects. This may take the form of guidance, model, and software enhancements and will be communicated through standing calls with regional staff, seminars, and counterpart meetings. This is a new task that supports knowledge management and transfer gained through the implementation of this project by incorporating the state-of-practice approaches from this project into existing risk tools, such as the SPAR models and SPAR-DASH.

Requesting Business Line	Operating Reactors
Estimated Completion	FY 2027
Estimate of Total Research Resources	52.9 Full-Time Equivalent (FTE) and \$12.9M over a 5-year period

⁶⁴ A Risk and Reliability Assessment Tool

Support for Component Reliability and Integrity Assessment for Advanced Reactors (NRR-2022-009)	
Importance to the NRC Mission	The research activities will provide necessary information and tools to support NRC reviews related to advanced reactor technologies. The research activities will assist the NRC in understanding the risk and reliability considerations for component performance and monitoring and will provide NRC reviewers with necessary methods and tools to support regulatory review of non-light-water reactor designs.
Planned Activities	Activities include evaluating the use of Reliability Integrity Management for life cycle management of passive components, developing guidance for evaluating the adequacy of applicants' approaches for setting reliability targets, assessing the potential for stress relaxation cracking, and developing tools and technical basis to support integrity assessment of graphite.
Requesting Business Line	New Reactors
Estimated Completion	FY 2025
Estimate of Total Research Resources	3.6 FTE and \$1.3M over a 3-year period

Radiation Protection Computer Code Analysis and Maintenance Program (RAMP) Support for Decommissioning Computer Codes (Office of Nuclear Material Safety and Safeguards (NMSS)-2022-008)	
Importance to the NRC Mission	The purpose of this work is to provide technical support, maintenance, training, and code distribution of the decommissioning and the uranium recovery computer codes via the RAMP.
Planned Activities	The planned activities are to provide hosting and technical support for the various RAMP web pages to support the decommissioning computer codes and to provide maintenance, technical support, error fixing, and training support for five decommissioning computer codes.
Requesting Business Line	Decommissioning and Low-Level Waste
Estimated Completion	FY 2025
Estimate of Total Research Resources	1.2 FTE and \$195K over a 3-year period

Recommendations for NRC Regulatory Guidance Updates (Fuel and Irradiation Parameters) for High-Assay Low-Enriched Uranium and High Burnup Light Water Reactor Spent Fuels (NMSS-2022-005)	
Importance to the NRC Mission	The purpose of this work is to provide recommendations on updates to NRC regulatory guidance documents related to spent fuel dry storage systems and facilities and for transportation packages for spent fuel and radioactive material, regarding any needed changes to fuel and irradiation parameters for the treatment of higher initial enrichment and higher burnup light water reactor spent fuels. These updates are essential for NMSS staff to be able to review and license higher enrichment and higher burnup spent fuel applications for transportation and dry storage systems.
Planned Activities	The planned activities are to provide an in-depth review of the current NRC regulatory guidance documents related to spent fuel storage and transportation and provide recommendations for the treatment of increased enrichment and higher burnup spent fuels, specifically for performing shielding and criticality analyses.
Requesting Business Line	Spent Fuel Storage and Transportation
Estimated Completion	FY 2023
Estimate of Total Research Resources	0.3 FTE and \$450K over a 2-year period

Recommendations for Using Sensitivity/Uncertainty Analyses in Validation of Computational Methods for Criticality Safety of High-Assay Low-Enriched Uranium Systems (NMSS-2022-006)	
Importance to the NRC Mission	A portion of the criticality safety review process, for fissile material systems, is understanding the computer code and the associated nuclear data ability of predicting criticality. Sensitivity/uncertainty analyses may assist in demonstrating that current critical experiments can be extended to higher enrichment fissile material systems utilized in fuel cycle facilities, transportation packages, and storage systems. Sensitivity/uncertainty methods may be used to identify a wider applicability of criticality experiments, resulting in a higher fidelity validation methods. These methods may benefit other technologies by identifying additional critical experiments that can be used in validating new fuel designs like accident tolerant fuel and advanced non-light-water-reactor fuels.
Planned Activities	The planned activities will review current methods and best practices for validating criticality codes and provide new recommendations when using sensitivity/uncertainty methods for the validation of criticality safety calculations and software for high-assay low-enriched uranium applications.
Requesting Business Line	New Reactors & Spent Fuel Storage and Transportation
Estimated Completion	FY 2023

Estimate of Total Research Resources	0.3 FTE and \$400K over a 2-year period
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Supporting Burnup Credit (BUC) Analyses for Accident Tolerant, Increased Enriched and Higher Burnup Fuels (NMSS-2022-007)	
Importance to the NRC Mission	This work will support the NRC with criticality safety analyses for fissile materials systems used under Title 10 of the <i>Code of Federal Regulations</i> (CFR) Part 71, "Packaging and Transportation of Radioactive Material," and 10 CFR Part 72, "Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor-Related Greater Than Class C Waste." Specifically, this work will support evaluations related to the licensing and certification of spent fuel systems that rely on BUC in the criticality safety analysis for increased enrichment and higher burnup fuel applications.
Planned Activities	The planned activities are being initiated to respond to industry initiatives to operate with increased uranium-235 initial enrichments and higher burnups beyond existing practice (e.g., up 8 weight-percent initial enrichment and 75 GWd/MTU assembly average burnup) for BUC applications. BUC is taking credit for the reduced reactivity of spent nuclear fuel in criticality analyses. One important component of BUC is the validation of the criticality code used for these predictions. Work will consist of updating technical documents related to the validation of minor actinides and fission products in BUC criticality safety analyses of commercial spent nuclear fuel storage and transportation systems for increased enrichment and higher burnup applications.
Requesting Business Line	Spent Fuel Storage and Transportation
Estimated Completion	FY 2023
Estimate of Total Research Resources	0.4 FTE and \$490K over a 2-year period

Severe Accident Analysis and Licensing Support for Small Modular Reactors (SMRs) (NRR-2022-015)	
Importance to the NRC Mission	The purpose of this work is to update or create MELCOR models for the NuScale US460 standard design approval application, General Electric Hitachi BWRX-300, and Holtec SMR-160 using information submitted by the respective SMR applicants and to perform confirmatory analysis using these models to support the review of severe accident analysis and risk insights from PRAs.
Planned Activities	For each SMR design, planned research will include updating or creating the MELCOR model based on design information submitted by the applicant and performing calculations to confirm phenomenological processes impacting severe accident progression.
Requesting Business Line	New Reactors

Estimated Completion	FY 2025
Estimate of Total Research Resources	3.3 FTE and \$775K over a 4-year period

Regulatory Guidance Development Support for Veterinarian Release (NMSS-2022-001)	
Importance to the NRC Mission	The NRC authorizes the release of animals to owners following veterinary procedures involving byproduct material when the exposure to members of the public from the animal is expected to be below the public dose limits in 10 CFR Part 20, "Standards for Protection Against Radiation." Industry and NRC staff reviewers have requested that guidance be updated to reflect the current state-of-knowledge.
Planned Activities	RES staff will provide support to NMSS by updating the PIMAL (modeling tool for dosimetry calculations for radiation workers) code to include canine, cat, and horse phantoms; developing a technical basis document to support regulatory guidance development; and developing a Regulatory Guide to provide licensees with acceptable methodologies for development of animal release criteria.
Requesting Business Line	Nuclear Materials Users
Estimated Completion	FY 2027
Estimate of Total Research Resources	2.6 FTE and \$620K over a 6-year period

Summary of Completed Research Projects⁶⁵

During the reporting period, the following research projects were completed:

Support in the Development and Enhancement of NRC Risk Analysis Tools (NRR-2015-009)	
Importance to the NRC Mission	<p>The primary objective of this activity was to provide and maintain standard tools, methods, and guidance for risk analysis of inspection findings and reactor incidents for the SDP, the Accident Sequence Precursor Program, and Incident Investigation Program, while recognizing differences in purpose among programs. By using these standard tools, methods, and guidance, NRC analysts from various Headquarters and regional offices will achieve more consistent results when performing risk assessments of licensee performance issues and operational events.</p> <p>The research program plan for these capabilities has been updated and reported in the Summary of New Research Projects section under NRR-2022-001.</p>

⁶⁵ The research project resources are estimates of staff hours and program support costs based on inspection of project records, including staffing plans and contract spending plans.

Research Results or Findings	RES accomplished updates to routine SPAR models, documentation, shutdown model, and data. In addition, model modifications were made to assess SDP findings, some models were converted to an all-hazard model, and the external hazards were enhanced in all models. RES also accomplished new software revisions, which corrected errors, made improvements, added new features, and began development of a web-based version of SAPHIRE.
Duration of the Project	7 years
Estimate of Total Research Resources	38.5 FTE and \$16.9M over the 7-year period

Confirmatory Testing of Carbon Fiber Reinforced Polymer (CFRP) (NRR-2019-001)

Importance to the NRC Mission	This research effort acquired confirmatory testing data related to CFRP to address uncertainties and provided the technical bases to support staff reviews of licensees' relief requests and American Society of Mechanical Engineers Code actions related to the use of CFRP for repair of piping systems.
Research Results or Findings	Supporting operations and repair of CFRP piping in the fleet, RES issued several reports including: (1) a report documenting the results of CFRP mechanical testing; (2) a report documenting the results of CFRP material adjustment factors testing; and (3) a white paper on non-destructive examination of CFRP composites. An additional task was also completed to evaluate the risk due to the potential failure of the CFRP repairs.
Duration of the Project	3 years
Estimate of Total Research Resources	1.5 FTE and \$600K over the 3-year period

BWRX-300 Containment Evaluation Method Licensing Topical Report Confirmatory Analysis (NRR-2021-001)

Importance to the NRC Mission	The NRC is currently engaged in pre-application activities with General Electric Hitachi for the BWRX-300 design. General Electric Hitachi submitted the BWRX-300 Containment Method Licensing Topical Report, which presents a novel evaluation methodology to analyze the BWRX-300 design. Confirmatory analyses were needed to assess the conservatism of certain aspects of the topical report.
Research Results or Findings	RES staff developed and analyzed TRACE thermal hydraulic and MELCOR severe accident models of the primary and containment systems of the BWRX-300 design to independently evaluate the novel aspects of the BWRX-300 containment methodology. Several important findings were communicated to NRR staff to inform audit questions and requests for additional information (RAIs). RES staff documented their findings in a report. RES staff also presented the staff's analysis to the Advisory Committee on Reactor Safeguards.

Duration of the Project	1.5 years
Estimate of Total Research Resources	1 FTE over the 1.5-year period

User Need Request NRO-2015-006, “Develop the Technical Bases to Support Revisions to Regulatory Guide 1.208.”

Importance to the NRC Mission	This research supported the NRC’s external hazards safety assessment activities in the area of seismic hazards. Given the change in current understanding of earthquake hazard across the country, this research monitored evolving scientific theories and incorporated newly discovered information and knowledge into technical documents to be used in updating the relevant regulatory guidance.
Research Results or Findings	As part of these research activities, 10 different technical documents were developed addressing different aspects of seismic hazards, including a new guidance document on how to develop site response calculations, a new set of recommendations on how to develop probabilistic seismic hazard assessments, an assessment of newly developed ground motion models, and development of probabilistic strain compatible properties for soil structure interaction analysis.
Duration of the Project	7 years
Estimate of Total Research Resources	5 FTE and \$1.4M over the 7-year period

Modification of the Reference Plant Fluoride Salt-Cooled Reactor to Support the Review of the Hermes Non-power Test Reactor Preliminary Safety Analyses (NRR-2022-001)

Importance to the NRC Mission	This research involved independent analyses using the SCALE (neutronics) and MELCOR (severe accident) computer codes to develop insights into Kairos Power LLC’s Hermes non-power reactor transient behavior in order to aid in the review of the construction permit application.
Research Results or Findings	The modifications to the reference plant modeling were based on publicly available information in the Hermes construction permit application. Using the modified reference plant model, three scenarios were simulated in order to simulate transients, and results were compared with the results in the construction permit application. Sensitivity analyses were performed to gain additional insights into the plant response, supporting the timely review of the application.
Duration of the Project	1 year
Estimate of Total Research Resources	0.2 FTE and \$80K

3-5 Fees Billed

The tables below provide information on Part 170 fees billed for each fee class. For each fee class, the NRC staff compared the fees billed to the receipts estimated in the annual fee rule.⁶⁶

Fee Class	FY 2022 Part 170 Receipts Proposed – Annual Fee Rule (\$M)	Part 170 Billed in Q4 FY 2022 (\$M)	Total Part 170 – Billed in FY 2022 (\$M)
Fuel Facilities	\$7.8	\$2.6	\$8.8
Generic Decommissioning	\$0.7	\$0.6	\$2.9
Materials Users ⁶⁷	\$0.9	\$0.1	\$1.0
Operating Power Reactors	\$160.0	\$36.3	\$156.6
Research and Test Reactors	\$5.8	\$1.6	\$5.0
Spent Fuel Storage / Reactor Decommissioning	\$10.3	\$2.6	\$12.3
Rare Earth	\$0.1	\$0.0	\$0.1
Transportation	\$2.8	\$0.9	\$3.5
Uranium Recovery	\$0.5	\$0.1	\$0.6

Significant Ongoing Licensing Actions

The following table includes a comparison of the fees billed to projected resources for subsequent license renewal application reviews, the SHINE Medical Technologies, LLC (SHINE) operating license application review, and the Kairos Hermes construction permit application review.

Docket	Project Name	Projected Resources (\$M) ⁶⁸	Fees Billed to Date (\$M) ⁶⁹
Point Beach Units 1 and 2 05000266/05000301	Point Beach Units 1 and 2 Subsequent License Renewal Application — Safety Review	\$5.0 ⁷⁰	\$3.5
Point Beach Units 1 and 2 05000266/05000301	Point Beach Units 1 and 2 Subsequent License Renewal Application — Environmental Review	\$1.4	\$1.4

⁶⁶ The FY 2022 Final Fee Rule was published in the *Federal Register* (FR) on June 22, 2022 ([87 FR 37197](#)).

⁶⁷ Materials Users—Billed as flat fee applications and included in the estimates and billed.

⁶⁸ Projected resources are calculated based on the FTE estimates provided to applicants in the acceptance letters. Dollar amounts are obtained by multiplying the hours estimate by the professional hourly rate.

⁶⁹ The NRC bills its licensees/applicants in the first month of the quarter following the timeframe in which the work was performed. For example, NRC work performed in July, August, and September would be invoiced to the licensee/applicant in October. Therefore, the total billed amounts listed in Table 3-5 reflects costs for NRC work performed through June 2022.

⁷⁰ When the formal acceptance letter for the Point Beach subsequent license renewal application was sent to the licensee on January 15, 2021 ([ML21006A417](#)), the NRC estimated that it would take approximately \$6.4M to complete the application review.

Docket	Project Name	Projected Resources (\$M) ⁶⁸	Fees Billed to Date (\$M) ⁶⁹
North Anna Units 1 and 2 05000338/05000339	North Anna Units 1 and 2 Subsequent License Renewal Application — Safety Review	\$5.0 ⁷¹	\$3.0
North Anna Units 1 and 2 05000338/05000339	North Anna Units 1 and 2 Subsequent License Renewal Application — Environmental Review	\$1.4	\$1.5
Oconee Units 1, 2, and 3 05000269/05000270/ 05000287	Oconee Units 1, 2, and 3 Subsequent License Renewal Application — Safety Review	\$5.0 ⁷²	\$3.3
Oconee Units 1, 2, and 3 05000269/05000270/ 05000287	Oconee Units 1, 2, and 3 Subsequent License Renewal Application — Environmental Review	\$1.4	\$0.7
SHINE Medical Technologies, LLC 05000608	SHINE Medical Isotope Production Facility Operating License Application Review — Safety and Environmental Reviews	\$6.5 ⁷³	\$6.9 ⁷⁴
St. Lucie Units 1 and 2 05000335/05000389	St. Lucie Units 1 and 2 Subsequent License Renewal Application — Safety Review	\$5.0 ⁷⁵	\$2.8
St. Lucie Units 1 and 2 05000335/05000389	St. Lucie Units 1 and 2 Subsequent License Renewal Application — Environmental Review	\$1.4	\$0.4
Kairos Hermes 05007513	Kairos Hermes – Construction Permit – Safety and Environmental Reviews	\$5.5 ⁷⁶	\$2.4

⁷¹ When the formal acceptance letter for the North Anna subsequent license renewal application was sent to the licensee on October 13, 2020 ([ML20258A284](#)), the NRC estimated that it would take approximately \$6.4M to complete the application review.

⁷² When the formal acceptance letter for the Oconee subsequent license renewal application was sent to the licensee on July 22, 2021 ([ML21194A245](#)), the NRC estimated that it would take approximately \$6.4M to complete the application review.

⁷³ The update to the projected resource estimate for this application review was provided to SHINE by letter dated February 17, 2022 ([ML22047A179](#)).

⁷⁴ Increases in the scope of the review related to the phased construction approach, unexpected design modifications, and novel technical and licensing challenges for this first-of-a-kind facility resulted in increased resource expenditures relative to the estimate.

⁷⁵ When the formal acceptance letter for the St. Lucie subsequent license renewal application was sent to the licensee on September 24, 2021 ([ML21246A091](#)), the NRC estimated that it would take approximately \$6.4M to complete the application review.

⁷⁶ The projected resource estimate was provided to Kairos Power LLC by letter dated December 15, 2021 ([ML21343A214](#)).

3-6 Requests for Additional Information (RAIs)

The table below provides information on RAIs associated with licensing actions that are considered “requested activities of the Commission” for which the NRC staff issues a final SE, consistent with Section 102(c) of NEIMA. While Section 102(c) of NEIMA only applies to licensing actions accepted after July 13, 2019, the RAI data also include licensing actions accepted prior to July 13, 2019, to provide a complete inventory.

Type of Facility or Activity Type	Total Inventory of Open RAIs as of the End of Reporting Period	Total Number of RAIs Issued in Reporting Period	Total Number of RAIs Responded to in Reporting Period	Total Number of RAIs Closed in Reporting Period ⁷⁷
Operating Reactors	333	44	118	117
Non-Power Production and Utilization Facilities ⁷⁸	458	3	0	8
Design Certifications for New Reactors ⁷⁹	N/A	N/A	N/A	N/A
Early Site Permits for New Reactors ⁸⁰	N/A	N/A	N/A	N/A
Combined Licenses for New Reactors	0	0	0	0
Construction Permits for New Reactors or Non-Power Production and Utilization Facilities	0	4 ⁸¹	4	4
Fuel Facilities	42	13	11	7
Power Reactor Decommissioning	70	17	17	0
Research and Test Reactor Decommissioning	12	12 ⁸²	12	0
Spent Fuel	769	18	18	1
Materials	0	0	0	0
Pre-Application Activities for Advanced Reactors	5	0	0	0

⁷⁷ RAIs are considered closed once the final SE, environmental assessment, or environmental impact statement is finalized except for RAIs associated with new reactor application reviews. Due to the phased approach taken over several years for new reactor application reviews, RAIs are closed throughout the review process once the staff has determined that no additional information is needed to resolve the issue.

⁷⁸ For the purposes of RAI reporting, non-power production and utilization facilities include all operating research and test reactors and medical radioisotope facilities licensed under 10 CFR Part 50, “Domestic Licensing of Production and Utilization Facilities,” including the ongoing review of the SHINE operating license application.

⁷⁹ No design certification applications are currently under review by the NRC; therefore, there will be no RAI data to report until an application is submitted and accepted by the NRC for review.

⁸⁰ No early site permit applications are currently under review by the NRC; therefore, there will be no RAI data to report until an application is submitted and accepted by the NRC for review.

⁸¹ These RAIs are associated with the Kairos Hermes construction permit application.

⁸² These RAIs are associated with the Aerotest Radiography and Research Reactor Decommissioning Plan ([ML22151A252](#)).

3-7 Workforce Development and Management

FY 2022 Staffing by Office⁸³

	FY 2022 Budget	FTE Utilization 06/19/22 - 07/30/22	FTE Utilization 07/31/22 - 08/27/22	FTE Utilization 08/28/22 - 09/24/22	FTE Utilization as of 09/24/22	Delta (Q4 FTE Utilization – FY 2022 Budget)	End of Year (EOY) ⁸⁴ Actual Utilization	Delta (EOY Utilization – FY 2022 Budget)
Totals	2889.9	316.6	209.0	214.1	2705.3	-184.6	2705.3	-184.6
COMM	42.0	2.5	1.7	1.8	22.9	-19.1	22.9	-19.1
OIG	63.5	7.0	4.4	4.2	59.0	-4.5	59.0	-4.5
Totals Other Offices	2784.4	307.1	202.9	208.1	2623.4	-161.0	2623.4	-161.0
OCFO	92.0	10.5	6.8	6.8	88.6	-3.4	88.6	-3.4
OGC	90.7	10.9	7.0	7.3	93.9	3.2	93.9	3.2
OCA	10.0	1.2	0.7	0.7	10.0	0.0	10.0	0.0
OCAA	7.0	0.5	0.4	0.4	5.7	-1.3	5.7	-1.3
OPA	13.0	1.5	1.0	1.0	13.0	0.0	13.0	0.0
SECY	17.0	2.0	1.3	1.4	16.5	-0.5	16.5	-0.5
OIP	34.0	3.9	2.5	2.4	32.8	-1.2	32.8	-1.2
ASLBP	23.0	2.3	1.4	1.4	19.5	-3.5	19.5	-3.5
ACRS	23.5	2.8	1.6	1.8	23.2	-0.3	23.2	-0.3
OEDO	26.0	2.9	2.1	2.1	26.2	0.2	26.2	0.2
NRR	565.6	59.1	37.9	40.2	511.1	-54.5	511.1	-54.5
NMSS	302.2	34.0	22.5	23.5	291.3	-10.9	291.3	-10.9
RES	202.7	22.8	14.9	14.8	190.7	-12.0	190.7	-12.0
NSIR	159.3	17.1	11.1	11.2	143.9	-15.4	143.9	-15.4
R-I	171.2	19.0	12.9	13.5	165.2	-6.0	165.2	-6.0
R-II	208.0	23.9	16.2	16.6	200.7	-7.3	200.7	-7.3
R-III	170.7	20.1	13.5	13.8	168.6	-2.1	168.6	-2.1
R-IV	160.9	19.4	12.7	13.5	167.1	6.2	167.1	6.2
OE	31.5	3.3	2.2	2.2	29.2	-2.3	29.2	-2.3
OI	35.0	3.6	2.4	2.4	32.3	-2.7	32.3	-2.7
OCIO	169.0	18.4	12.2	12.2	150.1	-18.9	150.1	-18.9
ADM	119.1	13.6	9.4	9.2	116.1	-3.0	116.1	-3.0
SBCR	13.0	1.5	1.0	1.0	13.0	0.0	13.0	0.0
OCHCO	137.0	12.8	9.1	8.8	113.0	-24.0	113.0	-24.0
CSU	3.0	0.1	0.1	0.1	1.7	-1.3	1.7	-1.3

3-8 Inspection Activities

The table below shows the average number of hours of direct inspection per plant in CY 2022.

⁸³ Some numbers might not add due to rounding.

⁸⁴ Based on FTE utilization as of September 24, 2022.

Average ROP Direct Inspection Hours

Nationwide Per Plant (unit)	Column 1 of ROP Action Matrix	Column 2 of ROP Action Matrix	Column 3 of ROP Action Matrix	Column 4 of ROP Action Matrix
1107 Hours	1107 Hours	1986 Hours ⁸⁵	No Plants in Column 3	No Plants in Column 4

The table below shows the staff hours expended for inspection-related effort at operating power reactor sites by CY

Items	Description	CY 2021 (Hours)	CY 2022 (Hours)
i.	Baseline Inspection	230,383	162,659
ii.	Plant-Specific Inspection	4,854	6,416
iii.	Generic Safety Issue Inspections	2,426	83
iv.	Performance Assessment	3,530	2,914
v.	Other Activities	93,068	73,504
vi.	Total Staff Effort	334,261	245,575
vii.	Total Staff Effort Per Operating Site	5,969 ⁸⁶	4,465 ⁸⁷

3-9 Backfit

Facility-Specific Backfits

No facility-specific backfits were issued during the reporting period.

Generic Backfits

No generic backfits were issued during the reporting period.

Backfit Appeals Filed by Licensees and Applicants

There were no backfit appeals submitted to the NRC during the reporting period.

⁸⁵ Callaway Plant was in Column 2 of the ROP Action Matrix ([ROP Action Matrix](#)) in Q1 FY 2022, and moved to Column 1 on May 6, 2022 ([ML22123A227](#)). Davis-Besse Nuclear Power Station, Unit 1 was in Column 2 in Q1 and Q2 FY 2022 ([ML22055B117](#)).

⁸⁶ Total staff effort is divided by 56 sites for CY 2021, due to Duane Arnold Unit 1 permanently ceasing operations in August 2020.

⁸⁷ Total staff effort is divided by 55 sites for CY 2022, due to Indian Point Unit 3 permanently ceasing operations in April 2021.