Appendix D: Historical and Current Efforts to Streamline License Renewal Safety Reviews

Process Improvements/Lessons Learned

As a learning organization, the U.S. Nuclear Regulatory Commission (NRC) has been actively applying lessons learned from each license renewal (LR) review to ongoing and future reviews. A significant number of process improvements were initiated and fully implemented before 2023, as shown in table D-1.

With these process improvements, the NRC staff estimates an overall reduction in hours for initial LR and subsequent license renewal (SLR) applications without compromising safety. Specifically, the staff estimates a reduction of approximately 4,000 hours for reviews of the Perry Nuclear Power Plant, Unit 1, LR application and Virgil C. Summer Nuclear Station, Unit 1, SLR application relative to the estimate for review of the Monticello Nuclear Generating Plant, Unit 1, SLR application.

Table D-1 Fully Implemented Process Improvement Initiatives

	Process Improvement Initiatives (Fully Implemented)
1	Preapplication Engagement with Applicants Before an application is submitted to the NRC, the staff communicates with the applicant on lessons learned from previous reviews, updates to relevant guidance documents, and the characteristics of a quality application. The staff and industry have recognized that early and consistent engagement improves the quality and consistency of applications and enhances efficiency in reviews. Recently, the staff has engaged in substantial preapplication discussions for the applications for Browns Ferry Nuclear Plant, Clinton Power Station, and Dresden Nuclear Power Station.
2	Reduction of Advisory Committee on Reactor Safeguards (ACRS) Meeting to One Full Committee Meeting For both initial LRs and SLRs, there is an opportunity to reduce the number of ACRS meetings to one Full Committee meeting if the safety evaluation contains no open, unresolved, or confirmatory items. This reduction saves resources for the NRC staff, the applicant, and the ACRS and contributes to a shorter schedule.
3	Elimination of Inspections as Part of Licensing Decisions for SLRs For SLR application reviews, inspections are not required for licensing decisions because such inspections would be redundant to the initial LR inspections that sites are already subject to while they are in the period of extended operation.
4	Increased Use of Remote Communications Over the last few years, the review process has involved an increased use of remote communications, including online portals, to maximize the efficiency of in-office review time and reduce the level of staff activities at the reactor site.

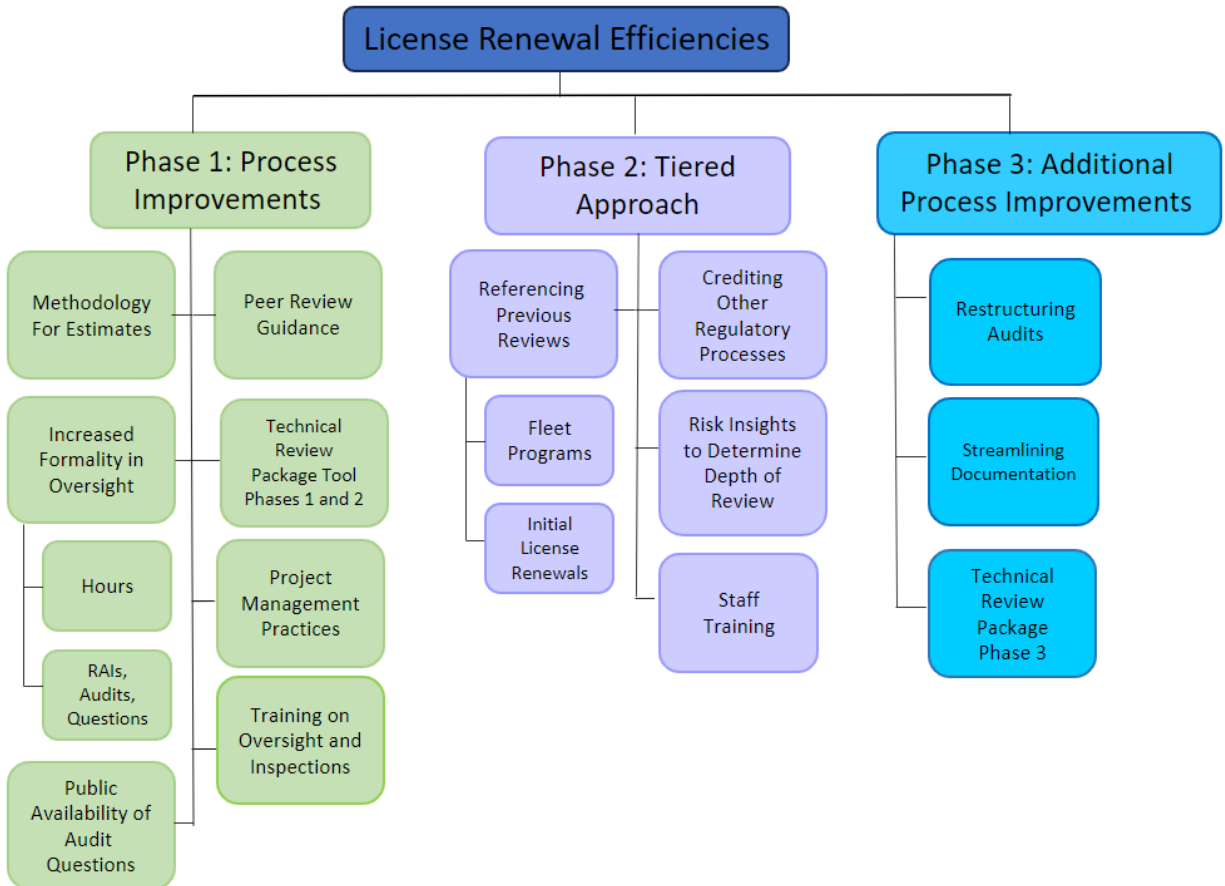|	Process Improvement Initiatives (Fully Implemented)
5	Requests for Confirmatory Information (RCIs) The NRC staff has expanded its use of RCIs. RCIs are a unique type of request for information that is used when the staff has identified specific nondocketed information that is necessary to support a regulatory finding during the review. Staff and industry feedback indicates that the use of RCIs has reduced staff resources needed for developing requests for additional information (RAIs) and applicant resources in responding to those requests.
6	Using a Tiger Team for Acceptance Reviews As recommended by the Office of Nuclear Reactor Regulation (NRR) EMBARK Venture Studio, a tiger team (30 percent of the safety review team) of experienced technical reviewers conducts the acceptance review, rather than the entire safety review team.
7	Safety Evaluation Report Streamlining The staff has reduced Section 2, "Structures and Components Subject to Aging Management Review," of the safety evaluation by more than 40 percent to be clearer and more concise. The narrative and context in which RAIs are cited in safety evaluations are streamlined to focus on the staff's finding. This ensures consistency with how RAIs are cited in other business lines across the agency, as originally proposed by NRR's EMBARK Venture Studio.
8	Consolidation of Reports for Aging Management Audit Rather than developing and issuing three separate audit reports, the reports have been streamlined and consolidated into a single report that is issued at the conclusion of the aging management audit.

Three-Phased Approach

In 2023, the NRC staff began to formally explore further opportunities to improve the LR process while engaging with industry. As a result, the NRC staff developed a three-phase approach to make the LR process more efficient, as depicted in figure D-1.

Phase 1, Process Improvements, features leveraging best practices with respect to the estimation of project hours, consistency in technical reviews, improved transparency, and cross-discipline knowledge management. The NRC staff considered how the best practices identified for new and advanced reactor reviews that have recently contributed to timely and cost-effective safety decisions may be implemented for LR reviews (e.g., project management practices, conduct of audits). For each LR application, the NRC staff right-sizes the project estimates by analyzing previous reviews, fleet programs, and unique aspects of the application. Consistency is improved with increased management oversight. Audit questions are made publicly available shortly after audits are completed to allow industry to benefit from understanding the types of technical topics, issues, and questions asked by the staff in audits. For knowledge management, the staff trains its reviewers on the inspection and oversight process to afford a holistic understanding of the LR process. Table D-2 contains additional detail on Phase 1.

Phase 2, the Tiered Approach, is discussed in appendix C.

Phase 3, Additional Process Improvements, involves optimizing audits and the safety evaluation further and leveraging information technology tools to the greatest extent possible. Table D-3 gives additional detail on Phase 3.

License Renewal Efficiencies

Phase 1: Process Improvements
- Methodology For Estimates
- Peer Review Guidance
- Increased Formality in Oversight
  - Hours
  - RAIs, Audits, Questions
  - Public Availability of Audit Questions
- Technical Review Package Tool Phases 1 and 2
- Project Management Practices
- Training on Oversight and Inspections

Phase 2: Tiered Approach
- Referencing Previous Reviews
- Fleet Programs
- Initial License Renewals
- Crediting Other Regulatory Processes
- Risk Insights to Determine Depth of Review
- Staff Training

Phase 3: Additional Process Improvements
- Restructuring Audits
- Streamlining Documentation
- Technical Review Package Phase 3

Figure D-1 LR efficiencies

Table D-2 Phase 1—Process Improvements

	Phase 1—Process Improvements (Expected Implementation: March 2024)
1	Methodology for Estimates—Right-Sizing Estimated Review Hours The NRC staff considered how the best practices identified for new and advanced reactor reviews that have recently contributed to timely and cost-effective safety decisions may be implemented for LR reviews. For each application, the NRC staff right-sizes the estimated review hours for each specific review area. Right-sizing involves analyzing hours expended on previous reviews, accounting for work already accomplished for fleet programs that may be informative to the review, and considering unique features related to the specific plant. The hours expended are closely tracked, and any potential deviations from the original estimate are assessed to determine whether an increase is necessary to make a required regulatory finding.
2	Increased Formality in Management Oversight The NRC staff has incorporated more explicit management checkpoints into the review process, from the beginning stages of project planning to the technical review. Increasing management oversight ensures there is consistency and lessons learned across reviews. Examples of oversight include closely monitoring expended hours, audit activity, and questions, RCIs, and RAIs issued over the course of the review.
3	Public Availability of Audit Questions The NRC staff makes audit questions publicly available shortly after an audit is completed, rather than the previous practice of releasing them with the audit report. By doing so, applicants with upcoming audits can benefit from understanding the types of technical topics, issues, and questions being asked by the staff in audits. In particular, they can make sure that their application addresses those concerns or, if the application has already been submitted but the audit has not yet taken place, they can better prepare for staff concerns during the audit.
4	Peer Review Guidance Internal guidance was developed to offer NRC staff reviewers a clear understanding of the roles and responsibilities of a peer review. The internal guidance ensures consistency across reviewers.
5	Modernization of Information Technology Tools (Technical Review Package (TRP) —Phases 1 and 2) The NRC is modernizing its information technology tools and enhancing project management tools to facilitate more efficient reviews and contribute to the reduction of required resources. Phases 1 and 2 of the TRP Modernization Effort improved the stabilization, user experience, and timeliness of the process to make work assignments for initial LR and SLR reviews. In particular, Phase 1 of the TRP Modernization Effort involved stabilizing an antiquated system. The stabilization remedied interruptions

	Phase 1—Process Improvements (Expected Implementation: March 2024)
	previously caused by system failures and unreliable networks. Phase 2 introduced automatically processing the PDF submissions, reducing the reliance of staff manual efforts to input data. This new feature is expected to aid in the efficiency, accuracy, and timeliness of making work assignments. The Reactor Program System continues to adopt new features to aid the NRC staff in the management, tracking, and data reporting of reviews.
6	Project Management Practices The NRC staff has also adopted project management best practices from new and advanced reactor reviews including: 1) close monitoring of hours expended throughout the review and 2) leveraging audits to the greatest extent for early identification and resolution of potential issues and to reduce the number of RAIs required by the staff. Additionally, the staff has improved communications through kickoff and close-out meetings, informing management of updates regarding the review on a timely basis, and sharing lessons learned on how to best address technical issues early in the review process.
7	Training on Oversight and Inspections For knowledge management, the NRC staff trains its reviewers on the inspection and oversight process, to afford a holistic understanding of the LR process.

To date, all initiatives from Phase 1 have been fully implemented, in exception to Initiative #3, "Public Availability of Audit Questions." Initiative #3 is expected to be completed no later than March 31, 2024.

Table D-3 Phase 3—Additional Process Improvements

	Phase 3—Additional Process Improvements (Expected Implementation: December 2024)
1	Optimizing and Restructuring Audits The NRC staff and industry continue to recognize the value of audits as part of the LR review, including reducing the need for RAIs. The NRC will proceed to optimize and seek opportunities to restructure audits to further maximize the effectiveness of open and productive technical dialogue between staff and applicants.
2	Streamlining Safety Evaluations While the safety evaluation has been streamlined in the past, the NRC will look for additional opportunities to capture the staff's safety findings in a more clear and concise manner.
3	Modernization of Information Technology Tools (Technical Review Package—Phase 3) Phase 3 of the TRP Modernization Effort targets leveraging technology to adopt functionality beyond establishing work assignments. This may include housing files, maintaining proper version control, and gaining the ability to automatically track and report related data. Additionally, project managers, technical reviewers, and branch chiefs are expected to have access to the TRP for greater visibility and transparency of work management.