

From 40 to 60 to 80 Years – What is Next for License Renewal in the USA?

Brian W. Smith, Director
(Brian.Smith@NRC.GOV)

Division of New and Renewed Licenses
Office of Nuclear Reactor Regulation

IAEA Fifth International Conference on Nuclear
Power Plant Life Management
Vienna, Austria

November 28, 2022



Topics

- License Renewal Approach & the GALL Report
- Subsequent License Renewal
- Recent Activities
 - License Renewal for 40 Years / Plant Operation to 100 Years
 - Risk-informing License Renewal
 - Development of Revision 1 of GALL-SLR
- License Status of US Operating Reactors
- Summary

License Renewal Approach

- License Renewal – Part 54 of Title 10 of the U.S. *Code of Federal Regulations* (10 CFR Part 54)
- Standards for approval – “*reasonable assurance* that the activities authorized by the renewed license will continue to be conducted in accordance with the current licensing basis”
 - Managing the effects of aging during the period of extended operation on the functionality of in-scope long-lived, passive structures and components
 - Time-limited Aging Analyses (TLAAs)
 - Satisfy requirements for environmental review



License Renewal Principles

- The ongoing regulatory process is adequate to ensure an acceptable level of safety for operating plants
- The same plant operating rules (plant current licensing basis) apply during the renewal term
 - Requires additional actions for aging management of passive, long-lived plant structures and components for license renewal



Regulatory Process Essential Elements

- Resident inspectors and Regional inspections
- Performance assessments of inspection findings
- Daily assessment of events
- Safety issue resolutions (generic and plant specific)
- Materials aging & degradation issues important to safety addressed by
 - Rule changes
 - Generic communications
 - Orders
 - Voluntary actions



License Renewal Early History

- Initial applications in 1998
- Early identification that adequate existing programs are frequently used for license renewal
- Commission approval to develop guidance, became Generic Aging Lessons Learned (GALL) Report, and the Standard Review Plan for License Renewal (SRP-LR)
- Ensure that regulatory guidance is clear and understandable to stakeholders so that the license renewal process is stable and predictable for future applicants.
- Update guidance, as appropriate, to capture the additional lessons learned and improve the license renewal process.

Subsequent License Renewal – Operation for 80 Years

- The principles of license renewal continue to be effective to ensure safety for operations beyond 60 years
- Identification of aging management needs for the 60- to 80-year operating period
- Issued GALL report for 80 years (GALL-SLR) and SRP-SLR in 2017



Consideration of 40-Year License Renewal Terms and Plant Operation to 100 Years

- License Renewal for an Additional 40 years
 - Motivated by a plant with a 40-year license operating near the end of that license
 - Looked at legal/regulatory aspects, environmental review, safety review, and inspection/oversight aspects
 - Public meeting on February 18, 2021 – [ADAMS ML21070A117](#)
 - Industry stated not on their radar right now
 - Public comments generally not supportive
- Technical Issues for 100 years of Operation
 - Public meeting on January 21, 2021 – [ADAMS ML21078A453](#)
 - Industry stated prudent to continue relevant research
 - Public comments generally not supportive
- Closure Memo dated June 22, 2021: [ADAMS ML21117A007](#)
 - Both activities were discontinued

Risk-Informing License Renewal

- Part 54 is largely a deterministic rule
 - Scoping and Screening, aging management review, TLAAAs
 - 54.21(a)(3) - *For each structure and component identified . . . , demonstrate that the effects of aging will be adequately managed so that the **intended function(s)** will be maintained consistent with the CLB for the period of extended operation.*
- Current use of risk in guidance documents
 - GALL-SLR XI.M41: Piping inspection locations are selected based on risk (i.e., susceptibility to degradation and consequences of failure).



Risk-Informed Aging Management Programs

- Submitted by NEI on February 18, 2022
- Proposed (pilot) AMPs: GALL-SLR XI.M33 (selective leaching) and XI.E3 (non-EQ inaccessible power cables)
- Public meeting held June 2
- If approved will add to GALL-SLR Revision 1



Risk-Informing LR and SLR

- Public meeting held July 2022
- Follow-up to session at the NRC's March 2022 Regulatory Information Conference (RIC)
- Considered items that can be implemented now consistent with Part 54, or could require rulemaking
- Conclusion was to risk-inform aging management programs and their implementation for now
- Remains an area of interest for us



Development of GALL-SLR Revision 1

- Focus is topics previously identified as possible SLR-ISGs; not a comprehensive review of the documents
- Basis for updates
 - Revised and new guidance
 - Substantive corrections
 - Incorporate completed SLR-ISGs
- Public meeting held in early September – summary [here](#)
- Plan to hold public meetings to understand international perspectives – details to be determined

License Status of US Operating Reactors

- Renewed licenses issued for 94 units (10 have ceased operation)
 - 8 units with 40-year licenses
 - 78 units with 60-year licenses: applications for 6 more expected before March 2024
 - 6 units with 80-year licenses (Turkey Point*, Peach Bottom* and Surry): applications for 9 units under review, and for 7 more units by end of 2025
- 61 units (52 operating) have entered their 41st year of operation; first was in April 2009
 - ~430 reactor-years of operation beyond 40 years by end of 2022
 - Oldest units have operated for 53 years

* SLR licenses were reduced to 60-year duration pending revised environmental reviews

Summary

- License renewal is a limited scope review focused on demonstrating that aging effects will be adequately managed to ensure plant safety will be maintained during all operating periods
- This limited scope review is enabled by the regulatory process essential elements outlined previously
- The NRC is seeking to appropriately risk-inform license renewal, starting with consideration of aging management programs
- The NRC is developing Revision 1 of the GALL-SLR report and during this process we plan to reach out to international colleagues for their perspectives



References

- **License Renewal**
 - <http://www.nrc.gov/reactors/operating/licensing/renewal.html>
- **Subsequent License Renewal**
 - <http://www.nrc.gov/reactors/operating/licensing/renewal/subsequent-license-renewal.html>