Modern Regulatory Processes Enabling Improved Efficiencies for Power Uprate Licensing

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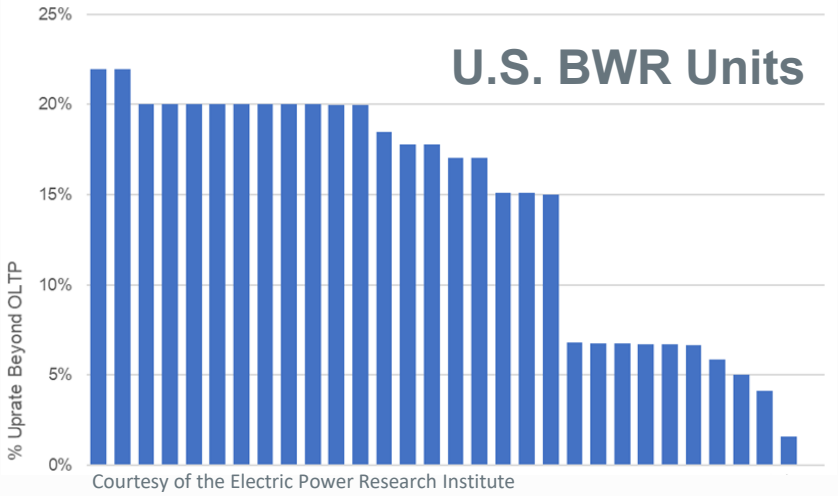
NUCLEAR ENERGY INSTITUTE

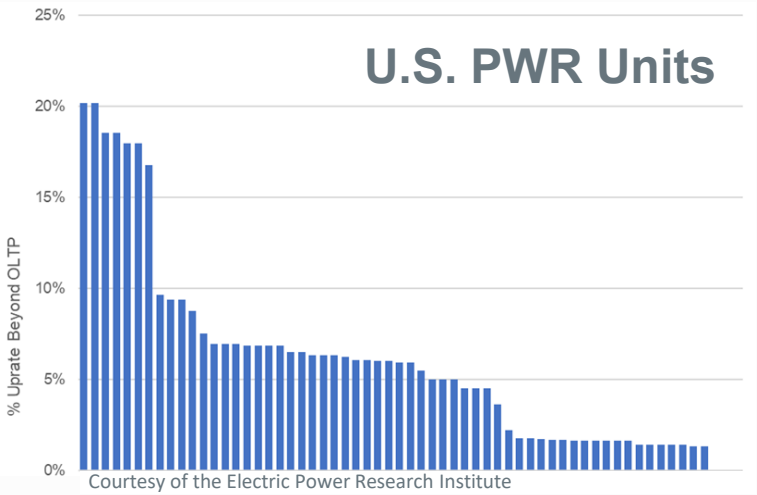
NEI Power Uprate Task Force

Mission: Provide Strategic Guidance to the Industry Power Uprate Activities

Power Uprates: Background

- NRC approved over 170 power uprates
- Nearly all U.S. plants have uprated
- Swedish units uprated to beyond 125% of the Original Licensed Thermal Power

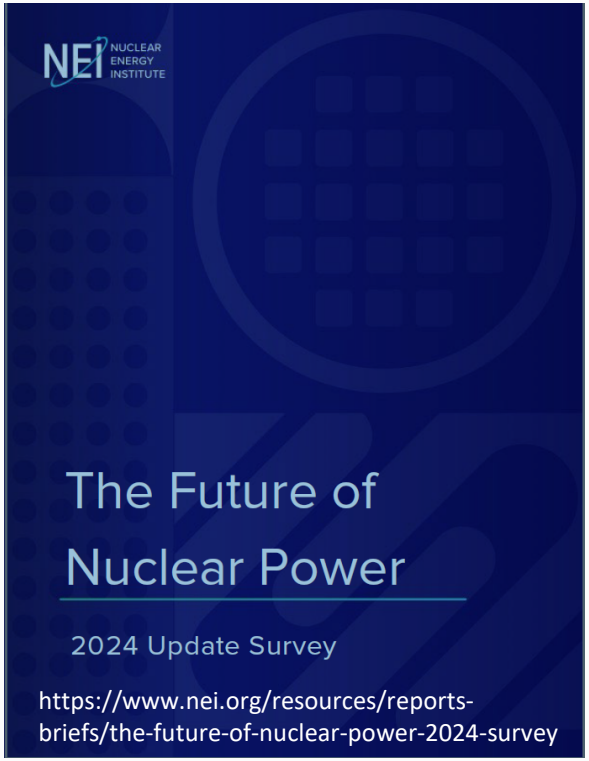




- NEI examined public records for NRC review duration and costs for uprates
- Data showed NRC review durations, review hours, and costs increased significantly over time

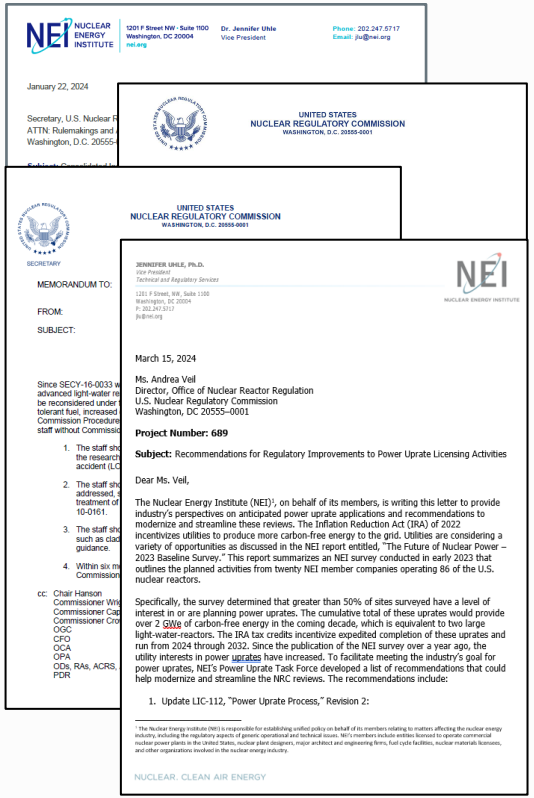
Power Uprates: Current Aspirations

- Federal tax credits incentivize new clean energy production (uprates and restarts)
- 2024 NEI Future of Nuclear Power Survey:
  - **>70% of sites** have a level of interest/planning for one or more power uprates with a combined capacity **increase of 3 GWe**
  - **Nearly 50%** of sites have varying interest/plans for one or more of the enabling changes (ATF/ LEU+, Extended Fuel Cycles, and/or RI LOCA)
- ADVANCE Act is an opportunity to enable improved power uprate review efficiencies



Power Uprate Regulatory Improvements

- NEI letters to NRC providing the industry's recommendations for modern efficient reviews
- Updated NRC uprate review timeliness targets:
  - MUR: 9➡6 m, SPU: 12➡9 m, and EPU: 18➡12 m
- NRC/NEI Uprate Review Efficiency Workshops:
  - Flexibility for sequential, combined concurrent reviews
  - NRC graded approach using past review precedents
  - Improved efficiencies by optimizing bundled reviews
  - PWR: Uprates combined with advanced fuel transition
  - BWR: MUR and/or EPU combined with MELLLA+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January 22, 2024
UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001
SECRETARY
MEMORANDUM TO:
FROM:
SUBJECT:
JENNIFER UHLE, Ph.D.
Vice President
Technical and Regulatory Services
1201 F Street, NW, Suite 1100
Washington, DC 20004
P: 202.247.3717
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March 15, 2024
Ms. Andrea Veil
Director, Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555–0001
Project Number: 689
Subject: Recommendations for Regulatory Improvements to Power Uprate Licensing Activities
Dear Ms. Veil,
The Nuclear Energy Institute (NEI)[1], on behalf of its members, is writing this letter to provide industry's perspectives on anticipated power uprate applications and recommendations to modernize and streamline these reviews. The Inflation Reduction Act (IRA) of 2022 incentivizes utilities to produce more carbon-free energy to the grid. Utilities are considering a variety of opportunities as discussed in the NEI report entitled, "The Future of Nuclear Power – 2023 Baseline Survey." This report summarizes an NEI survey conducted in early 2023 that outlines the planned activities from twenty NEI member companies operating 86 of the U.S. nuclear reactors.
Specifically, the survey determined that greater than 50% of sites surveyed have a level of interest in or are planning power uprates. The cumulative total of these uprates would provide over 2 GWe of carbon-free energy in the coming decade, which is equivalent to two large light-water-reactors. The IRA tax credits incentivize expedited completion of these uprates and run from 2024 through 2032. Since the publication of the NEI survey over a year ago, the utility interests in power uprates have increased. To facilitate meeting the industry's goal for power uprates, NEI's Power Uprate Task Force developed a list of recommendations that could help modernize and streamline the NRC reviews. The recommendations include:
1. Update LIC-112, "Power Uprate Process," Revision 2:
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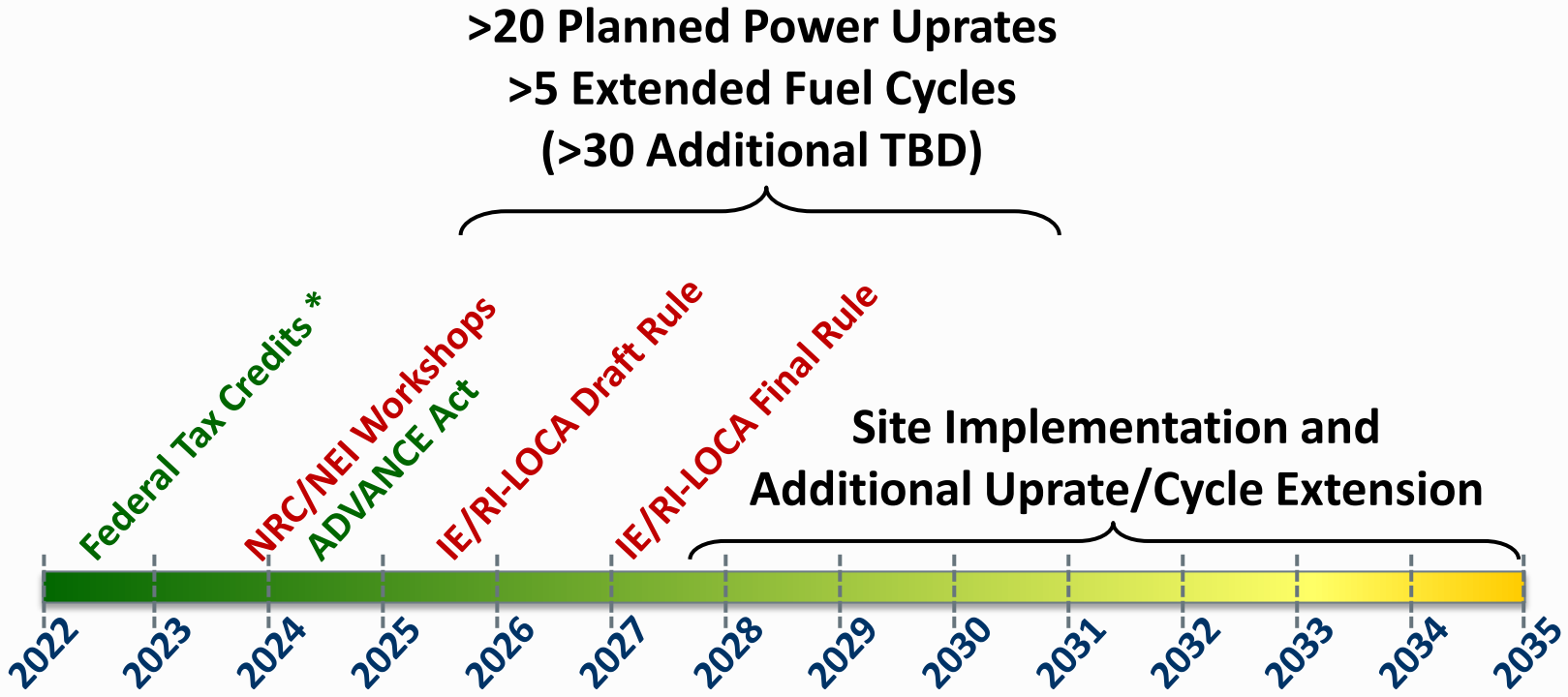
Uprates and Advanced Fuels Transition

- Combined license applications for plant specific aims:
  - ATF/LEU+/HBU to achieve uprates and/or 24-month fuel cycles (PWR)
- Analytical synergy for combined review efficiencies:

Power Uprates		Advanced Fuel Transition
• Chapter 15 Analysis: - AOOs/LOCA/ATWS/SBO/Dose - Stability (BWR) - SG tube rupture (PWR) - Locked rotor (PWR), etc… • Chapter 4 / 6 • Fuel Pool Storage	Similar	• Chapter 15 Analysis: - AOOs/LOCA/ATWS/SBO/Dose - Stability (BWR) - SG tube rupture (PWR) - Locked rotor (PWR), etc… • Chapter 4 / 6 • Fuel Pool Storage

Improved licensing efficiencies with reduced iterative & duplicative reviews

Uprates and Advanced Fuels Transition



* Phase out: latter of 2032 or emissions <75% of 2022 levels