

IE Rulemaking: Industry Feedback

AI Csontos – NEI
Director, Fuels

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IE Rulemaking Key Messages



- LARs for uprates and/or advanced fuels are on the way
- IE rule and schedule are vital to industry strategic plans
- Draft IE Rule from the recent ACRS meetings has many appropriate improvements, but major concerns remain
- Industry feedback remains consistent with recent NEI letters:
 - March 2023 (ML23107A230)
 - January 2024 (ML24023A604)
- ACRS should allow the draft IE rule for Commission review
- Workshops needed for industry engagement on concerns

ADVANCE Act alignment for a modern, risk-informed, and efficient IE Rule

IE Rulemaking Key Messages



- Generally, beneficial impacts with the overall rule package:
 - Allows increase enrichments to LEU+
 - Allows existing UF₆ packages to ship with up to 10 wt% U-235
 - Improved risk-informed control room dose design criteria
 - RG 1.183 revisions permit some units to move forward with strategic plans
 - ◆ More realistic modeling of potential release paths
 - ◆ NRC workshops yielded a more predictable, durable, and stable RG
 - Openness to LBLOCA as BDBA has potential for significant improvements
 - NUREG-2266 for up to 10 wt% U-235 and 80 GWd/MTU burnup
- Specific areas remain deterministic, prescriptive, and not risk-informed with additional burdens and inefficiencies resulting in high uncertainty to implementation

Enabling Advanced Fuel Technologies



- ATF/LEU+/HBU fuels are complementary to uprates and enabling in some cases
- Modern advanced fuel technologies can:
 - Enable 24-month fuel cycles for PWRs
 - Less waste = improved safety/fuel efficiency
 - Improve plant resiliency and performance
 - Increase potential for power uprates
 - Improve economics for fleet sustainment
- On track to meet industry's goal to deploy batch quantities in the mid-to-late 20s:
 - Applications for 24-month cycles submitted
 - Efficient NRC licensing for advanced fuels and uprates by 2027 with the IE rule needed

2024 NEI Future of Nuclear Power Survey



- Key takeaways:
 - **>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)
- <https://www.nei.org/resources/reports-briefs/the-future-of-nuclear-power-2024-survey>



Prioritized Concern: Implementation



- 2010 50.46a rule: substantial implementation burden compared to the potential benefits obtained (ML 100260383 & ML 10316027)
- Does not reflect improvements, efficiencies, and learnings gained from fleet-wide risk informed change programs since 2010:
 - RIEP duplicates requirements for implementing risk informed change programs already communicated in RG-1.200 and RG-1.174
 - DG-1428 still requires plant specific seismic analyses even though the industry addressed seismic risk per NRC 50.54 order after Fukushima
- More stringent criteria with additional unnecessary burdens than currently required, e.g. change control, inspections, reporting, etc.

Prioritized Concern: Flexibility & Durability



- Codifying a prescriptive TBS definition with additional inspection requirements hardwires a single solution pathway:
 - May not be applicable or readily implementable for many LWR sites
 - May lead to future rulemaking and/or numerous exemption requests
 - Assumes that BDBA LOCA treatment is sufficient to address FFRD
- Rule should allow alternative approaches for defining and implementing TBS with prescriptive requirements moved to RGs
- Minimal changes in rule language provide more flexibility and durability capable of supporting future regulatory improvements without need for exemption requests, e.g. EPRI ALS, Alt. #4, etc.

Prioritized Concern: Stability & Predictability



- Straightforward implementation of the rule needs regulatory clarity, stability, and predictability to well-defined NRC acceptance criteria:
 - Technical areas open to interpretation can lead to analysis paralysis
 - Industry appreciates staff returning LOCA definition to historical norms
- What is meant by best estimate LOCA for breaks above TBS?
 - NRC expectations for “true best estimate” are not clear or predictable
 - BDBA analyses should not be obscured by artificial biasing
- Need a clear and predictable path forward for addressing dispersal
- Forward fit and backfit guidance needed for this voluntary rule regarding future licensing actions not involving LEU+/HBU

Prioritized Concern: Modernization



- Breakaway oxidation testing requirements should be removed:
 - NEI March 2023 letter (ML23107A230)
- Rules should be technology neutral wrt approved cladding alloys:
 - Exemptions would be required for several existing approved alloys
- Prescriptive augmented inspections result in unnecessary additional occupational dose to plant staff and is not risk-informed
- Legacy reporting requirements should be updated and/or removed, especially for BDBA LOCA considerations

Summary



- IE rule with 50.46a/c would enable more realistic operational margins for advanced fuels and additional power uprates as incentivized in the IRA
- Alignment of the combined draft rule to Commission direction and intent of the ADVANCE Act for a modern, risk-informed, and efficient regulatory process
- Industry feedback remains consistent with recent NEI letters:
 - Combined/modernized rule with modified 50.46a/c – Mar '23 (ML23107A230)
 - IE Rulemaking Regulatory Basis industry comments – Jan '24 (ML24023A604)
- Development of a clear, efficient, and durable rule with draft regulatory guides needs full consideration of the holistic implementation pathway for licensees
- NRC workshops would enable an open and transparent dialogue on the Industry's implementation, efficiency, predictability, and durability concerns