

UCS Perspectives on Part 53

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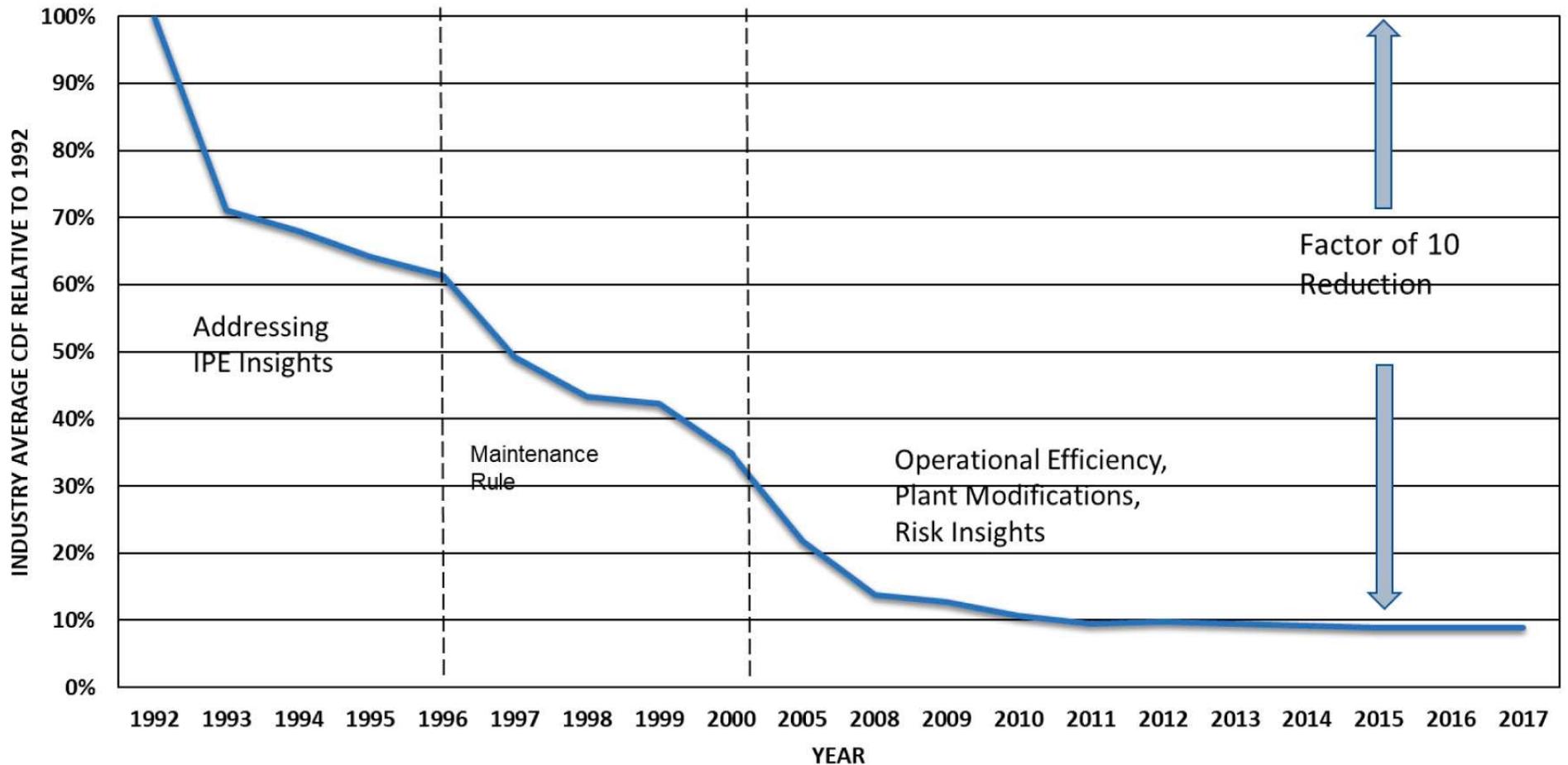
The current Part 53 approach remains problematic

- The staff's objective in developing Part 53 (per Commission policy) is to provide the same level of safety and security as currently operating plants
- But the current draft does not clearly provide for levels of safety and security equivalent to the operating fleet
 - Rule text does not define the frequency cutoff between DBAs and non-DBA LBEs—and even if it did, it is unclear how it would compare to operating LWRs
 - RES project to apply the LMP to operating plants could help establish a basis for comparison—what's its status?
 - Incorporation of the QHOs as fundamental acceptance criteria will allow licensing of plants *less safe* than the current fleet
 - Proposed Section 73.100 is completely divorced from current physical protection requirements

Margin to QHOs has increased

- Part 53 does need specific, quantitative acceptance criteria for limiting the risk of (non-DBA) LBEs, but the QHOs are not the right ones
- QHOs represent the (minimum) level of safety of the fleet as it was 30 years ago
- SRM-SECY-89-102 (Implementation of the Safety Goals) pointed out that operating plants circa 1990 already met the QHOs with margin
- Today's operating plant average core damage frequency is 10 times lower than in 1990
 - Vogtle Level 3 PRA finds a hundred-fold margin to the latent cancer fatality QHO and a million-fold margin to the prompt fatality QHO

Decrease in Average Core Damage Frequency



D. True and J. Butler, "The nexus between safety and operational performance,"
Nuclear News, May 2020

QHOs need to be revised

- Unless the rule includes a specific requirement to maintain a large margin to QHOs, Part 53 applicants could have much higher core damage frequencies than the current fleet and still meet the QHOs
- Other issues:
 - Absence of societal risk metric (land contamination)
 - Use of average cancer fatality risk is inherently discriminatory
 - Insensitive to the fact that Blacks and other disadvantaged populations have lower cancer survival rates than Whites
 - Growing evidence of non-cancer endpoints for low-level radiation exposure (e.g. cardiovascular disease)

Revised QHOs (cont.)

- Revised QHOs should
 - Be reduced by at least one order of magnitude
 - Incorporate cancer incidence rather than cancer mortality, consider other disease endpoints as information becomes available
 - Include land contamination (risk of long-term relocation)

PRA issues

- A Level 3 PRA, including all hazards, modes, and sources of potential radiological release will be necessary to support Framework A licensing
- The recent publication of the first part of the Vogtle Level 3 PRA illustrated the significant time and resources required for such an effort, even for a well-studied reactor design with significant operating experience
- Can applicants develop a high-quality and sufficiently complete Level 3 PRA for advanced reactors in the timeframe needed for licensing?

Framework B/AERI Approach

- Our preliminary assessment is that the AERI approach in Framework B looks generally reasonable (pending a more detailed review)
 - However, the same caveats regarding the QHOs apply here as well
 - It remains unclear what additional value is added by the “entry criterion” for use of Framework B. Applicants could just as well do a direct comparison of the bounding event to the (hopefully revised) QHOs for screening

Proposed Section 73.100

- 73.100 is a completely arbitrary and irresponsible gutting of NRC's physical protection requirements but would be available for use by any Part 53 applicant
- Would place an undue burden on NRC inspectors and analysts
- It should be removed

Policy decisions that the NRC should reconsider

- Safety goal for advanced reactors:
 - “Given the performance of the current generation of plants, I believe a safety goal for these plants is not good enough for the future ... to argue that the level of safety that is achieved by plant designs that are over 10 years old is good enough for the next generation is to have little faith in the ingenuity of engineers and in the potential for nuclear technology. I would have required the next generation of plants to be substantially safer than the currently operating plants.” – 1986 Safety Goal Policy Statement, Separate Views of Commissioner Asselstine

Policy issues (cont.)

- Use of safety goals in licensing:
 - “Safety goals are to be used in a more generic sense and not to make specific licensing decisions.” – SRM-SECY-89-102, June 1990.
 - Staff’s proposed incorporation of QHOs into the Part 53 rule text would arguably be inconsistent with this position
 - Important to establish an updated basis for this significant policy change

No need for speed

- The nuclear industry is trying to pressure the NRC to radically accelerate licensing reviews for new, untested, paper reactors (see NEI June 7, 2022 letter to NRR)
- The NRC must not compromise its fundamental safety and security obligations to the public based on a false sense of urgency
- UCS sees no evidence that the current Part 53 approach involves “significant increases in regulatory burden,” as NEI alleges

Conclusions

- The Commission should develop revisions to the relevant policy statements and positions to provide a clear basis for Part 53 moving forward
- The absence of a regulatory basis document for the rule is compromising the public's ability to understand its technical underpinnings and allows for the arbitrary addition of provisions without any clear technical justification such as Section 73.100
- Trying to include all this content in the Part 53 Statement of Considerations will be a heavy lift

Acronyms

- **AERI: Alternative Evaluation for Risk Insights**
- **CDF: Core Damage Frequency**
- **DBA: Design-Basis Accident**
- **LBE: Licensing Basis Event**
- **LMP: Licensing Modernization Project**
- **PRA: Probabilistic Risk Assessment**
- **QHOs: Quantitative Health Objectives**
- **UCS: Union of Concerned Scientists**