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Preliminary Proposed Rule Language: Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors

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Submitter Information

Email: rani@thebreakthrough.org

Organization: The Breakthrough Institute

General Comment

See attached file(s)

Attachments

August 31 2022 Part 53 Comment Final

August 31, 2022

Mr. Christopher Regan
Director, Division of Rulemaking, Environmental, and Financial Support
Office of Nuclear Materials Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Comments on Preliminary 10 CFR Part 53, “Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors” [Regulation Identifier Number RIN-3150-AK31; Docket ID NRC-2019-0062]

Dear Mr. Regan,

I write on behalf of the Breakthrough Institute (BTI) to comment on the U.S. Nuclear Regulatory Commission (NRC) staff’s development of preliminary rule language for licensing advanced reactors in accordance with Congressional mandates, including the Atomic Energy Act of 1954, the Energy Reorganization Act of 1974, and, more recently, the Nuclear Energy Innovation and Modernization Act (NEIMA) of 2019.

As a preliminary matter, BTI is an independent 501(c)(3) global research center that identifies and promotes technological solutions to environmental and human development challenges. We advocate appropriate regulation for licensing and oversight of advanced nuclear reactors to enable the timely deployment of safe, innovative, and economically viable emerging nuclear technologies. We believe new and advanced reactors represent critical pathways to climate mitigation and deep decarbonization. The BTI represents the public’s interests and does not receive funding from industry.

The NRC’s mission is not just to ensure adequate protection of public health and safety. When one examines the very legislation establishing the NRC and its predecessor, the Atomic Energy Commission (AEC), it becomes clear that the NRC’s role, responsibility, and obligation is to **enable the safe civilian use of nuclear materials**, including materials used to generate nuclear power. To achieve this crucial societal imperative, the NRC must balance public safety with National energy security and the environmental, public health, and economic benefits of nuclear energy.

The Atomic Energy Act of 1954 declared “the development, use, and control of atomic energy shall be directed so as to make the maximum contribution to the general welfare... improve the general welfare, increase the standard of living, and strengthen free competition in private enterprise.”¹

Similarly, the Energy Reorganization Act of 1974, which established the NRC separate from the Energy Research and Development Administration (later the Department of Energy), reiterates the NRC’s numerous responsibilities to Society and the Nation:

¹[Atomic Energy Act of 1954.pdf \(nti.org\)](#), Section 1, Declaration

The Congress hereby declares that the general welfare and the common defense and security require effective action to develop, and increase the efficiency and reliability of use of, all energy sources to meet the needs of present and future generations, to increase the productivity of the national economy and strengthen its position in regard to international trade, to make the Nation self-sufficient in energy, to advance the goals of restoring, protecting, and enhancing environmental quality, and assure public health and safety.²

The NRC's long-standing regulatory posture and practices to ensure public safety have obscured its other responsibilities and obligations to the point that they are largely missing from NRC's communications with public stakeholders, and they are virtually absent from the regulations, policies and programs governing nuclear energy today.

On August 26, 2022, I presented an alternative approach to 10 CFR Part 53 during a Risk-informed, Performance-based Principles and Policy Committee (RP3C) webinar. The alternative is modeled after the NRC's flagship program – the Reactor Oversight Process (ROP) – which transformed NRC's oversight of operating power reactors and endures over two decades later. The ROP shifted the NRC's oversight paradigm from enforcement of compliance with prescriptive, deterministic regulatory requirements to a risk-informed, performance-based (RIPB) assessment of safety. Under the ROP, NRC applies inspection resources that are **necessary and sufficient** to verify safe operation, commensurate with a nuclear power plant's safety performance. As such, the RIPB features of the ROP focus NRC and licensee resources on those things **most important to safety based on performance**, not based on compliance with regulations except under very limited circumstances.³ The ROP is a durable regulatory program that has been adopted, in part or in full, by many international nuclear safety regulators because of its RIPB features.

The August 26, 2022, RP3C webinar was recorded for posterity, knowledge management and knowledge transfer. I incorporate the [recording](#)⁴ by reference into the instant comment as an efficient, effective and durable approach to achieving the flexibility and practicability of a RIPB and technology-inclusive licensing pathway for advanced reactors⁵, as mandated by the NEIMA.

The BTI believes that retention of high-level performance objectives in Part 53 is warranted. However, to afford maximum flexibility to a wide variety of developers and applicants, the prescriptive, risk-based and deterministic requirements for **how** those high-level objectives are met should not be codified in Frameworks A and B, but rather relocated to guidance (e.g., standard

²<https://www.nrc.gov/docs/ML0224/ML022410201.pdf>, Section 2, Declaration of Purpose

³ Traditional enforcement of compliance with regulatory requirements is limited to matters that impede NRC's regulatory functions, involve willfulness, or result in actual consequences as defined in Section 2.2.4 of NRC's Enforcement Policy (see <https://www.nrc.gov/docs/ML1813/ML18138A138.pdf>)

⁴ <https://www.youtube.com/watch?v=erEG4SkHHxI>

⁵ NEIMA defines the term "advanced nuclear reactor" broadly as "a nuclear fission or fusion reactor, including a prototype plant (as defined in sections 50.2 and 52.1 of title 10, Code of Federal Regulation (as in effect on the date of enactment of this Act)), with significant improvements compared to commercial nuclear reactors under construction as of the date of enactment of this Act..."

review plans) as acceptable approaches for meeting the new rule. Other methods and approaches should be equally accommodated by high-level objectives in Part 53. In fact, the NRC has issued Regulatory Guide 1.233 to endorse guidance in the Licensing Modernization Project that was proposed in 2019 by the nuclear power industry to specify *an* acceptable method to meet the high-level objectives in 10 CFR Part 50.⁶

In closing, the BTI appreciates this opportunity to comment on Part 53 and offer an alternative approach before the NRC staff finalizes a proposed rule package for the Commission's consideration. The NRC's success in satisfying the NEIMA is of paramount public interest. However, the volume of prescriptive (Frameworks A and B), risk-based (Frameworks A and B) and deterministic (Framework B's alternative evaluation to risk insights) rule language in the preliminary NRC staff proposals will not achieve the transformative, technology-inclusive licensing pathway for advanced reactors that was envisioned.

Sincerely,



Rani Franovich
Senior Policy Advisor, Climate and Energy
The Breakthrough Institute

Copy: M. Shams, NRR, DANU
R. Taylor, NRR
A. Veil, NRR
D. Roberts, DEDO
D. Dorman, EDO
C. Hanson, Chair
J. Baran, Commissioner
D. Wright, Commissioner
A. Caputo, Commissioner
B. Crowell, Commission

⁶ <https://www.nrc.gov/docs/ML2009/ML20091L698.pdf>