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

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General Comment

Please see attached pdf.

Attachments

Joint NGO Part 53 Comment

July 23, 2021
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Joint NGO Comments on Preliminary Proposed Rule Language, "Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors" [Regulation Identifier Number RIN-3150-AK31; Docket ID NRC-2019-0062]

Dear U.S. Nuclear Regulatory Commission Staff:

The Nuclear Regulatory Commission (NRC) is currently working to develop a risk-informed, performance-based, and technology inclusive regulatory framework in 10 CFR Part 53 ("Part 53") to support the regulation and deployment of advanced reactors. We thank the NRC staff for their continued work to facilitate stakeholder discussion and feedback on draft rule text.

This joint comment provides the unique perspective on the Part 53 rulemaking process from several non-governmental organizations (NGOs) with a shared interest in the development and deployment of advanced nuclear reactors to support public clean energy needs. The NGO perspectives shared in this comment include those of The Breakthrough Institute, ClearPath, Good Energy Collective, Nuclear Innovation Alliance, and Third Way.

This joint comment offers several high-level observations on the Part 53 draft rule text and makes recommendations both to help ensure advanced reactor safety and to facilitate the development and deployment of advanced reactors that can meet public climate mitigation and clean energy needs.

Summary

The draft rule text incorporates some performance-based regulatory requirements but thus far does not fully align with the intent of the Nuclear Energy Innovation and Modernization Act (NEIMA), PL 115-439. While many prescriptive regulatory requirements found in 10 CFR Part 50 ("Part 50") and 10 CFR Part 52 ("Part 52") have been replaced with performance-based regulatory requirements, the draft text also introduces new prescriptive programmatic requirements that are not present in existing regulations and are not aligned with a transformative performance-based regulatory framework. As currently proposed, the Part 53

licensing framework would not produce an advanced reactor licensing process that works for the wide variety of advanced reactor technologies currently under development.

The co-signing organizations offer the following recommendations:

1. Develop a clear vision and mission statement for Part 53 and include it as a purpose statement in the regulatory text.
2. Ensure that all regulatory requirements facilitate risk-informed, performance-based, and technology-inclusive licensing activities.
3. Balance predictability and flexibility in regulatory processes and requirements.
4. Create effective and efficient licensing structures that ensure that review durations meet public climate mitigation and clean energy needs.

These four recommendations are presented jointly by these NGOs to advance the public interest in ensuring that the Part 53 rulemaking process produces a final rule that establishes an effective and efficient regulatory framework for advanced reactors.

Introduction

Congress has mandated development of a new regulatory framework to facilitate advanced reactor innovation and commercialization.

NEIMA requires the Nuclear Regulatory Commission (NRC) to develop a technology-inclusive regulatory framework for advanced reactors that utilizes flexible and practicable evaluation methods to facilitate the risk-informed, performance-based licensing of advanced reactors. The purpose of NEIMA was, in part, "to develop the expertise and regulatory processes necessary to allow innovation and the commercialization of advanced nuclear reactors."[1] This rulemaking mandate is also consistent with the Commission's directives for continued incorporation of risk-informed, performance-based principles into new and existing NRC regulations[2]. The Part 53 regulatory framework developed through this rulemaking should facilitate the timely development and deployment of safe advanced reactors by creating an efficient and effective regulatory process.

We appreciate NRC's adoption of an open rulemaking process in which draft rule text is released on a rolling basis for review. This process facilitates engagement between industry, NRC staff, members of the public, and other stakeholders to ensure that the final rule text meets the goals of the new regulatory framework as directed by NEIMA.

We offer the four recommendations in this letter in response to the draft text releases and to promote a final rule that ensures safety and facilitates the development and deployment of advanced reactors. Redirecting the Part 53 licensing framework development process at this

[1] https://www.congress.gov/bill/115th-congress/senate-bill/512/text
[2] U.S. NRC Strategic Plan: Fiscal Years 2018 - 2022 (NUREG-1614, Vol. 7)

early stage can reduce the need for significant revisions later in the Part 53 rulemaking process or in future rulemakings to amend an ineffective Part 53. The early redirection of the Part 53 rulemaking process can also help the NRC meet its accelerated rulemaking timeline and facilitate the deployment of advanced reactors to meet our nation's clean energy goals.

Recommendations

1. Develop a clear vision and mission statement for Part 53 and include it as a purpose statement in the regulatory text

NEIMA offers the NRC an opportunity in Part 53 to facilitate the development and licensing of advanced reactors using a new regulatory paradigm based upon risk-informed, performance-based, and technology-inclusive principles. However, based on our review of the current draft rule text, the NRC does not seem to be exercising available flexibility in the development of a regulatory framework. As an initial matter, the Part 53 regulatory framework should be clearly and explicitly based on a paradigm that is distinct from the largely prescriptive and light-water reactor-centric regulatory requirements in Part 50 and Part 52. The development and articulation of a clear purpose and vision statement for Part 53 at the start of the rule text and in other supporting documents would provide NRC staff, future applicants, and other stakeholders with a clearer understanding of the regulatory philosophy that underpins the new rule.

A clear purpose and vision statement, which could be incorporated into the final rule's Statements of Consideration, would also help focus future applicants as they develop license applications demonstrating compliance with the final regulatory requirements. In the near term, a clear purpose statement would provide a common language and basis for interactions between NRC staff and other stakeholders when discussing the underlying intent of the proposed draft regulatory requirements. This common understanding would facilitate more effective engagement between the NRC and stakeholders and result in a more efficient rulemaking process.

2. Ensure that all regulatory requirements facilitate risk-informed, performance-based, and technology-inclusive licensing activities

Congress and the Commission intended for the Part 53 rulemaking process to create a risk-informed, performance-based, and technology-inclusive regulatory framework that facilitates the licensing of any advanced reactor design. Some of the draft rule text fully incorporates these new framework principles, but several of its sections are still overly prescriptive. We understand that these overly prescriptive requirements could discourage advanced reactor applicants from utilizing Part 53 or require the development of exemptions to the rule.

The Part 53 draft text introduces new emphasis on the role and use of probabilistic risk assessment (PRA) to meet specific quantitative risk requirements (i.e., the Qualitative Health Objectives [QHOs]) that are included within the rule text instead of within Commission policy — a departure from past practice. This role and use of PRA is significantly greater than under

Parts 50 and 52 (§ 53.450(a)). Finally, Part 53 also includes new prescriptive programmatic requirements such as the Facility Safety Program (§ 53.890).

Requirements proposed in Part 53, but not present in either Part 50 or Part 52, can negatively impact the usefulness of Part 53 if the mandates do not clearly provide necessary safety benefits. As written, the need for these additional requirements is not clearly based on the Part 53 safety criteria, and the need for these additional programs has not been specified. Furthermore, we understand that some applicants would not utilize these specific methods because they are inadequate, inappropriate, or unnecessary to demonstrate safety for their specific advanced reactor design. While these methods (such as PRA to demonstrate compliance with QHOs comparable with a Level 3 PRA for an LWR) and programs (such as the Facility Safety Program) can be used to help ensure safety, they are not the only methods that can be used. For example, a graded approach to the use of PRA based on the specific risk of the design could be used to meet the same safety requirements but would not fully align with the requirements in the current Part 53 draft text. The final Part 53 rule should ensure that advanced reactor applicants have the flexibility to select the methods that best allow them to demonstrate their compliance with performance-based regulatory requirements.

Now that NRC staff have released a significant portion of the draft rule text, the staff should reevaluate the entirety of the text to ensure that it does not introduce new prescriptive regulatory requirements that do not directly derive from safety functions, and ensure that the text fully incorporates performance-based regulatory requirements and principles. Applicants should have the flexibility to meet performance-based requirements in a manner that makes sense for their specific design. In addition, some prescriptive requirements in the current draft rule text would be better suited as one of several acceptable methods to meet regulatory requirements and could be included as regulatory guidance.

3. Balance predictability and flexibility in regulatory processes and requirements

Achieving balance between predictability and flexibility is critical for the successful implementation of an effective and efficient Part 53 regulatory framework. A rule with a high degree of flexibility may be less predictable, as different methods that could demonstrate compliance with the rule would require NRC approval. Conversely, a rule with a high degree of predictability may be less flexible if a regulator defines the exact methods that are acceptable to demonstrate compliance with the rule. Balancing predictability and flexibility is particularly important for performance-based regulation, in which the methods to demonstrate compliance with high-level safety functions or requirements are not prescribed. This balance is, admittedly, difficult to achieve because the desired balance of regulatory detail in the Part 53 rule and associated guidance will vary by topic and stakeholder.

An example of the draft rule text inappropriately favoring predictability over flexibility is in the codification of many of the aspects of the Licensing Modernization Project (LMP) in the Part 53 draft rule text. The industry-led LMP effort has resulted in useful regulatory insights and guidance, but not all applicants will utilize all LMP guidance in their regulatory activities. Use of

an LMP-like process is just one way to meet the risk-informed, performance-based, and technology-inclusive requirements in Part 53. While use of alternative evaluation methods may decrease process predictability and require additional engagement with NRC staff to demonstrate compliance with regulatory requirements, the intended applicability of Part 53 for all advanced reactors underscores the need for sufficient flexibility.

NRC staff should consider this balance of predictability and flexibility when revising existing draft rule text, developing new draft rule text, and creating implementation guidance for the rule. Doing so will help ensure that the final rule creates an efficient and effective licensing process for advanced reactors.

4. Create effective and efficient licensing structures that ensure that review durations meet public climate mitigation and clean energy needs

Avoiding unnecessarily lengthy licensing reviews is critical to enabling advanced reactor deployment. The licensing process needs to give NRC staff the time to appropriately evaluate the safety basis of a new nuclear facility. At the same time, lengthy regulatory reviews are often characterized by the industry as primarily burdening the applicant with no real safety benefits. However, this leaves out the fact that advanced reactors can play a significant role in reducing emissions in the electricity, industrial, and other sectors. While the NRC's primary mandate is safety, establishing efficient licensing processes would be consistent with the purposes of NEIMA, and ensuring that the NRC is not an undue impediment to advanced reactor deployment. By contrast, complicated licensing structures and lengthy review durations that delay the deployment of clean energy sources could discourage the development of advanced reactor technologies, contrary to NEIMA's objectives. Creating licensing structures that ensure public health and safety while facilitating efficient licensing reviews is important to the potential role of advanced reactors to help meet clean energy needs.

Conclusions

Creating a risk-informed, performance-based, and technology-inclusive regulatory framework in Part 53 will help facilitate the safe development and deployment of advanced reactors. A new regulatory framework would enable effective and efficient licensing of innovative advanced reactors designs and provide flexibility to demonstrate safety.

The Part 53 rule text should be refocused to ensure that the final rule will meet the intended goals of NEIMA and produce an effective and efficient regulatory framework for advanced reactors. We believe that the following changes to the Part 53 draft text would help produce a final rule that both ensures safety and facilitates the development and deployment of advanced reactors.

We recommend that the NRC:

- Develop a clear vision and mission statement for Part 53 and include it as a purpose statement in the regulatory text.
- Ensure that all regulatory requirements facilitate risk-informed, performance-based, and technology-inclusive licensing activities.
- Balance predictability and flexibility in regulatory processes and requirements.
- Create effective and efficient licensing structures that ensure that review durations meet public climate mitigation and clean energy needs.

These actions would help produce a rule that is practicable for industry and that ensures the NRC fulfills its primary mission of protecting public health and safety. Advanced nuclear energy has an opportunity to help meet our nation's clean energy needs and an effective Part 53 regulatory framework can play a critical role in making the opportunity a reality.

The NGOs supporting this letter (The Breakthrough Institute, ClearPath, Good Energy Collective, Nuclear Innovation Alliance, and Third Way) again thank NRC staff and management for their continued work to make Part 53 an effective framework to support the safe development and deployment of advanced reactors. If you have any questions regarding this joint comment, please contact Judi Greenwald (jgreenwald@nuclearinnovationalliance.org).

Sincerely,

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