

# 2021 Advanced Nuclear Regulatory Outlook: What's Next for the NRC?



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Safe, reliable nuclear energy is a major contributor to the low-carbon options on which we can rely, and advanced nuclear technologies show promise to contribute to tackling climate change. But, as the International Energy Agency noted in a [recent report](#), scenarios for achieving from one-third to one-half of the emissions reductions needed to reach net-zero emissions will likely come from technologies that are not yet commercially available. **If advanced nuclear is to play a role, it needs our attention now.**

So as we begin a new year and a new Administration, what should we anticipate and focus upon from a regulatory perspective?

## New Leadership at NRC

It goes without saying that a change in administration will affect the agencies most directly engaged in advanced reactor initiatives. The Nuclear Regulatory Commission (NRC) is seeing the

transition to new leadership. President Biden recently designated Commissioner Christopher Hanson, the newest member of the Commission, as Chairman of the NRC to succeed Kristine Svinicki who resigned on January 20. Chairman Hanson assumes the task of leading the agency and building consensus among his fellow commissioners in setting the course for NRC's accomplishment of its responsibilities. In addition to the vacancy resulting from Svinicki's departure, the term of another Republican, Commissioner Annie Caputo, will end June 30 unless she is renominated and confirmed. Given the legislative proscription that no more than three of the NRC's five commissioners can be affiliated with the same political party, we are likely to see a pairing of nominees to keep the Commission at full strength.

Apart from vacancies on the Commission, the position of the Director of Nuclear Reactor Regulation (NRR) needs to be permanently filled in light of the departure of Ho Nieh at the end of January. The NRR Director is perhaps the most important of the senior leadership positions reporting to the Commission, given the director's responsibilities for licensing and oversight of the existing reactor fleet as well as for new and advanced reactors. The Commission appoints the NRR director, who has historically been a senior career government employee. The new director will face a number of challenges and priorities related to advanced reactors, including carrying through to fruition the development of 10 CFR Part 53 rulemaking -- the proposed technology neutral framework for licensing and regulating advanced reactors. The NRR director will also be managing applications for advanced reactors put before the NRC for review and developing the workforce at NRC equipped to handle the reviews of these new technologies. Given NRR's licensing and oversight responsibilities for the existing fleet and the new focus on advanced technologies, having qualified staff and the capacity to undertake these responsibilities is an important priority, particular as NRC copes with the generational shift in its workforce.

## **Progress on Transforming the Regulatory Framework**

It's well understood that, on balance, NRC's regulatory framework for reviewing the acceptability of reactor designs is essentially directed toward large light water reactors, which have dominated the commercial application of nuclear power to date. For example, the General Design Criteria in NRC's regulations have their origin under the Atomic Energy Commission in the early 1970s and have served as the overarching standards shaping the assessment of light water reactor designs ever since. Over the past few years the NRC has initiated efforts to prepare itself to undertake the assessment of advanced reactor designs. These efforts included issuing guidance for the development of principal design criteria that advanced reactor developers would need to address with the goal of reducing regulatory uncertainty and improving the timeliness and efficiency of licensing reviews. The NRC developed a vision and strategy document and a roadmap for addressing non-light water reactor reviews.

The focus on modernizing the regulatory framework for advanced reactors received a further shot in the arm with the passage of the bi-partisan Nuclear Energy Innovation and Modernization Act (NEIMA) in early 2018. Among other things, NEIMA requires NRC to develop by the end of 2027 a “rulemaking to establish technology-inclusive, regulatory framework for optional use by commercial advanced nuclear reactor applicants for new reactor license applications.” In October 2020, the Commission endorsed the NRC staff’s proposal to develop such a rule and, to its credit, advanced the timeline for adopting a final rule to October 2024. The staff has started to roll out approaches to the new Part 53 and is engaging stakeholders on the potential content of the rule to support development of a complete proposed rule for Commission review and approval by October 2022, which would then be published for public comment in accordance with the federal Administrative Procedure Act.

Apart from development of Part 53, we should encourage continued progress on other initiatives in front of the NRC. The Commission has endorsed development of a generic environmental impact statement (GEIS) applicable to advanced reactors with a small generating output and small environmental footprint as a means of streamlining the environmental review process. Within the last month, the staff has also proposed to the Commission an update to its environmental review regulations to, among other things, “provide greater alignment between the environmental review process and the safety reviews for commercial advanced nuclear reactors.” Two other generic rules are scheduled to come before the Commission later this year: a final rule on emergency preparedness requirements for small modular reactors and other new technologies and a proposed rule on alternative physical security requirements for advanced reactors. These regulatory initiatives are important steps toward ultimately transforming the regulatory framework to ensure greater flexibility and effectiveness in reviewing new and advanced reactor designs.

## **International Cooperation and Harmonization**

As Third Way’s 2020 Advanced Nuclear Map shows, innovation in advanced nuclear technologies is budding across the globe. That makes continued engagement with international counterparts a priority as the development of new reactor technologies advances. From the regulatory perspective, co-operation and work toward harmonization are important objectives. Regulatory acceptance of reactor technologies is vested in individual national regulatory bodies rather than an international regulator. Nonetheless, regulators across the globe are connected on both a bilateral and multilateral basis to share best practices and insights from their evaluation of new technologies. International organizations like the International Atomic Energy Agency (IAEA) and the OECD Nuclear Energy Agency (NEA) help foster that cooperation.

There are already several international groups working toward greater harmonization, and we can build on their experience. The Multinational Design Evaluation Programme (MDEP), carried out with NEA support, is leveraging resources and knowledge in assessment of new reactor designs, as is the World Nuclear Association’s Cooperation in Reactor Design Evaluation and Licensing Working

Group (CORDEL). The IAEA established a Small Modular Reactor Regulators' Forum (which includes work related to advanced designs) in March 2015 to develop, for example, suggestions for new or revised IAEA guidance documents, position statements on regulatory issues and challenges, and suggested changes to international codes and standards. The NEA is also undertaking co-operative work through its standing committees.

The NRC and the Canadian Nuclear Safety Commission (CNSC) concluded a Memorandum of Cooperation in August 2019 to share best practices and experiences in the review of SMR and advanced reactor designs and to collaborate on approaches to the resolution of technical issues. The CNSC has entered into a similar agreement with the Office for Nuclear Regulation in the United Kingdom. Continued focus by the NRC on enhancing international cooperation and harmonization not only benefits the regulatory process, but it also helps developers establish a foothold in international markets.

There are a lot of things to juggle – agency leadership and staffing, improving the regulatory framework, international cooperation and harmonization – to ensure progress toward enhancing the opportunities for advanced reactor technologies as part of a clean energy portfolio. If I were to pick one thing on which continued focus is essential in the next year, it would be the work in adapting and reframing the regulatory approach through development of Part 53. This effort is particularly important in meeting the Commission's ambitious goal to promulgate a final rule by 2024. That said, with the right resources, talent, and coordination, there's no reason the NRC can't manage all of these tasks simultaneously. We've proven ourselves to be pretty good at juggling when we're determined to succeed.

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