UNCERTAINTIES IN THE LEGAL AND REGULATORY LANDSCAPE



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ROADMAP

- **INTRODUCTION** and Expertise
- **WHAT HAS CHANGED?** Three Seismic Shifts in the Legal Landscape
- **TAKEAWAYS**

(1) *The nuclear industry is at an inflection point not only because of technological changes, but because of the seismic legal transformations that have been happening (sometimes invisibly) under its feet.*

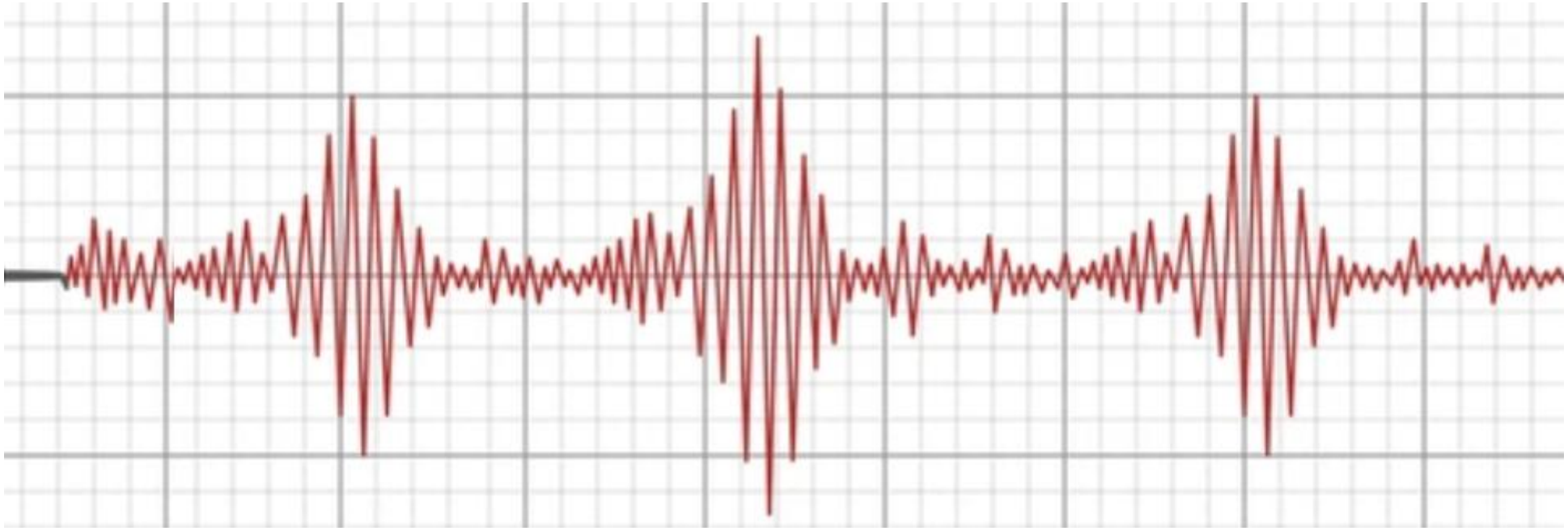
(2) *The legal and regulatory changes are extraordinary and complex and introduce important but neglected uncertainties.*

(3) *The community can no longer rely on a precautionary and independent regulatory who will "take care" of safety. Stakeholders should plan for increased legal uncertainty and should plan to engage actively with risk analysis, cost-benefit analysis, and nuclear safety.*

WHO AM I AND WHAT DO I DO?

- **General Areas of Expertise**
  - Administrative law, risk regulation, environmental law, legal management of risk and uncertainty, regulation of emerging technology, agency decision-making, and regulatory cost-benefit analysis
  - Associate Dean for Research and Mildred van Voorhis Professor of Law at the College of Law; have also taught at Harvard Law School, Duke Law School, and the University of Chicago Law School, with visiting stints at Oxford University and the Environmental Protection Agency
- **Interdisciplinary expertise**
  - Collaborations with engineers, social scientists, scientists, and philosophers include co-editing RISK ANALYSIS OF NATURAL HAZARDS: INTERDISCIPLINARY CHALLENGES AND INTEGRATED SOLUTIONS (SPRINGER, 2015) with Paolo Gardoni and Colleen Murphy; and authoring "The Regulatory Landscape of Respiratory Protection," in National Academies of Science, Engineering, and Medicine, FRAMEWORKS FOR PROTECTING WORKERS AND THE PUBLIC FROM INHALATION HAZARDS 447-528 (2022)
- **Experience in technology and nuclear energy**
  - Affiliate, Beckman Institute for Advanced Science & Technology; Affiliate, Socio-Technical Risk Analysis Research Laboratory
  - Substantial grant work on nuclear regulation, e.g. NRC Research and Development Grant, "Context-Based Analysis of a Risk-informed, Performance-based Regulatory Approach for Advanced Nuclear Reactors" (2024-27) (with PI Prof. Zahra Mohaghegh); DoE Nuclear Energy University Program (NEUP), "Systematic Enterprise Risk Management by Integrating the RISMC Toolkit and Cost-Benefit Analysis" (2017-2020) (with PI Prof. Zahra Mohaghegh)

WHAT HAS CHANGED?
MULTIPLE SEISMIC SHIFTS IN NUCLEAR REGULATION



STATUTORY MANDATE

DISCRETION

INDEPENDENCE

WHAT HAS CHANGED?
NRC'S **INDEPENDENCE**

"Old" Legal Landscape (pre-2024)

The Nuclear Regulatory Commission (NRC), **an independent agency** since its creation in 1974, regulated civilian nuclear energy.

As a result of its legal independence, NRC was insulated from executive orders and direct or political control by the President. It could base its discretionary decisions on expertise without considering politics or going through the same rulemaking processes as executive agencies. Policies were typically stable across Presidential administrations.

Modern Legal Landscape

Post *Trump v. Slaughter* (2026), the NRC is **no longer independent**. Like other executive agencies, it is now subject to direct political control by the President.

Commissioners may now be fired "at will" by the President -at any time for any reason, including political reasons. The agency is now subject to executive orders, including those (e.g. EO 12,866 and 13,563) requiring agencies to perform cost-benefit analysis and to use centralized executive review through the Office of Information and Regulatory Affairs (OIRA). Policy judgments should now be expected to oscillate with Presidents.

WHAT HAS CHANGED?
NRC'S **STATUTORY MANDATE**

"Old" Legal Landscape (pre-2024)

Under the Atomic Energy Act (AEA) and the Energy Reorganization Act of 1974, NRC's objective was to provide "reasonable assurance of adequate protection" of public health, safety, and the environment.

Courts read the AEA as unambiguous insofar as it required reasonable assurance of adequate protection without mentioning or requiring treatment of countervailing concerns, such as cost or efficiency. Under this statutory mandate, *UCS v. NRC* interpreted the NRC to be prohibited from considering cost or doing cost-benefit analysis to allow any action below a cost-blind safety "floor." As a result, cost-benefit analysis at NRC became a specialty procedure reserved for e.g. beyond-the-floor backfitting.

Modern Legal Landscape

Under the ADVANCE Act of 2024, the agency's fundamental mission changed. Although directed to continue to provide reasonable assurance of adequate protection of public health, safety, and the environment, it was *also* mandated to ensure that licensing and regulation be conducted in a manner that is "efficient" and "does not unnecessarily limit . . . the benefits of civilian use of radioactive materials and nuclear energy technology to society."

Modern courts will interpret the new statute, not the old one. In light of the new statute, safety is no longer the agency's only mandate. The status of *UCS v. NRC* is legally questionable, as is continuing to limit use of cost-benefit analysis.

WHAT HAS CHANGED?
NRC'S **DISCRETION**

"Old" Legal Landscape (pre-2024)

NRC received substantial deference from courts when interpreting ambiguous statutory language (such as what constitutes "adequate protection"). Under *Chevron* (1984), courts deferred to agency interpretations whenever the agency's interpretations were reasonable.

NRC was able to base its interpretations of terms such as "adequate protection" on the exercise of its expertise, so long as their interpretations did not directly contravene the statute.

Modern Legal Landscape

Post *Loper Bright v. Raimondo* (2024), **wherever the agency faces ambiguous statutory language, courts – not the agency – will use their "independent judgment" to determine the meaning of the statute.**

NRC decisions can no longer be sustained on the ground that the agency's interpretation of an ambiguous statutory term (such as "efficiency") is one reasonable interpretation. If a reviewing court determines that the NRC's interpretation is inconsistent with the "best" reading, the agency's action may be set aside.

TAKEAWAYS

(1) The nuclear industry is at an inflection point not only because of technological changes, but because of the seismic legal transformations that have been happening (sometimes invisibly) under its feet.

These include statutory changes (to the ADVANCE Act), judicial changes (to how courts interpret statutes, in *Loper Bright*, and the constitutional status of independent agencies, via *Trump v. Slaughter*), and executive changes (in amount and substance of Presidential control, including over cost-benefit analysis and political decision-making).

(2) The legal and regulatory changes are extraordinary and complex and introduce important but neglected uncertainties.

Courts will overturn NRC actions they believe to exceed the agency's legal mandates. Importantly, courts overturn illegal actions even when doing so is very disruptive. This makes relying upon NRC actions much chancier than it was at any point in history. Meanwhile, executive involvement in NRC actions has already substantially increased, and in future years policy choices may be unstable.

(3) The community can no longer rely on a precautionary and independent regulatory who will "take care" of safety. Stakeholders should plan for increased legal uncertainty and should plan to engage actively with risk analysis, cost-benefit analysis, and nuclear safety.

New licensing requirements for advanced reactors – unlike past requirements for LWRs – must be set on the basis of (social) efficiency as well as safety. And for safety for advanced reactors, NRC lacks the long history of safety data that it had for LWRs. Stakeholders should not expect agency that has a different structure, different statutory mandate, and different political positioning, and which is considering different technologies, to operate as it did in the past.

FURTHER READING

- George Joslin, Arden Rowell, Ha Bui, Justin Valentino, Ziwei Che, Seyed Reihani, and Zahra Mohaghegh, *Managing Uncertainty in Efficiency, Safety, and Independence for the Licensing and Regulation of Advanced Nuclear Reactors*, 200 NUCLEAR SCIENCE AND ENGINEERING ___ (forthcoming 2026).
- Arden Rowell and Jud Mathews, *The End of NRC Independence and the Future of Nuclear Safety*, REGULATORY REVIEW at The Supreme Court's 2025-2026 Regulatory Term | The Regulatory Review (July 27, 2026).
- George Joslin, Arden Rowell, and Zahra Mohaghegh, 1-18 "Comments on the Nuclear Regulatory Commission's Proposed Rule, 'Licensing Requirements for Microreactors and Other Reactors With Comparable Risk Profiles' 91 Fed. Reg. 23628 (Docket No. NRC 2025–0379)" (June 15, 2026).
- George Joslin, Arden Rowell, Seyed Reihani, and Zahra Mohaghegh, *Don't scrap ALARA—modernize it*, NUCLEAR NEWSWIRE at https://www.ans.org/news/article-8164/dont-scrap-alaramodernize-it/ (July 7, 2026).
- George Joslin, Arden Rowell, Zahra Mohaghegh, Justin Valentino, and Seyed Reihani, 1-12 "Comments on the Department of Energy 'Categorical Exclusion for Advanced Nuclear Reactors,' 91 Fed. Reg. 4550" (March 2, 2026).
- George Joslin, Arden Rowell, Ha Bui, Justin Valentino, Ziwei Che, Seyed Reihani, and Zahra Mohaghegh, *Nuclear Power's New Rulebook: Managing Uncertainty in Efficiency, Safety, and Independence*, NUCLEAR NEWSWIRE at https://www.ans.org/news/2025-11-21/article-7572/nuclear-powers-new-rule-book-managing-uncertainty-in-efficiency-safety-and-independence/ (November 21, 2025).
- Arden Rowell, Zahra Mohaghegh, Ha Bui, George Joslin, 1-8 "Part 53: As Proposed, Part 53 Fails to Address Important Legal Changes to the NRC's Authority" (February 28, 2025).

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