ORAL ARGUMENT NOT YET SCHEDULED

Case No. 24-1318

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

BEYOND NUCLEAR, INC. and THE SIERRA CLUB, INC., *Petitioners,*

v.

UNITED STATES NUCLEAR REGULATORY COMMISSION and THE UNITED STATES OF AMERICA, *Respondents,*

NUCLEAR ENERGY INSTITUTE, INC., *et al., Intervenor-Respondents.*

On Petition for Review of an Order by the
United States Nuclear Regulatory Commission

FINAL BRIEF OF INTERVENOR-RESPONDENTS NUCLEAR ENERGY INSTITUTE, INC., FLORIDA POWER & LIGHT COMPANY, AND NEXTERA ENERGY POINT BEACH, LLC

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Dated: June 9, 2025

CERTIFICATE AS TO PARTIES, RULINGS, AND RELATED CASES

In accordance with D.C. Circuit Rule 28(a)(1), the Nuclear Energy Institute (NEI), Florida Power & Light Company (FPL), and NextEra Energy Point Beach, LLC (collectively, Intervenors) submit this certificate as to parties, rulings, and related cases.

A. Parties and Amici

Except for amicus Miami Waterkeeper, all parties, intervenors, and amici appearing in this Court are listed in Petitioners' Opening Brief.

B. Rulings Under Review

References to the ruling at issue appear in Petitioners' Opening Brief.

C. Related Cases

Intervenors are not aware of any related cases within the meaning of D.C. Circuit Rule 28(a)(1)(C).

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CORPORATE DISCLOSURE STATEMENT FOR THE NUCLEAR ENERGY INSTITUTE

In accordance with Federal Rule of Appellate Procedure 26.1(a) and D.C. Circuit Rules 26.1 and 28(a)(1)(A), NEI submits the following corporate disclosure statement. NEI is a nonprofit organization incorporated in the District of Columbia. NEI is a "trade association" as that term is defined in D.C. Circuit Rule 26.1(b). NEI has no parent company and no publicly held company has any ownership interest in NEI.

NEI represents the policy interests of its members in the nuclear power industry, including nuclear power plant licensees, reactor designers and advanced technology companies, architect and engineering firms, fuel suppliers and service companies, consulting services and manufacturing companies, companies involved in nuclear medicine and nuclear industrial applications, radionuclide and radiopharmaceutical companies, universities and research laboratories, law firms, labor unions, and international electric utilities.

Respectfully submitted,

/s/ Jonathan M. Rund

Dated: June 9, 2025

CORPORATE DISCLOSURE STATEMENT FOR FLORIDA POWER & LIGHT COMPANY AND NEXTERA ENERGY POINT BEACH, LLC

In accordance with Federal Rule of Appellate Procedure 26.1(a) and D.C. Circuit Rules 26.1 and 28(a)(1)(A), FPL and NextEra Energy Point Beach, LLC submit this joint corporate disclosure statement identifying: (1) the parent corporation for each entity and any publicly held corporation that owns 10% or more of each entity's stock or other ownership shares; and (2) the general nature and purpose for each entity, insofar as is relevant to this litigation:

1. NextEra Energy, Inc., a publicly held company traded on the New York Stock Exchange (NYSE:NEE), is the parent company and owns all the stock of FPL. FPL owns 100 percent of and is the licensed operator of St. Lucie Plant Unit 1 and owns approximately 85 percent of and is the licensed operator of St. Lucie Plant Unit 2. The St. Lucie Plant is a two-unit nuclear power plant located in Jensen Beach, Florida. FPL also owns 100 percent of and is the licensed operator of Turkey Point Nuclear Generating Units 3 and 4, a two-unit nuclear power plant located near Homestead, Florida.

2. FPL is a rate-regulated electric utility engaged primarily in the generation, transmission, distribution, and sale of electric energy in Florida. FPL provides service to its electric customers through an integrated transmission and

distribution system that links its generation facilities to its customers. The St. Lucie and Turkey Point nuclear plants are FPL electric generation facilities.

3. NextEra Energy Point Beach, LLC is a wholly owned direct subsidiary of ESI Energy, LLC, which in turn is a wholly owned direct subsidiary of NextEra Energy Resources, LLC. NextEra Energy Resources, LLC is a wholly owned direct subsidiary of NextEra Energy Capital Holdings, Inc., which in turn is a wholly owned direct subsidiary of NextEra Energy, Inc. NextEra Energy Point Beach, LLC owns 100 percent of and is the licensed operator of Point Beach Nuclear Plant Units 1 and 2, a two unit nuclear power plant located in Two Rivers, Wisconsin.

4. No publicly held company owns 10% or more of the stock of NextEra Energy, Inc.

Respectfully submitted,

/s/ Anne Leidich

Dated: June 9, 2025

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GLOSSARY

EIS	Environmental Impact Statement
FPL	Florida Power & Light Company
GEIS	Generic Environmental Impact Statement for License Renewal of Nuclear Plants
NEPA	National Environmental Protection Act
NRC	U.S. Nuclear Regulatory Commission

INTRODUCTION

Nuclear energy is essential to meeting the nation's growing electricity needs while advancing critical environmental, reliability, and economic goals. Today, nuclear power accounts for nearly one-fifth of total U.S. electricity generation and half of the nation's carbon-free electricity.[1] As electricity demand increases—driven by domestic manufacturing, data-intensive industries such as artificial intelligence, and widespread electrification—keeping existing nuclear plants online is vital to the nation's energy security and preventing higher greenhouse gas emissions and degraded local air quality.[2]

Extending the operating life of nuclear plants is therefore essential to sustaining economic growth and protecting the environment. Nearly all U.S. nuclear plants are already operating under renewed licenses, and most are expected to seek subsequent renewals, making a timely and effective renewal process imperative to preserving this firm, clean, reliable generation capacity.

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[1] U.S. Energy Info. Admin., *Frequently Asked Questions (FAQ), What Is U.S. Electricity Generation by Energy Source?*, https://www.eia.gov/tools/faqs/faq.php?id=427&t=3 (last updated Feb. 29, 2024); U.S. Dep't of Energy, Office of Nuclear Energy, *Advantages and Challenges of Nuclear Energy* (June 11, 2024), https://www.energy.gov/ne/articles/advantages-and-challenges-nuclear-energy.

[2] Center for Climate and Energy Solutions, *Emissions Implications of Nuclear Retirements*, https://www.c2es.org/wp-content/uploads/2017/08/emissions-implications-nuclear-retirements.pdf (July 2017).

The Atomic Energy Act lets the U.S. Nuclear Regulatory Commission (NRC) issue renewable 40-year licenses.[3] NRC regulations allow plants to apply for 20-year extensions, based on a focused safety review that looks at how each plant will monitor and manage aging equipment during the renewal period.[4] NRC's review process is rigorous, typically requiring tens of thousands of staff hours and millions of dollars per application.[5] Separately, all other aspects of plant safety remain subject to continuous oversight under NRC's broader regulatory programs, which ensure plants continue to operate safely as conditions change over time.

In addition to its safety reviews, NRC also evaluates the environmental impacts of license renewal in compliance with the National Environmental Policy Act (NEPA). Under NEPA, agencies may use generic analyses for issues that are recurring and have similar effects across plants, and NRC has followed that approach for license renewal reviews since 1996. The 2024 Generic Environmental Impact Statement for License Renewal of Nuclear Plants (2024 GEIS) represents the latest update to NRC's generic analyses. It incorporates prior analyses by reference and reflects current plant data, updated modeling, and insights from

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3 *See* 42 U.S.C. § 2133(c).

4 *See* 10 C.F.R. §§ 54.29(a), 54.31(b).

5 Nuclear Energy Institute, *Examination of NRC Review Performance* at 7 (June 2023), https://www.nei.org/CorporateSite/media/filefolder/resources/reports-and-briefs/Examples-of-NRC-Review-Performance.pdf.

major industry events like Fukushima. Importantly, the GEIS considers safety information relevant to environmental impacts and does not duplicate NRC's separate safety reviews.

Beyond Nuclear and Sierra Club (collectively, Petitioners) seek to upend this longstanding and judicially approved framework. Yet they do not raise a single bona fide challenge to the analyses in the 2024 GEIS. Instead, they launch a collateral attack on NRC's broader safety review process—insisting that issues already addressed through the agency's comprehensive safety programs must be reexamined in the NEPA analysis. But as discussed below, further consideration of those issues would not materially alter the GEIS's environmental conclusions. Petitioners' approach would only impose substantial costs, unnecessary delays, and regulatory burdens on license renewal applicants, without improving agency decision-making in any meaningful way.

NRC's use of generic environmental findings reflects its expert technical judgment, avoids duplicative analyses, and is projected to save more than $100 million for the agency and industry[6]—all of which is consistent with NEPA's rule of reason and recent congressional directives to streamline environmental

[6] Final Rule and Guidance, Renewing Nuclear Power Plant Operating Licenses—Environmental Review, 89 Fed. Reg. 64,166, 64,167 (Aug. 6, 2024) (2024 Rule).

reviews. Backed by a robust technical record spanning hundreds of pages, the 2024 GEIS reasonably concludes that environmental impacts from reactor accidents remain small and that accident mitigation alternatives need not be revisited absent new and significant information. Petitioners' attempt to repackage safety concerns as NEPA objections—and their unsubstantiated challenges to the GEIS accident analyses—plainly do not pass muster. The Court should deny the Petition and uphold NRC's 2024 GEIS and Rule.

STATEMENT OF JURISDICTION

Intervenors agree with the Statement of Jurisdiction in the Brief for Federal Respondents.

STATUTES AND REGULATIONS

Except for 42 U.S.C. § 4336, Pub. L. No. 118-67, § 506, 138 Stat. 1447, 1478-80, and 10 C.F.R. § 54.21, which are set forth in the addendum bound with this brief, all pertinent statutes and regulations are contained in the addenda to the briefs filed by Petitioners and Federal Respondents.

STATEMENT OF THE ISSUES

1. NEPA requires agencies to take a hard look at reasonably foreseeable environmental effects and reach reasonable conclusions based on the record and their expertise. In the GEIS, NRC evaluated severe accident risk from internal initiating events—including age-related degradation—using state-of-the-art

models, operating experience, and its comprehensive oversight framework. NRC concluded that the probability-weighted environmental impacts from severe accidents are small. In light of that record, does NEPA require further aging-related analysis in the GEIS?

2. NEPA requires agencies to consider reasonably foreseeable environmental effects using sound methodologies and expert judgment. In the GEIS, NRC evaluated climate-influenced external hazards—including hurricanes and flooding—using bounding assumptions, state-of-the-art models, and current data. The agency concluded that accident risks remain small and committed to addressing new and significant information in each plant-specific supplemental environmental impact statement (EIS). Given that approach, does NEPA require further climate-specific analysis in the GEIS?

3. NEPA permits generic resolution of environmental issues when supported by technical analysis and a process for addressing significant new information. NRC reaffirmed in the GEIS that one severe accident mitigation alternatives analysis per plant is sufficient, while requiring applicants and the agency to address any new and significant information in each plant-specific supplemental EIS. Given that structure, and this Court's prior endorsement, does NEPA compel a second full analysis in every case?

STATEMENT OF THE CASE

NRC's license renewal process involves two distinct reviews: a safety review under 10 C.F.R. Part 54 and an environmental review under 10 C.F.R. Part 51. The safety review focuses on ensuring that each plant can manage the effects of aging on long-lived, passive structures and components that are important to safety during the renewal period.[7] Applicants must describe programs for monitoring and managing the aging of these components, and NRC assesses whether those programs provide reasonable assurance that safety functions will be maintained throughout the renewal term.[8]

The safety review does not reopen the plant's existing licensing basis—a comprehensive set of requirements and commitments that is continuously updated through NRC's robust regulatory oversight.[9] The Commission has long held that revisiting the full licensing basis during license renewal would be both duplicative and inefficient, as ongoing inspection, licensing, and enforcement programs already ensure safe plant operation. As the Commission explained, it would be "unnecessary and wasteful" to review such issues during license renewal, since

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[7] *Entergy Nuclear Operations, Inc*. (Indian Point, Units 2 & 3), CLI-15-6, 81 NRC 340, 347 (2015).

[8] 10 C.F.R. §§ 54.21, 54.29(a).

[9] *Fla. Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 & 4), CLI-01-17, 54 NRC 3, 8–9 (2001).

they are addressed through other regulatory pathways.[10] Indeed, these issues are far too important to be deferred until a license renewal review.

NRC's environmental review of license renewals under NEPA differs in scope. It evaluates the environmental impacts of continued plant operation for an additional 20 years.[11] The backbone of this review is NRC's GEIS, which assesses a comprehensive set of environmental issues common to all power reactor license renewals. The GEIS was first issued in 1996, updated in 2013, and revised again in 2024.[12] NRC has committed to reviewing the GEIS every 10 years to identify further improvements.[13] Each GEIS update reflects extensive additional operating experience, technical advancements, and updated analytical tools. Each revision is also informed by public comment and adopted through rulemaking.

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10 *Id.* at 7.

11 *Id.*

12 *See* NUREG-1437, Generic Environmental Impact Statement for License Renewal of Nuclear Plants (May 1996) (1996 GEIS); NUREG-1437, Rev. 1, Generic Environmental Impact Statement for License Renewal of Nuclear Plants (June 2013) (2013 GEIS); NUREG-1437, Rev. 2, Generic Environmental Impact Statement for License Renewal of Nuclear Plants (Aug. 2024) (2024 GEIS).

13 10 C.F.R. Part 51, Subpart A, Appendix B, Environmental Effect of Renewing the Operating License of a Nuclear Power Plant, Table B-1 (Table B-1); 89 Fed. Reg. at 64,169.

The GEIS classifies issues as either "Category 1" (generic) or "Category 2" (requiring plant-specific review).[14] Among the more than 60 Category 1 issues addressed in the 2024 GEIS are the environmental impacts of postulated accidents, including both design-basis accidents (those each nuclear plant is specifically designed to address) and severe accidents (those that may challenge plant safety systems beyond expected conditions).[15] The GEIS generically resolves the environmental impacts of severe accidents, but also continues to require plant-specific evaluation of "severe accident mitigation alternatives"[16] where such analysis has not previously been completed.[17] This generic framework is applied to each application through a plant-specific supplemental EIS, which addresses any "new and significant" information that could affect the GEIS's conclusions.[18]

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[14] Final Rule, Environmental Review for Renewal of Nuclear Power Plant Operating Licenses, 61 Fed. Reg. 28,467, 28,474 (June 5, 1996) (1996 Rule).

[15] Table B-1.

[16] The severe accident mitigation alternatives analysis fulfills NEPA's requirement to evaluate alternatives that could reduce a plant's environmental impacts by assessing possible design modifications that may lessen the severity or likelihood of a severe accident. Final Rule, Revisions to Environmental Review for Renewal of Nuclear Power Plant Operating Licenses, 78 Fed. Reg. 37,282, 37,313 (June 20, 2013).

[17] 89 Fed. Reg. at 64,180; Table B-1 n.7.

[18] 10 C.F.R. §§ 51.53(c)(3)(iii)–(iv), 51.95(c)(4).

SUMMARY OF THE ARGUMENT

Petitioners' core argument rests on the unfounded premise that NRC failed to account for aging-component and climate risks in its regulatory framework and must therefore redo the GEIS accident analyses. This mischaracterizes both the agency's regulatory approach and the content of the 2024 GEIS.

NRC's safety framework includes both the license renewal safety review and the agency's broader regulatory and inspection programs, all of which are designed to ensure continued safe operation of nuclear plants. The GEIS appropriately draws on that framework where relevant to assessing environmental impacts—such as from accidents that could potentially result from aging or external hazards—without duplicating the agency's separate safety reviews or ongoing oversight. That approach is not a flaw but a reasonable and long-established feature of the GEIS.

Petitioners disregard that approach and instead take isolated phrases in the 2024 GEIS out of context, raise speculative concerns, and ignore the document's detailed analysis—which synthesizes hundreds of pages of technical evaluation across multiple earlier GEIS iterations and nearly seventy supplemental EISs. In effect, their challenge functions as a collateral attack on NRC's broader safety oversight—insisting that issues already addressed through NRC's comprehensive safety framework must also be reexamined under NEPA. The GEIS, however,

shows that further consideration of those issues would not materially alter its conclusions. Petitioners' argument contravenes NEPA's "rule of reason," which requires agencies to take a hard look at environmental consequences—not to revisit every conceivable scenario or hypothetical objection. As shown below, NRC's conclusions are reasonable and grounded in decades of scientific, technical, and regulatory experience. Petitioners offer no valid basis to conclude otherwise.

First, Petitioners incorrectly claim that NRC "refused" to consider how plant aging could affect the probability or consequences of severe accidents. In fact, NRC's license renewal framework centers on addressing aging. While Petitioners acknowledge that aging is addressed in the safety review, they accuse NRC of (a) conceding the existence of knowledge gaps and uncertainties and (b) relying on NRC regulatory requirements including enforceable maintenance and aging management programs. Neither criticism has merit.

NEPA requires reasonable forecasting—not elimination of uncertainty. NRC's accident analysis accounts for uncertainty through conservative assumptions and robust modeling, as detailed in Appendix E of the 2024 GEIS and earlier versions. Petitioners ignore these discussions and cite no legal authority to support their contrary view. Furthermore, the very documents Petitioners cite as support demonstrate that NRC analyzed the same "gaps and uncertainties" Petitioners now claim remain unresolved.

Petitioners also assert that NRC improperly substituted its safety regulations for environmental review. Not so. The GEIS reflects decades of experience in which NRC draws on its broader safety regime—including its aging management, maintenance, and oversight programs—where relevant to evaluate environmental impacts. This approach ensures that risks from aging are systematically monitored, managed, addressed, and factored into the NEPA analysis. NRC's reliance on its safety framework is both factually grounded and legally sound. Petitioners cite no authority requiring an agency to ignore its own regulatory processes when conducting environmental reviews under NEPA.

Second, Petitioners argue that NRC failed to address climate change in its postulated accident analysis. But the 2024 GEIS directly considers the impacts of climate-related hazards—such as flooding, high winds, and extreme weather—and evaluates their potential impacts on accident risk using updated data and conservative modeling. Petitioners do not engage with that analysis. Moreover, NRC's broader oversight ensures that changing environmental conditions are addressed as they arise. NRC's NEPA procedures then provide a structured mechanism for identifying and evaluating any new and significant information—in addition to the generic analysis—during plant-specific reviews.

Third, Petitioners challenge NRC's approach to severe accident mitigation alternatives, contending that the 2024 Rule improperly forecloses plant-specific

review. That argument fails on procedural, legal, and factual grounds. NRC's longstanding, judicially sanctioned framework ensures that every plant undergoes a severe accident mitigation alternatives analysis unless one has already been completed, with further review required if new and significant information emerges. Petitioners, however, did not claim during the rulemaking that aging management or climate change warranted further consideration in the severe accident mitigation alternatives analysis. They cannot do so now. In any event, their position conflicts with this Court's precedent affirming NRC's approach as rational, robust, and sufficient under NEPA.

In sum, Petitioners' arguments ignore NRC's expert judgments and reasoned decision-making. The agency's findings are grounded in technical expertise, fully supported by the record, and consistent with controlling NEPA principles. Recent legislative reforms directing streamlined, focused NEPA compliance further reinforce the need for efficient decision-making—not the redundant and speculative analysis Petitioners seek. NRC's conclusion—that the environmental impacts of accidents, including those potentially affected by aging or climate change, are small—should be affirmed.

STANDARD OF REVIEW

The Federal Respondents' brief sets forth the well-established standard of review for this rulemaking under the Administrative Procedure Act and NEPA.[19]

Beyond that, recent statutory amendments reinforce NEPA's limited scope and deferential standard of review. The 2023 amendments enacted through the Fiscal Responsibility Act of 2023 are expressly designed to streamline the NEPA process.[20] The amendments confirm that an agency is not required to conduct new research unless it is essential to a reasoned decision and can be obtained without unreasonable cost or delay.[21] They also codify time and page limits for NEPA documents, clarify agency roles, and emphasize review efficiency.[22]

Similarly, the Accelerating Deployment of Versatile, Advanced Nuclear for Clean Energy (ADVANCE) Act directs NRC to report to Congress on its efforts to "facilitate efficient, timely, and predictable environmental reviews" of nuclear projects, specifically endorsing the "expanded use of . . . generic environmental

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19 *See* Fed.-Br. at 28–29.

20 *See* Fiscal Responsibility Act of 2023, Pub. L. No. 118-5, § 321, 137 Stat. 10, 38–46 (Builder Act) (2023).

21 *See id.*, 137 Stat. at 40 (adding Sec. 106(b)(3)) (codified at 42 U.S.C. § 4336(b)(3)).

22 *See id.*, 137 Stat. at 41–42 (adding Sec. 107(e) and (g)) (codified at 42 U.S.C. § 4336a(e), (g)).

impact statements."[23] Notably, the license renewal GEIS is the paradigmatic example of a generic environmental impact statement that streamlines review.

These directives underscore Congress's recognition that NEPA must enable—not obstruct—reasonable agency decision-making grounded in technical expertise. That recognition confirms what longstanding precedent already instructs: courts should not require agencies to conduct exhaustive or redundant analyses where NEPA's objectives are already met through reasoned, technically supported procedures. In reviewing the 2024 GEIS, this Court should give effect to these statutory directives favoring concise, efficient environmental analysis and avoid imposing procedural burdens that Congress has expressly rejected.

ARGUMENT

Petitioners scarcely acknowledge NRC's long history of performing license renewal reviews and thorough evaluation of postulated accidents in the 2024 GEIS—including more than 100 pages of technical analysis in Appendix E, building on nearly 150 pages in the 1996 GEIS, 50 pages in the 2013 GEIS, and nearly seventy plant-specific supplemental EISs prepared for license renewal.[24]

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[23] *See* Fire Grants and Safety Act of 2023, Pub. L. No. 118-67, § 506(a), 138 Stat. 1447, 1478 (2024).

[24] *See* 2024 GEIS at 4-129 to 4-132, E-1 to E-109; 2013 GEIS at 4-158 to 4-162; E-1 to E-53; 1996 GEIS at 5-1 to 5-120; G-1 to G-38.

Petitioners overlook this substantial body of rigorous agency analysis in favor of flyspecking and conjectural claims. Nowhere in their filing do they explain why NRC's conclusions are unsupported or fail to address the issues they raise. That approach contravenes NEPA's "rule of reason," which obliges agencies to take a hard look at environmental consequences—not to address every conceivable scenario or speculative concern.

As discussed below, NRC has repeatedly taken that hard look. NRC's conclusions—that the environmental impacts of postulated accidents are small for all plants, and that duplicative, plant-specific severe accident mitigation alternatives analyses are unnecessary where one has already been completed—are not only reasonable but grounded in decades of study and technical judgment. Petitioners offer no legal or factual basis to disturb those conclusions.

I. NRC reasonably concluded that severe accidents triggered by aging components would have only small environmental impacts because its technical analysis incorporates aging-related risks and relies on a comprehensive regulatory framework.

Petitioners assert that the 2024 GEIS and Rule are flawed because they allegedly "refuse" to consider the effects of aging components on the risk of severe accidents during license renewal.[25] Petitioners cite no language in the GEIS, the

[25] Pet.-Br. at 40. Unlike their climate risk argument, Petitioners' aging-related argument focuses solely on severe accidents; they raise no objection to how

Rule, or any supporting document suggesting that NRC declined to evaluate aging-related influences on accident risk. That silence is not surprising: NRC has long focused on understanding and managing how component aging affects plant safety and environmental risk. In fact, NRC's license renewal framework, from its inception, has squarely addressed the intersection of aging, plant safety, and environmental impacts.[26] The 2024 GEIS further reflects decades of technical refinement, drawing on probabilistic risk assessments, operating experience, and expanding research on material degradation and system performance.[27]

Petitioners eventually concede that NRC evaluates aging-related accident risks but fault the analysis for two reasons: it acknowledges "uncertainty"[28] and it relies on NRC's maintenance and aging management requirements.[29] As explained

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aging-related risks are addressed in the GEIS's evaluation of design-basis accidents.

[26] *See* 1996 GEIS at 5-10 (JA365).

[27] Probabilistic risk assessment allows NRC to evaluate accident risk by quantifying both the likelihood of various accident scenarios and the environmental consequences if they occur—providing a probability-weighted measure of potential impacts. *See* NRC, *Probabilistic Risk Assessment (PRA)* (July 7, 2020), https://www.nrc.gov/about-nrc/regulatory/risk-informed/pra.html.

[28] *See, e.g.*, Pet.-Br. at 41.

[29] *See, e.g.*, *id.* at 43–44.

below, neither criticism has merit. NRC's 2024 GEIS fully satisfies NEPA's requirement for a forward-looking review based on the best available information.

A. NRC's acknowledgment of uncertainty complies with NEPA because reasonable forecasting, not absolute certainty, is all that the statute requires.

NEPA requires agencies to make reasonable forecasts of environmental impacts based on available information, not to resolve every technical uncertainty.[30] As such, Petitioners' criticism that the 2024 GEIS acknowledges "some uncertainty" and is therefore inadequate "as a matter of law"[31] misses the mark, both legally and factually.

Petitioners cite no authority for the proposition that NEPA prohibits agencies from acknowledging uncertainty in environmental analyses. On the contrary, this Court has long held that NEPA requires only "reasonable forecasting,"[32] not a "crystal ball inquiry."[33] An agency satisfies NEPA when it considers and discloses uncertainties and evaluates the impacts using the best

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30 *Village of Bensenville v. FAA*, 457 F.3d 52, 71–72 (D.C. Cir. 2006); *Biodiversity Conservation All. v. Jiron*, 762 F.3d 1036, 1051 (10th Cir. 2014).

31 Pet.-Br. at 41 (citing 2024 GEIS at A-213 (JA212)).

32 *Scientists' Inst. for Pub. Info., Inc. v. AEC*, 481 F.2d 1079, 1092 (D.C. Cir. 1973).

33 *NRDC v. Morton*, 458 F.2d 827, 837 (D.C. Cir. 1972) (internal quotation marks omitted).

available information.[34] To the extent Petitioners suggest otherwise, they are wrong as a matter of law.

Petitioners also ignore NRC's express, conservative methodology for addressing uncertainty. The 1996 GEIS employed very conservative estimates designed to ensure actual risks would be unlikely to exceed NRC's projections, and the 2024 GEIS continues that approach, explicitly addressing uncertainty throughout Appendix E, including a dedicated Section E.3.9 titled "Uncertainties."[35] Importantly, the updated GEIS demonstrates that when considering *all hazards*—internal and external alike—the incorporation of updated probabilistic risk assessment data yields a *12,000 percent reduction* in estimated population dose risk compared to the conservative 1996 estimates in the initial GEIS.[36]

NRC's analysis explicitly incorporates potential mechanical, electrical, and structural failures—whether caused by aging, natural hazards, or other factors—as

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[34] *See Baltimore Gas & Elec. Co. v. NRDC*, 462 U.S. 87, 88, 98–100, 101–02 (1983) (finding that the NRC complied with NEPA's requirements of consideration and disclosure where it summarized major uncertainties and found the evidence tentative but favorable).

[35] 2024 GEIS at E-1, E-67 (JA245, 311). These conservative estimates reflect what statisticians call a "95th percentile upper confidence bound," meaning there is at least a 95 percent chance that the actual risk is at or below this value.

[36] 2024 GEIS at E-93 (JA337).

possible initiators of severe accidents.[37] Its probabilistic risk analysis is not an abstract desk exercise. Rather, it synthesizes extensive real-world operating experience, historical data, and modern computational methods to evaluate the likelihood and consequences of a full spectrum of potential accident scenarios, including loss-of-coolant accidents, fires, and critical equipment malfunctions.[38] Aging effects are embedded in that analysis. NRC's modeling assumes constant failure rates for critical components—a conservative assumption that is justified by robust regulatory programs requiring licensees to monitor, maintain, and replace aging equipment throughout the license term.[39] Petitioners never confront NRC's technical judgment that conservative failure rate assumptions support the conclusion that some uncertainty is acceptable and that uncertainty does not undermine the demonstrated reduction in estimated accident risk.

Petitioners also mischaracterize NRC's technical research on aging management and the associated regulatory framework. They posit that the 2024 GEIS failed to address "gaps and uncertainties" in the knowledge of aging effects that were identified in 2014 in NRC Memorandum SECY-14-0016 and the

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37 *See, e.g.*, 2024 GEIS at E-70 (considering "random equipment failures") (JA314).

38 2024 GEIS at E-28, E-39 (JA272, 283).

39 2024 GEIS at A-213 (JA212).

Expanded Materials Degradation Assessment.[40] Petitioners overlook that identification of these technical issues spurred a nearly decade-long process of research, collaboration, integration of data from domestic and international experience, operating event reports, materials research, and extensive stakeholder engagement to produce updated guidance that has enhanced the agency's and industry's understanding of aging mechanisms and mitigation strategies.[41] Indeed, NRC addressed these issues, as reflected in the rulemaking comment responses and Petitioners' own supporting documents.

As NRC explained in responding to comments, "[f]ollowing Staff Requirements Memorandum (SRM)-SECY-14-0016[], emerging issues related to aging were addressed in the 2017 Generic Aging Lessons Learned Report."[42] In that report, NRC reviewed results from aging management program audits, findings from the Degradation Assessment, domestic and international operating

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[40] Pet.-Br. at 42 (citing Memorandum SECY-14-0016 (Aug. 29, 2014) and the Expanded Materials Degradation Assessment, NUREG/CR-7153 (Oct. 2014) (Degradation Assessment)).

[41] *See* Fed-Br. at 42–43.

[42] 2024 GEIS at A-104 (JA103).

experience, and public comments to identify technical issues that need to be considered to ensure safe operation of NRC-licensed nuclear power plants.[43]

As the 2024 GEIS notes, NRC's subsequent 2023 Lessons Learned Report further "discusses generic aging management reviews of systems, structures, and components . . . that may be within the scope of [subsequent license renewal] applications and identifies aging management programs . . . that are determined to be acceptable for managing the effects of aging . . . within the scope of license renewal, as required by Part 54."[44] That 2023 report also incorporated interim guidance reflecting updated codes, plant experience, lessons learned from subsequent license renewal reviews, and new aging management programs—including revisions specific to reactor internals, structural materials, and electrical components.[45] Petitioners ignore these updates to the 2017 report.

Finally, Petitioners offer no alternative methodology or technical critique of the agency's extensive analysis or comment response. They do not dispute that updated operating experience—including current information about plant-specific

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43 Generic Aging Lessons Learned for Subsequent License Renewal (GALL-SLR) Report; Final Report, Vol. 1 at xxviii (July 2017) (2017 Lessons Learned Report) (JA509).

44 2024 GEIS at A-104 (JA103).

45 Generic Aging Lessons Learned for Subsequent License Renewal (GALL-SLR) Report; Draft Report for Comment, Vol. 1, Rev. 1 at xxvi-xxvii (July 2023) (2023 Lessons Learned Report) (JA565–566).

risk analyses, as well as enhanced technical understanding of accident phenomena—shows a dramatic reduction in accident risk. Nor do they explain how any further analysis would materially alter NRC's NEPA findings for severe accidents. Instead, they ask this Court to second-guess NRC's technical judgment—an approach foreclosed by well-settled precedent.[46] NEPA does not require worst-case scenario analysis or the resolution of every uncertainty for an agency to make a reasoned decision.[47] NRC's forthright acknowledgment of relevant uncertainties fully satisfies NEPA's requirements for reasonable forecasting and forward-looking environmental review.

B. NRC reasonably accounted for its maintenance and aging management programs because NEPA permits agencies to rely on existing regulatory safeguards when assessing environmental risk.

Having ignored how NRC addresses uncertainty and its generic analysis of aging management issues, Petitioners assert that NRC safety guidance acknowledges "uncertainties and knowledge gaps."[48] They further claim that NRC

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[46] *See Baltimore Gas*, 462 U.S. at 103 ("a reviewing court must remember that the Commission is making predictions, within its area of special expertise, at the frontiers of science").

[47] *See Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 353 (1989); *Dep't of Transp. v. Public Citizen*, 541 U.S. 752, 767–69 (2004).

[48] Pet.-Br. at 42–43, 50.

has "shifted" responsibility for resolving those issues to licensees.[49] That claim identifies no NEPA deficiency. By regulation, license renewal applicants must demonstrate that aging effects are adequately managed, and NRC may not grant a renewed license unless and until it makes a plant-specific finding to that effect.[50] NRC's assumption that any material gaps will be resolved through plant-specific review is reasonable because the law requires it for license renewal[51]—and failing to account for that framework would distort the NEPA process by elevating speculative worst-case risks over reasoned forecasting.[52] Petitioners cite no authority requiring NRC's NEPA analysis to presume unlawful or inadequate safety reviews.

NRC's Maintenance Rule[53] and the aging management requirements in 10 C.F.R. Part 54 mandate continuous monitoring, trending, and corrective action

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49 *Id.*

50 *See* 10 C.F.R. §§ 54.21(a)(3), (c)(1)(iii) (requiring "[e]ach application" to present an affirmative demonstration that "the effects of aging" "will be adequately managed"), 54.29(a) (prohibiting issuance of a renewed license unless NRC finds "reasonable assurance" that aging effects will be adequately managed during the period of extended operation).

51 *See U.S. Postal Serv. v. Gregory*, 534 U.S. 1, 10 (2001) ("[A] presumption of regularity attaches to the actions of Government agencies.").

52 *See Methow Valley*, 490 U.S. at 357.

53 10 C.F.R. § 50.65.

for safety-significant systems, structures, and components performing active and passive intended safety functions. These programs are not static; they are regularly updated in response to new data, research, and operating experience, reflecting NRC's and industry's ongoing commitment to continuous improvement. NRC did not invoke this regulatory framework to avoid its NEPA obligations. Rather, it properly considered these legally required programs as part of its informed evaluation of environmental impacts.

The adequacy of NRC's safety review under Part 54 is outside the scope of the 2024 Rule and this proceeding. Still, there should be no doubt that Part 54 requires each licensee to evaluate aging effects during the subsequent renewal term on a plant-specific basis—including through application of the very guidance Petitioners cite. The 2017 and 2023 Lessons Learned Reports describe aging management programs that NRC has found acceptable for subsequent license renewal based on prior experience and analyses. That guidance, however, does not give licensees a free pass through the renewal process. Each licensee must demonstrate that its plant's conditions and operating experience fall within the bounds of the generic program.[54] If not, the licensee must identify any additional

[54] 2023 Lessons Learned Report at xxi (JA560).

aging effects and augment its programs accordingly.[55] Each application is therefore expected to address the agency's guidance, demonstrate program effectiveness, and identify enhancements where warranted. In short, licensees already must consider and address subsequent aging-related data on a plant-specific basis—and NRC reasonably relied on that process in its NEPA review.[56]

In summary, the agency reasonably considered its regulatory programs as part of its informed, NEPA-compliant assessment of aging-related influences on

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[55] *Id.*

[56] As an example of plant-specific analysis, GEIS rulemaking comments cite concerns about reactor pressure vessel embrittlement at the Point Beach Nuclear Plant. 2024 GEIS at A-365 to A-366 (JA237-238). That issue was addressed in a contested proceeding in which the public could participate. *See id.* at A-370 (JA242) (generally referring to contested proceedings); *NextEra Energy Point Beach, LLC* (Point Beach Nuclear Plant, Units 1 & 2), CLI-22-5, 95 NRC 97, 106 (2022). That renewal application discussed how the licensee would obtain relevant data on neutron embrittlement damage to the reactor vessel by withdrawing and testing surveillance capsules exposed to operating conditions at the plant, including one that "will bound the projected fluence at the end of the [license renewal] operating term." *Point Beach*, CLI-22-5, 95 NRC at 106 (citation omitted). The surveillance program generates data on neutron fluence and reactor vessel material properties, and that data is used to evaluate how embrittlement may affect operating limits or regulatory compliance. *See NextEra Energy Point Beach, LLC* (Point Beach Nuclear Plant, Units 1 & 2), LBP-21-5, 94 NRC 1, 42 (2021). This illustrates how NRC and licensees obtain precisely the kind of information Petitioners wrongly claim is missing—namely, pressure vessel "data at high fluences, for long radiation exposure (duration), and resulting high embrittlement." Pet.-Br. at 15.

the environmental impacts of postulated severe accidents. This approach exemplifies the reasoned decision-making NEPA requires.

C. NRC's dynamic, forward-looking process for updating the GEIS and preparing supplemental EISs satisfies NEPA's rule of reason.

NEPA requires agencies to take a hard look at the environmental consequences of major federal actions, using the best available data and a reasoned, forward-looking methodology. Although the 2024 GEIS easily meets that standard, Petitioners contend otherwise, relying heavily on *New York v. NRC I*.[57] But the circumstances here are fundamentally different. Unlike in *New York I*, NRC has prepared a comprehensive, up-to-date GEIS and has a process for considering potentially new and significant information at both the plant-specific and generic levels. As this Court later held in *New York v. NRC II*, in circumstances like those here, "NRC has done exactly what NEPA requires for major federal actions; it prepared an environmental impact statement."[58]

NRC's environmental conclusions in the 2024 GEIS reflect the agency's ongoing commitment to integrating advances in technical analysis, risk modeling, regulatory oversight, and other relevant scientific developments. NRC prepares plant-specific supplemental EISs that require evaluation of any new and significant

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[57] *See* Pet.-Br. at 41, 44 (citing *New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012)).

[58] *New York v. NRC*, 824 F.3d 1012, 1017 (D.C. Cir. 2016).

information and regularly reviews and updates the GEIS as part of its commitment to a ten-year review cycle. NRC's public comment process and waiver procedures appropriately balance NEPA's requirements for rigorous environmental review, public input, and efficient, focused decision-making.

Recent NEPA reforms further confirm the soundness of NRC's approach. Both the Fiscal Responsibility Act of 2023 amendments to NEPA and the NRC-specific ADVANCE Act seek to streamline and modernize environmental reviews, with an emphasis on efficiency, scientific rigor, and focused decision-making. NRC's tiered process—incorporating a robust bounding generic analysis, public comment, and plant-specific supplements—aligns with these congressional directives.

In sum, Petitioners have not identified any legal or technical deficiency in the 2024 GEIS or Rule. Their arguments either ignore or mischaracterize the record, or reflect disagreement with NRC's technical judgments, not a lack of reasoned decision-making. NRC's evaluation of aging effects and accident risk is grounded in extensive technical expertise, empirical operating data, and a comprehensive regulatory framework. The agency's finding—that the environmental consequences of severe accidents, including those involving aging-related failures, are small—is lawful, reasonable, and should be upheld.

II. NRC's expert judgment that climate-driven events do not alter its postulated accident risk conclusions is reasonable because NEPA requires only informed forecasting, and the 2024 GEIS thoroughly evaluates natural hazards, including those affected by climate change.

Petitioners argue that NRC's treatment of climate change in the 2024 Rule is deficient, claiming both that NRC ignored risks posed by climate-driven events and, contradictorily, that its consideration of such events was inadequate.[59] They contend that NRC failed to account for the possibility that future climate-related hazards could materially affect accident consequences, implying that some undefined new research should have been conducted to more precisely assess how climate-driven changes might influence accident risk.

These arguments lack merit. The record shows that NRC evaluated climate-driven phenomena—including high winds, flooding, and other natural hazards—using the best available information, extensive operating experience, and a forward-looking methodology. The 2024 GEIS expressly considers these hazards in assessing the environmental consequences of postulated accidents during the license renewal term. NRC reasonably concluded that the 1996 GEIS remains bounding even in the face of potential climate-intensified events and, if anything, overstates the risks. Petitioners identify no factual or legal deficiency in this approach. Their challenge amounts to a demand for speculative, open-ended

[59] *Compare* Pet.-Br. at 45–49, *with id.* at 53–54.

research that violates NEPA's rule of reason and conflicts with Congress's directive to streamline environmental reviews.[60]

A. NRC properly considered climate-driven hazards in the 2024 GEIS because NEPA permits agencies to rely on established safety frameworks and forward-looking environmental analysis.

As Petitioners acknowledge, NRC has not invoked NEPA's "remote and speculative" exception to avoid considering climate-related hazards.[61] Yet they contend that NRC "refused" to analyze climate change impacts, pointing to an isolated phrase in the 2024 GEIS stripped of its broader context.[62]

NRC reviews license renewal applications through two separate regulatory tracks: safety and environmental. The safety review in a license renewal proceeding is limited to aging management issues and does not reexamine a plant's design bases for extreme natural phenomena.[63] Broader radiological safety oversight—including requirements that plants withstand natural hazards such as

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60 *See, e.g.*, *Town of Winthrop v. FAA*, 535 F.3d 1, 11–13 (1st Cir. 2008) (noting that an EIS "is not, after all, a research document."); *Izaak Walton League of Am. v. Marsh*, 655 F.2d 346, 377 (D.C. Cir. 1981) ("Where adverse environmental impacts are not likely, expensive and time-consuming studies are not necessary."); *Lee v. U.S. Air Force*, 354 F.3d 1229, 1244 (10th Cir. 2004).

61 Pet.-Br. at 45–46 (quoting *New York*, 681 F.3d at 478).

62 *Id.* at 45.

63 *See* Fed.-Br. at 6–7.

earthquakes, floods, and hurricanes—is handled through NRC's ongoing oversight programs. If new information, such as evolving climate hazards, indicates a need to update a plant's design protections, NRC would address those issues through its continuous safety oversight process—not through the license renewal safety review, and certainly not through the NEPA process.[64]

The license renewal environmental review is different from the safety review. It fully assesses the environmental consequences of postulated accidents, including potential impacts from climate-related hazards during the renewal term, as described further in the next section.[65] Petitioners attempt to seize on a statement in the GEIS that "the impacts of future changing natural phenomena on nuclear power plant postulated accidents are outside the scope of this [license renewal] GEIS and rulemaking."[66] But that statement simply clarifies that NRC does not use NEPA to set or revise design safety standards; those standards are addressed separately through regulatory oversight.[67] NRC's NEPA obligation is to

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64 *See, e.g.,* 2024 GEIS at 3-42 (JA085).

65 2024 GEIS at E-23 (JA267) (noting the 2024 GEIS expressly "considers the impact" of climate-related natural phenomena (such as high winds, floods, and other external hazards) in evaluating the potential environmental impacts of postulated accidents during a license renewal term).

66 Pet.-Br. at 46 (quoting 2024 GEIS at A-222 (JA221)).

67 The GEIS observes, and Petitioners concede, that efforts to protect against the external events like floods are regulated as part of a facility's continuing

evaluate environmental impacts based on the plant's as-is condition—not to preemptively redesign plant infrastructure. This conclusion is fully consistent with the Supreme Court's long-held view that NEPA is a purely procedural statute that does not mandate specific outcomes.[68]

Furthermore, elsewhere in the 2024 GEIS, NRC explicitly states that climate change remains within the scope of license renewal environmental review "where appropriate, in the analysis of postulated accidents."[69] The agency's approach thus complies fully with NEPA's requirement for reasonable, forward-looking environmental evaluation. Petitioners' argument that NRC "refused" to consider climate change impacts is baseless.

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licensing basis outside the scope of license renewal. 2024 GEIS at E-7 (JA251) ("If additional changes are identified, they would be made applicable to operating nuclear power reactors regardless of whether they have a renewed license."); Pet.-Br. at 52. This is illustrated by FPL's 2020 commitment to implement flood protection mechanisms and the subsequent incorporation of those into Turkey Point's licenses basis in 2022, as reflected in the plant's Updated Final Safety Analysis Report. FPL, *Turkey Point Nuclear Generating, Units 3 and 4 – Updated Final Safety Analysis Report, Chapter 5 Structures*, at 5G-3, 5G-4 (Oct. 11, 2022), https://www.nrc.gov/docs/ML2230/ML22303A027.pdf.

[68] *Methow Valley*, 490 U.S. at 350.

[69] 2024 GEIS at A-308 (JA236).

Their secondary challenge—that NRC's treatment of design-basis accidents is unreasonable—fares no better.[70] NRC's environmental review distinguishes between design-basis accidents (those each plant is specifically designed to address) and severe accidents (those that may challenge plant safety systems beyond expected conditions).[71] Petitioners largely ignore the design-basis accident evaluation and the legal mandate that every licensed nuclear plant must, as a baseline, be designed and operated to withstand extreme natural phenomena.[72]

Petitioners' sole objection to the design-basis accident evaluation is that NRC purportedly relies too heavily on historical data and fails to "look forward."[73] But NRC's regulations require that design-basis assessments incorporate "sufficient margin" to account for limitations in historical data and anticipate future variability—including climatic changes.[74] Petitioners cite no evidence suggesting that this forward-looking margin is inadequate.

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70 *See* Pet.-Br. at 51–55.

71 Fed.-Br. at 15.

72 *See* 10 C.F.R. Part 50, Appendix A (Criterion 2).

73 Pet.-Br. at 52 (quoting *New York*, 681 F.3d at 481).

74 10 C.F.R. Part 50, Appendix A (Criterion 2) (requiring plants to withstand "the most severe of the natural phenomena that have been historically reported for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated").

Nor is the design basis static. NRC's safety framework requires continuous monitoring of hazards and, where necessary, updates to plants based on new information.[75] The GEIS appropriately finds that, with these dynamic regulatory safeguards in place, the environmental impacts of design-basis accidents during the renewal term are small.

B. NRC's evaluation of severe accidents is grounded in the best available information and expert judgment confirming that any climate-driven risk increases are outweighed by factors showing that overall risk remains small.

Having failed to show any flaw in NRC's treatment of design-basis accidents, Petitioners turn to the agency's evaluation of severe accidents. They argue that NRC's accident assessment is unreasonable and legally insufficient.[76] That argument fails as well. The record demonstrates that NRC's evaluation incorporates updated information, relies on state-of-the-art risk assessments, and fully satisfies NEPA.

The 2024 GEIS incorporates new information on external events (such as flooding and earthquakes) into its severe accident analysis.[77] It explains that, following Fukushima, NRC undertook an extensive reassessment of external event

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75 *See* Fed.-Br. at 48–50; 2024 GEIS at A-222 (JA221).

76 Pet.-Br. at 53–55.

77 2024 GEIS at E-4 to E-7 (JA248-251).

risks and ultimately confirmed that the probability-weighted consequences of severe accidents remain bounded by the 1996 GEIS.[78] In addition, the GEIS finds that post-Fukushima safety initiatives have substantially reduced the overall risk of postulated accidents compared to the 1996 assessment.[79]

The 2024 GEIS also reasonably incorporates information developed in response to the Fukushima task force recommendations.[80] This includes updated data from licensees and mitigation measures implemented in the wake of the accident. For example, the Florida Power & Light (FPL) submittals for Turkey Point Units 3 and 4[81] included a detailed flooding hazards reevaluation, with

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78 *Id.* at E-6 (JA250).

79 *Id.* at E-7 (JA251).

80 *Id.* at E-5 to E-7 (JA249-251). While the damage to the Fukushima plant was caused by a tsunami, NRC's post-Fukushima flooding reevaluation analyses considered a range of potential initiating events, including storm surges, seiches, intense precipitation, and dam failures. NRC, *Request for Information Pursuant to 10 C.F.R. § 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident*, Enclosure 2 at 6 (Mar. 12, 2012), https://www.nrc.gov/docs/ML1205/ML12053A340.pdf.

81 While amicus Miami Waterkeeper attempts to inject Turkey Point into this case, the Turkey Point subsequent license renewal proceeding bears no connection to the 2024 GEIS rulemaking. That license renewal involved a plant-specific environmental review *without* relying on any GEIS. That Turkey Point has become a topic of contention here only underscores that the climate change arguments raised here are, in substance, a challenge to NRC's broader regulatory framework—not to the 2024 GEIS or Rule under review.

analysis of flood protection margins accounting for 20 years of sea level rise. NRC staff independently reviewed those calculations—evaluating, among other things, projected sea level rise over the next century[82]—and separately assessed flood protection at Turkey Point during 2017–2018 site inspections.[83]

Having considered this and similar information, NRC reaffirmed that the probability-weighted consequences of severe accidents remain bounded by the 1996 GEIS.[84] As noted above, incorporating updated data and modeling into the 2024 GEIS reduced the projected population dose risk by a staggering 12,000 percent compared to the original 1996 estimates.[85] As this Court has recognized, NRC may generically analyze risks that are "essentially common" to all plants so long as its analysis is "thorough and comprehensive."[86] That standard is clearly

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82 *See* NRC, *Turkey Point Nuclear Generating Station, Unit Nos. 3 and 4 - Staff Assessment of Response to 10 CFR 50.54(f) Information Request - Flood-Causing Mechanism Reevaluation* at 1, 13-15, Tbl. 3.5-1 (Dec. 4, 2014), https://www.nrc.gov/docs/ML1432/ML14324A816.pdf (referring to the Flooding Hazard Reevaluation Report).

83 NRC, *Turkey Point Nuclear Generating, Units 3 and 4 – Documentation of the Completion of Required Actions Taken in Response to the Lessons Learned from the Fukushima Dai-ichi Accident*, at 9 (Mar. 24, 2020), https://www.nrc.gov/docs/ML2005/ML20055F060.pdf.

84 2024 GEIS at E-6 (JA250).

85 *Id.* at E-93 (JA337).

86 *New York II*, 824 F.3d at 1019.

met here: the 2024 GEIS uses conservative assumptions, reflects plant-specific operating experience, and reaches bounding conclusions applicable across the fleet.

Petitioners and amicus Miami Waterkeeper dismiss NRC's thorough assessment and instead speculate that climate change could increase the frequency or intensity of certain initiating events. But they ignore a decisive fact: NRC already considered updated data on external event risks and accident consequences—and still concluded that the probability-weighted impacts of severe accidents have significantly decreased.[87] As a result, even if climate change were to increase the frequency of certain initiating events, the overall risk remains dramatically lower. In NRC's expert judgment, that reduction far outweighs any potential climate-driven increase in accident likelihood, and the environmental impact remains small.[88] Petitioners offer no evidence in the record—either in their comments to the agency or in this Court—that undermines the significance of the updated data.[89]

In sum, Petitioners' challenge to NRC's treatment of climate-related accident risks under the 2024 Rule provides no basis for relief. NRC's evaluation

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87 *Id.* at E-93 (JA337).

88 *Id.* at A-222 (JA221).

89 *Baltimore Gas*, 462 U.S. at 103.

is technically rigorous, procedurally sound, and fully consistent with NEPA's requirements for reasoned and focused environmental review.

III. NRC's longstanding, court-approved approach to severe accident mitigation alternatives is lawful because it remains responsive to new information and satisfies NEPA's hard look standard.

Petitioners make a cursory challenge to NRC's treatment of severe accident mitigation alternatives in the 2024 Rule, contending that it arbitrarily forecloses plant-specific review of accident mitigation measures related to aging management and climate change.[90] But this throwaway argument fails procedurally, legally, and factually.

As an initial matter, Petitioners and other commenters never suggested during the GEIS rulemaking that aging management or climate mitigation warranted reconsideration as part of the severe accident mitigation alternatives analysis. That omission is dispositive. As the Supreme Court has made clear, a party challenging agency action under NEPA must raise its concerns with specificity during the administrative process so the agency can meaningfully consider them.[91] Petitioners' failure to preserve their claims bars their challenge.

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[90] Pet.-Br. at 56–58.

[91] *See Public Citizen*, 541 U.S. at 764 (citing *Vt. Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519, 553 (1978)).

Petitioners' argument lacks merit in any event. NRC's tiered framework for severe accident mitigation alternatives—upheld by this Court in *Natural Resources Defense Council v. NRC*[92]—requires applicants to conduct a plant-specific severe accident mitigation alternatives analysis unless one has already been completed, and to supplement that prior analysis if new and significant information emerges.[93] Severe accident mitigation alternatives have been—and continue to be—considered in every license renewal proceeding under this framework.

This classic NEPA-style tiered review, established by the 1996 Rule and reaffirmed in the 2013 Rule, remains firmly in place.[94] The 2024 Rule reclassifies severe accident mitigation alternatives as a Category 1 issue—generic for most plants—because nearly all reactors have completed an initial analysis.[95] NRC expressly confirmed, however, that this reclassification does not exempt any plant

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92 823 F.3d 641 (D.C. Cir. 2016).

93 *See* 10 C.F.R. §§ 51.53(c)(3)(ii)(L), 51.53(c)(3)(iv), 51.71(a), 51.95(c)(1).

94 *See* 89 Fed. Reg. at 64,189 (making no changes to 10 C.F.R. § 51.53(c)(3)(ii)(L) or (c)(3)(iv)); Final Rule, Revisions to Environmental Review for Renewal of Nuclear Power Plant Operating Licenses, 78 Fed. Reg. 37,282 (June 20, 2013) (same); Final Rule, Environmental Review for Renewal of Nuclear Power Plant Operating Licenses, 61 Fed. Reg. 28,467, 28,488 (June 5, 1996) (codifying to 10 C.F.R. § 51.53(c)(3)(ii)(L) or (c)(3)(iv)).

95 89 Fed. Reg. at 64,180.

from further review if new and significant information arises.[96] The 2024 Rule thus reflects a change of form, not substance.

Petitioners mischaracterize the 2024 Rule as a "refusal" to consider severe accident mitigation alternatives. In reality, NRC's approach ensures that every plant is subject to a full analysis at least once and remains subject to further review when warranted. Petitioners ignore these built-in safeguards and misapprehend the function and flexibility of the tiered process.

This Court has already sustained this very framework. In *Natural Resources Defense Council*, the Court upheld NRC's approach as "rational, supported by facts, and . . . sufficient to satisfy the Commission's 'hard look' obligation under NEPA."[97] The Court also noted that NRC had "wisely chosen to focus its limited resources in other more availing areas, while still building in several safety valves."[98] Petitioners neither cite nor attempt to distinguish *Natural Resources Defense Council*—controlling precedent that squarely forecloses their argument.

Nor do Petitioners meaningfully engage with the agency's extensive technical and policy justifications for maintaining this approach. NRC explained

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96 89 Fed. Reg. at 64,180; *see also* 2024 GEIS at A-230 (JA229) ("an assessment of new and significant [severe accident mitigation alternatives]-related information is required").

97 823 F.3d at 653.

98 *Id.* at 651.

that requiring repeat severe accident mitigation alternatives analyses for reactors that have already undergone full review would add significant cost and delay while yielding little environmental benefit.[99] Petitioners do not dispute that rationale, let alone show it to be unreasonable.

Petitioners also assert that NRC failed to adequately account for aging management or climate resilience in its treatment of severe accident mitigation alternatives. But these topics *were* evaluated in the 2024 GEIS and Rule.[100] Even if Petitioners had preserved the claim—and they did not—they never explain why any information in these areas would paint a seriously different picture of the environmental impacts or justify a reevaluation of mitigation measures. NRC's longstanding conclusion—based on past plant-specific reviews and ongoing regulatory oversight—is that few, if any, additional mitigation alternatives would be cost-beneficial or materially alter the already-low risk of severe accidents. Petitioners offer no reasoned basis for questioning that judgment.

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[99] 2024 GEIS at E-84 to E-85 (JA328-329); 89 Fed. Reg. at 64,195. As the 2024 GEIS notes, none of the severe accident mitigation analyses performed by license renewal applicants to date has identified plant-specific "major" cost-beneficial severe accident mitigation alternatives that significantly reduce the risk of a severe accident. Further reductions in the risk profiles of operating reactors have made this outcome even less likely.

[100] *See* sections I and II above.

NRC's determination that no additional severe accident mitigation analysis is required absent new and significant information also reflects Congress's recent direction to streamline and focus environmental reviews. The Fiscal Responsibility Act's NEPA amendments require agencies to complete EISs within two years and limit them to 150 pages (or 300 pages for complex projects).[101] The ADVANCE Act similarly directs NRC to improve the timeliness and predictability of its environmental reviews and specifically endorses the "expanded use of…generic environmental impact statements."[102] NRC's continued treatment of severe accident mitigation alternatives fully comports with these mandates—preserving analytical rigor while avoiding redundant, low-value exercises.

At bottom, Petitioners' severe accident mitigation alternatives challenge is both procedurally barred and substantively infirm. NRC's longstanding, court-approved framework remains firmly in place; it continues to ensure appropriate consideration of accident mitigation alternatives; and it reflects the agency's well-supported technical judgment and accords with recent congressional directives.

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[101] *See* Fiscal Responsibility Act of 2023, Pub. L. No. 118-5, § 321, 137 Stat. 10, 41–42 (adding Sec. 107(e) and (g)) (codified at 42 U.S.C. § 4336a(e), (g)).

[102] Fire Grants & Safety, Advance Act, Pub. L. No. 118-67, § 506(a), 138 Stat. 1447, 1478 (2024).

CONCLUSION

The Petition for Review should be denied. NRC's 2024 GEIS and Rule reflect decades of technical expertise, rigorous oversight, and a dynamic process that ensures evolving risks—including those from aging components and climate change—are thoroughly evaluated and effectively managed. The agency's analysis is not only comprehensive but also bounding, combining probability-weighted evaluations and qualitative judgment to address the full range of plausible accidents. It demonstrates—through reasonable forecasting and sound technical analysis—that the environmental impacts of such accidents remain small. Petitioners offer no credible evidence or legal basis to disturb NRC's expert judgment or to question its reasoned treatment of severe accident mitigation alternatives. NRC's rulemaking exemplifies the forward-looking, data-driven, and efficient environmental review that NEPA requires. Accordingly, the Court should uphold NRC's 2024 GEIS and Rule in full.

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Dated: June 9, 2025

CERTIFICATE OF COMPLIANCE

This brief complies with the type-volume limitations of Fed. R. App. P. 32(a)(7)(B) and D.C. Cir. R. 32(e)(2)(B)(1) because it contains 8,531 words, excluding the parts of the document exempted by Fed. R. App. P. 32(f) and D.C. Cir. R. 32(e)(1).

This brief complies with the typeface requirements of Fed. R. App. P. 32(a)(5) and the type-style requirements of Fed. R. App. P. 32(a)(6) because it was prepared using Microsoft Word in a proportionally spaced typeface in 14-point Times New Roman font.

Respectfully submitted,

/s/ Jonathan M. Rund

Dated: June 9, 2025

ADDENDUM OF STATUTES AND REGULATIONS

42 U.S.C. § 4336

Procedure for determination of level of review

(a) Threshold determinations

An agency is not required to prepare an environmental document with respect to a proposed agency action if-

(1) the proposed agency action is not a final agency action within the meaning of such term in chapter 5 of title 5;

(2) the proposed agency action is excluded pursuant to one of the agency's categorical exclusions, another agency's categorical exclusions consistent with section 4336c of this title, or another provision of law;

(3) the preparation of such document would clearly and fundamentally conflict with the requirements of another provision of law; or

(4) the proposed agency action is a nondiscretionary action with respect to which such agency does not have authority to take environmental factors into consideration in determining whether to take the proposed action.

(b) Levels of review

(1) Environmental impact statement

An agency shall issue an environmental impact statement with respect to a proposed agency action requiring an environmental document that has a reasonably foreseeable significant effect on the quality of the human environment.

(2) Environmental assessment

An agency shall prepare an environmental assessment with respect to a proposed agency action that does not have a reasonably foreseeable significant effect on the quality of the human environment, or if the significance of such effect is unknown, unless the agency finds that the proposed agency action is excluded pursuant to one of the agency's categorical exclusions, another agency's categorical exclusions

consistent with section 4336c of this title, or another provision of law. Such environmental assessment shall be a concise public document prepared by a Federal agency to set forth the basis of such agency's finding of no significant impact or determination that an environmental impact statement is necessary.

(3) Sources of information

In making a determination under this subsection, an agency-

(A) may make use of any reliable data source; and

(B) is not required to undertake new scientific or technical research unless the new scientific or technical research is essential to a reasoned choice among alternatives, and the overall costs and time frame of obtaining it are not unreasonable.

Pub. L. No. 118-67, § 506, 138 Stat. 1447, 1478-80 (2024)

Sec. 506. Modernization of Nuclear Reactor Environmental Reviews.

(a) In General.—Not later than 180 days after the date of enactment of this Act, the Commission shall submit to the appropriate committees of Congress a report on the efforts of the Commission to facilitate efficient, timely, and predictable environmental reviews of nuclear reactor applications for a license under section 103 of the Atomic Energy Act of 1954 (42 U.S.C. 2133), including through expanded use of categorical exclusions, environmental assessments, and generic environmental impact statements.

(b) Report.—In completing the report under subsection (a), the Commission shall—

(1) describe the actions the Commission will take to implement the amendments to the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.) made by section 321 of the Fiscal Responsibility Act of 2023 (Public Law 118–5; 137 Stat. 38);

(2) consider—

(A) using, through adoption, incorporation by reference, or other appropriate means, categorical exclusions, environmental assessments, and environmental impact statements prepared by other Federal agencies to streamline environmental reviews of applications described in subsection (a) by the Commission;

(B) using categorical exclusions, environmental assessments, and environmental impact statements prepared by the Commission to streamline environmental reviews of applications described in subsection (a) by the Commission;

(C) using mitigated findings of no significant impact in environmental reviews of applications described in subsection (a) by the Commission to reduce the impact of a proposed action to a level that is not significant;

(D) the extent to which the Commission may rely on prior studies or analyses prepared by Federal, State, and local governmental permitting agencies to streamline environmental reviews of applications described in subsection (a) by the Commission;

(E) opportunities to coordinate the development of environmental assessments and environmental impact statements with other Federal agencies to avoid duplicative environmental reviews and to streamline environmental reviews of applications described in subsection (a) by the Commission;

(F) opportunities to streamline formal and informal consultations and coordination with other Federal, State, and local governmental permitting agencies during environmental reviews of applications described in subsection (a) by the Commission;

(G) opportunities to streamline the Commission's analyses of alternatives, including the Commission's analysis of alternative sites, in environmental reviews of applications described in subsection (a) by the Commission;

(H) establishing new categorical exclusions that could be applied to actions relating to new applications described in subsection (a);

(I) amending section 51.20(b) of title 10, Code of Federal Regulations, to allow the Commission to determine, on a case-specific basis, whether an environmental assessment (rather than an environmental impact statement or supplemental environmental impact statement) is appropriate for a particular application

described in subsection (a), including in proceedings in which the Commission relies on a generic environmental impact statement for advanced nuclear reactors;

(J) authorizing the use of an applicant's environmental impact statement as the Commission's draft environmental impact statement, consistent with section 107(f) of the National Environmental Policy Act of 1969 (42 U.S.C. 4336a(f));

(K) opportunities to adopt online and digital technologies, including technologies that would allow applicants and cooperating agencies to upload documents and coordinate with the Commission to edit documents in real time, that would streamline communications between—

(i) the Commission and applicants; and

(ii) the Commission and other relevant cooperating agencies; and

(L) in addition to implementing measures under paragraph (3), potential revisions to part 51 of title 10, Code of Federal Regulations, and relevant Commission guidance documents—

(i) to facilitate efficient, timely, and predictable environmental reviews of applications described in subsection (a);

(ii) to assist decision making about relevant environmental issues;

(iii) to maintain openness with the public;

(iv) to meet obligations under the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.); and

(v) to reduce burdens on licensees, applicants, and the Commission; and

(3) include a schedule for promulgating a rule for any measures considered by the Commission under subparagraphs (A) through (K) of paragraph (2) that require a rulemaking.

10 C.F.R. § 54.21

Contents of application—technical information.

Each application must contain the following information:

(a) An integrated plant assessment (IPA). The IPA must—

(1) For those systems, structures, and components within the scope of this part, as delineated in § 54.4, identify and list those structures and components subject to an aging management review. Structures and components subject to an aging management review shall encompass those structures and components—

(i) That perform an intended function, as described in § 54.4, without moving parts or without a change in configuration or properties. These structures and components include, but are not limited to, the reactor vessel, the reactor coolant system pressure boundary, steam generators, the pressurizer, piping, pump casings, valve bodies, the core shroud, component supports, pressure retaining boundaries, heat exchangers, ventilation ducts, the containment, the containment liner, electrical and mechanical penetrations, equipment hatches, seismic Category I structures, electrical cables and connections, cable trays, and electrical cabinets, excluding, but not limited to, pumps (except casing), valves (except body), motors, diesel generators, air compressors, snubbers, the control rod drive, ventilation dampers, pressure transmitters, pressure indicators, water level indicators, switchgears, cooling fans, transistors, batteries, breakers, relays, switches, power inverters, circuit boards, battery chargers, and power supplies; and

(ii) That are not subject to replacement based on a qualified life or specified time period.

(2) Describe and justify the methods used in paragraph (a)(1) of this section.

(3) For each structure and component identified in paragraph (a)(1) of this section, demonstrate that the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation.

(b) CLB changes during NRC review of the application. Each year following submittal of the license renewal application and at least 3 months before scheduled completion of the NRC review, an amendment to the renewal application must be

submitted that identifies any change to the CLB of the facility that materially affects the contents of the license renewal application, including the FSAR supplement.

(c) An evaluation of time-limited aging analyses.

(1) A list of time-limited aging analyses, as defined in § 54.3, must be provided. The applicant shall demonstrate that—

(i) The analyses remain valid for the period of extended operation;

(ii) The analyses have been projected to the end of the period of extended operation; or

(iii) The effects of aging on the intended function(s) will be adequately managed for the period of extended operation.

(2) A list must be provided of plant-specific exemptions granted pursuant to 10 CFR 50.12 and in effect that are based on time-limited aging analyses as defined in § 54.3. The applicant shall provide an evaluation that justifies the continuation of these exemptions for the period of extended operation.

(d) An FSAR supplement. The FSAR supplement for the facility must contain a summary description of the programs and activities for managing the effects of aging and the evaluation of time-limited aging analyses for the period of extended operation determined by paragraphs (a) and (c) of this section, respectively.