ORAL ARGUMENT NOT YET SCHEDULED

No. 14-1210, consolidated with Nos. 14-1212, 14-1216, 14-1217

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

STATE OF NEW YORK *et al.*; PRAIRIE ISLAND INDIAN COMMUNITY; BEYOND NUCLEAR, INC. *et al.*; and NATURAL RESOURCES DEFENSE COUNCIL, INC., *Petitioners,*
and
COMMONWEALTH of MASSACHUSETTS, *Intervenor-Petitioner,*
v.
UNITED STATES NUCLEAR REGULATORY COMMISSION and THE UNITED STATES OF AMERICA, *Respondents,*
and
NUCLEAR ENERGY INSTITUTE, INC. *et al., Intervenor-Respondents.*

On Petition for Review of an Order by the U.S. Nuclear Regulatory Commission

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September 4, 2015

CERTIFICATE AS TO PARTIES, RULINGS, AND RELATED CASES

In accordance with Circuit Rule 28(a)(1), respondents United States Nuclear Regulatory Commission and the United States of America submit this certificate as to parties, rulings, and related cases.

(A) Parties, Intervenors, and Amici

Petitioners are New York, Vermont, and Connecticut (No. 14-1210); Prairie Island Indian Community (No. 14-1212); Beyond Nuclear, Inc.; Blue Ridge Environmental Defense League, Inc.; Missouri Coalition for the Environment, Inc.; New England Coalition, Inc.; Nuclear Information and Resource Service, Inc.; Riverkeeper, Inc.; San Luis Obispo Mothers for Peace, Inc.; Sustainable Energy and Economic Development Coalition, Inc.; and Southern Alliance for Clean Energy, Inc. (No. 14-1216); and Natural Resources Defense Council, Inc. (No. 14-1217). Respondents are the United States Nuclear Regulatory Commission ("NRC") and the United States of America.

The Court has allowed the State of Massachusetts to intervene in support of petitioners. The Court has permitted intervention in support of respondents by the Nuclear Energy Institute, Inc.; Entergy Nuclear Operations, Inc.; and Northern States Power Company. The Sierra Club and California State Energy Resources Conservation and Development Commission are participating as amici curiae.

(B) Rulings under review

The petitions for review seek review of:

1. Continued Storage of Spent Nuclear Fuel, Final Rule, 79 Fed. Reg. 56,238 (Sept. 19, 2014); and
2. Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel, 79 Fed. Reg. 56,263 (Sept. 19, 2014) ("GEIS").

(C) Related Cases

NRC issued the Continued Storage Rule and GEIS in response to this Court's remand order on June 8, 2012, in *State of New York et al. v. United States Nuclear Regulatory Commission and United States of America*, No. 11-1045.

The current proceeding consists of four consolidated cases:

1. *State of New York et al. v. Unites States Nuclear Regulatory Commission and United States of America*, No. 14-1210;
2. *Prairie Island Indian Community v. Unites States Nuclear Regulatory Commission and United States of America*, No. 14-1212;
3. *Beyond Nuclear, Inc. et al. v. Unites States Nuclear Regulatory Commission and United States of America*, No. 14-1216; and
4. *Natural Resources Defense Council, Inc. v. Unites States Nuclear Regulatory Commission and United States of America*, No. 14-1217.

The following cases are also related to the current proceeding:

1. *Missouri Coalition for the Environment, Inc. v. United States Nuclear Regulatory Commission and United States of America*, No. 15-1114 (D.C. Cir.), which was filed on April 23, 2015, by Missouri Coalition for the Environment, Inc., one of the petitioners in No. 14-1216. On April 23, 2015, the petitioner filed a motion to hold this petition for review in abeyance pending the Court's decision in the instant case because "[b]riefing in [the instant] case will resolve, in their entirety, all of the [Atomic Energy Act], [National Environmental Policy Act], and [Administrative Procedure Act] claims that apply to this petition for review." The Court granted this motion on May 22, 2015.

2. *Beyond Nuclear, Inc. v. United States Nuclear Regulatory Commission and United States of America*, No. 15-1173 (D.C. Cir.), which was filed on June 19, 2015, by Beyond Nuclear, Inc., one of the petitioners in No. 14-1216. On July 22, 2015, the petitioner moved to hold in abeyance the portion of this petition related to the Continued Storage Rule and GEIS pending the outcome of the instant case because "the Court's decision in [the instant case] will fully resolve that claim." The Court has not yet ruled on this motion.

3. Six cases that have been consolidated: (1) *Blue Ridge Environmental Defense League v. United States Nuclear Regulatory Commission and United States of America*, No. 15-1258 (D.C. Cir.); (2) *Blue Ridge Environmental Defense League v. United States Nuclear Regulatory Commission and United States of America*, No. 15-1259 (D.C. Cir.); (3) *Blue Ridge Environmental Defense League v. United States Nuclear Regulatory Commission and United States of America*, No. 15-1260 (D.C. Cir.); (4) *Nuclear Information and Resource Service v. United States Nuclear Regulatory Commission and United States of America*, No. 15-1261 (D.C. Cir.); (5) *Sustainable Energy and Economic Development Coalition v. United States Nuclear Regulatory Commission and United States of America*, No. 15-1262 (D.C. Cir.); and (6) *Beyond Nuclear v. United States Nuclear Regulatory Commission and United States of America*, No. 15-1263 (D.C. Cir.). Each of these petitions for review was filed by one of the petitioners in No. 14-1216 on August 6, 2015 (except a corrected petition was filed on August 7, 2015, in No. 15-1262). Each of these petitions was filed along with a motion to hold the petition in abeyance pending the Court's decision in the instant case because "[b]riefing in [the instant] case will resolve, in their entirety, all of the [National Environmental

Policy Act] and [Administrative Procedure Act] claims that apply to this petition for review [and each of the petitioners] has not raised any other claims in this appeal." On August 7, 2015, the Court consolidated these petitions on its own motion and granted the petitioners' motions to hold these cases in abeyance.

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GLOSSARY

AEA	Atomic Energy Act
APA	Administrative Procedure Act
DOE	Department of Energy
EIS	Environmental Impact Statement
GEIS	Generic Environmental Impact Statement
JA	Joint Appendix
NEPA	National Environmental Policy Act
NRC	Nuclear Regulatory Commission
NRDC	Natural Resources Defense Council, Inc.

JURISDICTIONAL STATEMENT

Various governmental and private entities[1] seek review of a rulemaking order of the Nuclear Regulatory Commission ("NRC") adopting a new Continued Storage Rule ("Rule") at 10 C.F.R. § 51.23.[2] The Rule codifies the impacts contained in NRC's Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel ("GEIS").[3] The Rule and GEIS replace the temporary storage rule and waste confidence decision[4] vacated by this Court in *New York v. NRC,* 681 F.3d 471 (D.C. Cir. 2012) ("*New York I*").

The Rule and the impacts in the GEIS codified in the Rule are subject to judicial review because the Rule constitutes a "final order" in a rulemaking proceeding under Section 189(a)(1)(A) of the Atomic Energy Act ("AEA"), 42 U.S.C. § 2239(a)(1)(A). Such final orders trigger Hobbs Act jurisdiction under 28 U.S.C. § 2342 and 42 U.S.C. § 2239(b)(1). All petitions for review were timely filed within sixty days of the Rule's publication.

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[1] We refer to New York, Vermont, and Connecticut (petitioners in No. 14-1210) and intervenor Massachusetts as "the States"; to the Prairie Island Indian Community (petitioner in No. 14-1212) as "the Tribe"; and to Natural Resources Defense Council, Inc. and Beyond Nuclear, Inc. *et al.* (petitioners in No. 14-1217 and No. 14-1216, respectively) collectively as "NRDC."

[2] The text of the Rule and other pertinent statutes and regulations is set forth in a separately bound addendum.

[3] 79 Fed. Reg. 56,238, 56,239 (Sept. 19, 2014) (JA__).

[4] 75 Fed. Reg. 81,032 (Dec. 23, 2010); 75 Fed. Reg. 81,037 (Dec. 23, 2010).

STATEMENT OF ISSUES

1. Whether NRC reasonably defined the proposed federal action as adoption of a revised Rule and reasonably determined that cessation of reactor licensing and other alternatives would not satisfy the purpose of and need for that action.

2. Whether NRC reasonably determined that it could generically identify and evaluate continued storage impacts by performing bounding analyses, given that NRC permits consideration of site-specific factors upon an adequate showing.

3. Whether NRC reasonably analyzed the impacts of potential spent fuel pool fires and leaks and allowed sufficiently for site-specific variations by performing bounding analyses.

4. Whether NRC made reasonable assumptions about the continuity of institutional controls and other issues in making predictive judgments about the impacts resulting from continued storage.

5. Whether NRC reasonably met its obligation to consider the possibility that a repository will never become available.

6. Whether NRC reasonably addressed potential measures to mitigate the impacts of continued storage, given the opportunity to consider mitigation in site-specific licensing decisions and that the mitigation alternatives suggested by petitioners are beyond the scope of this rulemaking.

7. Whether petitioners have waived any arguments challenging the Rule under the AEA.

STATEMENT OF THE CASE

In *New York I*, this Court vacated NRC's waste confidence decision and temporary storage rule, which together addressed the implications of "continued storage," i.e., storing spent fuel beyond the licensed life of a nuclear power reactor, either in the reactor's spent fuel pool or an onsite or offsite storage facility.[5] The Court's decision required NRC to take action to comply with the National Environmental Policy Act ("NEPA").[6]

On remand, NRC discontinued its waste confidence approach in favor of an entirely new and comprehensive GEIS that analyzes the environmental impacts of continued storage and addresses several specific concerns identified by the Court. NRC published a proposed rule and draft GEIS in September 2013 and invited comments through December 20, 2013.[7] In preparing the GEIS and adopting the

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[5] The phrase "licensed life of a reactor" refers to the term of the license to operate a reactor. The GEIS assumes an original licensed life of 40 years and up to two 20-year license extensions. Thus, the period of continued storage refers to the period beyond the initial term and any renewed terms but before the delivery of fuel to a repository. 79 Fed. Reg. at 56,245 (JA__).

[6] *See infra* page 7.

[7] 78 Fed. Reg. 56,776 (Sept. 13, 2013) (JA__); 78 Fed. Reg. 66,858 (Nov. 7, 2013) (JA__).

Rule, NRC duly considered and, as appropriate, responded to over 1,000 unique written comment submittals as well as comments conveyed during thirteen public meetings.[8] The final GEIS was adopted on September 19, 2014,[9] along with a final rule codified at 10 C.F.R. § 51.23.[10]

Section 51.23(a) identifies the GEIS as the agency's generic assessment of the impacts of continued storage. Section 51.23(b) incorporates the impacts from the GEIS into each applicable NRC licensing proceeding, thus dispensing with the need to identify these impacts in site-specific licensing proceedings. Section 51.23(c) makes clear that the Rule does not apply to consideration of impacts during the licensed term of a reactor or fuel storage facility. Instead, those impacts are addressed in separate environmental analyses performed at the time of licensing.

STATEMENT OF FACTS

I. The history of NRC's consideration of continued storage.

Since the mid-1980s, NRC has generically analyzed the environmental impacts of continued storage. NRC's earliest analysis followed this Court's

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[8] GEIS D-2-3 (JA__).

[9] 79 Fed. Reg. 56,263 (Sept. 19, 2014) (JA__).

[10] 79 Fed. Reg. at 56,238-39 (JA__).

decision in *Minnesota v. NRC*,[11] which led to what NRC termed its "waste confidence" proceedings, a rulemaking that generically assessed the environmental and safety implications of continued storage.[12]

This rulemaking culminated in a series of findings concerning, first, whether high-level radioactive waste "can be safely disposed of" and "when such disposal or off-site storage will be available"; and, second, "whether radioactive wastes can be safely stored on-site past the expiration of existing facility licenses until off-site

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[11] 602 F.2d 412 (D.C. Cir. 1979).

[12] *See* 49 Fed. Reg. 34,658 (Aug. 31, 1984). The term "waste confidence" had its genesis in 1977, when NRC determined, in rejecting an NRDC petition for rulemaking, that the AEA does not require NRC to make findings concerning the feasibility of a repository as a prerequisite to reactor licensing. In so doing, NRC stated that, as a matter of policy, it "would not continue to license reactors if it did not have reasonable confidence that the wastes can and will in due course be disposed of safely." 42 Fed. Reg. 34,391, 34,393 (July 5, 1977). The Second Circuit upheld NRC's interpretation of the AEA and denial of the rulemaking petition in *NRDC v. NRC*, 582 F.2d 166, 170-71, 175 (2d Cir. 1978).

NRC initiated its waste confidence proceedings as a consequence of this Court's decision in *Minnesota*, which involved a challenge to NRC's decisions to expand the storage capacity of two nuclear plants' spent fuel pools. In *Minnesota*, this Court expressed concern that the "reasonable confidence" conclusion contained in NRC's denial of NRDC's rulemaking petition was not supported by "the kind of comprehensive inquiry into . . . disposal solutions that would be required to give content to a 'generic' determination." 602 F.2d at 417. The Court remanded for consideration by NRC of "whether there is reasonable assurance that an off-site storage solution will be available by the years 2007-09, the expiration of the plants' operating licenses, and if not, whether there is reasonable assurance that the fuel can be stored safely at the sites beyond those dates." *Id.* at 418.

disposal or storage is available."[13] Among other things, NRC concluded that it had "reasonable assurance" that spent fuel could be stored (as distinct from being disposed of in a repository) both safely and without significant environmental impacts beyond the license term of the reactor that generated it.[14] The findings were accompanied by a new regulation, 10 C.F.R. § 51.23, that applied the findings generically to the NEPA analysis in each applicable licensing proceeding and precluded further deliberation of these issues.[15]

The decision and rule were updated in 1990,[16] reviewed but not changed in 1999,[17] and updated again in 2010.[18] The 2010 update departed from the past

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[13] 44 Fed. Reg. 61,372, 61,373 (Oct. 25, 1979).

[14] 49 Fed. Reg. at 34,660 (finding 4). "Reasonable assurance" has long been the safety standard employed by NRC in licensing under the AEA. *See, e.g., Vt. Yankee Nuclear Power Corp. v. NRDC,* 435 U.S. 519, 527 n.5 (1978); 10 C.F.R. § 50.57(a)(3) (requiring NRC to find, in approving an operating license, that "[t]here is reasonable assurance . . . that the activities authorized by the operating license can be conducted without endangering the health and safety of the public").

[15] 49 Fed. Reg. 34,688, 34,694 (Aug. 31, 1984).

[16] 55 Fed. Reg. 38,474 (Sept. 18, 1990).

[17] 64 Fed. Reg. 68,005 (Dec. 6, 1999).

[18] 75 Fed. Reg. at 81,032. NRC explained in this update that its waste confidence decision constituted an environmental assessment supporting the rule. *Id.* at 81,033.

practice of predicting a date by which a repository would be available and concluded instead that a repository would be available "when necessary."[19]

In *New York I*, this Court found that NRC's 2010 update failed to comply with NEPA in three respects:

- First, related to NRC's finding that a repository would be available "when necessary," the Court ordered NRC to "assess the potential environmental effects of [failing to establish a repository]."[20]
- Second, the Court determined that NRC must prepare an analysis of spent fuel pool leaks that "would necessarily look *forward* to examine the effects of the additional time in storage, as well as examining past leaks in a manner that would allow the Commission to rule out the possibility that those leaks were only harmless because of site-specific factors or even sheer luck."[21]
- Third, the Court required NRC to "undertake to examine the consequences of [spent fuel] pool fires" in addition to examining their probability.[22]

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[19] *Id.* at 81,040.

[20] 681 F.3d at 478-79.

[21] *Id.* at 481.

[22] *Id.* at 482.

The Court rejected petitioners' claim that an Environmental Impact Statement ("EIS") was categorically required to address these deficiencies.[23]

II. Development of the Continued Storage Rule and GEIS.

On remand, NRC considered revising the environmental assessment underlying its waste confidence decision and continuing to use the "findings" format developed in the waste confidence proceedings. However, NRC recognized both that the findings format was neither imposed by the Court in *Minnesota* nor used elsewhere and that that its use of "reasonable assurance" language in its waste confidence findings might have become confusing.[24] Accordingly, NRC concluded that a traditional and comprehensive NEPA analysis—in the form of an EIS—would be a more effective vehicle for disclosing the environmental impacts of continued storage. Additionally, employing an EIS to identify the impacts of continued storage allowed NRC to follow both the format used for similar analyses

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[23] *Id.* at 477, 482.

[24] *See* GEIS D-11-12, D-29-32 (JA__); 79 Fed. Reg. at 56,243-44 (JA__). As NRC explained, the agency now satisfies its obligations under the AEA to protect the public health and safety from hazards related to spent fuel storage through the comprehensive regulatory framework that it has developed since the original waste confidence rulemaking. *See* GEIS D-30-32 (JA__).

in licensing nuclear power plants and the generic format used for analysis of environmental impacts in license renewal proceedings.[25]

Changing the framework for its analysis also enabled NRC to retire its historic practice of trying to predict the availability of a repository. Thus, instead of specifying when a repository will become available, the GEIS analyzes various repository-availability scenarios, including the possibility that a repository never becomes available.[26]

The subject matters previously addressed in the waste confidence decision are addressed in the GEIS. But contrary to NRDC's assertions (Br. 6, 19), the findings are not wholly "incorporated" into the GEIS. Although the subjects of the findings are exhaustively analyzed, they are not distilled into discrete conclusions; instead, they are addressed as part of a comprehensive discussion that reflects NRC's considered judgment regarding these issues and informs the analysis of impacts in each of the timeframes considered.[27]

III. Format and content of the GEIS.

The GEIS includes discussions of the impacts of at-reactor and away-from-reactor storage, supporting appendices, and responses to comments. The impacts to

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[25] *See* 78 Fed. Reg. 37,325 (June 20, 2013); 10 C.F.R. pt. 51, subpt. A, app. B.

[26] GEIS xxx (JA__).

[27] *See* 79 Fed. Reg. at 56,244 (JA__).

seventeen separate resource areas, as well as impacts to these resources caused by accidents and acts of terrorism, are discussed in detail in Chapters 4 and 5 of the GEIS and are summarized for both at-reactor and away-from-reactor storage at Tables 4-2 and 5-1, respectively (JA__). NRC concluded that the impacts of continued storage, both direct and indirect, "will not vary significantly across sites, despite variations in site-specific characteristics," rendering a generic approach appropriate.[28] The GEIS thus generically characterizes impacts as small, moderate, or large (and in some cases as a range), and it provides supporting explanation for each conclusion. The identification of certain impacts, including the impacts of accidents, is informed by both the potential consequences and probability of the underlying events.[29]

The GEIS analyzes impacts for three postulated timeframes: short-term, long-term, and indefinite storage. The short-term timeframe considers 60 years beyond the reactor's license term (including two renewal terms); the long-term timeframe considers an additional 100 years; and the indefinite timeframe assumes that no repository becomes available.[30] NRC found repository availability before

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[28] *Id.* at 56,242 (JA__).

[29] GEIS xxxiii (JA__).

[30] *See id.* xxx-xxxi (JA__). For a new reactor licensing decision made in 2015, the short-term period would last from 2095 to 2155 (because it would begin in 80 years

the end of the short-term period to be "the most likely" scenario, though "not certain," and it found the indefinite-timeframe scenario to be "highly unlikely."[31]

STANDARD OF REVIEW

The standard of review for agency rulemaking is governed by the Administrative Procedure Act ("APA"), 5 U.S.C. § 706(2)(A), which provides that an agency decision may be set aside only if it is "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law."

This narrow standard requires the Court to uphold an agency decision provided the agency has "examine[d] the relevant data and articulate[d] a satisfactory explanation for its action."[32] A reviewing court "is not to substitute its judgment for that of the agency."[33] Rather, the court must "defer to the wisdom of the agency, provided its decision is reasoned and rational, and even uphold a

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(after a 40-year term and two 20-year renewals) and would end after another 60 years); the long-term period would end 100 years later; and the indefinite period would begin after the conclusion of the long-term period, i.e., in 2255. *See id.* 1-17 (JA__).

[31] *See id.* xxx (JA__).

[32] *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 513 (2009) (internal quotation marks omitted); *see also Transcon. Gas Pipe Line Corp. v. FERC*, 518 F.3d 916, 919 (D.C. Cir. 2008).

[33] *Fox Television Stations,* 556 U.S. at 513 (internal quotation marks omitted).

decision of less than ideal clarity if the agency's path may reasonably be discerned."[34]

Factual resolution of issues requiring a high level of scientific expertise is best left to "the informed discretion of the responsible federal agencies."[35] Particular deference is owed here to NRC's expertise across the spectrum of disciplines that the GEIS draws upon. As the Supreme Court has stated:

> [A] reviewing court must remember that the Commission is making predictions, within its area of special expertise, at the frontiers of science. When examining this kind of scientific determination, as opposed to simple findings of fact, a reviewing court must generally be at its most deferential.[36]

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[34] *Dillmon v. NTSB*, 588 F.3d 1085, 1089 (D.C. Cir. 2009) (internal quotation marks omitted).

[35] *Marsh v. Or. Nat. Res. Council*, 490 U.S. 360, 377 (1989) (quoting *Kleppe v. Sierra Club,* 427 U.S. 390, 412 (1976)).

[36] *Balt. Gas & Elec. Co. v. NRDC*, 462 U.S. 87, 103 (1983) (internal quotation marks omitted); *see also Blue Ridge Envtl. Def. League v. NRC,* 716 F.3d 183, 195 (D.C. Cir. 2013); *Massachusetts v. NRC,* 708 F.3d 63, 73 (1st Cir. 2013) (judicial deference is "particularly marked" for NRC actions); *N.J. Envtl. Fed'n v. NRC,* 645 F.3d 220, 230 (3d Cir. 2011); *Nuclear Energy Inst., Inc. v. EPA*, 373 F.3d 1251, 1276 (D.C. Cir. 2004).

Finally, this rulemaking implicates NRC's judgment in "deciding the most efficient way to administer its licensing . . . procedures."[37] In this regard, judicial deference is owed to NRC's judgment on how best to comply with NEPA.[38]

SUMMARY OF ARGUMENT

The GEIS represents the culmination of two years of exhaustive work by a full-time staff of dedicated experts considering highly technical subject matters. Under customary rules of judicial review, its conclusions warrant great deference.

Petitioners claim that the proposed federal action should have been stated as reactor licensing and that, accordingly, NRC should have considered alternatives to issuing licenses. But this Court has held that an NRC rulemaking adopting generic inputs to be employed in a subsequent licensing decision is not itself a licensing action. Petitioners' arguments concerning the alternatives that NRC should have considered are therefore unavailing.

Petitioners assert that site-specific, rather than generic, analysis of the environmental impacts of continued storage is necessary. This claim is refuted by this Court's instruction in *New York I* that such impacts may be analyzed by a conservatively bounding analysis, particularly where, as here, NRC permits

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[37] *Collins v. NTSB,* 351 F.3d 1246, 1253 (D.C. Cir. 2003); *see Union of Concerned Scientists v. NRC*, 920 F.2d 50, 54-55 (D.C. Cir. 1990).

[38] *See Blue Ridge,* 716 F.3d at 195.

consideration of site-specific factors through the opportunity to seek waiver in a particular licensing proceeding. Petitioners' specific assertions regarding the impropriety of the generic analysis of leaks and fires are easily refuted by the conservatively bounding analysis afforded these subjects in separate appendices.

Petitioners challenge NRC's assumption that institutional controls (i.e., maintenance of a regulatory regime) will continue, but their arguments ignore both that NRC's assumptions are well grounded in the regulatory structure of the AEA for securing nuclear materials and that the purpose of an EIS is to provide meaningful information to the decisionmaker. Petitioners also fail to note that NRC fully acknowledged the potential consequences of a loss of institutional controls.

Petitioners' assertion that NRC failed to analyze the possibility that a repository will not be available is based on a misreading of *New York I* and also misstates NRC's analysis of impacts resulting from storage in the indefinite timeframe.

Petitioners' claim regarding potential mitigation measures ignores that analysis of mitigation will take place before a facility license is issued or renewed. Petitioners' arguments also improperly suggest that NRC must consider imposing new regulatory requirements as part of a NEPA analysis.

Finally, despite informing the Court that they needed extra words to raise a challenge to the Rule under the AEA, petitioners have not raised any such arguments in their briefs. Those arguments should be deemed waived.

ARGUMENT

I. NRC reasonably defined the proposed federal action as a rulemaking that generically evaluates the environmental impacts of continued storage.

A. The purpose of the Rule is to preserve efficiency in NRC licensing processes by codifying the environmental impacts of continued storage.

The federal action under review in this case is clearly defined: "the adoption of a revised Rule . . . [that] codifies (i.e., adopts into regulation) the analysis in the GEIS of the environmental impacts of continued storage of spent fuel."[39] The action results from NRC's threshold determination that the environmental impacts of continued storage can be determined generically.[40] NRC's generic identification of impacts obviates the "need to separately consider the environmental impacts of continued storage" in environmental analyses performed in connection with the licensing of reactors and fuel storage facilities.[41]

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[39] GEIS 1-5 (JA__).

[40] *Id.* (JA__).

[41] *Id.*

The proposed action is further explained in NRC's description of the purpose of and need for the proposed action:

> The need for the proposed action is to provide processes for use in NRC licensing to address the environmental impacts of continued storage. Historically, the NRC and license applicants have relied on 10 CFR [§] 51.23 to conclusively address the environmental impacts of continued storage in environmental reports, EISs, [Environmental Assessments], and hearings.
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> The purpose of the proposed action is to preserve the efficiency of the NRC's licensing processes with respect to the environmental impacts of continued storage.[42]

B. This Court has rejected the argument that adoption of a generic NEPA analysis constitutes a licensing action.

Petitioners ignore what the GEIS repeatedly affirms—that the adoption of the Rule is *not* a licensing action because it does not authorize initial or continued operation of any reactor or storage facility.[43] For example, NRDC claims that, in adopting the Rule, NRC "fail[ed] to identify the proposed action as licensing" (Br. 20). NRDC further asserts that the Rule "codifies NRC's determination that reactors may be licensed" (*id.* 33). Petitioners use this characterization to maintain that NRC's action requires not only environmental analysis but also consideration

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[42] *Id.* 1-6 (JA__).

[43] *See, e.g.*, *id.* 3-10, 3-32, 5-35, 8-1 n.1 (JA__).

of alternatives to issuing licenses, including, most conspicuously, not licensing plants at all (States Br. 45; NRDC Br. 22-23).

But petitioners fail to note that the Court rejected this characterization of an NRC generic environmental analysis when NRDC itself advanced it nearly 40 years ago.[44] In *NRDC v. NRC*, this Court unequivocally endorsed the view, which forms the analytic basis for NRC's use of the GEIS, that a generic assessment of a subset of impacts attributable to facility licensing is not a separate licensing decision but instead serves as an input to be "plugged into" NRC's NEPA analysis during a site-specific licensing proceeding:

> We reject the contention that [NRC's generic assessment of uranium fuel cycle impacts in] Table S-3 is itself a "major Federal action" requiring an environmental impact statement. The Commission characterized this rulemaking as merely addressing "a procedural question involving the implementation of NEPA . . . ." Petitioners, however, claim Table S-3 has "substantive" effect, since it establishes values for environmental effects on which subsequent licensing decisions may turn. *While we agree that Table S-3 may have important decisional consequences by implying that fuel cycle problems are manageable, in the circumstances presented here, we do not believe these implications ripen into a proposal for agency action until they are incorporated into individual licensing decision[s]. At that point an impact statement will be prepared with regard to the licensing decision.* We do not read the statute as requiring more.[45]

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[44] *See NRDC v. NRC*, 547 F.2d 633 (D.C. Cir. 1976), *rev'd on other grounds sub nom. Vt. Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519 (1978).

[45] *Id.* at 653 n.57 (citations omitted; emphasis added).

This Court's unqualified conclusion in *NRDC* is fully consistent with NRC's approach here. The GEIS is but one of several generic inputs used by NRC as part of the reactor licensing process. In addition to Table S-3 (the generic input considered in *NRDC*), 10 C.F.R. § 51.51, NRC relies upon Table S-4, 10 C.F.R. § 51.52, which codifies the impacts of spent fuel and waste transportation. Similarly, NRC employs its Generic Environmental Impact Statement for License Renewal of Nuclear Plants[46] to identify impacts attributable to reactor license renewal. Ultimately, these generic inputs are considered in conjunction with the wide array of site-specific impacts that NRC also identifies through its extensive NEPA process, including impacts expected during reactor construction and operation. These impacts collectively inform NRC's consideration of the issues that its NEPA-implementing regulations require it to address prior to issuance of a license or renewal.[47]

Not surprisingly, to support their arguments petitioners rely upon the portion of *New York I* suggesting that the waste confidence decision "enabled" the licensing of reactors (*see, e.g.*, NRDC Br. 9, 18, 20). But *enabling* a licensing

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[46] *See* 10 C.F.R. pt. 51, subpt. A, app. B.

[47] *See id.* § 51.103 (requiring issuance of a "Record of Decision" documenting NRC's decisionmaking under NEPA to specify any alternatives deemed to be environmentally preferable, how its preferences have been balanced, and what steps have been undertaken to avoid or minimize environmental harms).

decision is a far cry from *constituting* a licensing decision. The GEIS's identification of impacts does not preordain any licensing determination and is not, in and of itself, such a determination; instead, the impacts identified in the GEIS are merely one set of inputs among the scores of individual considerations that inform the agency's NEPA process.[48]

In short, this Court did not hold in *New York I* that a decision by NRC to codify part of the environmental impacts resulting from the issuance of a license is itself a licensing action. Indeed, no court has reached such a conclusion, and petitioners' argument in support of such a position directly contradicts this Court's conclusion in *NRDC* and should be rejected.

C. Cessation of licensing is not an alternative to the rulemaking.

In light of NRC's proper identification of the purpose and need of the Rule, NRC considered appropriate alternatives to the rulemaking in Section 1.6 of the GEIS (JA__). Adhering to its "licensing decision" mantra, however, NRDC ignores the rulemaking character of the federal action and claims that NRC failed to examine substantive alternatives to the continued generation and resulting

[48] Amicus Sierra Club acknowledges as much, noting that "the ultimate purpose of the Continued Storage Rule is to inform the NRC's licensing and relicensing decisions," not to make such decisions (Br. 10).

storage of spent fuel, including the cessation of licensing altogether (NRDC Br. 20-23; *see also* Sierra Club Br. 5-7).

The linchpin of this argument, of course, is the flawed claim that "the proposed major federal action here . . . *is licensing nuclear reactors* that produce spent fuel," such that NRC must evaluate "alternatives that avoid or mitigate the environmental impacts of spent fuel production" (NRDC Br. 21-22; emphasis added). But, as NRC explained, cessation of reactor licensing or termination of existing licenses would not serve the purpose of the Rule.[49] Indeed, NRDC's argument conflates the purpose of the Rule—preserving efficiency in the licensing process by codifying the environmental impacts of continued storage—with the purpose of the NEPA analysis performed during the reactor licensing process—considering the degree to which these impacts militate against issuing or renewing a specific license. At the time of reactor licensing, alternatives that further the same purpose and need as the licensing action itself—such as relying on other forms of electricity generation, relying on different sites or designs, or foregoing

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[49] GEIS 1-9 (JA__); *see, e.g.*, *Theodore Roosevelt Conservation P'ship v. Salazar*, 661 F.3d 66, 72 (D.C. Cir. 2011) ("An alternative is reasonable if it is objectively feasible as well as reasonable in light of [the agency's] objectives." (alteration in original; internal quotation marks omitted)).

the project altogether—are properly considered under NEPA.[50] But those alternatives are not properly considered here.

Nor is there any support for the argument (*see, e.g.*, NRDC Br. 23) that a "no licensing" alternative (or other alternatives) must be considered on a programmatic basis in the GEIS, as opposed to site-specifically. NRC determines whether to issue (including whether to renew) licenses, and thus considers the "no licensing" option, on a case-by-case basis, after consideration of all the environmental impacts that result from the particular licensed activity and from applicable alternatives.[51] Given the case-specific nature of the analysis involved and the need to weigh both the costs and benefits of issuing each license, it is not reasonable, and is certainly not necessary, for NRC to consider alternatives in the abstract, without the opportunity to consider all the costs and benefits that might influence its decisionmaking.

Moreover, petitioners' argument in support of consideration of a generic decision to stop licensing across-the-board presupposes an authority that belongs to Congress, not to NRC. Section 103(b) of the AEA commands that the

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[50] *See, e.g.*, 10 C.F.R. §§ 51.45(c), 51.50(b)(1), 51.71(d), 51.75(b), 51.91(c), 51.103(a), 51.107(a)(3).

[51] *See* GEIS D-117 (JA__) ("[T]he alternative of not issuing or not renewing a nuclear power plant license is considered during the site-specific review of an individual license application.").

"Commission shall issue such licenses" to applicants demonstrating that they can operate a facility in accordance with NRC's public health and safety and common defense and security requirements, and Section 185(a) similarly states that an applicant "shall, if the application is otherwise acceptable to the Commission, be initially granted a construction permit."[52] Congress has directed that NRC consider license applications on a case-by-case basis, and petitioners have offered no explanation for why, or how, NRC could disregard this direction.

If petitioners believe that a global cessation of reactor licensing is warranted because of the environmental impacts of the continued storage of spent fuel (or any other impact resulting from reactor operations), then they may take their concerns to Congress. But petitioners have cited no authority suggesting that consideration of such action is properly made, let alone *must* be made, when, as here, NRC has generically identified one element of the environmental review associated with its licensing process.

D. NRC properly analyzed cumulative impacts and has not improperly segmented its analysis.

NRDC also claims (Br. 31-33) that the cumulative impacts of continued storage have not been considered. However, much as it fails to recognize that the

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[52] 42 U.S.C. §§ 2133(b), 2235(a); *see* GEIS 1-9, D-117-18 (JA__).

GEIS is to be employed as part of a licensing decision for a particular facility, it misinterprets the scope of the cumulative impacts analysis in the GEIS, which is limited to the cumulative impacts attributable to a *single* facility.[53] Because "the purpose of the GEIS [is] to support an *individual* licensing action," the relevant inquiry with respect to cumulative impacts is to identify the past, present, and reasonably foreseeable future impacts of continued storage related to the *individual facility being licensed.*[54]

> NRC addressed this issue in response to a comment, explaining that
>
> [t]he recommendation that the GEIS report the risks on a national scale for all reactors goes beyond the scope of the cumulative impact analysis, which is to evaluate the continued storage impacts applicable to an individual reactor licensing action while taking into account the additional impacts of past, present, and reasonably foreseeable future actions that would overlap in both space and time and accumulate with the impacts from continued storage.[55]

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[53] That is why GEIS Chapter 2 "describes typical facility characteristics and activities" (GEIS 2-1 (JA__))—to facilitate analysis of the impacts of licensing a single, generic facility.

[54] *Id.* D-489 (JA__) (emphasis added). Thus, the quotation from the GEIS regarding cumulative impacts from "other actions on the affected resource" that NRDC cites (Br. 32 (quoting GEIS 6-1 (JA__))) does not refer to the impact of the national inventory of spent fuel, as NRDC suggests. It refers to other actions, such as other projects or facilities in the same area that will affect the same resources as the *decision to issue a single license.* Such a decision will result in the continued storage impacts that the GEIS generically identifies.

[55] GEIS D-495 (JA__).

NRDC likewise claims that the GEIS should have evaluated the "incremental impacts" of spent fuel generation in light of the existing and future inventory of spent fuel and the need for disposal. In NRDC's view, the GEIS improperly segments the analysis so as to obscure a substantial environmental impact.[56] But cumulative impacts from different projects must be considered together only "where several proposed actions are pending at the same time" in a particular region, so as to "prevent agencies from dividing one project into multiple individual actions each of which has an insignificant environmental impact, but which collectively have a substantial impact."[57] This is not the case here. By relying upon the GEIS (as well as other generic and site-specific analyses that apply) in each licensing proceeding, NRC will consider the direct, indirect, and cumulative impacts attributable to the generation of spent fuel pursuant to the license under consideration, including any impacts that have already resulted or are reasonably likely to result on any affected resources. As such, NRC has not improperly segmented its NEPA obligations.

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[56] *See* Br. 31-32 (citing *Theodore Roosevelt Conservation P'ship v. Salazar,* 616 F.3d 497, 514 (D.C. Cir. 2010)).

[57] *Theodore Roosevelt,* 616 F.3d at 514 (internal quotation marks omitted).

II. NRC reasonably determined that it could generically identify and analyze the impacts of continued storage.

The States' primary argument (Br. 25-35) is that the impacts of continued storage should not have been assessed generically. We address that general assertion in this section and demonstrate that the criteria that NRC employed to determine whether to make a generic assessment is consistent with and expressly contemplated by prior precedent. We respond to the States' specific assertions that the impacts related to fires and leaks are inadequately addressed in the GEIS (both because they should not have been assessed generically and for other reasons) in Sections III and IV, *infra*.

A. NRC's longstanding practice of generic rulemaking has been judicially approved.

For the past thirty years, NRC has generically determined the environmental impacts of continued storage. This generic analysis has preserved efficiency in NRC's licensing process by codifying NRC's generic impact determinations, enabling NRC to avoid the need to reanalyze and litigate substantially the same issue in successive licensing proceedings. This method of analysis has been endorsed by both the Supreme Court and by this Court.

In *Baltimore Gas & Electric Co. v. NRDC,* 462 U.S. 87 (1983), the Supreme Court upheld NRC's generic assessment of the environmental impacts of the uranium fuel cycle, including the impacts of spent fuel disposal in a permanent

geologic repository. NRC's assessment included a "zero-release assumption," i.e., it assumes complete repository integrity without radioactivity escaping to the environment. Although NRC acknowledged when it promulgated this assessment that the zero-release assumption "involve[s] substantial uncertainties,"[58] NRC eschewed the option of permitting an opportunity for "reassessing the significance of the uncertainties in individual licensing proceedings."[59] The Supreme Court upheld NRC's rule and explained that NRC's generic approach, even in the face of these uncertainties, was appropriate:

> The generic method chosen by the agency is clearly an appropriate method of conducting the 'hard look' required by NEPA. The environmental effects of much of the fuel cycle are not plant specific, for any plant, regardless of its particular attributes, will create additional wastes that must be stored in a common long-term repository. Administrative efficiency and consistency of decision are both furthered by a generic determination of these effects without needless repetition of the litigation in individual proceedings, which are subject to review by the Commission in any event.[60]

The Court explained that, by adopting a generic result by rule, NRC need not eliminate all uncertainty but must only determine reasonably "that the uncertainty was insufficient to affect any individual licensing decision."[61] If so, "[t]he generic

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[58] *Balt. Gas,* 462 U.S. at 98.

[59] *Id.* at 94.

[60] *Id.* at 101 (citation omitted).

[61] *Id.*

method chosen by the agency is clearly an appropriate method of conducting the 'hard look' required by NEPA."[62]

In *New York I*, this Court observed that the Supreme Court had earlier "endorsed the Commission's longstanding practice of considering environmental issues through general rulemaking in appropriate circumstances."[63] Citing *Baltimore Gas*, this Court upheld that generic approach as sufficient under NEPA to analyze the environmental impacts of continued storage:

> [W]e see no reason that a comprehensive general analysis would be insufficient to examine on-site risks that are essentially common to all plants . . . particularly . . . given the Commission's use of conservative bounding assumptions and the opportunity for concerned parties to raise site-specific differences at the time of a specific site's licensing.[64]

The conditions identified by the Court in *New York I* are the same as those underlying NRC's conclusions that generic analysis is appropriate here. Specifically, NRC endorsed this approach only after concluding that the impacts are essentially common and that the "assumptions [used in the analysis] are sufficiently conservative to bound the impacts such that any variances that may occur from site to site are unlikely to result in environmental impact

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[62] *Id.*

[63] 681 F.3d at 480.

[64] *Id.*

determinations that are greater than those presented in the GEIS."[65] In addition, as discussed in Section II.C, *infra*, NRC's regulations ensure that requests for waivers from application of the Rule in individual licensing proceedings will be fairly considered and granted as warranted.

B. NRC's conclusions concerning the bounding nature of its analysis are entitled to substantial deference.

Wherever the analysis that NRC performed in preparing the GEIS involved a range of impact values, the agency explained how it bounded the range. NRC did not reach these conclusions in a vacuum. NRC has extensive experience in preparing generic environmental analyses, like the generic inputs to licensing discussed earlier.[66] NRC also has decades of experience in licensing and regulating fuel storage in pools and dry storage facilities at over 100 different reactors now or previously operational. As NRC explained:

> The reasonableness of NRC's [generic] determinations regarding continued storage is supported by numerous environmental reviews of spent fuel storage. Spent fuel storage during the period of operations has been considered in NRC's site-specific licensing of new reactors, [fuel storage facilities], and license renewal.[67]

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[65] GEIS D-83 (JA__).

[66] *See supra* page 18.

[67] GEIS D-96 (JA__). As a further bounding factor, NRC concluded that "none of the comments demonstrated that the environmental impacts of spent fuel storage in the period of continued storage would be greater than the impacts during the licensed period of operations, which will be assessed in the site-specific licensing review for each facility." *Id.*

Hence, when NRC determined here that impacts from continued storage are amenable to generic treatment, it was not writing on a blank slate.

This conclusion was subject to public scrutiny. For example, NRC offered commenters the opportunity "to raise site-specific considerations that might indicate that certain analyses or impact determinations cannot be generically resolved."[68] NRC carefully examined these comments and found nothing that would invalidate a generic approach "at any particular site."[69] Petitioners have supplied no legal reason that would preclude generic analysis, only claiming (States Br. 26-32) that site variations indeed exist with respect to issues such as pool fires and leaks. As this Court has stated, however, site-specific variations do not preclude generic consideration if they are sufficiently bounded,[70] and that is exactly the approach NRC adopted here.

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[68] *Id.* D-35 (JA__).

[69] *Id.*; *see also id.* D-94-96 (JA__).

[70] *New York I,* 681 F.3d at 480.

C. NRC's waiver rule provides suitable relief where site-specific differences render generic treatment inappropriate.

NRC's waiver rule at 10 C.F.R. § 2.335(b) allows hearing participants to request that the prohibition against challenging the GEIS be waived in a particular proceeding.[71] Thus, NRC repeatedly explained in the GEIS that

> [a] participant may be able to support a petition for waiver upon a showing that, due to site-specific special circumstances, the GEIS would not satisfy the NRC's NEPA obligation to evaluate the impacts of continued storage. . . . [T]he waiver process ensures that participants have [an] opportunity to raise any site-specific circumstances that may arise in the future.[72]

Although no court has ever held that NRC unreasonably denied a waiver, the States nonetheless insinuate that NRC's waiver process is a charade (*see* Br. 3, 25). This accusation is, as an initial matter, improperly raised here. To the extent any aggrieved party believes that a waiver has been improperly denied in an individual licensing proceeding, its remedy is to mount a challenge to the waiver

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[71] The Continued Storage Rule identifies the impacts related to continued storage that the agency must consider in connection with the licensing of nuclear reactors and storage facilities. *See* 10 C.F.R. § 51.23(a)-(b). Therefore, absent a waiver, a proposed contention at a licensing hearing contesting or seeking to add to the impacts identified in the GEIS with site-specific data would constitute an impermissible attack upon the Rule under 10 C.F.R. § 2.335(a).

[72] *E.g.*, GEIS D-35-36 (JA__).

rule's application.[73] In any event, NRC's application of section 2.335 is entitled to the "presumption of regularity [that] attaches to the actions of Government agencies,"[74] and the States have failed to rebut that presumption with evidence of a single instance of arbitrariness.

Indeed, the argument that the waiver process is flawed is contradicted by the one judicial decision analyzing the propriety of a waiver denial. In that case, the First Circuit found "reasonable" NRC's denial of a waiver request involving a generic impact analysis for license renewal.[75] And although the States go so far as to assert that NRC would likely never permit a waiver of the Rule because its purpose is to preclude site-specific consideration of impacts (Br. 34), they fail to note that NRC has rejected precisely this interpretation of 10 C.F.R. § 2.335.[76] Thus, rather than evidencing improper use of its waiver rule, NRC's track record regarding waiver confirms its judicious use of generic analysis and underscores

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[73] *See Dominion Nuclear Conn., Inc.* (Millstone Nuclear Power Station, Units 2 and 3), CLI-05-24, 62 N.R.C. 551, 559-60 (2005) (explaining waiver criteria).

[74] *See USPS v. Gregory,* 534 U.S. 1, 10 (2001).

[75] *Massachusetts,* 708 F.3d at 74 & n.17.

[76] *See Exelon Generation Co., LLC* (Limerick Generating Station, Units 1 and 2), CLI-13-7, 78 N.R.C. 199, 209 & n.49 (2013) (in identifying purpose of generic rule for purposes of waiver analysis, necessary to "'look further'" than mere achievement of intended effect of precluding site-specific analysis), *petition for review filed*, No. 14-1225 (D.C. Cir. Nov. 4, 2014).

the propriety of deferring to the agency's judgment concerning how best to implement its NEPA obligations.

The States also suggest that the waiver process unfairly shifts to them the burden of proving site-specific variations (Br. 33-34). As NRC explained, however, any shift in burden is simply a by-product of the practice, endorsed by the Supreme Court and by this Court in *New York I*, of performing a generic analysis and precluding relitigation of the analysis in the absence of a waiver.[77] Were it otherwise, efficiencies that an agency might gain by conducting generic assessments would be illusory.

In the end, any party arguing that the generic analysis in the GEIS is inapplicable to a particular license application can seek a waiver of the portion of the Rule that incorporates the impacts from the GEIS. And, of course, NRC must consider whether there is new and significant information relevant to the environmental impacts of each proposed action.[78] But there is nothing in this extensive administrative record to undermine NRC's determination that the impacts of continued storage are essentially common to all sites, and nothing suggests that the agency's waiver rule is somehow insufficient to provide site-

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[77] *See* GEIS D-36 (JA__).

[78] *See* 10 C.F.R. § 51.92(a)(2); *Blue Ridge*, 716 F.3d at 196.

specific consideration when a party can demonstrate, based on the applicable criteria, that such consideration is warranted.

III. The GEIS adequately analyzes spent fuel pool fires.

A. NRC complied with the remand instructions to consider the consequences as well as the probability of a pool fire.

The GEIS analyzes potential pool fires in Appendix F. In this discussion, which supports the analysis of severe accidents in section 4.18.2.1 (JA__), NRC explained how it analyzed each credible initiating event that could lead to a fire, including "loss of offsite power, internal fires, loss of pool cooling, loss-of-coolant inventory, seismic event, cask drop, aircraft crash, and a tornado missile."[79] The GEIS likens the consequences of a fire to those previously calculated for a severe reactor accident and provides a detailed description of potential pool fire consequences "in terms of direct human health impacts (e.g., early fatalities or latent cancer fatalities) and economic damages arising from the actions taken to avoid human exposures (e.g., evacuation and relocation costs, costs for cleanup of contaminated land, and the loss of economic value associated with land that cannot be used following a severe accident)."[80]

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[79] GEIS F-10 (JA__).

[80] *Id.* F-4, F-13, F-16 (JA__). Numerical values for these consequences are collected in Table F-1 (*id.* F-5 (JA__)). NRC was mindful of the Court's instruction to consider the consequences of a pool fire, notwithstanding its

NRC recognized, as a predicate to its analysis, that pool fires are an issue for only the short-term timeframe because reactor decommissioning (including decommissioning of the spent fuel pool) must be completed within sixty years after operations cease.[81] Because this timeframe is imposed by NRC rule, the States cannot credibly assert that NRC employed an unjustified or "baseless" assumption (Br. 3, 20).[82] Moreover, even if an extension of this period were granted (as NRC's regulations allow[83]), the States have not suggested how or why NRC's analysis would change materially, particularly given that an extension would itself require an analysis of any potentially adverse consequences.

Overall, NRC concluded that, "while the consequences [of a] fire could be significant and destabilizing, the probability of such an event is extremely

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improbability. *See New York I*, 681 F.3d at 482. Thus, these calculations, which present only the potential consequences and are not probability-weighted, are not influenced by "the remote probability of an accident" causing a fire. GEIS F-5 (JA__).

[81] GEIS F-1 (JA__); *see* 10 C.F.R. § 50.82(a)(3). The same assumption also applies to NRC's analysis of pool leaks. GEIS E-1 (JA__).

[82] *See* GEIS xxxii (JA__). In response to comments, NRC further provided a cogent explanation for this assumption, which the States do not address. *See id.* D-170 (JA__) (explaining NRC's judgment, based on its experience with decommissioning, that pools are in fact decommissioned before the end of sixty years because of the lack of need for pool cooling for more than sixty years and the higher operational costs of wet storage compared to dry storage).

[83] 10 C.F.R. § 50.82(a)(3).

remote."[84] And because risk is the product of probability and consequences—a point the States acknowledge (Br. 26) but ultimately ignore—NRC reasonably determined that the "extremely remote" probability of such a fire renders the risk uniformly low and the environmental impact of a severe fire thus uniformly "small."[85]

NRC's approach comports with this Court's directive in *New York I* to examine both the probability and the consequences of a fire as well as its endorsement of deference to an agency's use of probability-weighted impact assessments.[86] NRC's ultimate characterization of the impact of fires—as the Second Circuit held in rejecting arguments from several states similar to those raised here[87]—is the result of its considered scientific judgment, and petitioners have supplied no reason to disturb it here.

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[84] GEIS F-1 (JA__).

[85] *See id.* F-1-16 (JA__).

[86] 681 F.3d at 482 (citing *City of New York v. DOT*, 715 F.2d 732, 751-52 (2d Cir. 1983) for proposition that courts should defer to an "agency's weighing of a 'catastrophic' harm against an 'infinitesimal probability'").

[87] *New York v. NRC*, 589 F.3d 551, 553-55 (2d Cir. 2009) (per curiam) (rejecting states' challenge to denial for petition for rulemaking that questioned, among other things, NRC's generic identification of risks of in-pool storage during plant operation, and concluding that states' challenge amounted simply to disagreement with NRC's determination, based on four decades of study, that risk of pool fires was uniformly low).

B. NRC's conclusions account for variances among sites.

NRC specifically structured its generic review of fires to bound the analysis such that sites with greater risk of an impact from a pool fire were captured. As it explained,

> The consequence results in Appendix F provide a reasonable representation of the consequences of a spent fuel pool fire at a typical site. . . . NRC has added discussion in Appendix F to describe the site-specific factors (e.g., population density) that may impact the consequences of a spent fuel pool fire. However, the assumptions used in the analysis are *sufficiently conservative to bound the impacts* such that variances that may occur between sites are *unlikely to result in environmental impact determinations greater than those presented in the GEIS*.[88]

NRC specifically mentioned several highly significant conservatisms supporting its conclusion, including the agency's assessment of the rate of evacuation and the time at which zirconium fuel cladding would begin burning in the event of a fire; and the reduced consequences of a fire as a result of NRC-mandated licensee actions that post-date the agency's original assessment of the probability-weighted consequences of a pool fire.[89] The States fail to mention, let alone rebut, NRC's reasoned conclusion concerning the numerous conservatisms built into its analysis.

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[88] GEIS D-424 (JA__) (emphasis added).

[89] *Id.* F-5-7 (JA__); *see also id.* F-14-15 (JA__) (noting that analysis performed after publication of NUREG-1738, NRC's 2001 assessment of pool accident risk at decommissioning plants, has shown the existence of significant time between an initiating event and fuel assemblies becoming uncovered, and describing NRC's

The States cite earthquakes and fuel characteristics as contributors to the probability component of risk that will vary across sites (Br. 26). NRC explained, however, how it bounded seismic risk,[90] an analysis the States have likewise not addressed in their brief. The States further assert (without elaboration) that spent fuel characteristics "matter substantially" (Br. 26), but NRC explained, again without refutation, both how it considered a range of values for the radioactive isotopes in the pool inventory "that contribute the most to offsite consequences,"[91] and how other fuel variations do not alter the conclusion that the impacts NRC identified can be generically assessed.[92] NRC also used a range of spent fuel inventory ages in calculating dose consequences.[93] Again, the States do not question this analysis; they assert only generally that values will vary from site to site, a fact that NRC does not contest but that does not change the reasonableness of NRC's ultimate conclusion.

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actions in response to September 11, 2001 attacks and 2011 Fukushima Dai-ichi accident). These conservatisms are further accentuated by new research data to bound probabilities and consequences, suggesting that "pool fire risk is unlikely to persist beyond the first few years of continued storage in spent fuel pools." *Id.* D-424 (JA__).

[90] *Id.* F-10 (JA__).

[91] *Id.* F-6 (JA__).

[92] *Id.* D-425 (JA__).

[93] *Id.* F-4-5, F-12-13 (JA__).

Finally, relying on *Limerick Ecology Action, Inc. v. NRC*,[94] the States point to differences between sites in population and land development, noting that the area surrounding Indian Point is more densely populated than the reference plants used in the GEIS (Br. 27).[95] However, *Limerick Ecology* does not foreclose generic analysis of the impacts on a population where an agency not only acknowledges the existence of the variation in population but explains why this variance does not alter its analysis.

NRC has done precisely that. The GEIS fully discloses that total population collective dose after a fire would vary according to site population:

> In general, health impacts could be higher or lower than the values reported in these studies if the amount of radioactive material that could be released (which depends on the amount of material in the pool and the fraction of that material involved in the fire) were higher or lower than assumed in these studies *or the total population and population density were higher or lower*.[96]

And the GEIS concludes that variation in surrounding site population is *not* a significant contributor to pool fire risk because of the remote probability of any sequence of fire-initiating events, regardless of the nearby population:

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[94] 869 F.2d 719, 738 (3d Cir. 1989).

[95] NRC considered three nuclear reactors in making these calculations, including the Zion plant, near both Chicago and Milwaukee, which ranks above the 90th percentile in population density. *See* GEIS F-7 (JA__).

[96] *Id*. (emphasis added).

> The NRC recognizes that the consequences of a severe accident in an area of higher population density would involve higher consequences. However, the probability of such an event remains very low and, because of this, the risk (which is a product of the probability of an accident and the consequences of that accident) remains low. The NRC concludes that impacts related to the risk from these events are SMALL.[97]

In addition to relying on the low probability of a fire and the conservatisms in its analysis to identify the associated risk on a generic basis, NRC also explained that its analysis regarding individual risks to the average member of the community—which forms the basis for NRC's determination of the impacts from an accident—does not vary with the size of nearby populations. Specifically, NRC explained that it calculated the health risk to the average individual within both one mile and ten miles of a plant, regardless of whether the plant is located in rural Virginia (as the States emphasize, Br. 30-32) or in a more populated area, and it determined the extent to which the increased risk to such persons as a result of an accident was consistent with Commission's overall safety goals.[98] Thus, while it is inevitable, as the States note, that higher population densities will lead to a higher collective risk from any particular accident, this conclusion does not change NRC's assessment that the risk from such an accident, irrespective of its location,

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[97] *Id.* D-144-45 (JA__).

[98] *Id.* F-8 (JA__).

can be generically identified as small because the risk to the average individual is small.

At bottom, NEPA requires disclosure sufficient to inform decisionmakers and the public of potential environmental impacts. Thus, in reviewing an agency's consideration of environmental impacts, a court's role is to "ensure that the agency has *adequately* considered and disclosed the environmental impacts of its actions."[99] Here, NRC's calculation of risk to the average member of the affected community; its acknowledgement of the variance in population density; and its unchallenged conclusion that, due primarily to the low probability of an underlying event, variance in population density does not change its overall conclusions, satisfy NRC's NEPA obligations.

Moreover, "[e]ven as to impacts that are sufficiently likely to occur such that they are reasonably foreseeable and merit inclusion, the [agency] need only furnish such information as appears to be reasonably necessary under the circumstances for evaluation of the project."[100] Thus, "[d]etailed analysis is required only where

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[99] *Balt. Gas*, 462 U.S. at 97-98 (emphasis added).

[100] *Utahns for Better Transp. v. U.S. Dep't of Transp.,* 305 F.3d 1152, 1176 (10th Cir. 2002).

impacts are likely."[101] Here, NRC found, and the States do not dispute, that likelihood of a pool fire at any plant is "extremely remote."[102] The States do not and cannot contest that the GEIS describes health and economic impacts of a pool fire and the risk of such consequences in Tables F-1 and F-2 and related text (JA___) sufficiently for the agency and public to understand the impact and likelihood of such a fire, whether at Indian Point or elsewhere.

The same conclusion also applies to the argument (States Br. 27) about the location of the Prairie Island site, as NRC has fully disclosed and evaluated the potential risks of a pool fire to members of the Tribe. As to the unique impact that a fire or accident may have on the objects of cultural significance, these impacts apply equally to periods other than the timeframes covered by the GEIS (i.e., during the term of each license that relies on the GEIS) and will therefore be acknowledged and considered as part of NRC's site-specific NEPA analysis for each licensing action at Prairie Island, with due regard for the Tribe's unique interests.

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[101] *Izaak Walton League v. Marsh*, 655 F.2d 346, 377 (D.C. Cir. 1981); *accord Am. Whitewater v. Tidwell,* 770 F.3d 1108, 1121 (4th Cir. 2014); *Utahns,* 305 F.3d at 1176.

[102] GEIS F-1 (JA__).

C. The arguments of the California Energy Commission are not properly raised and otherwise lack merit.

The arguments of amicus California Energy Commission ("California") regarding seismic risk to California plants should be disregarded for two reasons, each of which is amplified by California's decision neither to file a petition for review nor to intervene (and its resulting nonparticipation in the extensive case management process that this case engendered). First, no party has questioned the sufficiency of the GEIS as to seismic analysis for California plants. The States offer only a passing observation that earthquake risk will vary from site to site (Br. 26). Therefore, California's extensive discussion of whether the GEIS adequately considers seismicity at California plants improperly raises new issues and arguments.[103] Second, California acknowledges its strong reliance upon documents outside the rulemaking record (Br. 11-15 & nn.3-4) and provides no compelling reason to permit consideration of information that could have been submitted to NRC during the extensive rulemaking process but was not.[104]

Even if California's arguments were considered, they lack merit not because California's concerns about seismic risk are unimportant or unjustified, but

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[103] *NACS v. Bd. of Governors of Fed. Reserve Sys.*, 746 F.3d 474, 482 (D.C. Cir. 2014).

[104] *See Am. Petroleum Inst. v. SEC,* 714 F.3d 1329, 1334 (D.C. Cir. 2013).

because California ignores the exacting safety analysis preceding issuance or renewal of an NRC license, which guarantees that each plant design specifically accounts for the unique site characteristics that California identifies.[105] In a nutshell, the analysis in the GEIS accounts for the increased seismic risk discussed by California because each plant is uniquely designed to withstand the effects of the natural phenomena to which it may be subjected. NRC's licensing, regulatory, and hearing processes (in which many of the petitioners participate) ensure that plants are operated in compliance with applicable health and safety requirements, even as circumstances change or new information is discovered. Due to each plant's unique design basis, the likelihood of a pool fire resulting from a beyond-design-basis accident, whether caused by an earthquake or otherwise, is acceptably low at all licensed plants and therefore can be (and has been) generically assessed in the GEIS.

IV. The GEIS adequately analyzes potential pool leaks.

A. The GEIS critically analyzes each factor contributing to the occurrence and migration of leaks.

The GEIS provides exhaustive treatment of the environmental impacts of known and potential leaks, going well beyond the limited remand issue and ruling

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[105] *See* GEIS 2-11-13, 4-76-77, D-348-49 (JA__).

out "the possibility that those leaks were only harmless because of site-specific factors or even sheer luck."[106] As discussed *infra*, site-specific factors influence leakage impacts, but the range of factors and resulting impacts can be defined generically. And although the timing and characteristics of a specific leak may be unpredictable, this does not preclude an accurate generic assessment of the environmental impacts of such leaks.

NRC explained the basis for its generic analysis of leaks in a manner that resolves any concerns that its conclusions are not forward-looking. Specifically, NRC noted that, regardless of the site, a pool's physical characteristics minimize the potential for an environmentally significant leak. First, relatively little radioactivity escapes from the spent fuel into pool water.[107] Second, spent fuel pools are "massive, seismically designed structures" constructed from thick concrete walls lined with stainless steel, forming a water-tight barrier.[108] The

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[106] *See New York I*, 681 F.3d at 481.

[107] The integrity of spent fuel and cladding within the pool's controlled water chemistry serve to limit the volume of radionuclides potentially lost to spent fuel pool water—a finding supported by operational experience and scientific studies. Degradation of the fuel cladding occurs very slowly over time in this controlled environment and should be minimal over the short-term timeframe. GEIS B-10-12 (JA__).

[108] *Id.* B-12, E-2 (JA__).

pool's steel liner and the licensee's active monitoring of the pool for leaks prevent most leaks from reaching the environment undetected.[109]

NRC acknowledged that "relatively small cracks can occur in the stainless-steel liner due to intergranular stress-corrosion cracking and crevice corrosion of the stainless-steel liner, seam or plug weld defects, or damage to the liner."[110] But particularly given the overall integrity of this robust structure, NRC noted that leaks "seldom occur."[111] Recognizing the potential for leaks, NRC requires licensees to establish rigorous programs to monitor groundwater.[112]

Owing to siting criteria, reactors (and thus fuel pools) tend to be located in areas with similar hydrologic conditions,[113] and the GEIS considers the hydrologic and chemical processes that affect (and reduce) the migration of leaks.[114] The GEIS explains that the physical processes of radionuclide transport[115] and hydrologic characteristics of typical nuclear power plant settings[116] substantially

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[109] *Id.* E-9 (JA__).

[110] *Id.*

[111] *Id.*

[112] *Id.* E-5-9 (JA__).

[113] *Id.* E-13 (JA__).

[114] *Id.* E-11-15 (JA__).

[115] *See id.* E-11-13 (JA__).

[116] *See id.* E-13-15 (JA__).

reduce migration of pool-leakage radionuclides to offsite water sources and soil and thus mitigate leakage impacts.[117] The States provide no reason to call this analysis into question.

B. After determining how leaks occur and migrate, NRC concluded that leak impacts can be reasonably bounded as "small."

NRC relied upon the unchallenged analysis set forth above to conclude that leaks would not significantly affect groundwater resources, determining that "it is unlikely that a leak of sufficient quantity and duration [to reach offsite locations] could occur without detection, or that such a leak would not be impeded by physical processes and hydrologic characteristics typical at spent fuel pool locations."[118] Impacts to surface water were also identified as small "because surface water bodies in the vicinity of nuclear power plants (e.g., oceans, lakes, rivers) . . . would dilute any groundwater contaminants that flow into them" to well below regulatory standards.[119] And NRC explained that this conclusion utilized

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[117] These processes and characteristics "include radionuclide adsorption, dilution, and decay; delayed transport times due to the relatively flat hydraulic gradients in the shallow water tables; lengthy distance to local groundwater users; and the likelihood that local groundwater usage is in deeper confined aquifers." *Id.* E-16 (JA__).

[118] *Id.* E-17 (JA__). NRC acknowledged that leaks from a pool with atypical hydrology could result in greater contamination that "could noticeably alter, but not destabilize a groundwater resource." *Id.* E-16 (JA__).

[119] *Id.* E-17-19 (JA__).

"the range of hydrogeologic conditions at current and potential future sites," with analytical assumptions that "are sufficiently conservative to bound the impacts," such that site variances are unlikely to result in impacts greater than those the GEIS predicts.[120]

Even though a combination of pool characteristics, site hydrology, and regulatory controls will likely prevent large, undetected leaks, the GEIS analyzed the impacts of a "long-term, undetected spent fuel pool leak."[121] It determined that, "even in the unlikely event that undetected spent fuel pool leakage flowed continuously (24 hours per day, 365 days per year) to local surface waters, the quantities of radioactive material discharged . . . would be *comparable to values associated with permitted, treated effluent discharges* from operating nuclear power plants."[122] For these reasons, NRC reasonably determined that the potential impacts of leaks, no matter the form of transport, are "small."[123]

The States argue (Br. 27) that insufficient attention was given to Indian Point. But NRC *did* consider the Indian Point conditions and, as it explained in

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[120] *Id.* D-458 (JA__).

[121] *Id.* D-470 (JA__).

[122] *Id.* E-19 (JA__) (emphasis added).

[123] *Id.* E-21 (JA__).

response to comments, found that those conditions fell comfortably within its analysis:

> The comments regarding Indian Point neither raise issues unique to Indian Point nor provide information that would change the impact determinations in the GEIS. Overall, the particulars of spent fuel pool leakage during continued storage at Indian Point, like leakage at any site, are bounded by the generic assessment of leak potential and consequences in Appendix E of the GEIS. On the issue of the potential for future leaks, at Indian Point, the evaluation in the GEIS does not assume that leaks will not occur or will occur only below a certain frequency. For the reasons explained in Appendix E, should a leak occur, it is unlikely that it will remain undetected long enough to cause significant offsite impacts.[124]

The States offer no record basis to show that these conclusions are arbitrary and capricious. And, as with fires, mere variation from site to site regarding pool leaks does not negate the propriety of generic analysis and the possibility of waiver in those circumstances in which a waiver may be warranted.

Finally, although it performed the forward-looking analysis that the Court required, NRC's exhaustive analysis of leaks is corroborated by over fifty years of operating experience. The historic data compiled in Appendix E show that relatively few leaks have occurred at the 100-plus NRC-licensed reactors.[125] The relative infrequency of leaks, their limited migration offsite, and the almost total

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[124] *Id.* D-456 (JA__).

[125] *Id.* E-23 (JA__).

absence of dose to the public from those leaks confirm the reasonableness of the GEIS's analysis.[126]

V. The impacts identified in the GEIS are based upon reasonable assumptions.

Because NRC's analysis in identifying impacts is, of necessity, predictive in nature (and, in some cases, predictive of conditions in the distant future), the agency is entitled to make reasonable assumptions in attempting to forecast the consequences of continued storage.[127] To the extent that petitioners seek to impose a heftier burden on NRC in the course of generating predictive analyses, *see, e.g.*, States Br. 36-37 (criticizing NRC's assumption concerning the anticipated length of the decommissioning process because a contrary assumption is not definitively precluded by regulation), they misunderstand both the relevant case law and the policies underlying NEPA. It is true, as petitioners note, that an agency must consider scenarios that are not remote and speculative. But that proposition does not compel the much broader conclusion that, in the course of identifying the

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[126] *Id.* E-21-26 (JA__). The only potential dose to the public occurred at Indian Point, where NRC conservatively assumed that "all onsite groundwater discharged directly to the Hudson River," resulting in a calculated dose of 0.0021% of the dose permitted by regulation. *Id.* E-24 & n.(c) (JA__).

[127] *See Balt. Gas,* 462 U.S. at 103-06; *see also, e.g.*, *S.F. Baykeeper v. U.S. Army Corps of Eng'rs*, 219 F. Supp. 2d 1001, 1016 (N.D. Cal. 2002) ("Because this methodology was not arbitrary, and the Corps used reasonable assumptions to implement this methodology, its conclusion . . . was likewise not arbitrary.").

reasonably foreseeable impacts of its actions under NEPA, an agency must map out every single possibility derived from every imaginable assumption. Such a requirement would require an agency to consider an unlimited number of possible decision trees, deprived of its predictive judgment about the impacts that are likely to result from a given major federal action.

A. The GEIS reasonably assumes the continuity of institutional controls.

1. Assuming continuity of institutional controls is consistent with federal responsibility for spent fuel.

Largely ignoring this legal backdrop, petitioners criticize (NRDC Br. 26-31; States Br. 35-38) some of the analytical assumptions, set forth in Section 1.8.3 of the GEIS (JA__), that enabled NRC to consider the impacts of continued storage in a meaningful fashion. In particular, NRDC quarrels with NRC's assumption concerning the continuity of institutional controls, i.e., the regulatory structure created by the AEA and implemented by NRC for protecting the public from radiation hazards. But it wholly fails to demonstrate that the bases that NRC supplied for its assumption (on pages B-26 to B-31 of the GEIS (JA__)) are unreasonable.

As an initial matter, assuming continuity of institutional controls is consistent with the ongoing responsibilities of the Federal Government under the

AEA and Nuclear Waste Policy Act for regulating and disposing of spent fuel.[128] And, of course, the primacy of federal power expressed in the Constitution presumes "the continued existence of the United States as a government to which every American citizen may look for security and protection in every part of the land."[129]

Moreover, as NRC explained, in the event that plans for a repository are completely abandoned, it is simply not rational "to assume that national policy would default to complete inaction so as to leave spent fuel in dry casks

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[128] NRDC errs in stating that assuming continuity of institutional controls relies upon "future legislation" (Br. 27-28). The AEA requires NRC to have reasonable assurance that spent fuel can be stored throughout the term of each successive license in a manner that adequately protects the health and safety of the public and is in accord with the common defense and security. *See* 42 U.S.C. § 2232(a); *Vt. Yankee,* 435 U.S. at 527 n.5; *Bullcreek v. NRC*, 359 F.3d 536, 537 (D.C. Cir. 2004). And when Congress passed the Nuclear Waste Policy Act, it acknowledged that "the Federal Government has the responsibility to provide for the permanent disposal of high-level radioactive waste and such spent nuclear fuel as may be disposed of in order to protect the public health and safety and the environment." 42 U.S.C. § 10131(a)(4). A change in the statutory or regulatory framework would be required only to implement a new national storage policy creating new kinds of storage facilities (which presumably would require their own environmental analysis). While NRC raised the possibility of such a change in the event that geologic disposal is deemed not possible, the GEIS affirmatively concluded that a geologic repository is, in fact, technically feasible. GEIS B-2-5 (JA__). Consequently, nothing suggests that NRC is either "hoping for" or relying on legislation to evade its responsibilities under NEPA, as NRDC contends.

[129] *Ex parte Siebold*, 100 U.S. 371, 399 (1879).

unprotected, much less unattended or ultimately forgotten."[130] Even if near-term plans for disposal do not come to fruition, dry cask storage facilities are "highly visible" and far from likely to "simply be forgotten."[131] NRC concluded that "it would be illogical for any government . . . to [simply] abandon the storage facilities," given the hazards of spent fuel.[132] NRC's assumption is entirely reasonable, and NRDC does not suggest otherwise.

NRDC cites a report discussing possible loss of institutional controls at the Department of Energy ("DOE") "legacy sites" (Br. 27 n.11). This document alone proves little. Simply because NRC might have had a basis to make a contrary assumption concerning institutional controls does not render its own assumption unreasonable; agencies are entitled to use their "seasoned judgment" when choosing among "conflicting assumptions and data."[133] Moreover, as NRC explained, neither the report upon which NRDC relies, nor others that NRC considered, concluded that a permanent loss of institutional controls is likely. Rather, those reports emphasized that, to maintain institutional controls, periodic updating of regulatory oversight will be necessary, a point with which NRC has no

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[130] GEIS B-27 (JA__).

[131] *Id.* B-28 (JA__).

[132] *Id.*

[133] *See, e.g.*, *Pub. Serv. Co. v. FERC,* 832 F.2d 1201, 1210 (10th Cir. 1987).

quarrel. NRC thus explained why the potential (and even the need) for regulatory upgrades does not impede its impact determinations,[134] and NRDC does not challenge that explanation. That such upgrades might occur in no way undermines, and only serves to confirm, the reasonableness of NRC's assumption of continued institutional controls.

2. Assuming the continuity of institutional controls best enables meaningful NEPA analysis.

Practical concerns about NRC's ability to predict an apocalyptic scenario also support NRC's assumption. In this regard, NRC explained that

> [t]he most reasonably foreseeable assumption is that institutional controls (i.e., the continued regulation of spent fuel) will continue. The assumption that institutional controls will continue enables an appropriate and reasonable evaluation of the environmental impacts of continued storage over an indefinite timeframe. Absent the stability and predictability that follows institutional controls, including but not limited to NRC licensing and regulatory controls, few impacts could be reliably forecast.[135]

What government will look like centuries from now is incapable of substantiation. Not surprisingly, NRDC cites no case in which a court has imposed upon an agency under NEPA or otherwise the burden of predicting exactly what impacts will befall the country in the event of a complete collapse of society and

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[134] GEIS B-29, D-174-75 (JA__).

[135] *Id.* 1-16 (JA__).

self-governance.[136] And although the National Academy of Sciences has found that it is possible to design standards to account for physical and geologic phenomena for millennia to come,[137] the forecasts necessary to complete this work are a far cry from predicting how government and society will evolve during the same period. Were NRC required to undertake such a prediction, its analysis would deteriorate into crystal-ball gazing. "Congress did not enact NEPA . . . so that an agency would contemplate the environmental impact of an action as an abstract exercise," but, rather, intended that the impacts be meaningfully considered as part of each agency's decisionmaking process.[138] NRC's assumption of the continuity of institutional controls best serves that purpose and is not unreasonable.

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[136] NRDC cites the Court's "clear directive" in *New York I* to evaluate impacts from a failure "'to secure permanent storage'" in a repository (Br. 29). But a failure to site a buried repository does not equal loss of institutional controls over previously constructed above-ground storage facilities. In fact, no issue of institutional controls was before the Court in *New York I*. NRDC also relies upon *New York I* to argue that NRC may not avoid NEPA responsibilities by "blindly rely[ing] on future regulatory actions" (Br. 30). That discussion was aimed at reliance on NRC oversight of licensee monitoring of pool leaks to justify a finding of no significant impact. *See New York I*, 681 F.3d at 481. The Court did not mandate that, if NRC were to perform a full EIS pertaining to continued storage, it must assume the collapse of the entire regulatory structure.

[137] *Nuclear Energy Inst.,* 373 F.3d at 1268.

[138] *Balt. Gas,* 462 U.S. at 100.

This conclusion comports with the Supreme Court's treatment of uncertain impacts in *Baltimore Gas*. There, the Court upheld NRC's "zero-release" assumption as reasonable, notwithstanding its considerable uncertainties[139] and the fact that "rigorous verification" of the zero-release assumption was "not possible."[140] What mattered to the Court was the "the careful consideration" of these uncertainties, which NRC had not "ignored or failed to disclose."[141]

Such is the case here. As in *Baltimore Gas*, the assumed continuity of institutional controls cannot be viewed "in isolation" but must instead be judged "in relation to the limited purpose for which the Commission made the assumption."[142] The GEIS is not making an assumption that directly bears on whether or not NRC should issue a license, but rather an assumption to help identify environmental impacts in a very discrete portion of its overall environmental analysis for that license application. And NRC has acknowledged the uncertainties inherent in its assumption.

Finally, NRDC's contention concerning institutional controls contravenes the Supreme Court's admonition that challenges to agency action not be reduced to

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[139] *Id.* at 98.

[140] *Id.* at 104.

[141] *Id.* at 98, 100.

[142] *See id.* at 102.

gamesmanship. NRDC posits no realistic scenario by which governance over storage facilities will cease or by which radioactive material will be released from robust and secure storage facilities because of a wholesale cessation of institutional controls. And *Vermont Yankee* teaches that "[t]o make an impact statement something more than an exercise in frivolous boilerplate [a party's suggestion of a NEPA issue] . . . must be bounded by some notion of feasibility."[143] NRDC's unexplained loss-of-institutional-controls-and-radioactive-releases scenario is precisely the kind of "cryptic and obscure reference to matters that 'ought to be' considered" that *Vermont Yankee* rejected.[144]

3. Even if the continuity of institutional controls cannot be assumed, the GEIS complies with NEPA.

Notwithstanding the assumed continuity of a regulatory structure, NRC also considered the all-but-unpredictable impacts of a loss of institutional controls, both temporarily and permanently, and it did not sugar-coat its conclusions.[145] NRC found that, "although too remote to calculate meaningfully, a permanent loss of institutional controls would likely have catastrophic consequences"[146] affecting

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[143] 435 U.S. at 551.

[144] *Id.* at 554.

[145] *See* GEIS B-30 (JA__) (considering accident analysis as a surrogate for temporary loss); *id.* B-30-31 (JA__) (permanent loss).

[146] *Id.* B-26 (JA__).

nearly all resource areas, which would be "clearly noticeable and destabilizing."[147] Thus, the harm from a loss of institutional controls, though most unlikely, has been fully disclosed without minimizing the consequences. And while the details of a dystopian society and loss of controls are inherently unpredictable, NRC's analysis satisfies NEPA's twin objectives of informing the public and the decisionmaker of relevant impacts.

NRDC asserts in a footnote, based upon the "no-action" alternative contained in DOE's EIS for its Yucca Mountain repository application, that NRC could have evaluated the effects of a loss of containment of spent fuel in the event of a complete loss of institutional controls (Br. 29 n.12). But as NRC explained, DOE's analysis assumed a passive loss of institutional controls not because it was likely to happen—a conclusion that DOE expressly disclaimed—but because it was, literally, the alternative involving "no action" if a repository were not constructed and spent fuel were simply left to degrade at all storage sites over a 10,000 year period.[148]

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[147] *Id.* B-31 (JA__).

[148] *Id.* B-30-31 (JA__). DOE's most recent analysis of this scenario estimated, among other things, 1,000 latent cancer deaths over a 10,000-year period due to the entry of radionuclides into the accessible environment. Department of Energy, Final Supplemental Environmental Impact Statement for a Geologic Repository at Yucca Mountain S-51 (2008) (JA__).

NRC concluded that the impacts caused by a complete loss of institutional controls "could be similar" to the "catastrophic" impacts depicted by DOE's no-action scenario. But NRC determined that there were too many uncertainties associated with such a scenario to provide meaningful information to those making licensing decisions about a single facility.[149] Particularly given that NRC acknowledged the potentially catastrophic character of these impacts without reservation, NRC's description constitutes a reasonable means of satisfying any disclosure obligation it could have with respect to this quintessentially uncertain scenario.

B. Additional assumptions underlying the GEIS are reasonable.

The States also challenge NRC's assumptions about dry cask replacement (Br. 38). Their arguments, in addition to not being sufficiently developed (and

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[149] GEIS B-31 (JA__) (explaining NRC's view that depiction of this scenario would be inconsistent with "the kind of detailed and scientifically supportable analysis . . . that the GEIS provides in every other respect for decision-makers and the public"). DOE itself expressed similar reservations about forecasting this scenario, acknowledging that the increasing uncertainty beyond 10,000 years precluded "a meaningful basis for quantitative impact analyses because of the limitless number of scenarios that could occur." Department of Energy, Final Supplemental Environmental Impact Statement for a Geologic Repository at Yucca Mountain S-51 (JA__); *see also* Department of Energy, Final Environmental Impact Statement for a Geologic Repository at Yucca Mountain 7-37-38, 7-40-41 (2002) (JA__) (originally estimating 3,300 latent cancer deaths over 10,000 year period but acknowledging that due to uncertainties this estimate could understate or overstate the impacts by several orders of magnitude).

thus waived[150]), are unfounded. First, the standard upon which their argument is based relates to the use of mitigation to justify a finding of no significant environmental impacts[151] and is therefore wholly inapplicable to the reasonableness of a predictive assumption. Second, the GEIS demonstrates, and the States do not contest, that there is no technological barrier to using a dry cask transfer system, even if such a system has not been constructed yet.[152] Third, contrary to the States' argument, the GEIS contemplates that, due to the DOE's breach of its contracts to accept spent fuel, the federal government will bear an increasing share of the cost of long-term continued storage, to the full extent of its contractual liability.[153]

VI. NRC has complied with this Court's instructions to consider the environmental impacts of repository unavailability.

In *New York I*, this Court instructed NRC on remand to "examine the environmental consequences of failing to establish a repository when one is needed."[154] The GEIS includes an analysis of each resource affected during the

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[150] *See, e.g.*, *United States v. Hughes*, 514 F.3d 15, 18 (D.C. Cir. 2008).

[151] *See Nat'l Audubon Soc'y v. Hoffman*, 132 F.3d 7, 17 (2d Cir. 1997).

[152] *See* GEIS 2-20-24 (JA__).

[153] *See id.* B-27-28 (JA__); *see, e.g., Consol. Edison Co. of N.Y. v. United States*, 676 F.3d 1331, 1334 (Fed. Cir. 2012) (detailing government's acknowledgment of responsibility for paying storage costs).

[154] 681 F.3d at 479.

short-term timeframe (60 years after reactor operation ceases); the long-term timeframe (an additional 100 years); and indefinitely (in the event that a repository never becomes available). Thus, in accordance with the Court's direction, the indefinite storage of spent fuel both onsite (GEIS Ch. 4 (JA__)) and offsite (GEIS Ch. 5 (JA__)) is analyzed for each resource category, just as it is for the short-term and long-term timeframes.

NRDC nonetheless claims that any "small" finding for "radiological environmental impacts" in the GEIS[155] relies on an "assertedly low probability of repository failure" and that the GEIS "lacks any analysis of the probability of a failure to site a repository" (Br. 23-24). Its arguments fail for several reasons. First, the conclusions in various resource areas of "small" throughout the GEIS are not based upon the relative likelihood of any of the timeframes evaluated; rather, they are based either on the magnitude of the impact itself or the very low probability of an event that would trigger larger impacts.

Second, this Court did *not* instruct NRC to calculate the probability of failing to site a repository. Rather, the Court ruled that NRC must consider the

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[155] The GEIS does not have a separate resource category for "radiological impacts." Radiological impacts are discussed within the applicable resource category.

environmental impacts of repository unavailability, and the GEIS unquestionably provides that impact analysis for "indefinite" storage, as explained above.[156]

To be sure, this Court *did* rule that an agency must consider "the probability of a given harm occurring,"[157] but not, as NRDC posits (Br. 25), with reference to the possibility that a repository would not be available. Instead, the context for the Court's ruling was NRC's risk assessment for pool fires. And, as the Court explained, such a risk assessment may be performed under NEPA to determine if the risk of an impact is so insignificant as to render it "remote and speculative."[158] The GEIS reached no such conclusion on repository unavailability. Rather, NRC assumed the unavailability of disposal in a repository in accordance with the Court's directive in *New York I* and examined the indefinite storage scenario exhaustively.

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[156] Further, the GEIS explains why NRC believes it most likely that a repository will be available before the end of the short-term timeframe (a period that, for a new reactor licensed in 2015, ends in 2155). GEIS B-2-9 (JA__). NRDC does not identify a basis upon which to challenge NRC's reasoned predictive judgment in this regard.

[157] *New York I*, 681 F.3d at 482.

[158] *Id.*

VII. The GEIS reasonably considered mitigation.

A. NRC reasonably determined that mitigation is best considered as part of the site-specific licensing process.

The States challenge NRC's failure to analyze mitigation measures related to fires and leaks (Br. 40-44). But NRC plainly stated that mitigation would be addressed as part of the site-specific component of its environmental reviews, such that "[a]ny determinations by the NRC about whether to require mitigation measures of any type will occur on a site-specific basis during facility licensing or during the course of ongoing NRC oversight."[159] This approach is wholly reasonable, as the facilities for which the GEIS will serve as an input for NRC's analysis will require an assessment of mitigation each time they are licensed. Thus, the States' complaint that the GEIS's treatment of mitigation should be more specific than "a list" (Br. 43) ignores NRC's approach to considering mitigation, which warrants deference here.[160]

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[159] GEIS D-61 (JA__); *see also id.* D-38, D-41 (JA__). This comprehensive consideration will include consultation with sister agencies to protect, among other things, wildlife, historic, and water resources. *Id.* 4-45-47, 4-51-53, 5-30-37, 6-32-36 (JA__).

[160] *See supra* notes 37-38 and accompanying text. To the extent the States suggest that the GEIS must contain a fully developed plan to mitigate environmental harm, their argument contravenes the Supreme Court's holding in *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 352 (1989).

Further, any potential methods to mitigate the impacts of continued storage will not necessarily be unique to the period beyond the time of reactor operations. Because mitigation measures may apply during both reactor operations and thereafter, such measures relating to construction, operation, and storage can be (and, in NRC's considered judgment, should be) evaluated, as appropriate, whenever a license is issued or renewed. And discussion of these issues will be incorporated within the Record of Decision for each licensing decision, as NEPA and NRC regulations require.[161]

B. NRC reasonably rejected petitioners' suggestion of pool fire mitigation measures.

The States' challenge (Br. 40-43) to NRC's treatment of pool fire mitigation largely consists of proposals for new regulatory requirements that go far afield of the limited purpose of the Rule. For example, the States argue that NRC should require licensees to prepare a severe accident mitigation alternatives analysis akin to what is required for reactor licensing (Br. 41). But the States ignore NRC's dual determinations that requiring a new severe accident mitigation alternatives analysis just for spent fuel pools (1) is beyond the scope of the current rulemaking because

[161] *See supra* note 47.

it would impose new licensing requirements; and (2) would not produce the desired mitigation in any event.[162]

As to the first point, the States offer no support for their suggestion that the agency must consider such separate rulemaking proceedings as part of the Rule, which merely codifies the generic impacts of continued storage and imposes no new substantive requirements. Indeed, a separate rulemaking would be required for the changes in licensing suggested by petitioners. NRC provides fora in which to raise rulemaking proposals of this type,[163] but they need not be considered in the rulemaking at issue here.

As to the second point, the States point to no mitigating value in the severe accident alternatives analysis requirement (or any other requirement) they propose. They cite no supporting expert opinion or other authority contradicting NRC's conclusion that yet another such analysis, layered upon the analysis already performed in connection with reactor licensing, would not produce additional benefits in light of the already "very low probability of a spent fuel pool fire."[164]

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[162] GEIS D-316 (JA__).

[163] *See* 10 C.F.R. § 2.802.

[164] GEIS D-316 (JA__). NRC's conclusion found support in, among other things, an evaluation performed in 2008 as part of its consideration of a petition for rulemaking that had proposed that NRC employ site-specific, as opposed to generic, treatment of pool impacts as part of its NEPA analysis. *Id.*; *see also id.* D-

Petitioners fail to provide any reason why NRC's considered judgment concerning this issue, which is further informed by analysis performed after the Fukushima Dai-ichi accident,[165] is not entitled to deference here.

The other fuel-related mitigation alternatives proposed by petitioners (States Br. 40, 45; NRDC Br. 23) include expedited spent fuel transfer to dry casks, limiting the use of high-burnup fuel, changing pool configuration requirements, and new severe accident measures. Here again, these measures do not suit the purpose of and need for the Rule, and NRC thus properly explained that it was "not considering new regulatory requirements in the GEIS."[166] The agency did note, however, that certain suggestions perceived in comments to have mitigation potential have received serious attention from the Commission as part of its

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360-61 (JA__). The Second Circuit affirmed this denial. *New York*, 589 F.3d at 554-55 (rejecting states' challenge to NRC's generic treatment of impacts of pool storage during period of plant operation).

[165] GEIS D-316, D-386, D-391, D-397 (JA__).

[166] *Id.* D-50; *see also id.* D-74 (JA__) ("Alternatives suggested by commenters that focus on licensing actions (e.g., cessation of licensing or reactor operations) . . . or implementing new regulatory requirements . . . are beyond the scope of the proposed action.").

regulatory process. To increase public understanding, NRC included in the GEIS descriptions of its efforts and conclusions concerning these issues.[167]

C. Petitioners identify no error in NRC's discussion of mitigation of pool leak impacts.

The States' truncated arguments related to pool-leak mitigation (Br. 43-44) are unpersuasive. Beyond the fact that such mitigation will be addressed on a site-specific basis, the States overlook NRC's description of various remediation techniques that can be employed in the event of a leak, based on the characteristics of the leak and local hydrology, and they do not question NRC's determination concerning the efficacy of these techniques.[168] Further, the States' reliance upon *New York I* for the proposition that an agency cannot "merely advert[] to existing compliance measures" (Br. 43) is misplaced. NRC has not adverted to compliance measures as part of a conclusion that there will be no significant impact from leaks; rather, in response to a comment, NRC referenced certain remediation measures as possible courses of action in the unlikely event of a short-term, high-volume leak.[169] And NRC did so after providing a comprehensive discussion of

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[167] *E.g.*, *id.* D-50-51, D-530-31 (JA__) (describing NRC's consideration of the expedited transfer of fuel from pools into dry storage); *id.* App. I (JA__) (appendix devoted to high-burnup fuel and its storage).

[168] *Id.* E-8 (JA__).

[169] *Id.* D-471 (JA__).

leaks in Appendix E of the GEIS and further noting in its comment response that NRC will consider appropriate mitigation efforts at licensing relating to groundwater based upon unique site hydrological conditions.[170]

Moreover, contrary to the States' arguments (Br. 38-39, 43-44) groundwater monitoring is required by regulation. As a result of a 2011 rulemaking, all reactor licensees "are required to perform groundwater monitoring to determine the extent of any existing contamination and to aid in the timely detection of any future contamination . . . [to] allow licensees to identify and repair leaks and employ mitigation measures, as necessary, to minimize or eliminate any environmental impacts that would result from leaks."[171]

Nor is NRC's expertise in overseeing leaks remediation grounded in speculation, as the States assert (Br. 43). In fact, the GEIS's discussion of potential mitigation measures related to leaks is supported by decades of hands-on experience resulting in the very "supporting analytical data" the States allege to be missing.[172] That the States have not questioned the effectiveness of past remediation speaks volumes to NRC's capacity to apply mitigation measures effectively.

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[170] *See id.*

[171] *Id.* 3-19 (JA__) (citing 10 C.F.R. §§ 20.1406, 20.1501); *id.* E-5-19 (JA__).

[172] *Id.* E-21-25 (JA__).

VIII. Petitioners have waived any potential AEA arguments.

NRC explained in the GEIS that during the thirty years since the original waste confidence proceedings it has developed a comprehensive regulatory framework through which NRC ensures the safe continued storage of spent fuel, and NRC confirmed in the GEIS that it relies upon this framework to satisfy its safety-related obligations under the AEA.[173] It was for this reason that NRC opted to cease including "reasonable assurance" findings in its analysis of continued storage.[174]

This determination resulted in numerous comments during the rulemaking process about the safety findings NRC must make under the AEA related to the storage and disposal of fuel.[175] Promulgation of the Rule thus provided an opportunity for petitioners to assert that any safety prerequisites to reactor licensing previously satisfied through the waste confidence proceedings are no longer satisfied. And, in recognition of this opportunity, petitioners informed the Court that they intended to raise this issue and took affirmative steps to ensure that it would be resolved in this case.

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[173] *See id.* B-9-25, D-31-32 (JA__).

[174] *See supra* note 24 and accompanying text.

[175] GEIS D-28-32 (JA__).

Specifically, petitioners represented in their Briefing Proposal (January 20, 2015, Document No. 1533039), as endorsed by the parties' Joint Motion to Govern Further Proceedings (April 1, 2015, Document No. 1545545), that they intended (and needed at least 1,500 words) to argue that, by adopting the Rule, "NRC failed to comply with the Atomic Energy Act's requirement that NRC must make safety determinations regarding the continued storage of spent fuel."[176] Petitioners further opposed the consolidation of this case with *Missouri Coalition for the Environment, Inc. v. NRC*, No. 15-1114, in which one of the co-petitioners in this case raised the same argument, on the ground that it would be resolved in *this* litigation.[177] And in *Beyond Nuclear, Inc. v. NRC*, No. 15-1173, another petitioner in this case has asserted that reliance on the Rule and GEIS violates the AEA but

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[176] This characterization corresponds to the language Beyond Nuclear et al. (petitioners in Case No. 14-1216) used to describe their AEA claim in their Nonbinding Statement of Issues (December 1, 2014, Document No. 1524640): "Whether the [Rule and GEIS] violate the [AEA], by failing to provide adequate assurances that waste generated during reactor operation can be safely disposed of in a repository, and therefore issuing reactor licenses will not be inimical to the health and safety of the public."

[177] On April 23, 2015, the Missouri Coalition moved to hold its petition for review in Case No. 15-1114 in abeyance pending the outcome of this case on the ground that the "[b]riefing in [this] case will resolve, in their entirety, all of the AEA, NEPA, and APA claims that apply to [No. 15-1114]." Motion to Hold Petition for Review in Abeyance (Document No. 1548920) at 3. Respondents consented to the motion and agreed not to seek further consolidation of this case with Case No. 15-1114 on the basis of this representation.

that all of its arguments concerning such "unlawful[ness]" will be "fully resolve[d]" here.[178]

Petitioners expended the additional words granted to them to include their AEA argument. But petitioners have not raised *any* AEA arguments in their opening briefs (and, of course, cannot do so on reply). Thus, this Court should explicitly determine that any such argument has been waived.[179]

CONCLUSION

For the foregoing reasons, the petitions for review should be denied.

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[178] Motion to Hold Petition for Review in Abeyance (July 22, 2015, Document No. 1563792) at 2-3.

[179] *Evans v. Sebelius*, 716 F.3d 617, 619 (D.C. Cir. 2013).

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September 4, 2015

CERTIFICATE OF COMPLIANCE

Pursuant to Rule 32(a)(7)(C) of the Federal Rules of Appellate Procedure and the Court's order dated May 22, 2015, the undersigned counsel certifies that the Initial Brief of Federal Respondents complies with the type-volume limitation because it contains 15,445 words, excluding parts exempted by Fed. R. App. P. 32(a)(7)(B)(iii) and Circuit Rule 32(e)(1), according to the Microsoft Word 2013 software program with which the Brief was prepared.

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CERTIFICATE OF SERVICE

I hereby certify that on September 4, 2015, the undersigned counsel for Respondent U.S. Nuclear Regulatory Commission filed the attached Brief of Federal Respondents with the U.S. Court of Appeals for the District of Columbia Circuit by filing the same with the Court's CM/ECF filing system. That method is calculated to serve:

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