

United States Court of Appeals For the First Circuit

Nos. 12-1404, 12-1772

COMMONWEALTH OF MASSACHUSETTS,

Petitioner,

v.

U.S. NUCLEAR REGULATORY COMMISSION; THE UNITED STATES OF AMERICA,

Respondents,

ENERGY NUCLEAR OPERATIONS, INC.;
ENERGY NUCLEAR GENERATION COMPANY,

Intervenors.

PETITIONS FOR REVIEW OF ORDERS OF THE
U.S. NUCLEAR REGULATORY COMMISSION

Before

Lynch, Chief Judge,
Torruella, Circuit Judge,
and DiClerico,* District Judge.

Matthew Brock, Assistant Attorney General, Office of the Attorney General, Environmental Protection Division, with whom Martha Coakley, Attorney General, was on brief, for petitioner.

James E. Adler, Attorney, Office of the General Counsel, U.S. Nuclear Regulatory Commission, with whom Ignacia S. Moreno, Assistant Attorney General, J. David Gutner II, Attorney, Appellate Section, Environmental and Natural Resources Division, U.S. Department of Justice, Marian L. Zabler, Acting General Counsel,

* of the District of New Hampshire, sitting by designation.

John F. Cordes, Jr., Solicitor, and Lauren Woodall, Attorney, Office of General Counsel, U.S. Nuclear Regulatory Commission, were on brief, for respondents.

Kevin P. Martin, with whom Elise N. Zoli, Goodwin Procter LLP, David R. Lewis, Paul A. Gaukler, Timothy J. V. Walsh, and Pillsbury Winthrop Shaw Pittman LLP, were on brief, for intervenors Entergy Nuclear Operations, Inc. and Entergy Nuclear Generation Company.

February 25, 2013

LYNCH, Chief Judge. The Commonwealth of Massachusetts petitions for review from the Nuclear Regulatory Commission's ("NRC" or "Commission") March 8, 2012 order denying the Commonwealth's petition for review of the Atomic Safety and Licensing Board's ("ASLB") denial of Massachusetts's motion to admit a new contention, and other related requests (12-1404). The NRC rejected the Commonwealth's claims that the environmental findings in the environmental impact statement ("EIS"), prepared under the National Environmental Policy Act ("NEPA"), 42 U.S.C. § 4321 et seq., were inadequate in light of the damage to the Fukushima Daiichi ("Fukushima") nuclear power plant in Japan in March of 2011.¹ The Commonwealth also petitions for review from the NRC's May 25, 2012 vote to renew the license of the Pilgrim Nuclear Power Station in Plymouth, Massachusetts, and the May 29, 2012 renewed license (12-1772).

The Commonwealth's substantive challenges to the NRC's decisions are not based in any alleged failure on the part of the NRC to ensure basic health and safety under the Atomic Energy Act ("AEA"), 42 U.S.C. § 2011, et seq. Rather, the Commonwealth argues

¹ Entergy Nuclear Operations, Inc., and Entergy Nuclear Generation Company (collectively, "Entergy"), the operators of Pilgrim Nuclear Power Station, filed an application with the NRC on January 25, 2006, to renew the plant's operating license, which was set to expire on June 8, 2012, for an additional twenty years. 71 Fed. Reg. 15,222 (Mar. 27, 2006). Pilgrim has been operating since 1972. After the NRC issued its final EIS for Pilgrim in July of 2007, but before the renewed license was issued, the Great East Japanese Earthquake occurred on March 11, 2011.

that the Commission's failure to file supplemental analysis on the environmental impacts of relicensing in light of purported new and significant information learned from Fukushima violated its obligations under NEPA and NRC regulations.

The claims made by Massachusetts to the NRC roughly fall into three categories. The first two categories go to whether, in light of Fukushima, the EIS was adequate in its environmental assessments of: (1) spent fuel pool fires; and (2) core damage² events. The third category questions whether the decision to proceed with relicensing was contrary to law. The Commonwealth also asserts that the NRC failed to sufficiently consider its own Task Force's report that contained purportedly new and significant information, or explain why it did not require supplementation of the EIS, and Massachusetts claims that it was denied a hearing in violation of the AEA.

Under the applicable standards of judicial review, we deny the petition for review.

I.

The regulatory scheme governing this license renewal falls under two statutes, the AEA and NEPA. NEPA and the right to

² The term "core damage" refers to damage to the portion of the nuclear reactor containing the nuclear fuel the plant uses to create heat for electricity generation.

a hearing under the AEA are at issue here. The AEA³ requires the NRC to provide "adequate protection" for the health and safety of the public, 42 U.S.C. § 2232(a), which the NRC seeks to ensure on an ongoing basis through an "evolving set of requirements and commitments for a specific plant that are modified as necessary over the life of a plant to ensure continuation of an adequate level of safety." 60 Fed. Reg. 22,461, 22,473 (May 8, 1995).⁴

Those safety provisions under the AEA are not at issue here. The AEA also states that the NRC shall grant a hearing to a person affected by a relicensing, 42 U.S.C. § 2239(a), but as we discuss later, the NRC determined that the Commonwealth did not meet the procedural requirements, and that decision was not arbitrary and capricious.

³ The AEA is the NRC's organic statute, authorizing the NRC to issue licenses to operate nuclear power plants for a period not to exceed 40 years. 42 U.S.C. § 2133(c). The AEA also permits the renewal of operating licenses, *id.*, and delegates to the NRC the authority to determine appropriate rules and regulations, Massachusetts v. United States, 522 F.3d 115, 119 (1st Cir. 2008); see also Siegel v. AEC, 400 F.2d 778, 783 (D.C. Cir. 1968) (AEA is "a regulatory scheme which is virtually unique in the degree to which broad responsibility is reposed in the administering agency, free of close prescription in its charter as to how it shall proceed in achieving the statutory objectives"); 10 C.F.R. § 54.31(b) (permitting renewal up to 20 years before expiration for no more than 20 additional years beyond the current license's expiration date).

⁴ At the license renewal stage, the NRC has decided to focus its safety review on managing the aging of important plant structures, components, and systems. See Massachusetts, 522 F.3d at 119; 10 C.F.R. §§ 54.21, 54.29(a).

NEPA, by contrast, requires federal agencies to prepare an EIS for major federal actions that would significantly affect the quality of the human environment, including a discussion of "the environmental impact of the proposed action," "any adverse environmental effects which cannot be avoided should the proposed action be implemented," and "alternatives to the proposed action." 42 U.S.C. § 4332(C) (i)-(iii). Relicensing requires the preparation of an EIS. 10 C.F.R. §§ 51.20(b)(2) (requiring EIS for renewal), 51.95(c) (discussing what EIS must address).

NEPA's EIS requirement serves two purposes. First, "it places upon an agency the obligation to consider every significant aspect of the environmental impact of a proposed action." Balt. Gas & Elec. Co. v. Natural Res. Def. Council, Inc., 462 U.S. 87, 97 (1983) (quoting Vt. Yankee Nuclear Power Corp. v. Natural Res. Def. Council, Inc., 435 U.S. 519, 553 (1978)) (internal quotation marks omitted). Second, it provides assurance that the agency will inform the public that it has considered environmental concerns in its decisionmaking process. Id. (citing Weinberger v. Catholic Action of Haw./Peace Educ. Project, 454 U.S. 139, 143 (1981)). Put differently, NEPA seeks to guarantee process, not specific outcomes. Town of Winthrop v. FAA, 535 F.3d 1, 4 (1st Cir. 2008). In short, NEPA requires the agency to take a "hard look" at the environmental consequences of a major federal action. Balt. Gas & Elec. Co., 462 U.S. at 97.

It is significant to this petition that the NRC assesses environmental impacts through two different procedures. One, for site-specific impacts, is done in the course of the individual plant relicensing. The other, for impacts that are generic to all plants of a particular type, is done through rulemaking rather than individual licensing proceedings. The Commonwealth confuses the two, and attempts to raise in the petition seeking review of the relicensing issues which both belong in generic rulemaking, see Massachusetts v. United States, 522 F.3d 115, 127 (1st Cir. 2008) (environmental impacts of spent fuel pools dealt with through rulemaking), and are in fact being addressed in that rulemaking.

As to relicensing, the NRC requires an applicant to submit an environmental report with its relicensing application. 10 C.F.R. § 51.53(c)(1). That was done here in 2006. The report for a license renewal must analyze the environmental impacts of the proposed action and include a severe accident mitigation alternatives ("SAMA") analysis. Id. § 51.53(c)(3)(ii)(L). The SAMA analysis, in the most basic sense, is a cost-benefit analysis that addresses whether the expense of implementing a mitigation measure not mandated by the NRC is outweighed by the expected reduction in environmental cost it would provide in a core damage event.⁵ See Duke Energy Corp., 56 N.R.C. 1, 7-8 (2002) ("Whether

⁵ Included as benefits are averted costs such as public exposure, offsite property damage, occupational exposure costs, cleanup and decontamination costs, and replacement power costs.

a SAMA may be worthwhile to implement is based upon a cost-benefit analysis -- a weighing of the cost to implement the SAMA with the reduction in risks to public health, occupational health, offsite and onsite property.").

As to the second mechanism for environmental impacts that are not plant-specific, but instead apply to all like plants, the Supreme Court has held that the NRC is permitted to make generic determinations to meet its NEPA obligations. Balt. Gas & Elec. Co., 462 U.S. at 101 (stating generic method is "clearly an appropriate method of conducting the hard look required by NEPA"). The NRC has labeled these issues as "Category 1" issues and has adopted generic EISs for them. See 10 C.F.R. pt. 51, subpt. A, app. B (listing NEPA issues for license renewal and assigning them Category 1 or 2 classification); 61 Fed. Reg. 28,467 (June 5, 1996) (explaining generic EIS). Those environmental impacts need not be included in an environmental report nor need they be considered on a site-specific basis in the EIS. See 10 C.F.R. §§ 51.53(c) (3) (i) (environmental report), 51.71(d) (EIS). These generic determinations need not be addressed in individual proceedings. As we held in an earlier case, the generic rulemaking includes the subject of environmental impacts of spent fuel pools. Massachusetts, 522 F.3d at 127.

Going back to these relicensing proceedings, in certain instances where an EIS has been prepared, and the relicensing has

not yet occurred, the emergence of new information will require federal agencies to supplement an EIS. Marsh v. Or. Natural Res. Council, 490 U.S. 360, 372-73 (1989). Even so, to ensure that the agency decisionmaking process is not delayed unnecessarily, supplementation of the EIS is not required every time new information arises. Id. at 373. Rather, a supplemental EIS only need be prepared if there are "significant new circumstances or information." Town of Winthrop, 535 F.3d at 7 (quoting 40 C.F.R. § 1502.9(c)(1)) (emphasis omitted); see also 10 C.F.R. § 51.92(a)(2) (requiring final EIS be supplemented with "new and significant" information). That means new information must "paint[] a dramatically different picture of impacts compared to the description of impacts in the EIS." Town of Winthrop, 535 F.3d at 12; see also Wisconsin v. Weinberger, 745 F.2d 412, 418 (7th Cir. 1984) (supplementation required where new information "provides a seriously different picture of the environmental landscape").

To obtain a hearing on this claim of new information, requestors must meet certain requirements. In this case, two NRC regulations are relevant. First, where the record has been closed, a party must meet the record reopening standards to have its new information considered in an adjudication. See 10 C.F.R. § 2.326(a)(1)-(3). The NRC's regulations impose three requirements:

- (1) The motion must be timely. However, an exceptionally grave issue may be considered in the discretion of the presiding officer even if untimely presented;
- (2) The motion must address a significant safety or environmental issue; and
- (3) The motion must demonstrate that a materially different result would be or would have been likely had the newly proffered evidence been considered initially.

Id.

Second, the requestor seeking a formal hearing must also meet the Commission's general contention admissibility standards.

The request for a hearing must:

- (i) Provide a specific statement of the issue of law or fact to be raised or controverted . . . ;
- (ii) Provide a brief explanation of the basis for the contention;
- (iii) Demonstrate that the issue raised in the contention is within the scope of the proceeding;
- (iv) Demonstrate that the issue raised in the contention is material to the findings the NRC must make to support the action that is involved in the proceeding;
- (v) Provide a concise statement of the alleged facts or expert opinions which support the requestor's/petitioner's position on the issue and on which the petition intends to rely at hearing, together with references to the specific sources and documents on which the requestor/petitioner intends to rely to support its position on the issue;
- (vi) In a proceeding other than one under 10 C.F.R. 52.103, provide sufficient information to show that a genuine dispute exists with the applicant/licensee on a material issue of law or fact. . . .

Id. § 2.309(f) (1) (i)-(vi).

II.

A. Proceedings Prior to Fukushima

As said, Entergy's relicensing application included an environmental report containing a SAMA analysis. The analysis included scenarios dealing with complete loss of offsite power, various sorts of operator failures during core damage events, the possibility of hydrogen build up in a core damage event leading to an explosion, and the use of filtered vents.

The environmental report did not address the environmental impacts of spent fuel pool accidents⁶ because the NRC had adopted a generic EIS on that issue. Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Comm'n, NUREG-1437, 1 Generic Environmental Impact Statement for License Renewal of Nuclear Plants: Main Report (May 1996).⁷ This court rejected Massachusetts's earlier challenge that this spent fuel pool issue

⁶ Spent fuel rods are a radioactive waste product of nuclear power plants and are often stored in racks in water-filled storage pools located at the plant. See Massachusetts, 522 F.3d at 122. When Pilgrim was originally licensed in 1972, there was a national policy of eventually disposing of the spent fuel through reprocessing, but that policy was abandoned in the mid-1970s. Id. Without reprocessing, and without a national repository, spent fuel has accumulated at onsite storage facilities. Id.

⁷ The regulation in place stated that "[t]he expected increase in the volume of spent fuel from an additional 20 years of operation can be safely accommodated on site with small environmental effects through dry or pool storage at all plants if a permanent repository or monitored retrievable storage is not available." Massachusetts, 522 F.3d at 121 n.4 (alteration in original) (quoting 10 C.F.R. pt. 51, subpt. A, app. B).

had to be heard in the relicensing rather than in rulemaking and preserved for the Commonwealth its ability to present its arguments in rulemaking after it had made the wrong choice as to which vehicle was proper. Massachusetts, 522 F.3d at 127-33.⁸ The staff issued a final EIS in July of 2007. Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Comm'n, NUREG-1437, Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 29 Regarding Pilgrim Nuclear Power Station (July 2007). Upon completing consideration of a contention filed by Pilgrim Watch in the relicensing, the ASLB⁹ closed the record in June of 2008. See Entergy Nuclear Generation Co., 68 N.R.C. 590, 595-97 & n.26 (2008). In March of 2010, the NRC partially reversed an earlier ASLB decision and remanded one limited issue, regarding a meteorological model used in the SAMA analysis, to the ASLB for

⁸ The NRC later denied that rulemaking petition because the studies presented by Massachusetts did not constitute new and significant information and the NRC's findings related to the storage of spent nuclear fuel in pools remained valid. 73 Fed. Reg. 46,204, 46,212 (Aug. 8, 2008). The Second Circuit upheld the NRC's denial of the Commonwealth's petition for rulemaking. New York v. NRC, 589 F.3d 551, 553-55 (2d Cir. 2009) (per curiam).

⁹ The NRC "appoints [ASLBs] to conduct public hearings and to make intermediate or final decisions in administrative proceedings" relating to licensing decisions. Johnston v. NRC, 766 F.2d 1182, 1183 (7th Cir. 1985). A Board consists of three members, one of whom is qualified in the conduct of administrative proceedings and two of whom have technical or other qualifications the NRC deems appropriate. 42 U.S.C. § 2241(a). ASLBs now preside over most licensing hearings. Citizens Awareness Network, Inc. v. United States, 391 F.3d 338, 357 n.6 (1st Cir. 2004) (Lipez, J., concurring).

further hearing. Entergy Nuclear Generation Co., 71 N.R.C. 287 (2010).

B. Fukushima and the NRC Response

On March 11, 2011, before the ASLB had issued a decision on the remanded issue, an earthquake and tsunami occurred off the coast of Japan. The tsunami hit the Fukushima nuclear power plant causing a blackout at five of the six units and resulting in core damage at three of the units. Notably, however, virtually no damage occurred to any of the spent fuel pools on site and there were no spent fuel pool fires.

The NRC took action within days to respond to the grave events at Fukushima, establishing a Task Force by a March 23, 2011 memorandum, and requiring the Task Force "to conduct a methodical and systematic review of [the NRC's] processes and regulations to determine whether the agency should make additional improvements to [its] regulatory system and to make recommendations to the Commission for its policy direction." The NRC also directed its staff to complete a review and implement lessons learned by 2016.

On July 12, 2011, the Task Force issued its report, making twelve overarching recommendations, including on emergency preparedness and mitigation measures. The Task Force also made clear that a sequence of events like that at Fukushima is unlikely to occur in the United States and that "continued operation and

continued licensing activities do not pose an imminent risk to public health and safety."

On March 12, 2012, the NRC issued three orders implementing certain Task Force recommendations. First, the NRC ordered license holders to "develop, implement and maintain guidance and strategies to restore or maintain core cooling, containment, and [spent fuel pool] cooling capabilities in the event of a beyond-design-basis external event." Second, the NRC ordered all boiling water reactors with Mark I and Mark II containments (including Pilgrim) to install hardened vents to ensure proper venting of the structure. Third, the NRC required "provisions for reliable spent fuel pool indications," because during the Fukushima event "[t]he lack of information on the condition of the spent fuel pools contributed to a poor understanding of possible radiation releases and adversely impacted effective prioritization of emergency response actions by decision makers." Each applies to Pilgrim.

C. Massachusetts's Post-Fukushima Motion to the NRC to Admit Contention

On June 2, 2011, slightly less than three months after Fukushima, Massachusetts moved to admit a contention and to reopen the Pilgrim record, arguing that Fukushima revealed new and significant information that the environmental impact analysis and SAMA analysis needed to address. The Commonwealth contended that Fukushima showed: (1) the likelihood of spent fuel pool accidents

was higher than estimated in the existing EIS;¹⁰ and (2) the frequency of core-melt accidents was also higher than estimated in the existing EIS, and relatedly, in light of new information on a variety of matters concerning core damage events,¹¹ certain mitigation measures that the SAMA analysis ignored or rejected might be cost-effective.¹²

Massachusetts also included a petition for waiver, seeking to litigate the spent fuel pool accident issues in the individual adjudication, 10 C.F.R. § 2.335(b), as opposed to challenging it through rulemaking. In the alternative, if a waiver was denied, Massachusetts requested that the NRC rescind the spent fuel pool determinations through rulemaking, and that the relicensing proceedings be suspended until that rulemaking request was resolved.

¹⁰ Massachusetts's expert stated in his report that the loss of water in an event could lead to a pool fire and that the Fukushima incident "provide[d] direct experience of events that could be precursors of pool fires."

¹¹ These included operators' ability to mitigate an accident, the effects of secrecy about mitigation measures, the risk of hydrogen explosions during core damage events, and the use of filtered venting.

¹² Earlier in the relicensing proceeding, the agency had considered some similar issues raised in a contention by a different group, including the accuracy of the probabilistic risk assessment's ("PRA") estimation of core damage frequency in the SAMA analysis and the use of filtered vents, which were rejected by the agency in an October 16, 2006 order.

The contention was accompanied by an expert report by Dr. Gordon Thompson, a senior research scientist at Clark University. Massachusetts moved, on August 11, 2011, to supplement its filing with the released Task Force Report, which Massachusetts stated "provide[d] further support for its contention." Massachusetts filed a supplemental declaration from Dr. Thompson, which discussed the reasons he felt the report supported his views in support of the contention.

On November 28, 2011, the ASLB denied Massachusetts's motion for a hearing, as well as the waiver motion, and the request for a stay. The ASLB determined that: (1) the spent fuel concerns were not unique to Pilgrim and so denied the waiver petition; and (2) each portion of the contention concerning core damage events failed to meet the agency's record reopening standards and/or its general admissibility standards.¹³

The NRC affirmed¹⁴ the ASLB's decision on March 8, 2012. On the spent fuel pool issues, the NRC denied the waiver petition, referred the rulemaking petition to its staff, and denied the request to suspend the proceedings pending resolution of that

¹³ One member of the Board concurred, agreeing that the contention should be denied, but concluding that the contention was premature, and Fukushima-related contentions should be allowed when "relevant information becomes ripe for consideration."

¹⁴ The Chairman concurred in the majority's decision to deny the waiver petition and suspension request, but dissented in the majority's decision to apply the usual record reopening standards.

petition. The NRC rejected the contention on all other issues. It noted that Massachusetts had not provided sufficient information to make a significant difference in the environmental review. The NRC considered the core damage frequency claim and each of the related claims that new information on core damage events might affect the SAMA analysis, finding for many reasons that each aspect of the contention either failed to meet the agency's reopening standards or its admissibility standards. In particular, the NRC explained that the failure to sufficiently link the Fukushima events to the Pilgrim environmental analysis was the basic problem with the contention.

On May 25, 2012, the majority of the NRC approved the renewal of Pilgrim's operating license. The Chairman was the sole dissenter, preferring to wait on making the licensing decision until all issues before the agency were resolved. The other Commissioners made no direct response, but two noted that if the renewed license were set aside on judicial review, the previous license would be reinstated pursuant to 10 C.F.R. § 54.31(c).

Massachusetts petitioned this court for review. Massachusetts's primary arguments are that the NRC violated NEPA and acted arbitrarily and capriciously by failing to take a hard look at the lessons from Fukushima and by failing to require supplementation of the EIS as to both the spent fuel pool and core damage concerns before granting a renewed license. It also argues

that, under NEPA, the NRC should have heard its rulemaking petition and completed all the post-Fukushima review before granting the license.

The record shows that the NRC gave a hard look to the information Massachusetts presented to it, and it engaged in reasoned decisionmaking in explaining why it refused to reopen the record and why it denied the contention. The NRC did not need to wait to grant the relicensing based on conjecture that additional information might arise in the future. Indeed, the NRC gave assurances that if such information did arise, and resulted in new requirements, those requirements would, under its normal procedures, be applied to Pilgrim.

III.

Because there is no apparent conflict between the NRC's record reopening and general admissibility standards and NEPA's standard for requiring supplementation of an EIS, we proceed to determine if the NRC permissibly applied its procedural rules. We start with the NRC's denial of the waiver of rulemaking petition on the spent fuel pool issue. We then move on to the NRC's rejection of the other portions of the contention. In doing so, we address both the record reopening standards and the general admissibility standards. We do so because the NRC relied on different provisions in those distinct requirements in rejecting the various parts of

the Commonwealth's contention.¹⁵ On some substantive issues the NRC relied on both standards, and on other issues, rested on just a provision in the reopening or the admissibility standards. Therefore, we address both standards in order to fully deal with the Commonwealth's challenge and the NRC's rejection of the entire contention. For ease of organization, we address each substantive issue separately, including the reopening and/or the admissibility standards that are the basis for the rejection. Finally, we consider the NRC's decision to proceed with licensing.

A. Standard of Review

Our review of NEPA claims is governed by the Administrative Procedure Act, 5 U.S.C. § 501, et seq. ("APA"). See Dubois v. U.S. Dep't of Agric., 102 F.3d 1273, 1284 (1st Cir. 1996). The APA "authorizes this court to displace the [NRC's] decisions only to the extent that they are 'arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law.'" Massachusetts, 522 F.3d at 126 (quoting 5 U.S.C. § 706(2)(A)). Errors of law are reviewed de novo. Dubois, 102 F.3d at 1284.

An agency's decision is not arbitrary and capricious if that decision was based on consideration of the relevant factors, and if the agency did not commit a clear error of judgment. Town

¹⁵ For example, and as will be discussed more below, the NRC rejected Massachusetts's "secrecy" argument regarding accident mitigation measures only on the basis that it was outside the scope of the proceedings, failing to meet one of the general admissibility standards. 10 C.F.R. § 2.309(f)(1)(iii).

of Winthrop, 535 F.3d at 8. A decision fails "if the agency relied on improper factors, failed to consider pertinent aspects of the problem, offered a rationale contradicting the evidence before it, or reached a conclusion so implausible that it cannot be attributed to a difference of opinion or the application of agency expertise." Associated Fisheries of Me., Inc. v. Daley, 127 F.3d 104, 109 (1st Cir. 1997). "This general posture of deference toward agency decision-making is particularly marked with regards to NRC actions," including relicensing, because of the amount of discretion the AEA grants to the Commission. Massachusetts, 522 F.3d at 126.

Moreover, in "determining what constitutes significant new information," a reviewing court "owes considerable deference" to the agency's determination because "that is a factual question requiring technical expertise." Town of Winthrop, 535 F.3d at 8. Thus, "[c]onsiderable deference is owed to the [agency's] determination of whether [a completed EIS] remains accurate, adequate, and current." Id.

We also give substantial deference to an agency when it adopts reasonable interpretations of its own regulations. Auer v. Robbins, 519 U.S. 452, 461 (1997). "We must accept the agency's position unless it is plainly erroneous or inconsistent with the regulation." Massachusetts, 522 F.3d at 127 (quoting Auer, 519 U.S. at 461) (internal quotation marks omitted).

Still, our role is to ensure that the agency took a "hard look" at the purportedly new information and determine whether its decisions were arbitrary or capricious. Dubois, 102 F.3d at 1284.¹⁶

B. Denial of the Spent Fuel Pool Waiver Petition

One of Massachusetts's main claims before the NRC concerned the risk of spent fuel pool accidents. That is a Category 1 issue, addressed globally for all nuclear power plants, 10 C.F.R. pt. 51, subpt. A, app. B, through rulemaking, and that is where the NRC is dealing with this issue. Further, NRC regulations generally prohibit the challenging of such generic determinations in individual adjudicatory proceedings, see 10 C.F.R. § 2.335(a), but under certain specified conditions,¹⁷ the NRC will waive that

¹⁶ At times, Massachusetts's brief appears to make a weak argument that the NRC's procedural rules (particularly its record reopening standards) are incompatible with NEPA. However, in its reply brief, Massachusetts disavows that and asserts it is only arguing that the NRC "cannot unreasonably interpret or misapply its contention admissibility standards."

¹⁷ One exception to the prohibition on a challenge in an individual proceeding is for a party to seek a waiver under 10 C.F.R. § 2.335(b), which provides that "[t]he sole ground for petition of waiver or exception is that special circumstances with respect to the subject matter of the particular proceeding are such that the application of the rule or regulation (or provision of it) would not serve the purposes for which [it] was adopted." The NRC has interpreted the regulation to require a waiver petitioner to meet four factors: (1) the rule's strict application would not serve the purpose for which it was adopted; (2) there are special circumstances that were not considered, explicitly or implicitly, in the rulemaking proceeding; (3) those circumstances are "unique" to the facility and not common to a large class of facilities; and (4) a waiver is necessary to reach a significant safety problem. Dominion Nuclear Conn., Inc., 62 N.R.C. 551, 559-60 (2005). The NRC's decision that Massachusetts did not meet the standards was

rule and hear issues in a particular relicensing proceeding. Although some may doubt whether Massachusetts has explicitly, rather than implicitly, challenged the NRC's ruling on the waiver petition, we nonetheless address it briefly.

In denying Massachusetts's waiver petition, the NRC permissibly reasoned that Massachusetts did not show that the spent fuel pool issues in its contention were unique to Pilgrim. Rather, they applied to all nuclear power plants and would be more appropriately handled through rulemaking. We add that onsite storage of spent fuel is one of the issues being considered in the Commission's post-Fukushima review of lessons learned, as the Commission itself has noted.

We also reject the argument that NEPA was violated by the NRC decision to go ahead with relicensing. In addition to denying the waiver request and sending the spent fuel pool issue to rulemaking, the NRC also considered whether to delay relicensing, in light of the information Massachusetts presented. It stated, referring at least in part to the spent fuel pool issue, that "we do not have sufficient information at this time to make a significant difference in the Pilgrim environmental review." Massachusetts has conceded that "affirmative evidence of a pool fire has not emerged" from the Fukushima accident. The record also

reasonable.

supports the NRC's conclusion that there was no apparent significant damage to the spent fuel at Fukushima.

C. The NRC's Denial of the Commonwealth's Position on Core Damage Issues

1. The "Direct Experience" Core Damage Frequency Model

The second major portion of Massachusetts's contention is that the existing SAMA analysis in the EIS underestimated core damage frequency by an order of magnitude as shown by the Fukushima event and thus needed to be supplemented. The NRC rejected this portion of the contention based on its record reopening standards. It reasoned that under its record reopening standards: (1) the claim was untimely because it could have been raised from the outset, 10 C.F.R. § 2.326(a)(1); and (2) the claim did not demonstrate the existence of a significant environmental issue, *id.* § 2.326(a)(2). These decisions, based on the reopening standards, were reasoned and we have no basis to set them aside.¹⁸

¹⁸ The NRC acted reasonably in deciding to apply its record reopening standards, a decision Massachusetts does not challenge. The ASLB closed the record in June of 2008. See Entergy Nuclear Generation Co., 68 N.R.C. at 595-96 & n.26. Although the NRC remanded a portion of another party's contention in 2010, different from the one at issue here, the record remained closed as to all other issues. Agencies are permitted to impose requirements or thresholds for parties seeking to reopen a closed record. See, e.g., Vt. Yankee, 435 U.S. at 554-55. Further, the NRC's reopening standards have been upheld by other courts. See N.J. Env'tl. Fed'n v. NRC, 645 F.3d 220, 233 (3d Cir. 2011) ("We have upheld the motion to reopen standard and deferred to the NRC's application of its rules, so long as it is reasonable."); Oystershell Alliance v. NRC, 800 F.2d 1201, 1207 (D.C. Cir. 1986) ("In examining petitioners' plea to reopen the record, we rely on the same court-sanctioned test applied by the Commission").

It is quite clear there was nothing new about the purportedly new methodology used to determine the frequency of core damage events. The methodological issue could have been raised from the beginning of the relicensing proceeding by Massachusetts, but was not. 10 C.F.R. § 2.326(a)(1). Massachusetts belatedly asserts that by taking five historical core damage events (Three Mile Island, Chernobyl, and three units at Fukushima) and dividing that number by the number of operating years of all nuclear power plants worldwide, the frequency of core damage events is approximately ten times higher than the estimate in the SAMA analysis. The same methodological argument could have been made before Fukushima occurred. As the ASLB and the NRC agreed, applying the purported "direct experience" methodology at the time the initial opportunity for a hearing was announced, pre-Fukushima, would have produced a frequency approximately five times greater than that contained in the SAMA analysis. Although Fukushima increased the order of magnitude of the frequency of core damage events if assessed under another underlying methodology -- the "direct experience" methodology -- the fact that the Fukushima disaster occurred is beside the point here as it did not change the fact that the underlying methodological challenge was not new.

Even if it were new, the NRC reasonably concluded this methodology contention, timely or not, did not raise a significant environmental issue. 10 C.F.R. § 2.326(a)(2). Indeed, it

reasonably concluded it was already using a better methodology. The NRC uses a site-specific and plant-specific PRA methodology, which answers three questions: (1) what can go wrong; (2) how likely is it; and (3) what are the consequences.¹⁹

The NRC had adequate evidence²⁰ that the "Pilgrim-specific PRA is expected to yield a much more accurate estimate of risk (including [core damage frequency]) than a historical rate calculation using an extremely limited set of data points that aggregates all different plant designs, operational practices, and site conditions around the world." Further, Massachusetts also did not explain how Dr. Thompson's methodology, based on a limited data set, would be used to develop a new spectrum of core damage frequencies.

"[A]gencies are entitled to select their own methodology as long as that methodology is reasonable," and we give deference

¹⁹ This requires an evaluation of the combinations of plant failures that can lead to core damage, and for each core damage sequence identified, an evaluation of core damage progression and possible containment failure. R. at 1216. Importantly, the PRA methodology is both site-specific and plant-specific, and takes into account hazards, the design of the plant, and plant-specific operational practices that affect how the plant responds to potential challenges. R. at 1903. The overall probability that core damage will occur at the plant is calculated by aggregating the individual probabilities of various accident scenarios. R. at 1094.

²⁰ By contrast, Dr. Thompson's report admitted his methodology relied on "a data set that is comparatively sparse and therefore does not provide a statistical basis for a high-confidence estimate of [core damage frequency]." He stated that the data set and method provided at most a "reality check" to the PRA estimates.

to that decision here. Town of Winthrop, 535 F.3d at 13 (quoting Hughes River Watershed Conservancy v. Johnson, 165 F.3d 283, 289 (4th Cir. 1999)) (internal quotation mark omitted).

2. The NRC's Denial of the SAMA Specific Issues

Massachusetts's contention also raised more specific information that it said should be considered or reevaluated in a SAMA analysis, arguing that the information concerned the cost-effectiveness of mitigation alternatives. The NRC rejected each one, offering a reasoned basis under the reopening and/or the admissibility standards for each, which we do not disturb.

First, Massachusetts asserted that operators at the nuclear power plant at Fukushima were unable to perform mitigation actions, which could affect the probability of a radioactive release and should be considered in a SAMA analysis. Most of this portion of the contention and expert report focused intently upon spent fuel storage pools, which, as noted, the Commission had referred to the rulemaking process.²¹

To the extent the claim dealt with other operator mitigation issues, the NRC again required Massachusetts to meet its record reopening standard. The NRC found that the reopening standard was not met because Massachusetts had not demonstrated

²¹ To the extent the claim deals with environmental impacts from spent fuel pools, it failed to meet the admissibility standards because it is outside the scope of the proceedings, 10 C.F.R. § 2.309(f)(1)(iii), for the reasons we described earlier.

sufficiently that a materially different result (in the SAMA analysis) would have been likely had the information been considered initially. See 10 C.F.R. § 2.326(a)(3). That determination is supported by the fact that operator actions not involving spent fuel pools were considered in Entergy's license renewal application, a fact which Massachusetts did not even address in its contention. Further, Massachusetts did not indicate how those already stated analyses would be affected by the proposed new information. The NRC was not arbitrary in concluding that the Commonwealth's mere pointing to a piece of information and speculating that the results of the SAMA analysis may be different was not sufficient to meet the requirement of 10 C.F.R. § 2.326(a)(3).

Second, Massachusetts argues "the NRC's excessive secrecy regarding accident mitigation measures and the phenomena associated with spent-fuel-pool fires degrades the licensee's capability to mitigate an accident." Dr. Thompson's report explains that secrecy could result in managers and operators not having a thorough understanding of the measures they are to implement. The NRC permissibly decided this portion of the contention failed to satisfy the general admissibility standards because it fell outside the scope of the proceeding, id. § 2.309(f)(1)(iii), stating that the "concerns appear to be directed more generally at policy issues governing access and categorization of non-public information."

Third, relying on its earlier assertion that Fukushima presents new and significant information about the likelihood of spent fuel pool accidents, Massachusetts's expert asserted that a new SAMA analysis should consider low-density, open-frame storage racks. The NRC properly determined this claim failed to satisfy the general admissibility standards because it fell outside the scope of the proceeding, id. § 2.309(f)(1)(iii), in light of its denial of the waiver petition and the referral of the rulemaking petition to its staff.

Fourth, Massachusetts argues new information about hydrogen explosions during reactor accidents could alter the SAMA analysis. Dr. Thompson's report contends that "the potential for such explosions has not been adequately considered in the Pilgrim license extension proceeding," and that "containment venting and other hydrogen control systems at the Pilgrim plant should be upgraded, and should use passive mechanisms as much as possible."

The NRC rejected this claim on two grounds: (1) under the record reopening standard, Massachusetts had not shown a likelihood of a materially different result had the hydrogen control information been considered initially, id. § 2.326(a)(3); and (2) whether or not the record was reopened, under the general admissibility standards, Massachusetts did not raise a genuine dispute with the existing SAMA analysis, id. § 2.309(f)(1)(vi). For present purposes, we deal only with the second, more merits-

based ground for rejection, and find it permissible. In fact, neither Massachusetts's contention nor Dr. Thompson's reports addressed the consideration of hydrogen explosions present in the existing SAMA analysis. The analysis examined "the potential loss of containment integrity," including as a result of "hydrogen deflagration or detonation." Massachusetts did not even attempt to explain how the extant analysis was inadequate or how the new information would alter it, and failed to raise a genuine dispute.

Finally, Massachusetts raised a claim relating to filtered venting of reactor containment. Specifically, Massachusetts stated "it appears likely that filtered venting . . . could substantially reduce the atmospheric release of radioactive material from an accident at the Pilgrim [nuclear power plant]." Its expert therefore recommended that filtered vents should be considered in a new SAMA analysis.

The claim that the EIS was inadequate for these reasons was rejected on two grounds: (1) Massachusetts failed to demonstrate the likelihood of a materially different result under the reopening standards, 10 C.F.R. § 2.326(a)(3); and (2) in any event, to the extent that Massachusetts would require filtered vents, the general admissibility standards were not met because it was outside the scope of the proceeding, id. § 2.309(f)(1)(iii). The first ground (record reopening) is supported by the fact that Massachusetts did not discuss the costs and benefits of adding

filters, which is fatal to its claim because a SAMA analysis is a cost-benefit analysis. Further, the SAMA analysis did in fact consider filtered vents, finding that the cost was three times greater than the projected benefit. Massachusetts's contention and supporting materials did not acknowledge or challenge that analysis. The NRC also permissibly rejected the claim, through its admissibility standards, as outside the scope of the proceeding, because the claim was not that the consideration was inadequate, but that filtered vents were mandated. That is clearly beyond the scope. See Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 350 (1989) (stating NEPA "does not mandate particular results").

In sum, the NRC's decision to reject the contention as to each issue raised was not arbitrary or capricious and constituted reasoned decisionmaking. See Allentown Mack Sales & Serv., Inc. v. NLRB, 522 U.S. 359, 374 (1998) (agency adjudications must be reasoned decisionmaking).

Although whether the NRC complied with NEPA's "hard look" requirement is a separate and independent question, the process and reasoning provided by the NRC, discussed above, demonstrates that the "hard look" requirement was plainly met: information proffered by Massachusetts was considered before the ASLB and NRC, the agency obtained opinions from the NRC staff, and from experts outside the agency, including those of Massachusetts and Entergy. The NRC also

offered a reasoned explanation. This meets the requirement of taking a "hard look" at such information. See, e.g., Hughes River, 165 F.3d at 288 (listing obtaining opinions from agency's own experts, outside experts, giving scientific scrutiny, and offering responses to legitimate concerns as evidence of a sufficiently "hard look" (citing Marsh, 490 U.S. at 378-85)).

Massachusetts fleetingly argues that its rights to a hearing under the AEA were somehow violated. Not so. The hearing right provided in the AEA "does not confer the automatic right of intervention upon anyone." Union of Concerned Scientists v. NRC, 920 F.2d 50, 55 (D.C. Cir. 1990) (quoting BPI v. Atomic Energy Comm'n, 502 F.2d 424, 428 (D.C. Cir. 1974)) (internal quotation marks omitted). The NRC may certainly impose procedural requirements for obtaining a hearing where the statute provides no additional guidance, and because the decision that those standards were not met was not arbitrary and capricious, as just discussed, the AEA claim fails. See Am. Trucking Ass'ns, Inc. v. United States, 627 F.2d 1313, 1321 (D.C. Cir. 1980) (stating that agencies have wide discretion in establishing and applying rules for hearings).

IV.

Rather than argue explicitly about the findings of the NRC, as to whether the portions of the contention met the reopening and/or the admissibility standards, in rejecting the Commonwealth's

contention, Massachusetts devotes a substantial portion of its brief to arguing that the NRC acted arbitrarily and capriciously, alleging that: (1) the NRC failed to explain why the Task Force Report did not support Massachusetts's claims; and (2) the NRC's explanations for denying the contention were somehow inconsistent with the fact that the Task Force made recommendations, some of which the NRC adopted, based on the events at Fukushima. We reject both arguments. There is a disconnect in the Commonwealth's argument that the NRC ignored its own Task Force's work product, which it cited and which it is now implementing and reviewing.

As a factual matter, the argument is simply wrong. The NRC dealt with the Task Force Report as part of its analysis in rejecting the Commonwealth's contention. First, the NRC acknowledged that Massachusetts claimed that the ASLB had ignored the Task Force Report in its decision. Second, the NRC incorporated the Report into its analysis of each issue where relevant,²² and found the NRC's reopening and/or admissibility requirements were still not met.²³

²² In reaching its determination that "[a]t bottom, Massachusetts has not shown that its contention should be litigated in this proceeding because it has failed to demonstrate a sufficiently supported link between the Fukushima Dai-ichi events and the Pilgrim environmental analysis," the NRC cited to Dr. Thompson's supplemental declaration on the Task Force Report at least seven times.

²³ To the extent Massachusetts's complaint is not the merits of the rejection, but that the NRC did not explicitly explain why it issued certain orders based on the Task Force Report while not

The NRC also stated that its review of the Fukushima event is ongoing and that all plants will be required to comply with NRC directions resulting from that review. At the time of its decision, however, the NRC said the Commonwealth had not presented sufficient information from the Fukushima incident to make a significant difference in Pilgrim's environmental review.

The Task Force Report did not make environmental-impact estimates, assess the implementation costs of its recommendations, or engage in any PRA, as even Massachusetts's own expert admitted. It used direct mechanisms under the AEA to address safety and did not reveal the type of information used in a NEPA analysis.

"The basic thrust of the agency's responsibilities under NEPA is to predict the environmental effects of a proposed action," Am. Bird Conservancy, Inc. v. FCC, 516 F.3d 1027, 1033 (D.C. Cir. 2008) (emphasis added), and NEPA does not require substantive outcomes. The Task Force Report is not in conflict with the NRC's decision not to supplement the EIS in the Pilgrim relicensing.²⁴

updating the environmental analysis, Massachusetts never raised the issue before the NRC and cannot raise it newly here. Further, there is no representation from the Commonwealth as to why this would lead to any different conclusions.

²⁴ Three Commission orders were issued in response to the Task Force recommendations. Two orders, one on mitigation strategies for beyond-design-basis external events and one on hardened vents, were issued as "adequate protection" requirements under the AEA and were issued without plant-specific PRAs or cost-benefit analyses, which are normally part of a SAMA analysis. See Entergy Nuclear Generation Co., CLI-12-15, slip op. at 4-5 & n.11 (June 7, 2012); see also 10 C.F.R. § 50.109(a)(4)(ii) (no backfit analysis required

At heart, Massachusetts's argument is simply a variant of the argument that the NRC should not have reached the licensing question, but should have deferred until more information could be collected or obtained to create a more complete picture. The argument fails.

V.

We are still left with the question of whether the NRC lawfully acted within its discretion when it denied Massachusetts's request to suspend license renewal proceedings pending resolution of the Commonwealth's petition for rulemaking. As to the spent fuel pool issue, the rulemaking petition asks the NRC to rescind its regulations that this is a Category 1 issue that need not be addressed on a site-specific basis in an EIS. 10 C.F.R. § 51.71(d). The NRC referred the rulemaking petition to the Commission's staff, but denied the accompanying suspension request.

The NRC contends that Massachusetts failed to preserve its challenge to the denial of the suspension request. The Commonwealth may well have failed to preserve the issue, but we choose to rely on the alternate merits ground.

for action necessary to ensure adequate protection). The third order, requiring reliable spent fuel pool instrumentation, was exempted from a cost-benefit analysis. Nothing in the orders calls into question the accuracy of the EIS.

A. The NRC's Application of its Suspension of Relicensing Test

The NRC did not act arbitrarily or capriciously in its application of its suspension standard. In Private Fuel Storage, LLC, 54 N.R.C. 376 (2001), the NRC said that, in deciding whether to suspend licensing proceedings, it will consider whether moving forward would (1) "jeopardize the public health and safety," (2) "prove an obstacle to fair and efficient decisionmaking," or (3) "prevent appropriate implementation of any pertinent rule or policy changes that might emerge from [the Commission's] important ongoing evaluation of []related policies." Id. at 380. Here, the NRC reasonably weighed each of the Private Fuel Storage factors and concluded that, on balance, suspension of the Pilgrim plant proceedings was not warranted. Massachusetts does not challenge the NRC's determination that the Private Fuel Storage factors favor the denial of the Commonwealth's suspension request.

The NRC concluded that moving forward with the Pilgrim license renewal proceedings would not jeopardize the public health or safety, and the Commonwealth has presented no basis to say this was not a reasonable conclusion. To be clear, this issue is not about whether Pilgrim would continue to operate in the interim under NRC rules. It would. See 10 C.F.R. § 2.109(b).

Further, the AEA explicitly authorizes the NRC to modify or revoke a license after it is granted if "conditions revealed by . . . any report, record, or inspection or other

means . . . would warrant the Commission to refuse to grant a license on an original application." 42 U.S.C. § 2236(a).²⁵ This provision "reflects a deliberate policy choice on the part of Congress . . . to render licenses for nuclear facilities subject to postlicensing review under evolving licensing standards." Ft. Pierce Utils. Auth. v. United States, 606 F.2d 986, 996 (D.C. Cir. 1979).

The NRC has represented that it fully intends to undertake post-licensing review of environmental and safety conditions at the Pilgrim plant where such review becomes warranted. The relicensing of Pilgrim does not mean the plant will not receive the benefit of the lessons learned from Fukushima. The NRC has stated that "[a]ll affected nuclear plants ultimately will be required to comply with NRC direction resulting from lessons learned from the Fukushima accident, regardless of the timing of issuance of the affected licenses."

Moreover, if it should occur that the NRC adopts more stringent licensing standards going forward and does not apply those standards to Pilgrim, then the Commonwealth can request that the NRC initiate proceedings to determine whether the Pilgrim plant license would have been granted under the new criteria. See 10

²⁵ See also 42 U.S.C. § 2237 (statutory authority to modify licenses); 10 C.F.R. §§ 2.202, 2.206 (implementing regulations).

C.F.R. § 2.206(a).²⁶ And, if that request is denied, Massachusetts can petition to the court of appeals, see Fla. Power & Light Co. v. Lorion, 470 U.S. 729, 741 (1985), where there is judicial review to ensure that the Commission has not "default[ed] on its fundamental responsibility to protect the public safety." Massachusetts v. NRC, 878 F.2d 1516, 1522 (1st Cir. 1989); see also Mass. Pub. Interest Research Grp. v. NRC, 852 F.2d 9, 19 (1st Cir. 1988).

B. NEPA Did Not Require Suspension of License Renewal

Massachusetts, nonetheless, makes the novel claim that under NEPA, the Commission must, as a matter of law, complete its review of the lessons learned from Fukushima before it renews the Pilgrim plant license, but does not cite any pertinent authority. We have already determined that the NRC met its obligation under NEPA to take a "hard look" at the environmental consequences of the Pilgrim plant license renewal; the Commission is, of course, free

²⁶ When a person requests that the NRC initiate proceedings to modify or revoke a license, the director of the relevant NRC office must determine "[w]ithin a reasonable time" whether the request will be honored and, if not, must state the reasons for his or her decision in writing. 10 C.F.R. § 2.206(b). In other words, the NRC's own regulations state that any challenge to the Pilgrim plant license based on information gleaned from the rulemaking process will be considered promptly by the Commission's staff, and the Commission has provided a procedural mechanism "to allow interested parties to prevent agency reliance on previous determinations when new information or other pertinent concerns demand special consideration." Nuclear Info. Res. Serv. v. NRC, 969 F.2d 1169, 1178 (D.C. Cir. 1992) (en banc).

to take a harder look at the spent fuel pool issue and other generic issues through the rulemaking process.

Massachusetts's premise, that the NRC must wait for even more information to become available before the license can be renewed, finds no support. Massachusetts relies particularly on its reading of two Supreme Court decisions: Baltimore Gas & Electric Co., 462 U.S. 87, and Robertson, 490 U.S. 332. Both are inapposite.

Baltimore Gas & Electric says nothing about the need to delay licensing when currently unavailable information might come to light in the future. Rather, it upheld an NRC rule directing licensing boards to assume for purposes of NEPA that permanent storage of certain nuclear waste at plant sites would have no significant environmental impact and that the risk of leakage need not be considered in individual licensing proceedings. 462 U.S. at 89-90, 93-95.

Massachusetts cites Robertson for the proposition that an agency must consider potential environmental impacts before taking a major federal action to "ensure[] that important effects will not be overlooked or underestimated only to be discovered after resources have been committed or the die otherwise cast." 490 U.S. at 349. But that general language about the purpose of NEPA and the need to consider environmental impacts imposes no requirement on the NRC to hold off on taking action where information is either

unavailable or insufficient to change an existing environmental analysis.²⁷

To the contrary, in Town of Winthrop, 535 F.3d 1, we found that it was reasonable for an agency to decline to study, in a supplemental EIS, a pollutant for which there was not yet a standard method of measurement or analysis. Id. at 13. It is similarly reasonable not to delay relicensing until even more information becomes available because the process could otherwise become unending, as new information is always developing. Cf. Marsh, 490 U.S. at 373 (explaining that requiring an updated EIS every time new information arises is not practical because agencies would always be "awaiting updated information only to find the new information outdated by the time a decision is made").

NEPA imposed no obligation on the NRC to withhold the granting of a renewed license here because of the possibility that currently unavailable information might become available in the future.

VI.

The petitions for review are denied.

²⁷ To the extent Massachusetts seeks to impose a substantive requirement that the NRC must require certain mitigation measures under NEPA, that is foreclosed by the fact that NEPA is not outcome driven. Robertson, 490 U.S. at 353 ("[I]t would be inconsistent with NEPA's reliance on procedural mechanisms -- as opposed to substantive, result-based standards -- to demand the presence of a fully developed plan that will mitigate environmental harm before an agency can act.").