

Nos. 12-1404; 12-1772

UNITED STATES COURT OF APPEALS
FOR THE FIRST CIRCUIT

COMMONWEALTH OF MASSACHUSETTS,
Petitioner,
v.
UNITED STATES; UNITED STATES NUCLEAR REGULATORY
COMMISSION
Respondents,

ENTERGY NUCLEAR OPERATIONS, INC.;
ENTERGY NUCLEAR GENERATION COMPANY,
Intervenors.

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

BRIEF FOR PETITIONER
COMMONWEALTH OF MASSACHUSETTS

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PRELIMINARY STATEMENT

The Nuclear Regulatory Commission (NRC or Commission) denied a request by the Commonwealth of Massachusetts (Commonwealth) that the agency consider new and significant information from the radiological accident at the Fukushima Daiichi nuclear power plants in Japan, and its relevance in evaluating the risks and environmental impacts of relicensing the Pilgrim nuclear power plant in Plymouth, Massachusetts, before granting the Pilgrim plant a twenty year license extension. The NRC also rejected the Commonwealth's request that the NRC consider additional mitigation measures to reduce the risk of a severe accident at Pilgrim - a plant of similar design to those that failed at Fukushima - either in the individual Pilgrim relicensing proceeding or in an alternative generic rulemaking applicable to Pilgrim, before making a final decision on relicensing.

The Commonwealth supported these requests with an expert report which found, based upon the lessons learned from Fukushima, that the risk of a severe accident at Pilgrim is an order of magnitude (a factor of ten) greater than set forth in the Pilgrim relicensing application, and with a report by the NRC's own Task Force on Fukushima which concluded that the NRC's requirements regarding prevention and control of severe accidents are inadequate and that additional risk-mitigation measures should be ordered to increase the level of safety at Pilgrim and other U.S. nuclear plants. The Commission denied the Commonwealth's requests,

claiming the Commonwealth failed to raise a significant environmental issue or to meet the NRC's admissibility standards for a hearing. In denying the Commonwealth's petition, the Commission never addressed the findings of its own Task Force.

While the Commonwealth's appeal on these issues was pending before the Commission, the NRC - outside of the Pilgrim relicensing proceeding - ordered that U.S. nuclear plants, including Pilgrim, increase the level of safety and implement some additional mitigation measures, based upon the same NRC Task Force report on Fukushima relied upon by the Commonwealth.

The NRC thereby ordered additional mitigation measures to reduce the risk of a severe accident at Pilgrim, but denied the Commonwealth and the public a hearing and a right to comment on these measures, including mitigation measures beyond those proposed by the NRC. The NRC also failed to supplement the Environmental Impact Statement for the Pilgrim plant, based upon the lessons learned from Fukushima to date, even though the NRC is required to do so where there is new information showing that the relicensing decision may affect the quality of the human environment in a significant manner not previously considered.

Finally, even though the NRC acknowledges that it still has not completed its review of the new and significant information from Fukushima, the

agency has determined that it need not wait to complete that process, and consider the relevance of this additional information for relicensing the Pilgrim plant, before granting the license extension.

JURISDICTIONAL STATEMENT

These consolidated actions involve an appeal by the Commonwealth of Massachusetts of final orders by the U.S. Nuclear Regulatory Commission (NRC or Commission), refusing to grant the Commonwealth a hearing and related relief to consider new and significant information arising from the radiological accident at the Fukushima Daiichi Nuclear Power Plants in Japan, and its relevance to the environmental risks of relicensing the Pilgrim nuclear power plant, before granting the Pilgrim plant a license extension for an additional twenty years.

Entergy Nuclear Generation Company and Entergy Nuclear Operations, Inc. (Pilgrim Nuclear Power Station), CLI-12-06, 75 NRC __ (March 8, 2012), Addendum (ADD-1) attached hereto; *see also Renewal of Full Power Operating License for the Pilgrim Nuclear Power Station* (May 25, 2012) ADD-36, and *Entergy Nuclear Generation Company and Entergy Nuclear Operations, Inc. (Pilgrim Nuclear Power Station), Renewed Facility Operating License, Renewed License No. DPR-35* (May 29, 2012) ADD-47, (collectively *Licensing Orders*).

This Court has jurisdiction pursuant to the Hobbs Act, 28 U.S.C. § 2342(4); the Administrative Procedure Act (APA), 5 U.S.C. § 702; and the Atomic Energy

Act (AEA), 42 U.S.C. § 2239(b). The appeals were timely filed pursuant to 28 U.S.C. § 2344 because, respectively, the first was docketed on April 9, 2012, within sixty days after issuance of CLI-12-06 on March 8, 2012 (12-1404); and the second was docketed on June 19, 2012, within sixty days after issuance of the Pilgrim Licensing Orders on May 25 and 29, 2012 (12-1772). By order dated June 22, 2012, the Court consolidated the two actions.

ISSUES PRESENTED FOR REVIEW

1. Did the NRC violate the National Environmental Policy Act (NEPA) and the APA a) by refusing to take a hard look at new and significant information concerning the environmental impacts and risks of relicensing the Pilgrim nuclear power plant; and b) by failing to supplement the Environmental Impact Statement for Pilgrim, before granting a twenty-year license extension?

2. Did the NRC violate the AEA by refusing to grant the Commonwealth a hearing on the material licensing issue concerning the environmental impacts and risks of relicensing the Pilgrim nuclear power plant before granting a twenty-year license extension?

STATEMENT OF THE CASE

A. STATUTORY FRAMEWORK

1. The National Environmental Policy Act

a. Statutory Purpose

The goal of the National Environmental Policy Act (NEPA), 42 U.S.C. §§ 4321-4347 is to focus attention on the possible environmental effects of proposed actions, which in turn furthers two important purposes: to ensure that agencies do not make decisions based upon incomplete information, and to provide information about environmental effects to the public and other governmental agencies in a timely fashion so that they have an opportunity to respond.

Town of Winthrop v. FAA, 535 F. 3d 1, 4 (1st Cir. 2008); *see also* 40 C.F.R. § 1500.1(c).

To accomplish these purposes, NEPA requires federal agencies to examine the environmental consequences of their actions *before* taking those actions, in order 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.” *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989). In short, NEPA requires that an “agency take a ‘hard look’ at the environmental consequences before taking a major [federal] action.” *Baltimore Gas & Elec. Co. v. Natural Res. Def. Council*, 462 U.S. 87, 97 (1983).

b. Environmental Impact Statement

An agency’s obligations under NEPA are “not discretionary, but are specifically mandated by Congress, and are to be reflected in the procedural

process by which agencies render decisions.” *Silva v. Romney*, 473 F.2d 287, 292 (1st Cir. 1973). The primary method by which NEPA ensures that its mandate is met is the “action-forcing” requirement for preparation of an Environmental Impact Statement (EIS), which assesses the environmental impacts of the proposed action and weighs the costs and benefits of alternative actions. *Robertson*, 490 U.S. at 350-51. Publication of an EIS is also intended to serve as an “environmental full disclosure law, providing information which Congress thought the public should have concerning the particular environmental costs involved in a project.” *Silva v. Lynn*, 482 F.2d 1282, 1285 (1st Cir. 1973). The environmental impacts that must be considered in an EIS include “reasonably foreseeable” impacts which have “catastrophic consequences, even if their probability of occurrence is low . . .” 40 C.F.R. § 1502.22(b)(4).

As part of the nuclear relicensing process, NRC regulations implementing NEPA also require a license renewal applicant, in a site specific EIS, to consider “alternatives for reducing adverse impacts” to mitigate severe accidents (severe accident mitigation alternatives or SAMAs). 10 C.F.R. § 51.53(c)(3)(iii); *see also* Final Rule, Environmental Review for Renewal of Nuclear Power Plant Operating Licenses, 10 C.F.R Part 51, 61 Fed. Reg. 28,467 - 28,480 (June 5, 1996).

Finally, after the NRC prepares a draft EIS, it must solicit comments from, among others, state environmental agencies and the public. 10 C.F.R. §§ 51.73;

51.74 A final EIS must respond to those comments. 10 C.F.R. § 51.91; *see also* 42 U.S.C. § 4321 *et seq.* (requiring an EIS whenever a major federal action may have a significant effect on the human environment).¹

c. Continuing Duty to Consider New Information

The completion of an EIS for a proposed action does not end an agency's responsibility to weigh the environmental impacts of a proposed action. *Marsh v. Oregon Natural Resources Council*, 490 U.S.360, 371-72 (1989). As the Supreme Court recognized in *Marsh*, it would be incongruous with NEPA's "action-forcing" purpose to allow an agency to put on "blinders to adverse environmental effects," just because the EIS has been completed. *Id.* at 371. Accordingly, up until the point when the agency is ready to take the proposed action, it must supplement the EIS if there is new information showing that the remaining federal action may affect the quality of the human environment "in a significant manner or to a significant extent not already considered . . ." *Id.* at 374. Thus, consistent with *Marsh*, NRC regulation 10 C.F.R. § 51.92(a)(2) requires that the NRC must supplement an EIS where there are "new and significant circumstances or

¹ An agency has the discretion to rely upon a generic (e.g. rulemaking), rather than a site specific, EIS to evaluate environmental impacts which are common to more than one federal action, but the generic determination must be "plugged into" the individual proceeding in which the issue arose. *Baltimore Gas & Elec. Co. v. Natural Resources Defense Council*, 462 U.S. 87, 100-01 (1983).

information relevant to environmental concerns and bearing on the proposed action or its impacts.”

2. The Atomic Energy Act

The Atomic Energy Act, 42 U.S.C. § 2011 *et seq.* (1992) (AEA), charges the NRC with ensuring that the generation and transmission of nuclear power “will provide adequate protection to the health and safety of the public.” AEA § 182, 42 U.S.C. § 2232(a); *see also* AEA § 103(b), 42 U.S.C. § 2133(b) (2005). The NRC acknowledges that public safety should be “the first, last, and a permanent consideration in any decision on the issuance of a construction permit or a license to operate a nuclear facility.” *See Power Reactor Dev. Co. v. Int'l Union of Elec., Radio & Mach. Workers*, 367 U.S. 396, 402 (1961)(citation omitted).

The NRC may issue a license to operate a nuclear power plant for a period of up to forty years and renew it upon the expiration of that period. AEA § 103(b)-(c), 42 U.S.C. § 2133(b)-(c) (2005); 10 C.F.R. Part 54. When the NRC issues or renews a license, it is required to “grant a hearing upon the request of any person whose interest may be affected by the proceeding.” 42 U.S.C. § 2239(a)(1)(A). The scope of the AEA hearing extends to all issues material to relicensing. *Union of Concerned Scientists v. U.S. Nuclear Regulatory Comm'n*, 735 F.2d 1437, 1439. (D.C. Cir. 1984).

B. CASE SUMMARY

In this action, the Commonwealth of Massachusetts requests this Court to reverse and remand CLI-12-06, and to vacate the Licensing Orders, in which the NRC refused to consider new and significant information submitted by the Commonwealth from the radiological accident at the Fukushima Daiichi nuclear power plants in Japan, or to complete its review of the lessons learned from that accident, before granting a license extension for the Pilgrim nuclear power plant for an additional twenty years. The NRC also refused to supplement the EIS for Pilgrim, based upon the lessons learned from Fukushima to date, which demonstrate that the NRC's planning for severe accidents at Pilgrim is inadequate and that additional mitigation measures are necessary to reduce these risks. The NRC then denied the Commonwealth a hearing on these material relicensing issues and denied the Commonwealth's motion to suspend the Pilgrim relicensing proceeding until the NRC completes an alternative rulemaking proceeding and applies its findings to the Pilgrim plant before granting the license extension. Before completing its own review of the lessons learned from Fukushima, or allowing the Commonwealth and the public an opportunity to participate in that process, the NRC then issued final Licensing Orders for the Pilgrim nuclear power plant.

By refusing to consider new and significant information concerning the increased environmental impacts and reasonable mitigation measures before – not after – relicensing the Pilgrim plant, and as part of the Pilgrim relicensing decision-making process, the Commission violated NEPA, denied the Commonwealth its AEA hearing right on these material relicensing issues, acted arbitrarily and capriciously in violation of the APA, and effectively ruled that any lessons learned from Fukushima, as may be applied to Pilgrim, shall be determined as a matter of unfettered agency discretion and outside of the public NEPA and AEA relicensing process for the Pilgrim plant.

The Commonwealth therefore requests this Court to reverse and remand CLI-12-06, and to order that the NRC consider these issues before deciding whether to relicense the Pilgrim plant for another twenty years. The Commonwealth also asks this Court to vacate the NRC's Licensing Orders to extend the license for the Pilgrim nuclear power plant unless and until the NRC considers the Commonwealth's new and significant information on the lessons learned from Fukushima in accordance with NEPA and the AEA, in either a site specific or generic hearing process, and applies those considerations and rulings to the individual Pilgrim relicensing proceeding, as may be modified by any further order of this Court.

STATEMENT OF FACTS

A. The Commonwealth's Initial Challenge to the Pilgrim License Renewal

In 1996, the NRC issued the License Renewal Generic Environmental Impact Statement (GEIS), in which it asserted that the environmental impacts of storing spent nuclear fuel in spent fuel pools (SFPs), to keep the highly radioactive fuel cool, can be determined generically for all U.S. nuclear power plants and that the impacts are small. 10 C.F.R. Part 51, Appendix B, Table B-1.

In 2006, based upon a series of expert reports, the Commonwealth filed contentions (challenges) with the Pilgrim and Vermont Yankee Atomic Safety and Licensing Boards disputing the NRC's conclusion and asserting that the NRC had failed to give due consideration to the risk of severe accidents involving spent fuel pools before deciding whether to relicense the Pilgrim and Vermont Yankee plants.

[T]he potential for severe pool accidents caused by intentional malicious acts and by equipment failures and natural disasters such as earthquakes is not only reasonably foreseeable, but is likely enough to qualify as a "design-basis accident," *i.e.*, an accident that must be designed against under NRC safety regulations. The ER [Environmental Report which is the foundation for the EIS] also fails to satisfy 10 C.F.R. § 51.53(c)(3)(iii) because it does not consider reasonable alternatives for avoiding or reducing the environmental impacts of a severe spent fuel accident, *i.e.*, SAMAs [Severe Accident Mitigation Alternatives]. Alternatives that should be considered

include re-racking the fuel pool with low-density fuel storage racks and transferring a portion of the fuel to dry storage.²

Following a lengthy proceeding, the NRC denied the Commonwealth's request for a site specific hearing and alternative generic rulemaking on the risk of severe accidents involving SFPs. The Commission concluded that no additional mitigation measures were needed to reduce the risk of severe SFP accidents, and that the NRC's generic findings in the 1996 License Renewal GEIS that SFP impacts are "small" "remain valid." Denial of Petitions for Rulemaking, 73 Fed. Reg. at 46,208 and 46,212 (August 8, 2008). JA- II-1203 and 1207.

In response to the NRC's rulings, the Commonwealth filed two judicial appeals.

First, the Commonwealth filed a judicial appeal in the First Circuit Court of Appeals. On procedural grounds, this Court denied the Commonwealth's appeal for failure to exhaust administrative remedies. *Massachusetts v. U.S. NRC*, at 132. However, in doing so, the First Circuit observed that:

NEPA does impose an obligation on the NRC to consider environmental impacts of the Pilgrim and Vermont Yankee license renewal before issuing a final decision . . . In theory, what fetters the agency's decision-making process and ensures ultimate compliance with NEPA is judicial review.

Id. at 130.

² Massachusetts Attorney General's Request for Hearing and Petition for Leave to Intervene (May 26, 2006). JA-I-656-657; see also *Massachusetts v. U.S. NRC*, 522 F.3d 115, 122-23 (1st Cir. 2008).

Second, following the subsequent denial of the Commonwealth's Rulemaking Petition by the Commission, the State of New York filed an appeal with the Second Circuit Court of Appeals.³ The Second Circuit Court of Appeals affirmed the NRC's decision to reject the Commonwealth's new and significant information on the increased risk of severe SFP accidents and the need to require additional mitigation measures to reduce those risks. *New York v. U.S. Nuclear Regulatory Commission*, 589 F.3d 551 (2nd Cir. 2009). In doing so, the Second Circuit did not apply the test of reasonableness generally applied to NEPA decisions. *Cf., e.g., United States v. Coalition for Buzzards Bay*, 644 F.3d 26, 38 (1st Cir. 2011) (agency failure to take hard look at environmental consequences and make reasoned finding showing compliance with NEPA is reversible error). Instead, the Court applied the standard of review for decisions denying rulemaking petitions, which it summarized as "so high as to be 'akin to non-reviewability.'" *NY v. U.S. N.R.C.*, 589 F.3d at 554 (quoting *Cellnet Comm'n, Inc. v. FCC*, 965 F.2d 1106, 1111 (D.C. Cir. 1992)).

³ Since the State of New York commented on the Commonwealth's rulemaking petition to the NRC, and was first to file a petition for review (in the Second Circuit) before the Commonwealth filed in the First Circuit, the rulemaking case was heard and decided by the Second Circuit Court of Appeals. See 28 U.S.C. § 2112(a).

B. The Accident at Fukushima

1. Commonwealth initial filings on lessons learned from Fukushima.

On March 11, 2011, an earthquake and tsunami initiated a severe accident involving four Nuclear Power Plants (NPPs) on the Fukushima Daiichi (Number 1) site in Japan, which included the loss of cooling and water makeup to the spent fuel pools, loss of power over multiple days, station blackout, and failed venting systems leading to increased pressure, explosion in the reactor buildings, core melt, and radioactive release.⁴

⁴ “The tsunami resulted in extensive damage to the site facilities and a complete loss of ac electrical power at Units 1 through 5, a condition known as station blackout (SBO)...cooling was lost to the fuel in [Units 1 – 3], resulting in damage to the nuclear fuel shortly after the loss of cooling...[t]he Unit 1, 2, and 3 explosions were caused by the buildup of hydrogen gas within the primary containment produced during fuel damage in the reactor...” U.S. Nuclear Regulatory Commission Task Force, Near-Term Review of Insights from the Fukushima Dai-ichi Accident: Recommendations for Enhancing Reactor Safety in the 21st Century (July 2011) (NRC Task Force Report). JA-III-2451. The Japanese government initially recommended that residents within a twelve-mile radius evacuate. Based upon a recommendation by the Nuclear Regulatory Commission, the American Embassy advised that Americans living within a fifty-mile radius should evacuate, an area with a population of about two million people. David E. Sanger, Matthew L. Wald and Hiroko Tabuchi, *U.S. Calls Radiation ‘Extremely High;’ Sees Japan Nuclear Crisis Worsening*, N.Y. Times, March 16, 2011.

On May 2, 2011, the Commonwealth filed with the Commission a request to suspend the Pilgrim relicensing proceeding, pending consideration of the new and significant information from Fukushima.⁵

On June 2, 2011, the Commonwealth filed a contention supported by its expert, Dr. Gordon Thompson, as well as a renewed request to stay the Pilgrim proceeding and related filings, based upon the lessons learned from Fukushima to date.⁶ In his report, Dr. Thompson identified six areas in which information that was then available regarding the Fukushima accident supported either conclusive (established) or provisional (likely) findings, including, based upon the direct experience of the accidents at Three Mile Island, Chernobyl, and Fukushima, that

⁵ Commonwealth of Massachusetts Response to Commission Order Regarding Lessons Learned from the Fukushima Daiichi Nuclear Power Station Accident, Joinder in Petition to Suspend the License Renewal Proceeding for the Pilgrim Nuclear Power Plant, and Request for Additional Relief (May 2, 2011). JA-II-1437.

⁶ *See e.g.* Commonwealth of Massachusetts' Conditional Motion to Suspend Pilgrim License Renewal Proceeding Pending Resolution of Petition for Rulemaking to Rescind Spent Fuel Pool Regulations (June 2, 2011). JA-II-1769; Commonwealth Contention Regarding New and Significant Information Revealed by the Fukushima Radiological Accident (June 2, 2011). JA-1759; Motion to Admit Contention and, if Necessary, to Re-Open Record Regarding New and Significant Information Revealed by Fukushima Accident (June 2, 2011). JA-II-1667; Petition for Waiver of 10 C.F.R. Part 51 Subpart A, Appendix B, or, in the Alternative, Petition for Rulemaking to Rescind Regulations Excluding Consideration of Spent Fuel Storage Impacts from License Renewal Environmental Review (June 2, 2011) ("Waiver Petition"). JA-II-1727; Gordon R. Thompson, Institute for Resource and Security Studies, New and Significant Information from the Fukushima Daiichi Accident in the Context of Future Operation of the Pilgrim Nuclear Power Plant (June 2011) ("Thompson 2011 Report"). JA-II-1679.

Entergy - which relied solely on a theoretical model in its relicensing application - had underestimated the likelihood of a severe accident at Pilgrim by an order of magnitude (a factor of ten). *See* Thompson 2011 Report, JA-II-1694-1695.

[B]ased on cumulative direct experience of NPP [Nuclear Power Plant] accidents, including the Fukushima accident, the Pilgrim licensee under-estimates reactor core damage frequency [CDF] by an order of magnitude. Thus, the licensee's SAMA [Severe Accident Mitigation Alternatives] analysis for Pilgrim should be re-done with a baseline CDF that is increased by an order of magnitude. In light of experience at Fukushima, the re-done SAMA analysis should encompass, among other SAMA options, measures to accommodate: (i) structural damage; and (ii) station blackout, loss of service water, and/or loss of fresh water supply, occurring for multiple days. *Id.* at JA-II-1707-1708.⁷

2. NRC Task Force Report on Fukushima

On March 23, 2011, to evaluate the lessons learned from Fukushima and their relevance for U.S. nuclear power plants, the NRC directed the establishment of the Near-Term Task Force to provide:

[a] systematic and methodical review of U.S. Nuclear Regulatory Commission 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, in light of the accident at the Fukushima Dai-ichi Nuclear Power Plant.

⁷ In part relying upon his 2006 report, Dr. Thompson also concluded, once again, that additional mitigation including dry cask storage should be considered for the Pilgrim spent fuel pool (SFP) to reduce the risk of severe accidents involving the SFP, and for the containment venting systems to be improved, including use of filtered vents, to reduce the risk of hydrogen explosion and radioactive release. *Id.* at JA-II-1706.

NRC Task Force Report. ADD-111 (excerpt), JA-III-2439.

On July 12, 2011, the Task Force issued its Report on the lessons learned to date from Fukushima, which included a number of significant recommendations to change NRC policies and practices for regulating U.S. nuclear plants, including changes to the regulatory system on which the NRC relies to make the safety findings that the AEA requires for licensing of reactors and to increase the level of safety that is minimally required for all nuclear plants in order to protect public health and safety:

In response to the Fukushima accident and the insights it brings to light, the Task Force is recommending actions, some general, some specific that it believes would be a reasonable, well-formulated set of actions *to increase the level of safety associated with adequate protection of the public health and safety.*

Id. at JA-III-2431, excerpt at ADD-115 (emphasis added).

In particular, the Task Force found that “the NRC’s safety approach is incomplete without a strong program for dealing with the unexpected, including severe accidents.” *Id.* at JA-III-2460. The Task Force also recognized that the great majority of the NRC’s current regulations do not impose mandatory safety requirements on severe accidents, and severe accident measures are adopted only on a “voluntary” basis or through a “patchwork” of requirements. *Id.*

The Task Force concluded:

While the Commission has been partially responsive to recommendations calling for requirements to address beyond-design-

basis accidents, the NRC has not made fundamental changes to the regulatory approach for beyond-design-basis events and severe accidents for operating reactors.

Id. at JA-III-2459.

Therefore, the Task Force recommended that the NRC incorporate some potential severe accidents into the “design basis,” subject them to mandatory safety regulations, and suggested that some severe accident mitigation measures should be adopted into the design basis, i.e., the set of mitigation measures adopted without regard to their cost which establish the minimum level of adequate protection required for all nuclear power plants. *Id.* excerpt at ADD-115 and 117, JA-III-2460 and JA-III-2462; *see also Union of Concerned Scientists v. NRC*, 824 F. 2d 108, 120 (D.C. Cir. 1987).

In support of and in parallel with its recommendations to upgrade the level of safety to address severe accidents, the Task Force also proposed a series of specific safety investigations, design changes, equipment upgrades, and improvements to emergency planning and operating procedures, *see* Task Force Report at JA-III-2511 – 2512; 2515 – JA-III-2517, including enhanced mitigation measures to reduce the risks of accidents involving spent fuel pools, *id.* at JA-III-2511 (#7) and “requiring reliable hardened vent designs in BWR [Boiling Water

Reactors] with Mark 1 [e.g. Pilgrim and Vermont Yankee] and Mark 2 containment designs.” *Id.* at JA-III-2511 (#5).⁸

3. Commonwealth Filings Re: NRC Task Force Report

On August 11, 2011, the Commonwealth filed a motion and a second expert report with the Pilgrim ASLB in order to supplement its contention, based upon the NRC Task Force Report, to provide additional new and significant information on the environmental impacts and risks of relicensing the Pilgrim plant.⁹ As Dr. Thompson explained, the findings of the NRC’s Task Force on Fukushima substantially overlap and are consistent with those previously submitted by the Commonwealth in its initial contention, including the need for the NRC to improve planning to address the risk of severe accidents and to require additional mitigation

⁸ In its Report, the Task Force found that no “imminent risk” was posed by operation or licensing such that the U.S. plants should be shut down immediately, *id.*, at JA-III-2460, excerpt at ADD-115, and that U.S. reactors meet the statutory standard for security, *i.e.*, they are “not inimical to the common defense and security.” *Id.* Notably, however, the Task Force did not report a conclusion that the continued licensing of reactors such as the Pilgrim Nuclear Power Plant would satisfy NEPA, without first addressing the lessons learned from the accident at Fukushima.

⁹ Commonwealth of Massachusetts Motion to Supplement Bases to Commonwealth Contention to Address NRC Task Force Report on Lessons Learned from the Radiological Accident at Fukushima (Aug. 11, 2011) JA-III-2535.

measures to reduce that risk,¹⁰ including mitigation of accidents involving spent fuel pools.¹¹

Based upon his 2006 and June 2012 reports, and as further supported by the NRC's own Task Force Report, Dr. Thompson concluded that the lessons learned from Fukushima presented new and significant information which required that the SAMA analysis for the Pilgrim plant, and the Pilgrim-specific supplement to the GEIS (Generic EIS) for license renewal, were inadequate and should be redone. *Id.* at Section IV, ADD-124.

4. Pilgrim ASLB Decision

On November 28, 2011, a Majority of the Pilgrim ASLB denied admission of the Commonwealth's contention, holding that the Commonwealth's contention did not present new and significant information and did not satisfy any of the NRC's nineteen standards for admissibility, late filing, and reopening a closed record (collectively "late-filed" contention standards). In so doing, the Majority evaluated and rejected the merits of the Commonwealth's expert opinion – at the

¹⁰ Declaration of Gordon R. Thompson Addressing New and Significant Information Provided by the NRC's Near-Term Task Force Report on the Fukushima Accident (Aug. 11, 2011). JA-III-2551, ADD-118; ¶ II-3 (severe accidents) ADD-120; ¶¶ III-2 and III-3 (rely upon direct experience of nuclear accidents as part of risk analysis), ADD-121.

¹¹ *Id.* at ¶¶ III-4 and III-5, ADD-121-122; ¶¶ III-10 and III-11 (mitigation of spent fuel pool accidents), ADD-122 - ADD-123; see also *id.* at ¶¶ III-8 and III-9, ADD-122; ¶¶ III-12 and III-13, ADD-123 (improve hardened venting systems at the containment, and consider other mitigation measures including filtration, to reduce the risk of hydrogen explosion and radioactive release).

contention admission stage of the proceeding and without a hearing – on the need to revise SAMAs and provide additional mitigation measures for the Pilgrim plant.¹² The Pilgrim ASLB Majority also disregarded the findings of the NRC’s own Task Force on Fukushima.

We note the Commonwealth has observed the Near-Term Task Force Report’s suggestion that some severe accidents should be included in the design basis [for Pilgrim and other plants; citation omitted] but that result must await scientific investigation and its outcome.

Id. at ADD-200 n.230. Therefore, the ASLB Majority concluded that no hearing on the Commonwealth’s concerns was warranted.

Judge Young concurred only in the Majority Decision result, finding, based upon the Commission’s prior determination in CLI-11-05, that it would be “premature” to reach issues arising from Fukushima raised by the Commonwealth’s contention.¹³ However, she expressly did not adopt the

¹² See, e.g., *In the Matter of: Entergy Nuclear Generation Company And Entergy Nuclear Operations, Inc. (Pilgrim Nuclear Power Station)*, LBP-11-35 (November 28, 2011) at ADD-195 (Denying Commonwealth of Massachusetts’ Request for Stay, Motion for Waiver, and Request for Hearing on A New Contention Relating to Fukushima Accident) ADD-136 (report and declarations of the Commonwealth’s expert amount to only a “bare conclusory statement” and fail to show that other SAMAs “would have been considered”), ADD-195 and (“there is presently absolutely no information presented from the Fukushima accidents that has been indicated to have any impact on the Pilgrim Plant or its environmental impact . . .”). ADD-206.

¹³ *Id.* at ADD- 209 (citing to *Union Electric Company d/b/a/ Ameren Missouri (Callaway Plant, Unit 2) et al.*, (CLI-11-05) (September 9, 2011) [hereinafter CLI-11-05] JA-III-2671.) The Commission issued CLI-11-05 on September 9, 2011, in which the Commission found that it would be “premature” to conduct a NEPA

reasoning of the Majority Decision. Instead, she concluded that “information from Fukushima is clearly ‘new’ information” and that the Commonwealth had shown “at least some likelihood” that the information on Fukushima could lead to significantly different analysis of environmental consequences of renewing the Pilgrim operating license. ADD-211, 213. Judge Young concluded that, while the Commonwealth’s contention may not yet be ripe as ordered by the Commission in CLI-11-05, “...it would appear that Fukushima-related issues must be addressed in some manner in this proceeding prior to its conclusion and a final determination on the license renewal request . . .” ADD-213 n.13.

On December 8, 2011, the Commonwealth filed a Petition for Review of the Pilgrim ASLB decision with the Commission. JA-III-2893.

5. NRC Staff Proposed Orders on Lessons Learned from Fukushima

On February 17, 2012, while the Commonwealth’s Pilgrim appeal was pending before the Commission, the NRC Staff submitted a series of proposed orders to the Commission - based upon the findings of the same NRC Task Force report on Fukushima relied upon by the Commonwealth - “to redefine the level of

analysis based upon the lessons learned from Fukushima because “the full picture of what happened at Fukushima is still far from clear,” CLI-11-05 at JA-III-2700, and denied requests to suspend relicensing proceedings and related relief in about twenty relicensing proceedings from around the country. *Id.* at JA-III-2711 – 2712. However, the Commission specifically did not rule upon the Commonwealth’s contention filings, reserving that decision in the first instance for later decision by the Pilgrim ASLB. *Id.* at JA-III-2706 n.122.

protection regarded as adequate pursuant to [NRC regulations] and require actions of licensees [including the Pilgrim licensee] to meet that new level of protection.”¹⁴ The NRC Staff thus proposed additional mitigation strategies to address beyond design basis (i.e. severe) accidents,¹⁵ including accidents involving spent fuel pools;¹⁶ and to require reliable hardened vents in BWR Mark 1 (e.g. Pilgrim) and other containments.¹⁷

Collectively, these three orders proposed some, but not all, of the mitigation measures for which the Commonwealth had sought a hearing as part of the Pilgrim relicensing process. For example, with resistance from industry, the NRC excused U.S. nuclear plants from requiring some of the more effective mitigation measures proposed by the Commonwealth’s expert for consideration: lowering the density of the fuel in spent fuel pools and utilizing dry cask storage to reduce the risk of spent fuel pool fire; *Staff Proposed Orders* at JA-III-3039; *cf.* ; JA-I-657, JA-II-1706 and *Mass. v. U.S. NRC*, 522 F.3d at 122-123, and adding vent filters to reduce radiation release in the event of a severe accident. *Staff Proposed Orders* at JA-III-3039.

¹⁴ JA-III-3041; see also ADD-32 n.145 (Commission citing *Proposed Orders and Requests for Information in Response to Lessons Learned from Japan’s March 11, 2011, Great Tohoku Earthquake and Tsunami* (February 17, 2012)(JA-III-3035)).

¹⁵ *Order Modifying Licenses with Regard to Requirements For Mitigation Strategies For Beyond-Design-Basis External Events* (Effective Immediately) (February 17, 2012). JA-III-3071.

¹⁶ *Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation* (Effective Immediately) (February 17, 2012) JA-III-3097.

¹⁷ *Order Modifying Licenses with Regard to Reliable Hardened Containment Vents* (Effective Immediately) (February 17, 2012) JA-III-3051.

(“[S]taff has encouraged licensees to consider the potential for the later addition of filters.”); *cf.* 2011 Thompson Supplemental Declaration at 6 (¶III-13), ADD-123.

6. Commission Denial of Commonwealth Petition

On March 8, 2012, the Commission denied the Commonwealth’s petition for review, finding that the Commonwealth had not satisfied any of the NRC’s late-filed standards for contention admission.¹⁸ The Commission also found that the Commonwealth had not raised a ‘significant environmental issue’ and that the “direct experience” of Fukushima, Chernobyl, and Three Mile Island -- suggesting that Entergy had underestimated the risk of a severe accident involving the Pilgrim plant by an order of magnitude -- failed to demonstrate the inadequacy of Entergy’s theoretical model of risk (Probabilistic Risk Assessment) which predicted that an accident like Fukushima was unlikely to happen. CLI-12-06 at ADD-21. In rejecting the Commonwealth’s “direct experience” methodology, the Commission never explained why the single “direct experience” of Fukushima nevertheless was adequate to support the recommendations of the NRC’s own Task Force to increase the level of safety at U.S. nuclear plants.¹⁹

¹⁸ *See e.g.* CLI-12-06 at ADD-19.

¹⁹ The Commission also concluded that the Commonwealth was late in raising Chernobyl and TMI as real world events to challenge Entergy’s theoretical model because they had happened years before, and could not be reconsidered as “new” even in combination with the new information from Fukushima. *Id.* at ADD-21 n.99.

In summary, the Commission concluded that the Commonwealth had failed to meet its “heavy burden” to satisfy NRC “late-filed” contention standards and obtain a hearing on the lessons learned from Fukushima. *Id.* at ADD-19. As the Commission explained: “[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.” *Id.*

While concluding that the Commonwealth was not entitled to a site specific hearing on the lessons learned from Fukushima prior to relicensing the Pilgrim plant for an additional twenty years, the Commission similarly found that the Commonwealth was not entitled to a generic (i.e. rulemaking) hearing process before the Commission granted the Pilgrim license extension. “[W]e have already considered and rejected the notion that our Fukushima lessons-learned review needs to be completed prior to a decision on any pending license renewal application.” *Id.* at ADD-30.²⁰

On March 12, 2012, four days after denying the Commonwealth’s request for a public NEPA process and an AEA hearing on the lessons learned from Fukushima and their relevance for the Pilgrim plant, the Commission issued in

²⁰ *Id.* at ADD-30. (denying the Commonwealth’s request to suspend the Pilgrim proceeding pending a decision on the Commonwealth’s alternative request for rulemaking on spent fuel pool issues).

substantially similar form the NRC Staff's proposed orders to Pilgrim and other U.S. nuclear plants, to address the risk of severe accidents and to require some additional mitigation measures, based upon the same NRC Task Force Report which the Commission had determined was inadequate to support admission of the Commonwealth's NEPA contention.²¹ In issuing the orders, the Commission noted that "[t]he events at Fukushima highlight the possibility that extreme natural phenomena could challenge the prevention, mitigation, and emergency preparedness defense in depth layers," Severe Accident Order (cover page) at JA-III-3125, ADD-125 (excerpt), and that "these [mitigation] measures are necessary to ensure adequate protection of public health and safety." *Id.* at JA-III-3134, ADD-133 (excerpt).²²

²¹ *Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events* (March 12, 2012) (Severe Accident Order). JA-III-3125, ADD-125 (excerpt); *see also Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation* (March 12, 2012) JA-III-3163, ADD-134 (excerpt); *Issuance of Order to Modify Licenses with Regard to Reliable Hardened Containment Vents* (March 12, 2012). (JA-III-3203, ADD-135 (excerpt).

²² In denying the Commonwealth's petition, the Commission cited to the NRC Staff's proposed orders to the Commission on these issues. CLI-12-06 at JA-I-32, n.145, ADD-32. The Commonwealth therefore requests that the Court take judicial notice that the Commission subsequently issued these orders in substantially similar form as proposed by the NRC Staff. *See* Fed. R. Ev. 201 (b)(2) (court may judicially notice a fact that is not subject to reasonable dispute); *Aguilar v. U.S. Immigration & Customs Enforcement Div. of Dept. of Homeland Sec.*, 510 F.3d 1, 8 n.1 (1st Cir. 2007) (Judicial notice allows circuit courts (on their own or by party request) to supplement the record with facts that meet Rule 201.).

On May 29, 2012, the NRC issued a twenty-year license extension for the Pilgrim nuclear power plant. JA-I-47, ADD-44.

Ten days after the NRC issued the Pilgrim license renewal, the D.C. Circuit Court of Appeals vacated the NRC's Waste Confidence Decision (WCD) and the NRC's final rule regarding Consideration of Environmental Impacts of Spent Fuel After Cessation of Reactor Operation (Temporary Storage Rule or TSR), including the Commission's generic finding that spent fuel pool fires are sufficiently unlikely as to pose no significant environmental threat. *State of New York v. NRC*, No. 11-1045 (D.C. Cir. June 8, 2012).²³ The Court concluded that “[o]verall, we cannot defer to the Commission’s conclusions regarding temporary storage [of spent nuclear fuel] because the Commission did not conduct a sufficient [NEPA] analysis of the environmental risks” and that the NRC’s “analysis is plagued by a failure to examine the consequences of pool fires in addition to the probabilities.” *Id.* at slip op. 20, 18. In response, the Commission noted that “[w]aste confidence undergirds certain agency licensing decisions, in particular new reactor licensing and reactor license renewal,” and concluded that “we will not issue licenses dependent upon the Waste Confidence Decision or the Temporary Storage Rule until the Court’s remand is appropriately addressed.” *In the Matter of Calvert*

²³ The Court’s mandate has not yet issued.

Cliffs Nuclear Power Project, LLC (Calvert Cliffs Nuclear Power Plant, Unit 3), et. al., CLI-12-16 (August 7, 2012) Sl. Op. at 4. (ML12220A099).²⁴

SUMMARY OF THE ARGUMENT

In this action, the Commonwealth presented new and significant information on the lessons learned from the radiological accident at Fukushima, including an independent expert report and the NRC's own Task Force report on Fukushima, which demonstrates that the risk of a severe accident at the Pilgrim nuclear power plant is substantially greater than is reflected in Entergy's license renewal application, that the NRC's planning for severe accidents is inadequate, and that additional Severe Accident Mitigation Alternatives or SAMAs should be considered for Pilgrim to reduce the risk. The Commonwealth also requested the NRC to take a hard look at this new and significant information and to supplement the Pilgrim Environmental Impact Statement before deciding whether to grant the Pilgrim license extension.

The Commission denied the Commonwealth's hearing and related requests in CLI-12-06 to consider this new and significant information because, according to the Commission, the information from Fukushima was too undeveloped or

²⁴ NRC uses ML accession numbers for documents in its "Electronic Reading Room." To find documents, one may use the agency's search engine known as Agency-wide Documents Access and Management System (ADAMS) at <http://www.nrc.gov/reading-rm/adams.html#web-based-adams>.

“inchoate” to support a NEPA analysis. However, the Commission never discussed its own Task Force Report on Fukushima which concluded that the information from Fukushima to date was clear and compelling enough to require that the level of safety should be increased for Pilgrim and other U.S. nuclear plants and that additional mitigation measures should be ordered immediately for those plants to reduce the risk of severe accidents.

The Commission also never explained why it made sense to deny the Commonwealth’s request for a NEPA and AEA hearing on this new and significant information, when the Commission simultaneously – and outside the public Pilgrim relicensing proceeding – relied upon the same Task Force Report to order some additional mitigation measures to reduce the risk of severe accidents at Pilgrim and other plants – although not all of the measures requested by the Commonwealth. The Commission then refused to complete its review of the new and significant information from Fukushima before granting the twenty-year license extension for the Pilgrim plant.

By these procedural maneuvers, the NRC failed to meet NEPA’s requirement to ensure that it will take a “hard look” at the new and significant information that bears on the environmental impacts of the proposed action. *Marsh*, 490 U.S. at 371-372. The NRC also failed to satisfy NEPA’s basic requirement to consider the environmental concerns in a timely way, i.e., before

taking the major federal action that is proposed, *Robertson*, 490 U.S. at 349, and violated NEPA and acted arbitrarily by failing to supplement the Pilgrim EIS in a public process. 10 C.F.R. § 51.92(a)(2); 10 C.F.R. §§ 51.73 - 51.74.

Similarly, under the AEA, interested members of the public have the right to be heard on all material licensing issues, including the question of whether the NRC has complied with its NEPA duties. 42 U.S.C. § 2239(a); *Union of Concerned Scientists v. NRC*, 735 F.2d at 1439. In this case, the Commission violated the AEA's nondiscretionary hearing requirement by failing to grant the Commonwealth's hearing requests either (a) in the individual license renewal proceeding for Pilgrim or (b) in an alternative rulemaking proceeding, and "plug in" its results, before granting a twenty-year license extension for the Pilgrim plant. *Baltimore Gas & Electric Co*, 462 U.S. at 101.

STANDARD OF REVIEW

Under the Administrative Procedure Act, a reviewing court must "hold unlawful and set aside agency action, findings and conclusions found to be arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." *Dubois v. U.S. Dept. of Agriculture*, 102 F.3d 1273, 1284 (1st Cir. 1996) (quoting 5 U.S.C. § 706(2)(A)). Errors of law are reviewed "*de novo*," with the court deciding "relevant questions of law." *Id.* (quoting *Howard v. FAA*, 17 F.3d

1213, 1215 (9th Cir. 1994)). Legal conclusions are judged under a standard of reasonableness. *Sierra Club v. Marsh*, 769 F.2d 868, 873 (1st Cir. 1985).

An agency decision is arbitrary and capricious where it fails to make “a reasoned evaluation of the relevant factors.” *Marsh*, 490 U.S. at 378. An agency may also “exceed grants of discretion – even ringing grants of broad, essentially standardless discretion – in various ways” including where an agency “neglect[s] to consider a significant factor that appropriately bears on the discretionary decision . . . [or] mak[es] a clear judgmental error in weighing [the relevant factors].” *Henry v. I.N.S.*, 74 F.3d 1, 4 (1st Cir. 1996).

Finally, while courts defer to agency factual decisions, the degree of deference owed by the court depends on the extent to which the agency’s decision involves exercise of the agency’s scientific expertise. *Puerto Rico Aqueduct & Sewer Author. v. EPA*, 35 F.3d 600, 604 (1st Cir. 1994). The more a factual decision depends on legal determinations, the less deference is required. *Id.*; see also *Dubois*, 102 F.3d at 1285, (citing *Citizens Awareness Network*, 59 F.3d 284, 290 (1st Cir. 1995))(Court must conduct a “searching and careful” inquiry, satisfying itself that the agency’s decision “makes sense”).

ARGUMENT

I. THE NRC VIOLATED NEPA AND ACTED ARBITRARILY AND CAPRICIOUSLY BY REFUSING TO TAKE A HARD LOOK AT THE LESSONS LEARNED FROM FUKUSHIMA, OR TO SUPPLEMENT THE ENVIRONMENTAL IMPACT STATEMENT FOR THE PILGRIM PLANT, BEFORE GRANTING A TWENTY YEAR LICENSE EXTENSION.

A. The NRC violated NEPA by failing to complete its hard look review of the lessons learned from Fukushima, and by excluding the Commonwealth and the public from that review, before relicensing the Pilgrim plant.

In reviewing an agency decision declining to supplement an EIS, the court should determine 1) “whether the agency took a ‘hard look’ at the possible effects of the proposed action;” and 2) “if such a hard look has been taken, the court must ask whether the agency decision was arbitrary and capricious.” *Village of Grand View v. Skinner*, 947 F. 2d 651, 657 (2nd Cir. 1991); *Hughes River Watershed Conservancy v. Johnson*, 165 F.3d 283, 286 (4th Cir. 1999). The agency is required to take a hard look at new information on the potential environmental effects of a proposed action even if it later determines that the information would not change the EIS. *Marsh*, 490 U.S at 385 (agency required to take hard look “regardless of its eventual assessment of the significance of this information.”).²⁵

²⁵ To evaluate whether an agency “took a ‘hard look’ at the new information,” in order to determine whether supplemental NEPA analysis was necessary, courts consider “whether the agency obtains opinions from its own experts, obtains opinions from experts outside the agency, gives careful scientific scrutiny, responds to all legitimate concerns that are raised, . . . or otherwise provides a reasoned explanation for the new circumstance's lack of significance.” *Southern Utah Wilderness Alliance v. Norton*, 301 F.3d 1217, 1238-39 (10th Cir. 2002),

In this case, the Commonwealth presented new and significant information to the NRC on the environmental impacts of relicensing the Pilgrim plant based upon the Commonwealth's independent expert report and the NRC's own Task Force Report that found:

As new information and new analytical techniques are developed, safety standards need to be reviewed, evaluated and changed, as necessary, to insure that they continue to address the NRC's requirements to provide reasonable assurance of adequate protection of public health and safety. The Task Force believes, based upon its review of the information currently available from Japan and the current regulations, that the time has come for such change.

Task Force Report at JA-III-2460, excerpt at ADD-115.

The NRC itself confirmed the significance of the Task Force recommendations by relying upon them to propose and then implement immediately effective orders to require Pilgrim and other U.S. nuclear plants to provide additional mitigation measures to reduce the risk of severe accidents – even while rejecting the Commonwealth's request to take a hard look at this information as part of the public relicensing process for Pilgrim under NEPA. Thus the Commonwealth not only demonstrated that the lessons learned from Fukushima *could* alter the environmental impacts of relicensing and *could* require

rev'd on other grounds, 542 U.S. 55 (2004) (quoting *Headwaters Inc. v. Bureau of Land Mgmt., Medford Dist.*, 914 F.2d 1174, 1177 (9th Cir. 1990) and *Hughes River Watershed Conservancy v. Johnson*, 165 F.3d 283, 288 (4th Cir. 1999)) (internal citations omitted); *see also Natural Resource Defense Council, Inc. v. F.A.A.*, 564 F.3d 549, 561 (2nd Cir. 2009).

additional mitigation measures, but the NRC’s own actions confirm that the lessons learned from Fukushima to date have changed NRC practices to consider the risk of severe accidents at Pilgrim and other U.S. nuclear plants and have required additional mitigation measures to reduce these risks.²⁶

As Judge Young of the Pilgrim ASLB noted:

The accident at Fukushima happened, and it happened at reactors of the same model as the Pilgrim reactor. In this light, not to consider information concerning the *severe accident* at the Fukushima plant as ‘new’ information that is relevant to the Pilgrim SAMA analysis – the *severe accident* mitigation alternatives analysis[under NEPA] – including those aspects of it that concern containment failure, offsite consequences, and the functioning and use of the DTV, would seem to be short-sighted, if not indeed absurd.²⁷

Yet notwithstanding the conceded significance of the lessons learned from Fukushima, the NRC refused to complete its hard look review of those lessons

²⁶ The NRC Task Force findings focus upon “the NRC’s requirements to provide reasonable assurance of adequate protection of public health and safety,” Task Force Report at JA-III-2460, ADD-115, in order to satisfy the NRC’s regulatory obligation “to provide adequate protection to the health and safety of the public” under the AEA. 42 U.S.C. § 2232(a). The NRC’s AEA safety findings substantially overlap with the environmental impacts that the NRC also is required to address under NEPA, because the degree to which a project may affect public health and safety is a major consideration under NEPA. See 40 C.F.R. § 1508.27 (b)(2)(“significance” of impacts under NEPA includes “[t]he degree to which the proposed action affects public health or safety”); see also 40 C.F.R. §1508.14 (the term “human environment” “shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment.”).

²⁷ *Entergy Nuclear Generation Co. (Pilgrim Nuclear Power Station)*, LBP-11-23, 74 N.R.C. ____ (Sept. 8, 2011) (Young, J., concurring in part and dissenting in part) (slip op. at 3)(emphasis original),(ML11251A206).

before granting a twenty-year license extension for the Pilgrim plant. CLI-12-06 at JA-I-31, ADD-31 (“Our review of the events at Fukushima Dai-ichi is ongoing.”); *id.* at CLI-12-06 at JA-I-30, ADD-30 (“[W]e have already considered and rejected the notion that our Fukushima lessons-learned review needs to be completed prior to a decision on any pending license renewal application.”).

By failing to complete its review, the Commission violated its nondiscretionary duty to take a hard look at new and significant information on the lessons learned from Fukushima before – not after – relicensing the Pilgrim plant for another twenty years. *Massachusetts v. NRC*, 522 F. 3d at 130 (“NEPA does impose an obligation on the NRC to consider environmental impacts of the Pilgrim [] license renewal before issuing a final decision.”); *Baltimore Gas*, 462 U.S. at 97 (NEPA requires an agency to “take a ‘hard look’ at the environmental consequences before taking a major action.”); *Robertson*, 490 U.S. at 349. The Commission’s promise to complete that process in the future does not excuse the present violation. *Southern Utah Wilderness Alliance*, 301 F.3d at 1239 (agency assertion that it “hopes to fulfill, or even will fulfill, its NEPA obligations in the future does not address its current failures to act.”).

Moreover, to the extent the NRC has already considered the lessons learned to date from Fukushima, it did so outside of the public NEPA process, without allowing the Commonwealth the right to comment upon and contest the need for

additional mitigation at Pilgrim, and without supplementing the Pilgrim EIS (discussed *infra.*). The NRC thereby granted a twenty-year license extension for the Pilgrim plant in complete disregard of the public notice and participation requirements of NEPA and without completing its hard look review. *Town of Winthrop v. FAA*, 535 F. 3d 1, 4 (the two important purposes of NEPA are “to ensure that agencies do not make decisions based on incomplete information” and “to provide information about environmental effects to the public and other governmental agencies in a timely fashion so that they have an opportunity to respond.”); *see also Natural Resources Defense Council, Inc. v. Callaway*, 524 F.2d 79, 92 (2nd Cir. 1975)(holding that “the critical agency decision” must be made after the new information has been considered in good faith; otherwise “the process becomes a useless ritual, defeating the purpose of NEPA, and rather making a mockery of it.”).

The NRC thus “skirt[ed] NEPA,” and “essentially exempt[ed] a licensee from regulatory compliance, . . . [which] is manifestly arbitrary and capricious.” *Citizens Awareness Network*, 59 F.3d at 293; *see also Public Service Co. of New Hampshire v. U.S. Nuclear Regulatory Commission*, 582 F. 2d 77, 81 (1st Cir. 1978)(“NEPA’s mandate has been given strict enforcement in the courts, with frequent admonitions that it is insufficient to give mere lip service to the statute and then proceed in blissful disregard of its requirements.”).

B. The NRC violated NEPA and acted arbitrarily and capriciously by refusing to supplement the Pilgrim EIS

1. The NRC's finding that it lacked sufficient information to supplement the Pilgrim EIS is arbitrary and refuted by the record.

The NRC is required to supplement the EIS for the Pilgrim plant where new information “provides a *seriously* different picture of the environmental landscape.” *Nat’l Comm. for the River v. FERC*, 373 F. 3d 1323, 1330 (D.C. Cir. 2004) (emphasis in original). The Commission’s action in relying upon the Task Force Report on the lessons learned from Fukushima to increase safety and order additional mitigation at Pilgrim and other U.S. nuclear plants essentially conceded that that information meets this standard, and requires the NRC to supplement the Pilgrim EIS. 10 C.F.R. 51.92 (a)(“NRC staff will prepare a supplement to a final environmental impact statement . . . , if (2) [t]here are new and significant circumstances or information relevant to the environmental concerns and bearing on the proposed action or its impacts.”); *see also* 40 C.F.R. § 1508.27 (discussing “significance” of information under NEPA).

However, in denying the Commonwealth’s petition for NEPA review and a hearing on the lessons learned from Fukushima, the Commission claimed that it was not obligated under NEPA to supplement the EIS prior to relicensing Pilgrim

because the NRC “do[es] not have sufficient information at this time to make a significant difference in the Pilgrim environmental review . . . [NEPA] does not, however, require that we wait until inchoate information matures into something that later might affect our review.” CLI-12-06 at JA-I-32, ADD-32. The Commission’s rationale is not credible given the specific recommendations of the NRC’s own Task Force to increase safety based upon the direct experience of Fukushima, and the Commission’s reliance upon those same recommendations to order immediate changes to NRC practices and policies to address severe accidents at Pilgrim and other U.S. nuclear plants.²⁸

Therefore, the Commission’s excuse for refusing to supplement the Pilgrim EIS and comply with NEPA does not “make sense” and is arbitrary and capricious.

²⁸ See e.g. Task Force Report at JA-III-2440, ADD-112 (excerpt) (“The Task Force concluded that the Fukushima Dai-ichi accident similarly provides new insights regarding low-likelihood, high-consequence events that warrant enhancements to defense-in-depth on the basis of redefining the level of protection that is regarded as adequate.”); and JA-III-2441, ADD-113 (“Enhancing Mitigation”); *cf.* Commonwealth expert report (August 11, 2011) at ADD-124 (“[T]he Task Force report provides new and significant information that supports both sets of findings in the Thompson 2011 report...The Thompson 2011 report’s findings on six, Pilgrim specific issues show that the existing SAMA [severe accident mitigation alternatives] analysis for the Pilgrim plant should be entirely redone...the Pilgrim-specific supplement to the GEIS [Generic Environmental Impact Statement] for the license renewal of nuclear power plants should be redone.”); *cf.* Severe Accident Order (March 12, 2012) at JA-III-3073-3074, ADD-129-130 (“NRC’s assessment of new insights from the events at Fukushima Dai-ichi leads the staff to conclude that additional requirements must be imposed upon Licensees or CP holders to increase the capability of nuclear power plants to mitigate beyond design basis events. These additional requirements are needed to provide adequate protection to public health and safety, as set forth in Section III of this Order.”).

Dubois 102 F. 3d at 1285, (citing *Citizens Awareness Network*, 59 F. 3d at 290); see also *Henry v. I.N.S.*, 74 F. 3d at 4 (agency may abuse discretion where it “neglect[s] to consider a significant factor” or makes a “clear judgmental error” in weighing the relevant factors). The Commission also seeks to justify its failure to comply with NEPA by stating that the Commonwealth did not meet its “heavy burden” to satisfy any of the NRC’s late-filed standards for admissibility of the Commonwealth’s NEPA contention. See CLI-12-06 at JA-I-19. ADD-19.

However, the Commission fails to recognize that the burden is on the NRC – not the Commonwealth – to comply with NEPA. *Dept. of Transportation v. Pub. Citizen*, 541 U.S. 752, 765 (2004) (“the agency bears the primary responsibility to ensure that it complies with NEPA”); *United States v. Coalition for Buzzards Bay*, 644 F. 3d 26, 34(1st Cir. 2011) (burden of ensuring NEPA compliance rests with the agency that is proposing the action and not with those who wish to challenge that action). See also *Dubois v. U.S. Dept. of Agric.*, 102 F.3d at 1291 (“[T]he purpose of public participation regulations is simply to ‘provide notice’ to the agency. . . . NEPA requires the agency to try on its own to develop alternatives that will ‘mitigate the adverse environmental consequences’ of a proposed project.” (Quoting *Robertson*, 490 U.S. at 351)).²⁹

²⁹ Moreover, the Commission’s finding that the Commonwealth did not meet the NRC standards for contention admissibility is irrational, given the NRC’s own actions in relying upon the same Task Force Report to change NRC practices to

Similarly, the NRC does not have the discretion to rely upon heightened admissibility standards under its regulations as a means to avoid complying with NEPA. *Calvert Cliffs Coordinating Comm. v. AEC*, 449 F. 2d 1109, 1115 (D.C. Cir. 1971) (NEPA’s duties “must be complied with to the fullest extent, unless there is a clear conflict of *statutory* authority.”)(emphasis in original); *Silva v. Romney*, 473 F.2d at 292 (agency has a nondiscretionary obligation to comply with NEPA).³⁰

2. The NRC’s failure to provide a reasoned explanation for its refusal to supplement the Pilgrim EIS is arbitrary and capricious.

The Commission provides virtually no explanation for finding – outside of the public relicensing process for Pilgrim – that the Task Force report is sufficient to support fundamental changes to the NRC’s approach to increase safety and mitigate severe accidents, while within the public relicensing proceeding that same

mitigate the risk of severe accidents. At a minimum, the Commonwealth’s expert supported supplemental contention raised a “genuine dispute that could materially affect the ultimate conclusions of the SAMA cost-benefit analysis,” and the Commonwealth is entitled to a hearing - site specific or generic rulemaking - to resolve that dispute prior to relicensing. *Entergy Nuclear Generation Co. (Pilgrim Nuclear Power Station)*, CLI-09-11, 7 NRC at 7 (June 4, 2009)(ML091550806).

³⁰ To the extent the Commission also suggests that it can be excused from complying with NEPA because the lessons learned from Fukushima are generic and not Pilgrim specific, *cf.* CLI-12-06 at JA-I-32, ADD-32 (the NRC “do[es] not have sufficient information at this time to make a significant difference in the *Pilgrim* environmental review”), that interpretation of NEPA is erroneous as a matter of law. NEPA requires the NRC to consider the environmental impacts of its actions before taking that action, whether or not the information is site specific or generic to multiple plants. *Baltimore Gas & Elec. Co.*, 462 U.S. at 96.

information remains “inchoate” and cannot support a NEPA analysis. *See* CLI-12-06 at JA-I-32, ADD-32. Indeed, in denying the Commonwealth’s petition, the Commission provides virtually no discussion of the Task Force’s recommendations at all, instead focusing almost exclusively on criticizing the Commonwealth’s expert. The NRC thereby acted arbitrarily and capriciously by failing to provide “a reasoned evaluation of the relevant factors.” *Marsh*, 490 U.S. at 378 (quoting *Citizens to Preserve Overton Park, Inc. v. Volpe*, 401 U.S. 402, 416 (1971)); *see also Burlington Truck Lines, Inc. v. United States*, 371 U.S. 156, 168 (1962)(agency must “articulate [a] rational connection between the facts found and the choice made.”).³¹

Because the NRC has authority over nuclear power plant operations with potentially catastrophic impacts, it is particularly important that the Commission explain the basis for its decisions. *Am. Lung Ass’n v. E.P.A.*, 134 F.3d 388, 392 (D.C. Cir. 1998) (“Congress has delegated to an administrative agency the critical task of assessing the public health and the power to make decisions of national

³¹ Since Dr. Thompson’s conclusions substantially overlap and support those of the NRC’s own Task Force, 2011 Thompson Supplemental Declaration at JA-III-2553-2556, ADD-121-123, the Commission’s criticisms of the Commonwealth’s expert are inconsistent with the NRC’s support for the Task Force’s findings and are not well reasoned. *Cf. Citizens Awareness Network*, 59 F. 3d at 292. (Court criticizing the “Commission’s failure to provide any explanation for its seemingly irrational change in policy.”)

import . . . , that agency has the heaviest of obligations to explain and expose every step of its reasoning.”). This the Commission failed to do.

II. THE NRC VIOLATED THE ATOMIC ENERGY ACT BY FAILING TO GRANT THE COMMONWEALTH A HEARING ON THE NEW AND SIGNIFICANT INFORMATION FROM FUKUSHIMA AND ITS RELEVANCE TO THE ENVIRONMENTAL IMPACTS OF RELICENSING THE PILGRIM PLANT.

Section 189a of the AEA requires the NRC to provide a hearing to anyone “whose interest may be affected by the proceeding” on any decision regarding the issuance or amendment of a nuclear facility license. 42 U.S.C. § 2239(a)(1)(A).

The scope of issues on which a petitioner may request a hearing includes all issues that are material to the NRC’s licensing decision. *Union of Concerned Scientists*, 735 F.2d at 1439.

To obtain approval for the relicensing, the license renewal applicant must evaluate environmental issues, in the first instance, in an Environmental Report (ER). 10 C.F.R. § 51.53. Entergy also must satisfy the requirement of 10 C.F.R. § 51.53(c)(3)(iv) that its ER must address “any new and significant information regarding the environmental impacts of license renewal of which the applicant is aware.” The NRC in turn uses the ER to prepare an EIS, although it has an independent obligation to “evaluate and be responsible for the reliability” of the information. 10 C.F.R. § 51.70. The EIS must be supplemented where “[t]here are new and significant circumstances or information relevant to environmental

concerns and bearing on the proposed action.” 10 C.F.R. § 51.92 (a)(2). As part of the EIS process, the NRC must evaluate the environmental impacts of relicensing the Pilgrim plant and conduct a SAMA analysis which evaluates the cost-effectiveness of measures to mitigate or avoid the environmental impacts of the Pilgrim relicensing. 10 C.F.R. § 51.71(d).

Because these regulatory requirements are material to relicensing, under the AEA the Commonwealth is entitled to a hearing on whether the EIS satisfied these requirements, in view of the new and significant information that emanated – and continues to emanate – from Fukushima. *Union of Concerned Scientists*, 735 F.2d at 1446 (holding that while the NRC has “great discretion” to determine what matters are relevant to its licensing decisions, it lacks discretion to eliminate issues from hearings once they are found to be relevant); see also *Citizens Awareness Network*, 59 F. 3d at 295 (NRC improperly denied AEA hearing right). And while the NRC has the discretion to address this new and significant information in either a site specific or generic (rulemaking) process, it must do so consistent with the Commonwealth’s AEA hearing right before making a final decision on relicensing. *Baltimore Gas*, 462 U.S. at 101 (“[T]he Commission has the discretion to evaluate generically the environmental effects [of the proposed action] and require that these values be ‘plugged into’ individual licensing decisions.”).

Thus, in violation of the AEA, the Commission failed to satisfy its nondiscretionary duty to grant the Commonwealth a hearing on the material licensing issues raised in the Commonwealth's NEPA contention. *Id.*

CONCLUSION AND REQUEST FOR RELIEF

For the foregoing reasons, the Commonwealth respectfully requests this Court reverse and remand CLI-12-06, and vacate the Commission's Licensing Orders to grant a twenty year license extension for the Pilgrim nuclear power plant, with directions that the Commission grant the Commonwealth a hearing and consider and rule upon the Commonwealth's new and significant information in accordance with NEPA and the AEA, and apply those considerations and rulings to the individual Pilgrim relicensing proceeding, before making a final relicensing decision, subject to any further rulings by the Court.

Respectfully submitted,

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Dated: August 29, 2012

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³² Twenty-five pages of relevant excerpts from the record are included pursuant to Local Rule 28.0(a)(2).

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS:

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In the Matter of)

ENERGY NUCLEAR GENERATION COMPANY AND)
ENERGY NUCLEAR OPERATIONS, INC.)

(Pilgrim Nuclear Power Station))
_____)

Docket No. 50-293-LR

CLI-12-06

MEMORANDUM AND ORDER

The Commonwealth of Massachusetts and Pilgrim Watch seek review of LBP-11-35, in which the Licensing Board denied Massachusetts' motion to admit a new contention relating to the recent nuclear events in Japan, as well as other, related requests.¹ For the reasons set forth below, we deny the petitions for review. We also rule on a related suspension request.²

¹ *Commonwealth of Massachusetts' Notice of Appeal of LBP-11-35* (Dec. 8, 2011); *Commonwealth of Massachusetts' Brief in Support of Appeal from LBP-11-35* (Dec. 8, 2011) (Massachusetts Petition for Review); *Pilgrim Watch's Petition for Review of Memorandum and Order (Denying Commonwealth of Massachusetts' Request for Stay, Motion for Waiver, and Request for Hearing on a New Contention Relating to the Fukushima Accident)* Nov. 28, 2011 (Dec. 8, 2011) (Pilgrim Watch Petition for Review).

² See *Commonwealth of Massachusetts' Conditional Motion to Suspend Pilgrim Nuclear Power Plant License Renewal Proceeding Pending Resolution of Petition for Rulemaking to Rescind Spent Fuel Pool Exclusion Regulations* (June 2, 2011) (Conditional Motion to Suspend).

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I. BACKGROUND

This adjudicatory proceeding commenced in 2006 with the publication in the *Federal Register* of a notice of opportunity for hearing.³ Massachusetts and Pilgrim Watch each submitted hearing requests challenging Entergy Nuclear Generation Company and Entergy Nuclear Operations, Inc.'s (together, Entergy) license renewal application for the Pilgrim Nuclear Power Station.⁴ In addition to its hearing request, Massachusetts filed a petition for rulemaking to rescind the 10 C.F.R. Part 51 regulations that set forth the NRC's generic findings for certain environmental impacts during the license renewal term, namely, the regulations pertaining to the environmental impacts of spent fuel storage.⁵ Massachusetts claimed that "new and significant information" invalidated the findings with respect to spent fuel pool environmental impacts.⁶ The

³ Entergy Nuclear Operations, Inc., Pilgrim Nuclear Power Station; Notice of Acceptance for Docketing of the Application and Notice of Opportunity for Hearing Regarding Renewal of Facility Operating License No. DPR-35 for an Additional 20-Year Period, 71 Fed. Reg. 15,222 (Mar. 27, 2006).

⁴ See generally *Request for Hearing and Petition to Intervene by Pilgrim Watch* (May 25, 2006); *Massachusetts Attorney General's Request for a Hearing and Petition for Leave to Intervene with Respect to Entergy Nuclear Operations Inc.'s Application for Renewal of the Pilgrim Nuclear Power Plant Operating License and Petition for Backfit Order Requiring New Design Features to Protect Against Spent Fuel Pool Accidents* (May 30, 2006).

⁵ See Massachusetts Attorney General; Receipt of Petition for Rulemaking, 71 Fed. Reg. 64,169 (Nov. 1, 2006).

⁶ *Id.* at 64,170.

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Board granted Pilgrim Watch's hearing request and admitted two of its proposed contentions—Contentions 1 and 3.⁷ The Board denied Massachusetts' hearing request.⁸

Massachusetts appealed the Board's ruling; we affirmed.⁹ In doing so, we found that the Board properly rejected Massachusetts' contention—which raised concerns similar to those in its rulemaking petition—as an impermissible challenge to our regulations.¹⁰ We explained that Massachusetts' generically-applicable concerns were not appropriate for resolution in an adjudicatory proceeding, and acknowledged Massachusetts' rulemaking petition as the appropriate mechanism for raising those concerns.¹¹ We also denied, as premature, Massachusetts' request to suspend the adjudicatory proceeding pending the disposition of its rulemaking petition because at that time Massachusetts was not a party or an "interested governmental entity," and thus had no right under our rules to request such a stay.¹²

⁷ LBP-06-23, 64 NRC 257, 348-49 (2006). Contentions 1 and 3 challenged Entergy's aging management program for buried piping, and certain aspects of the severe accident mitigation alternatives (SAMA) analysis in Entergy's Environmental Report, respectively. See *id.* at 349.

⁸ *Id.* at 349.

⁹ *Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc.* (Vermont Yankee Nuclear Power Station), CLI-07-3, 65 NRC 13, 23 (2007). See also *Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc.* (Vermont Yankee Nuclear Power Station), CLI-07-13, 65 NRC 211, 215 (2007) (denying motion for reconsideration of CLI-07-3). CLI-07-3 and CLI-07-13 addressed essentially identical appeals in both the *Vermont Yankee* and *Pilgrim* proceedings.

¹⁰ *Vermont Yankee*, CLI-07-3, 65 NRC at 20-21.

¹¹ *Id.* at 20.

¹² *Id.* at 22 n.37; *Vermont Yankee*, CLI-07-13, 65 NRC at 214-15. See generally 10 C.F.R. § 2.802(d) (permitting a rulemaking petitioner to request that we "suspend all or any part of any licensing proceeding to which the petitioner is a party pending disposition of the petition for rulemaking").

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Massachusetts challenged these rulings in the U.S. Court of Appeals for the First Circuit. The court upheld our ruling on Massachusetts' hearing request.¹³ With regard to the suspension request, the court ordered a brief stay of the close of this proceeding to allow Massachusetts an opportunity to request status as an interested governmental entity.¹⁴ Shortly thereafter, Massachusetts filed a notice of intent to participate as an interested state.¹⁵

We later denied Massachusetts' rulemaking petition, which was consolidated with a similar petition filed by the State of California, finding that the information raised in the petitions was neither new nor significant.¹⁶ We "further determined that [the] findings related to the [environmental impacts of] storage of spent nuclear fuel in pools . . . remain valid."¹⁷ The U.S. Court of Appeals for the Second Circuit upheld our decision.¹⁸

Separate from the pendency and resolution of Massachusetts' appeals, litigation proceeded on Pilgrim Watch's admitted contentions. The Board granted summary disposition of Contention 3 in favor of Entergy.¹⁹ And after holding an evidentiary hearing on Contention 1, the

¹³ *Massachusetts v. United States*, 522 F.3d 115, 129-30 (1st Cir. 2008).

¹⁴ *Id.* at 130.

¹⁵ *Commonwealth of Massachusetts' Notice of Intent to Participate as an Interested State* (May 6, 2008). See also CLI-08-9, 67 NRC 353, 355-56 (2008) (addressing the effect of the court-ordered stay on the *Pilgrim* proceeding). See generally 10 C.F.R. § 2.315(c).

¹⁶ The Attorney General of Commonwealth of Massachusetts, The Attorney General of California; Denial of Petitions for Rulemaking, 73 Fed. Reg. 46,204, 46,208 (Aug. 8, 2008) (2008 Rulemaking Denial). Chairman Jaczko dissented. *Id.* at 46,212.

¹⁷ *Id.* at 46,212.

¹⁸ See *New York v. NRC*, 589 F.3d 551, 555 (2d Cir. 2009).

¹⁹ LBP-07-13, 66 NRC 131, 154 (2007).

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Board formally closed the record on June 4, 2008.²⁰ The Board then resolved Contention 1 in Entergy's favor and terminated the proceeding.²¹

Pilgrim Watch petitioned for review of the Board's rulings on Contentions 1 and 3, as well as earlier Board rulings.²² We granted Pilgrim Watch's petition for review as to Contention 3, and reversed and remanded a portion of that contention to the Board for hearing.²³ We expressly stated that the remand was "limited by [that] ruling."²⁴ Later, we denied the balance of Pilgrim Watch's petition for review, including Pilgrim Watch's challenge to the Board's merits ruling on Contention 1.²⁵ The Board has since issued an initial decision on the remanded portion of Contention 3, resolving it in favor of Entergy.²⁶ We recently denied Pilgrim Watch's petition for review of that decision.²⁷

At issue today is the Board's ruling on a new Massachusetts contention challenging the severe accident mitigation alternatives (SAMA) analysis in the Pilgrim final supplemental

²⁰ Memorandum and Order (Ruling on Pilgrim Watch Motions Regarding Testimony and Proposed Additional Evidence Relating to Pilgrim Watch Contention 1) (June 4, 2008), at 3-4 (unpublished). The Board closed the record on Contention 1 in accordance with our direction in CLI-08-9. See CLI-08-9, 67 NRC at 356.

²¹ LBP-08-22, 68 NRC 590, 610 (2008).

²² *Pilgrim Watch's Petition for Review of LBP-06-848, LBP-07-13, LBP-06-23 and the Interlocutory Decisions in the Pilgrim Nuclear Power Station Proceeding* (Nov. 12, 2008).

²³ CLI-10-11, 71 NRC 287, 290 (2010).

²⁴ *Id.*

²⁵ CLI-10-14, 71 NRC 449, 477 (2010).

²⁶ LBP-11-18, 74 NRC __ (July 19, 2011) (slip op. at 34).

²⁷ CLI-12-1, 75 NRC __ (Feb. 9, 2012) (slip op.).

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environmental impact statement (FSEIS) based on the recent nuclear events in Japan.²⁸ On March 11, 2011, Japan suffered a 9.0 magnitude earthquake, followed by a devastating tsunami that severely damaged the Fukushima Dai-ichi Nuclear Power Station. Massachusetts argues that these events present "new and significant information" that must be considered in the Pilgrim FSEIS before a decision is made on Entergy's license renewal application.²⁹ Massachusetts included with its new contention a petition for waiver of 10 C.F.R. § 51.71(d) and 10 C.F.R. Part 51, Subpart A, Appendix B, which preclude the consideration of the environmental impacts of spent fuel pool storage in individual license renewal adjudications.³⁰ As an alternative, in the event the Board were to deny Massachusetts' waiver petition,

²⁸ See LBP-11-35, 74 NRC __ (Nov. 28, 2011) (slip op.).

²⁹ See *Commonwealth of Massachusetts' Motion to Admit Contention and, if Necessary, to Re-open Record Regarding New and Significant Information Revealed by Fukushima Accident* (June 2, 2011) (Motion to Reopen); *Commonwealth of Massachusetts' Contention Regarding New and Significant Information Revealed by the Fukushima Radiological Accident* (June 2, 2011) (New Contention); *Declaration of Dr. Gordon R. Thompson in Support of Commonwealth of Massachusetts' Contention and Related Petitions and Motions* (June 1, 2011); *New and Significant Information from the Fukushima Daiichi Accident in the Context of Future Operation of the Pilgrim Nuclear Power Plant* (June 1, 2011) (Thompson Report). Two months later, Massachusetts filed a motion to supplement the basis for its contention, and attached a supplemental declaration for Dr. Thompson. *Commonwealth of Massachusetts Motion to Supplement Bases to Commonwealth Contention to Address NRC Task Force Report on Lessons Learned from the Radiological Accident at Fukushima* (Aug. 11, 2011) (Motion to Supplement Contention); *Declaration of Gordon R. Thompson Addressing New and Significant Information Provided by the NRC's Near-Term Task Force Report on the Fukushima Accident* (Aug. 11, 2011) (Supplemental Thompson Declaration). The Board granted Massachusetts' motion and considered Dr. Thompson's supplemental declaration. LBP-11-35, 74 NRC at __ (slip op. at 70).

³⁰ See *Commonwealth of Massachusetts' Petition for Waiver of 10 C.F.R. Part 51 Subpart A, Appendix B or, in the Alternative, Petition for Rulemaking to Rescind Regulations Excluding Consideration of Spent Fuel Storage Impacts from License Renewal Environmental Review* (June 2, 2011) (Waiver/Rulemaking Petition).

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Massachusetts contemporaneously requested that we consider its filing as a petition for rulemaking to rescind those regulations, similar to its earlier petition for rulemaking.³¹

Massachusetts also included a "conditional motion" to suspend the proceeding pending resolution of its standby rulemaking petition, in the event of the rulemaking petition's activation.³²

In LBP-11-35, the Board rejected Massachusetts' new contention and denied its waiver petition.³³ The Board found that Massachusetts' new contention failed to satisfy the criteria for reopening a closed record, and failed to satisfy the timeliness and general contention admissibility standards.³⁴ With regard to the waiver petition, the Board determined that a rule waiver was not warranted because Massachusetts had not shown that the spent fuel pool

³¹ *Id.* at 30.

³² Conditional Motion to Suspend at 1-2.

³³ LBP-11-35, 74 NRC at ___ (slip op. at 70-71). Judge Young concurred only in the result. *Id.* at ___ (slip op. at 72-77). She would have rejected the contention as premature, and would not have addressed the reopening or contention admissibility standards, or the waiver petition. See *id.* at ___ (slip op. at 72-73) (citing *Union Electric Co. d/b/a Ameren Missouri (Callaway Plant, Unit 2)*, CLI-11-5, 74 NRC ___ (Sept. 9, 2011) (slip op. at 29-30)).

The Board also denied a request that Massachusetts filed in May 2011, seeking to stay the Board's decision on the license renewal application pending our review of a separate Massachusetts request to suspend the proceeding to consider lessons learned from the Fukushima events. LBP-11-35, 74 NRC at ___ (slip op. at 70); *Commonwealth of Massachusetts Motion to Hold Licensing Decision in Abeyance Pending Commission Decision Whether to Suspend the Pilgrim Proceeding to Review the Lessons of the Fukushima Accident* (May 2, 2011) (citing *Commonwealth of Massachusetts Response to Commission Order Regarding Lessons Learned from the Fukushima Daiichi Nuclear Power Station Accident, Joinder in Petition to Suspend License Renewal Proceeding for the Pilgrim Nuclear Plant, and Request for Additional Relief* (May 2, 2011)). Massachusetts' stay request became moot when we issued our decision in CLI-11-5, which, among other things, denied its request to suspend this license renewal proceeding. See *Callaway*, CLI-11-5, 74 NRC at ___ (slip op. at 36).

³⁴ LBP-11-35, 74 NRC at ___ (slip op. at 70).

issues underlying its waiver request uniquely applied to Pilgrim, rather than generically to a class of nuclear power plants.³⁵

Massachusetts then filed the instant appeal. As noted above, Pilgrim Watch also seeks review of the Board's ruling. Entergy and the Staff oppose both requests for review.³⁶ The Board's ruling also places before us Massachusetts' "conditional" request to suspend the proceeding. We consider each of these matters below.

II. DISCUSSION

Pilgrim Watch and Massachusetts seek review under separate provisions of our rules. Massachusetts filed its appeal under section 2.311, which governs appeals of board rulings on

³⁵ *Id.* at ___ (slip op. at 15-16).

³⁶ See *Entergy's Answer Opposing the Commonwealth's Appeal of LBP-11-35* (Dec. 19, 2011), at 1-2; *Entergy's Answer Opposing Pilgrim Watch's Petition for Review of LBP-11-35* (Dec. 19, 2011), at 3 (Entergy Answer to Pilgrim Watch); *NRC Staff's Answer to the Commonwealth of Massachusetts' Brief in Support of Appeal from LBP-11-35* (Dec. 19, 2011), at 2; *NRC Staff's Answer in Opposition to Pilgrim Watch's Petition for Review of LBP-11-35* (Dec. 19, 2011), at 2 (Staff Answer to Pilgrim Watch). Pilgrim Watch replied. *Pilgrim Watch Reply to Entergy's and NRC Staff's Answers to Pilgrim Watch's Petition for Review of Memorandum and Order (Denying Commonwealth of Massachusetts' Request for Stay, Motion for Waiver, and Request for Hearing on a New Contention Relating to the Fukushima Accident)* Nov. 28, 2011 (Dec. 23, 2011) (Pilgrim Watch Reply).

Massachusetts filed a motion to reply. *Commonwealth of Massachusetts' Motion to Reply to NRC Staff and Entergy Oppositions to Commonwealth Appeal of LBP-11-35* (Dec. 23, 2011); *Commonwealth of Massachusetts' Brief in Reply to NRC Staff and Entergy Oppositions to the Commonwealth's Appeal of LBP-11-35* (Dec. 23, 2011). Entergy and the Staff oppose Massachusetts' motion. *Entergy's Answer Opposing Commonwealth of Massachusetts' Motion to File a Reply to Entergy's and NRC Staff's Answers* (Jan. 3, 2012); *NRC Staff's Answer in Opposition to Commonwealth of Massachusetts' Motion to Reply to NRC Staff and Entergy Oppositions to Commonwealth Appeal of LBP-11-35* (Jan. 3, 2012). Massachusetts has filed its appeal pursuant to 10 C.F.R. § 2.311, which does not permit the filing of a reply. See 10 C.F.R. § 2.311(b). As discussed below, however, Massachusetts' appeal is properly considered a petition for review subject to the requirements of 10 C.F.R. § 2.341, which affords the petitioner a right to reply. We therefore consider Massachusetts' reply.

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hearing requests, petitions to intervene, and access to certain non-public information.³⁷ Section 2.341, on the other hand, governs review of the majority of presiding officer decisions.³⁸ Pilgrim Watch filed its request under section 2.341(b). Because the decision that Massachusetts challenges here is not a board ruling on a hearing request, petition to intervene, or access to non-public information, its appeal does not lie under section 2.311. Accordingly, we consider both requests under the same provision—section 2.341(b)—as petitions for review.

We will grant a petition for review at our discretion, giving due weight to the existence of a substantial question with respect to one or more of the following considerations:

- (i) a finding of material fact is clearly erroneous or in conflict with a finding as to the same fact in a different proceeding;
- (ii) a necessary legal conclusion is without governing precedent or is a departure from or contrary to established law;
- (iii) a substantial and important question of law, policy, or discretion has been raised;
- (iv) the conduct of the proceeding involved a prejudicial procedural error; or
- (v) any other consideration which we may deem to be in the public interest.³⁹

For threshold issues like contention admissibility, we give substantial deference to a

³⁷ See 10 C.F.R. § 2.311(a).

³⁸ See *id.* § 2.341(a)(1). *Cf. South Texas Project Nuclear Operating Co.* (South Texas Project, Units 3 and 4), CLI-09-18, 70 NRC 859, 862 (2009) (“As a general matter, contentions filed after the initial petition are not subject to appeal pursuant to section 2.311.”).

³⁹ 10 C.F.R. § 2.341(b)(4)(i)-(v).

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board's determinations.⁴⁰ We will affirm decisions on the admissibility of contentions where we find no error of law or abuse of discretion.⁴¹ As discussed below, neither Pilgrim Watch nor Massachusetts has presented a substantial question warranting review.

A. Pilgrim Watch's Petition for Review

Pilgrim Watch argues that although the Board's decision "is largely directed to requests and motions filed by . . . Massachusetts," portions of it "directly affect Pilgrim Watch."⁴² According to Pilgrim Watch, the Board's statement that the record closed in June 2008, the statement that the record remains closed, the Board's application of the criteria for reopening a closed record, and the Board's passing reference to Pilgrim Watch's new contentions being "previously resolved or . . . resolved by this Order," directly affect its interests.⁴³ Pilgrim Watch asserts that the Board improperly uses its decision on Massachusetts' contention to "bolster" the Board's "previous incorrect" decisions on various new Pilgrim Watch contentions.⁴⁴ Repeating

⁴⁰ See *Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Unit 3), CLI-09-5, 69 NRC 115, 119 (2009).

⁴¹ See *Southern Nuclear Operating Co.* (Vogtle Electric Generating Plant, Units 3 and 4), CLI-11-8, 74 NRC __ (Sept. 27, 2011) (slip op. at 5-6); *AmerGen Energy Co., LLC* (Oyster Creek Nuclear Generating Station), CLI-09-7, 69 NRC 235, 260 (2009).

⁴² Pilgrim Watch Petition for Review at 1.

⁴³ *Id.* at 1-2 (citing LBP-11-35, 74 NRC at __ (slip op. at 3, 64, 71)); Pilgrim Watch Reply at 2-3.

⁴⁴ Pilgrim Watch Petition for Review at 3. Pilgrim Watch has sought review of those decisions. See generally *Pilgrim Watch's Petition for Review of Memorandum and Order (Denying Pilgrim Watch's Requests for Hearing on Certain New Contentions)* ASLBP No. 06-848-02-LR, August 11, 2011 (Aug. 26, 2011) (Pilgrim Watch August 26 Petition); *Pilgrim Watch's Petition for Review of Memorandum and Order (Denying Pilgrim Watch's Requests for Hearing on New Contentions Relating to Fukushima Accident)* Sept. 8, 2011 (Sept. 23, 2011) (Pilgrim Watch September 23 Petition). We denied the Pilgrim Watch September 23 Petition; the Pilgrim Watch August 26 Petition is pending. See CLI-12-3, 75 NRC __ (Feb. 22, 2012) (slip op.).

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the same arguments that it has raised in its own petitions for review, Pilgrim Watch argues that the Board incorrectly applied the reopening standards because the proceeding has not closed, and because Massachusetts, like Pilgrim Watch, filed a contention that raises new issues.⁴⁵

Entergy argues that we should reject Pilgrim Watch's petition because Pilgrim Watch has suffered no cognizable injury from the Board's rejection of Massachusetts' contention, and thus it has no standing to appeal.⁴⁶ The Staff asserts that we should deny the petition because Pilgrim Watch does not address issues of fact or law that are central to the Board's decision, but rather Pilgrim Watch "seeks only to bolster its arguments in . . . appeals now pending before the Commission."⁴⁷ Therefore, according to the Staff, Pilgrim Watch's petition is "outside the scope of the appealable issues contemplated by the regulations."⁴⁸

We agree with Entergy's and the Staff's arguments. Although Pilgrim Watch insists that the Board's decision directly affects its interests, the portions of the Board's decision that Pilgrim Watch references are focused on the Board's resolution of Massachusetts' contention and do not concretely affect the admissibility of Pilgrim Watch's new contentions.⁴⁹ At bottom, Pilgrim

⁴⁵ Pilgrim Watch Petition for Review at 4-8; Pilgrim Watch August 26 Petition at 3-6; Pilgrim Watch September 23 Petition at 7-9.

⁴⁶ Entergy Answer to Pilgrim Watch at 1-2.

⁴⁷ Staff Answer to Pilgrim Watch at 4.

⁴⁸ *Id.* at 3.

⁴⁹ See *Houston Lighting and Power Co.* (Allens Creek Nuclear Generating Station, Unit 1), ALAB-631, 13 NRC 87, 89 (1981) (explaining that a litigant is not entitled to challenge a board ruling "unless and until that ruling has worked a concrete injury to his personal interests"). The Board's statement that it resolved five of Pilgrim Watch's new contentions in earlier decisions or in LBP-11-35 is imprecise. See LBP-11-35, 74 NRC at ___ (slip op. at 64 n.232). LBP-11-35 (continued. . .)

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Watch reiterates its claim that the Board erred in applying the reopening standards to a contention raising new issues—an argument that we rejected in a recent decision in this proceeding.⁵⁰ As we stated then, “[c]ontrary to Pilgrim Watch’s assertions, the reopening standards . . . expressly contemplate contentions that raise issues not previously litigated.”⁵¹ To the extent Pilgrim Watch seeks review of the Board’s decision on Massachusetts’ behalf, its petition fails for lack of standing. Pilgrim Watch “may act to vindicate its own rights,” but “it has no standing . . . to assert the rights of others.”⁵² Accordingly, we deny its petition for review.

B. Massachusetts’ Petition for Review

Massachusetts argues that the Board “ignored” its obligation to consider the “new and significant information” presented in its new contention and waiver petition, contrary to the

(. . .continued)

contains no legal analysis or conclusions directed to any Pilgrim Watch contention; we view the Board’s statement here as a catch-all phrase with no independent legal significance.

⁵⁰ CLI-12-3, 75 NRC at ___ (slip op. at 9-12). There, we reiterated our position that raising new issues related to the Fukushima events did not warrant new procedures or a separate timetable. *Id.* at ___ (slip op. at 11) (citing *Callaway*, CLI-11-5, 74 NRC at ___ (slip op. at 35)). We noted the ongoing review of the Fukushima events and our confidence that the existing procedural rules can be applied effectively to address proposed new or amended contentions. *Id.* Our analyses, as well as the analyses of NRC’s expert staff, have uncovered no new information that causes us to change our view.

⁵¹ *Id.* at ___ (slip op. at 9). Therefore, even were we to consider Pilgrim Watch’s filing as an answer supporting Massachusetts’ petition for review, we reject its argument that the reopening standards do not apply here. See *id.* at ___ (slip op. at 9-12). Cf. *Tennessee Valley Authority* (Clinch River Breeder Reactor Plant), ALAB-345, 4 NRC 212, 213 (1976) (noting that even though a party who is not injured by a board’s ruling has no right to appeal that ruling, it may file a supporting brief at the appropriate time).

⁵² *Clinch River*, ALAB-345, 4 NRC at 213. See also *Carolina Power and Light Co.* (Shearon Harris Nuclear Power Plant), ALAB-837, 23 NRC 525, 542-43 n.58 (1986).

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requirements of the National Environmental Policy Act (NEPA).⁵³ Further, Massachusetts asserts that the Board improperly applied a "heightened standard"—what Massachusetts characterizes as essentially a merits review—in rejecting the new contention.⁵⁴ Massachusetts maintains that it has "met its initial burden to present new and significant information,"⁵⁵ and argues that the requirements of NEPA supersede our procedural rules when new and significant information is presented.⁵⁶ We disagree. We find that the Board correctly applied our procedural rules for reopening the record and for the admission of contentions, and appropriately determined that Massachusetts failed to show that its new contention and the issues underlying its waiver petition should be considered in this adjudication.⁵⁷

1. Massachusetts' Waiver Petition

Massachusetts' petition for review offers little in the way of argument against the Board's denial of its waiver petition. At most, Massachusetts references the Board's finding that

⁵³ See Massachusetts Petition for Review at 14. Massachusetts also states that the Board rejected its alternative request for rulemaking. See *id.* at 1, 13. But the Board did not rule on Massachusetts' rulemaking petition, nor could it have, because that petition is now pending before us. We address the rulemaking petition and the related request to suspend the proceeding, below. (Massachusetts captioned its Waiver/Rulemaking Petition as before the Board or the Commission.)

⁵⁴ See *id.* at 12, 23.

⁵⁵ *Id.* at 16.

⁵⁶ See *id.* at 24-27.

⁵⁷ Contrary to Massachusetts' assertion, NEPA does not supersede our procedural rules. Federal courts leave to an agency's discretion the manner in which the agency determines whether information is new or significant to warrant supplementation of an environmental impact statement, including the application of its procedural rules. See *Marsh v. Or. Natural Res. Council*, 490 U.S. 360; 373-77 (1989); *Massachusetts*, 522 F.3d at 130; *Union of Concerned Scientists v. NRC*, 920 F.2d 50, 55-56 (D.C. Cir. 1990).

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Massachusetts had not demonstrated “uniqueness” of the spent fuel pool storage issues raised in the waiver request, and reiterates the spent-fuel-pool-related arguments in support of its contention.⁵⁸ Thus, it is unclear whether Massachusetts challenges the Board’s ruling on the waiver petition. Nevertheless, we briefly address the Board’s ruling.

As a general matter, our regulations are not subject to challenge in adjudicatory proceedings.⁵⁹ Section 2.335(b), however, provides an exception to this general rule. That provision permits a party to an adjudication to petition for a waiver of a rule or regulation upon a showing that “special circumstances with respect to the subject matter of the particular proceeding are such that the application of the rule or regulation (or a provision of it) would not serve the purposes for which [it] was adopted.”⁶⁰ In order to meet this standard, the party seeking a waiver must attach an affidavit that, among other things, “state[s] with particularity the special circumstances [claimed] to justify the waiver or exception requested.”⁶¹

In the *Millstone* license renewal proceeding, we established a four-factor test based on NRC case law interpreting section 2.335(b).⁶² The waiver petitioner must meet all four factors, demonstrating that: (i) the rule’s strict application would not serve the purpose for which it was adopted; (ii) there are “special circumstances” that were “not considered, either explicitly, or by

⁵⁸ See Massachusetts Petition for Review at 6-7, 11, 13, 29.

⁵⁹ 10 C.F.R. § 2.335(a).

⁶⁰ *Id.* § 2.335(b).

⁶¹ *Id.*

⁶² *Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Units 2 and 3), CLI-05-24, 62 NRC 551, 559-60 (2005).

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necessary implication, in the rulemaking proceeding leading to the rule sought to be waived”; (iii) those circumstances are unique to the facility, rather than “common to a large class of facilities”; and (iv) a waiver of the rule is necessary to reach a “significant safety problem.”⁶³

The Board found that Massachusetts “plainly” had not met the third factor—a showing that the spent fuel pool issues raised in Massachusetts’ waiver petition are “unique” to Pilgrim rather than “common to a large class of facilities.”⁶⁴ The Board agreed with Entergy and the Staff that the spent fuel pool accident risks asserted in the waiver petition and supporting attachments are applicable to other plants.⁶⁵ The Board pointed out that onsite storage of spent fuel is being addressed as part of our comprehensive review of lessons learned from the Fukushima Dai-ichi events, indicating that Massachusetts’ spent fuel pool concerns are more appropriately addressed “through more generic regulatory reform.”⁶⁶

We find the Board’s reasoning sound, and we decline to disturb it here. Because the concerns that Massachusetts raises apply generically to “*all* spent fuel pools at all reactors,”

⁶³ *Id.* at 559-60. See also *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-11-11, 74 NRC __ (Oct. 12, 2011) (slip op. at 30).

⁶⁴ LBP-11-35, 74 NRC at __ (slip op. at 14-15).

⁶⁵ See *id.*

⁶⁶ *Id.* at __ (slip op. at 16). See generally “Recommendations for Enhancing Reactor Safety in the 21st Century, The Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident” (July 12, 2011), at 43-46 (transmitted to the Commission via “Near-Term Report and Recommendations for Agency Actions Following the Events in Japan,” Commission Paper SECY-11-0093 (July 12, 2011) (ML11186A950 (package)) (Near-Term Report) (discussing recommendations regarding spent fuel pool safety).

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they are more appropriately addressed via rulemaking or other appropriate generic activity.⁶⁷ "It makes more sense for the NRC to study whether, as a technical matter, the agency should modify its requirements relating to spent fuel storage for all plants . . . than to litigate [the issue] in particular adjudications."⁶⁸ As discussed below, we now consider Massachusetts' waiver petition as an active rulemaking petition and we refer it to the Staff for further consideration.⁶⁹

2. *Massachusetts' New Contention*

In its new contention, Massachusetts argued that the Staff must revise the FSEIS to account for new and significant information from the events at Fukushima Dai-ichi.⁷⁰ In support, Massachusetts attached a declaration and report from Dr. Gordon R. Thompson. Dr. Thompson outlined six main areas in which, he argued, the events at Fukushima Dai-ichi provide new and significant information.⁷¹ According to Massachusetts, if these issues are considered in a revised Pilgrim SAMA analysis, "previously rejected or ignored" mitigation

⁶⁷ *Vermont Yankee*, CLI-07-3, 65 NRC at 20-21. See also *AmerGen Energy Co., LLC (Oyster Creek Nuclear Generating Station)*, CLI-07-8, 65 NRC 124, 133-34 (2007).

⁶⁸ *Vermont Yankee*, CLI-07-3, 65 NRC at 20. See also *Massachusetts*, 522 F.3d at 129-30.

⁶⁹ See Waiver/Rulemaking Petition at 30.

⁷⁰ New Contention at 1. The contentions reads: "The Commonwealth contends that the environmental impact analysis and the SAMA analysis in [the FSEIS] are inadequate to satisfy NEPA because they fail to address new and significant information revealed by the Fukushima accident that is likely to affect the outcome of those analyses. The new and significant information shows that both core-melt accidents and spent fuel pool accidents are significantly more likely than estimated or assumed in [the FSEIS]. As a result, the environmental impacts of re-licensing the Pilgrim [Nuclear Power Station] have been underestimated. In addition, the SAMA analysis is deficient because it ignores or rejects mitigative measures that may now prove to be cost-effective in light of this new understanding of the risks of re-licensing Pilgrim." New Contention at 5-6.

⁷¹ Thompson Report at 3.

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alternatives "may prove to be cost-effective."⁷² In a supplemental filing, Massachusetts asserted that the July 2011 Near-Term Task Force Report presents new and significant information that further supports its new contention.⁷³ Massachusetts claimed that the Task Force proposed a number of safety improvements and regulatory changes that align with the issues identified in the Thompson Report.⁷⁴ Massachusetts also attached a supplemental declaration by Dr. Thompson further describing the areas where the Task Force's findings support his views.⁷⁵

Although Massachusetts argued that the reopening standards do not apply, it nonetheless addressed them.⁷⁶ Massachusetts was right to have done so. The Board closed the evidentiary record in June 2008. Even after our later remand of a portion of Pilgrim Watch's Contention 3, the record remained closed on all issues except that single, remanded issue. Because Massachusetts filed its new contention after the Board already had closed the evidentiary record, it was obliged to address the reopening standards.⁷⁷ We therefore find that the Board appropriately applied the reopening standards here. Furthermore, as discussed below, we find no Board error or abuse of discretion in the manner in which the Board applied

⁷² See New Contention at 9.

⁷³ See Motion to Supplement Contention at 1-2.

⁷⁴ See *id.* at 6-7.

⁷⁵ See Supplemental Thompson Declaration at 1-7.

⁷⁶ See Motion to Reopen at 2.

⁷⁷ See CLI-12-3, 75 NRC at ___ (slip op. at 9-12); *Entergy Nuclear Vermont Yankee, L.L.C. and Entergy Nuclear Operations, Inc.* (Vermont Yankee Nuclear Power Station), CLI-10-17, 72 NRC 1, 10 n.37 (2010).

these standards to the issues identified in Massachusetts' new contention, the supplement to its new contention, and the supporting declarations and Thompson Report.

Motions to reopen a closed record are governed by 10 C.F.R. § 2.326. The movant must show that: (1) the motion is timely; (2) the motion addresses a "significant safety or environmental issue"; and (3) "a materially different result would be or would have been likely had the newly proffered evidence been considered initially."⁷⁸ "Each of the criteria must be separately addressed, with a specific explanation of why it has been met."⁷⁹

The level of support required to sustain a motion to reopen is greater than that required for a contention under the general admissibility requirements of 10 C.F.R. § 2.309(f)(1).⁸⁰ The motion to reopen "must be accompanied by affidavits that set forth the factual and/or technical bases for the movant's claim that the . . . [three criteria for reopening] have been satisfied."⁸¹ "Evidence contained in [the] affidavits must meet the admissibility standards [in 10 C.F.R. § 2.337]."⁸² That is, it must be "relevant, material, and reliable."⁸³ Further, the "[a]ffidavits must be given by competent individuals with knowledge of the facts alleged, or by experts in the disciplines appropriate to the issues raised."⁸⁴ A litigant seeking to reopen a closed record

⁷⁸ 10 C.F.R. § 2.326(a)(1)-(3).

⁷⁹ *Id.* § 2.326(b).

⁸⁰ Compare *id.*, with *id.* § 2.309(f)(1)(v).

⁸¹ *Id.* § 2.326(b).

⁸² *Id.*

⁸³ *Id.* § 2.337(a).

⁸⁴ *Id.* § 2.326(b).

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necessarily faces a "heavy" burden.⁸⁵ After a record has closed, finality attaches to the hearing process, and after that point, only timely, significant issues will be considered.⁸⁶ At 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.

Massachusetts now argues that the Board "ignored the [Near-Term Report] and [Massachusetts'] expert supported new and significant information."⁸⁷ We address each of these areas of purported new and significant information, which are discussed in detail in the supporting material provided by Dr. Thompson, in turn.⁸⁸

In its new contention, Massachusetts first argued that the SAMA analysis underestimates core damage frequency by an order of magnitude.⁸⁹ Rather than use the probabilistic risk assessment (PRA) techniques that are used in the Pilgrim SAMA analysis to estimate core damage frequency, Dr. Thompson employed what he termed a "direct

⁸⁵ *Oyster Creek*, CLI-09-7, 69 NRC at 287.

⁸⁶ See Final Rule, Criteria for Reopening Records in Formal Licensing Proceedings, 51 Fed. Reg. 19,535, 19,539 (May 30, 1986) ("The purpose of this rule is not to foreclose the raising of important . . . issues, but to ensure that, once a record has been closed and all timely-raised issues have been resolved, finality will attach to the hearing process.").

⁸⁷ Massachusetts Petition for Review at 17.

⁸⁸ Massachusetts' Motion to Supplement discusses the ways in which the Near-Term Report supports Dr. Thompson's views. See Motion to Supplement Contention at 1-2. The Supplemental Thompson Declaration discusses in further detail the purported supporting information in the Near-Term Report. See Supplemental Thompson Declaration at 1-7.

⁸⁹ See New Contention at 6; Thompson Report at 17.

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experience" methodology.⁹⁰ Even though Dr. Thompson observed that the data set for his methodology "is comparatively sparse and therefore does not provide a statistical basis for a high-confidence estimate of [core damage frequency]," he nonetheless concluded that it provides a "reality check" for the Pilgrim SAMA analysis.⁹¹

The Board reasoned that Massachusetts did not show how Dr. Thompson's "direct experience" methodology called into question the scenario-specific core damage frequencies that were developed in the Pilgrim application for "the entire spectrum of core damaging events, ranging from those that do minimal damage to those that involve massive core melting," nor did it show how Dr. Thompson's methodology (with its limited data set) would be used to develop a separate spectrum of core damage frequencies.⁹² The Board also determined that Massachusetts failed to explain the effect of Dr. Thompson's core damage frequency estimate on potential containment failure and subsequent offsite release.⁹³

We find no error or abuse of discretion in the Board's ruling on this point. Although the Board made its observations while analyzing the timeliness of Massachusetts' motion to reopen

⁹⁰ See Thompson Report at 15-16. Where the PRA methodology takes into account a variety of accident scenarios and the probability of their occurrence, Dr. Thompson's "direct experience" methodology focuses on five actual core damage accidents at commercial nuclear power plants, divided by approximately 14,500 reactor years of operating experience at commercial nuclear power plants worldwide (as of May 16, 2011), yielding a core damage frequency that is ten times higher than the baseline estimate in the Pilgrim SAMA analysis. See *id.* at 15-17.

⁹¹ *Id.* at 16. See also Supplemental Thompson Declaration at 4 (arguing that the Task Force showed a "clear preference for direct experience as the primary basis for its recommendations").

⁹² LBP-11-35, 74 NRC at ___ (slip op. at 51 & n.203).

⁹³ *Id.*

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under subsection 2.326(a)(1),⁹⁴ we find them more pertinent to subsection 2.326(a)(2). Massachusetts has not demonstrated the existence of a “significant environmental issue.”⁹⁵ Although Massachusetts suggested a different methodology for performing the SAMA analysis, it ultimately failed to show how the PRA methodology that is currently used is inadequate to satisfy NEPA’s “hard look” requirement.⁹⁶ As we have stated, our adjudicatory proceedings are not “EIS editing sessions.”⁹⁷ The burden is on the proponent of a contention to show that the Staff’s analysis or methodology is unreasonable or insufficient.⁹⁸ Other than the sweeping assertion that the “direct experience” methodology provides a “reality check” for the Pilgrim SAMA analysis, Massachusetts’ contention and the Thompson Report do not challenge the Pilgrim site-specific spectrum of events making up the PRA core damage frequency in the FSEIS.⁹⁹

⁹⁴ See *id.* at ___ (slip op. at 49-55).

⁹⁵ See 10 C.F.R. § 2.326(a)(2).

⁹⁶ See CLI-10-11, 71 NRC at 315-16 (“In short, NEPA allows agencies ‘to select their own methodology as long as that methodology is reasonable.’” (quoting *Town of Winthrop v. FAA*, 535 F.3d 1, 13 (1st Cir. 2008))).

⁹⁷ *Duke Energy Corp.* (McGuire Nuclear Station, Units 1 and 2; Catawba Nuclear Station, Units 1 and 2), CLI-03-17, 58 NRC 419, 431 (2003).

⁹⁸ See *id.*

⁹⁹ We also question the timeliness of Massachusetts’ “direct experience” claim. See 10 C.F.R. § 2.326(a)(1). As the Board observed, in addition to the accident at Fukushima Dai-ichi, Dr. Thompson’s “direct experience” methodology is based on the Three Mile Island and Chernobyl accidents—both of which occurred decades ago. See LBP-11-35, 74 NRC at ___ (slip op. at 27, 52-53). The Board observed that a direct experience calculation using information from Three Mile Island and Chernobyl alone would have yielded a core damage frequency five times higher than that provided in the Pilgrim SAMA analysis. *Id.* at ___ (slip op. at 52 & n.206). The information arising out of the Fukushima accident, when used in the direct experience (continued. . .)

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Second, Massachusetts asserted that operators at Fukushima Dai-ichi were unable to perform mitigative actions to lessen or prevent an offsite radiation release due to the severity of damage at the site.¹⁰⁰ According to Massachusetts, the possibility of similar conditions limiting operator ability to effectively mitigate an accident should be considered in the Pilgrim SAMA analysis.¹⁰¹ Relating to spent fuel storage, Dr. Thompson argued that the inability of operators to mitigate an accident “could affect the conditional probability of a spent-fuel-pool fire” if operators are unable to add water to the pools.¹⁰² Based on reports of attempts to add water to the spent fuel pools at Fukushima Dai-ichi, Dr. Thompson questioned the efficacy of the measures in place at Pilgrim to mitigate or prevent a spent fuel pool fire.¹⁰³

For Massachusetts' claims relating to operator actions and mitigation procedures not involving the spent fuel pool, the Board found them inadequate for failure to address the “actual consideration of those matters in the [license renewal application], and failure to “indicate how [they] would be affected by consideration of the proposed new information.”¹⁰⁴ Based on this reasoning, we find no error in the Board's analysis. The Board appropriately found that Massachusetts had not demonstrated sufficiently that a materially different result would have

(. . .continued)

analysis, provided a different value for the core damage frequency, but it did not change Massachusetts' underlying challenge to the method for calculating core damage frequency itself. The Board did not err in finding that Massachusetts' direct experience claim was late, since it could have been raised at the outset of this proceeding. See *id.* at ___ (slip op. at 52-53).

¹⁰⁰ New Contention at 6; Thompson Report at 18; Supplemental Thompson Declaration at 4-5.

¹⁰¹ New Contention at 6-7; Thompson Report at 20.

¹⁰² Thompson Report at 18-19.

¹⁰³ *Id.* at 19-20; Supplemental Thompson Declaration at 4-5.

¹⁰⁴ LBP-1 1-35, 74 NRC at ___ (slip op. at 59).

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been likely had this information been considered initially.¹⁰⁵ As for Massachusetts' remaining spent-fuel-pool-related claims, the Board found them to be outside the scope of the proceeding and did not consider them further.¹⁰⁶ We agree.

Massachusetts' third argument is closely tied with the second. Massachusetts asserted that "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."¹⁰⁷ Dr. Thompson elaborated that because certain measures to mitigate severe accidents were only recently disclosed to the public, there is a risk of their inadequacy due to their not having received the benefit of public input, as well as a risk that the entities involved in implementing the measures may not understand fully the details of the tasks they are expected to perform.¹⁰⁸

The Board found Massachusetts' "secrecy" claims to be outside the scope of the proceeding.¹⁰⁹ The Board did not err in holding that these claims are out-of-scope. Massachusetts' concerns appear to be directed more generally at policy issues governing access and categorization of non-public information,¹¹⁰ and it is not apparent how the claimed "excessive secrecy" could affect, or even be factored into, the SAMA analysis.

¹⁰⁵ See *id.* at ___ (slip op. at 59).

¹⁰⁶ See *id.* at ___ (slip op. at 46, 50).

¹⁰⁷ New Contention at 7.

¹⁰⁸ See Thompson Report at 21-23. See also Supplemental Thompson Declaration at 5.

¹⁰⁹ LBP-11-35, 74 NRC at ___ (slip op. at 65).

¹¹⁰ See Thompson Report at 21-23.

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Massachusetts' fourth argument pertains to the prevention of hydrogen explosions during a reactor accident.¹¹¹ Massachusetts claimed that "[b]ased on the occurrence of hydrogen explosions at Fukushima [Dai-ichi] . . . it appears likely that hydrogen explosions similar to those experienced at Fukushima could occur at . . . Pilgrim."¹¹² In support, Dr. Thompson asserted that "containment venting and other hydrogen control systems at the Pilgrim plant should be upgraded, and should use passive mechanisms as much as possible."¹¹³ In his view, hydrogen control measures—both hardware and operating procedures—should be incorporated into Pilgrim's design basis.¹¹⁴

In rejecting Massachusetts' hydrogen control claims, the Board found that Massachusetts had failed to confront the existing SAMA analysis' extensive consideration of the potential for hydrogen explosions and measures to mitigate the buildup of hydrogen.¹¹⁵ The Board thus concluded that Massachusetts had not shown the likelihood of a materially different result had Dr. Thompson's hydrogen control information been considered initially.¹¹⁶ We decline to disturb the Board's sound reasoning on this issue. As Entergy asserted, Dr. Thompson "nowhere references or addresses the Pilgrim SAMA analysis's extensive consideration of

¹¹¹ New Contention at 7; Thompson Report at 24.

¹¹² New Contention at 7.

¹¹³ Thompson Report at 25. *See also* Supplemental Thompson Declaration at 5.

¹¹⁴ Thompson Report at 26.

¹¹⁵ LBP-11-35, 74 NRC at ___ (slip op. at 59, 61-62). *See also id.* at 36-38 (citing *Entergy's Answer Opposing Commonwealth Contention and Petition for Waiver Regarding New and Significant Information Based on Fukushima* (June 27, 2011), at 41-43 (Entergy Answer to New Contention)).

¹¹⁶ LBP-11-35, 74 NRC at ___ (slip op. at 59).

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hydrogen explosions, let alone provide[s] any explanation of how any of it is inadequate.”¹¹⁷ Failure to challenge the existing SAMA analysis would be insufficient to establish a material dispute for the purposes of satisfying the general contention admissibility standards, let alone the reopening standards.¹¹⁸

Fifth, Massachusetts focuses on the probability of a spent fuel pool fire and a resulting radioactive release.¹¹⁹ Acknowledging that the state of knowledge about the Fukushima Dai-ichi accident continues to evolve, and “much of the relevant information is not available at this time,” Dr. Thompson hypothesized that there is evidence of fuel damage in at least one of the Fukushima Dai-ichi spent fuel pools.¹²⁰ He argued that this supports his view of a “substantial conditional probability of a pool fire during a reactor accident at . . . Pilgrim.”¹²¹ In addition, he referenced reports that he prepared in support of Massachusetts’ 2006 rulemaking petition, and asserted that “no evidence has emerged from Fukushima” to contradict the conclusions in those reports.¹²² He further argued that the “Pilgrim pool should be re-equipped with low-density,

¹¹⁷ Entergy Answer to New Contention at 41.

¹¹⁸ See 10 C.F.R. §§ 2.309(f)(1)(vi), 2.326(a)(3). The Board also found the hydrogen control claims to be outside the scope of the proceeding. See LBP-11-35, 74 NRC at ___ (slip op. at 65). The Board’s reasoning on this point is thin, but to the extent the Board excludes hydrogen control related to spent fuel pools, we agree that this would be outside the scope of this adjudication, in light of the Board’s denial of the waiver petition.

¹¹⁹ See New Contention at 7 (arguing that after Fukushima, “the NRC’s previous rejection [(presumably in the 2008 Rulemaking Denial)] of [Massachusetts’] concerns regarding the environmental impacts of high-density pool storage of spent fuel has been refuted”).

¹²⁰ Thompson Report at 26.

¹²¹ *Id.* at 27. See also Supplemental Thompson Declaration at 5-6.

¹²² Thompson Report at 27.

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open-frame racks.¹²³ Because the Board denied Massachusetts' waiver petition, it found this issue to be outside the scope of the proceeding.¹²⁴ We find no error in the Board's ruling on this point:

The final issue raised in Massachusetts' new contention pertains to filtered venting of reactor containment.¹²⁵ Dr. Thompson speculated that some of the radioactive material released at Fukushima might have traveled through vents designed to relieve containment pressure. To reduce the radiological impact of a severe accident, Dr. Thompson argued that filters should be added to the vents to remove radioactive material.¹²⁶ He asserted that the Pilgrim SAMA analysis should be revised to consider filtered vents, and that a filtered vent system that uses passive mechanisms should be installed at Pilgrim.¹²⁷

The Board rejected the claims concerning filtered vents, finding that Massachusetts failed to demonstrate the likelihood of a materially different result because Massachusetts had not discussed the relative costs and benefits of adding filters.¹²⁸ Additionally, the Board found the issue to be outside the scope of the proceeding to the extent Massachusetts would require installation of the filters.¹²⁹ We find no error in the Board's analysis here. We also note that

¹²³ *Id.* at 28.

¹²⁴ See LBP-11-35, 74 NRC at ___ (slip op. at 46; 50).

¹²⁵ New Contention at 7; Thompson Report at 28.

¹²⁶ Thompson Report at 28-29.

¹²⁷ See *id.* at 29; Supplemental Thompson Declaration at 6.

¹²⁸ LBP-11-35, 74 NRC at ___ (slip op. at 58-59).

¹²⁹ See *id.* at ___ (slip op. at 65).

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Massachusetts' filtered vent claims fail to satisfy the "materially different result" prong for an independent reason. As Entergy pointed out, filtered vents already were considered as a SAMA candidate in the Pilgrim FSEIS, and Massachusetts' contention and its supporting material do not acknowledge, let alone challenge, the existing analysis.¹³⁰ Therefore, the Board did not err in holding that Massachusetts failed to show the likelihood of a materially different result, given that the SAMA analysis already considered filtered vents.¹³¹

3. *Massachusetts' Rulemaking Petition and Suspension Request*

As discussed above, Massachusetts included with its waiver petition a "standby" petition for rulemaking and conditional motion to suspend the proceeding pending the disposition of the rulemaking request. With the Board's denial of its waiver petition, the question arises whether the rulemaking petition is now active. In pleadings submitted to the Board, the Staff and Massachusetts requested that the Board refer the rulemaking petition to the Staff for consideration upon the Board's denial of the waiver petition.¹³² The Board did not refer the

¹³⁰ See Entergy Answer to New Contention at 43-44.

¹³¹ See 10 C.F.R. § 2.326(a)(3); CLI-12-3, 75 NRC at __ (slip op. at 23-24).

¹³² See *NRC Staff's Response to the Commonwealth of Massachusetts' Petition for Waiver of 10 C.F.R. Part 51 Subpart A, Appendix B or, in the Alternative, Petition for Rulemaking* (June 27, 2011), at 2 ("Because Massachusetts filed the request with the Board, it is not yet before the portion of the agency tasked with processing petitions for rulemaking Consequently, should the Board dismiss the Waiver Petition, the Staff asks that the Board forward the request to the NRC Staff for consideration as a formal petition for rulemaking under 10 C.F.R. §§ 2.802 [and] 2.803."); *Commonwealth of Massachusetts Reply to the Responses of the NRC Staff and Entergy to Commonwealth Waiver Petition and Motion to Admit Contention or in the Alternative for Rulemaking* (July 5, 2011), at 3 & n.7.

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rulemaking petition expressly; therefore, we will today. We refer Massachusetts' rulemaking petition to the Staff for appropriate resolution in accordance with 10 C.F.R. Part 2, Subpart H.¹³³

However, we decline to suspend the proceeding pending the disposition of the rulemaking petition. We consider suspension of licensing proceedings a "drastic" action that is not warranted absent compelling circumstances.¹³⁴ In the *Private Fuel Storage* dry cask proceeding, we articulated three criteria for determining whether to suspend an adjudication.¹³⁵ We balance whether moving forward with the adjudication will: (1) "jeopardize the public health and safety"; (2) "prove an obstacle to fair and efficient decision[-]making"; and (3) "prevent appropriate implementation of any pertinent rule or policy changes that might emerge from our . . . ongoing [lessons-learned] evaluation."¹³⁶ Massachusetts argues that "it is necessary to suspend the . . . proceeding to allow sufficient time for the Commission to consider [the rulemaking petition] . . . to rescind the spent fuel pool . . . regulations on a generic basis, and ensure that the concerns raised [in its] . . . contention will be considered before the [Board] makes a final decision" on Entergy's license renewal application.¹³⁷ In other words,

¹³³ See generally *Waiver/Rulemaking Petition*; *Thompson Declaration*; *Thompson Report*; *Commonwealth of Massachusetts Supplemental Attachment to the Declaration of Dr. Gordon R. Thompson* (June 13, 2011); *Motion to Supplement Contention*; *Supplemental Thompson Declaration*.

¹³⁴ E.g., *AmerGen Energy Co., LLC* (Oyster Creek Nuclear Generating Station), CLI-08-23, 68 NRC 461, 484 (2008).

¹³⁵ *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-01-26, 54 NRC 376, 380 (2001). See also *Callaway*, CLI-11-5, 74 NRC at __ (slip op. at 19-20).

¹³⁶ *Private Fuel Storage*, CLI-01-26, 54 NRC at 380.

¹³⁷ *Conditional Motion to Suspend* at 2 (emphasis omitted).

Massachusetts asserts that we must suspend the proceeding to "protect its position," which eventually will enable it to litigate, in this adjudicatory proceeding, its challenges to the Pilgrim FSEIS.¹³⁸

With regard to the first factor, Massachusetts has not shown that continuing with the *Pilgrim* adjudication presents an immediate threat to public health and safety. Massachusetts' desire to protect its litigating position does not invoke a public health and safety threat. Moreover, the issues it raises in its contention and rulemaking petition concern a number of generic issues that may be addressed as part of our ongoing regulatory processes. When addressing similar suspension petitions that were submitted in response to the events at Fukushima Dai-ichi, we observed, particularly with respect to license renewal, that our current regulatory and oversight processes provide reasonable assurance that each plant continues to

¹³⁸ *Id.* at 2, 4, 7-8. Entergy and the Staff oppose Massachusetts' suspension motion. *Entergy Answer Opposing Commonwealth of Massachusetts Conditional Motion to Suspend License Renewal Proceeding* (June 13, 2011) (Entergy Answer to Conditional Motion to Suspend); *NRC Staff's Answer in Opposition to Commonwealth of Massachusetts' Conditional Motion to Suspend Pilgrim Nuclear Power Plant License Renewal Proceeding Pending Resolution of Petition for Rulemaking to Rescind Spent Fuel Pool Exclusion Regulations* (June 13, 2011). Massachusetts seeks leave to reply to Entergy and the NRC Staff, arguing that it could not have anticipated the arguments in Entergy's and the Staff's answers. *Commonwealth of Massachusetts Motion to Reply to NRC Staff and Entergy Oppositions to the Commonwealth of Massachusetts Motion to Suspend the License Renewal Proceeding for the Pilgrim Nuclear Power Plant* (June 16, 2011), at 1. Entergy opposes Massachusetts' motion to reply. *Entergy Answer Opposing Commonwealth of Massachusetts Motion to Permit Unauthorized Reply to Entergy and NRC Staff Answers Opposing Conditional Motion for Suspension* (June 24, 2011). We deny the motion to reply, finding no compelling circumstances presented here. See 10 C.F.R. § 2.323(c). We find that Massachusetts should have anticipated the arguments in the Staff's and Entergy's answers, which, in our view, were logical responses to Massachusetts' suspension motion. *Cf. Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 and 3), CLI-11-14, 74 NRC ___ (Dec. 22, 2011) (slip op. at 7-9).

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comply with its “current licensing basis,” which can be adjusted by future Commission order or by modification to the facility’s operating license outside the renewal proceeding.”¹³⁹

Massachusetts’ arguments in support of its rulemaking petition are more relevant to the second and third factors, in that they focus on the potential unfairness of continuing the adjudicatory proceeding while Massachusetts awaits the outcome of its rulemaking petition, and the ability of the NRC to consider Massachusetts’ claims before a decision is made on Entergy’s license renewal application. But any unfairness to Massachusetts equally applies to Entergy in this case, as Entergy argues that “*suspension* of this proceeding . . . would undermine fair and efficient decision[-]making.”¹⁴⁰ Moreover, we already have considered and rejected the notion that our Fukushima lessons-learned review needs to be completed prior to a decision on any pending license renewal application. Any rule or policy changes we may make as a result of our post-Fukushima review may be made irrespective of whether a license renewal application is pending, or whether final action on an application has been taken.¹⁴¹ Therefore, on balance, we

¹³⁹ *Callaway*, CLI-11-5, 74 NRC at __ (slip op. at 26) (citing Final Rule, Nuclear Power Plant License Renewal, 56 Fed. Reg. 64,943, 64,949, 64,953-54 (Dec. 13, 1991)). See also Near-Term Report at vii (concluding that “continued operation and continued licensing activities do not pose an imminent risk to public health and safety”).

¹⁴⁰ Entergy Answer to Conditional Motion to Suspend at 3 (emphasis in original). See generally 5 U.S.C. § 558(c) (requiring that an agency set and complete proceedings on license applications “with due regard for the rights and privileges of all the interested parties or adversely affected persons and within a reasonable time”). See also *Vermont Yankee*, CLI-07-3, 65 NRC at 22 (“[W]hatever the ultimate fate of [Massachusetts]’ ‘new information’ claim, admitting [Massachusetts]’ contention for an adjudicatory hearing is not necessary to ensure that the claim receives a full and fair airing.”).

¹⁴¹ See *Callaway*, CLI-11-5, 74 NRC at __ (slip op. at 26).

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do not find that suspension of this adjudicatory proceeding pending the disposition of Massachusetts' rulemaking petition is warranted in the circumstances presented here.

Our denial of Massachusetts' suspension petition should not be interpreted to mean that we take its claims lightly. Our review of the events at Fukushima Dai-ichi is ongoing. We have directed the Staff to strive to complete and implement lessons learned within five years—by 2016.¹⁴² The NRC continues to analyze the Fukushima events, to engage stakeholders, and to develop further recommendations.¹⁴³ We have in place well-established regulatory processes by which to impose any new requirements or other enhancements that may be needed following completion of regulatory actions associated with the Fukushima events.¹⁴⁴ All affected nuclear

¹⁴² Staff Requirements—SECY-11-0124—Recommended Actions to Be Taken Without Delay from the Near-Term Task Force Report (Oct. 18, 2011), at 1 (ML112911571). *See generally* “Recommended Actions to Be Taken Without Delay from the Near-Term Task Force Report,” Commission Paper SECY-11-0124 (Sept. 9, 2011) (ML11245A127, ML11245A144) (paper and attachment); Staff Requirements—SECY-11-0137—Prioritization of Recommended Actions to Be Taken in Response to Fukushima Lessons Learned (Dec. 15, 2011) (ML113490055) (Prioritization of Recommended Actions, SRM); “Prioritization of Recommended Actions to Be Taken in Response to Fukushima Lessons Learned,” Commission Paper SECY-11-0137 (Oct. 3, 2011) (ML11272A111) (package) (Prioritization of Recommended Actions, SECY-11-0137).

¹⁴³ These efforts include the engagement of internal and external stakeholders. *See* Staff Requirements—COMWDM-11-0001/COMWCO-11-0001—Engagement of Stakeholders Regarding the Events in Japan (Aug. 22, 2011) (ML112340693). For example, the Staff's prioritization of Near-Term Task Force recommended actions included a discussion of additional recommendations for “further consideration and potential prioritization” that stakeholders, as well as the Staff, have identified. *See* Prioritization of Recommended Actions, SECY-11-0137, at 4-5. *See also* Prioritization of Recommended Actions, SRM, at 2. (Although the Staff included “[f]iltration of containment vents”—an issue raised in Massachusetts' contention—as an item for further consideration and potential prioritization, the Staff noted that its “assessment of these issues is incomplete at this time.” Prioritization of Recommended Actions, SECY-11-0137, at 5. We acted on the Staff's recommendation and provided direction regarding “the analysis and interaction with stakeholders needed to inform a decision” on the filtered vents issue. Prioritization of Recommended Actions, SRM, at 2.)

¹⁴⁴ *See Callaway*, CLI-11-5, 74 NRC at ___ (slip op. at 24-25, 29).

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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.¹⁴⁵ Although our Fukushima lessons-learned review continues, we do not have sufficient information at this time to make a significant difference in the *Pilgrim* environmental review. NEPA requires that we conduct our environmental review with the best information available now.¹⁴⁶ It does not, however, require that we wait until inchoate information matures into something that later might affect our review.¹⁴⁷

¹⁴⁵ Most recently, the Staff transmitted to us recommendations to issue proposed orders in response to lessons learned from the events in Japan. See generally "Proposed Orders and Requests for Information in Response to Lessons Learned from Japan's March 11, 2011, Great Tohoku Earthquake and Tsunami," Commission Paper SECY-12-0025 (Feb. 17, 2012) (ML12039A103) (package).

¹⁴⁶ See *Village of Bensenville v. FAA*, 457 F.3d 52, 71-72 (D.C. Cir. 2006) (reasoning that the review method chosen by the agency in "creating its models with the best information available when it began its analysis and then checking the assumptions of those models as new information became available, was a reasonable means of balancing . . . competing considerations, particularly given the many months required to conduct full modeling with new data"); *Town of Winthrop*, 535 F.3d at 9-13 (upholding agency decision not to supplement an EIS with information in an area of research that was "still developing"). Accord *Marsh*, 490 U.S. at 373 ("[A]n agency need not supplement an EIS every time new information comes to light after the EIS is finalized. To require otherwise would render agency decision[-]making intractable, always awaiting updated information only to find the new information outdated by the time a decision is made.").

¹⁴⁷ See *Marsh*, 490 U.S. at 373-74. Our rules enable us to supplement an FSEIS if, before a proposed action is taken, new and significant information comes to light that bears on the proposed action or its impacts, consistent with the Supreme Court's decision in *Marsh v. Oregon Natural Resources Council*. See 10 C.F.R. § 51.92(a); *Marsh*, 490 U.S. at 373-74. See also LBP-11-35, 74 NRC at ___ (slip op. at 65 n.234) (noting that "[i]f and when Fukushima-derived information sheds new light on the Pilgrim SAMA analysis, the NRC has adequate mechanisms for addressing its regulatory impact").

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III. CONCLUSION

For the reasons set forth above, we *deny* Massachusetts' and Pilgrim Watch's petitions for review. We *refer* Massachusetts' rulemaking petition to the Staff for appropriate resolution. We *deny* Massachusetts' request to suspend the adjudicatory proceeding pending the disposition of its rulemaking petition.

IT IS SO ORDERED.¹⁴⁸

For the Commission

[NRC Seal]

/RA/

Annette L. Vietti-Cook
Secretary of the Commission

Dated at Rockville, Maryland,
this 8th day of March, 2012.

¹⁴⁸ Commissioner Apostolakis did not participate in this matter.

Chairman Gregory B. Jaczko, Concurring in Part, and Dissenting in Part

I concur with the majority decision to the extent it denies Massachusetts' waiver petition and request for suspension of the proceeding in the event that its rulemaking petition is activated. I dissent from the decision to the extent that it applies the standard reserved for reopening a closed hearing record, in 10 C.F.R. § 2.326(a), to Massachusetts' new Fukushima contention. Fundamentally, I believe that the reopening standard is not appropriate for Fukushima-related contentions. Therefore, I believe the admissibility of this contention should have been considered solely under the criteria applicable to nontimely filings in 10 C.F.R. § 2.309(c).

The higher threshold for contention admissibility imposed for reopening a record places a heavy burden on a litigant seeking the admission of new contentions. In my view, this more stringent contention admissibility standard is not appropriate for contentions arising from the unprecedented and catastrophic accident at Fukushima. We are in the process of conducting a comprehensive review of the Fukushima events from which we have, and will continue to, learn new information and gain new insights on the safety of our nuclear fleet. Given the significance of that accident and the potential implications for the safety of our nuclear reactors, we should allow members of the public to obtain hearings on new contentions on emerging information if they satisfy our ordinary contention standards. Applying more stringent admissibility standards to Fukushima contentions because a Board has taken the administrative action of closing the record on an unrelated hearing will lead to inconsistent outcomes and, more importantly, unfairly limit public participation in these important safety matters. When we considered whether our modifications to our adjudicatory processes should be modified for Fukushima-related contentions, we said we would monitor our proceedings and issue additional guidance as

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appropriate.¹ I believe that we should do so now and direct that the reopening criteria should not be applied.

¹ *Callaway*, CLI-11-5, 74 NRC at ___ (slip op. at 36).



SECRETARY

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 25, 2012

COMMISSION VOTING RECORD

DECISION ITEM: SECY-12-0062

TITLE: RENEWAL OF FULL-POWER OPERATING LICENSE FOR
PILGRIM NUCLEAR POWER STATION

The Commission acted on the subject paper as recorded in the Staff Requirements Memorandum (SRM) of May 25, 2012.

This Record contains a summary of voting on this matter together with the individual vote sheets, views and comments of the Commission.

A handwritten signature in black ink that reads "Kenneth R. Hart".

Kenneth R. Hart
Acting Secretary of the Commission

Attachments:

1. Voting Summary
2. Commissioner Vote Sheets

cc: Chairman Jaczko
Commissioner Svinicki
Commissioner Apostolakis
Commissioner Magwood
Commissioner Ostendorff
OGC
EDO
PDR

VOTING SUMMARY - SECY-12-0062

RECORDED VOTES

	APRVD	DISAPRVD	ABSTAIN	NOT PARTICIP	COMMENTS	DATE
CHRM. JACZKO			X		X	5/21/12
COMR. SVINICKI	X				X	4/30/12
COMR. APOSTOLAKIS				X		4/24/12
COMR. MAGWOOD	X					4/25/12
COMR. OSTENDORFF	X				X	5/1/12

NOTATION VOTE

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary
FROM: Chairman Gregory B. Jaczko
SUBJECT: SECY-12-0062 – RENEWAL OF FULL-POWER
OPERATING LICENSE FOR PILGRIM NUCLEAR
POWER STATION

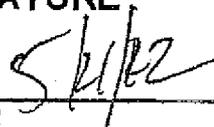
Approved _____ Disapproved X Abstain _____

Not Participating _____

COMMENTS: Below ___ Attached X None ___



SIGNATURE



DATE

Entered on "STARS" Yes X No _____

**Chairman Jaczko's Comments on SECY-12-0062,
"Renewal of Full-Power Operating License for Pilgrim"**

I disapprove the issuance of the renewed license for the Pilgrim Nuclear Power Station at this time. While I appreciate the need to have an appropriate procedure for bringing this process to completion, the current approach that my colleagues on the Commission support is unprecedented in license renewal proceedings and provides little basis for action. Furthermore, since the licensee is in timely renewal, no harm will come to the licensee as the issues are brought to conclusion.

The process for resolving license renewals and established in a number of proceedings in which I personally participated has been to allow the staff to move forward with a license renewal when Board action was complete and the only matters pending were *appeals of Board decision before the Commission*. That is simply not the case in this situation. In fact, the Commission itself has referred several petitions to the Atomic Safety and Licensing Board. Therefore, these matters are currently pending before the Board. This is an entirely new situation, one I never contemplated when I previously supported issuance of a renewed license while adjudicatory issues remained unresolved. The license renewal provisions of 10 C.F.R. § 54.31(c) explicitly reference a process for reinstating the previous license if the renewed license "is subsequently set aside upon further administrative or judicial *appeal*" [emphasis added]. While the Commission previously allowed licensees to move forward while issues were under consideration by Boards, those instances involved immediate effectiveness decisions while proceedings for initial issuance of operating licenses were pending.

The Commission, through its own action, has referred petitions raising questions about the adequacy of the staff's review of the Pilgrim license renewal application to the Board. But since it is the staff, rather than a participant in the hearing, that seeks immediate issuance of the license renewal the matter is treated as a simple SECY paper, implying that the action is not related to the ongoing administrative litigation. This hardly seems to be a fair process for the petitioners. Moreover, it appears to send a confusing message to the petitioners. On the one hand, by referring the petitions to the Board, the Commission appears to believe the petitions present at least some merit. On the other hand, by approving the staff's SECY paper the Commission appears to be saying there are no remaining initial matters of significance to resolve before the issuance of the license. If the Commission were so comfortable that the issues raised in the motion to reopen were trivial, the Commission could have simply dismissed them itself without referral to the Board.

The Commission has ample authority to take the reins of this hearing and move the process to a reasonable decision point. I would suggest this be done in the following way. First, the Commission should issue an order instructing that all final petitions seeking admission of new contentions be filed by a specified date. Next, staff should file a motion with the Commission expressing its interest in issuing the license. The Commission should then entertain briefs and issue a decision articulating its reasons based on the adjudicatory record relevant to the issues pending before the Board. The initial Commission order would make clear that subsequent motions filed would not be guaranteed to be reviewed. This process would be clear, transparent and fair to all parties in the proceeding and establish a process that would be applicable to future proceedings.



Gregory B. Jaczko
5/21/12
Date

NOTATION VOTE

RESPONSE SHEET

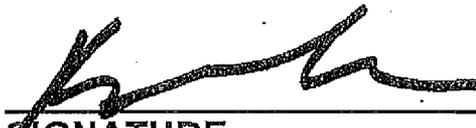
TO: Annette Vietti-Cook, Secretary
FROM: COMMISSIONER SVINICKI
SUBJECT: SECY-12-0062 – RENEWAL OF FULL-POWER
OPERATING LICENSE FOR PILGRIM NUCLEAR
POWER STATION

Approved XX Disapproved _____ Abstain _____

Not Participating _____

COMMENTS: Below XX Attached _____ None _____

I approve authorizing the Director of the Office of Nuclear Reactor Regulation to renew the operating license for the Pilgrim Nuclear Power Station upon his making the appropriate findings on safety and environmental matters. The Staff Requirements Memorandum for this action should state that "The Commission recognizes that in view of the petition for review pending before it and the intervention petition pending before the Atomic Safety & Licensing Board, if the renewed license is subsequently set aside on appeal, the previous operating license would be reinstated in accordance with 10 CFR 54.31(c)."



SIGNATURE

4/30/12

DATE

Entered on "STARS". Yes No _____

NOTATION VOTE

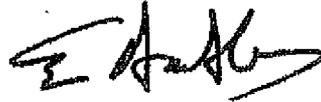
RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary
FROM: COMMISSIONER APOSTOLAKIS
SUBJECT: SECY-12-0062 – RENEWAL OF FULL-POWER
OPERATING LICENSE FOR PILGRIM NUCLEAR
POWER STATION

Approved _____ Disapproved _____ Abstain _____

Not Participating

COMMENTS: Below _____ Attached _____ None _____



SIGNATURE

4/24/12

DATE

Entered on "STARS" Yes No _____

NOTATION VOTE

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary
FROM: COMMISSIONER MAGWOOD
SUBJECT: SECY-12-0062 – RENEWAL OF FULL-POWER
OPERATING LICENSE FOR PILGRIM NUCLEAR
POWER STATION

Approved Disapproved _____ Abstain _____

Not Participating _____

COMMENTS: Below ___ Attached ___ None



SIGNATURE

25 April 2012

DATE

Entered on "STARS" Yes No _____

NOTATION VOTE

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary
FROM: COMMISSIONER OSTENDORFF
SUBJECT: SECY-12-0062 – RENEWAL OF FULL-POWER OPERATING LICENSE FOR PILGRIM NUCLEAR POWER STATION

Approved XX Disapproved _____ Abstain _____

Not Participating _____

COMMENTS: Below XX Attached _____ None _____

I approve the staff's recommendation to authorize the Director of the Office of Nuclear Reactor Regulation to renew the operating license for the Pilgrim Nuclear Power Station upon his making the appropriate findings on safety and environmental matters. I concur with Commissioner Svinicki that the Staff Requirements Memorandum for this action should state that "The Commission recognizes that in view of the petition for review pending before it and the intervention petition pending before the Atomic Safety & Licensing Board, if the renewed license is subsequently set aside on appeal, the previous operating license would be reinstated in accordance with 10 CFR 54.31(c)."

W. Ostendorff
SIGNATURE

5/1/12
DATE

Entered on "STARS" Yes X No _____



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 29, 2012

Mr. Michael A. Balduzzi
Senior Vice President & Chief Operating Officer
Regional Operations, NE
Entergy Nuclear Operations, Inc.
440 Hamilton Avenue
White Plains, NY 10601

SUBJECT: ISSUANCE OF RENEWED FACILITY OPERATING LICENSE NO. DPR-35 FOR
THE PILGRIM NUCLEAR POWER STATION

Dear Mr. Balduzzi:

The U.S. Nuclear Regulatory Commission (NRC) has issued Renewed Facility Operating License No. DPR-35 for the Pilgrim Nuclear Power Station (PNPS) (Enclosure 1). The NRC issued the renewed facility operating license based on the staff's review of your application dated January 25, 2006, as supplemented by letters submitted to the NRC through April 24, 2012. The review did not result in an amendment of the technical specifications for PNPS. The period of extended operation for PNPS begins at midnight on June 8, 2012.

Renewed Facility Operating License No. DPR-35 expires at midnight on June 8, 2032.

Enclosure 1 also contains the following attachments: Appendix A, "Technical Specifications," and Appendix B, "Additional Conditions."

Enclosure 2 is a copy of the related *Federal Register* notice of issuance of the renewed license. The original has been sent to the Office of the Federal Register for publication.

The technical basis for issuing the renewed license is set forth in NUREG-1891, "Safety Evaluation Report Related to the License Renewal of Pilgrim Nuclear Power Station," issued November 2007, as supplemented. The results of the environmental review related to the issuance of the renewed license are given in NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 29, Regarding Pilgrim Nuclear Power Station-Final Report," issued July 2007.

M. Balduzzi

- 2 -

If you have any questions about this action, please feel free to contact me at 301-415-1045 or by e-mail at Nate.Ferrer@nrc.gov.

Sincerely,



Nathaniel Ferrer, Project Manager
Projects Branch 1
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket No. 50-293

Enclosures:

1. Renewed Facility Operating License
No. DPR-35, with Appendix A, "Technical
Specifications," and Appendix B,
"Additional Conditions"
2. *Federal Register* Notice

cc: Listserv

M. Balduzzi

- 2 -

If you have any questions regarding this action, please feel free to contact me at 301-415-1045 or by e-mail at Nate.Ferrer@nrc.gov.

Sincerely,

/RA/

Nathaniel Ferrer, Project Manager
 Projects Branch 1
 Division of License Renewal
 Office of Nuclear Reactor Regulation

Docket No. 50-293

Enclosures:

1. Renewed Facility Operating License No. DPR-35, Appendix A, Technical Specifications, and Appendix B, Additional Conditions
2. *Federal Register Notice*

cc: Listserv

ADAMS Accession Nos.: (PKG) ML091040286, (LTR) ML091040423, (LIC) ML091040431, (App. A.&B) ML091040467, (FRN) ML091040439, *concurred via e-mail

OFFICE	PM:RPB1:DLR	LA:DLR	Tech Editor*	PM:DORL:LPLI-1	BC:DORL:LPLI-1
NAME	NFerrer	SFiguroa	JDougherty	RGuzman	GWilson
DATE	03 / 20 /12	10/19/11	02 / 21 /12	05 / 02 /12	05 / 08 /12
OFFICE	BC:RPB1:DLR	D:DLR	OGC	D:NRR	PM:RPB1:DLR
NAME	DMorey	BHolian	SUttal (NLO)	ELeeds	NFerrer
DATE	05 / 08 /12	05 / 25 /12	05 / 25 /12	05 / 29 /12	05 / 29 /12

OFFICIAL RECORD COPY

ENCLOSURE 1

**ENTERGY NUCLEAR GENERATION COMPANY
(PILGRIM NUCLEAR POWER STATION)
RENEWED FACILITY OPERATING LICENSE
RENEWED LICENSE NO. DPR-35**

ENTERGY NUCLEAR GENERATION COMPANY *

And ENTERGY NUCLEAR OPERATIONS, INC.

(PILGRIM NUCLEAR POWER STATION)

DOCKET NO. 50-293

RENEWED FACILITY OPERATING LICENSE

Renewed License No. DPR-35

The Nuclear Regulatory Commission (the Commission) has found that:

- a. Except as stated in condition 5, construction of the Pilgrim Nuclear Power Station (the facility) has been substantially completed in conformity with the application, as amended, the Provisional Construction Permit No. CPPR-49, the provisions of the Atomic Energy Act of 1954, as amended (the Act), and the rules and regulations of the Commission as set forth in Title 10, Chapter 1, CFR; and
- b. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the rules and regulations of the Commission; and
- c. There is reasonable assurance (i) that the activities authorized by the renewed operating license can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the rules and regulations of the Commission; and
- d. The Entergy Nuclear Generation Company (Entergy Nuclear) is financially qualified and Entergy Nuclear Operations, Inc. (ENO) is technically and financially qualified to engage in the activities authorized by this renewed operating license, in accordance with the rules and regulations of the Commission; and
- e. Entergy Nuclear and ENO have satisfied the applicable provisions of 10 CFR Part 140, "Financial Protection Requirements and Indemnity Agreements" of the Commission's regulations; and
- f. The issuance of this renewed operating license will not be inimical to the common defense and security or to the health and safety of the public; and
- g. After weighing the environmental, economic, technical, and other benefits of the facility against environmental costs and considering available alternatives, the issuance of this renewed operating license (subject to the condition for protection of the environment set forth herein) is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements of said regulations have been satisfied; and
- h. Actions have been identified and have been or will be taken with respect to (1) managing the effects of aging during the period of extended operation on the functionality of structures and components that have been identified to require review under

* The Nuclear Regulatory Commission approved the transfer of the license from Boston Edison Company to Entergy Nuclear Generation Company on April 29, 1999.

10 CFR 54.21(a)(1); and (2) time-limited aging analyses that have been identified to require review under 10 CFR 54.21(c), such that there is reasonable assurance that the activities authorized by the renewed operating license will continue to be conducted in accordance with the current licensing basis, as defined in 10 CFR 54.3, for the facility, and that any changes made to the facility's current licensing basis in order to comply with 10 CFR 54.29(a) are in accordance with the Act and the Commission's regulations.

Facility Operating License No. DPR-35, dated June 8, 1972, issued to the Boston Edison Company (Boston Edison) is hereby amended in its entirety, pursuant to an Initial Decision dated September 13, 1972, by the Atomic Safety and Licensing Board, to read as follows:

1. This renewed operating license applies to the Pilgrim Nuclear Power Station, a single cycle, forced circulation, boiling water nuclear reactor and associated electric generating equipment (the facility), owned by Entergy Nuclear and operated by ENO. The facility is located on the western shore of Cape Cod Bay in the town of Plymouth on the Entergy Nuclear site in Plymouth County, Massachusetts, and is described in the "Final Safety Analysis Report," as supplemented and amended.
2. Subject to the conditions and requirements incorporated herein, the Commission hereby licenses Entergy Nuclear:
 - A. Pursuant to the Section 104b of the Atomic Energy Act of 1954, as amended (the Act) and 10 CFR Part 50, "Licensing of Production and Utilization Facilities," a) Entergy Nuclear to possess and use and b) ENO to possess, use, and operate the facility as a utilization facility at the designated location on the Pilgrim site;
 - B. ENO, pursuant to the Act and 10 CFR 70, to receive, possess, and use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Final Safety Analysis Report, as supplemented and amended;
 - C. ENO, pursuant to the Act and 10 CFR Parts 30, 40 and 70 to receive, possess and use at any time any byproduct, source or special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;
 - D. ENO, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and
 - E. ENO, pursuant to the Act and 10 CFR Parts 30 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.
3. This renewed operating license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations; 10 CFR Part 20, Section 30.34 of 10 CFR Part 30, Section 40.41 of 10 CFR Part 40, Sections 50.54 and 50.59 of 10 CFR Part 50 and Section 70.32 of 10 CFR Part 70; and is subject to all applicable

Pt. 51, Subpt. A, App. B

10 CFR Ch. I (1-1-12 Edition)

TABLE B-1—SUMMARY OF FINDINGS ON NEPA ISSUES FOR LICENSE RENEWAL OF NUCLEAR POWER PLANTS¹—Continued

Issue	Category ²	Findings ³
Offsite radiological impacts (spent fuel and high level waste disposal).	1	<p>For the high level waste and spent fuel disposal component of the fuel cycle, there are no current regulatory limits for offsite releases of radionuclides for the current candidate repository site. However, if we assume that limits are developed along the lines of the 1995 National Academy of Sciences (NAS) report, "Technical Bases for Yucca Mountain Standards," and that in accordance with the Commission's Waste Confidence Decision, 10 CFR 51.23, a repository can and likely will be developed at some site which will comply with such limits, peak doses to virtually all individuals will be 100 millirem per year or less. However, while the Commission has reasonable confidence that these assumptions will prove correct, there is considerable uncertainty since the limits are yet to be developed, no repository application has been completed or reviewed, and uncertainty is inherent in the models used to evaluate possible pathways to the human environment. The NAS report indicated that 100 millirem per year should be considered as a starting point for limits for individual doses, but notes that some measure of consensus exists among national and international bodies that the limits should be a fraction of the 100 millirem per year. The lifetime individual risk from 100 millirem annual dose limit is about 3×10^{-3}.</p> <p>Estimating cumulative doses to populations over thousands of years is more problematic. The likelihood and consequences of events that could seriously compromise the integrity of a deep geologic repository were evaluated by the Department of Energy in the "Final Environmental Impact Statement: Management of Commercially Generated Radioactive Waste," October 1980. The evaluation estimated the 70-year whole-body dose commitment to the maximum individual and to the regional population resulting from several modes of breaching a reference repository in the year of closure, after 1,000 years, after 100,000 years, and after 100,000,000 years. Subsequently, the NRC and other federal agencies have expended considerable effort to develop models for the design and for the licensing of a high level waste repository, especially for the candidate repository at Yucca Mountain. More meaningful estimates of doses to population may be possible in the future as more is understood about the performance of the proposed Yucca Mountain repository. Such estimates would involve very great uncertainty, especially with respect to cumulative population doses over thousands of years. The standard proposed by the NAS is a limit on maximum individual dose. The relationship of potential new regulatory requirements, based on the NAS report, and cumulative population impacts has not been determined, although the report articulates the view that protection of individuals will adequately protect the population for a repository at Yucca Mountain. However, EPA's generic repository standards in 40 CFR part 191 generally provide an indication of the order of magnitude of cumulative risk to population that could result from the licensing of a Yucca Mountain repository, assuming the ultimate standards will be within the range of standards now under consideration. The standards in 40 CFR part 191 protect the population by imposing "containment requirements" that limit the cumulative amount of radioactive material released over 10,000 years. Reporting performance standards that will be required by EPA are expected to result in releases and associated health consequences in the range between 10 and 100 premature cancer deaths with an upper limit of 1,000 premature cancer deaths worldwide for a 100,000 metric tonnes (MTHM) repository.</p> <p>Nevertheless, despite all the uncertainty, some judgement as to the regulatory NEPA implications of these matters should be made and it makes no sense to repeat the same judgement in every case. Even taking the uncertainties into account, the Commission concludes that these impacts are acceptable in that these impacts would not be sufficiently large to require the NEPA conclusion, for any plant, that the option of extended operation under 10 CFR part 54 should be eliminated. Accordingly, while the Commission has not assigned a single level of significance for the impacts of spent fuel and high level waste disposal, this issue is considered Category 1.</p>
Nonradiological impacts of the uranium fuel cycle.	1	SMALL. The nonradiological impacts of the uranium fuel cycle resulting from the renewal of an operating license for any plant are found to be small.

Nuclear Regulatory Commission

Pt. 51, Subpt. A, App. B

TABLE B-1—SUMMARY OF FINDINGS ON NEPA ISSUES FOR LICENSE RENEWAL OF NUCLEAR POWER PLANTS¹—Continued

Issue	Category ²	Findings ³
Low-level waste storage and disposal.	1	SMALL. The comprehensive regulatory controls that are in place and the low public doses being achieved at reactors ensure that the radiological impacts to the environment will remain small during the term of a renewed license. The maximum additional on-site land that may be required for low-level waste storage during the term of a renewed license and associated impacts will be small. Nonradiological impacts on air and water will be negligible. The radiological and nonradiological environmental impacts of long-term disposal of low-level waste from any individual plant at licensed sites are small. In addition, the Commission concludes that there is reasonable assurance that sufficient low-level waste disposal capacity will be made available when needed for facilities to be decommissioned consistent with NRC decommissioning requirements.
Mixed waste storage and disposal	1	SMALL. The comprehensive regulatory controls and the facilities and procedures that are in place ensure proper handling and storage, as well as negligible doses and exposure to toxic materials for the public and the environment at all plants. License renewal will not increase the small, continuing risk to human health and the environment posed by mixed waste at all plants. The radiological and nonradiological environmental impacts of long-term disposal of mixed waste from any individual plant at licensed sites are small. In addition, the Commission concludes that there is reasonable assurance that sufficient mixed waste disposal capacity will be made available when needed for facilities to be decommissioned consistent with NRC decommissioning requirements.
On-site spent fuel	1	SMALL. The 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.
Nonradiological waste	1	SMALL. No changes to generating systems are anticipated for license renewal. Facilities and procedures are in place to ensure continued proper handling and disposal at all plants.
Transportation	1	SMALL. The impacts of transporting spent fuel enriched up to 5 percent uranium-235 with average burnup for the peak rod to current levels approved by NRC up to 62,000 MWd/MTU and the cumulative impacts of transporting high-level waste to a single repository, such as Yucca Mountain, Nevada are found to be consistent with the impact values contained in 10 CFR 51.52(c), Summary Table S-4—Environmental Impact of Transportation of Fuel and Waste to and from One Light-Water-Cooled Nuclear Power Reactor. If fuel enrichment or burnup conditions are not met, the applicant must submit an assessment of the implications for the environmental impact values reported in §51.52.
Decommissioning		
Radiation doses	1	SMALL. Doses to the public will be well below applicable regulatory standards regardless of which decommissioning method is used. Occupational doses would increase no more than 1 man-rem caused by buildup of long-lived radionuclides during the license renewal term.
Waste management	1	SMALL. Decommissioning at the end of a 20-year license renewal period would generate no more solid wastes than at the end of the current license term. No increase in the quantities of Class C or greater than Class C wastes would be expected.
Air quality	1	SMALL. Air quality impacts of decommissioning are expected to be negligible either at the end of the current operating term or at the end of the license renewal term.
Water quality	1	SMALL. The potential for significant water quality impacts from erosion or spills is no greater whether decommissioning occurs after a 20-year license renewal period or after the original 40-year operation period, and measures are readily available to avoid such impacts.
Ecological resources	1	SMALL. Decommissioning after either the initial operating period or after a 20-year license renewal period is not expected to have any direct ecological impacts.
Socioeconomic impacts	1	SMALL. Decommissioning would have some short-term socioeconomic impacts. The impacts would not be increased by delaying decommissioning until the end of a 20-year license renewal period, but they might be decreased by population and economic growth.

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TABLE B-1—SUMMARY OF FINDINGS ON NEPA ISSUES FOR LICENSE RENEWAL OF NUCLEAR POWER PLANTS¹—Continued

Issue	Category ²	Findings ³
Environmental Justice		
Environmental Justice ⁶	⁴ NA	NONE. The need for and the content of an analysis of environmental justice will be addressed in plant-specific reviews. ⁵

¹Data supporting this table are contained in NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (May 1996) and NUREG-1437, Vol. 1, Addendum 1, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants: Main Report Section 6.3—Transportation," Table 9.1 "Summary of findings on NEPA issues for license renewal of nuclear power plants," Final Report" (August 1999).

²The numerical entries in this column are based on the following category definitions:
 Category 1: For the issue, the analysis reported in the Generic Environmental Impact Statement has shown:
 (1) The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristic;
 (2) A single significance level (i.e., small, moderate, or large) has been assigned to the impacts (except for collective off site radiological impacts from the fuel cycle and from high level waste and spent fuel disposal); and
 (3) Mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are likely not to be sufficiently beneficial to warrant implementation.
 The generic analysis of the issue may be adopted in each plant-specific review.

Category 2: For the issue, the analysis reported in the Generic Environmental Impact Statement has shown that one or more of the criteria of Category 1 cannot be met, and therefore additional plant-specific review is required.

³The impact findings in this column are based on the definitions of three significance levels. Unless the significance level is identified as beneficial, the impact is adverse, or in the case of "small," may be negligible. The definitions of significance follow:

SMALL—For the issue, environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource. For the purposes of assessing radiological impacts, the Commission has concluded that those impacts that do not exceed permissible levels in the Commission's regulations are considered small as the term is used in this table.

MODERATE—For the issue, environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.

LARGE—For the issue, environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

For issues where probability is a key consideration (i.e., accident consequences), probability was a factor in determining significance.

⁴NA (not applicable). The categorization and impact finding definitions do not apply to these issues.

⁵If, in the future, the Commission finds that, contrary to current indications, a consensus has been reached by appropriate Federal health agencies that there are adverse health effects from electromagnetic fields, the Commission will require applicants to submit plant-specific reviews of these health effects as part of their license renewal applications. Until such time, applicants for license renewal are not required to submit information on this issue.

⁶Environmental Justice was not addressed in NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants," because guidance for implementing Executive Order 12898 issued on February 11, 1994, was not available prior to completion of NUREG-1437. This issue will be addressed in individual license renewal reviews.

[61 FR 66546, Dec. 18, 1996, as amended at 62 FR 59276, Nov. 3, 1997; 64 FR 48507, Sept. 3, 1999; 66 FR 39278, July 30, 2001]

Subpart B [Reserved]

Subpart A—Early Site Permits

PART 52—LICENSES, CERTIFICATIONS, AND APPROVALS FOR NUCLEAR POWER PLANTS

GENERAL PROVISIONS

- Sec.
- 52.0 Scope; applicability of 10 CFR Chapter I provisions.
- 52.1 Definitions.
- 52.2 Interpretations.
- 52.3 Written communications.
- 52.4 Deliberate misconduct.
- 52.5 Employee protection.
- 52.6 Completeness and accuracy of information.
- 52.7 Specific exemptions.
- 52.8 Combining licenses; elimination of repetition.
- 52.9 Jurisdictional limits.
- 52.10 Attacks and destructive acts.
- 52.11 Information collection requirements: OMB approval.

- 52.12 Scope of subpart.
- 52.13 Relationship to other subparts.
- 52.15 Filing of applications.
- 52.16 Contents of applications; general information.
- 52.17 Contents of applications; technical information.
- 52.18 Standards for review of applications.
- 52.21 Administrative review of applications; hearings.
- 52.23 Referral to the Advisory Committee on Reactor Safeguards (ACRS).
- 52.24 Issuance of early site permit.
- 52.25 Extent of activities permitted.
- 52.26 Duration of permit.
- 52.27 Limited work authorization after issuance of early site permit.
- 52.28 Transfer of early site permit.
- 52.29 Application for renewal.
- 52.31 Criteria for renewal.
- 52.33 Duration of renewal.
- 52.35 Use of site for other purposes.
- 52.39 Finality of early site permit determinations.

10 C.F.R. PART 54—REQUIREMENTS FOR RENEWAL OF OPERATING LICENSES FOR NUCLEAR POWER PLANTS

General Provisions

§ 54.1 Purpose.

This part governs the issuance of renewed operating licenses and renewed combined licenses for nuclear power plants licensed pursuant to Sections 103 or 104b of the Atomic Energy Act of 1954, as amended, and Title II of the Energy Reorganization Act of 1974 (88 Stat. 1242).

§ 54.3 Definitions.

(a) As used in this part, Current licensing basis (CLB) is the set of NRC requirements applicable to a specific plant and a licensee's written commitments for ensuring compliance with and operation within applicable NRC requirements and the plant-specific design basis (including all modifications and additions to such commitments over the life of the license) that are docketed and in effect. The CLB includes the NRC regulations contained in 10 CFR parts 2, 19, 20, 21, 26, 30, 40, 50, 51, 52, 54, 55, 70, 72, 73, 100 and appendices thereto; orders; license conditions; exemptions; and technical specifications. It also includes the plant-specific design-basis information defined in 10 CFR 50.2 as documented in the most recent final safety analysis report (FSAR) as required by 10 CFR 50.71 and the licensee's commitments remaining in effect that were made in docketed licensing correspondence such as licensee responses to NRC bulletins, generic letters, and enforcement actions, as well as licensee commitments documented in NRC safety evaluations or licensee event reports.

Integrated plant assessment (IPA) is a licensee assessment that demonstrates that a nuclear power plant facility's structures and components requiring aging management review in accordance with § 54.21(a) for license renewal have been identified and that the effects of aging on the functionality of such structures and components will be managed to maintain the CLB such that there is an acceptable level of safety during the period of extended operation.

Nuclear power plant means a nuclear power facility of a type described in 10 CFR 50.21(b) or 50.22.

Renewed combined license means a combined license originally issued under part 52 of this chapter for which an application for renewal is filed in accordance with 10 CFR 52.107 and issued under this part.

Time-limited aging analyses, for the purposes of this part, are those licensee calculations and analyses that:

- (1) Involve systems, structures, and components within the scope of license renewal, as delineated in § 54.4(a);
 - (2) Consider the effects of aging;
 - (3) Involve time-limited assumptions defined by the current operating term, for example, 40 years;
 - (4) Were determined to be relevant by the licensee in making a safety determination;
 - (5) Involve conclusions or provide the basis for conclusions related to the capability of the system, structure, and component to perform its intended functions, as delineated in § 54.4(b); and
 - (6) Are contained or incorporated by reference in the CLB.
- (b) All other terms in this part have the same meanings as set out in 10 CFR 50.2 or Section 11 of the Atomic Energy Act, as applicable.

§ 54.4 Scope.

(a) Plant systems, structures, and components within the scope of this part are--

- (1) Safety-related systems, structures, and components which are those relied upon to remain functional during and following design-basis events (as defined in 10 CFR 50.49 (b)(1)) to ensure the following functions--

- (i) The integrity of the reactor coolant pressure boundary;
- (ii) The capability to shut down the reactor and maintain it in a safe shutdown condition; or
- (iii) The capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to those referred to in § 50.34(a)(1), § 50.67(b)(2), or § 100.11 of this chapter, as applicable.

(2) All nonsafety-related systems, structures, and components whose failure could prevent satisfactory accomplishment of any of the functions identified in paragraphs (a)(1)(i), (ii), or (iii) of this section.

(3) All systems, structures, and components relied on in safety analyses or plant evaluations to perform a function that demonstrates compliance with the Commission's regulations for fire protection (10 CFR 50.48), environmental qualification (10 CFR 50.49), pressurized thermal shock (10 CFR 50.61), anticipated transients without scram (10 CFR 50.62), and station blackout (10 CFR 50.63).

(b) The intended functions that these systems, structures, and components must be shown to fulfill in § 54.21 are those functions that are the bases for including them within the scope of license renewal as specified in paragraphs (a)(1) - (3) of this section.

§ 54.5 Interpretations.

Except as specifically authorized by the Commission in writing, no interpretation of the meaning of the regulations in this part by any officer or employee of the Commission other than a written interpretation by the General Counsel will be recognized to be binding upon the Commission.

§ 54.7 Written Communications.

All applications, correspondence, reports, and other written communications shall be filed in accordance with applicable portions of 10 CFR 50.4.

§ 54.9 Information collection requirements: OMB approval.

(a) The Nuclear Regulatory Commission has submitted the information collection requirements contained in this part to the Office of Management and Budget (OMB) for approval as required by the Paperwork Reduction Act (44 U.S.C. 3501 et seq.). The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. OMB has approved the information collection requirements contained in this part under control number 3150-0155.

(b) The approved information requirements contained in this part appear in §§ 54.13, 54.15, 54.17, 54.19, 54.21, 54.22, 54.23, 54.33, and 54.37.

§ 54.11 Public Inspection of Applications.

Applications and documents submitted to the Commission in connection with renewal applications may be made available for public inspection in accordance with the provisions of the regulations contained in 10 CFR Part 2.

§ 54.13 Completeness and Accuracy of Information.

(a) Information provided to the Commission by an applicant for a renewed license or information required by statute or by the Commission's regulations, orders, or license conditions to be maintained by the applicant must be complete and accurate in all material respects.

(b) Each applicant shall notify the Commission of information identified by the applicant as having, for the regulated activity, a significant implication for public health and safety or common defense and security. An applicant violates this paragraph only if the applicant fails to notify the Commission of information that the applicant has identified as having a significant implication for public health and safety or common defense and security. Notification must be provided to the Administrator of the appropriate regional office within 2 working days

of identifying the information. This requirement is not applicable to information that is already required to be provided to the Commission by other reporting or updating requirements.

§ 54.15 Specific Exemptions.

Exemptions from the requirements of this part may be granted by the Commission in accordance with 10 CFR 50.12.

§ 54.17 Filing of Application.

- (a) The filing of an application for a renewed license must be in accordance with Subpart A of 10 CFR Part 2 and 10 CFR 50.4 and 50.30.
- (b) Any person who is a citizen, national, or agent of a foreign country, or any corporation, or other entity which the Commission knows or has reason to know is owned, controlled, or dominated by an alien, a foreign corporation, or a foreign government, is ineligible to apply for and obtain a renewed license.
- (c) An application for a renewed license may not be submitted to the Commission earlier than 20 years before the expiration of the operating license or combined license currently in effect.
- (d) An applicant may combine an application for a renewed license with applications for other kinds of licenses.
- (e) An application may incorporate by reference information contained in previous applications for licenses or license amendments, statements, correspondence, or reports filed with the Commission, provided that the references are clear and specific.
- (f) If the application contains Restricted Data or other defense information, it must be prepared in such a manner that all Restricted Data and other defense information are separated from unclassified information in accordance with 10 CFR 50.33(j).
- (g) As part of its application, and in any event before the receipt of Restricted Data or classified National Security Information or the issuance of a renewed license, the applicant shall agree in writing that it will not permit any individual to have access to or any facility to possess Restricted Data or classified National Security Information until the individual and/or facility has been approved for such access under the provisions of 10 CFR Parts 25 and/or 95. The agreement of the applicant in this regard shall be deemed part of the renewed license, whether so stated therein or not.

§ 54.19 Contents of Application--General Information.

- (a) Each application must provide the information specified in 10 CFR 50.33(a) through (e), (h), and (i). Alternatively, the application may incorporate by reference other documents that provide the information required by this section.
- (b) Each application must include conforming changes to the standard indemnity agreement, 10 CFR 140.92, Appendix B, to account for the expiration term of the proposed renewed license.

§ 54.21 Contents of Application--Technical Information.

Each application must contain the following information:

- (a) An integrated plant assessment (IPA). The IPA must--
 - (1) For those systems, structures, and components within the scope of this part, as delineated in § 54.4, identify and list those structures and components subject to an aging management review. Structures and components subject to an aging management review shall encompass those structures and components--
 - (i) That perform an intended function, as described in § 54.4, without moving parts or without a change in configuration or properties. These structures and components include, but are not limited to, the reactor vessel, the reactor coolant system pressure boundary, steam generators, the pressurizer, piping, pump casings, valve bodies, the core shroud, component supports, pressure

retaining boundaries, heat exchangers, ventilation ducts, the containment, the containment liner, electrical and mechanical penetrations, equipment hatches, seismic Category I structures, electrical cables and connections, cable trays, and electrical cabinets, excluding, but not limited to, pumps (except casing), valves (except body), motors, diesel generators, air compressors, snubbers, the control rod drive, ventilation dampers, pressure transmitters, pressure indicators, water level indicators, switchgears, cooling fans, transistors, batteries, breakers, relays, switches, power inverters, circuit boards, battery chargers, and power supplies; and

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

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

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

(b) CLB changes during NRC review of the application. Each year following submittal of the license renewal application and at least 3 months before scheduled completion of the NRC review, an amendment to the renewal application must be submitted that identifies any change to the CLB of the facility that materially affects the contents of the license renewal application, including the FSAR supplement.

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

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

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

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

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

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

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

§ 54.22 Contents of Application--Technical Specifications.

Each application must include any technical specification changes or additions necessary to manage the effects of aging during the period of extended operation as part of the renewal application. The justification for changes or additions to the technical specifications must be contained in the license renewal application.

§ 54.23 Contents of Application--Environmental Information.

Each application must include a supplement to the environmental report that complies with the requirements of Subpart A of 10 CFR Part 51.

§ 54.25 Report of the Advisory Committee on Reactor Safeguards.

Each renewal application will be referred to the Advisory Committee on Reactor Safeguards for a review and report. Any report will be made part of the record of the application and made available to the public, except to the extent that security classification prevents disclosure.

§ 54.27 Hearings.

A notice of an opportunity for a hearing will be published in the **Federal Register** in accordance with 10 CFR 2.105. In the absence of a request for a hearing filed within 30 days by a person whose interest may be affected, the Commission may issue a renewed operating license or renewed combined license without a hearing upon 30-day notice and publication in the **Federal Register** of its intent to do so.

§ 54.29 Standards for Issuance of a Renewed License.

A renewed license may be issued by the Commission up to the full term authorized by § 54.31 if the Commission finds that:

(a) Actions have been identified and have been or will be taken with respect to the matters identified in Paragraphs (a)(1) and (a)(2) of this section, such that there is reasonable assurance that the activities authorized by the renewed license will continue to be conducted in accordance with the CLB, and that any changes made to the plant's CLB in order to comply with this paragraph are in accord with the Act and the Commission's regulations. These matters are:

(1) managing the effects of aging during the period of extended operation on the functionality of structures and components that have been identified to require review under § 54.21(a)(1); and

(2) time-limited aging analyses that have been identified to require review under § 54.21(c).

(b) Any applicable requirements of Subpart A of 10 CFR Part 51 have been satisfied.

(c) Any matters raised under § 2.335 have been addressed.

§ 54.30 Matters Not Subject to a Renewal Review.

(a) If the reviews required by § 54.21 (a) or (c) show that there is not reasonable assurance during the current license term that licensed activities will be conducted in accordance with the CLB, then the licensee shall take measures under its current license, as appropriate, to ensure that the intended function of those systems, structures or components will be maintained in accordance with the CLB throughout the term of its current license.

(b) The licensee's compliance with the obligation under Paragraph (a) of this section to take measures under its current license is not within the scope of the license renewal review.

§ 54.31 Issuance of a Renewed License.

(a) A renewed license will be of the class for which the operating license or combined license currently in effect was issued.

(b) A renewed license will be issued for a fixed period of time, which is the sum of the additional amount of time beyond the expiration of the operating license or combined license (not to exceed 20 years) that is requested in a renewal application plus the remaining number of years on the operating license or combined license currently in effect. The term of any renewed license may not exceed 40 years.

(c) A renewed license will become effective immediately upon its issuance, thereby superseding the operating license or combined license previously in effect. If a renewed license is subsequently set aside upon further administrative or judicial appeal, the operating license or combined license previously in effect will be reinstated unless its term has expired and the renewal application was not filed in a timely manner.

(d) A renewed license may be subsequently renewed in accordance with all applicable requirements.

§ 54.33 Continuation of CLB and Conditions of Renewed License.

(a) Whether stated therein or not, each renewed license will contain and otherwise be subject to the conditions set forth in 10 CFR 50.54.

(b) Each renewed license will be issued in such form and contain such conditions and limitations, including technical specifications, as the Commission deems appropriate and necessary to help ensure that systems, structures, and components subject to review in accordance with § 54.21 will continue to perform their intended functions for

the period of extended operation. In addition, the renewed license will be issued in such form and contain such conditions and limitations as the Commission deems appropriate and necessary to help ensure that systems, structures, and components associated with any time-limited aging analyses will continue to perform their intended functions for the period of extended operation.

(c) Each renewed license will include those conditions to protect the environment that were imposed pursuant to 10 CFR 50.36b and that are part of the CLB for the facility at the time of issuance of the renewed license. These conditions may be supplemented or amended as necessary to protect the environment during the term of the renewed license and will be derived from information contained in the supplement to the environmental report submitted pursuant to 10 CFR Part 51, as analyzed and evaluated in the NRC record of decision. The conditions will identify the obligations of the licensee in the environmental area, including, as appropriate, requirements for reporting and recordkeeping of environmental data and any conditions and monitoring requirements for the protection of the nonaquatic environment.

(d) The licensing basis for the renewed license includes the CLB, as defined in § 54.3(a); the inclusion in the licensing basis of matters such as licensee commitments does not change the legal status of those matters unless specifically so ordered pursuant to paragraphs (b) or (c) of this section.

§ 54.35 Requirements During Term of Renewed License.

During the term of a renewed license, licensees shall be subject to and shall continue to comply with all Commission regulations contained in 10 CFR parts 2, 19, 20, 21, 26, 30, 40, 50, 51, 52, 54, 55, 70, 72, 73, and 100, and the appendices to these parts that are applicable to holders of operating licenses or combined licenses, respectively.

§ 54.37 Additional Records and Recordkeeping Requirements.

(a) The licensee shall retain in an auditable and retrievable form for the term of the renewed operating license or renewed combined license all information and documentation required by, or otherwise necessary to document compliance with, the provisions of this part.

(b) After the renewed license is issued, the FSAR update required by 10 CFR 50.71(e) must include any systems, structures, and components newly identified that would have been subject to an aging management review or evaluation of time-limited aging analyses in accordance with § 54.21. This FSAR update must describe how the effects of aging will be managed such that the intended function(s) in § 54.4(b) will be effectively maintained during the period of extended operation.

§ 54.41 Violations.

(a) The Commission may obtain an injunction or other court order to prevent a violation of the provisions of the following acts--

- (1) The Atomic Energy Act of 1954, as amended.
- (2) Title II of the Energy Reorganization Act of 1974, as amended or
- (3) A regulation or order issued pursuant to those acts.

(b) The Commission may obtain a court order for the payment of a civil penalty imposed under Section 234 of the Atomic Energy Act--

- (1) For violations of the following--
 - (i) Sections 53, 57, 62, 63, 81, 82, 101, 103, 104, 107, or 109 of the Atomic Energy Act of 1954, as amended;
 - (ii) Section 206 of the Energy Reorganization Act;
 - (iii) Any rule, regulation, or order issued pursuant to the sections specified in paragraph (b)(1)(i) of this section;
 - (iv) Any term, condition, or limitation of any license issued under the sections specified in paragraph (b)(1)(i) of this section.

(2) For any violation for which a license may be revoked under Section 186 of the Atomic Energy Act of 1954, as amended.

§ 54.43 Criminal Penalties.

(a) Section 223 of the Atomic Energy Act of 1954, as amended, provides for criminal sanctions for willful violations of, attempted violation of, or conspiracy to violate, any regulation issued under sections 161b, 161i, or 161o of the Act. For purposes of section 223, all the regulations in Part 54 are issued under one or more of sections 161b, 161i, or 161o, except for the sections listed in paragraph (b) of this section.

(b) The regulations in Part 54 that are not issued under Sections 161b, 161i, or 161o for the purposes of Section 223 are as follows: §§ 54.1, 54.3, 54.4, 54.5, 54.7, 54.9, 54.11, 54.15, 54.17, 54.19, 54.21, 54.22, 54.23, 54.25, 54.27, 54.29, 54.31, 54.41, and 54.43.

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NUCLEAR REGULATORY COMMISSION

10 CFR Part 51

RIN 3150-AD63

Environmental Review for Renewal of Nuclear Power Plant Operating Licenses

AGENCY: Nuclear Regulatory Commission.

ACTION: Final rule.

SUMMARY: The Nuclear Regulatory Commission (NRC) is amending its regulations regarding environmental protection regulations for domestic licensing and related regulatory functions to establish new requirements for the environmental review of applications to renew the operating licenses of nuclear power plants. The amendment defines those environmental impacts for which a generic analysis has been performed that will be adopted in plant-specific reviews for license renewal and those environmental impacts for which plant-specific analyses are to be performed.

The amendment improves regulatory efficiency in environmental reviews for license renewal by drawing on the considerable experience of operating nuclear power reactors to generically assess many of the environmental impacts that are likely to be associated with license renewal. The amendment also eliminates consideration of the need for generating capacity and of utility economics from the environmental reviews because these matters are under the regulatory jurisdiction of the States and are not necessary for the NRC's understanding of the environmental consequences of a license renewal decision.

The increased regulatory efficiency will result in lower costs to both the applicant in preparing a renewal application and to the NRC for

reviewing plant-specific applications and better focus of review resources on significant case specific concerns. The results should be a more focused and therefore a more effective NEPA review for each license renewal. The amendment will also provide the NRC with the flexibility to address unreviewed impacts at the site-specific stage of review and allow full consideration of the environmental impacts of license renewal.

The NRC is soliciting public comment on this rule for a period of 30 days. In developing any comment specific attention should be given to the treatment of low-level waste storage and disposal impacts, the cumulative radiological effects from the uranium fuel cycle, and the effects from the disposal of high-level waste and spent fuel.

DATES: Absent a determination by the NRC that the rule should be modified, based on comments received, the final rule shall be effective on August 5, 1996. The comment period expires on July 5, 1996.

ADDRESSES: Send comments to: The Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, Attention: Docketing and Services Branch, or hand deliver comments to the Office of the Secretary, One White Flint North, 11555 Rockville Pike, Rockville, Maryland between 7:30 a.m. and 4:15 p.m. on Federal workdays. Copies of comments received and all documents cited in the supplementary information may be examined at the NRC Public Document Room, 2120 L Street NW. (Lower Level), Washington, DC between the hours of 7:45 a.m. and 4:15 p.m. on Federal workdays.

FOR FURTHER INFORMATION CONTACT: Donald P. Cleary, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, telephone: (301) 415-6263; e-mail DPC@nrc.gov.

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I. Introduction

The Commission has amended its environmental protection regulations in 10 CFR part 51 to improve the efficiency of the process of environmental review for applicants seeking to renew an operating license for up to an additional 20 years. The amendments are based on the analyses conducted for and reported in NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (May 1996). The Commission's initial decision to undertake a generic assessment of the environmental impacts associated with the renewal of a nuclear power plant operating license was motivated by its beliefs that:

- (1) License renewal will involve nuclear power plants for which the

environmental impacts of operation are well understood as a result of data evaluated from operating experience to date;

(2) Activities associated with license renewal are expected to be within this range of operating experience, thus environmental impacts can be reasonably predicted; and

(3) Changes in the environment around nuclear power plants are gradual and predictable with respect to characteristics important to environmental impact analyses.

Although this amendment is consistent with the generic approach and scope of the proposed amendment published on September 17, 1991 (56 FR 47016), several significant modifications have been made in response to the public comments received. The proposed amendment would have codified the findings reached in the draft generic environmental impact statement (GEIS) as well as certain procedural requirements. The draft GEIS established the bounds and significance of potential environmental impacts at 118 light-water nuclear power reactors that, as of 1991, were licensed to operate or were expected to be licensed in the future.

All potential environmental impacts and other matters treated by the NRC in an environmental review of nuclear power plants were identified and combined into 104 discrete issues. For each issue, the NRC staff established generic findings encompassing as many nuclear power plants as possible. These findings would have been codified by the proposed amendment. Of the 104 issues reviewed for the proposed rule, the staff determined that 80 issues could be adequately addressed generically and would not have been reviewed in plant-specific license renewal reviews. For 22 of the issues, it was found that the issue was adequately addressed for some but not all plants. Therefore, a plant-specific review would be required to determine whether the plant is covered by the generic review or whether the issue must be assessed for that plant. The proposed amendment provided guidance on the application of these findings at the site-specific license renewal stage. For the two remaining issues, it was found that the issue was not generically addressed for any plant, and thus a plant-specific review would have been required for all plants.

Other major features of the proposed amendment included a conditional finding of a favorable cost-benefit balance for license renewal and a provision for the use of an environmental assessment that would address only those issues requiring

plant-specific review. A finding of no significant impact would have resulted in a favorable cost-benefit balance for that plant. If a finding of no significant impact could not be made for the plant, there would have to have been a determination as to whether the impacts found in the environmental assessment were sufficient to overturn the conditional cost-benefit balance found in the rule.

Although the final amendments to 10 CFR part 51 maintain the same generic approach used in the proposed rule, there are several modifications. The final amendments to 10 CFR part 51 now contain 92 issues. The reduction of the number of issues from 104 in the proposed rule to 92 in the final rule is due to (1) the elimination from the review of the consideration of the need for electric power and associated generating capacity and of the direct economic benefits and costs associated with electric power, (2) removing alternatives as an issue from Table B-1 and addressing review requirements only in the text of the rule, (3) combining the five severe accident issues used in the proposed rule into one issue, (4) eliminating several regional economic issues under socioeconomics that are not directly related to environmental impacts, (5) making minor changes to the grouping of issues under aquatic ecology and groundwater, (6) identifying collective offsite radiological impacts associated with the fuel cycle and all impacts of high level waste and spent fuel disposal as separate issues, and (7) adding environmental justice as an issue for consideration.

Of the 92 issues in the final rule, 68 issues were found to be adequately addressed in the GEIS, and therefore, additional assessment will not be required in a plant-specific review. Twenty-four issues were found to require additional assessment for at least some plants at the time of the license renewal review. In the final rule, the 2 issues in the proposed rule that would have required review for all plants are now included in the set of 24 issues of the final rule.

Public comments on the adequacy of the analysis for each issue were considered by the NRC staff. Any changes to the analyses and findings that were determined to be warranted were made in the final GEIS and incorporated in the rule. Several changes were made to the procedural features of the proposed rule in response to comments by the Council on Environmental Quality, the Environmental Protection Agency, and a number of State agencies. First, the NRC

will prepare a supplemental site-specific environmental impact statement (SEIS), rather than an environmental assessment (as initially proposed), for each license renewal application. The SEIS will be issued for public comment as part of the individual plant review process. The NRC will delay any conclusions regarding the acceptability of the overall impacts of the license renewal until completion of the site-specific review. In addition, the SEIS will be prepared in accordance with existing public scoping requirements. The NRC will also review and consider any new and significant information presented during the review of individual license renewal applications. In addition, any person may challenge the validity of the conclusions codified in the rule by filing a petition for rulemaking pursuant to 10 CFR 2.802. Finally, the NRC will review the rule and the GEIS on a schedule that allows revisions, if required, every 10 years. This review will be initiated approximately 7 years after the completion of the previous revision cycle.

In addition to the changes involving public participation, this final rule also contains several changes regarding the scope of analysis and conclusions in the rule and GEIS. The conditional cost-benefit balance has been removed from the GEIS and the rule. In place of the cost-benefit balancing, the NRC will use a new standard that will require a determination of whether or not the adverse environmental impacts of license renewal are so great, compared with the set of alternatives, that preserving the option of license renewal for future decisionmakers would be unreasonable. The final amendment also eliminates NRC's consideration of the need for generating capacity and the preparation of power demand forecasts for license renewal applications. The NRC acknowledges the primacy of State regulators and utility officials in defining energy requirements and determining the energy mix within their jurisdictions. Therefore, the issue of need for power and generating capacity will no longer be considered in NRC's license renewal decisions. The final GEIS has been revised to include an explicit statement of purpose and need for license renewal consistent with this acknowledgment. Lastly, the final rule has eliminated the consideration of utility economics from license renewal reviews under the National Environmental Policy Act (NEPA) except when such benefits and costs are either essential for a determination regarding the inclusion of an alternative

in the range of alternatives considered or relevant to mitigation. These and other features of the final rule are explained in detail below.

The NRC is soliciting public comment on this rule for a period of 30 days. In developing any comment specific attention should be given to the treatment of low-level waste storage and disposal impacts, the cumulative radiological effects from the uranium fuel cycle, and the effects from the disposal of high-level waste and spent fuel. Absent a determination by the NRC that the rule should be modified, based on comments received, the final rule shall be effective on August 5, 1996.

II. Rulemaking History

In 1986, the NRC initiated a program to develop license renewal regulations and associated regulatory guidance in anticipation of applications for the renewal of nuclear power plant operating licenses. A solicitation for comments on the development of a policy statement was published in the Federal Register on November 6, 1986 (51 FR 40334). However, the Commission decided to forgo the development of a policy statement and to proceed directly to rulemaking. An advance notice of proposed rulemaking was published on August 29, 1988 (53 FR 32919). Subsequently, the NRC determined that, in addition to the development of license renewal regulations focused on the protection of health and safety, an amendment to its environmental protection regulations in 10 CFR part 51 was warranted.

On October 13, 1989 (54 FR 41980), the NRC published a notice of its intent to hold a public workshop on license renewal on November 13 and 14, 1989. One of the workshop sessions was devoted to the environmental issues associated with license renewal and the possible merit of amending 10 CFR part 51. The workshop is summarized in NUREG/CP-0108, "Proceedings of the Public Workshop on Nuclear Power Plant License Renewal" (April 1990). Responses to the public comments submitted after the workshop are summarized in NUREG-1411, "Response to Public Comments Resulting from the Public Workshop on Nuclear Power Plant License Renewal" (July 1990).

On July 23, 1990, the NRC published an advance notice of proposed rulemaking (55 FR 29964) and a notice of intent to prepare a generic environmental impact statement (55 FR 29967). The proposed rule was published on September 17, 1991 (56 FR 47016). The same Federal Register notice described the supporting

documents that were available and announced a public workshop to be held on November 4-5, 1991. The supporting documents for the proposed rule included:

(1) NUREG-1437, "Draft Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (August 1991);

(2) NUREG-1440, "Regulatory Analysis of Proposed Amendments to Regulations Concerning the Environmental Review for Renewal of Nuclear Power Plant Operating Licenses: Draft Report for Comment" (August 1991);

(3) Draft Regulatory Guide DG-4002, Proposed Supplement 1 to Regulatory Guide 4.2, "Guidance for the Preparation of Supplemental Environmental Reports in Support of an Application To Renew a Nuclear Power Station Operating License" (August 1991); and

(4) NUREG-1429, "Environmental Standard Review Plan for the Review of License Renewal Applications for Nuclear Power Plants: Draft Report for Comment" (August 1991);

After the comment period, the NRC exchanged letters with the Council on Environmental Quality (CEQ) and the Environmental Protection Agency (EPA) to address their concerns about procedural aspects of the proposed rule. The Commission also decided that the staff should discuss with the States the concerns raised in comments by a number of States that certain features of the proposed rule conflicted with State regulatory authority over the need for power and utility economics. To facilitate these discussions, the NRC staff developed an options paper entitled "Addressing the Concerns of States and Others Regarding the Role of Need for Generating Capacity, Alternative Energy Sources, Utility Costs, and Cost-Benefit Analysis in NRC Environmental Reviews for Relicensing Nuclear Power Plants: An NRC Staff Discussion Paper." A Federal Register notice published on January 18, 1994 (59 FR 2542) announced the scheduling of three regional workshops during February 1994 and the availability of the options paper. A fourth public meeting on the State concerns was held in May 1994 in order for the NRC staff to better understand written proposals that had been submitted by two industry organizations after the regional workshops. After considering the comments from the workshops and the written comments, the NRC staff issued a proposed supplement to the proposed rule published on July 25, 1994 (59 FR 37724), that it believed would resolve the States' concerns regarding the

Commission's consideration of need for power and utility economics. Comments were requested on this proposal. The discussion below contains an analysis of these comments and other comments submitted in response to the proposed rule.

III. Analysis of Public Comments

The analysis of public comments and the NRC's responses to these comments are documented in NUREG-1529, "Public Comments on the Proposed 10 CFR part 51 Rule for Renewal of Nuclear Power Plant Operating Licenses and Supporting Documents: Review of Concerns and NRC Staff Response" (May 1996). The extent of comments received during the various stages of the rulemaking process and the principal concerns raised by the commenters, along with the corresponding NRC responses to these concerns, are discussed below.

A. Commenters

In response to the Federal Register notice on the proposed rule published on September 17, 1991 (56 FR 47016), 68 organizations and 49 private citizens submitted written comments. The 68 organizations included 5 Federal agencies; 26 State, regional, and local agencies; 19 nuclear industry organizations and engineering firms; 3 law firms; and 15 public interest groups. Before the close of the initial comment period, the NRC conducted a 2-day workshop on November 4-5, 1991, in Arlington, Virginia, to discuss the proposed rule. Representatives from Federal agencies, State agencies, utilities, engineering firms, law firms, and public interest groups attended the workshop. Workshop panelists included the NRC staff as well as representatives from the Department of Energy (DOE), Department of Interior (DOI), Environmental Protection Agency (EPA), Council on Environmental Quality (CEQ), several State agencies, the nuclear industry, and public interest groups.

In February 1994, the NRC conducted three public meetings to solicit views on the NRC staff's options for addressing the need for generating capacity, alternative energy sources, economic costs, and cost-benefit analysis in the proposed rule. The intent to hold public meetings and the availability of the options paper was noticed in the Federal Register on January 12, 1994 (59 FR 2542). Written comments were also solicited on the options paper. The public meetings were held in Rockville, Maryland; Rosemont, Illinois; and Chicopee, Massachusetts.

Representatives from several States, the National Association of Regulatory Utility Commissioners (NARUC), the nuclear industry, and public interest groups actively participated. Nineteen separate written comments were also submitted, primarily by the States and the nuclear industry. In their submittals, the Nuclear Energy Institute (NEI), formerly known as the Nuclear Management and Resources Council (NUMARC), and Yankee Atomic Electric Company (YAEC) each proposed an approach to handling the issues of need for generating capacity and alternative energy sources in the rule. For the NRC staff to better understand these proposals, an additional public meeting was held with NEI and YAEC on May 16, 1994, in Rockville, Maryland.

After considering the public comments on the NRC staff's options paper, the NRC issued a proposed supplement to the proposed rule; it was published in the Federal Register on July 25, 1994 (59 FR 37724). The proposed supplement set forth the NRC staff's approach to the treatment of need for generating capacity and alternative energy sources, as well as the staff's revision to the purpose of and need for the proposed action (i.e., license renewal), which was intended to satisfy the States' concerns and to meet NEPA requirements. Twenty separate written comments were received in response to this solicitation from Federal and State agencies, the nuclear industry, a public interest group, and two private citizens.

B. Procedural Concerns

The commenters on the proposed rule raised significant concerns regarding the following procedural aspects of the rule:

(1) State and public participation in the license renewal process and the periodic assessment of the GEIS findings;

(2) The use of economic costs and cost-benefit balancing; and

(3) Consideration of the need for generating capacity and alternative energy sources in the environmental review of license renewal applications.

Each of these concerns and the NRC response is discussed below.

1. Public Participation and the Periodic Assessment of the Rule and the GEIS

Concern. Many commenters criticized the draft GEIS finding that 80 of 104 environmental issues could be generically applied to all plants and, therefore, would not be subject to plant-specific review at the time of license renewal. As a consequence, these commenters believe they are being denied the opportunity to participate in the license renewal process. Moreover,

they pointed out that the site-specific nature of many important environmental issues does not justify a generic finding, particularly when the finding would have been made 20 years in advance of the decision to renew an operating license. The commenters believe that only a site-specific EIS to support a license renewal decision would satisfy NEPA requirements.

Federal and State agencies questioned how new scientific information could be folded into the GEIS findings because the GEIS would have been performed so far in advance of the actual renewal of an operating license. There were differing views on exactly how the NRC should address this question. A group of commenters, including CEQ and EPA, noted that the rigidity of the proposed rule hampers the NRC's ability to respond to new information or to different environmental issues not listed in the proposed rule. They believe that incorporation of new information can only be achieved through the process of amending the rules. One commenter recommended that, if the NRC decides to pursue the approach of making generic findings based on the GEIS, the frequency of review and update should be specifically stated in the rule. Recommendations on the frequency of the review ranged from 2 years to 5 years.

Response. In SECY-93-032, February 9, 1993, the NRC staff reported to the Commission their discussions with CEQ and EPA regarding the concerns these agencies raised, which were also raised by other commenters, about limiting public comment and the consideration of significant new information in individual license renewal environmental reviews. The focus of the commenters concerns is the limited nature of the site-specific reviews contemplated under the proposed rule. In response, the NRC has reviewed the generic conclusions in the draft rule, expanded the opportunity for site-specific review, and confirmed that what remains as generic is so. Also, the framework for consideration of significant new information has been revised and expanded.

The major changes adopted as a result of these discussions are as follows:

1. The NRC will prepare a supplemental site-specific EIS, rather than an environmental assessment (as initially proposed), for each license renewal application. This SEIS will be a supplement to the GEIS. Additionally, the NRC will review comments on the draft SEIS and determine whether such comments introduce new and significant information not considered in the GEIS analysis. All comments on

the applicability of the analyses of impacts codified in the rule and the analysis contained in the draft supplemental EIS will be addressed by NRC in the final supplemental EIS in accordance with 40 CFR 1503.4, regardless of whether the comment is directed to impacts in Category 1 or 2. Such comments will be addressed in the following manner:

a. NRC's response to a comment regarding the applicability of the analysis of an impact codified in the rule to the plant in question may be a statement and explanation of its view that the analysis is adequate including, if applicable, consideration of the significance of new information. A commenter dissatisfied with such a response may file a petition for rulemaking under 10 CFR 2.802. If the commenter is successful in persuading the Commission that the new information does indicate that the analysis of an impact codified in the rule is incorrect in significant respects (either in general or with respect to the particular plant), a rulemaking proceeding will be initiated.

b. If a commenter provides new information which is relevant to the plant and is also relevant to other plants (i.e., generic information) and that information demonstrates that the analysis of an impact codified in the final rule is incorrect, the NRC staff will seek Commission approval to either suspend the application of the rule on a generic basis with respect to the analysis or delay granting the renewal application (and possibly other renewal applications) until the analysis in the GEIS is updated and the rule amended. If the rule is suspended for the analysis, each supplemental EIS would reflect the corrected analysis until such time as the rule is amended.

c. If a commenter provides new, site-specific information which demonstrates that the analysis of an impact codified in the rule is incorrect with respect to the particular plant, the NRC staff will seek Commission approval to waive the application of the rule with respect to that analysis in that specific renewal proceeding. The supplemental EIS would reflect the corrected analysis as appropriate.

2. The final rule and the GEIS will not include conditional cost-benefit conclusions or conclusions about alternatives. Conclusions relative to the overall environmental impacts including cumulative impacts will be left entirely to each site-specific SEIS.

3. After consideration of the changes from the proposed rule to the final rule and further review of the environmental issues, the NRC has concluded that it is

adequate to formally review the rule and the GEIS on a schedule that allows revisions, if required, every 10 years. The NRC believes that 10 years is a suitable period considering the extent of the review and the limited environmental impacts observed thus far, and given that the changes in the environment around nuclear power plants are gradual and predictable with respect to characteristics important to environmental impact analyses. This review will be initiated approximately 7 years after completion of the last cycle. The NRC will conduct this review to determine what, if anything, in the rule requires revision.

Concern. As part of their comments on the July 1994 Federal Register notice, NEI, several utilities, and the DOE asked that the NRC reconsider its understanding with CEQ and EPA regarding the preparation of a site-specific supplemental EIS for each license renewal action. These commenters supported an approach that would allow the preparation of an environmental assessment for reviewing the environmental impacts of license renewal.

Response. The NRC does not agree with this position. The NRC believes that it is reasonable to expect that an assessment of the full set of environmental impacts associated with an additional 20 years of operation of any plant would not result in a "finding of no significant impact." Therefore, the review for any plant would involve an environmental impact statement.

2. Economic Costs and Cost-Benefit Balancing

Concern. State, Federal, and utility representatives expressed concern about the use of economic costs and cost-benefit balancing in the proposed rule and the draft GEIS. Commenters criticized the NRC's heavy emphasis on economic analysis and the use of economic decision criteria. They argued that the regulatory authority over utility economics falls within the States' jurisdiction and to some extent within the jurisdiction of the Federal Energy Regulatory Commission. Commenters also believe that the cost-benefit balancing used in the proposed rule and the draft GEIS went beyond NEPA requirements and CEQ regulations (40 CFR Parts 1500 to 1508). They noted that CEQ regulations interpret NEPA to require only an assessment of the cumulative effects of a proposed Federal action on the natural and man-made environment.

Response. In response to these concerns, the NRC has eliminated the use of cost-benefit analysis and

consideration of utility economics in its NEPA review of a license renewal application except when such benefits and costs are either essential for a determination regarding the inclusion of an alternative in the range of alternatives considered or relevant to mitigation. As discussed in more detail in the following section, the NRC recognizes that the determination of the economic viability of continuing the operation of a nuclear power plant is an issue that should be left to appropriate State regulatory and utility officials.

3. Need for Generating Capacity and Alternative Energy Sources

Concern. In their comments on the proposed rule and the draft GEIS, several States expressed concern that the NRC's analysis of need for generating capacity would preempt or prejudice State energy planning decisions. They argued that the determination of need for generating capacity has always been the States' responsibility. Recommendations on how to address this issue ranged from withdrawing the proposed rule to changing the categorization of the issue so that a site-specific review can be performed, thus allowing for meaningful State and public participation. Almost all the concerned States called on the NRC to modify the rule to state explicitly that NRC's analysis does not preempt a State's jurisdiction over the determination of need for generating capacity.

Regarding the issue of alternative energy sources, several commenters contended that the site-specific nature of the alternatives to license renewal did not justify the generic finding in the GEIS. One significant concern about this finding is the States' perception that a generic finding, in effect, preempts the States' responsibility to decide on the appropriate mix of energy alternatives in their respective jurisdictions.

Three regional public meetings were held during the February 1994 to discuss the concerns of the States. At these meetings, and later in written comments, the State of New York proposed an approach to resolve the problem. The approach was endorsed by several other States. This approach had three major conditions:

(1) A statement in the rule that the NRC's findings on need and alternatives are only intended to satisfy the NEPA requirements and do not preclude the States from making their own determination with respect to these issues;

(2) The designation of the need for generating capacity and alternative

energy sources as Category 3 (i.e., requiring site-specific evaluation); and

(3) A requirement that all site-specific EISs and relicensing decisions reference State determinations of need for generating capacity and alternative energy sources, and that they defer to those State determinations to the maximum extent possible.

Response. After consideration, the NRC staff did not accept all elements of the States' approach because the approach would have continued to require the NRC to consider the need for generating capacity and utility economics as part of its environmental analysis. In addition, the approach would have required the NRC to develop guidelines for determining the acceptability of State economic analyses, which some States may have viewed as an intrusion on their planning process.

The NRC staff developed and recommended another approach, which was published on July 25, 1994 (59 FR 37724), after consideration of information gathered at the regional meetings and from the written comments. This approach, which borrows some elements from NEI and YAEC proposals, has five major features:

(1) Neither the rule nor the GEIS would contain a consideration of the need for generating capacity or other issues involving the economic costs and benefits of license renewal and of the associated alternatives;

(2) The purpose and need for the proposed action (i.e., license renewal) would be defined as preserving the continued operation of a nuclear power plant as a safe option that State regulators and utility officials may consider in their future planning actions;

(3) The only alternative to the proposed action would be the "no-action" alternative, and the environmental consequences of this alternative are the impacts of a range of energy sources that might be used if a nuclear power plant operating license were not renewed;

(4) The environmental review for license renewal would include a comparison of the environmental impacts of license renewal with impacts of the range of energy sources that may be chosen in the case of "no action"; and

(5) The NRC's NEPA decision standard for license renewal would require the NRC to determine whether the environmental impacts of license renewal are so great that preserving the option of license renewal for future decisionmakers would be unreasonable.

The statement that the use of economic costs will be eliminated in this approach refers to the ultimate NEPA decision regarding the comparison of alternatives and the proposed action. This approach does not preclude a consideration of economic costs if these costs are essential to a determination regarding the inclusion of an alternative in the range of alternatives considered (i.e., an alternative's exorbitant cost could render it nonviable and unworthy of further consideration) or relevant to mitigation of environmental impacts. Also, the two local tax issues and the two economic structure issues under socioeconomics in the table would be removed from consideration when applying the decision standard.

Concern. Comments received from several States on the NRC staff's July 1994 recommended approach ranged from rejection to endorsement. Some States supported the three conditions proposed by the State of New York. Several States were still concerned about whether a meaningful analysis of need for generating capacity and alternative energy sources could be undertaken 20 years ahead of time. One State asked that the proposed rule be withdrawn. Another State wanted the proposed rule to be reissued for public comment. CEQ supported the approach proposed by the State of New York. CEQ believed that the NRC's recommended approach was in conflict with the NEPA process because the proposed statement of purpose and need for the proposed action was too narrow and did not provide for an appropriate range of alternatives to the underlying need for the proposed action. CEQ wanted the NRC to address other energy sources as separate alternatives, rather than as consequences of the no-action alternative. Moreover, CEQ stated that the proposed decision standard places a "weighty and improper burden of proof" on consideration of the alternative. The EPA endorsed CEQ's comments. In general, the nuclear industry was supportive of the recommended approach. However, NEI and the utilities strongly expressed the opinion that, with the redefined statement of purpose and need, alternative energy sources would no longer be alternatives to the proposed action and, therefore, need not be considered.

Response. After consideration of the comments received on the Commission's July 1994 proposal, the Commission has modified and clarified its approach in order to address the concerns of CEQ relative to consideration of appropriate alternatives

and the narrow definition of purpose and need. These modifications and clarifications addressed the States' concerns relative to treatment of need for generating capacity and alternatives. Specifically, the Commission has clarified the purpose and need for license renewal in the GEIS as follows:

The purpose and need for the proposed action (renewal of an operating license) is to provide an option that allows for power generation capability beyond the term of a current nuclear power plant operating license to meet future system generating needs, as such needs may be determined by State, utility, and, where authorized, Federal (other than NRC) decisionmakers.

Using this definition of the purpose of and need for the proposed action, which stresses options for the generation of power, the environmental review will include a characterization of alternative energy sources as being the alternatives to license renewal and not merely the consequences of the no-action alternative and, thus, it addresses CEQ's concern that the scope of the alternatives analysis is unacceptably restricted.

With respect to the States' concerns regarding need for generating capacity analysis, the NRC will neither perform analyses of the need for power nor draw any conclusions about the need for generating capacity in a license renewal review. This definition of purpose and need reflects the Commission's recognition that, absent findings in the safety review required by the Atomic Energy Act of 1954, as amended, or in the NEPA environmental analysis that would lead the NRC to reject a license renewal application, the NRC has no role in the energy planning decisions of State regulators and utility officials. From the perspective of the licensee and the State regulatory authority, the purpose of renewing an operating license is to maintain the availability of the nuclear plant to meet system energy requirements beyond the term of the plant's current license. The underlying need that will be met by the continued availability of the nuclear plant is defined by various operational and investment objectives of the licensee. Each of these objectives may be dictated by State regulatory requirements or strongly influenced by State energy policy and programs. In cases of interstate generation or other special circumstances, Federal agencies such as the Federal Energy Regulatory Commission (FERC) or the Tennessee Valley Authority (TVA) may be involved in making these decisions. The objectives of the various entities involved may include lower energy cost, increased efficiency of energy

production and use, reliability in the generation and distribution of electric power, improved fuel diversity within the State, and environmental objectives such as improved air quality and minimized land use.

The consideration of alternatives has been shifted to the site-specific review. The rule contains no information or conclusions regarding the environmental impacts of alternative energy sources, it only indicates that the environmental impact of alternatives will be considered during the individual plant review. However, the GEIS contains a discussion of the environmental impacts of alternative energy sources based on currently available information. The information in the GEIS is available for use by the NRC and the licensee in performing the site-specific analysis of alternatives and will be updated as appropriate. For individual plant reviews, information codified in the rule, information developed in the GEIS, and any significant new information introduced during the plant-specific review, including any information received from the State, will be considered in reaching conclusions in the supplemental EIS. The NRC's site-specific comparison of the impacts of license renewal with impacts of alternative energy sources will involve consideration of information provided by State agencies and other members of the public. This approach should satisfy the States' concerns relative to a meaningful analysis of alternative energy sources.

The Commission disagrees with CEQ's assertion that the new decision standard is inappropriate. Under this decision standard, the NRC must determine if the adverse environmental impacts of license renewal are so great that preserving the option of license renewal for energy planning decisionmakers would be unreasonable. The Commission expects that license renewal would be denied only if the expected environmental effects of license renewal significantly exceed all or almost all alternatives. The Commission believes that this is a reasonable approach to addressing the issue of environmental impacts of license renewal, given NRC's limited role in the area of energy systems planning. The operation of a nuclear power plant beyond its initial license term involves separate regulatory actions, one taken by the utility and the NRC, and the other taken by the utility and the State regulatory authorities. The decision standard would be used by NRC to determine whether, from an environmental perspective, it is

reasonable to renew the operating license and allow State and utility decisionmakers the option of considering a currently operating nuclear power plant as an alternative for meeting future energy needs. The test of reasonableness focuses on an analysis of whether the environmental impacts anticipated for continued operation during the term of the renewed license reasonably compare with the impacts that are expected from the set of alternatives considered for meeting generating requirements. The NRC would reject a license renewal application if the analysis demonstrated that the adverse environmental impacts of the individual license renewal were so great that preserving the option of license renewal for energy planning decisionmakers would be unreasonable.

After the NRC makes its decision based on the safety and environmental considerations, the final decision on whether or not to continue operating the nuclear plant will be made by the utility, State, and Federal (non-NRC) decisionmakers. This final decision will be based on economics, energy reliability goals, and other objectives over which the other entities may have jurisdiction. The NRC has no authority or regulatory control over the ultimate selection of future energy alternatives. Likewise, the NRC has no regulatory power to ensure that environmentally superior energy alternatives are used in the future. Given the absence of the NRC's authority in the general area of energy planning, the NRC's rejection of a license renewal application based on the existence of a single superior alternative does not guarantee that such an alternative will be used. In fact, it is conceivable that the rejection of a license renewal application by the NRC in favor of an individual alternative may lead to the implementation of another alternative that has even greater environmental impacts than the proposed action, license renewal.

Given the uncertainties involved and the lack of control that the NRC has in the choice of energy alternatives in the future, the Commission believes that it is reasonable to exercise its NEPA authority to reject license renewal applications only when it has determined that the impacts of license renewal sufficiently exceed the impacts of all or almost all of the alternatives that preserving the option of license renewal for future decision makers would be unreasonable. Because the objectives of the utility and State decisionmakers will ultimately be the determining factors in whether a nuclear power plant will continue to operate, NRC's proposed decision

standard is appropriate. The decision standard will not affect the scope or rigor of NRC's analyses, including the consideration of the environmental impacts relevant to the license renewal decision and associated alternatives. The NRC staff believes that, under the circumstances, the decision standard does not place "a weighty and improper burden of proof" on other alternatives as CEQ claims.

With respect to the industry's desire to eliminate consideration of alternative energy sources, the Commission does not agree. The Commission does not support the views of NEI and others that alternative energy sources need not be considered in the environmental review for license renewal. The Commission is not prepared to state that no nuclear power plant will fall well outside the range of other reasonably available alternatives far in advance of an actual relicensing decision. Following NEI's suggestion would not lead to a meaningful set of alternatives with which to compare a proposed action. The Commission has always held the view that alternative sources of energy should be compared with license renewal and continued operation of a nuclear power plant.

Lastly, the Commission does not believe it is necessary to reissue this rule for public comment as a State commenter requested. The Commission has taken many measures to involve the public concerning the resolution of public comments on the proposed rule. The Commission has conducted a number of public meetings and published for public comment its recommended procedural revisions to the proposed rule. The Commission believes that modifications made to the proposed rule reflect the logical outgrowth of the proposed rule based on the public comments received by the Commission.

C. Technical Concerns

1. Category and Impact Magnitude Definitions

Concerns. Many commenters expressed concern that the category definitions and the impact-significance definitions were ambiguous and appeared somewhat interconnected. The EPA expressed concern that mitigation of adverse impacts was not addressed adequately.

Commenters expressed a number of concerns about the use of the applicability categories and the magnitude-level categories. With respect to the applicability categories, concerns ranged from a general concern that Category 1 precludes or hinders public

involvement in an issue at the time of the plant-specific review to specific concerns about the technical adequacy of the analysis supporting a Category 1 finding for an issue. Several commenters believed that the definitions create confusion, especially as to whether the finding of small impact and Category 1 are interdependent. The GEIS appears to use Category 1 and "small" interchangeably. Concern was also expressed that the requirement to consider mitigative actions was inadequately addressed in the draft GEIS and proposed rule.

Response. To reduce potential confusion over the definitions, the use of the categories, and the treatment of mitigation within the context of the categorization scheme, the NRC has revised the definitions to eliminate any ambiguity as to how they are used. Further, the GEIS has been modified to clearly state the reasons behind the category and magnitude findings.

In order to facilitate understanding of the modifications to the GEIS, the previous approach is discussed as follows. In the proposed rule and the draft GEIS, findings about the environmental impact associated with each issue were divided into three categories of applicability to individual plant reviews. These categories were:

- Category 1: A generic conclusion on the impact has been reached for all affected nuclear power plants.
- Category 2: A generic conclusion on the impact has been reached for affected nuclear power plants that fall within defined bounds.
- Category 3: A generic conclusion on the impact was not reached for any affected nuclear power plants.

The significance of the magnitude of the impact for each issue was expressed as one of the three following levels.

- *Small* impacts are so minor that they warrant neither detailed investigation nor consideration of mitigative actions when such impacts are negative.
- *Moderate* impacts are likely to be clearly evident and usually warrant consideration of mitigation alternatives when such impacts are negative.
- *Large* impacts involve either a severe penalty or a major benefit, and mitigation alternatives are always considered when such impacts are negative.

With respect to the categories of applicability, under the proposed rule applicants would have:

- (1) Not provided additional analyses of Category 1 issues;
- (2) Not provided additional analyses if their plant falls within the bounds

defined in the rule for a Category 2 issue;

(3) Provided additional plant-specific analyses if their plant does not fall within the bounds defined in the rule for a Category 2 issue; and

(4) Provided plant-specific analyses of Category 3 issues.

In order to address the comments on these magnitude and category definitions, the GEIS has been modified to clearly state the reasons behind the category and magnitude findings.

The revised definitions are listed below.

- Category 1: For the issue, the analysis reported in the Generic Environmental Impact Statement has shown:

(1) The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristic;

(2) A single significance level (i.e., small, moderate, or large) has been assigned to the impacts (except for collective off site radiological impacts from the fuel cycle and from high level waste and spent fuel disposal); and

(3) Mitigation of adverse impacts associated with the issue has been considered in the analysis and it has been determined that additional plant-specific mitigation measures are likely not to be sufficiently beneficial to warrant implementation.

The generic analysis of the issue may be adopted in each plant-specific review. Issues for which the impact was found to be favorable were also defined to be Category 1 issues.

- Category 2: For the issue, the analysis reported in the GEIS has shown that one or more of the criteria of Category 1 cannot be met and, therefore, additional plant-specific review is required.

If, for an environmental issue, the three Category 1 criteria apply to all plants, that issue is Category 1 and the generic analysis should be used in a license renewal review for all plant applications. If the three Category 1 criteria apply to a subset of plants that are readily defined by a common plant characteristic, notably the type of cooling system, the population of plants is partitioned into the set of plants with the characteristic and the set without the characteristic. For the set of plants with the characteristic, the issue is Category 1 and the generic analysis should be used in the license renewal review for those plants. For the set of plants without the characteristic, the issue is Category 2 and a site-specific analysis for that issue will be performed

as part of the license renewal review. The review of a Category 2 issue may focus on the particular aspect of the issue that causes the Category 1 criteria not to be met. For example, severe accident mitigation under the issue "severe accidents" is the focus for a plant-specific review because the other aspects of the issue, specifically the offsite consequences, have been adequately addressed in the GEIS. With the revised definitions, the two issues previously designated as Category 3 are now designated Category 2. For an issue to be a Category 1, current mitigation practices and the nature of the impact were considered and a determination was made that it is unlikely that additional measures will be sufficiently beneficial. In the GEIS, in discussing the impacts for each issue, consideration was given to what is known about current mitigation practices.

The definitions of the significance level of an environmental impact have been revised to make the consideration of the potential for mitigating an impact separate from the analysis leading to a conclusion about the significance level of the impact. Further, the significance level of an impact is now more clearly tied to sustaining specific attributes of the affected resource that are important to its viability, health or usefulness. General definitions of small, moderate and large significance levels are given below. These definitions are adapted to accommodate the resource attributes of importance for each of the environmental issues in the GEIS. The definition of "small" clarifies the meaning of the term as it applies to radiological impacts. The definition of "small" in the proposed rule did not logically apply to such impacts.

The general definitions of significance level are:

- Small: For the issue, environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource. For the purposes of assessing radiological impacts, the Commission has concluded that those impacts that do not exceed permissible levels in the Commission's regulations are considered small.

- Moderate: For the issue, environmental effects are sufficient to alter noticeably but not to destabilize important attributes of the resource.

- Large: For the issue, environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

The discussion of each environmental issue in the GEIS includes an explanation of how the significance category was determined. For issues in

which probability of occurrence is a key consideration (i.e., accident consequences), the probability of occurrence has been factored into the determination of significance. The determination of the significance category was made independently of the consideration of the potential benefit of additional mitigation.

The major concerns (organized by topical areas) about the environmental issues examined in the draft GEIS and the NRC staff's response to those concerns are summarized next.

2. Surface Water Quality

Concern. Several commenters expressed concerns related to the National Pollutant Discharge Elimination System (NPDES) permitting process for surface water discharge. They believe that the NRC may have overlooked its legal obligation to comply with Section 401 of the Clean Water Act (CWA). Their recommendations included withholding approval for license renewal until a facility has complied with Section 401 and treating license renewal as an opportunity for a new NEPA review. On the other hand, other commenters recommended decoupling the NRC relicensing process from the NPDES permitting process.

Response. In issuing individual license renewals, the Commission will comply, as has been its practice, with the provisions of Section 401 of the Federal Water Pollution Control Act (see 10 CFR 51.45(d) and 51.71(c)). In addition, pursuant to Section 511(c) of the Federal Water Pollution Control Act of 1972, the Commission cannot question or reexamine the effluent limitations or other requirements in permits issued by the relevant permitting authorities. Nevertheless, compliance with the environmental quality standards and requirements of these permits does not negate the requirement for the Commission to consider all environmental effects of the proposed action. Accordingly, the Commission has not only taken existing permits into account in its analysis of the water quality impacts of license renewal but has also considered information on actual operating impacts collected from individual plants, State and Federal regulatory agencies, and published literature. As a result of this analysis, the Commission has concluded that the environmental impacts on surface water quality are small for those effluents subject to existing permit or certification requirements. A total decoupling of the license renewal process and the NPDES permitting process is not appropriate because, for

issues with incomplete Clean Water Act determinations, the NRC cannot complete its weighing and balancing of impacts without independently addressing the issues.

Concern. Several commenters raised concerns that various issues within the Surface Water Quality topic should be Category 2 or 3 Issues. These included water use conflicts as experienced in Arizona and the Midwest, thermal stratification and salinity gradients associated with once-through cooling systems, and the toxicity of biofouling compounds.

Response. Regarding the water use conflicts, the NRC has considered the impacts of water use during the renewal period and has concluded that these impacts are small for plants with a once-through cooling system and that this is a Category 1 issue for those plants. However, this issue is designated Category 2 for plants with cooling towers and cooling ponds because, for those plants, the impacts might be moderate (they could also be small). In either case, pursuant to 10 CFR 51.45(d), an applicant for license renewal must identify and indicate in its environmental report the status of State and local approvals regarding water use issues. For those reactor sites where thermal stratification or salinity gradient was found to be the most pronounced, the issues were reviewed during preparation of the GEIS and found to be acceptable by the States within the NPDES process. No change in the categorization in the GEIS would be required. Similarly, the NPDES permit for a facility establishes allowable discharges, including biocides. The NRC has no indication that residual environmental impacts would occur as a result of license renewal activities at any nuclear plant site other than perhaps water use conflicts arising at plants with cooling ponds or cooling towers using make-up water from a small river with low flow. For those plants, this issue is Category 2.

3. Aquatic Ecology

Concern. A number of comments regarding the ecological impact of cooling water withdrawal from aquatic bodies were received. Specific concerns included fish kills associated with the entrainment and impingement of fish within once-through and cooling pond cooling systems, the use of chlorine and molluscicides to control mussel and clam growth, and the long-term effects of heavy metal discharges from plants with copper-nickel condenser tubes. Another commenter noted that license extension affords the opportunity to review the intake and discharge

configuration of plant cooling water systems, since the best available technology that is economically available may be different given the additional 20 years of plant operating life.

Response. The Commission has considered the impacts of license renewal on aquatic ecology and, in doing so, has reviewed existing NPDES permits and other information. Based on this analysis, the Commission has concluded that these impacts are small with the exception that plants with once-through cooling and cooling ponds may have larger effects associated with entrainment of fish and shellfish in early life stages, impingement, and heat shock. Agencies responsible for existing permits are not constrained from reexamining the permit issues if they have reason to believe that the basis for their issuance is no longer valid. The Commission does not have authority under NEPA to impose an effluent limitation other than those established in permits issued pursuant to the Clean Water Act. The problem of the long-term effects of heavy metal discharges from plants with copper-nickel condenser tubes has been found at only one plant. The affected condenser tubes have been replaced with tubing of a more corrosion-resistant material.

Concern. A commenter pointed out that the issue of riparian zones should be addressed in the GEIS because the vegetation region along a water course can be affected by water withdrawal and is important in maintaining the habitat.

Response. The NRC agrees with the importance of addressing the impacts of license renewal on the riparian habitat. The final GEIS provides a discussion of the riparian habitat as an important resource and the potential effects of consumptive water use on riparian zones.

4. Groundwater Use and Quality

Concern. Several commenters indicated that groundwater issues should be reviewed on a site-specific basis because of groundwater use conflicts (in particular, the effect on aquifer recharge of using surface water for cooling water), opportunities for saltwater intrusion, and concerns over tritium found in wells at one site. On the other hand, a commenter requested that the issue of groundwater use for cooling tower makeup water be changed from Category 2 to Category 1 because the issue is based solely on data from Ranney wells at the Grand Gulf Nuclear Station, where tests have shown that the elevation of the water plain around Grand Gulf is not dropping.

Response. Based on consideration of comments, the issue of groundwater use conflicts resulting from surface water withdrawals for cooling tower makeup water or cooling ponds is now Category 2 for plants withdrawing surface water from small water bodies during low flow conditions. The GEIS has identified a potential reduction in aquifer recharge as a result of competing water use. These conflicts are already a concern at two closed-cycle nuclear power plants. The NRC does not agree that saltwater intrusion should be considered a Category 2 issue. When saltwater intrusion has been a problem, the major cause has been the large consumption of groundwater by agricultural and municipal users. Groundwater consumption by nuclear power plants is small by comparison and does not contribute significantly to the saltwater intrusion problem. With regard to traces of tritium found in the groundwater at one nuclear power plant, the tritium was attributed to a modification in the plant's inlet and discharge canal that did not take into consideration a unique situation in topology and groundwater flow. The releases were minor and the situation has been corrected.

Regarding the issue of the use of groundwater for cooling water makeup, the NRC has designated this issue as Category 2 even though only the Grand Gulf Nuclear Station is currently using Ranney wells to withdraw groundwater. This water intake does not conflict with other groundwater uses in the area. It is not possible to predict whether or not water use conflicts will occur at the Grand Gulf facility in the future. It is also not possible to determine the significance of the environmental impacts associated with Ranney well use at other nuclear plants that may choose to adopt this method in the future.

5. Terrestrial Ecology

Concern. Several commenters recommended that the issue of bird mortality resulting from collisions with transmission lines, towers, or cooling towers be characterized as a Category 2 issue. Such a characterization would provide for a review of mitigation at those plants with cooling towers that do not have illumination and for power plant transmission lines that transect major flyways or that cross wetlands used by large concentrations of birds.

Response. The NRC does not agree with this recommendation. The GEIS cites several studies that conclude that bird mortalities resulting from collision with transmission lines, towers, or cooling towers are not significantly

reducing bird populations. Mitigation measures in place, such as safety lights, were found adequate and additional measures were not warranted. Therefore, the issue remains a Category 1 issue because refurbishment will not involve construction of any additional transmission lines or natural draft cooling towers.

Concern. One commenter expressed concern that the GEIS analysis of land use did not adequately encompass the impact of onsite spent fuel storage on land use and that the Category 1 finding is questionable. A specific concern was the potential need for the construction of additional spent fuel storage facilities associated with the license renewal term, along with their associated impacts on the terrestrial environment.

Response. The NRC does not agree that there is a need to change the Category 1 determination for onsite land use. Waste management operations could require the construction of additional storage facilities and thus adversely affect land use and terrestrial ecology. However, experience has shown that the land requirements would be relatively small (less than 9 acres), impacts to land use and terrestrial ecology would also be relatively small, and the land that may be used is already possessed by the applicant; thus, its basic use would not be altered. Onsite land use is Category 1. Terrestrial ecology with disturbance of sensitive habitat is treated as a separate issue and is Category 2.

6. Human Health

Concern. In the human health section of the GEIS, the radiological impacts of plant refurbishment and continued operations during the license renewal term to workers and the general public were examined. Several commenters indicated that it was inappropriate to compare the radiation exposures associated with license renewal to natural background levels. These commenters believed that the appropriate argument should be that the risks associated with the additional exposures are so small that no additional mitigative measures are required.

Response. The NRC agrees that the assessment of radiation exposure should not be simply a comparison with background radiation. In response to comments on the draft generic environmental impact statement and the proposed rule, the standard defining a small radiological impact has changed from a comparison with background radiation to sustained compliance with the dose and release limits applicable to the various stages of the fuel cycle. This

change is appropriate and strengthens the criterion used to define a small environmental impact for the reasons that follow: The Atomic Energy Act requires the Nuclear Regulatory Commission to promulgate, inspect and enforce standards that provide an adequate level of protection of the public health and safety and the environment. The implementation of these regulatory programs provides a margin of safety. A review of the regulatory requirements and the performance of facilities provides the bases to project continuation of performance within regulatory standards. For the purposes of assessing radiological impacts, the Commission has concluded that impacts are of small significance if doses to individuals and releases do not exceed the permissible levels in the Commission's regulations.

With respect to whether additional mitigative measures are required, it should be noted that in 10 CFR parts 20 and 50 there are provisions that radiological impacts associated with plant operation be reduced to levels as low as reasonably achievable (ALARA).

Concern. Several commenters indicated that the GEIS needs a broader treatment of uncertainty as it relates to human health issues.

Response. The NRC agrees that there is considerable uncertainty associated with health effects, especially at low occupational and public dose levels, and particularly with respect to electromagnetic fields. Health effect estimates from radiation exposures are based on the best scientific evidence available and are considered to be conservative estimates. Several sections of the GEIS have been expanded to more thoroughly explain how predicted impacts could be affected by changes in scientific information or standards.

Concern. One commenter indicated that, in the GEIS and the proposed rule, risk coefficients should have been used for chemicals and radiation to obtain upper bound risk estimates of cancer incidence.

Response. The NRC does not agree with this comment. In making comparisons of alternatives, comparisons of the central or best estimates of impacts are consistent with NEPA requirements because they provide the fairest determination. The GEIS is written using current, Commission-approved risk estimators.

Concern. Two commenters expressed concern regarding the GEIS conclusion that the impact of radiation exposure to the public is small, citing a study done by the Massachusetts Department of Public Health (MDPH). This study concluded that adults who live within

10 miles of the Pilgrim Nuclear Power Plant have a risk of contracting leukemia four times greater than other individuals.

Response. The NRC staff reviewed the MDHP study and compared it with various other studies. The results of the study have been contradicted by a National Cancer Institute (NCI) study entitled "Cancer in Populations Living Near Nuclear Facilities" (July 1990). The NCI study, which included the Pilgrim plant in its analysis, found no reason to suggest that nuclear facilities may be linked causally with excess deaths from leukemia or from other cancers. The findings of the NCI study are consistent with the findings of several similar epidemiological studies in foreign countries and with the latest conclusions of expert bodies such as the National Research Council's Committee on the Biological Effects of Ionizing Radiation. The NRC continues to base its assessment of the health effects of ionizing radiation on the overall body of scientific knowledge and on the recommendations of expert groups.

7. Socioeconomics

Concern. A commenter concerned with historic preservation pointed out that this issue must be addressed through compliance with the National Historic Preservation Act (NHPA) and cannot be resolved generically.

Response. The NRC agrees with this comment. Historical and archaeological impacts have been changed from a Category 1 to a Category 2 issue (that is, it must be evaluated site-specifically). Consultation with State historical preservation offices and other Government agencies, as required by NHPA, must be undertaken to determine whether protected historical or archaeological resources are in areas that might be disturbed during refurbishment activities and operation during the renewal period.

Concern. Several commenters indicated that transportation issues associated with refurbishment activities should be changed from Category 3 to Category 2 because the impacts will be insignificant in the majority of cases. One recommendation was to use a level of service (LOS) determination for specific plants as the bounding criterion. The analysis would require that LOS be determined for that part of the refurbishment period during which traffic not related to the plant is expected to be the heaviest. Another recommendation was to establish bounding criteria based on past major routine outages.

Response. The NRC agrees that use of the LOS approach may prove to be

acceptable. Transportation still must be reviewed on a plant-specific basis, that is, it is a Category 2 issue (based on the revised definition).

Concern. There were recommendations to make the housing impacts during refurbishment a Category 1 issue instead of Category 2. One commenter noted that the construction period data used in the analysis appears to overestimate the impact on housing.

Response. The NRC does not agree that this should be a Category 1 issue. Although negligible housing impacts are anticipated for most license renewals, significant housing impacts have occurred during a periodic plant outage at one of the case plants studied for the analysis. This issue is now a Category 2 issue because moderate and large impacts on housing are possible depending on local conditions (e.g., areas with extremely slow population growth or areas with growth control measures that limit housing development).

8. The Uranium Fuel Cycle and Solid Waste Management

Concern. Wide-ranging concerns were expressed in the comments on the proposed rule and the draft GEIS about the treatment of storage and disposal of low-level waste (LLW), mixed waste, spent fuel, nonradiological waste, and the transportation of fuel and waste to and from nuclear power plants as a consequence of license renewal. Concern was expressed about the uncertain availability of disposal facilities for LLW, mixed waste, and spent fuel; the prospect of generation and onsite storage of an additional 20 years output of waste; and the resulting pressure that would be put on the States to provide LLW disposal facilities. Various commenters expressed concern about the adequacy of the treatment of the cost of waste management and the implications for the economic viability of license renewal. Numerous comments were provided on updating and clarifying data on waste management presented in the draft GEIS. Finally, various questions were raised about the applicability of Table S-3 (10 CFR 51.51 Uranium fuel cycle environmental data—Table S-3, Table of Uranium Fuel Cycle Environmental Data) to the management of waste generated as a result of license renewal.

With regard to spent fuel, several commenters expressed concern that dry cask storage is not a proven technology and that onsite storage of spent fuel from an additional 20 years of plant operation will present environmental and safety problems. Therefore, onsite

storage of spent fuel should be considered on a site-specific basis within a plant license renewal review.

Response. The Commission acknowledges that there is uncertainty in the schedule of availability of disposal facilities for LLW, mixed waste, and spent fuel. However, the Commission believes that there is sufficient understanding of and experience with the storage of LLW, mixed waste, and spent fuel to conclude that the waste generated at any plant as a result of license renewal can be stored safely and without significant environmental impacts before permanent disposal. In addition, the Commission concluded that the classification of storage and ultimate disposal as a Category 1 issue is appropriate because States are proceeding, albeit slowly, with the development of new disposal facilities; LLW and mixed waste have been and can be safely stored at reactor sites until new disposal capacity becomes available. Analyses to support this conclusion are presented in Chapter 6 of the final GEIS (NUREG-1437). The following summary of the responses to comments emphasizes the main features of these analyses.

In the draft GEIS, the environmental data in Table S-3 were discussed with respect to applicability during the license renewal period and supplemented with an analysis of the radiological release and dose commitment data for radon-222 and technetium-99. The proposed rule would have had this discussion apply to each plant at the time of its review for license renewal.

Further, in the draft GEIS, Chapter 6, "Solid Waste Management," covered the generation of LLW, mixed waste, spent fuel, and nonradiological waste as a result of license renewal; the transportation of the radiological waste; and the environmental impacts of waste management, including storage and disposal. The findings that were to have been codified in the rule were that, for nonradiological waste, mixed waste, spent fuel, and transportation, the environmental impacts are of small significance and that the analysis in the GEIS applies to each plant (Category 1). For LLW, the finding that would have been codified in the rule was that, if an applicant does not have access to a low-level radioactive waste disposal facility through a low-level waste compact or an unaffiliated State, the applicant must present plans for interim waste storage with an assessment of potential ecological habitat destruction caused by construction activities (Category 2).

In response to the questions about the applicability of Table S-3 to the management of waste associated with license renewal and to the various comments challenging the treatment of the several forms of waste in the draft GEIS and in the proposed rule, the discussion of Table S-3 has been moved from Section 4.8 of the draft GEIS to Chapter 6 of the final GEIS in order to provide a more integrated assessment of the environmental impacts associated with waste management as a consequence of license renewal. Also in response to various comments, the discussion of Table S-3 and of each of the types of waste has been expanded.

Supplemental data are presented in Chapter 6 of the final GEIS in order to extend the coverage of the environmental impacts of the uranium fuel cycle presented in the current Table S-3 and of transportation of radioactive waste presented in the current Table S-4 to radon-222, technetium-99, higher fuel enrichment, and higher fuel burnup. In part, the current Table S-3 and the data supplementing it cover environmental impacts of:

(1) Onsite storage of spent fuel assemblies in pools for 10 years, packaging and transportation to a Federal repository, and permanent disposal; and

(2) Short-term storage onsite of LLW, packaging and transportation to a land-burial facility, and permanent disposal.

The following conclusions have been drawn with regard to the environmental impacts associated with the uranium fuel cycle.

The radiological and nonradiological environmental impacts of the uranium fuel cycle have been reviewed. The review included a discussion of the values presented in Table S-3, an assessment of the release and impact of ^{222}Rn and of ^{99}Tc , and a review of the regulatory standards and experience of fuel cycle facilities. For the purpose of assessing the radiological impacts of license renewal the Commission uses the standard that the impacts are of small significance if doses and releases do not exceed permissible levels in the Commission's regulations. Given the available information regarding the compliance of fuel cycle facilities with applicable regulatory requirements, the Commission has concluded that, other than for the disposal of spent fuel and high-level waste, these impacts on individuals from radioactive gaseous and liquid releases will remain at or below the Commission's regulatory limits. Accordingly, the Commission concludes that offsite radiological impacts of the fuel cycle (individual effects from other than the disposal of

spent fuel and high-level waste) are small. ALARA efforts will continue to apply to fuel cycle activities. This is a Category 1 issue.

The radiological impacts of the uranium fuel cycle on human populations over time (collective effects) have been considered within the framework of Table S-3. The 100 year environmental dose commitment to the U.S. population from the fuel cycle, high level waste and spent fuel disposal excepted, is calculated to be about 14,800 man-rem, or 12 cancer fatalities, for each additional 20 year power reactor operating term. Much of this, especially the contribution of radon releases from mines and tailing piles, consists of tiny doses summed over large populations. This same dose calculation can theoretically be extended to include many tiny doses over additional thousands of years as well as doses outside the U.S. The result of such a calculation would be thousands of cancer fatalities from the fuel cycle, but this result assumes that even tiny doses have some statistical adverse health effect which will not ever be mitigated (for example no cancer cure in the next thousand years), and that these dose projections over thousands of years are meaningful. However these assumptions are questionable. In particular, science cannot rule out the possibility that there will be no cancer fatalities from these tiny doses. For perspective, the doses are very small fractions of regulatory limits, and even smaller fractions of natural background exposure to the same populations. No standards exist that can be used to reach a conclusion as to the significance of the magnitude of the collective radiological effects. Nevertheless, some judgement as to the regulatory NEPA implication of this issue should be made and it makes no sense to repeat the same judgement in every case. The Commission concludes that these impacts are acceptable in that these impacts would not be sufficiently large to require the NEPA conclusion, for any plant, that the option of extended operation under 10 CFR part 54 should be eliminated. Accordingly, while the Commission has not assigned a single level of significance for the collective effects of the fuel cycle, this issue is considered Category 1. For other Category 1 issues, the impacts will be considered at the individual renewal stage as a means of judging the total impact of an individual license renewal decision. However, the Commission has already judged the impact of collective effects of the fuel cycle as part of this rule.

There are no current regulatory limits for off-site releases of radionuclides for the current candidate repository site. However if we assume that limits are developed along the lines of the 1995 National Academy of Sciences (NAS) report, and that in accordance with the Commission's Waste Confidence Decision, a repository can and likely will be developed at some site which will comply with such limits, peak doses to virtually all individuals will be 100 millirem per year or less. However, while the Commission has reasonable confidence that these assumptions will prove correct there is considerable uncertainty since the limits are yet to be developed, no repository application has been completed or reviewed, and uncertainty is inherent in the models used to evaluate possible pathways to the human environment. The National Academy report indicated that 100 millirem per year should be considered as a starting point for limits for individual doses, but notes that some measure of consensus exists among national and international bodies that the limits should be a fraction of the 100 millirem per year. The lifetime individual risk from 100 millirem per year dose limit is about 3×10^{-3} . Doses to populations from disposal cannot now (or possibly ever) be estimated without very great uncertainty. Estimating cumulative doses to populations over thousands of years is more problematic. The likelihood and consequences of events that could seriously compromise the integrity of a deep geologic repository were evaluated by the Department of Energy in the "Final Environmental Impact Statement: Management of Commercially Generated Radioactive Waste," October 1980. The evaluation estimated the 70-year whole-body dose commitment to the maximum individual and to the regional population resulting from several modes of breaching a reference repository in the year of closure, after 1,000 years, after 100,000 years, and after 100,000,000 years. The release scenarios covered a wide range of consequences from the limited consequences of humans accidentally drilling into a waste package in the repository to the catastrophic release of the repository inventory by a direct meteor strike. Subsequently, the NRC and other Federal agencies have expended considerable effort to develop models for the design and for the licensing of a high level waste repository, especially for the candidate repository at Yucca Mountain. More meaningful estimates of doses to population may be possible in the future

as more is understood about the performance of the proposed Yucca Mountain repository. Such estimates would involve very great uncertainty, especially with respect to cumulative population doses over thousands of years. The standard proposed by the NAS is a limit on maximum individual dose. The relationship of potential new regulatory requirements, based on the NAS report, and cumulative population impacts has not been determined, although the report articulates the view that protection of individuals will adequately protect the population for a repository at Yucca Mountain. However, EPA's generic repository standards in 40 CFR part 191 generally provide an indication of the order of magnitude of cumulative risk to population that could result from the licensing of a Yucca Mountain repository, assuming the ultimate standards will be within the range of standards now under consideration. The standard in 40 CFR part 191 protects the population by imposing "containment requirements" that limit the cumulative amount of radioactive material released over 10,000 years. The cumulative release limits are based on EPA's population impact goal of 1,000 premature cancer deaths world-wide for a 100,000 metric tonne (MTHM) repository.

Nevertheless, despite all the uncertainty surrounding the effects of the disposal of spent fuel and high-level waste, some judgement as to the regulatory NEPA implications of these matters should be made and it makes no sense to repeat the same judgement in every case. Even taking the uncertainties into account, the Commission concludes that these impacts are acceptable in that these impacts would not be sufficiently large to require the NEPA conclusion, for any plant, that the option of extended operation under 10 CFR part 54 should be eliminated. Accordingly, while the Commission has not assigned a single level of significance for the impacts of spent fuel and high-level waste disposal, this issue is considered Category 1. Excepting the collective effects previously discussed, for other Category 1 issues, the impacts will be considered at the individual renewal stage as a means of judging the total impact of an individual license renewal decision. However, the Commission has already judged the impacts of high level waste disposal as part of this rule.

With respect to the nonradiological impact of the uranium fuel cycle, data concerning land requirements, water requirements, the use of fossil fuel, gaseous effluent, liquid effluent, and tailings solutions and solids, all listed in Table S-3, have been reviewed to

determine the significance of the environmental impacts of a power reactor operating an additional 20 years. The nonradiological impacts attributable to the relicensing of an individual power reactor are found to be of small significance. License renewal of an individual plant is so indirectly connected to the operation of fuel cycle facilities that it is meaningless to address the mitigation of impacts identified above. This is a Category 1 issue.

Table S-3 does not take into account long-term onsite storage of LLW, mixed waste, and storage of spent fuel assemblies onsite for longer than 10 years, nor does it take into account impacts from mixed waste disposal. The environmental impacts of these aspects of onsite storage are also addressed in Chapter 6 of the final GEIS and the findings are included in the final rule in Table B-1 of appendix B to 10 CFR part 51.

Chapter 6 of the GEIS discusses the impacts of offsite disposal of LLW and mixed waste and concludes that impacts will be small. The conclusion that impacts will be small is based on the regulations and regulatory programs in place (e.g., 10 CFR part 61 for LLW and 40 CFR parts 261, 264, and 268 for hazardous waste), experience with existing sites, and the expectation that NRC, EPA, and the States will ensure that disposal will occur in compliance with the applicable regulations.

The Low-Level Radioactive Waste Policy Act of 1980 (LLRWPA) made the States responsible for the disposal of commercially generated LLW. At present, 9 compacts have been formed, representing 42 States. The Texas Compact (Texas, Maine, and Vermont) is pending before the U.S. Congress.

New LLW disposal facilities in the host States of California, North Carolina, and Texas are forecast to be operational between 1997 and 1998. Facilities in the host States of Connecticut, Illinois, Massachusetts, Nebraska, New Jersey, Pennsylvania, and New York are scheduled for operation between 1999 and 2002. Envirocare, in Utah, takes limited types of waste from certain generators.

There are uncertainties in the licensing process and in the length of time needed to resolve technical issues, but in NRC's view there are no unsolvable technical issues that will inevitably preclude successful development of new sites or other off-site disposal capacity for LLW by the time they will be needed. For example, in California, the proposed Ward Valley LLW disposal facility was unexpectedly delayed by the need to resolve technical

issues raised by several scientists independent of the project after the license was issued. These issues were recently reviewed and largely resolved by an independent review group. In North Carolina, Texas, and Nebraska, the license application review period has been longer than is required by the LLRWPA, but progress continues to be made.

The State's LLW responsibilities include providing disposal capacity for mixed LLW. Mixed waste disposal facility developers face the same types of challenges as LLW site developers plus difficulties with dual regulation and small volumes. However, in NRC's view there are no technical reasons why offsite disposal capacity for all types of mixed waste should not become available when needed. NRC and EPA have developed guidance on the siting of mixed waste disposal facilities as well as a conceptual design for a mixed waste disposal facility. A disposal facility for certain types of mixed waste is operated by Envirocare in Utah. States have begun discussions with DOE about accepting commercial mixed waste for treatment and disposal at DOE facilities. Although these discussions have yet to result in DOE accepting commercial mixed waste at DOE facilities, it appears that progress is being made toward DOE's eventual acceptance of some portion of commercial mixed waste at its facilities.

While the NRC understands that there have been delays and that uncertainties exist such as those just discussed, the Commission concludes that there is reasonable assurance that sufficient LLW and mixed LLW disposal capacity will be made available when needed so that facilities can be decommissioned consistent with NRC decommissioning requirements. This conclusion, coupled with the expected small impacts from both storage and disposal justify classification of LLW and mixed waste disposal as Category 1 issues.

The GEIS addresses the matter of extended onsite storage of both LLW and mixed waste from refurbishment and operations for a renewal period of up to 20 years. Summary data are provided and radiological and nonradiological environmental impacts are addressed. The analysis considers:

- (1) The volumes of LLW and mixed waste that may be generated from license renewal;
- (2) Specific requirements under the existing regulatory framework;
- (3) The effectiveness of the regulations in maintaining low average doses to members of the public and to workers; and

(4) Nonradiological impacts, including land use, fugitive dust, air quality, erosion, sedimentation, and disturbance of ecosystems.

In addition, under 10 CFR 50.59, licensees are allowed to make changes to their facilities as discussed in the final safety analysis report without NRC permission if the evaluation indicates that a change in the technical specifications is not required or that an unreviewed safety question does not exist. Licensees would have to ensure that any new LLW activities would not represent an unreviewed safety question for routine operations or for conditions that might arise from potential accidents. Both onsite and offsite impacts would have to be considered. If a LLW or mixed waste activity fails either of the two tests in 10 CFR 50.59, a license amendment is required. Subject to the two possible review requirements just noted, the Commission finds that continued onsite storage of both LLW and mixed waste resulting from license renewal will have small environmental impacts and will require no further review within the license renewal proceeding.

The GEIS addresses extended onsite storage of spent fuel during a renewal period of up to 20 years. The Commission has studied the safety and environmental effects of the temporary storage of spent fuel after cessation of reactor operation and has published a generic determination of no significant environmental impact (10 CFR 51.23). The environmental data on storing spent fuel onsite in a fuel pool for 10 years before shipping for offsite disposal have been assessed and reported in NUREG-0116, "The Environmental Survey of the Reprocessing and Waste Management Portions of the LWR Fuel Cycle" (October 1976), and published in the Commission's regulations (10 CFR 51.51). Environmental assessments (EA) for expanding the fuel pool storage capacity have been conducted for numerous plants. In each case, a finding of no significant environmental impact was reached.

Radioactive exposures, waste generation, and releases were evaluated and found to be small. The only nonradiological effluent from waste storage is additional heat from the plant that was found to have a negligible effect on the environment. Accidents were evaluated and were found to have insignificant effects on the environment. Dry cask storage at an independent spent fuel storage installation (ISFSI) is another technology used to store under a general license. The environmental impacts of allowing onsite dry cask storage under a general license were

assessed in an EA and found to be insignificant. Further, the Commission has conducted EAs for seven specific licensed ISFSIs and has reached a finding of no significant environmental impact for each site. Each EA addressed the impacts of construction, use, and decommissioning. Potential impacts that were assessed include radiological impacts, land use, terrestrial resources, water use, aquatic resources, noise, air quality, socioeconomics, radiological impacts during construction and routine operation, and radiological impacts of off-normal events and accidents. Trends in onsite spent fuel storage capacity and the volume of spent fuel that will be generated during an additional 20 years of operation are considered in the GEIS. Spent fuel storage capacity requirements can be adequately met by ISFSIs without significant environmental impacts. The environmental impacts of onsite storage of spent fuel at all plants have been adequately assessed in the GEIS for the purposes of an environmental review and agency decision on renewal of an operating license; thus, no further review within the license renewal proceeding is required. This provision is relative to the license renewal decision and does not alter existing Commission licensing requirements specific to on-site storage of spent fuel.

The environmental impacts from the transportation of fuel and waste attributable to license renewal are found to be small when they are within the range of impacts of parameters identified in Table S-4. The estimated radiological effects are within regulatory standards. The nonradiological impacts are those from periodic shipments of fuel and waste by individual trucks or rail cars and thus would result in infrequent and localized minor contributions to traffic density. Programs designed to further reduce risk, which are already in place, provide for adequate mitigation. Recent, ongoing efforts by the Department of Energy to study the impacts of waste transportation in the context of the multi-purpose canister (see, 60 FR 45147, August 30, 1995) suggest that there may be unresolved issues regarding the magnitude of cumulative impacts from the use of a single rail line or truck route in the vicinity of the repository to carry all spent fuel from all plants. Accordingly, NRC declines to reach a Category 1 conclusion on this issue at this time. Table S-4 should continue to be the basis for case-by-case evaluation of transportation impacts of fuel and waste until such time as a detailed analysis of the environmental

impacts of transportation to the proposed repository at Yucca Mountain becomes available.

9. Accidents

Concern. Several commenters expressed concerns regarding the appropriateness of the severe accident determination in the GEIS and with the treatment of severe accident mitigation design alternatives (SAMDAs) for license renewal. A group of commenters identified areas of concern that they believe justify severe accidents being classified as a Category 3 issue. The areas included seismic risks to nuclear power plants and site-specific evacuation risks. Several commenters questioned whether the analyses of the environmental impacts of accidents were adequate to make a Category 1 determination for the issue of severe accidents. The contention is that a bounding analysis would be established only if plant-specific analyses were performed for every plant, which was not the case. Instead, the GEIS analysis made use of a single generic source term for each of the two plant types.

Response. The Commission believes that its analysis of the impacts of severe accidents is appropriate. The GEIS provides an analysis of the consequences of severe accidents for each site in the country. The analysis adopts standard assumptions about each site for parameters such as evacuation speeds and distances traveled, and uses site-specific estimates for parameters such as population distribution and meteorological conditions. These latter two factors were used to evaluate the exposure indices for these analyses. The methods used result in predictions of risk that are adequate to illustrate the general magnitude and types of risks that may occur from reactor accidents. Regarding site-evacuation risk, the radiological risk to persons as they evacuate is taken into account within the individual plant risk assessments that form the basis for the GEIS. In addition, 10 CFR Part 50 requires that licensees maintain up-to-date emergency plans. This requirement will apply in the license renewal term as well as in the current licensing term.

As was done in the GEIS analysis, the use of generic source terms (one set for PWRs and another for BWRs) is consistent with the past practice that has been used and accepted by the NRC for individual plant Final Environmental Impact Statements (FEISs). The purpose of the source term discussion in the GEIS is to describe whether or not new information on source terms developed after the completion of the most recent FEISs

indicates that the source terms used in the past under-predict environmental consequences. The NRC has concluded that analysis of the new source term information developed over the past 10 years indicates that the expected frequency and amounts of radioactive release under severe accident conditions are less than that predicted using the generic source terms. A summary of the evolution of this research is provided in NUREG-1150, "Severe Accident Risks: An Assessment for Five U.S. Nuclear Power Plants" (December 1990), and its supporting documentation. Thus, the analyses performed for the GEIS represent adequate, plant-specific estimates of the impacts from severe accidents that would generally over-predict, rather than under-predict, environmental consequences. Therefore, the GEIS analysis of the impacts of severe accidents for license renewal is retained and is considered applicable to all plants.

Based on an evaluation of the comments, the Commission has reconsidered its previous conclusion in the draft GEIS concerning site-specific consideration of severe accident mitigation. The Commission has determined that a site-specific consideration of alternatives to mitigate severe accidents will be required at the time of license renewal unless a previous consideration of such alternatives regarding plant operation has been included in a final environmental impact statement or a related supplement. Because the third criterion required to make a Category 1 designation for an issue requires a generic consideration of mitigation, the issue of severe accidents must be reclassified as a Category 2 issue that requires a consideration of severe accident mitigation alternatives, provided this consideration has not already been completed. The Commission's reconsideration of the issue of severe accident mitigation for license renewal is based on the Commission's NEPA regulations that require a consideration of mitigation alternatives in its environmental impact statements (EISs) and supplements to EISs, as well as a previous court decision that required a review of severe mitigation alternatives (referred to as SAMDAs) at the operating license stage. See, *Limerick Ecology Action v. NRC*, 869 F.2d 719 (3d Cir. 1989).

Although the Commission has considered containment improvements for all plants pursuant to its Containment Performance Improvement (CPI) program, which identified potential containment improvements for site-specific consideration by licensees,

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Proposed Rules

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This section of the FEDERAL REGISTER contains notices to the public of the proposed issuance of rules and regulations. The purpose of these notices is to give interested persons an opportunity to participate in the rule making prior to the adoption of the final rules.

NUCLEAR REGULATORY COMMISSION

10 CFR Part 51

[Docket No. PRM-51-10, NRC-2006-0022 and Docket No. PRM-51-12, NRC-2007-0019]

The Attorney General of Commonwealth of Massachusetts, The Attorney General of California; Denial of Petitions for Rulemaking

AGENCY: Nuclear Regulatory Commission (NRC).

ACTION: Petition for rulemaking; denial.

SUMMARY: The NRC is denying two petitions for rulemaking (PRM), one filed by the Attorney General of the Commonwealth of Massachusetts (Massachusetts AG) and the other filed by the Attorney General for the State of California (California AG), presenting nearly identical issues and requests for rulemaking concerning the environmental impacts of the high-density storage of spent nuclear fuel in large water pools, known as spent fuel pools (SFPs). The Petitioners asserted that "new and significant information" shows that the NRC incorrectly characterized the environmental impacts of high-density spent fuel storage as "insignificant" in its National Environmental Policy Act (NEPA) generic environmental impact statement (EIS) for the renewal of nuclear power plant licenses. Specifically, the Petitioners asserted that spent fuel stored in high-density SFPs is more vulnerable to a zirconium fire than the NRC concluded in its NEPA analysis.

ADDRESSES: You can access publicly available documents related to these petitions for rulemaking using the following methods:

Federal e-Rulemaking Portal: Go to <http://www.regulations.gov> and search for documents filed under Docket ID [NRC-2006-0022] (PRM-51-10), and [NRC-2007-0019] (PRM-51-12).

NRC's Public Document Room (PDR): The public may examine and have copied for a fee publicly available

documents at the NRC's PDR, Public File Area O1 F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland.

NRC's Agencywide Documents Access and Management System (ADAMS): Publicly available documents created or received at the NRC are available electronically at the NRC's electronic Reading Room at <http://www.nrc.gov/reading-rm/adams.html>. From this page, the public can gain entry into ADAMS, which provides text and image files of NRC's public documents. If you do not have access to ADAMS or if there are problems in accessing the documents located in ADAMS, contact the NRC PDR reference staff at 1-899-397-4209, 301-415-4737, or by e-mail to pdr.resource@nrc.gov.

FOR FURTHER INFORMATION CONTACT: L. Mark Padovan, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, telephone (301) 415-1423, e-mail Mark.Padovan@nrc.gov.

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- VII. Denial of Petitions

I. Background

The NRC received two PRMs requesting that Title 10 of the Code of Federal Regulations (10 CFR), Part 51, be amended. The Massachusetts AG filed its petition on August 25, 2006 (docketed by the NRC as PRM-51-10). The NRC published a notice of receipt and request for public comment in the Federal Register on November 1, 2006 (71 FR 64169). The California AG filed its petition on March 16, 2007 (docketed by the NRC as PRM-51-12). PRM-51-12 incorporates by reference the facts and legal arguments set forth in PRM-51-10. The NRC published a notice of receipt and request for public comment on PRM-51-12 in the Federal Register on May 14, 2007 (72 FR 27068). The California AG filed an amended petition (treated by the NRC as a supplement to PRM 51-12) on September 19, 2007, to clarify its rulemaking request. The NRC published a notice of receipt for the supplemental petition in the Federal Register on November 14, 2007 (72 FR 64003). Because of the similarities of PRM-51-10 and PRM-51-12, the NRC evaluated the two petitions together.

The Petitioners asserted the following in their petitions:

1. "New and significant information" shows that the NRC incorrectly characterized the environmental impacts of high-density spent fuel storage as "insignificant" in the NRC's NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, May 1996*. Specifically, the Petitioners asserted that an accident or a malicious act, such as a terrorist attack, could result in an SFP being drained, either partially or completely, of its cooling water. The Petitioners further asserted that this drainage would then cause the stored spent fuel assemblies to heat up and then ignite, with the resulting zirconium fire releasing a substantial amount of radioactive material into the environment.

2. The bases of the "new and significant information" are the following:

- a. NUREG-1738, *Technical Study of the Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants, January 2001*
- b. National Academy of Sciences Committee on the Safety and Security of Commercial Spent Nuclear Fuel Storage, *Safety and Security of Commercial*

Spent Nuclear Fuel Storage (National Academies Press: 2006) (NAS Report)
c. Gordon R. Thompson, "Risks and Risk-Reducing Options Associated with Pool Storage of Spent Nuclear Fuel at the Pilgrim and Vermont Yankee Nuclear Power Plants," May 25, 2006 (Thompson Report)

3. Specifically, the Petitioners asserted that the "new and significant" information shows the following:

a. The fuel will burn if the water level in an SFP drops to the point where the tops of the fuel assemblies are uncovered (complete or partial water loss resulting from SFP drainage being caused by either an accident or terrorist attack).

b. The fuel will burn regardless of its age.

c. The zirconium fire will propagate to other assemblies in the pool.

d. The zirconium fire may be catastrophic.

e. A severe accident caused by an intentional attack on a nuclear power plant SFP is "reasonably foreseeable."

The Petitioners also asserted that new and significant information shows that the radiological risk of a zirconium fire in a high-density SFP at an operating nuclear power plant can be comparable to, or greater than, the risk of a core-degradation event of non-malicious origin (i.e., a "severe accident") at the plant's reactor. Consequently, the Petitioners asserted that SFP fires must be considered within the body of severe accident mitigation alternatives (SAMAs).

II. Petitioners' Requests

PRM-51-10 requested that the NRC take the following actions:

1. Consider new and significant information showing that the NRC's characterization of the environmental impacts of spent fuel storage as insignificant in NUREG-1437 is incorrect.

2. Revoke the regulations which codify that incorrect conclusion and excuse consideration of spent fuel storage impacts in NEPA decision-making documents, namely, 10 CFR 51.53(c)(2), 51.95(c) and Table B-1, "Summary of Findings on NEPA Issues for License Renewal of Nuclear Power Plants," of appendix B to subpart A of 10 CFR Part 51. Further, revoke 10 CFR 51.23(a) and (b), 51.30(b), 51.53, 51.61, and 51.80(b) to the extent that these regulations find, imply, or assume that environmental impacts of high-density pool storage are insignificant, and therefore need not be considered in any plant-specific NEPA analysis.

3. Issue a generic determination that the environmental impacts of high-

density pool storage of spent fuel are significant.

4. Require that any NRC licensing decision that approves high-density pool storage of spent fuel at a nuclear power plant, or any other facility, must be accompanied by a plant-specific EIS that addresses the environmental impacts of high-density pool storage of spent fuel at that nuclear plant and a reasonable array of alternatives for avoiding or mitigating those impacts.

5. Amend its regulations to require that SAMAs that must be discussed in utility company environmental reports (ERs) and NRC supplemental EISs for individual plants under 10 CFR 51.53(c)(3)(ii)(L) and Table B-1 of appendix B to subpart A of 10 CFR part 51 ("Postulated Accidents: Severe Accidents") must include alternatives to avoid, or mitigate, the impacts of high-density pool zirconium fires.

PRM-51-12 incorporates by reference PRM-51-10. PRM-51-12 requested that the NRC take the following actions:

1. Rescind all NRC regulations found in 10 CFR part 51 that imply, find, or determine that the potential environmental effects of high-density pool storage of spent nuclear fuel are not significant for purposes of NEPA and NEPA analysis.

2. Adopt, and issue, a generic determination that approval of such storage at a nuclear power plant, or any other facility, does constitute a major federal action that may have a significant effect on the human environment.

3. Require that no NRC licensing decision that approves high-density pool storage of spent nuclear fuel at a nuclear power plant, or other storage facility, may issue without the prior adoption and certification of an EIS that complies with NEPA in all respects, including full identification, analysis, and disclosure of the potential environmental effects of such storage, including the potential for accidental or deliberately caused release of radioactive products to the environment, whether by accident or through acts of terrorism, as well as full and adequate discussion of potential mitigation for such effects, and full discussion of an adequate array of alternatives to the proposed storage project.

III. Public Comments

The NRC's notice of receipt and request for public comment invited interested persons to submit comments. The comment period for PRM 51-10 originally closed on January 16, 2007, but was extended through March 19, 2007. The public comment period for

PRM 51-12 closed on July 30, 2007. Accordingly, the NRC considered comments received on both petitions through the end of July 2007. The NRC received 1,676 public comments, with 1,602 of these being nearly identical form e-mail comments supporting the petitions. Sixty-nine other comments also support the petitions. These comments were submitted by States, private organizations, and members of the U.S. Congress. Two letters from the Nuclear Energy Institute (NEI) oppose the petitions, and three nuclear industry comments endorse NEI's comments.

In general, the comments supporting the petitions focused on the following main elements of the petitions:

- NRC should evaluate the environmental impacts (large radioactive releases and contamination of vast areas) of severe accidents and intentional attacks on high-density SFP storage in its licensing decisions (NEPA analysis).

- The 2006 decision of the United States Court of Appeals for the Ninth Circuit, *San Luis Obispo Mothers for Peace v. NRC*, 449 F.3d 1016 (9th Cir. 2006), cert. denied 127 S. Ct. 1124 (2007), concluded that the NRC must evaluate the environmental impacts of a terrorist attack on SFP storage in its licensing decisions.

- NRC's claim that the likelihood of a SFP zirconium fire is remote is incorrect. Partial loss of water in an SFP could lead to a zirconium fire and release radioactivity to the environment.

- NRC's characterization of the environmental impacts of high-density SFP storage as "insignificant" in NUREG-1437 is incorrect, and the NRC should revoke the regulations which codify this.

- Any licensing decision approving high-density spent fuel storage should have an EIS.

Comments opposing the petitions centered on the following:

- Petitioners failed to show that regulatory relief is needed to address "new and significant" information concerning the potential for spent fuel zirconium fires in connection with high-density SFP storage. None of the documents that the Petitioners cited or referenced satisfy the NRC's standard for new and significant information.

- Petitioners failed to show that the Commission should rescind its Waste Confidence decision codified at 10 CFR 51.23, or change its determination that the environmental impacts of high-density spent fuel storage are insignificant.

- The Commission has recently affirmed its longstanding view that NEPA demands no terrorism inquiry,

and that the NRC therefore need not consider the environmental consequences of hypothetical terrorist attacks on NRC-licensed facilities.

- The Commission's rejection of the Ninth Circuit Court's view is consistent with the U.S. Supreme Court's position that NEPA should not be read to force agencies to consider environmental impacts for which they cannot reasonably be held responsible. Moreover, the NRC has, in fact, examined terrorism under NEPA and found the impacts similar to the impacts of already-analyzed, severe reactor accidents.

The NRC reviewed and considered the comments in its decision to deny both petitions, as discussed in the following sections:

IV. NEPA and NUREG-1437

The NRC's environmental protection regulations in 10 CFR Part 51 identify renewal of a nuclear power plant operating license as a major federal action significantly affecting the quality of the human environment. As such, an EIS is required for a plant license renewal review in accordance with the NEPA. The Petitioners challenge NUREG-1437, which generically assesses the significance of various environmental impacts associated with the renewal of nuclear power plant licenses. NUREG-1437 summarizes the findings of a systematic inquiry into the potential environmental consequences of operating individual nuclear power plants for an additional 20 years. The findings of NUREG-1437 are codified in Table B-1 of appendix B to subpart A of 10 CFR part 51.

The NUREG-1437 analysis identifies the attributes of the nuclear power plants, such as major features and plant systems, and the ways in which the plants can affect the environment. The analysis also identifies the possible refurbishment activities and modifications to maintenance and operating procedures that might be undertaken given the requirements of the safety review as provided for in the NRC's nuclear power plant license renewal regulations at 10 CFR part 54.

NUREG-1437 assigns one of three impact levels (small, moderate, or large) to a given environmental resource (e.g., air, water, or soil). A small impact means that the environmental effects are not detectable, or are so minor that they will neither destabilize, nor noticeably alter, any important attribute of the resource. A moderate impact means that the environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource. A large impact means that the

environmental effects are clearly noticeable, and are sufficient to destabilize important attributes of the resource.

In addition to determining the significance of environmental impacts associated with license renewal, the NRC determined whether the analysis in NUREG-1437 for a given resource can be applied to all plants. Under the NUREG-1437 analysis, impacts will be considered Category 1 or Category 2. A Category 1 determination means that the environmental impacts associated with that resource are generic (i.e., the same) for all plants. A Category 2 determination means that the environmental impacts associated with that resource cannot be generically assessed, and must be assessed on a plant-specific basis.

The NRC regulations at 10 CFR part 51, subpart A, appendix B, Table B-1 and NUREG-1437 set forth three criteria for an issue to be classified as Category 1. The first criterion is that the environmental impacts associated with that resource have been determined to apply to all plants. The second criterion is that a single significance level (i.e., small, moderate, or large) has been assigned to the impacts.¹ The third criterion is that the mitigation of any adverse impacts associated with the resource has been considered in NUREG-1437 and further, it has been determined that additional plant-specific mitigation measures are not likely to be sufficiently beneficial to warrant implementation. For Category 1 issues, the generic analysis may be adopted in each plant-specific license renewal review.

A Category 2 classification means that the NUREG-1437 analysis does not meet the criteria of Category 1. Thus, on that particular environmental issue, additional plant-specific review is required and must be analyzed by the license renewal applicant in its ER.

For each license renewal application, the NRC will prepare a draft supplemental EIS (SEIS) to analyze those plant-specific (Category 2) issues. Neither the SEIS nor the ER is required to cover Category 1 issues. However, both are required to consider any new and significant information for Category 1 or unidentified issues. The draft SEIS is made available for public comment. After considering public comments, the NRC will prepare and issue the final SEIS in accordance with 10 CFR 51.91 and 51.93. The final SEIS and NUREG-

¹ A note to Table B-1 states that significance levels have not been assigned "for collective off site radiological impacts from the fuel cycle and from high level waste and spent fuel disposal." 10 CFR part 51, subpart A, app. B, Table B-1, n. 2.

1437, together, serve as the requisite NEPA analysis for any given license renewal application.

The NUREG-1437 analysis, as shown in Table B-1 of appendix B to subpart A of 10 CFR part 51, found that the environmental impact of the storage of spent nuclear fuel, including high-density storage, in SFPs, during any plant refurbishment or plant operation through the license renewal term, are of a small significance level and meet all Category 1 criteria. It is this finding that the Petitioners challenge. After reviewing the petitions and the public comments received, the NRC has determined that its findings in NUREG-1437 and in Table B-1 remain valid, both for SFP accidents and for potential terrorist attacks that could result in an SFP zirconium fire.

V. Reasons for Denial—General

A. Spent Fuel Pools

Spent nuclear fuel offloaded from a reactor is stored in a SFP. The SFPs at all nuclear plants in the United States are massive, extremely-robust structures designed to safely contain the spent fuel discharged from a nuclear reactor under a variety of normal, off-normal, and hypothetical accident conditions (e.g., loss of electrical power, floods, earthquakes, or tornadoes). SFPs are made of thick, reinforced, concrete walls and floors lined with welded, stainless-steel plates to form a leak-tight barrier. Racks fitted in the SFPs store the fuel assemblies in a controlled configuration (i.e., so that the fuel is both sub-critical and in a coolable geometry). Redundant monitoring, cooling, and makeup-water systems are provided. The spent fuel assemblies are positioned in racks at the bottom of the pool, and are typically covered by at least 25 feet of water. SFPs are essentially passive systems.

The water in the SFPs provides radiation shielding and spent fuel assembly cooling. It also captures radionuclides in case of fuel rod leaks. The water in the pool is circulated through heat exchangers for cooling. Filters capture any radionuclides and other contaminants that get into the water. Makeup water can also be added to the pool to replace water loss.

SFPs are located at reactor sites, typically within the fuel-handling (pressurized-water reactor) or reactor building (boiling-water reactor). From a structural point of view, nuclear power plants are designed to protect against external events such as tornadoes, hurricanes, fires, and floods. These structural features, complemented by the deployment of effective and visible

physical security protection measures, are also deterrents to terrorist activities. Additionally, the emergency procedures and SAMA guidelines developed for reactor accidents provide a means for mitigating the potential consequences of terrorist attacks.

B. Physical Security

The Petitioners raise the possibility of a successful terrorist attack as increasing the probability of an SFP zirconium fire. As the NAS Report found, the probability of terrorist attacks on SFPs cannot be reliably assessed, quantitatively or comparatively. The NRC has determined, however, that security and mitigation measures the NRC has imposed upon its licensees since September 11, 2001, and national anti-terrorist measures to prevent, for example, aircraft hijackings, coupled with the robust nature of SFPs, make the probability of a successful terrorist attack, though numerically indeterminate, very low.

The NRC's regulations and security orders require licensees to develop security and training plans for NRC review and approval, implement procedures for these plans, and to periodically demonstrate proficiency through tests and exercises.² In addition, reactor physical security systems use a defense-in-depth concept, involving the following:

- Vehicle (external) barriers.
- Fences.
- Intrusion detection, alarm, and assessment systems.
- Internal barriers.
- Armed responders.
- Redundant alarm stations with command, control, and communications systems.
- Local law enforcement authority's response to a site and augmentation of the on-site armed response force.
- Security and emergency-preparedness procedure development and planning efforts with local officials.
- Security personnel training and qualification.

The NRC's regulatory approach for maintaining the safety and security of power reactors, and thus SFPs, is based upon robust designs that are coupled with a strategic triad of preventive/protective systems, mitigative systems, and emergency-preparedness and response. Furthermore, each licensee's security functions are integrated and

² For additional related information, please see the NRC fact sheet "NRC Review of Paper on Reducing Hazards From Stored Spent Nuclear Fuel," which is available on the NRC's public Web site at: <http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/reducing-hazards-spent-fuel.html>.

coordinated with reactor operations and emergency response functions. Licensees develop protective strategies in order to meet the NRC design-basis threat (DBT).³ In addition, other Federal agencies such as the Federal Aviation Administration, the Federal Bureau of Investigation, and the Department of Homeland Security have taken aggressive steps to prevent terrorist attacks in the United States. Taken as a whole, these systems, personnel, and procedures provide reasonable assurance that public health and safety, the environment, and the common defense and security will be adequately protected.

C. Very Low Risk

Risk is defined as the probability of the occurrence of a given event multiplied by the consequences of that event.⁴ Studies conducted over the last three decades have consistently shown that the probability of an accident causing a zirconium fire in an SFP to be lower than that for severe reactor accidents. The risk of beyond design-basis accidents (DBAs) in SFPs was first examined as part of the landmark *Reactor Safety Study: An Assessment of Accident Risks in U.S. Commercial Nuclear Power Plants* (WASH-1400, NUREG-75/014, 1975), and was found to be several orders of magnitude below those involving the reactor core. The risk of an SFP accident was re-examined in the 1980's as Generic Issue 82, *Beyond Design Basis Accidents in Spent Fuel Pools*, in light of increased use of high-density storage racks and laboratory studies that indicated the possibility of zirconium fire propagation between assemblies in an air-cooled environment. The risk assessment and cost-benefit analyses developed through this effort, NUREG-1353, *Regulatory Analysis for the Resolution of Generic Issue 82, Beyond Design Basis Accidents in Spent Fuel Pools*, Section 6.2, April 1989, concluded that the risk of a severe accident in the SFP was low and "appear[s] to meet" the objectives of the Commission's "Safety Goals for the Operations of Nuclear Power Plants; Policy Statement," (August 4, 1986; 51

³ The DBT represents the largest threat against which a private sector facility can be reasonably expected to defend with high assurance. The NRC's DBT rule was published in the Federal Register on March 19, 2007 (72 FR 12705).

⁴ The American Society of Mechanical Engineers (ASME) "Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications," ASME RA-S-2002, defines risk as the probability and consequences of an event, as expressed by the risk "triple" that is the answer to the following three questions: (1) What can go wrong? (2) How likely is it? and (3) What are the consequences if it occurs?

FR 28044), as amended (August 21, 1986; 51 FR 30028), and that no new regulatory requirements were warranted.⁵

SFP accident risk was re-assessed in the late 1990s to support a risk-informed rulemaking for permanently shutdown, or decommissioned, nuclear power plants. The study, NUREG-1738, *Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants*, January 2001, conservatively assumed that if the water level in the SFP dropped below the top of the spent fuel, an SFP zirconium fire involving all of the spent fuel would occur, and thereby bounded those conditions associated with air cooling of the fuel (including partial-draindown scenarios) and fire propagation. Even when all events leading to the spent fuel assemblies becoming partially or completely uncovered were assumed to result in an SFP zirconium fire, the study found the risk of an SFP fire to be low and well within the Commission's Safety Goals.

Furthermore, significant additional analyses have been performed since September 11, 2001, that support the view that the risk of a successful terrorist attack (i.e., one that results in an SFP zirconium fire) is very low. These analyses were conducted by the Sandia National Laboratories and are collectively referred to herein as the "Sandia studies."⁶ The Sandia studies

⁵ The Commission's Safety Goals identified two quantitative objectives concerning mortality risks: (1) The risk to an average individual in the vicinity of a nuclear power plant of prompt fatalities that might result from reactor accidents should not exceed one-tenth of one percent (0.1 percent) of the sum of prompt fatality risks resulting from other accidents in which members of the U.S. population are generally exposed; and (2) The risk to the population in the area near a nuclear power plant of cancer fatalities that might result from nuclear power plant operation should not exceed one-tenth of one percent (0.1 percent) of the sum of cancer fatality risks resulting from all other causes.

⁶ Sandia National Laboratories, "Mitigation of Spent Fuel Pool Loss-of-Coolant Inventory Accidents and Extension of Reference Plant Analyses to Other Spent Fuel Pools," Sandia Letter Report, Revision 2 (November 2006) incorporates and summarizes the Sandia Studies. This document is designated "Official Use Only—Security Related Information." A version of the Sandia Studies, with substantial redactions, was made public as a response to a Freedom of Information Act request. It is available on the NRC's Agencywide Document Access and Management System (ADAMS). The redacted version can be found under ADAMS Accession No. ML062290362. For access to ADAMS, contact the NRC Public Document Room Reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to pdcr.resource@nrc.gov. For additional related information, please see the NRC fact sheet "NRC Review of Paper on Reducing Hazards From Stored Spent Nuclear Fuel," which is available on the NRC's public Web site at: <http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/reducing-hazards-spent-fuel.html>.

are sensitive security related information and are not available to the public. The Sandia studies considered spent fuel loading patterns and other aspects of a pressurized-water reactor SFP and a boiling-water reactor SFP, including the role that the circulation of air plays in the cooling of spent fuel. The Sandia studies indicated that there may be a significant amount of time between the initiating event (i.e., the event that causes the SFP water level to drop) and the spent fuel assemblies becoming partially or completely uncovered. In addition, the Sandia studies indicated that for those hypothetical conditions where air cooling may not be effective in preventing a zirconium fire (i.e., the partial drain down scenario cited by the Petitioners), there is a significant amount of time between the spent fuel becoming uncovered and the possible onset of such a zirconium fire, thereby providing a substantial opportunity for both operator and system event mitigation.

The Sandia studies, which more fully account for relevant heat transfer and fluid flow mechanisms, also indicated that air-cooling of spent fuel would be sufficient to prevent SFP zirconium fires at a point much earlier following fuel offload from the reactor than previously considered (e.g., in NUREG-1738). Thus, the fuel is more easily cooled, and the likelihood of an SFP fire is therefore reduced.

Additional mitigation strategies implemented subsequent to September 11, 2001, enhance spent fuel coolability and the potential to recover SFP water level and cooling prior to a potential SFP zirconium fire. The Sandia studies also confirmed the effectiveness of additional mitigation strategies to maintain spent fuel cooling in the event the pool is drained and its initial water inventory is reduced or lost entirely. Based on this more recent information, and the implementation of additional strategies following September 11, 2001, the probability, and accordingly, the risk, of a SFP zirconium fire initiation is expected to be less than reported in NUREG-1738 and previous studies.

Given the physical robustness of SFPs, the physical security measures, and SFP mitigation measures, and based upon NRC site evaluations of every SFP in the United States, the NRC has determined that the risk of an SFP zirconium fire, whether caused by an accident or a terrorist attack, is very low. As such, the NRC's generic findings in NUREG-1437, as further reflected in Table B-1 of appendix B to subpart A of 10 CFR part 51, remain valid.

VI. Reasons for Denial—NRC Responses to Petitioners' Assertions

A. New and Significant Information

The Petitioners asserted that new and significant information shows that the NRC incorrectly characterized the environmental impacts of spent fuel storage as "insignificant." The information relied upon by the Petitioners, however, is neither "new" nor "significant," within the NRC's definition of those terms. The NRC defines these terms in its Supplement 1 to NRC Regulatory Guide 4.2, *Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses*, Chapter 5 (September 2000) (RG 4.2S1). "New and significant" information, which would require supplementing NUREG-1437, is defined as follows:

(1) Information that identifies a significant environmental issue that was not considered in NUREG-1437 and, consequently, not codified in Appendix B to Subpart A of 10 CFR Part 51, or

(2) Information that was not considered in the analyses summarized in NUREG-1437 and that leads to an impact finding different from that codified in 10 CFR Part 51.

The Petitioners' "new and significant" information does not meet the RG 4.2S1 criteria. NUREG-1437 (Sections 6.4.6.1. to 6.4.6.3.), and the analyses cited therein, including the NRC's "Waste Confidence Rule" (September 18, 1990; 55 FR 38474, 38480-81), extensively considered the risk of SFP accidents. Moreover, to the extent any information submitted by the Petitioners was not considered in NUREG-1437, none of the information is "significant," because, as explained further in this document, it would not lead to "an impact finding different from that codified in 10 CFR Part 51," or as set forth in NUREG-1437.

B. Spent Fuel Assemblies Will Burn If Uncovered

The Petitioners asserted that new and significant information, consisting primarily of the Thompson Report, NUREG-1738, and a government-sponsored study, the NAS Report, show that spent fuel will burn if the water level in an SFP drops to the point where the tops of the fuel assemblies are uncovered. Specifically, the Petitioners asserted that the NRC fails to recognize the danger of a partial loss of water in an SFP, which in the Petitioners' view, is more likely to cause an SFP zirconium fire than a complete loss of water, because the remaining water will block the circulating air that would

otherwise act to cool the spent fuel assemblies.

The NRC does not agree with the Petitioners' assertions. The NRC has determined that a zirconium cladding fire does not occur when only the tops of the fuel assemblies are uncovered. In reality, a zirconium fire cannot occur unless fuel uncovering is more substantial. Even then, the occurrence of a zirconium fire requires a number of conditions which are extremely unlikely to occur together. The Sandia studies provide a more realistic assessment of the coolability of spent fuel under a range of conditions and a better understanding of the actual safety margins than was indicated in NUREG-1738. The Sandia studies have consistently and conclusively shown that the safety margins are much larger than indicated by previous studies such as NUREG-1738.

1. Heat Transfer Mechanisms

Past NRC studies of spent fuel heatup and zirconium fire initiation conservatively did not consider certain natural heat-transfer mechanisms which would serve to limit heatup of the spent fuel assemblies and prevent a zirconium fire. In particular, these studies, including NUREG-1738, did not consider heat transfer from higher-decay-power assemblies to older, lower-decay-power fuel assemblies in the SFP. This heat transfer would substantially increase the effectiveness of air cooling in the event the SFP is drained, far beyond the effectiveness of air cooling cited in past studies. Both the Sandia studies and the NAS Report confirm the NRC conclusion that such heat transfer mechanisms allow rapid heat transfer away from the higher-powered assemblies. The NAS Report also noted that such heat transfer could air-cool the assemblies to prevent a zirconium fire within a relatively short time after the discharge of assemblies from the reactor to the SFP.⁷ Thus, air cooling is an effective, passive mechanism for cooling spent fuel assemblies in the pool.

2. Partial Drain-Down

Air cooling is less effective under the special, limited condition where the water level in the SFP drops to a point where water and steam cooling is not sufficient to prevent the fuel from overheating and initiating a zirconium fire, but the water level is high enough to block the full natural circulation of air flow through the assemblies. This condition has been commonly referred to as a partial drain-down, and is cited in the Thompson Report. Under those

⁷NAS Report at 53.

conditions, however, it is important to realistically model the heat transfer between high- and low-powered fuel assemblies. The heat transfer from hot fuel assemblies to cooler assemblies will delay the heat-up of assemblies, and allow plant operators time to take additional measures to restore effective cooling to the assemblies. Further, for very low-powered assemblies, the downward flow of air into the assemblies can also serve to cool the assembly even though the full-circulation flow path is blocked. Also, as discussed further in this document, all nuclear plant SFPs have been assessed to identify additional, existing cooling capability and to provide new supplemental cooling capability which could be used during such rare events. This supplemental cooling capability specifically addresses the cooling needs during partial draindown events, and would reduce the probability of a zirconium fire even during those extreme events.

3. License Amendments

In January 2006, the nuclear industry proposed a combination of internal and external strategies to enhance the spent fuel heat removal capability systems at every operating nuclear power plant. The internal strategy implements a diverse SFP makeup system that can supply the required amount of makeup water and SFP spray to remove decay heat. The external strategy involves using an independently-powered, portable, SFP coolant makeup and spray capability system that enhances spray and rapid coolant makeup to mitigate a wide range of possible scenarios that could reduce SFP water levels. In addition, in cases where SFP water levels can not be maintained, leakage control strategies would be considered along with guidance to maximize spray flows to the SFP. Time lines have been developed that include both dispersed and non-dispersed spent fuel storage. The NRC has approved license amendments and issued safety evaluations to incorporate these strategies into the plant licensing bases of all operating nuclear power plants in the United States.

C. Fuel Will Burn Regardless of Its Age

The NRC disagrees with the Petitioners' assertion that fuel will burn regardless of age. Older fuel (fuel which has been discharged from the reactor for a longer time) is more easily cooled and is less likely to ignite because of its lower decay power. A study relied upon by the Petitioners, NUREG-1738, did conservatively assume that spent fuel stored in an SFP, regardless of age, may

be potentially vulnerable to a partial drain down event, and that the possibility of a zirconium fire could not be ruled out on a generic basis. This conclusion, however, was in no sense a statement of certainty and was made in order to reach a conclusion on a generic basis, without relying on any plant-specific analyses.

Furthermore, the SFP zirconium fire frequency in NUREG-1738 was predicated on a bounding, conservative assumption that an SFP fire involving all of the spent fuel would occur if the water level in the SFP dropped below the top of the spent fuel. The NUREG-1738 analysis did not attempt to specifically address a number of issues and actions that would substantially reduce the likelihood of a zirconium fire, potentially rendering the frequency estimate to be remote and speculative. For example, NUREG-1738 did not account for the additional time available following the spent fuel being partially or completely uncovered, but prior to the onset of a zirconium fire, that would allow for plant operator actions, makeup of SFP water levels, and other mitigation measures. In addition, NUREG-1738 did not consider the impact of plant and procedure changes implemented as a result of the events of the September 11, 2001, terrorist attacks. NUREG-1738 did clarify that the likelihood of a zirconium fire under such conditions could be reduced by accident management measures, but it was not the purpose of NUREG-1738 to evaluate such accident management measures.

D. SFP Zirconium Fire Will Propagate

Although it is possible that once a spent fuel assembly ignites, the zirconium fire can propagate to other assemblies in the SFP, the NRC has determined (as explained previously) that the risk of an SFP zirconium fire initiation is very low.

E. SFP Zirconium Fire May Be Catastrophic

1. Not New and Significant Information; Very Low Probability

The Massachusetts AG states that "while such a catastrophic accident is unlikely, its probability falls within the range that NRC considers reasonably foreseeable." Thus, the Petitioners asserted that an SFP zirconium fire qualifies as a DBA and, that the impacts of an SFP fire must be discussed in the ER submitted by the licensee and the NRC's EIS, as well as designed against under NRC safety regulations.

The facts that a SFP contains a potentially large inventory of

radionuclides and that a release of that material could have adverse effects are not new. These facts are well known, and were considered in the risk evaluation of spent fuel storage contained in NUREG-1738. Even with the numerous conservatisms in the NUREG-1738 study, as described previously, the NRC was able to conclude that the risk from spent fuel storage is low, and is substantially lower than reactor risk.

A study relied upon by the Petitioners, the Thompson Report, claimed that the probability (frequency) of an SFP zirconium fire would be $2E-5$ per year⁸ for events excluding acts of malice (e.g., terrorism) and $1E-4$ per year⁹ for acts of malice. With respect to random events (i.e., excluding acts of malice), the NRC concludes that the Thompson Report estimate is overly conservative. A more complete and mechanistic assessment of the event, as described in section VI.E.2. of this Notice, and associated mitigation measures, leads to considerably lower values. With respect to events initiated by a terrorist attack, the NRC concludes that such probability (frequency) estimates are entirely speculative. The NRC also concludes that the additional mitigation measures for SFP events implemented since September 11, 2001, together with the more realistic assessment of spent fuel cooling, indicates that the likelihood of a zirconium fire, though numerically indeterminable, is very low.

The $2E-5$ per year estimate for events excluding acts of malice is based on an unsubstantiated assumption that 50 percent of all severe reactor accidents that result in an early release of substantial amounts of radioactive material will also lead to a consequential SFP zirconium fire. The Thompson Report does not identify the necessary sequence of events by which such scenarios might lead to SFP zirconium fires, or discuss the probability of their occurrence. The NRC analysis in the Shearon Harris ASLBP proceeding (described in section VI.E.2. of this Notice) showed that a more complete and mechanistic assessment of the event and associated mitigation measures leads to considerably lower values. This assessment includes the following:

- Frequency and characteristics of the releases from the containment for each release location;
- Transport of gases and fission products within the reactor building;

⁸Two occurrences in 100,000 reactor years.

⁹One occurrence in 10,000 reactor years.

- Resulting thermal and radiation environments in the reactor building, with emphasis on areas in which SFP cooling and makeup equipment is located, and areas in which operator access may be needed to implement response actions;

- Availability/survivability of SFP cooling and makeup equipment in the sequences of concern; and
- Ability and likelihood of successful operator actions to maintain or restore pool cooling or makeup (including consideration of security enhancements and other mitigation measures implemented in response to the terrorist attacks of September 11, 2001).

2. Shearon Harris Atomic Safety and Licensing Board Panel (ASLBP) Proceeding

In the proceeding regarding the expansion of the SFP at the Shearon Harris nuclear power plant, located near Raleigh, North Carolina, the Shearon Harris intervenor described a scenario similar to that raised by the Petitioners, namely, that a severe accident at the adjacent reactor would result in a SFP zirconium fire.¹⁰ The Shearon Harris proceeding considered the probability of a sequence of the following seven events:

- a. A degraded core accident.
- b. Containment failure or bypass.
- c. Loss of SFP cooling.
- d. Extreme radiation levels precluding personnel access.
- e. Inability to restart cooling or makeup systems due to extreme radiation doses.
- f. Loss of most or all pool water through evaporation.
- g. Initiation of a zirconium fire in the SFP.

Based on a detailed probabilistic risk assessment, the licensee calculated the probability of a severe reactor accident that causes an SFP zirconium fire to be $2.78\text{E}-8$ per year. The NRC staff calculated the probability to be $2.0\text{E}-7$ per year. The intervenor calculated the probability to be $1.6\text{E}-5$ per year. The ASLBP concluded that the probability of the postulated sequence of events resulting in an SFP zirconium fire was "conservatively in the range described by the Staff: $2.0\text{E}-7$ per year (two occurrences in 10 million reactor years) or less."¹¹ Accordingly, the ASLBP found that the occurrence of a severe reactor accident causing an SFP zirconium fire "falls within the category of remote and speculative matters."¹²

¹⁰ *Carolina Power Light Co.*, LBP-01-9, 53 NRC 239, 244-245 (2001).

¹¹ *Id.*, 53 NRC at 267.

¹² *Id.*, 53 NRC at 268.

The Commission affirmed the ASLBP's decision, and the United States Court of Appeals, District of Columbia Circuit, upheld the Commission decision.¹³

In the Shearon Harris proceeding, the intervenor assumed that, given an early containment failure or bypass, a spent fuel zirconium fire would occur (i.e., a conditional probability of 1.0). In order for a reactor accident to lead to a SFP zirconium fire a number of additional conditions must occur. The reactor accident and containment failure must somehow lead to a loss of SFP cooling and must lead to a condition where extreme radiation levels preclude personnel access to take corrective action. There must be then an inability to restart cooling or makeup systems. There must be a loss of significant pool water inventory through evaporation (which can take substantial time). Finally, the event must also lead to a zirconium fire. In contrast to the intervenor's estimate, the licensee and the NRC staff estimated a conditional probability of about one percent that a severe reactor accident with containment failure would lead to a SFP accident. The NRC staff expects that the conditional probability of a SFP zirconium fire, given a severe reactor accident, would be similar to that established in the Shearon Harris proceeding. As such, the probability of a SFP zirconium fire due to a severe reactor accident and subsequent containment failure would be well below the Petitioners' $2\text{E}-5$ per year estimate.

The $1\text{E}-4$ per year estimate in the Thompson Report for events involving acts of malice assumes that there would be one attack on the population of U.S. nuclear power plants per century, and that this attack will be 100 percent successful in producing a SFP zirconium fire (thus, fire frequency = 0.01 attack/year \times 1.0 fire/attack \times $1/104$ total reactors = $1\text{E}-4$ /year). The security-related measures and other mitigation measures implemented since September 11, 2001, however, have significantly reduced the likelihood of a successful terrorist attack on a nuclear power plant and its associated SFP. Such measures include actions that would improve the likelihood of the following:

- a. Identifying/thwarting the attack before it is initiated.
- b. Mitigating the attack before it results in damage to the plant.

¹³ *Carolina Power Light Co.*, Commission Law Issuance (CLI)-01-11, 53 NRC 370 (2001), *pet. for review denied, sub nom. Orange County, NC v. NRC*, 47 Fed. Appx. 1, 2002 WL 31098379 (D.C. Cir. 2002).

c. Mitigating the impact of the plant damage such that an SFP zirconium fire is avoided.

Given the implementation of additional security enhancements and mitigation strategies, as well as further consideration of the factors identified above, the NRC staff concludes that the frequency of SFP zirconium fires due to acts of malice is substantially lower than assumed by the Petitioners.

3. SFP Zirconium Fire Does Not Qualify As a DBA

Regarding the Petitioners' assertion that a SFP zirconium fire qualifies as a design-basis accident (DBA), the NRC staff has concluded that a realistic probability estimate would be very low, such that these events need not be considered as DBAs or discussed in ERs and EISs. Moreover, the set of accidents that must be addressed as part of the design basis has historically evolved from deterministic rather than probabilistic considerations. These considerations, which include defense-in-depth, redundancy, and diversity, are characterized by the use of the single-failure criterion.¹⁴ The single-failure criterion, as a key design and analysis tool, has the direct objective of promoting reliability through the enforced provision of redundancy in those systems which must perform a safety-related function. The single failure criterion is codified in Appendix A and Appendix K to 10 CFR Part 50 and other portions of the regulations. The SFP and related systems have been designed and approved in accordance with this deterministic approach.

F. Intentional Attack on a SFP is "Reasonably Foreseeable."

The Petitioners asserted that an intentional attack targeting a plant's SFP is "reasonably foreseeable." Specifically, the Petitioners raised both the NAS study and the decision by the United States Court of Appeals for the Ninth Circuit, *San Luis Obispo Mothers for Peace v. NRC*, 449 F.3d 1016 (9th Cir. 2006), *cert. denied* 127 S. Ct. 1124 (2007), to support the assertion that the NRC's NEPA analysis of a license renewal action for a given facility must include analysis of the environmental impacts associated with a terrorist attack on that facility. The NRC has

¹⁴ "A single failure means an occurrence which results in the loss of capability of a component to perform its intended safety functions * * * Fluid and electric systems are considered to be designed against an assumed single failure if neither (1) a single failure of any active component * * * nor (2) a single failure of a passive component * * * results in a loss of the capability of the system to perform its safety functions." 10 CFR Part 50, App. A.

considered both the NAS Report and the Ninth Circuit decision, and remains of the view that an analysis of the environmental impacts of a hypothetical terrorist attack on an NRC-licensed facility is not required under NEPA.¹⁵ But, if an analysis of a hypothetical terrorist attack were required under NEPA, the NRC has determined that the environmental impacts of such a terrorist attack would not be significant, because the probability of a successful terrorist attack (i.e., one that causes an SFP zirconium fire, which results in the release of a large amount of radioactive material into the environment) is very low and therefore, within the category of remote and speculative matters.

1. NAS Report

The Petitioners rely, in part, upon the NAS Report, the public version of which was published in 2006 and is available from NAS.¹⁶ In response to a direction in the Conference Committee's Report accompanying the NRC's FY. 2004 appropriation,¹⁷ the NRC contracted with NAS for a study on the safety and security of commercial spent nuclear fuel. The NAS made a number of findings and recommendations, including:

- SFPs are necessary at all operating nuclear power plants to store recently discharged fuel;
- Successful terrorist attacks on SFPs, though difficult, are possible;
- The probability of terrorist attacks on spent fuel storage cannot be assessed quantitatively or comparatively;
- If a successful terrorist attack leads to a propagating zirconium cladding fire, it could result in the release of large amounts of radioactive material; and
- Dry cask storage has inherent security advantages over spent fuel

¹⁵ In the wake of the Ninth Circuit's *Mothers for Peace* decision, the Commission decided against applying that holding to all licensing proceedings nationwide. See, e.g., *Amergen Energy Co. LLC* (Oyster Creek Nuclear Generating Station), CLI-07-8, 65 NRC 124, 128-29 (2007), *pet. for judicial review pending*, No. 07-2271 (3d Cir.). The Commission will, of course, adhere to the Ninth Circuit decision when considering licensing actions for facilities subject to the jurisdiction of that Circuit. See *id.* Thus, on remand in the *Mothers for Peace* case itself, the Commission is currently adjudicating intervenors' claim that the NRC Staff has not adequately assessed the environmental consequences of a terrorist attack on the Diablo Canyon Power Plant's proposed facility for storing spent nuclear fuel in dry casks. See, *Pacific Gas & Elec. Co.*, CLI-07-11, 65 NRC 148 (2007). The Commission's ultimate decision in that case will rest on the record developed in the adjudication.

¹⁶ The NRC response to the NAS Report is available at ADAMS Accession No. ML0502804280.

¹⁷ Conference Committee's Report (H. Rept. 108-357) accompanying the *Energy and Water Development Act, 2004* (Pub. L. 108-137, December 3, 2003).

storage, but it can only be used to store older spent fuel.

The NAS Report found, and the NRC agrees, that pool storage is required at all operating commercial nuclear power plants to cool newly discharged spent fuel. Freshly discharged spent fuel generates too much decay heat to be placed in a dry storage cask.

The NRC agrees with the NAS finding that the probability of terrorist attacks on spent fuel storage cannot be assessed quantitatively or comparatively. However, the NRC concludes that the additional mitigation measures for SFP events implemented since September 11, 2001, together with a more realistic assessment of spent fuel cooling, as shown by the Sandia studies, indicates that the likelihood of a zirconium fire, though numerically indeterminate, is very low.

Furthermore, the NAS Report states that "[i]t is important to recognize, however, that an attack that damages a power plant or its spent fuel storage facilities would not necessarily result in the release of any radioactivity to the environment. There are potential steps that can be taken to lower the potential consequences of such attacks."¹⁸ The NAS Report observed that a number of security improvements at nuclear power plants have been instituted since September 11, 2001, although the NAS did not evaluate the effectiveness and adequacy of these improvements and has called for an independent review of such measures. Nevertheless, the NAS Report states that "the facilities used to store spent fuel at nuclear power plants are very robust. Thus, only attacks that involve the application of large energy impulses or that allow terrorists to gain interior access have any chance of releasing substantial quantities of radioactive material."¹⁹

As discussed previously, following the terrorist attacks of September 11, 2001, the NRC has required that nuclear power plant licensees implement additional security measures and enhancements the Commission believes have made the likelihood of a successful terrorist attack on an SFP remote.

2. Ninth Circuit Decision

The Petitioners asserted that the NRC should follow the decision of the United States Court of Appeals for the Ninth Circuit, *San Luis Obispo Mothers for Peace v. NRC*, 449 F.3d 1016 (9th Cir. 2006), *cert. denied* 127 S. Ct. 1124 (2007), by considering the environmental impacts of intentional attacks on nuclear power plant fuel

storage pools in all licensing decisions. The Ninth Circuit held that the NRC could not, under NEPA, categorically refuse to consider the consequences of a terrorist attack against a spent fuel storage facility on the Diablo Canyon reactor site.

The NRC's longstanding view is that NEPA does not require the NRC to consider the environmental consequences of hypothetical terrorist attacks on NRC-licensed facilities. NEPA requires that there be a "reasonably close causal relationship" between the federal agency action and the environmental consequences.²⁰ The NRC renewal of a nuclear power plant license would not cause a terrorist attack; a terrorist attack would be caused by the terrorists themselves. Thus, the renewal of a nuclear power plant license would not be the "proximate cause" of a terrorist attack on the facility.

If NEPA required the NRC to consider the impacts of a terrorist attack, however, the NRC findings would remain unchanged. As previously described, the NRC has required, and nuclear power plant licensees have implemented, various security and mitigation measures that, along with the robust nature of SFPs, make the probability of a successful terrorist attack (i.e., one that causes an SFP zirconium fire, which results in the release of a large amount of radioactive material into the environment) very low. As such, a successful terrorist attack is within the category of remote and speculative matters for NEPA considerations; it is not "reasonably foreseeable." Thus, on this basis, the NRC finds that the environmental impacts of renewing a nuclear power plant license, in regard to a terrorist attack on an SFP, are not significant.

The NRC has determined that its findings related to the storage of spent nuclear fuel in pools, as set forth in NUREG-1437 and in Table B-1 of Appendix B to Subpart A of 10 CFR Part 51, remain valid. Thus, the NRC has met and continues to meet its obligations under NEPA.

G. SFP Zirconium Fire Should Be Considered Within the Analysis of SAMAs

The Petitioners asserted that SFP fires should be considered within the analysis of severe accident mitigation alternatives (SAMAs). While a large radiological release is still possible, and

²⁰ *Department of Transportation v. Public Citizen*, 541 U.S. 762, 767 (2004) citing *Metropolitan Edison v. People Against Nuclear Energy*, 460 U.S. 766, 774 (1983).

¹⁸ NAS Report at 6 (emphasis in the original).

¹⁹ NAS Report at 30.

was assessed as part of Generic Issue 82, *Beyond Design Basis Accidents in Spent Fuel Pools*; and later, in NUREG-1738, the NRC considers the likelihood of such an event to be lower than that estimated in Generic Issue 82 and NUREG-1738. Based on the Sandia studies, and on the implementation of additional strategies implemented following September 11, 2001, the probability of a SFP zirconium fire is expected to be less than that reported in NUREG-1738 and previous studies. Thus, the very low probability of an SFP zirconium fire would result in an SFP risk level less than that for a reactor accident.

For example, in NUREG-1738, the SFP fire frequencies were conservatively estimated to be in the range of $5.8E-7$ per year to $2.4E-6$ per year. NUREG-1738 conservatively assumed that if the water level in the SFP dropped below the top of the spent fuel, an SFP zirconium fire involving all of the spent fuel would occur, and thereby bounded those conditions associated with air cooling of the fuel (including partial-drain down scenarios) and zirconium fire propagation. It did not mechanistically analyze the time between the spent fuel assemblies becoming partially or completely uncovered and the onset of a SFP zirconium fire, and the potential to recover SFP cooling and to restore the SFP water level within this time. NUREG-1738 also did not consider the possibility that air-cooling of the spent fuel alone could be sufficient to prevent SFP zirconium fires.

Furthermore, the Sandia studies indicated that air cooling would be much more effective in cooling the spent fuel assemblies. In those cases where air cooling is not effective, the time before fuel heatup and radiological release would be substantially delayed, thus providing a substantial opportunity for successful event mitigation. The Sandia studies, which more fully account for relevant heat transfer and fluid flow mechanisms, also indicated that air-cooling of spent fuel would be sufficient to prevent SFP zirconium fires much earlier following fuel offload than previously considered (e.g., in NUREG-1738), thereby further reducing the likelihood of an SFP zirconium fire. Additional mitigation strategies implemented subsequent to September 11, 2001, will serve to further enhance spent fuel coolability, and the potential to recover SFP cooling or to restore the SFP water level prior to the initiation of an SFP zirconium fire.

Given that the SFP risk level is less than that for a reactor accident, a SAMA that addresses SFP accidents would not

be expected to have a significant impact on total risk for the site. Despite the low level of risk from fuel stored in SFPs, additional SFP mitigative measures have been implemented by licensees since September 11, 2001. These mitigative measures further reduce the risk from SFP zirconium fires, and make it even more unlikely that additional SFP safety enhancements could substantially reduce risk or be cost-beneficial.

VII. Denial of Petitions

Based upon its review of the petitions, the NRC has determined that the studies upon which the Petitioners rely do not constitute new and significant information. The NRC has further determined that its findings related to the storage of spent nuclear fuel in pools, as set forth in NUREG-1437 and in Table B-1, of Appendix B to Subpart A of 10 CFR Part 51, remain valid. Thus, the NRC has met and continues to meet its obligations under NEPA. For the reasons discussed previously, the Commission denies PRM-51-10 and PRM-51-12.

Commissioner Gregory B. Jaczko's Dissenting View on the Commission's Decision To Deny Two Petitions for Rulemaking Concerning the Environmental Impacts of High-Density Storage of Spent Nuclear Fuel in Spent Fuel Pools

I disagree with the decision to deny the petition for rulemaking as included in this *Federal Register* notice. In general, I approve of the decision not to initiate a new rulemaking to resolve the petitioners' concerns, but because information in support of the petition will be considered when the staff undertakes the rulemaking to update the Generic Environmental Impact Statement for license renewal, I believe that the decision should have been to partially grant the petition rather than deny it.

The petitioners requested the agency review additional studies regarding spent fuel pool storage they believe would change the agency's current generic determination that the impacts of high-density pool storage are "small". I believe that the agency could commit to reviewing the information provided by the petitioners, along with any other new information, when the agency updates the Generic Environmental Impact Statement (GEIS) for License Renewal in the near future. Regardless of whether or not the information will change the GEIS' conclusions, at a minimum, the agency should be committing to ensure that this information is part of the analysis

performed by the staff upon the next update of the GEIS. While we can not predict the outcome of the significance level that will ultimately be assigned to the spent fuel category in the GEIS, it seems an obvious commitment to ensure that the ultimate designation will be appropriately based upon all information available to the staff at the time. Thus, I believe this decision should be explained as a partial granting of the petition. It may not provide the petitioners with everything they want, but it would more clearly state the obvious—that this information, and any other new information, will be reviewed by the agency and appropriately considered when the staff begins its update of the license renewal GEIS.

This specific issue illustrates a larger concern about how the agency handles petitions for rulemaking in general. I find it unfortunate that the agency appears to limit its responses to petitions based upon the vocabulary that has been established surrounding this program. Currently, when the agency discusses these petitions, we discuss them in the context of "granting" or "denying" the rulemaking petitions. We then appear to be less inclined to "grant" unless we are committing to the precise actions requested in the petition. But these petitions are, by their very definition, requests for rulemakings; which means, even if we do "grant" a petition for rulemaking, we can not guarantee a particular outcome for the final rule. The final rulemaking is the result of staff's technical work regarding the rule, public comments on the rule, and resolution of those comments. Rulemaking petitions are opportunities for our stakeholders to provide us with new ideas and approaches for how we regulate. By limiting our responses, we limit our review of the request, and thus, we risk missing many potential opportunities to improve the way we regulate.

Additional Views of the Commission

The Commission does not share Commissioner Jaczko's dissenting view. We appreciate his statement of concern about the petition for rulemaking (PRM) process, but believe these matters are extraneous to the Commission's analyses of the petitioners' technical bases for this particular rulemaking request and, consequently, they had no bearing on the majority view. Specifically, the Commission does not agree that the petitions should be granted in part on the basis of the agency's plan to update the Generic Environmental Impact Statement (GEIS) for License Renewal and make attendant

rule changes in the future. The Commission's detailed statement of reasons for denial of the petitions is the product of a careful review of the petitioners' assertions and other associated public comments, and is supported by the facts before us. In these circumstances, the Commission does not believe the petitioners' request can fairly, or reasonably, be "granted" in part based on a future undertaking which itself had no genesis in the petitioners' requests.

The Commission's timely and decisive action in response to the two petitions serves the interests of the Commission and other participants in an effective, disciplined, and efficient rulemaking petition process. In this instance, a decision now has particular value since it directly addresses the petitioners' statements of significant concern about certain, generic aspects of ongoing and future license renewal reviews. While the analyses performed to respond to these petitions will also undoubtedly inform NRC staff proposals regarding the next update of the GEIS, the Commission does not yet have such proposals before it. Any final Commission decisions on an updated GEIS would be preceded by proposed changes, solicitation of public comment, and evaluation of all pertinent information and public comments. Furthermore, a partial "granting" of the petition could imply that the Commission endorses the petitioners' requests and will give them greater weight than other points of view during the GEIS rulemaking.

As to the other matter raised in Commissioner Jaczko's dissent—that of agency review and disposition of petitions for rulemaking more generally—while petitions for rulemaking are indeed opportunities for stakeholders to suggest new considerations and approaches for regulation, Commissioner Jaczko's general concerns about the agency's process for handling rulemaking petitions go beyond the subject of the Commission's action on these petitions. However, this subject matter is being considered, as the Commission has instructed NRC staff [SRM dated August 6, 2007] to conduct a review of the agency's PRM process. At such time as staff may recommend, as an outgrowth of this review, specific proposals for Commission action which would strengthen the agency PRM process, the Commission will assess such recommendations and act on them, as appropriate.

Dated at Rockville, Maryland, this 1st day of August 2008.

For the Nuclear Regulatory Commission.
Annette L. Vletti-Cook,
Secretary of the Commission.
[FR Doc. E8-18291 Filed 8-7-08; 8:45 am]
BILLING CODE 7690-01-P

DEPARTMENT OF THE INTERIOR

Office of Surface Mining Reclamation and Enforcement

30 CFR Part 901

[SATS No. AL-074-FOR; Docket No. OSM-2008-0015]

Alabama Regulatory Program

AGENCY: Office of Surface Mining Reclamation and Enforcement, Interior.

ACTION: Proposed rule; public comment period and opportunity for public hearing on proposed amendment.

SUMMARY: We, the Office of Surface Mining Reclamation and Enforcement (OSM), are announcing receipt of a proposed amendment to the Alabama regulatory program (Alabama program) under the Surface Mining Control and Reclamation Act of 1977 (SMCRA or the Act). Alabama proposes revisions to its regulations regarding permit fees and civil penalties. Alabama intends to revise its program to improve operational efficiency.

This document gives the times and locations that the Alabama program and proposed amendment to that program are available for your inspection, the comment period during which you may submit written comments on the amendment, and the procedures that we will follow for the public hearing, if one is requested.

DATES: Comments on the proposed rule must be received on or before 4 p.m., c.t., September 8, 2008, to ensure our consideration. If requested, we will hold a public hearing on the amendment on September 2, 2008. We will accept requests to speak at a hearing until 4 p.m., c.t. on August 25, 2008.

ADDRESSES: You may submit comments by either of the following two methods:

- *Federal eRulemaking Portal:* <http://www.regulations.gov>. The proposed rule is listed under the agency name "OFFICE OF SURFACE MINING RECLAMATION AND ENFORCEMENT" and has been assigned Docket ID: OSM-2008-0015. If you would like to submit comments through the Federal eRulemaking Portal, go to www.regulations.gov and do the following. Click on the "Advanced Docket Search" button on the right side of the screen. Type in the Docket ID

OSM-2008-0015 and click the submit button at the bottom of the page. The next screen will display the Docket Search Results for the rulemaking. If you click on OSM-2008-0015, you can view the proposed rule and submit a comment. You can also view supporting material and any comments submitted by others.

- *Mail/Hand Delivery/Courier:* Sherry Wilson, Director, Birmingham Field Office, Office of Surface Mining Reclamation and Enforcement, 135 Gemini Circle, Suite 215, Homewood, Alabama 35209. Please include the Docket ID (OSM-2008-0015) with your comments.

We cannot ensure that comments received after the close of the comment period (see DATES) or sent to an address other than the two listed above will be included in the docket for this rulemaking and considered.

For additional information on the rulemaking process and the public availability of comments, see "III. Public Comment Procedures" in the SUPPLEMENTARY INFORMATION section of this document.

You may receive one free copy of the amendment by contacting OSM's Birmingham Field Office. See below FOR FURTHER INFORMATION CONTACT.

You may review a copy of the amendment during regular business hours at the following locations:

Sherry Wilson, Director, Birmingham Field Office, Office of Surface Mining Reclamation and Enforcement, 135 Gemini Circle, Suite 215, Homewood, Alabama 35209, Telephone: (205) 290-7282, swilson@osmre.gov.

Randall C. Johnson, Director, Alabama Surface Mining Commission, 1811 Second Avenue, P.O. Box 2390, Jasper, Alabama 35502-2390, Telephone: (205) 221-4130.

FOR FURTHER INFORMATION CONTACT: Sherry Wilson, Director, Birmingham Field Office, Telephone: (205) 290-7282. E-mail: swilson@osmre.gov.

SUPPLEMENTARY INFORMATION:

I. Background on the Alabama Program
II. Description of the Proposed Amendment
III. Public Comment Procedures
IV. Procedural Determinations

I. Background on the Alabama Program

Section 503(a) of the Act permits a State to assume primacy for the regulation of surface coal mining and reclamation operations on non-Federal and non-Indian lands within its borders by demonstrating that its program includes, among other things, " * * * a State law which provides for the regulation of surface coal mining and reclamation operations in accordance

NEPA REGULATIONS

40 C.F.R. § 1500.1(c) Purpose of National Environmental Protection Act

(c) Ultimately, of course, it is not better documents but better decisions that count. NEPA's purpose is not to generate paperwork--even excellent paperwork--but to foster excellent action. The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment. These regulations provide the direction to achieve this purpose.

40 C.F.R. § 1502.22(b) Environmental Impact Statement, Incomplete or Unavailable Information.

When an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an environmental impact statement and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking.

(b) If the information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known, the agency shall include within the environmental impact statement:

1. A statement that such information is incomplete or unavailable;
2. a statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment;
3. a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment, and
4. the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community. For the purposes of this section, "reasonably foreseeable" includes impacts which have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.

40 C.F.R. § 1508.14 Human Environment.

"Human environment" shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment. (See the definition of "effects" (Sec. 1508.8).) This means that economic or social effects are not intended by themselves to require preparation of an environmental impact statement. When an environmental impact statement is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement will discuss all of these effects on the human environment.

40 C.F.R. § 1508.27 Significantly.

"*Significantly*" as used in NEPA requires considerations of both context and intensity:

(a) *Context*. This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a

site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant.

(b) *Intensity*. This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. The following should be considered in evaluating intensity:

(1) Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.

(2) The degree to which the proposed action affects public health or safety.

(3) Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

(4) The degree to which the effects on the quality of the human environment are likely to be highly controversial.

(5) The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.

(6) The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.

(7) Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.

(8) The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

(9) The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

(10) Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

EXECUTIVE SUMMARY

The Near-Term Task Force was established in response to Commission direction to conduct a systematic and methodical review of U.S. Nuclear Regulatory Commission 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, in light of the accident at the Fukushima Dai-ichi Nuclear Power Plant. The Task Force appreciates that an accident involving core damage and uncontrolled release of radioactive material to the environment, even one without significant health consequences, is inherently unacceptable. The Task Force also recognizes that there likely will be more than 100 nuclear power plants operating throughout the United States for decades to come. The Task Force developed its recommendations in full recognition of this environment.

In examining the Fukushima Dai-ichi accident for insights for reactors in the United States, the Task Force addressed protecting against accidents resulting from natural phenomena, mitigating the consequences of such accidents, and ensuring emergency preparedness.

The accident in Japan was caused by a natural event (i.e., tsunami) which was far more severe than the design basis for the Fukushima Dai-ichi Nuclear Power Plant. As part of its undertaking, the Task Force studied the manner in which the NRC has historically required protection from natural phenomena and how the NRC has addressed events that exceed the current design basis for plants in the United States.

In general, the Task Force found that the current NRC regulatory approach includes:

- requirements for design-basis events with protection and mitigation features controlled through specific regulations or the general design criteria (Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," Appendix A, "General Design Criteria for Nuclear Power Plants")
- requirements for some "beyond-design-basis" events through specific regulations (e.g., station blackout, large fires, and explosions)
- voluntary industry initiatives to address severe accident features, strategies, and guidelines for operating reactors

This regulatory approach, established and supplemented piece-by-piece over the decades, has addressed many safety concerns and issues, using the best information and techniques available at the time. The result is a patchwork of regulatory requirements and other safety initiatives, all important, but not all given equivalent consideration and treatment by licensees or during NRC technical review and inspection. Consistent with the NRC's organizational value of excellence, the Task Force believes that improving the NRC's regulatory framework is an appropriate, realistic, and achievable goal.

The current regulatory approach, and more importantly, the resultant plant capabilities allow the Task Force to conclude that a sequence of events like the Fukushima accident is unlikely to occur in the United States and some appropriate mitigation measures have been implemented, reducing the likelihood of core damage and radiological releases. Therefore, continued operation and continued licensing activities do not pose an imminent risk to public health and safety.

However, the Task Force also concludes that a more balanced application of the Commission's defense-in-depth philosophy using risk insights would provide an enhanced

regulatory framework that is logical, systematic, coherent, and better understood. Such a framework would support appropriate requirements for increased capability to address events of low likelihood and high consequence, thus significantly enhancing safety. Excellence in regulation demands that the Task Force provide the Commission with its best insights and vision for an improved regulatory framework.

The Task Force finds that the Commission's longstanding defense-in-depth philosophy, supported and modified as necessary by state-of-the-art probabilistic risk assessment techniques, should continue to serve as the primary organizing principle of its regulatory framework. The Task Force concludes that the application of the defense-in-depth philosophy can be strengthened by including explicit requirements for beyond-design-basis events.

Many of the elements of such a regulatory framework already exist in the form of rules regarding station blackout, anticipated transient without scram, maintenance, combustible gas control, aircraft impact assessment, beyond-design-basis fires and explosions, and alternative treatment. Other elements, such as severe accident management guidelines, exist in voluntary industry initiatives. The Task Force has concluded that a collection of such "extended design-basis" requirements, with an appropriate set of quality or special treatment standards, should be established.

The Task Force further sees this approach, if implemented, as a more comprehensive and systematic application of defense-in-depth to NRC requirements for providing "adequate protection" of public health and safety. Implementation of this concept would require strong Commission support for a clear policy statement, rule changes, and revised staff guidance.

The Task Force notes that, after the attacks of September 11, 2001, the Commission established new security requirements on the basis of adequate protection. These new requirements did not result from any immediate or imminent threat to NRC-licensed facilities, but rather from new insights regarding potential security events. The Task Force concluded that the Fukushima Dai-ichi accident similarly provides new insights regarding low-likelihood, high-consequence events that warrant enhancements to defense-in-depth on the basis of redefining the level of protection that is regarded as adequate. The Task Force recommendation for an enhanced regulatory framework is intended to establish a coherent and transparent basis for treatment of the Fukushima insights. It is also intended to provide lasting direction to the staff regarding a consistent decisionmaking framework for future issues.

The Task Force has considered industry initiatives in this framework and sees that these could play a useful and valuable role. The Task Force believes that voluntary industry initiatives should not serve as a substitute for regulatory requirements but as a mechanism for facilitating and standardizing implementation of such requirements.

The Task Force applied this conceptual framework during its deliberations. The result is a set of recommendations that take a balanced approach to defense-in-depth as applied to low-likelihood, high-consequence events such as prolonged station blackout resulting from severe natural phenomena. These recommendations, taken together, are intended to clarify and strengthen the regulatory framework for protection against natural disasters, mitigation, and emergency preparedness, and to improve the effectiveness of the NRC's programs. The Task Force's overarching recommendations are:

Clarifying the Regulatory Framework

1. The Task Force recommends establishing a logical, systematic, and coherent regulatory framework for adequate protection that appropriately balances defense-in-depth and risk considerations. (Section 3)

Ensuring Protection

2. The Task Force recommends that the NRC require licensees to reevaluate and upgrade as necessary the design-basis seismic and flooding protection of structures, systems, and components for each operating reactor. (Section 4.1.1)
3. The Task Force recommends, as part of the longer term review, that the NRC evaluate potential enhancements to the capability to prevent or mitigate seismically induced fires and floods. (Section 4.1.2)

Enhancing Mitigation

4. The Task Force recommends that the NRC strengthen station blackout mitigation capability at all operating and new reactors for design-basis and beyond-design-basis external events. (Section 4.2.1)
5. The Task Force recommends requiring reliable hardened vent designs in boiling water reactor facilities with Mark I and Mark II containments. (Section 4.2.2)
6. The Task Force recommends, as part of the longer term review, that the NRC identify insights about hydrogen control and mitigation inside containment or in other buildings as additional information is revealed through further study of the Fukushima Dai-ichi accident. (Section 4.2.3)
7. The Task Force recommends enhancing spent fuel pool makeup capability and instrumentation for the spent fuel pool. (Section 4.2.4)
8. The Task Force recommends strengthening and integrating onsite emergency response capabilities such as emergency operating procedures, severe accident management guidelines, and extensive damage mitigation guidelines. (Section 4.2.5)

Strengthening Emergency Preparedness

9. The Task Force recommends that the NRC require that facility emergency plans address prolonged station blackout and multiunit events. (Section 4.3.1)
10. The Task Force recommends, as part of the longer term review, that the NRC pursue additional emergency preparedness topics related to multiunit events and prolonged station blackout. (Section 4.3.1)
11. The Task Force recommends, as part of the longer term review, that the NRC should pursue emergency preparedness topics related to decisionmaking, radiation monitoring, and public education. (Section 4.3.2)

Improving the Efficiency of NRC Programs

12. The Task Force recommends that the NRC strengthen regulatory oversight of licensee safety performance (i.e., the Reactor Oversight Process) by focusing more attention on defense-in-depth requirements consistent with the recommended defense-in-depth framework. (Section 5.1)

The Task Force presents further details on its recommendations in this report and an implementation strategy in Appendix A. The strategy includes several rulemaking activities to establish new requirements. Recognizing that rulemaking and subsequent implementation typically take several years to accomplish, the Task Force recommends interim actions to enhance protection, mitigation, and preparedness while the rulemaking activities are conducted.

These recommendations are based on the best available information regarding the Fukushima Dai-ichi accident and a review of relevant NRC requirements and programs. The Task Force concludes that these are a reasonable set of actions to enhance U.S. reactor safety in the 21st century.

Regulatory Framework for the 21st Century

strategies, and guidelines for operating reactors, and (4) specific requirements to address damage from fires and explosions and their mitigation.

The Task Force presents the following observations on the NRC regulatory approach:

- Although complex, the current regulatory approach has served the Commission and the public well and allows the Task Force to conclude that a sequence of events like those occurring in the Fukushima accident is unlikely to occur in the United States and could be mitigated, reducing the likelihood of core damage and radiological releases.
- Therefore, in light of the low likelihood of an event beyond the design basis of a U.S. nuclear power plant and the current mitigation capabilities at those facilities, the Task Force concludes that continued operation and continued licensing activities do not pose an imminent risk to the public health and safety and are not inimical to the common defense and security. Nonetheless, the Task Force is recommending building on the safety foundation laid in the 1960s and 1970s, and the safety improvements added from the 1980s to the present, to produce a regulatory structure well suited to licensing and overseeing the operation of nuclear power plants for decades to come. The Task Force sees these recommendations, not as a rejection of the past, but more as a fulfillment of past intentions.
- Adequate protection has been, and should continue to be, an evolving safety standard supported by new scientific information, technologies, methods, and operating experience. This was the case when new information about the security environment was revealed through the events of September 11, 2001. Licensing or operating a nuclear power plant with no emergency core cooling system or without robust security protections, while done in the past, would not occur under the current regulations. As new information and new analytical techniques are developed, safety standards need to be reviewed, evaluated, and changed, as necessary, to insure that they continue to address the NRC's requirements to provide reasonable assurance of adequate protection of public health and safety. The Task Force believes, based on its review of the information currently available from Japan and the current regulations, that the time has come for such change.
- In response to the Fukushima accident and the insights it brings to light, the Task Force is recommending actions, some general, some specific, that it believes would be a reasonable, well-formulated set of actions to increase the level of safety associated with adequate protection of the public health and safety.
- The Commission has come to rely on design-basis requirements and a patchwork of beyond-design-basis requirements and voluntary initiatives for maintaining safety. Design-basis requirements include consideration of anticipated operational occurrences and postulated accidents such as loss-of-coolant accidents. Beyond-design-basis considerations such as ATWS and SBO are discussed below. Voluntary initiatives have addressed some severe accident considerations (through the IPE and IPEEE programs), shutdown risk issues, containment vents for BWR Mark I designs, and SAMGs.
- The concept of beyond-design-basis requirements applies, for example, to ATWS, SBO, aircraft impact assessment (AIA), combustible gas control, and EDMGs. Since fire protection is not based on a design-basis fire, it too can be considered beyond design basis. Although the phrase "beyond design basis" appears only once in the NRC

regulations (i.e., in 10 CFR 50.150, "Aircraft Impact Assessment," known as the AIA rule), regulators and industry use it often. Unfortunately, the phrase "beyond design basis" is vague, sometimes misused, and often misunderstood. Several elements of the phrase contribute to these misunderstandings. First, some beyond-design-basis considerations have been incorporated into the requirements and therefore directly affect reactor designs. The phrase is therefore inconsistent with the normal meaning of the words. In addition, there are many other beyond-design-basis considerations that are not requirements. The phrase therefore fails to convey the importance of the requirements to which it refers.

- The Task Force has noted that other international regulatory systems also address considerations beyond the design basis. For example, while the NRC addresses regulatory requirements in five categories—three design basis (normal operation, anticipated operational occurrences, and postulated accidents) and two beyond design basis (one required and one voluntary)—Finland addresses regulatory requirements in six categories—four design basis (normal operation, anticipated operational occurrences, and two postulated accident categories), one "design extension condition," plus severe accidents. France also addresses both design-basis requirements and additional requirements in categories called "Risk Reduction Category 1" and "Risk Reduction Category 2." In addition, the phrase used in the IAEA Draft Safety Standard DS 414 addresses considerations beyond the design basis, referring to them as those addressing "design extension conditions." In this report, the Task Force will refer to past considerations beyond the design basis using that phrase (e.g., "beyond-design-basis events"). In the context of the Task Force recommendation for a new regulatory framework for the future, the Task Force will refer to such considerations as "extended design basis" requirements.
- The primary responsibility for safety rests with licensees, and the NRC holds licensees accountable for meeting regulatory requirements. In addition, voluntary safety initiatives by licensees can enhance safety if implemented and maintained effectively, but should not take the place of needed regulatory requirements. The NRC inspection and licensing programs give less attention to beyond-design-basis requirements and little attention to industry voluntary initiatives since there are no requirements to inspect against. Because of this, the NRC gives much more attention to design-basis events than to severe accidents.
- With the exception of a few special cases, licensees of operating reactors are not required to develop or maintain a PRA, although all licensees currently have a PRA. These PRAs are of varying scope and are generally not required to meet NRC-endorsed quality standards. New reactor applications must include a description of a design-specific PRA and its results and must address severe accident protection and mitigation features.
- The Commission has expressed its intent with respect to industry initiatives in the Regulatory Analysis Guidelines (NUREG/BR-0058, Revision 4). That document states, "It must be clear to the public that substituting industry initiatives for NRC regulatory action can provide effective and efficient resolution of issues, will in no way compromise plant safety, and does not represent a reduction in the NRC's commitment to safety and sound regulation."
- Lastly, the Task Force observes that for new reactor designs, the Commission's expectations that beyond-design-basis and severe accident concerns be addressed

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and resolved at the design stage are largely expressed in policy statements and staff requirements memoranda, only reaching the level of rulemaking when each design is codified through design certification rulemaking.

In summary, the major elements of the NRC regulatory approach relevant to the Fukushima accident, or a similar accident in the United States, are seismic and flooding protection (well established in the design-basis requirements); SBO protection (required, but beyond the design-basis requirements); and severe accident mitigation (expected but neither the severe accident mitigation features nor the SAMGs are required). In addition, U.S. facilities could employ EDMGs as further mitigation capability. The Task Force observes that this collection of approaches is largely the product of history; it was developed for the purpose of reactor licensing in the 1960s and 1970s and supplemented as necessary to address significant events or new issues. This evolution has resulted in a patchwork regulatory approach.

The Fukushima accident clearly demonstrates the importance of defense-in-depth. Whether through extraordinary circumstances or through limited knowledge of the possibilities, plants can be challenged beyond their established design bases protection. In such circumstances, the next layer of defense-in-depth, mitigation, is an essential element of adequate protection of public health and safety. Mitigation is provided for beyond-design-basis events and severe accidents, both of which involve external challenges or multiple failures beyond the design basis. This beyond-design-basis layer of defense-in-depth is broadly consistent with the IAEA concept of "design extension conditions" (presented in Draft Safety Standard DS 414).

The Task Force concludes that the NRC's safety approach is incomplete without a strong program for dealing with the unexpected, including severe accidents. Continued reliance on industry initiatives for a fundamental level of defense-in-depth similarly would leave gaps in the NRC regulatory approach. The Commission has clearly established such defense-in-depth severe accident requirements for new reactors (in 10 CFR 52.47(23), 10 CFR 52.79(38), and each design certification rule), thus bringing unity and completeness to the defense-in-depth concept. Taking a similar action, within reasonable and practical bounds appropriate to operating plants, would do the same for operating reactors.

The Task Force therefore concludes that the future regulatory framework should be based on the defense-in-depth philosophy, supported and modified as necessary by state-of-the-art PRA techniques. The Task Force also concludes that the application of defense-in-depth should be strengthened by formally establishing, in the regulations, an appropriate level of defense-in-depth to address requirements for "extended" design-basis events. Many of the elements of such regulations already exist in the form of the SBO rule (10 CFR 50.63), ATWS rule (10 CFR 50.62), maintenance rule (10 CFR 50.65), AIA rule (10 CFR 50.150), the requirements for protection for beyond-design-basis fires and explosions (10 CFR 50.54(hh)), and the alternative treatment requirements (10 CFR 50.69) and new reactor policy regarding regulatory treatment of nonsafety systems as described in SECY-94-084, "Policy and Technical Issues Associated with the Regulatory Treatment of Nonsafety Systems in Passive Plant Designs," dated March 28, 1994. Other elements such as SAMGs exist in voluntary industry initiatives. The Task Force envisions this collection of beyond-design-basis requirements as a coherent whole in a separate section of 10 CFR Part 50 (e.g., 10 CFR 50.200, 10 CFR 50.201) or as a dedicated appendix to 10 CFR Part 50. This separate section would have an appropriate set of quality standards, analogous to Appendix B to 10 CFR Part 50, plus a change process similar to the 10 CFR Part 52 "50.59-

**UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION**

**BEFORE THE ATOMIC SAFETY AND LICENSING BOARD
OR
THE COMMISSION**

In the Matter of
Entergy Corporation

Docket # 50-293-LR

Pilgrim Nuclear Power Station

License Renewal Application

August 11, 2011

**DECLARATION OF GORDON R. THOMPSON
ADDRESSING NEW AND SIGNIFICANT INFORMATION
PROVIDED BY THE NRC'S NEAR-TERM TASK FORCE
REPORT ON THE FUKUSHIMA ACCIDENT**

I, Gordon R. Thompson, declare as follows:

I. INTRODUCTION

I-1. In the course of this proceeding I prepared a declaration dated June 2, 2011, which supported a contention and related petitions and motions by the Commonwealth of Massachusetts. That declaration set forth my affiliations, qualifications, and experience.¹ It also described reports that I have prepared in the context of this proceeding. One such report, dated June 1, 2011, and entitled "New and Significant Information From the Fukushima Daiichi Accident in the Context of Future Operation of the Pilgrim Nuclear Power Plant", is described here as the "Thompson 2011 report".

I-2. Subsequently, I prepared a declaration dated July 5, 2011, which replied to two submissions in this proceeding. One submission, dated June 27, 2011, was by Entergy. The other submission, dated June 27, 2011, was by the Nuclear Regulatory Commission (NRC) Staff.

I-3. The present declaration ("this declaration") addresses information that is new and significant in the context of this proceeding, and that is contained in a report published by the NRC on July 12, 2011. That report is entitled "Recommendations for Enhancing Reactor Safety in the 21st Century: The Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident", and is described here as the "Task Force report".

I-4. This declaration addresses selected points in the Task Force report, and is not a comprehensive review of that report. Lack of discussion here of a finding or

¹ On June 13, 2011, the Commonwealth of Massachusetts submitted a supplemental attachment to my declaration of June 2, 2011, containing an updated version of my CV.

recommendation in the Task Force report does not imply my agreement or disagreement with that finding or recommendation.

I-5. The Task Force report acknowledges limitations in currently-available information about the Fukushima accident. At page 1, the report states that detailed information in each of the issue areas investigated by the Task Force “was, in many cases, unavailable, unreliable, or ambiguous”. Thus, the potential exists for emergence, during coming months and years, of new information that could significantly alter findings in the Task Force report.

I-6. The Task Force report contains a substantial body of information that is new and significant in the context of the Pilgrim license extension proceeding. The breadth of that body of information is evident from the twelve overarching recommendations of the Task Force, which are summarized at page ix of the report and again at pages 69-70. Each of those recommendations calls for action that is new and significant in the context of future operation of the Pilgrim plant. For example, Recommendation #7 (see page 46 of the Task Force report) calls for enhanced instrumentation and water makeup capability for the spent-fuel pool of each nuclear power plant (NPP) licensed by the NRC. These capabilities do not now exist at the Pilgrim plant, and have the potential to reduce the risk of a spent-fuel-pool fire at the plant. In the Thompson 2011 report, and in my previous reports incorporated therein by reference, I have drawn attention to this risk and discussed measures for reducing the risk.

I-7. The Task Force report proposes, in its Appendix A, a five-part process for implementing its recommendations. The five parts are: (i) issuance of a Commission policy statement; (ii) initiation of rulemaking in seven issue areas; (iii) issuance of orders requiring licensees to take near-term actions in twelve issue areas; (iv) initiation of NRC Staff action in five issue areas; and (v) Staff pursuit of longer-term review in ten issue areas.

I-8. There are at least two technical reasons why the Task Force recommendations should be considered in the Pilgrim license extension proceeding. First, many of the actions recommended in the Task Force report have plant-specific features, and therefore require plant-specific regulatory attention.² Second, as shown in this declaration, the findings in the Task Force report call for substantial revision of the Pilgrim-specific supplement to the NRC’s generic environmental impact statement (GEIS) for license renewal of nuclear power plants, especially Appendix G of that supplement.³ It is my understanding that completion of an accurate, plant-specific supplement to the GEIS is required before a license extension is granted. It is my further understanding that severe

² In illustration of this point, at a June 15, 2011, public briefing to NRC Commissioners on the progress of the Task Force review, the Task Force leader discussed the installation of hardened wetwell vents by licensees of BWR plants. He said that “each licensee installed a specific configuration”, and described substantial differences in these configurations. See the briefing transcript, page 17, lines 4-15. It follows that upgrading of the venting systems would involve plant-specific design changes.

³ US Nuclear Regulatory Commission, Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 29, Regarding Pilgrim Nuclear Power Station, NUREG-1437, Supplement 29, July 2007.

accident mitigation alternatives (SAMAs) that are determined in that supplement to be cost-effective must be implemented as a condition of license extension.

I-9. The Thompson 2011 report set forth general findings together with findings on six specific issues. The general findings address design weaknesses in US nuclear power plants, including the Pilgrim plant, and related weaknesses in the NRC regulatory arena. The findings on specific issues are directly relevant to license extension for the Pilgrim plant. The Task Force report provides information that supports both sets of findings, as explained below.

II. THE TASK FORCE REPORT AND GENERAL FINDINGS IN THE THOMPSON 2011 REPORT

II-1. The Thompson 2011 report set forth, in its Section V and elsewhere, general findings regarding design weaknesses in the Pilgrim plant and other NPPs, and related weaknesses in the NRC regulatory arena. Information provided in the Task Force report supports these findings, as shown in the following paragraphs.

II-2. As mentioned in paragraph I-6, above, the Task Force report sets forth twelve overarching recommendations. Six of the recommendations directly involve re-evaluation or upgrading of the designs of currently-licensed NPPs.⁴ Those recommendations directly respond to design weaknesses. Four of the recommendations pertain to emergency preparedness.⁵ Those recommendations seek to compensate for design weaknesses. Two of the recommendations pertain to the NRC regulatory framework and regulatory practice.⁶ Those recommendations seek to strengthen NRC regulation so that design weaknesses are more readily identified and related actions are taken. Thus, all of the Task Force recommendations respond, in varying ways, to clearly-evident weaknesses in the design of NRC-licensed NPPs.

II-3. The Task Force report states, at page 18, that “the Commission [NRC] has come to rely on design-basis requirements and a patchwork of beyond-design-basis requirements and voluntary [licensee] initiatives for maintaining safety”. That statement confirms general findings in the Thompson 2011 report, set forth in its Section V and elsewhere, about weaknesses in NRC regulation of NPPs. These regulatory weaknesses share common roots with fundamental deficiencies in NPP design. When NPPs such as Pilgrim were designed, nuclear safety regulation was founded on the principle that abnormal situations, such as accidents, would occur within a plant’s design basis. Over time, analysis and operating experience revealed that the design basis originally adopted was inadequate, resulting in a significant risk of fuel damage and radioactive release to the environment. Piecemeal efforts to address this basic problem have led to the “patchwork of beyond-design-basis requirements and voluntary initiatives” described in the Task Force report. Overarching Recommendation #1 in that report (see its page ix) is to establish a “logical, systematic, and coherent regulatory framework” to replace the present patchwork.

⁴ Recommendations in this category are numbers 2, 3, 4, 5, 6, and 7.

⁵ Recommendations in this category are numbers 8, 9, 10, and 11.

⁶ Recommendations in this category are numbers 1, and 12.

III. THE TASK FORCE REPORT AND FINDINGS IN THE THOMPSON 2011 REPORT REGARDING SIX SPECIFIC ISSUES

III-1. The Thompson 2011 report set forth, in its Sections VI and VII, findings on six specific issues that are directly relevant to license extension for the Pilgrim plant. Information provided in the Task Force report supports these findings, as shown in the following paragraphs.

III-2. The first specific issue discussed in the Thompson 2011 report (in its Section VI.1 and Conclusion C4) was the probability of reactor core damage and radioactive release, accounting for cumulative direct experience. The Thompson 2011 report found that, for the purposes of SAMA analysis, direct experience provides an estimate of probability that is more appropriate than licensee estimates derived from the use of probabilistic risk assessment (PRA) techniques.

III-3. The Task Force report does not directly discuss the appropriateness of PRA estimates for the purposes of SAMA analysis. It does, however, show a clear preference for direct experience as the primary basis for its recommendations. As discussed in paragraphs I-6 and II-2, above, the Task Force report sets forth a wide-ranging set of recommendations. A number of the actions it recommends would, in the Pilgrim licensing context, be categorized as SAMAs. Yet, the Task Force report does not justify its recommendations by any SAMA-type analysis or any resort to PRA estimates. Clearly, the authors rely instead on their concept of prudent engineering principles, informed by cumulative, direct experience of NPP accidents and accident precursors. Indeed, their report entirely bypasses the question of probability. In that respect, the Task Force report goes beyond the Thompson 2011 report, which offers an alternative probability estimate for use in SAMA analysis.

III-4. The second specific issue discussed in the Thompson 2011 report (in its Section VI.2 and Conclusion C5) was the operators' capability to mitigate an accident, and the effect of that capability on the conditional probability of a spent-fuel-pool fire during a reactor accident. The Thompson 2011 report set forth three findings on this issue. First, the operators' capability to mitigate an accident at the Pilgrim NPP can be severely degraded in the local environment created by a reactor accident. Second, the nuclear industry's recently-disclosed extensive damage mitigation guidelines (EDMGs) are inadequate to address the range of core-damage and spent-fuel-damage events that could occur at Pilgrim. Third, there is a substantial conditional probability of a spent-fuel-pool fire during a reactor accident at Pilgrim.

III-5. The Task Force report does not directly address the findings set forth in the preceding paragraph. However, Task Force recommendations effectively endorse these findings. For example, implicit endorsement of these findings is clearly evident in Task Force Recommendation #7. As discussed in paragraph I-6, above, Recommendation #7 calls for enhanced instrumentation and water makeup capability for the spent-fuel pool of each nuclear power plant licensed by the NRC. Pages 43-46 of the Task Force report provide details. The recommended capabilities do not now exist at the Pilgrim plant. Indeed, these new capabilities would replace ad hoc, crude EDMGs now on the books at

Pilgrim. The recommended capabilities would be substantially more effective than the EDMGs. For example, one of the aspects of Recommendation #7 is that licensees should be ordered to install seismically qualified means (i.e., robust, pre-installed pipes, nozzles, etc.) to spray water into each spent fuel pool, with a supply connection at grade outside the building. That arrangement would be substantially more robust and reliable than the jury-rigged spray arrangement now envisioned in the Pilgrim EDMGs, as discussed in Section VI.2 of the Thompson 2011 report. In recommending such upgrades of instrumentation and water makeup capability, the Task Force report effectively acknowledges that, under present arrangements, there is a substantial conditional probability of a spent-fuel-pool fire during a reactor accident at Pilgrim. It should be noted, as discussed in paragraph III-11, below, that re-equipment of the Pilgrim spent-fuel pool with low-density, open-frame racks would yield risk reduction beyond that arising from implementation of Task Force Recommendation #7.

III-6. The third specific issue discussed in the Thompson 2011 report (in its Section VI.3 and Conclusion C6) was secrecy regarding accident-mitigating measures. The Thompson 2011 report found that NRC's excessive secrecy degrades the licensee's capability to mitigate an accident at the Pilgrim NPP.

III-7. The Task Force report does not directly address the debilitating effects of secrecy. However, its recommendations implicitly acknowledge those effects. This acknowledgement is evident, for example, in Appendix A of the Task Force report. As described in paragraph I-7, above, Appendix A sets forth a five-part process for implementing the report's recommendations. There is no mention of secrecy in Appendix A, even though some of the actions recommended by the Task Force would replace measures – such as EDMGs – that have been or are now secret. One can reasonably infer that the Task Force report is recommending a reduction in the NRC's use of secrecy.

III-8. The fourth specific issue discussed in the Thompson 2011 report (in its Section VI.4 and Conclusion C7) was hydrogen control. The Thompson 2011 report found that hydrogen explosions similar to those experienced at Fukushima could occur at the Pilgrim NPP.

III-9. Recommendations #5 and #6 in the Task Force report clearly support the finding of the Thompson 2011 report on hydrogen control. Recommendation #5, described at pages 39-41 of the Task Force report, calls for requirement of reliable, hardened venting of the containment at each boiling-water-reactor (BWR) plant with a Mark I or Mark II containment. The Pilgrim plant is a BWR with a Mark I containment. Hydrogen control would be one of the major functions of the recommended venting system. It should be noted, as discussed in paragraph I-8, above, that hardened venting systems at BWR plants have a variety of plant-specific design features. Recommendation #6, described at pages 41-43 of the Task Force report, calls for further investigation of hydrogen control as part of a longer-term review of the Fukushima accident.

III-10. The fifth specific issue discussed in the Thompson 2011 report (in its Section VI.5 and Conclusion C8) was the probability of a spent-fuel-pool fire and radioactive release, accounting for Fukushima direct experience. This issue overlaps the issue

discussed in paragraph III-4, above. The Thompson 2011 report found that there is a substantial conditional probability of a spent-fuel-pool fire during a reactor accident at Pilgrim. The same finding, reached through a different approach, is discussed in paragraph III-4.

III-11. As discussed in paragraph III-5, above, the Task Force report effectively acknowledges that, under present arrangements, there is a substantial conditional probability of a spent-fuel-pool fire during a reactor accident at the Pilgrim NPP. That acknowledgement is evident, for example, from Task Force Recommendation #7. It should be noted that Task Force Recommendation #7 does not exhaust the potential for reduction of the risk of a spent-fuel-pool fire. A greater reduction of risk could be achieved by re-equipment of the Pilgrim spent-fuel pool with low-density, open-frame racks.⁷ The Thompson 2011 report found (see its Conclusion C8) that such re-equipment is indicated by SAMA analysis and, separately, by prudent engineering principles.

III-12. The sixth specific issue discussed in the Thompson 2011 report (in its Section VI.6 and Conclusion C9) was filtered venting of reactor containment. The Thompson 2011 report found that filtered venting of the Pilgrim reactor containment could substantially reduce the atmospheric release of radioactive material from an accident at the Pilgrim NPP.

III-13. The Task Force report does not specifically discuss filtered venting of reactor containment. However, its Recommendation #5, as discussed in paragraph III-9, above, calls for requirement of reliable, hardened venting of the Pilgrim reactor containment. It follows that the Task Force envisions situations in which the containment would be deliberately vented to the atmosphere during an accident involving reactor core damage. As discussed in Section VI.6 of the Thompson 2011 report, adding a filter to the vent pathway could substantially reduce the amount of radioactive material released to the atmosphere during the venting process. Indeed, installation of a filtered venting system is normal practice in some countries. Thus, Task Force Recommendation #5 implies that filtered venting of containment should be considered in a re-done SAMA analysis for Pilgrim. Moreover, the Thompson 2011 report determined (see its Conclusion C9) that prudent engineering principles, separate from SAMA analysis, call for the Pilgrim containment to be equipped with a filtered venting system that uses passive mechanisms. It should be noted that the option of deliberate venting of the containment reflects fundamental deficiencies in the design of the Pilgrim plant, as discussed in paragraphs II-1 through II-3, above. Additional of a filter to the vent pathway could partially offset some of those deficiencies.

IV. Conclusions

IV-1. The Thompson 2011 report set forth general findings together with findings on six specific issues. The general findings address design weaknesses in NRC-licensed NPPs, including the Pilgrim plant, and related weaknesses in the NRC regulatory arena. The findings on the six specific issues are directly relevant to license extension for the Pilgrim

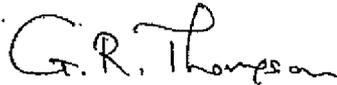
⁷ See, for example, Table 8-1 of the Thompson 2006 report; that report is incorporated by reference at page 8 of the Thompson 2011 report.

NPP. As shown in this declaration, the Task Force report provides new and significant information that supports both sets of findings in the Thompson 2011 report. The support is indirect in each instance but is, nevertheless, substantial.

IV-2. The Thompson 2011 report's findings on six, Pilgrim-specific issues show that the existing SAMA analysis for the Pilgrim plant should be entirely re-done. It follows, as discussed in paragraph I-8, above, that the Pilgrim-specific supplement to the GEIS for license renewal of nuclear power plants should be re-done. As shown in paragraph IV-1, above, the Task Force report supports that conclusion.

I declare, under penalty of perjury, that the foregoing facts provided in my Declaration are true and correct to the best of my knowledge and belief, and that the opinions expressed herein are based on my best professional judgment.

Executed on August 11, 2011.



Gordon R. Thompson



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 12, 2012

EA-12-049

All Power Reactor Licensees and
Holders of Construction Permits in
Active or Deferred Status

**SUBJECT: ISSUANCE OF ORDER TO MODIFY LICENSES WITH REGARD TO
REQUIREMENTS FOR MITIGATION STRATEGIES FOR
BEYOND-DESIGN-BASIS EXTERNAL EVENTS**

The U.S. Nuclear Regulatory Commission (NRC) has issued the enclosed Order that modifies the current license for your facility. The Order requires provisions for mitigation strategies for beyond-design-basis external events, and applies to all addressees listed in Attachment 1 to the enclosed Order.

Following the earthquake and tsunami at the Fukushima Dai-ichi nuclear power plant in March 2011, the NRC established a senior-level task force referred to as the Near-Term Task Force (NTTF). The NTTF conducted a systematic and methodical review of the NRC regulations and processes to determine if the agency should make safety improvements in light of the events in Japan. As a result of this review, the NTTF issued SECY-11-0093, "Near-Term Report and Recommendations for Agency Actions Following the Events in Japan," Agencywide Documents Access and Management System (ADAMS) Accession No. ML11186A950. SECY-11-0124, "Recommended Actions to be Taken Without Delay from the Near-Term Task Force Report," ADAMS Accession No. ML112911571 and SECY-11-0137, "Prioritization of Recommended Actions to be Taken in Response to Fukushima Lessons Learned," ADAMS Accession No. ML11272A111 were issued to establish the NRC staff's prioritization of the recommendations. Recommendation 4.2 concerning mitigation strategies was determined to be a high-priority action. This Order is based upon the NTTF recommendation.

The events at Fukushima Dai-ichi highlight the possibility that extreme natural phenomena could challenge the prevention, mitigation and emergency preparedness defense-in-depth layers. At Fukushima, limitations in time and unpredictable conditions associated with the accident significantly challenged attempts by the responders to preclude core damage and containment failure. During the events in Fukushima, the challenges faced by the operators were beyond any faced previously at a commercial nuclear reactor. It was determined that additional requirements must be imposed to mitigate beyond-design-basis external events. These additional requirements impose guidance and strategies to be available if the loss of power, motive force and normal access to the ultimate heat sink to prevent fuel damage in the reactor and spent fuel pool affected all units at a site simultaneously.

The NRC staff has determined that continued operation does not pose an imminent risk to public health and safety; however, the additional requirements outlined in this Order are necessary in light of insights gained from the events at Fukushima Dai-ichi. The requirements of this Order are immediately effective and are expected to remain in place until superseded by Order or rule.

All Power Reactor Licensees and
Holders of Construction Permits in
Active or Deferred Status

-2-

Pursuant to Section 223 of the Atomic Energy Act of 1954, as amended, any person who willfully violates, attempts to violate, or conspires to violate, any provision of this Order shall be subject to criminal prosecution as set forth in that section. Violation of this order may also subject the person to civil monetary penalty.

The enclosed Order requires responses and actions within specified timeframes. Please contact your Licensing Project Manager or Mr. Steven Bloom, Mitigation Strategies Order Project Manager (301-415-2431), regarding any issues related to compliance with the requirements in the enclosed Order, or if you have other questions.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. The NRC also includes significant enforcement actions on its Web site at (<http://www.nrc.gov/reading-rm/doc-collections/enforcement/actions/>). The enclosed Order has been forwarded to the Office of the *Federal Register* for publication.

Sincerely,



Eric J. Leeds, Director
Office of Nuclear Reactor Regulation



Michael R. Johnson, Director
Office of New Reactors

Enclosure:
Order (EA-12-049)

cc: Listserv

7590-01-P

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)	
)	
ALL POWER REACTOR)	Docket Nos. (as shown in Attachment 1)
LICENSEES AND HOLDERS)	License Nos. (as shown in Attachment 1) or
OF CONSTRUCTION PERMITS IN)	Construction Permit Nos. (as shown in
ACTIVE OR DEFERRED STATUS)	Attachment 1))
)	
)	EA-12-049

**ORDER MODIFYING LICENSES
WITH REGARD TO REQUIREMENTS FOR MITIGATION STRATEGIES
FOR BEYOND-DESIGN-BASIS EXTERNAL EVENTS
(EFFECTIVE IMMEDIATELY)**

I.

The Licensees and construction permits (CP) holders¹ identified in Attachment 1 to this Order hold licenses and CPs issued by the U.S. Nuclear Regulatory Commission (NRC or Commission) authorizing operation and/or construction of nuclear power plants in accordance with the Atomic Energy Act of 1954, as amended, and Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," and Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants."

II.

On March 11, 2011, a magnitude 9.0 earthquake struck off the coast of the Japanese island of Honshu. The earthquake resulted in a large tsunami, estimated to have exceeded 14 meters (45 feet) in height, that inundated the Fukushima Dai-ichi nuclear power plant site.

¹ CP holders, as used in this Order, includes CPs, in active or deferred status, as identified in Attachment 1 to this Order (i.e., Watts Bar, Unit 2; and Bellefonte, Units 1 and 2)

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The earthquake and tsunami produced widespread devastation across northeastern Japan and significantly affected the infrastructure and industry in the northeastern coastal areas of Japan.

When the earthquake occurred, Fukushima Dai-ichi Units 1, 2, and 3 were in operation and Units 4, 5, and 6 were shut down for routine refueling and maintenance activities. The Unit 4 reactor fuel was offloaded to the Unit 4 spent fuel pool (SFP). Following the earthquake, the three operating units automatically shut down and offsite power was lost to the entire facility. The emergency diesel generators (EDGs) started at all six units providing alternating current (ac) electrical power to critical systems at each unit. The facility response to the earthquake appears to have been normal.

Approximately 40 minutes following the earthquake and shutdown of the operating units, the first large tsunami wave inundated the site, followed by additional waves. The tsunami caused extensive damage to site facilities and resulted in a complete loss of all ac electrical power at Units 1 through 5, a condition known as station blackout. In addition, all direct current electrical power was lost early in the event on Units 1 and 2 and after some period of time at the other units. Unit 6 retained the function of one air-cooled EDG. Despite their actions, the operators lost the ability to cool the fuel in the Unit 1 reactor after several hours, in the Unit 2 reactor after about 70 hours, and in the Unit 3 reactor after about 36 hours, resulting in damage to the nuclear fuel shortly after the loss of cooling capabilities.

Following the events at the Fukushima Dai-ichi nuclear power plant, the NRC established a senior-level agency task force referred to as the Near-Term Task Force (NTTF). The NTTF was tasked with conducting a systematic and methodical review of the NRC regulations and processes and determining if the agency should make additional improvements to these programs in light of the events at Fukushima Dai-ichi. As a result of this review, the NTTF developed a comprehensive set of recommendations, documented in SECY-11-0093, "Near-Term Report and Recommendations for Agency Actions Following the Events in Japan,"

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dated July 12, 2011. These recommendations were enhanced by the NRC staff following interactions with stakeholders. Documentation of the staff's efforts is contained in SECY-11-0124, "Recommended Actions to be Taken Without Delay From the Near-Term Task Force Report," dated September 9, 2011, and SECY-11-0137, "Prioritization of Recommended Actions to be Taken in Response to Fukushima Lessons Learned," dated October 3, 2011.

As directed by the Commission's staff requirements memorandum (SRM) for SECY-11-0093, the NRC staff reviewed the NTF recommendations within the context of the NRC's existing regulatory framework and considered the various regulatory vehicles available to the NRC to implement the recommendations. SECY-11-0124 and SECY-11-0137 established the staff's prioritization of the recommendations based upon the potential safety enhancements.

Since receiving the Commission's direction in SRM-SECY-11-0124 and SRM-SECY-11-0137, the NRC staff conducted public meetings to discuss enhanced mitigation strategies intended to maintain or restore core cooling, containment, and SFP cooling capabilities following beyond-design-basis external events. At these meetings, the industry described its proposal for a Diverse and Flexible Mitigation Capability (FLEX), as documented in the Nuclear Energy Institute's (NEI's) letter dated December 16, 2011 (Agency Documents Access and Management System (ADAMS) Accession No. ML11353A008). FLEX is proposed as a strategy to fulfill the key safety functions of core cooling, containment integrity, and spent fuel cooling. Stakeholder input influenced the staff to pursue a more performance-based approach to improve the safety of operating power reactors than envisioned in NTF Recommendation 4.2, SECY-11-0124, and SECY-11-0137.

Current regulatory requirements and existing plant capabilities allow the NRC to conclude that a sequence of events such as the Fukushima Dai-ichi accident is unlikely to occur in the U.S. Therefore, continued operation and continued licensing activities do not pose an imminent threat to public health and safety. However, NRC's assessment of new insights from the events at

- 4 -

Fukushima Dai-ichi leads the staff to conclude that additional requirements must be imposed on Licensees or CP holders to increase the capability of nuclear power plants to mitigate beyond-design-basis external events. These additional requirements are needed to provide adequate protection to public health and safety, as set forth in Section III of this Order.

Guidance and strategies required by this Order would be available if the loss of power, motive force, and normal access to the ultimate heat sink to prevent fuel damage in the reactor and SFP, affected all units at a site simultaneously. This Order requires a three-phase approach for mitigating beyond-design-basis external events. The initial phase requires the use of installed equipment and resources to maintain or restore core cooling, containment, and SFP cooling. The transition phase requires providing sufficient, portable, onsite equipment and consumables to maintain or restore these functions until they can be accomplished with resources brought from off site. The final phase requires obtaining sufficient offsite resources to sustain those functions indefinitely.

Additional details on an acceptable approach for complying with this Order will be contained in final Interim Staff Guidance (ISG) scheduled to be issued by the NRC in August 2012. This guidance will also include a template to be used for the plan that will be submitted in accordance with Section IV, Condition C.1 below.

III.

Reasonable assurance of adequate protection of the public health and safety and assurance of the common defense and security are the fundamental NRC regulatory objectives. Compliance with NRC requirements plays a critical role in giving the NRC confidence that Licensees or CP holders are maintaining an adequate level of public health and safety and common defense and security. While compliance with NRC requirements presumptively assures adequate protection, new information may reveal that additional requirements are

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warranted. In such situations, the Commission may act in accordance with its statutory authority under Section 161 of the Atomic Energy Act of 1954, as amended, to require Licensees or CP holders to take action in order to protect health and safety and common defense and security.

To protect public health and safety from the inadvertent release of radioactive materials, the NRC's defense-in-depth strategy includes multiple layers of protection: (1) prevention of accidents by virtue of the design, construction, and operation of the plant; (2) mitigation features to prevent radioactive releases should an accident occur; and (3) emergency preparedness programs that include measures such as sheltering and evacuation. The defense-in-depth strategy also provides for multiple physical barriers to contain the radioactive materials in the event of an accident. The barriers are the fuel cladding, the reactor coolant pressure boundary, and the containment. These defense-in-depth features are embodied in the existing regulatory requirements and thereby provide adequate protection of the public health and safety.

Following the events of September 11, 2001, the NRC issued Order EA-02-026, dated February 25, 2002, which required Licensees to develop mitigating strategies related to the key safety functions of core cooling, containment, and SFP cooling. NEI Document 06-12, "B.5.b Phase 2 & 3 Submittal Guideline" (ADAMS Accession No. ML070090060) provides guidelines that describe the necessary mitigating strategies. The NRC endorsed these guidelines in a letter dated December 22, 2006, designated as Official Use Only. Those mitigating strategies were developed in the context of a localized event that was envisioned to challenge portions of a single unit. The events at Fukushima, however, demonstrate that beyond-design-basis external events may adversely affect: (1) more than one unit at a site with two or more units, and (2) multiple safety functions at each of several units located on the same site.

The events at Fukushima further highlight the possibility that extreme natural phenomena could challenge the prevention, mitigation, and emergency preparedness defense-in-depth layers. To address the uncertainties associated with beyond-design-basis external events, the

- 6 -

NRC is requiring additional defense-in-depth measures at licensed nuclear power reactors so that the NRC can continue to have reasonable assurance of adequate protection of public health and safety in mitigating the consequences of a beyond-design-basis external event.

The strategies and guidance developed and implemented by Licensees or CP holders in response to the requirements imposed by this Order will provide the necessary capabilities to supplement those of the permanently installed plant structures, systems, and components that could become unavailable following beyond-design-basis external events. These strategies and guidance will enhance the safety and preparedness capabilities established following September 11, 2001, and codified as 10 CFR 50.54(hh)(2). In order to address the potential for more widespread effects of beyond design basis external events, this Order requires strategies with increased capacity to implement protective actions concurrently at multiple units at a site. The strategies shall be developed to add multiple ways to maintain or restore core cooling, containment and SFP cooling capabilities in order to improve the defense-in-depth of licensed nuclear power reactors.

The Commission has determined that ensuring adequate protection of public health and safety requires that power reactor Licensees and CP holders develop, implement and maintain guidance and strategies to restore or maintain core cooling, containment, and SFP cooling capabilities in the event of a beyond-design-basis external event. These new requirements provide a greater mitigation capability consistent with the overall defense-in-depth philosophy, and, therefore, greater assurance that the challenges posed by beyond-design-basis external events to power reactors do not pose an undue risk to public health and safety. In order to provide reasonable assurance of adequate protection of public health and safety, all operating reactor licenses and CPs under Part 50 identified in Attachment 1 to this Order shall be modified to include the requirements identified in Attachment 2 to this Order. All combined licenses

- 7 -

(COLs) under 10 CFR Part 52 identified in Attachment 1 to this Order shall be modified to include the requirements identified in Attachment 3 to this Order.

Accordingly, the NRC has concluded that these measures are necessary to ensure adequate protection of public health and safety under the provisions of the backfit rule, 10 CFR 50.109(a)(4)(ii), and is requiring Licensee or CP holder action. In addition, pursuant to 10 CFR 2.202, the NRC finds that the public health, safety and interest require that this Order be made immediately effective.

IV.

Accordingly, pursuant to Sections 161b, 161i, 161o, and 182 of the Atomic Energy Act of 1954, as amended, and the Commission's regulations in 10 CFR 2.202, and 10 CFR Parts 50 and 52, IT IS HEREBY ORDERED, EFFECTIVE IMMEDIATELY, THAT ALL LICENSES AND CONSTRUCTION PERMITS IDENTIFIED IN ATTACHMENT 1 TO THIS ORDER ARE MODIFIED AS FOLLOWS:

- A. 1. All holders of CPs issued under Part 50 shall, notwithstanding the provisions of any Commission regulation or CPs to the contrary, comply with the requirements described in Attachment 2 to this Order except to the extent that a more stringent requirement is set forth in the CP. These CP holders shall complete full implementation **prior to issuance of an operating license.**
2. All holders of operating licenses issued under Part 50 shall, notwithstanding the provisions of any Commission regulation or license to the contrary, comply with the requirements described in Attachment 2 to this Order except to the extent that a more stringent requirement is set forth in the license. These Licensees shall promptly start implementation of the requirements in Attachment 2 to the Order and shall complete full implementation **no later than two (2) refueling cycles**



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 12, 2012

EA-12-051

All Power Reactor Licensees and
Holders of Construction Permits in
Active or Deferred Status

**SUBJECT: ISSUANCE OF ORDER TO MODIFY LICENSES WITH REGARD TO RELIABLE
SPENT FUEL POOL INSTRUMENTATION**

The U.S. Nuclear Regulatory Commission (NRC) has issued the enclosed Order that modifies the current license for your facility. The Order requires provisions for reliable spent fuel pool indications and applies to all addressees listed in Attachment 1 to the enclosed Order.

Following the earthquake and tsunami at the Fukushima Dai-ichi nuclear power plant in March 2011, the NRC established a senior-level task force referred to as the Near-Term Task Force (NTTF). The NTTF conducted a systematic and methodical review of the NRC regulations and processes to determine if the agency should make safety improvements in light of the events in Japan. As a result of this review, the NTTF issued SECY-11-0093, "Near-Term Report and Recommendations for Agency Actions Following the Events in Japan" (Agencywide Document Access and Management System (ADAMS) Accession No. ML11186A950). SECY 11-0124, "Recommended Actions to be Taken Without Delay from the Near-Term Task Force Report," (ADAMS Accession No. ML112911571) and SECY-11-0137, "Prioritization of Recommended Actions to be Taken in Response to Fukushima Lessons Learned," (ADAMS Accession No. ML11272A111) were issued to establish the NRC staff's prioritization of the recommendations. Recommendation 7.1, concerning reliable spent fuel pool instrumentation, was determined to be a high-priority action. This Order is based upon the NTTF recommendation.

During the events in Fukushima, responders were without reliable instrumentation to determine water level in the spent fuel pool. This caused concerns that the pool may have boiled dry, resulting in fuel damage. Numerous attempts were made to refill the spent fuel pools, which diverted resources and attention from other efforts. The events at Fukushima demonstrated the confusion and misapplication of resources that can result from beyond-design-basis external events when adequate instrumentation is not available.

The NRC staff has determined that the current fleet of nuclear power plants is safe to continue operation. Additionally, the Commission has determined that the enhanced spent fuel pool instrumentation required by this Order represents a substantial increase in protection to public health and safety. The requirements of this Order are immediately effective and are expected to remain in place until superseded by Order or rule.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 12, 2012

EA-12-050

All Operating Boiling-Water Reactor
Licensees with Mark I and
Mark II Containments

**SUBJECT: ISSUANCE OF ORDER TO MODIFY LICENSES WITH REGARD TO RELIABLE
HARDENED CONTAINMENT VENTS**

The U.S. Nuclear Regulatory Commission (NRC) has issued the enclosed Order modifying the current license for your facility. The Order requires that all licensees listed in Attachment 1 to the Order implement requirements for reliable hardened containment vents at their facilities.

Following the earthquake and tsunami at the Fukushima Dai-ichi nuclear power plant in March 2011, the NRC established a senior-level task force referred to as the Near-Term Task Force (NTTF). The NTTF conducted a systematic and methodical review of the NRC regulations and processes to determine if the agency should make safety improvements in light of the events in Japan. As a result of this review, the NTTF issued SECY-11-0093, "Near-Term Report and Recommendations for Agency Actions Following the Events in Japan," (Agencywide Documents Access and Management System (ADAMS) Accession No. ML11186A950). SECY-11-0124, "Recommended Actions to be Taken Without Delay from the Near-Term Task Force Report," (ADAMS Accession No. ML112911571) and SECY-11-0137, "Prioritization of Recommended Actions to be Taken in Response to Fukushima Lessons Learned," (ADAMS Accession No. ML11272A111), were issued to establish the NRC staff's prioritization of the recommendations. Recommendation 5.1 concerning reliable hardened vents was determined to be a high-priority action. This Order is based upon the NTTF recommendation.

The events at Fukushima Dai-ichi highlight the possibility that extreme natural phenomena could challenge the prevention, mitigation and emergency preparedness defense-in-depth layers. At Fukushima, a variety of challenges, some of which are not yet clearly known, significantly challenged attempts by the responders to preclude core damage and containment failure. One item that is known is that, under that particular set of circumstances, the operators were unable to successfully operate the containment venting system early in the event. The inability to reduce containment pressure inhibited efforts to cool the reactor core. If additional backup or alternate sources of power had been available to operate the containment venting system remotely, or if certain valves had been more accessible for manual operation, the operators at Fukushima may have been able to depressurize the containment earlier. This, in turn, could have allowed operators to implement strategies using low-pressure water sources that may have limited or prevented damage to the reactor core. Thus, the events at Fukushima demonstrate that reliable hardened vents at boiling-water reactors facilities with Mark I and Mark II containment designs are important to maintain core and containment cooling.

The NRC staff has determined that continued operation does not pose an imminent risk to public health and safety; however, the additional requirements outlined in this Order are necessary in light of insights gained from the events at Fukushima Dai-ichi. The requirements of this Order are immediately effective and are expected to remain in place until superseded by Order or rule.

LBP-11-35

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Ann Marshall Young, Chair
Dr. Paul B. Abramson
Dr. Richard F. Cole

In the Matter of:

ENTERGY NUCLEAR GENERATION
COMPANY AND ENTERGY NUCLEAR
OPERATIONS, INC.
(Pilgrim Nuclear Power Station)

Docket No. 50-293-LR

ASLBP No. 06-848-02-LR

November 28, 2011

MEMORANDUM and ORDER
(Denying Commonwealth of Massachusetts'
Request for Stay, Motion for Waiver, and Request for Hearing on
a New Contention Relating to Fukushima Accident)

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 c. The Commonwealth's Proposed Contention fails to satisfy the
 requirements of 10 C.F.R. § 2.309(f)(1) and 10 C.F.R.
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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Ann Marshall Young, Chair
Dr. Paul B. Abramson
Dr. Richard F. Cole

In the Matter of:

ENTERGY NUCLEAR GENERATION
COMPANY AND ENTERGY NUCLEAR
OPERATIONS, INC.
(Pilgrim Nuclear Power Station)

Docket No. 50-293-LR

ASLBP No. 06-848-02-LR

November 28, 2011

MEMORANDUM and ORDER
(Denying Commonwealth of Massachusetts'
Request for Stay, Motion for Waiver, and Request for Hearing on
A New Contention Relating to Fukushima Accident)

In this Order, we address remaining matters before us raised by the Commonwealth of Massachusetts (Commonwealth) in the proceeding concerning the application by Entergy Nuclear Generation Company and Entergy Nuclear Operations, Inc (collectively, Entergy) for renewal of the operating license for the Pilgrim Nuclear Power Station (Pilgrim) for an additional twenty-year period beyond its current operating license expiration date of June 8, 2012.¹ These matters are: (a) a motion amounting to a request for a stay of this proceeding (Stay Request);² (b) a motion to admit (Motion to Admit) a new contention challenging the Entergy SAMA analysis because of asserted new information regarding both Spent Fuel Pool (SFP) accidents and severe accident probabilities based upon the events at Fukushima (Fukushima Contention);³ (c) a request for a waiver of the provisions of our regulations providing that SFP

¹ See 71 Fed. Reg. 15,222, 15,222 (Mar. 27, 2006).

² Commonwealth of Massachusetts Motion to Hold Licensing Decision in Abeyance Pending Commission Decision Whether to Suspend the Pilgrim Proceeding to Review the Lessons of the Fukushima Accident (May 2, 2011) [hereinafter Stay Request].

³ Commonwealth of Massachusetts' Motion to Admit Contention and, If Necessary, to Reopen Record Regarding New and Significant Information Revealed By Fukushima Accident (June 2, (continuing . . .)

- 2 -

issues are outside the scope of a license renewal proceeding such as this (Request for Waiver);⁴ and (d) a motion to supplement the bases of its proposed contention to address the NRC's Near-Term Task Force Report on lessons learned from Fukushima (Motion to Supplement).⁵

For reasons discussed below:

- a. we deny the Stay Request;
- b. we deny the Waiver Request;
- c. we grant the Motion to Supplement, considering the information presented therewith for its value to this matter; and
- d. we deny the Motion to Admit, finding the Commonwealth has failed to satisfy the requirements for reopening under 10 C.F.R. § 2.326, the standards for untimely contentions under 10 C.F.R. § 2.309(c), and the contention admissibility criteria of 10 C.F.R. § 2.309(f)(1).

(. . . continued)

2011) [hereinafter Motion to Admit and Reopen]; Commonwealth of Massachusetts' Contention Regarding New and Significant Information Revealed by the Fukushima Radiological Accident (June 2, 2011) [hereinafter Fukushima Contention].

⁴ Commonwealth of Massachusetts' Petition for Waiver of 10 C.F.R. Part 51 Subpart A, Appendix B or, in the Alternative, Petition for Rulemaking to Rescind Regulations Excluding Consideration of Spent Fuel Storage Impacts from License Renewal Environmental Review (June 2, 2011) [hereinafter Waiver Petition].

⁵ Commonwealth of Massachusetts Motion to Supplement Bases to Commonwealth Contention to Address NRC Task Force Report on Lessons Learned from the Radiological Accident at Fukushima (Aug. 11, 2011) at 1-2 (citing Dr. Charles Miller et al., Recommendations for Enhancing Reactor Safety in the 21st Century, The Near-Term Task Force Review of Insight from the Fukushima Dai-Ichi Accident (July 12, 2011) (ADAMS Accession No. ML111861807) [hereinafter Near-Term Task Force Report]) [hereinafter Motion to Supplement].

I. PERTINENT BACKGROUND

Entergy's application has been opposed by Pilgrim Watch⁶ and the Commonwealth.⁷ We originally closed these proceedings by order issued June 4, 2008,⁸ however, on March 26, 2010 the Commission reversed in part the Board majority's grant of summary disposition as to an admitted contention filed by Pilgrim Watch challenging Entergy's analysis of severe accident mitigation alternatives (SAMAs).⁹ We ruled in favor of Entergy as to the remanded matter by order dated July 19, 2011 (hereinafter, our Remanded Issue Order).¹⁰

On May 2, 2011, while the remand was pending, the Commonwealth filed its Stay Request, requesting a stay of these proceedings until the Commission has completed its studies of, and released a related plan for action regarding, the Fukushima events.¹¹ On June 2, 2011, the Commonwealth submitted to us its Waiver Request¹² and simultaneously filed its Motion to Admit¹³ respecting its Fukushima Contention.¹⁴ On August 11, 2011, the Commonwealth filed its Motion to Supplement, asking to supplement its bases for its new contention based upon

⁶ Request for Hearing and Petition to Intervene by Pilgrim Watch (May 25, 2006).

⁷ Massachusetts Attorney General's Request for a Hearing and Petition for Leave to Intervene with Respect to Entergy Nuclear Operations Inc.'s Application for Renewal of the Pilgrim Nuclear Power Plant Operating License and Petition for Backfit Order Requiring New Design Features to Protect Against Spent Fuel Pool Accidents (May 30, 2006).

⁸ LBP-08-22, 68 NRC 590, 596 (2008); Board Memorandum and Order (Ruling on Pilgrim Watch Motions Regarding Testimony and Proposed Additional Evidence Relating to Pilgrim Watch Contention 1) (June 4, 2008) at 3-4 (unpublished).

⁹ See CLI-10-11, 71 NRC ___, ___ (slip op. at 3) (Mar. 26, 2010).

¹⁰ LBP-11-18, 74 NRC ___, ___ (slip op. at 1-2) (July 19, 2011).

¹¹ See Stay Request at 1.

¹² Waiver Request at 1.

¹³ Motion to Admit at 1.

¹⁴ Fukushima Contention.

information it garnered from the NRC's Near-Term Task Force Report.¹⁵ Entergy and Staff filed answers and oppositions to these petitions and motions,¹⁶ and the Commonwealth filed replies and motions for leave to reply.¹⁷ Entergy and the NRC Staff filed oppositions to the

¹⁵ Motion to Supplement at 1-2.

¹⁶ Entergy's Answer Opposing Commonwealth's Motion to Hold Licensing Decision in Abeyance (May 12, 2011) [hereinafter Entergy Opposition to Stay Request]; NRC Staff's Answer in Opposition to Commonwealth of Massachusetts Motion to Hold Licensing Decision in Abeyance Pending Commission Decision Whether to Suspend the Pilgrim Proceeding to Review the Lessons of the Fukushima Accident (May 12, 2011) [hereinafter NRC Staff Opposition to Stay Request]; Entergy's Answer Opposing Commonwealth Contention and Petition for Waiver Regarding New and Significant Information Based on Fukushima (June 27, 2011) [hereinafter Entergy Answer to Waiver Petition and Fukushima Contention]; NRC Staff's Response to the Commonwealth of Massachusetts' Petition for Waiver of 10 C.F.R. Part 51 Subpart A, Appendix B or, in the Alternative, Petition for Rulemaking (June 27, 2011) [hereinafter NRC Staff Answer to Waiver Petition]; NRC Staff's Response to Commonwealth of Massachusetts' Motion to Admit Contention and, if Necessary, Re-Open Record Regarding New and Significant Information Revealed by Fukushima Accident (June 27, 2011) [hereinafter NRC Staff Opposition to Fukushima Contention]; Entergy's Answer Opposing Commonwealth Motion to Supplement Bases to Commonwealth Contention to Address NRC Task Force Report on Lessons Learned from Fukushima (Sept. 6, 2011); Letter from Paul A. Gaukler, Counsel for Entergy, to Office of the Secretary, NRC (Sept. 19, 2011) (explaining that Entergy refiled its answer to the Commonwealth's Motion to Supplement to correct only the caption); Entergy's Answer Opposing Commonwealth Motion to Supplement Bases to Commonwealth Contention to Address NRC Task Force Report on Lessons Learned from Fukushima (Sept. 19, 2011) [hereinafter Entergy Opposition to Motion to Supplement]; NRC Staff's Response to Commonwealth of Massachusetts' Motion to Supplement Bases to Proposed Contention to Address NRC Task Force Report on Lessons Learned from Fukushima (Sept. 6, 2011) [hereinafter NRC Staff Opposition to Motion to Supplement. The NRC Staff had moved that we extend the time for filing responses to the Commonwealth's Motion to Supplement, NRC Staff's Unopposed Motion for an Extension to September 6, 2011, to File a Response to the Commonwealth of Massachusetts' Motion (Aug. 16, 2011), and we granted its extension request, Board Order (Granting NRC Staff's Unopposed Motion for Extension) at 1-2 (Aug. 17, 2011) (unpublished).

¹⁷ Commonwealth of Massachusetts Motion to Reply to the Answers of the NRC Staff and Entergy in Opposition to the Commonwealth of Massachusetts Motion to Hold Licensing Decision in Abeyance Pending Commission Decision Whether to Suspend the Pilgrim Proceeding to Review the Lessons of the Fukushima Accident (May 19, 2011); Commonwealth of Massachusetts Reply to NRC Staff and Entergy Oppositions to Commonwealth Motion to Hold Licensing Decision in Abeyance Pending Commission Decision Whether to Suspend the Pilgrim Proceeding to Review the Lessons of the Fukushima Accident (May 19, 2011) [hereinafter Reply for Stay Request]; Commonwealth of Massachusetts Reply to the Responses of the NRC Staff and Entergy to Commonwealth Waiver Petition and Motion to Admit Contention or in the Alternative for Rulemaking (July 5, 2011) [hereinafter Reply for Waiver Petition and Fukushima Contention]; Commonwealth of Massachusetts Reply to NRC Staff and Entergy (continuing . . .)

Commonwealth's motion for leave to reply regarding the Stay Request,¹⁸ and Entergy filed an opposition to the Commonwealth's motion for leave to reply regarding the Motion to Supplement.¹⁹ Entergy moved also to strike portions of the Commonwealth's reply regarding the Waiver Petition and the Fukushima Contention.²⁰ The Commonwealth filed an opposition to Entergy's motion to strike.²¹

In addition, Pilgrim Watch filed requests for hearing on proposed new contentions while the remand was pending. We found inadmissible the three proposed new contentions that Pilgrim Watch filed prior to the accident at Fukushima by order dated August 11, 2011 (hereinafter, our Pre-Fukushima Order)²² and the two proposed new contentions that Pilgrim

(. . . continued)

Entergy Oppositions to Commonwealth Motion to Supplement Bases to Contention on NRC Task Force Report on Lessons Learned from Fukushima (Sept. 13, 2011); Commonwealth of Massachusetts Motion to Reply to NRC Staff and Entergy Oppositions to Commonwealth Motion to Supplement Bases to its Contention (Sept. 13, 2011); Commonwealth of Massachusetts Amended Motion to Reply to NRC Staff and Entergy Opposition to Commonwealth Motion to Supplement Bases to its Contention (Sept. 15, 2011).

¹⁸ Entergy's Answer Opposing Commonwealth of Massachusetts Motion to Permit Unauthorized Reply to NRC Staff and Entergy Answers Opposing Motion to Hold Licensing Decision in Abeyance (May 31, 2011); NRC Staff's Answer in Opposition to Commonwealth of Massachusetts' Motion to File Reply to Staff Response to Motion to Hold Licensing Board Decision in Abeyance Pending the Commission's Decision on Motion to Suspend Proceedings (May 31, 2011).

¹⁹ Entergy Answer Opposing Commonwealth of Massachusetts Motion to Reply to NRC Staff and Entergy Oppositions to Commonwealth Motion to Supplement Bases of its Contention (Sept. 23, 2011).

²⁰ Entergy Motion to Strike Portions of the Commonwealth of Massachusetts Reply to Entergy and the NRC Staff Answers Opposing Waiver Petition and Motion to Admit Contention (July 15, 2011).

²¹ Commonwealth of Massachusetts Answer in Opposition to Entergy's Motion to Strike Portions of Massachusetts Reply (July 21, 2011). We have considered all the information set out in the Commonwealth's reply for the value it contributed, and therefore need not address either the Entergy's motion to strike nor the opposition thereto from the Commonwealth.

²² LBP-11-20, 74 NRC __, __ (slip op. at 2-3) (Aug. 11, 2011) [hereinafter Pre-Fukushima Order].

Watch filed after, and respecting information it garnered from, the accident at Fukushima by order dated September 8, 2011 (hereinafter, our Pilgrim Watch Post-Fukushima Order).²³

During the pendency of our issuance of this ruling on the Commonwealth's pleadings respecting the events at Fukushima, Pilgrim Watch filed yet another proposed new contention.²⁴

The history of this proceeding is discussed in greater detail in our Remanded Issue Order, in our Pre-Fukushima Order, and in our Pilgrim Watch Post Fukushima Order.

II. ANALYSIS

A. Stay Request

The Commonwealth requests that

the Atomic Safety and Licensing Board (Pilgrim ASLB) hold its decision in abeyance whether to relicense the Pilgrim Nuclear Power Plant for an additional twenty (20) years until the Nuclear Regulatory Commission (NRC or Commission) issues a decision on the pending petition to suspend the Pilgrim relicensing proceeding to consider new and significant information on the lessons of the accident at the Fukushima Daiichi Nuclear Power Station.²⁵

The Commonwealth states that the grant of the stay would be consistent with NRC customary practice to facilitate orderly judicial review, and states the reasons for its request as follows:

To allow for an orderly process, and in view of the Commission's own stated intent to entertain further filings on the license suspension and related issues, the Commonwealth is requesting the Pilgrim ASLB to grant a housekeeping or anticipatory stay to allow the Commission to decide these issues before the Pilgrim ASLB may render a final licensing decision.²⁶

²³ LBP-11-23, 74 NRC __, __ (slip op. at 3) (Sept. 8, 2011) [hereinafter Pilgrim Watch Post-Fukushima Order].

²⁴ Pilgrim Watch Request for Hearing on a New Contention Regarding Inadequacy of Environmental Report, Post-Fukushima (Nov. 18, 2011).

²⁵ Stay Request at 1.

²⁶ Id. at 2.

The Commonwealth explains that the request to suspend the Pilgrim relicensing proceeding is made to permit "further consideration of new and significant information arising from the Fukushima accident regarding the risks associated with the spent fuel pool at Pilgrim and related issues."²⁷ The Commonwealth also requests "an additional thirty days to submit expert testimony with initial findings in support [of] this request and for related relief."²⁸

In addition, the Commonwealth joined in the petitions before the Commission,²⁹ wherein petitioners requested:

- Suspension of "all decisions regarding the issuance of construction permits, new reactor licenses, [Combined Licenses (COLs)], [Early Site Permits (ESPs)], license renewals, or standardized design certification pending completion by the NRC's Task Force . . . of its investigation of the near-term and long-term lessons of the Fukushima accident and the issuance of any proposed regulatory decisions and/or environmental analyses of those issues."
- Suspension of all proceedings—specifically, all hearings and opportunities for public comment—on reactor or spent fuel pool issues identified for investigation by the Task Force, including external event issues, station blackout, severe accident measures, implementation of 10 C.F.R. § 50.54(hh)(2) requirements on response to fire or explosions, and emergency preparedness.
- Suspension of proceedings in connection with any other issues identified by the Task Force pending completion of investigation of those issues and issuance of any proposed regulatory decisions and/or environmental analyses.³⁰

²⁷ Id.

²⁸ Id.

²⁹ Commonwealth of Massachusetts Response to Commission Order Regarding Lessons Learned from the Fukushima Daiichi Nuclear Power Station Accident, Joinder in Petition to Suspend the License Renewal Proceeding for the Pilgrim Nuclear Power Plant, and Request for Additional Relief (May 2, 2011) at 3.

³⁰ Union Electric Company d/b/a Ameren Missouri (Callaway Plant, Unit 2), CLI-11-05, 74 NRC __, __ (slip op. at 20) (Sept. 9, 2011) (citations omitted); accord Emergency Petition to Suspend All Pending Reactor Licensing Decisions and Related Rulemaking Decisions Pending Investigation of Lessons Learned from Fukushima Daiichi Nuclear Power Station Accident (Apr. 14, 2011) at 1-2. The Commission noted that the requested relief also included "analysis of whether the events at Fukushima constitute 'new and significant information' under NEPA; safety analysis of the regulatory implications of the events at Fukushima; and establishment of a schedule for raising new issues in pending licensing proceedings." Callaway, CLI-11-05, 74 NRC at __ (slip op. at 9).

In CLI-11-05, the Commission denied those petitions insofar as they requested cessation of licensing activities,³¹ finding:

[F]or pending license renewal applications, where the period of extended operation, provided renewed licenses are issued, will not begin for, at a minimum, nearly a year, and, in the majority of cases, for several years. . . . there is no imminent threat to public health and safety that requires suspension of any of these proceedings or the associated licensing decisions now.³²

Going on, the Commission summarized as follows:

In sum, we find no imminent risk to public health and safety if we allow our regulatory processes to continue. Instead of finding obstacles to fair and efficient decision-making, we see benefits from allowing our processes to continue so that issues unrelated to the Task Force's review can be resolved. We have well-established processes for imposing any new requirements necessary to protect public health and safety and the common defense and security. Moving forward with our decisions and proceedings will have no effect on the NRC's ability to implement necessary rule or policy changes that might come out of our review of the Fukushima Daiichi events.³³

And, specifically addressing the Commonwealth's request that the Commission suspend this proceeding, the Commission held:

The Commonwealth requests that we suspend the Pilgrim license renewal proceeding pending the Commission's consideration of "new and significant" information related to spent fuel pools, related risks, and regulatory requirements; and "[g]rant the Commonwealth and the public an additional reasonable time following completion of the release of the NRC's own findings on the lessons of Fukushima to comment on them and propose licensing or regulatory changes as appropriate." Consistent with our decisions on the requests for relief contained in the primary Petition, above, we deny the Commonwealth of Massachusetts's similar requests for relief. The Commonwealth's petition, like the primary Petition, fails to satisfy our three-part Private Fuel Storage test and therefore does not support suspending the Pilgrim proceeding pending evaluation of information obtained as a result of the events in Japan.³⁴

³¹ Id. at ___ (slip op. at 20).

³² Id. at 25.

³³ Id. at 29.

³⁴ Id. at 36 (quoting Commonwealth of Massachusetts Response to Commission Order Regarding Lessons Learned from the Fukushima Daiichi Nuclear Power Station Accident, Joinder in Petition to Suspend the License Renewal Proceeding for the Pilgrim Nuclear Power Plant, and Request for Additional Relief (May '2, 2011) at 13-14 and referring to Private Fuel (continuing . . .)

We find the Commission's ruling to be dispositive of, and therefore DENY, the Commonwealth's Stay Request.

B. Waiver Request

The Commonwealth requests:

a waiver of 10 C.F.R. § 51.71(d) and 10 C.F.R. Part 51 Subpart A, Appendix B (collectively "spent fuel pool exclusion regulations") to the extent that these regulations generically classify the environmental impacts of high density pool storage of spent fuel as insignificant and thereby permit their exclusion from consideration in environmental impact statements (EISs) for renewal of nuclear power plant operating licenses.³⁵

The Commonwealth argues that:

Waiver of the spent fuel pool exclusion regulations is necessary in order to allow full consideration of the issues raised in the Commonwealth's new contention, also filed today, which challenges the adequacy of the environmental impact analysis and severe accident mitigation alternatives (SAMA) analysis performed by Entergy Corp. and the NRC in support of their proposal to re-license the Pilgrim nuclear power plant (NPP), in light of significant new information revealed by the Fukushima accident.³⁶

The Commonwealth asserts that there are two fundamental tenets of the NRC's rulemaking on SFP issues which have been undermined by the results of the Fukushima accident and that, because the purpose of the regulation would not be served by its application in the unique circumstances of this licensing proceeding, a waiver is required.³⁷ In addition, the Commonwealth asserts that because SAMA analysis is performed on a plant-specific basis, and because the resultant implications from the Fukushima accident are plant-specific, the purpose

(... continued)

Storage, L.L.C. (Independent Spent Fuel Storage Installation), CLI-01-26, 54 NRC 376, 380 (2001)).

³⁵ Waiver Petition at 1-2.

³⁶ Id., at 2.

³⁷ See id. at 3-4.

of the regulation, to make a generic finding of no significant impact for all NPPs, will not be served.³⁸

Nonetheless, the Commonwealth recognizes that

information from the Fukushima accident continues to emerge, and that at this juncture the accident may not be completely understood. . . . [but], as discussed in Dr. [Gordon R.] Thompson's report, attached hereto, the Fukushima accident conclusively demonstrates that spent fuel pool and reactor accident risks are significantly higher than previously determined by the NRC.³⁹

Discussing the Agency's duty to consider catastrophic events with large consequences and reasonably foreseeable impacts even where the probability of occurrence of such events is low,⁴⁰ the Commonwealth discusses the NRC's SAMA requirements and asserts that the continuing obligation to consider new information requires the NRC to update its EIS with supplemental SAMA analysis to include Fukushima-derived information.⁴¹

³⁸ Id. at 5.

³⁹ Id. (referring to Declaration of Dr. Gordon R. Thompson in Support of Commonwealth of Massachusetts' Contention and Related Petitions and Motions (June 1, 2011) [hereinafter Thompson Declaration]). The Commonwealth further notes:

[The] accident is ongoing. Publicly available information about the accident in English language – and probably in Japanese as well – is incomplete and inconsistent at this time. Nevertheless, information has become available that is new and significant in the context of the Pilgrim NPP license renewal proceeding. Additional information of this type is likely to become available over the coming months.

In his report, Dr. Thompson has identified six areas in which information that is presently available regarding the Fukushima accident supports either conclusive (established) or provisional (likely) findings that challenge the adequacy of the existing SAMA analysis for Pilgrim NPP, including the analysis related to spent fuel pool risks.

Id. at 16.

⁴⁰ As we have observed before, remote and speculative events need not be considered in NEPA safety and environmental impacts analysis. E.g., LBP-11-23, 74 NRC at ___ (slip op. at 14 n.66).

⁴¹ Waiver Petition at 20-28.

In the alternative, the Commonwealth requests that the Commission (before whom this petition was also filed) "rescind the spent fuel pool exclusion regulations across the board, in a rulemaking."⁴²

In CLI-11-05, discussed above, the Commission ruled on the Commonwealth's request that the Commission suspend this proceeding and grant the public additional time to comment on the NRC's completed findings regarding Fukushima and to propose licensing or regulatory changes based on them.⁴³ Although the Commission did not directly issue an order respecting the Commonwealth's request that we waive the exclusion respecting spent fuel pool matters from license renewal matters, it did "[d]eny the requests for relief made by the Commonwealth of Massachusetts."⁴⁴

Of particular import to the request before us to waive an existing rule excluding spent fuel pool matters from the scope of license renewal, the Commission, addressing safety and environmental contentions raised in ongoing proceedings, held:

[O]ur license renewal review is a limited one, focused on aging management issues. It is not clear whether any enhancements or changes considered by the Task Force will bear on our license renewal regulations, which encompass a more limited review. The NRC's ongoing regulatory and oversight processes provide reasonable assurance that each facility complies with its "current licensing basis," which can be adjusted by future Commission order or by modification to the facility's operating license outside the renewal proceeding (perhaps even in parallel with the ongoing license renewal review).⁴⁵

The Commission acknowledged that it is "conducting extensive reviews to identify and apply the lessons learned from the Fukushima Daiichi accident, and . . . will use the information from these activities to impose any requirements it deems necessary, irrespective of whether a plant

⁴² Id. at 30.

⁴³ Callaway, CLI-11-05, 74 NRC at ___ (slip op. at 36).

⁴⁴ Id. at ___ (slip op. at 42) (emphasis omitted).

⁴⁵ Id. at ___ (slip op. at 26) (internal citations omitted).

is applying for or has been granted a renewed operating license.”⁴⁶ Nonetheless, because the Commission was not explicit on this particular waiver request, we address it here.

Turning to its request for waiver of the regulation excluding SFP matters from a license renewal proceeding, the Commonwealth asserts:

The applicable regulation, 10 C.F.R. § 2.335(b), provides that the “sole ground for a petition of waiver or exception” to NRC regulations is that “special circumstances with respect to the subject matter of the particular proceeding are such that the application for the rule or regulation (or a provision of it) would not serve the purposes for which the rule or regulation was adopted.”⁴⁷

10 C.F.R. § 2.335 provides that, absent a waiver or exception from the presiding officer, “no rule or regulation of the Commission, or any provision thereof, concerning the licensing of production and utilization facilities . . . is subject to attack by way of discovery, proof, argument, or other means in any adjudicatory proceeding subject to this part.”⁴⁸ The presiding officer must dismiss any petition for waiver that does not make a “prima facie showing” of “special circumstances with respect to the subject matter of the particular proceeding . . . such that the application of the rule or regulation (or provision of it) would not serve the purposes for which the rule or regulation was adopted.”⁴⁹

In addition, as the Commonwealth properly points out,⁵⁰ the Commission has endorsed the four-pronged Millstone test respecting grant of a waiver:

(i) the rule’s strict application “would not serve the purposes for which [it] was adopted”; (ii) the movant has alleged “special circumstances” that were “not

⁴⁶ Id. at __ (slip op. at 26-27) (quoting Entergy’s Answer Opposing Petition to Suspend Pending Licensing Proceedings (May 2, 2011) at 3).

⁴⁷ Waiver Petition at 25.

⁴⁸ 10 C.F.R. § 2.335(a).

⁴⁹ Id. § 2.335(b)-(c).

⁵⁰ Waiver Petition at 26.

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considered, either explicitly or by necessary implication, in the rulemaking proceeding leading to the rule sought to be waived"; (iii) those circumstances are "unique" to the facility rather than "common to a large class of facilities"; and (iv) a waiver of the regulation is necessary to reach a "significant safety problem."⁵¹

The Commission carefully explained that: "The use of 'and' in this list of requirements is both intentional and significant. For a waiver request to be granted, all four factors must be met."⁵²

The Commission also explained that asserting that a regulation does not ensure the protection of public health and safety is not always sufficient to satisfy the first prong:⁵³

Of course, all our Part 50 regulations are aimed, directly or indirectly, at protecting public health and safety. But that does not mean that they are all suitable subjects for litigation in a license renewal proceeding. They are not. In fact, the primary reason we excluded emergency-planning issues from license renewal proceedings was to limit the scope of those proceedings to "age-related degradation unique to license renewal." Emergency planning is, by its very nature, neither germane to age-related degradation nor unique to the period covered by the Millstone license renewal application. Consequently, it makes no sense to spend the parties' and our own valuable resources litigating allegations of current deficiencies in a proceeding that is directed to future-oriented issues of aging. Indeed, at an earlier stage of this very proceeding, the Commission approved a Board decision excluding an emergency-planning contention.⁵⁴

Entergy argues that the Waiver Petition fails to meet the second of these four prongs (special circumstances), because "the Fukushima accident has revealed no special circumstances or new information about the likelihood of a spent fuel pool fire or applicable mitigation measures."⁵⁵ The Commonwealth addresses the second prong,⁵⁶ and the NRC Staff

⁵¹ Dominion Nuclear Connecticut, Inc. (Millstone Nuclear Power Station, Units 2 and 3), CLI-05-24, 62 NRC 551, 559-60 (2005) (internal citations omitted). We agree that this same test is equally appropriate respecting a waiver regarding a NEPA-related contention.

⁵² Id. at 560.

⁵³ Although this ruling dealt with a safety-related regulation, we find the principle applicable to environmental matters – the mere assertion of a shortcoming in the regulation does not rise to the required level.

⁵⁴ Id. at 560-61 (internal footnotes omitted).

⁵⁵ Entergy Answer to Waiver Petition and Fukushima Contention at 44.

⁵⁶ Waiver Petition at 25-26.

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agrees that it has been satisfied.⁵⁷ But all of the prongs must be satisfied for a waiver to be granted and they are not. For example, the Commonwealth proffers no arguments regarding why the circumstances are “unique” to the Pilgrim facility rather than “common to a large class of facilities,” although we might take its general arguments that all SAMAs are plant specific to address that matter.⁵⁸

Staff observes that

The third prong of the Millstone test embodies the Commission’s policy to resolve generic issues through rulemaking, as opposed to a series of site-specific determinations in adjudications. Therefore, parties with new and significant information that could undermine the rationale for a Commission regulation must seek a rulemaking instead of challenging the regulation in a particular proceeding unless the information uniquely applies to a given adjudication.⁵⁹

Asserting that the Commonwealth has failed to show any unique applicability to Pilgrim of information learned from the accident at Fukushima, Staff argues that all of the asserted phenomena applicable to Pilgrim could be applicable to other plants.⁶⁰ The Staff points out that Commonwealth expert Dr. Thompson’s conclusions on probability are based upon global nuclear industry experience which, Staff avers, would therefore apply to all operating reactors and have no unique applicability to Pilgrim.⁶¹ Similarly, Entergy argues that the Commonwealth has not demonstrated uniqueness, citing a number of examples such as the Commonwealth’s assertion that reactor accident probability has increased which, Entergy states, must be based upon an analysis that inherently applies to every operating nuclear power plant in the world.⁶²

⁵⁷ NRC Staff Answer to Waiver Petition at 14.

⁵⁸ Id. at 4.

⁵⁹ NRC Staff Answer to Waiver Petition at 8 (citing 10 C.F.R. §§ 2.335, 2.802).

⁶⁰ Id. at 9.

⁶¹ Id.

⁶² Entergy Answer to Waiver Petition and Fukushima Contentions at 44.

Staff notes the Commonwealth's use of the concept of site-specific analyses, but again asserts that the issues and arguments put forth by the Commonwealth are applicable to many other plants, not singularly Pilgrim.⁶³

Further, the Staff argues that the Commonwealth has not satisfied the fourth Millstone prong because it has failed to demonstrate that the Fukushima accident raises a problem of regulatory significance for Pilgrim.⁶⁴

Staff also asserts that the Commission has previously addressed and rejected, in this proceeding, a request for spent fuel pool accidents to be included in SAMA analyses, holding, instead, that generic analysis remains appropriate.⁶⁵ Staff further explains that the Commission's Task Force is presently undertaking an intensive review of the Fukushima events and is expected to consider many of the factors that led the Commission to conclude that the environmental impacts of onsite storage during the period of extended operations will be small.⁶⁶

We agree with Entergy and Staff, for the reasons they have set forth in their respective Answers as well as the reasons set out in this Order, that the third element (uniqueness) of the Commission's four pronged test is plainly not satisfied in the present circumstances. In

Millstone, the Commission interpreted "uniqueness" as follows:

As for the third waiver factor—uniqueness—we cannot accept Suffolk County's argument that its circumstances are "unique" to the Millstone facility rather than "generic." Suffolk County's principal claim to uniqueness is grounded in the

⁶³ NRC Staff Answer to Waiver Petition at 10. Indeed, this view is bolstered by the Commission's own view that "lack of a specific link between the relief requested and the particulars of the individual applications makes it difficult to conclude that moving forward with any individual licensing decision or proceeding will have a negative impact on public health and safety." Callaway, CLI-11-05, 74 NRC at ___ (slip op. at 22) (emphasis added).

⁶⁴ Id. at 14.

⁶⁵ Id. at 10-11 (citing CLI-10-14, 71 NRC ___ (slip op. at 29, 39) (Jun. 17, 2010)).

⁶⁶ Id. at 15.

county's proximity to a nuclear power facility located in an adjoining state. But Suffolk County is hardly unique in this respect. Suffolk County also claims to be unique due to changes in its demographics and roadway limitations. Yet, . . . this is an important but common problem addressed by the NRC's ongoing regulatory program. Other jurisdictions are subject to demographic trends similar to those of Suffolk County.⁶⁷

Here a waiver has been requested from regulatory provisions that spent fuel storage pool matters are outside the scope of license renewal. Spent fuel matters will be addressed on a much wider scope than a singular focus upon the Pilgrim plant. Indeed there are more than 20 BWR Mark-I plants which share the characteristics of Pilgrim, not to mention the fact that each and every nuclear power plant in this country has a spent fuel pool. It is noteworthy that the NRC's Fukushima Task Force's recommendations regarding new programs that might be implemented in response to information gleaned from the Fukushima Dai-Ichi accidents include a program of containment overpressurization protection measures for BWR Mark-I plants,⁶⁸ making plain that the issues raised are not "unique" to the Pilgrim plant alone. This is precisely the sort of program to which the Commission referred in CLI 11-05 when it stated that issues of this nature will be addressed, if its studies of the implications from Fukushima warrant, through more generic regulatory reform.⁶⁹

For the foregoing reasons, we DENY the request of the Commonwealth of Massachusetts for a waiver of the NRC's spent fuel pool exclusion regulations.

Nonetheless, even though matters respecting spent fuel pools are outside the scope of this proceeding, and therefore all aspects of the Commonwealth Fukushima Contention that regard spent fuel pools are inadmissible, because the Commonwealth's pleadings intertwine matters respecting increased spent fuel risks and severe (reactor) accident risks, we do not

⁶⁷ Millstone, CLI-05-24, 62 NRC at 562 (internal footnotes omitted).

⁶⁸ Near-Term Task Force Report at § 4.2.2.

⁶⁹ See Callaway, CLI-11-05, 74 NRC at ___ (slip op. at 40).

entirely eliminate discussion of some of those portions of the Commonwealth Fukushima Contention in our discussion below.

C. Fukushima Contention

For the proposed new contention to be admitted, the Commonwealth, as the party proposing admission of the contention, must satisfy the Commission's demanding regulatory requirements for reopening the record.⁷⁰

As we noted in our earlier orders,⁷¹ the Commission emphasized, in this proceeding, the need for affidavits to support any motion to reopen, finding that intervenors' speculation that further review of certain issues "might" change some conclusions in the final safety evaluation report did not justify restarting the hearing process.⁷² This view was repeated in the Commission's ruling on the various requests by petitioners that all licensing proceedings be stayed until the Commission has completed its studies of the effects of the accidents at Fukushima.

In addition, should the requirements for reopening the record be satisfied, the requirements for untimely contentions under 10 C.F.R. § 2.309(c) must be satisfied, and the Commonwealth Fukushima Contention must satisfy the contention admissibility criteria of 10 C.F.R. § 2.309(f)(1).

⁷⁰ See 10 C.F.R. § 2.326. In this regard, the Commission has most recently repeated its view when addressing the numerous Fukushima related petitions: "[O]ur rules deliberately place a heavy burden on proponents of contentions, who must challenge aspects of license applications with specificity, backed up with substantive technical support; mere conclusions or speculation will not suffice. An even heavier burden applies to motions to reopen." Callaway, CLI-11-05, 74 NRC at ___ (slip op. at 33) (internal citations omitted).

⁷¹ Pilgrim Watch Post-Fukushima Order at 8; Pre-Fukushima Order at 13.

⁷² AmerGen Energy Co., LLC (Oyster Creek Nuclear Generating Station), CLI-08-23, 68 NRC 461, 486 (2008). The CLI-08-23 order involved four NRC proceedings, including the Pilgrim proceeding.

1. Legal Standards Governing Motion to Reopen the Record

We addressed in depth the standards for reopening a record in our Pre-Fukushima Order and expanded that discussion in our Pilgrim Watch Post Fukushima Order, and do not repeat that entire discussion here; rather we hereby incorporate that discussion by reference and set out only a few key points.

The standards for reopening the record under 10 C.F.R. § 2.326(a) are as follows:

- (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.

And, as we noted in our previous rulings, a motion to reopen must be "accompanied by affidavits that set forth the factual and/or technical bases for the movant's claim that the criteria of paragraph (a) of this section have been satisfied."⁷³ In such affidavits, "[e]ach of the criteria must be separately addressed, with a specific explanation of why it has been met."⁷⁴

Additionally, where a motion to reopen relates to a contention not previously in controversy, section 2.326(d) requires that the motion demonstrate that the balance of the nontimely filing factors (see 10 C.F.R. § 2.309(c)) favors granting the motion to reopen.

The Section 2.309(c) factors are as follows:

- (i) Good cause, if any, for the failure to file on time;
- (ii) The nature of the requestor's/petitioner's right under the Act to be made a party to the proceeding;
- (iii) The nature and extent of the requestor's/petitioner's property, financial or other interest in the proceeding;

⁷³ 10 C.F.R. § 2.326(b).

⁷⁴ Id.

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- (iv) The possible effect of any order that may be entered in the proceeding on the requestor's/petitioner's interest;
- (v) The availability of other means whereby the requestor's/petitioner's interest will be protected;
- (vi) The extent to which the requestor's/petitioner's interests will be represented by existing parties;
- (vii) The extent to which the requestor's/petitioner's participation will broaden the issues or delay the proceeding; and
- (viii) The extent to which the requestor's/petitioner's participation may reasonably be expected to assist in developing a sound record.

Finally, if the reopening standards are inapplicable as the Commonwealth avers, or if the reopening criteria had been satisfied, the new contention must also meet the standards for contention admissibility under 10 C.F.R. § 2.309(f)(1), and, where the contention is based upon new information, those of C.F.R. § 2.309(f)(2)..

2. Analysis of Commonwealth Fukushima Contention

The Commonwealth's pleadings respecting the Fukushima Contention assert:

[T]he environmental impact analysis and the SAMA analysis in Supp. 29 to the Generic Environmental Impact Statement (GEIS) for License Renewal (1996) are inadequate to satisfy NEPA because they fail to address new and significant information revealed by the Fukushima accident that is likely to affect the outcome of those analyses. The new and significant information shows that both core-melt accidents and spent fuel pool accidents are significantly more likely than estimated or assumed in Supp. 29 of the License Renewal GEIS or the SAMA analysis for the Pilgrim NPP. As a result, the environmental impacts of re-licensing the Pilgrim NPP have been underestimated. In addition, the SAMA analysis is deficient because it ignores or rejects mitigative measures that may now prove to be cost-effective in light of this new understanding of the risks of re-licensing Pilgrim.⁷⁵

Based upon these assertions, the Commonwealth asserts that the Pilgrim SAMA analysis should be redone to encompass

measures to accommodate: (a) structural damage; and (b) station blackout, loss of service water, and/or loss of fresh water supply, occurring for multiple days. Also, the measures to be considered should include systems for hydrogen

⁷⁵ Fukushima Contention at 5-6.

explosion control, filtered venting of containment, and replacement of high-density spent fuel storage racks with low-density open-frame racks.⁷⁶

The Commonwealth supports its contention with, and provides for its basis, the report and the declaration of Dr. Thompson.⁷⁷ The findings in that declaration and report, the Commonwealth observes, are classified by Dr. Thompson as either "Provisional" or "Conclusive."⁷⁸

The Commonwealth further supports the admissibility of this contention with a separate filing (Motion to Admit) submitting its legal arguments for admissibility.⁷⁹ The Commonwealth states, as to the separate filing:

While the Commonwealth does not believe that the record of this proceeding has closed, the motion also seeks re-opening of the record in the alternative, in the event the ASLB determines that it has closed. The motion covers all issues that must be addressed in order to raise a contention at a late stage of a license renewal adjudication.⁸⁰

In its Motion to Supplement, the Commonwealth asserts:

[T]he Task Force recommended that the NRC incorporate some potential severe accidents into the "design basis" and subject them to mandatory safety regulations. By doing so, the Task Force also effectively recommends a significant change in the NRC's system for mitigating severe accidents through consideration of severe accident mitigation alternatives (SAMAs). As the Task Force recognizes, currently the NRC does not impose measures for the mitigation of severe accidents unless they are shown to be cost-beneficial or unless they are adopted voluntarily. . . . The Task Force now suggests that some severe accident mitigation measures should be adopted into the design basis, i.e., the set of regulations adopted without regard to their cost which establish the minimum level of adequate protection required for all nuclear power plants. . . . Thus, the values assigned to the cost-benefit analysis for Pilgrim

⁷⁶ Id. at 7-8.

⁷⁷ Thompson Declaration; Gordon R. Thompson, Institute for Resource and Security Studies, New and Significant Information From the Fukushima Daiichi Accident in the Context of Future Operation of the Pilgrim Nuclear Power Plant (June 1, 2011) [hereinafter Thompson Report].

⁷⁸ Fukushima Contention at 8.

⁷⁹ Motion to Admit and Reopen.

⁸⁰ Fukushima Contention at 4 (emphasis added).

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SAMAs should be re-evaluated in light of the Task Force's finding that the value of some SAMAs is so high that they should be required as a matter of course.⁸¹

The Commonwealth supports its Motion to Supplement with a second Declaration from Gordon R. Thompson,⁸² in which he raises matters respecting spent fuel pools and probabilities of both severe accidents and spent fuel pool fires.⁸³ He asserts, in relevant part, as follows (emphasis added):

Each of [the Task Force's twelve overarching] recommendations calls for action that is new and significant in the context of future operation of the Pilgrim plant. For example, Recommendation #7 (see page 46 of the Task Force report) calls for enhanced instrumentation and water makeup capability for the spent-fuel pool of each nuclear power plant (NPP) licensed by the NRC. These capabilities do not now exist at the Pilgrim plant, and have the potential to reduce the risk of a spent-fuel-pool fire at the plant. . . .

. . . .

There are at least two technical reasons why the Task Force recommendations should be considered in the Pilgrim license extension proceeding. First, many of the actions recommended in the Task Force report have plant-specific features, and therefore require plant-specific regulatory attention. Second, as shown in this declaration, the findings in the Task Force report call for substantial revision of the Pilgrim-specific supplement to the NRC's generic environmental impact statement (GEIS) for license renewal of nuclear power plants, especially Appendix G of that supplement. It is my understanding that completion of an accurate, plant-specific supplement to the GEIS is required before a license extension is granted. It is my further understanding that severe accident mitigation alternatives (SAMAs) that are determined in that supplement to be cost-effective must be implemented as a condition of license extension.

. . . .

. . . When NPPs such as Pilgrim were designed, nuclear safety regulation was founded on the principle that abnormal situations, such as accidents, would occur within a plant's design basis. Over time, analysis and operating experience revealed that the design basis originally adopted was inadequate, resulting in a significant risk of fuel damage and radioactive release to the environment. Piecemeal efforts to address this basic problem have led to the "patchwork of beyond-design-basis requirements and voluntary initiatives" described in the Task Force report. Overarching Recommendation #1 in that report (see its page

⁸¹ Motion to Supplement at 5.

⁸² Declaration of Gordon R. Thompson Addressing New and Significant Information Provided by the NRC's Near-Term Task Force Report on the Fukushima Accident (Aug. 11, 2011) [hereinafter Thompson Supplemental Declaration].

⁸³ E.g., id. ¶¶ I-6, III-2 to III-4.

ix) is to establish a “logical, systematic, and coherent regulatory framework” to replace the present patchwork.⁸⁴

Drawing from his earlier report, Dr. Thompson states:

- a. The Thompson 2011 report set forth . . . findings on six specific issues that are directly relevant to license extension for the Pilgrim plant. Information provided in the Task Force report supports these findings, as shown in the following paragraphs.

. . . . The first specific issue discussed in the Thompson 2011 report . . . was the probability of reactor core damage and radioactive release, accounting for cumulative direct experience. The Thompson 2011 report found that, for the purposes of SAMA analysis, direct experience provides an estimate of probability that is more appropriate than licensee estimates derived from the use of probabilistic risk assessment (PRA) techniques.⁸⁵

The NRC Staff explains that the direct experience approach

“comput[es] the core damage frequency (CDF) for a particular plant (in this case, Pilgrim) by taking the historical number of all core-damage events that have occurred at all commercial nuclear plants; regardless of plant design and site conditions, and dividing that number by the total number of years of operation of all commercial nuclear plants worldwide.”⁸⁶

In his report, Dr. Thompson asserts that his direct experience approach provides a reality check for PRA estimates, which are known to be uncertain, and that it would be prudent and responsible to assume, until proven otherwise, that a particular NPP has a core damage frequency (CDF) as indicated by direct experience.⁸⁷ He further asserts that the burden of proving that a particular NPP has a lower CDF falls to the licensee.⁸⁸

⁸⁴ Id. ¶¶ I-6, I-8, II-3. (emphasis added) (footnotes omitted).

⁸⁵ Id. ¶¶ III-1 to III-2 (emphasis added). The “direct experience” approach is at the center of the Commonwealth’s arguments.

⁸⁶ NRC Staff Opposition to Fukushima Contention at 9 (quoting id., Att., Affidavit of Dr. S. Tina Ghosh in Support of the NRC Staff’s Response to Massachusetts’ Motion to Admit New Contention and Reopen to Admit New and Significant Information (June 27, 2011) at 2-3 [hereinafter Ghosh Affidavit]).

⁸⁷ Thompson Report at 16.

⁸⁸ See id. at 17.

In his supplemental declaration, Dr. Thompson also discusses the capability for operators to mitigate an accident:

The second specific issue discussed in the Thompson 2011 report . . . was the operators' capability to mitigate an accident, and the effect of that capability on the conditional probability of a spent-fuel-pool fire during a reactor accident. The Thompson 2011 report set forth three findings on this issue. First, the operators' capability to mitigate an accident at the Pilgrim NPP can be severely degraded in the local environment created by a reactor accident. Second, the nuclear industry's recently-disclosed extensive damage mitigation guidelines (EDMGs) are inadequate to address the range of core-damage and spent-fuel-damage events that could occur at Pilgrim. Third, there is a substantial conditional probability of a spent-fuel-pool fire during a reactor accident at Pilgrim.⁸⁹

Going on, Dr. Thompson recognizes that the Task Force report does not directly address the statements of his report, but asserts the Task Force nonetheless, in effect, endorses his findings:

The Task Force report does not directly address the [three] findings [on operators' capability to mitigate an accident] However, Task Force recommendations effectively endorse these findings. For example, implicit endorsement of these findings is clearly evident in Task Force Recommendation #7. . . . Recommendation #7 calls for enhanced instrumentation and water makeup capability for the spent-fuel pool of each nuclear power plant licensed by the NRC. Pages 43-46 of the Task Force report provide details. The recommended capabilities do not now exist at the Pilgrim plant.⁹⁰

Dr. Thompson further asserts:

The fourth specific issue discussed in the Thompson 2011 report . . . was hydrogen control. The Thompson 2011 report found that hydrogen explosions similar to those experienced at Fukushima could occur at the Pilgrim NPP.

. . . Recommendations #5 and #6 in the Task Force report clearly support the finding of the Thompson 2011 report on hydrogen control. Recommendation #5, described at pages 39-41 of the Task Force report, calls for requirement of reliable, hardened venting of the containment at each boiling-water-reactor (BWR) plant with a Mark I or Mark II containment. The Pilgrim plant is a BWR with a Mark I containment. Hydrogen control would be one of the major functions of the recommended venting system. It should be noted . . . that hardened venting systems at BWR plants have a variety of plant-specific design features. Recommendation #6, described at pages 41-43 of the Task Force report, calls

⁸⁹ Thompson Supplemental Declaration ¶ III-4 (emphasis added).

⁹⁰ Id. ¶ III-5 (emphasis added).

for further investigation of hydrogen control as part of a longer-term review of the Fukushima accident.

. . . The fifth specific issue discussed in the Thompson 2011 report . . . was the probability of a spent-fuel-pool fire and radioactive release, accounting for Fukushima direct experience. . . The Thompson 2011 report found that there is a substantial conditional probability of a spent-fuel-pool fire during a reactor accident at Pilgrim.⁹¹

As discussed above,⁹² for this new contention submitted by the Commonwealth to be admitted, there are several legal thresholds to be passed: the requirements of 10 C.F.R. § 2.326; the requirements for a nontimely contention set out in subsection (c) of 10 C.F.R. § 2.309; and all of the requirements for an admissible contention under 10 C.F.R. § 2.309(f)(1), and, where the reopening requirements have been satisfied or are inapplicable, the requirements of subsection (i) through (iii) of 10 C.F.R. § 2.309(f)(2)

Although the pleadings are not organized to address these standards separately, we address them seriatim for clarity.

a. The Requirements of 10 C.F.R. § 2.326 Regarding Reopening a Closed Record

The Commonwealth states, in its Motion to Admit, that it believes the standards set out in 10 C.F.R. § 2.309(f)(2)(i)-(iii) for the timely filing of contentions based on newly discovered information govern admissibility of their contention because it believes the record of this proceeding remains open and the contention is timely filed.⁹³ Nevertheless, it addresses the reopening standards.

Entergy answers that the Commonwealth's contention fails to satisfy any of the standards for reopening a closed record, asserting that it fails to meet any of the requirements in 10 C.F.R. § 2.326(a)(1)-(3) and that the supplied affidavit fails to satisfy the requirements of 10

⁹¹ Id. ¶¶ III-8 to III-10 (emphasis added).

⁹² Supra Section II(C).

⁹³ Motion to Admit at 2.

C.F.R. § 2.326(b).⁹⁴ Similarly, Staff answers generally that this contention should be denied because it does not satisfy the standards for reopening a closed record, the Thompson Report does not establish that information gleaned for the accident at Fukushima itself would materially alter the Pilgrim SAMA analysis and the findings of the GEIS, or that they raise a significant environmental issue, or is timely.⁹⁵

(i) Is the motion timely under § 2.326(a)(1)?

The Commonwealth begins with the assertion that the contention is timely because it is based upon new, not previously available information.⁹⁶ The contention is based, asserts the Commonwealth, upon new information from the Fukushima accident regarding the actual occurrence of radiological release rather than the probabilistic analysis used in the present license renewal application (LRA).⁹⁷ Referring to the Thompson Report, the Commonwealth avers that new information is now available regarding the probability of core melt, station blackout duration, the effectiveness of mitigation measures (including the potential benefits of filtered containment venting), and the import of spent fuel accidents.⁹⁸

Further, argues the Commonwealth, the contention is timely submitted because it was submitted "before the NRC ha[d] even published its initial findings about an accident that continues to unfold."⁹⁹ The Commonwealth observes that "from a technical standpoint it would have been preferable to wait for further developments before filing a contention," but stated that

⁹⁴ Entergy Answer to Waiver Petition and Fukushima Contention at 18.

⁹⁵ NRC Staff Opposition to Fukushima Contention at 2.

⁹⁶ Motion to Admit at 3.

⁹⁷ Id.

⁹⁸ Id. at 3 (citing Thompson Report at 14-18, 29).

⁹⁹ Id. at 5.

it filed its contention based on then-available information because a license renewal decision for the Pilgrim NPP may be imminent.¹⁰⁰

The Commonwealth summarizes the new and significant information as follows:

1. The experience of the Fukushima accident, taken together with the history of other NPP accidents in the world, shows that the estimate of core damage frequency relied on in Supp. 29 and the related SAMA analysis is unrealistically low by an order of magnitude.
2. The experience of the Fukushima accident shows that the NRC's assumptions about operators' capability to mitigate an accident at the Pilgrim NPP are unrealistically optimistic and that in fact, the operators' capability to carry out mitigative measures can be severely degraded in the accident environment.
 - a. Mitigative measures known as extensive damage mitigation guidelines (EDMGs), which the NRC previously relied on in its Rulemaking Denial to dismiss the Commonwealth's concerns that spent fuel pool storage impacts are insignificant, are clearly inadequate to address the range of core-damage and spent-fuel-damage events that could occur at Pilgrim.
 - b. Given the demonstrated ineffectiveness of the mitigative measures relied on by the NRC to conclude that spent fuel storage impacts are insignificant, there is a substantial conditional probability of a spent-fuel-pool fire during a reactor accident at Pilgrim.
 - c. Based on operators' experience during the Fukushima accident and a review of the EDMGs that were publicly disclosed pursuant to the Fukushima accident, 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 at the Pilgrim NPP.
 - d. Based on the occurrence of hydrogen explosions at Fukushima NPPs and on the reported experience of Fukushima operators with hydrogen control systems, it appears likely that hydrogen explosions similar to those experienced at Fukushima could occur at the Pilgrim NPP, and therefore should be considered in the SAMA analysis.
 - e. Based on currently available information regarding damage to spent-fuel pools and their support systems (for cooling, makeup, etc.), there appears to be a substantial conditional probability of a spent-fuel-pool fire during a reactor accident at Pilgrim. Therefore the NRC's previous rejection of the Commonwealth's concerns regarding the environmental impacts of high-density pool storage of spent fuel has been refuted.
 - f. Based on the reported release of radioactive material to the atmosphere from NPPs at Fukushima, it appears likely that filtered venting of the

¹⁰⁰ Id. at 5 (citing Thompson Declaration ¶¶ 14 and Thompson Report at 5-6). In this regard, we note the Commission's view, discussed above, that the pending renewal of a license is not a reason to suspend licensing activities. See supra text accompanying note 32.

Pilgrim reactor containment could substantially reduce the atmospheric release of radioactive material from an accident at the Pilgrim NPP.¹⁰¹

Staff avers that none of the reasons the Commonwealth provides satisfies the timeliness criterion in 10 C.F.R. § 2.326(a)(1) and because of ongoing efforts and the developing state of information on the accident, the Commonwealth's contention, as framed, is premature.¹⁰²

Moreover, asserts Staff, the lack of definitive information causes the claims to be in the nature of speculation, and the Commonwealth must raise issues that are "based on 'more than mere allegations; it must be tantamount to evidence' to overcome the strict requirements for reopening a closed record."¹⁰³ Thus, Staff concludes, the Commonwealth's attempts to litigate the impact of the events of Fukushima are untimely because its contention largely relies, even according to the Commonwealth, upon incomplete and undeveloped information.¹⁰⁴

Entergy asserts that all of the Commonwealth's claims and bases could have been raised long ago, and that Fukushima provided no materially new information with respect to these claims.¹⁰⁵ To support this assertion, Entergy challenges the "newness" of information providing the foundation for the "direct experience" information underlying the Commonwealth's challenge, arguing:¹⁰⁶

First, Dr. Thompson's CDF calculation is not timely raised. If the CDF assumed by the Pilgrim SAMA analysis is "unrealistically low" after the Fukushima accident under Dr. Thompson's direct experience method, it was also unrealistically low long before Fukushima. Under Dr. Thompson's reasoning, there were two core melt accidents before Fukushima, Three Mile Island and Chernobyl. Two core melt accidents over approximately 14,484 years of reactor operations results in a

¹⁰¹ Fukushima Contention at 6-7.

¹⁰² NRC Staff Opposition to Fukushima Contention at 13.

¹⁰³ Id. at 14.

¹⁰⁴ Id.

¹⁰⁵ Entergy Answer to Waiver Petition and Fukushima Contention at 21.

¹⁰⁶ Because of the fundamental import of these arguments to our decision, we repeat Entergy's response nearly verbatim.

“direct experience” CDF of approximately 1.4E-04 per reactor year, or approximately four times higher than the CDF assumed in the Pilgrim SAMA. At the time the Pilgrim LRA was submitted five years ago, there were approximately 2,200 fewer reactor years of operation experience than there are now (five years multiplied by 440 operating units). Hence, at the time the initial opportunity for hearing was announced, the direct experience method would have revealed a CDF of 1.6E-04 per reactor year, or five times more than that assumed in the Pilgrim SAMA analysis. Under Dr. Thompson’s rationale, the Pilgrim SAMA analysis CDF has been deficient since the outset of the proceeding, and therefore Dr. Thompson’s direct experience challenge to Pilgrim’s SAMA analysis is not timely raised now.¹⁰⁷

Entergy goes on to discuss the Commonwealth’s renewed claims respecting spent fuel issues, asserting that nothing new or materially different regarding spent fuel issues is raised.¹⁰⁸

Entergy notes that the Commonwealth raised the same issue in its appeal of the Commission’s Rulemaking Denial to the U.S. Court of Appeals for the Second Circuit.¹⁰⁹

Entergy then argues that the Commonwealth’s claim that “excessive secrecy degrades the licensee’s capability to mitigate an accident at the Pilgrim NPP” is a policy issue unrelated to any SAMA or NEPA issue.¹¹⁰

As to hydrogen explosion issues, Entergy provides affidavit support for the position that the potential for hydrogen explosions is not new, but rather has been recognized by the industry since the Three Mile Island accident, and regulations are in place to ensure that combustible gases are controlled to minimize this potential.¹¹¹ Further to the point, Entergy notes that Dr. Thompson does not point out any respect in which he claims that the Pilgrim SAMA

¹⁰⁷ Id. at 22-23.

¹⁰⁸ Id. at 23-25.

¹⁰⁹ Id. at 25 (citing Brief of Petitioners at 33-34, New York v. NRC, 589 F.3d 551 (2nd Cir. 2009) (No. 08-3903-ag(L))).

¹¹⁰ Id. at 25 (quoting Fukushima Contention at 7).

¹¹¹ Id. at 26 (citing id., Att., Declaration of Joseph R. Lynch, Lori Ann Potts, and Dr. Kevin R. O’Kula in Support of Entergy’s Answer Opposing Commonwealth Claims of New and Significant Information Based on Fukushima ¶ 76 [hereinafter Lynch, Potts, and O’Kula Declaration] and 10 C.F.R. § 50.44).

inadequately considered hydrogen explosions.¹¹² Thus, argues Entergy, there is no new or materially different information from Fukushima that was not already accounted for in the Pilgrim SAMA analysis.¹¹³

Finally, Entergy points out that the installation of a filtered direct torus vent (DTV) was considered in Pilgrim's SAMA analysis and subsequent responses to NRC requests for additional information, and that the accidents at Fukushima have revealed no new or materially different information not already considered in Pilgrim's SAMA analysis.¹¹⁴

Addressing the alternative means to satisfy Section 2.326(a)(1), the Commonwealth asserts its contention presents an exceptionally grave issue for three reasons:

First, the Fukushima accident shows that a severe reactor and/or spent-fuel-pool accident is significantly more likely than estimated or assumed in the NRC's current environmental analyses for the Pilgrim NPP. Second, the experience of the Fukushima accident shows that the accident mitigation measures relied on by the NRC are inadequate to prevent the type of catastrophic damage at Pilgrim that has occurred at Fukushima. Finally, the Fukushima accident shows how corrosive and debilitating to accident responders is the high level of secrecy that the NRC has maintained with respect to accident mitigation measures, thereby contributing to the use of ineffective measures at Fukushima. Accident mitigation measures (excluding sensitive, site-specific details) should be subject to public scrutiny in an appropriate environmental review process, which includes those with primary emergency responsibilities such as the Commonwealth, in order to ensure that they are known to emergency personnel and have been adequately evaluated for effectiveness.¹¹⁵

Entergy answers that, because exceptionally grave is interpreted to mean "a sufficiently grave threat to public safety," since the Commonwealth's contention does not regard any safety issue but seeks only revised environmental analyses in light of the purportedly new information,

¹¹² Id.

¹¹³ Id. (citing Lynch, Potts, and O'Kula Declaration ¶¶ 79-88).

¹¹⁴ Id. (citing Lynch, Potts, and O'Kula Declaration ¶¶ 92-99).

¹¹⁵ Motion to Admit and Reopen at 10-11 (emphasis added) (citing Thompson Declaration ¶ 15 and Thompson Report).

there is nothing in the Fukushima Contention that can be characterized as exceptionally grave.¹¹⁶

(ii) Does the motion address a significant safety or environmental issue?

Addressing the requirements of Section 2.326(a)(2), the Commonwealth asserts the contention raises a significant environmental issue for the same reasons that it presents an exceptionally grave issue: the Fukushima accident shows that (1) the Pilgrim environmental analyses underestimates the likelihood of a severe reactor and/or spent fuel pool accident; (2) the NRC is relying on inadequate accident mitigation measures; and (3) the NRC's high level of secrecy about accident mitigation measures debilitates accident responders.¹¹⁷

As to the specific assertion that a significant environmental issue was raised, Entergy refers us to the standard adopted by the Commission that "the allegedly new and significant information must 'paint a seriously different picture of the environmental landscape.'"¹¹⁸ Entergy asserts that bare assertions and speculation do not supply the requisite support to satisfy the Section 2.326 standards; i.e., a mere showing that changes to the SAMA analysis results are possible or likely or probable is not enough.¹¹⁹ Entergy asserts that the Commonwealth's own pleadings ("likely to affect" and "may prove to be") demonstrate its assertions are speculative.¹²⁰ Entergy explains that Dr. Thompson's declaration is also speculative and void of connection to

¹¹⁶ Entergy Answer to Waiver Petition and Fukushima Contention at 27.

¹¹⁷ Motion to Admit and Reopen at 10 (citing Thompson Declaration ¶ 15 and Thompson Report).

¹¹⁸ Entergy Answer to Waiver Petition and Fukushima Contention at 28 (quoting Private Fuel Storage, L.L.C. (Independent Spent Fuel Storage Installation), CLI-06-03, 63 NRC 19, 28 (2006) [hereinafter Private Fuel Storage II]).

¹¹⁹ Id. (quoting AmerGen Energy Company, LLC (Oyster Creek Nuclear Generating Station), CLI-09-7, 69 NRC 235, 287 (2009) and AmerGen Energy Company, LLC (Oyster Creek Nuclear Generating Station), CLI-08-28, 68 NRC 658, 670, 674 (2008) [hereinafter Oyster Creek I]).

¹²⁰ Id. at 28-29 (quoting Fukushima Contention at 5, 9) (emphasis added by Entergy).

the Pilgrim SAMA analysis or the Pilgrim Environmental Report.¹²¹ Like Entergy, Staff avers the motion to reopen the record should be denied for failing to satisfy 10 C.F.R. § 2.326(a)(2);¹²² the Commonwealth has not

demonstrated that the . . . contention raises a significant environmental issue. . . . Because [the Commonwealth's] claims challenge the GEIS and the SAMA analysis, which is a part of the NRC's environmental review, the . . . contention raises an environmental issue.¹²³

Noting that there is no precise definition of the level of issue necessary to be "significant," Staff asserts the proper standard can be determined by analogy to an Appeal Board decision regarding the significance of safety contentions stating that to demonstrate a significant safety issue, "petitioners 'must establish either that uncorrected . . . errors endanger safe plant operation, or that there has been a breakdown of the quality assurance program sufficient to raise legitimate doubt as to the plant's capability of being operated safely.'"¹²⁴ Based on this logic, Staff states:

The Thompson Report discusses none of the site specific risks at Pilgrim that are discussed in the FSEIS and lacks sound, technical analyses that compare the site characteristics of the Pilgrim and Fukushima plants. . . . Consequently, [the Commonwealth] cannot claim, based on the events at Fukushima, that the Pilgrim plant presents a unique threat to public health and safety.

[The Commonwealth] also has not shown that the issue it seeks to raise constitutes a significant environmental issue that requires the Board to make an exception and re-open a closed record. [The Commonwealth] seeks to ensure compliance with NEPA. But, the courts have often observed that NEPA is a procedural statute that does not mandate any particular results. . . .

In fact, Dr. [S. Tina] Ghosh and Dr. Nathan Bixler recently explained in a June 6, 2011 affidavit, in response to Pilgrim Watch's request for hearing on a new SAMA contention, "that the SAMA analysis is not a safety analysis; it is a cost-

¹²¹ Id. at 29.

¹²² NRC Staff Opposition to Fukushima Contention at 13.

¹²³ Id. at 10.

¹²⁴ Id. at 10–11 (quoting Public Service Company of New Hampshire (Seabrook Station, Units 1 and 2), ALAB-940, 32 NRC 225, 243 (1990)).

benefit analysis for the purpose of identifying cost-beneficial mitigation alternatives that existing plant examinations missed.” Thus, the SAMA analysis has no direct safety or environmental significance.¹²⁵

The Commonwealth, in its Reply, responds:

The Staff’s position that SAMAs are legally insignificant is incorrect as a matter of law. As the Council on Environmental Quality recognizes, consideration of alternatives “is the heart of the environmental impact statement.” Consistent with NEPA’s requirement to consider alternatives, the NRC’s Severe Reactor Accidents Policy Statement commits the Commission to “take all reasonable steps to reduce the chances of occurrence of a severe accident involving substantial damage to the reactor core and to mitigate the consequences of such an accident should one occur.” . . .

Moreover, the Staff misses the point of the Commonwealth’s contention, which is that new information shows the existence of previously unconsidered accident vulnerabilities that increase the environmental impacts of re-licensing Pilgrim and therefore the outcome of the cost-benefit analysis of alternatives. The Fukushima accident brings severe accident statistics worldwide to a level which is well above the generally accepted goals for nuclear safety of no more than one accident per 100,000 reactor year.¹²⁶

Responding to the Staff’s use of the word “unique,” the Commonwealth argues

NEPA contains no requirement that environmental impacts must be particular to a facility in order to be worthy of consideration in an EIS. The only relevant question is whether the experience of the Fukushima accident shows that the potential for a severe accident at the Pilgrim nuclear plant is significantly greater than previously considered in the environmental analyses for Pilgrim – and the Commonwealth has met that standard of proof, based upon expert testimony and the NRC’s own past practice and pronouncements on the significance of direct experience to evaluate risk.¹²⁷

- (iii) Does the motion demonstrate that a materially different result would be or would have been likely had the newly proffered evidence been considered initially?

And, finally, as to the requirements of 2.326(a)(3), the Commonwealth asserts that a materially different result would be likely because the NRC would have considered a

much broader and more rigorous array of severe accident mitigation alternatives (SAMAs) than have been previously considered, including systems for hydrogen

¹²⁵ Id. at 12 (citations omitted).

¹²⁶ Reply for Waiver Petition and Fukushima Contention at 7-8 (internal citations omitted).

¹²⁷ Id. at 9.

control, containment venting, and replacement of high-density spent fuel storage racks with low-density, open-frame racks.¹²⁸

Entergy and the NRC Staff aver that the contention fails to demonstrate that a materially different result would be obtained had the asserted new information been considered ab initio.¹²⁹

Entergy notes that the Commonwealth has a “deliberatively heavy” burden to demonstrate that a materially different result would be likely, and that is it not sufficient simply to raise an issue:

“Rather, ‘longstanding agency practice hold[s] that a party seeking to reopen a closed record to introduce a new issue . . . must back its claim with enough evidence to withstand summary disposition when measured against its opponent’s contravening evidence.’”¹³⁰ Entergy points

out that “no reopening of the evidentiary hearing will be required if the documents submitted in response to the motion demonstrate that there is no genuine unresolved issue of fact.”¹³¹

Entergy’s asserts its experts’ declaration “shows that there is no genuine unresolved issue of material fact.”¹³²

Staff and Entergy assert that their experts’ declarations refute Dr. Thompson’s claim that direct experience shows that “the licensee has underestimated the baseline CDF [(core damage

¹²⁸ Motion to Admit and Reopen at 11 (citing Thompson Declaration ¶¶ 16 and Thompson Report § VI).

¹²⁹ Entergy Answer to Waiver Petition and Fukushima Contention at 31; NRC Staff Opposition to Fukushima Contention at 8.

¹³⁰ Entergy Opposition to Fukushima Contention at 30 (quoting Private Fuel Storage, L.L.C. (Independent Spent Fuel Storage Installation), CLI-05-12, 61 NRC 345, 348 (2005) [hereinafter Private Fuel Storage I]).

¹³¹ Id. at 30-31 (quoting Private Fuel Storage I, CLI-05-12, 61 NRC at 350).

¹³² Id. at 31.

frequency)] of the Pilgrim plant by an order of magnitude."¹³³ Entergy asserts its experts' declaration explicitly demonstrates that Dr. Thompson's "direct experience" method

is not a scientifically accepted approach because it has no basis in logic, has never been used to calculate a CDF, and violates fundamental precepts of PRA developed and used throughout the nuclear industry, including regulation by the NRC. . . . [and] is inherently invalid in that it does not provide an appropriate statistical basis for calculating the CDF for Pilgrim.¹³⁴

Entergy elaborates that

Dr. Thompson's direct experience CDF method directly contradicts fundamental precepts of PRA developed and used throughout the nuclear industry, including regulation by the NRC for the past 36 years. Under well-established NRC precedent, practice and regulatory guidance, PRAs are based on specific reactor and containment design, operating procedures, and site considerations for evaluating overall vulnerabilities, establishing prioritization of potential improvements, and for purposes of making risk-informed decisions. Utilizing design-specific and site-specific information is critical to obtain meaningful results because many nuclear plants have significant differences in design and siting that directly affect the probability of a core damage event. Dr. Thompson's direct experience CDF method would nevertheless establish one CDF for all plants with no distinction for design and site differences. Dr. Thompson's method ignores and fails to take into account plant-unique site conditions, plant design, support system dependencies, plant maintenance procedures, plant operating procedures, operator training, and the dependencies all of which directly affect and influence the CDF estimate for a specific plant.¹³⁵

The Staff's expert, Dr. Ghosh, also criticizes the direct experience method because it "does not consider that each power plant has different risks that are based on the design of the plant, the site location, and site geography among other things."¹³⁶ The Staff also points out that Dr. Thompson does not discuss any of that in depth.¹³⁷

¹³³ NRC Staff Opposition to Fukushima Contention at 8 (quoting Thompson Report at 17); see also Entergy Answer to Waiver Petition and Fukushima Contention at 31 (citing Thompson Report at 17).

¹³⁴ Entergy Answer to Waiver Petition and Fukushima Contention at 31 (citing Lynch, Potts, and O'Kula Declaration ¶¶ 16-18, 33-34).

¹³⁵ Id. at 31-32 (citing Lynch, Potts, and O'Kula Declaration ¶¶ 18-24).

¹³⁶ NRC Staff Opposition to Fukushima Contention at 9 (citing Ghosh Affidavit at 2).

¹³⁷ Id.

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Entergy concludes that

[a]ppplied to the facts and circumstance here, Dr. Thompson's direct experience CDF method would have Pilgrim and all other plants arbitrarily increase their CDF even though they may never be subject to a tsunami nor, if subject, may be able to mitigate the event so as to suffer no core damage.

For similar reasons, Dr. Thompson's direct experience method is inherently inadequate to estimate the CDF for Pilgrim in that it does not provide a sufficient or appropriate statistical basis for doing so. . . . The inappropriateness of using Dr. Thompson's direct experience method for calculating the CDF is highlighted by the fact that none of the five core-melt data points in Dr. Thompson's database are applicable to Pilgrim.¹³⁸

The Staff also points out:

[T]he contention, as framed by [the Commonwealth], raises issues that either were previously considered and rejected by the Board and the Commission or were found to not demonstrate that there would be a materially different result if the events of Fukushima are considered. The Staff has already considered spent fuel pool accidents similar to the events referenced in [the Commonwealth's] Contention, and those results have been represented in the GEIS. Nothing known about the FDNPP accident indicates a significant environmental impact not previously considered in the GEIS. Therefore, issues 2 ("operator actions"), 3 ("secrecy"), and 5 ("spent fuel pool fires") are not subject to legal challenges under the re-opening and contention admissibility rules.¹³⁹

Turning to the Commonwealth's assertions about spent fuel pool accidents,¹⁴⁰ Entergy, relying upon, and citing to as relevant, its experts' affidavits, asserts that there again, the Commonwealth has failed to demonstrate that a materially different result would be likely had their allegedly new and significant information been considered initially, and that Entergy's Declaration shows that there is no genuine unresolved issue of material fact.¹⁴¹

¹³⁸ Entergy Answer to Waiver Petition and Fukushima Contention at 34-35 (citing Lynch, Potts, and O'Kula Declaration at ¶ 23).

¹³⁹ NRC Staff Opposition to Fukushima Contention at 7-8 (internal footnotes and citations omitted).

¹⁴⁰ Notwithstanding our denial of the Commonwealth's requested waiver of our spent fuel pool accident exclusionary regulations, we address these matters here for completeness.

¹⁴¹ See Entergy Answer to Waiver Petition and Fukushima Contention at 31, 36-40.

Regarding hydrogen generation, the NRC Staff continues:

Next, the Thompson Report asserts that generation of hydrogen during a reactor accident is a problem and discusses the flaws associated with Mark I reactor containments. Though Dr. Thompson attempts to draw comparisons that “the Pilgrim NPP and the NPPs involved in the Fukushima accident each have a low-volume, pressure-suppression containment[,]” the analysis stops short of analyzing how this general design observation would materially alter the current Pilgrim SAMA analysis. . . .

The report lacks any detailed discussion of how the Mark I reactor containment design at Fukushima is similar or different from the design at the Pilgrim plant, the site-specific risks and hazards at the Pilgrim plant, or how the operation at Fukushima and Pilgrim might differ. In addition, while Dr. Thompson concludes in the report that “filtered venting of containment should be considered in a redone SAMA analysis for Pilgrim,” the report ignores the FSEIS discussion identifying filtered vents as one of the candidate SAMAs.¹⁴²

Entergy argues that Dr. Thompson’s claims that hydrogen explosions experienced at Fukushima could be replicated at the Pilgrim plant, and that the potential for such explosions has not been adequately considered in Pilgrim’s SAMA analysis, that containment venting and other hydrogen control systems at Pilgrim should be upgraded, and that the plant should be modified to use passive mechanisms as much as possible, are not justified in light of what actually occurred at Fukushima.¹⁴³ Entergy avers that Dr. Thompson “nowhere references or addresses the Pilgrim SAMA analysis’s extensive consideration of hydrogen explosions, let alone provide[s] any explanation of how any of it is inadequate.”¹⁴⁴ Referring extensively to its experts’ Declaration, Entergy observes that the potential for hydrogen explosions is not new information; both design features and regulations are in place at Pilgrim to control hydrogen generation and to prevent hydrogen explosions within the primary containment.¹⁴⁵ In particular,

¹⁴² NRC Staff Opposition to Fukushima Contention at 9–10 (internal footnotes and citations omitted).

¹⁴³ Entergy Answer to Waiver Petition and Fukushima Contention at 41.

¹⁴⁴ *Id.*

¹⁴⁵ Entergy Answer to Waiver Petition and Fukushima Contention at 42 (citing Lynch, Potts, and O’Kula Declaration ¶ 76).

the Pilgrim primary containment is inert, i.e., filled with non-combustible nitrogen gas, and Pilgrim's procedures for containment venting assure that sufficient hydrogen does not accumulate within the primary containment.¹⁴⁶ For example, based on the data from Fukushima, Entergy states that the Pilgrim venting procedures would require venting of the primary containment long before that action was undertaken at Fukushima.¹⁴⁷ In further contrast to the events at Fukushima, Entergy points out that, "[a]t Pilgrim the authority to vent the containment rests with the control room Shift Manager, rather than a government official, as appears to have been the case at Fukushima."¹⁴⁸ Moreover, states Entergy,

the potential for hydrogen explosions within either the primary or secondary containments has been fully considered in the Pilgrim SAMA analysis. Specifically, hydrogen explosion within the primary containment is considered a credible mechanism for early primary containment failure, which considers the potential loss of containment integrity at or before reactor pressure vessel failure.¹⁴⁹

Entergy observes that

Table E.1-5 of the Environmental Report specifically identifies a functional event node that considers failure of the primary containment vessel due to hydrogen explosion. Several collapsed accident progression bins ("CAPBs"), which represent the consequence radioactive source terms that are used to evaluate postulated accident consequences in the SAMA analysis, include accident sequences in which early containment failure occurs. Thus, hydrogen explosion is considered in these CAPBs. Similarly, the potential for hydrogen explosion in the reactor building has been considered, because the SAMA analysis considers the ability of the reactor building to retain fission products released from containment.¹⁵⁰

¹⁴⁶ Id. (citing Lynch, Potts, and O'Kula Declaration ¶¶ 76-77).

¹⁴⁷ Id. (citing Lynch, Potts, and O'Kula Declaration ¶ 77).

¹⁴⁸ Id. (citing Lynch, Potts, and O'Kula Declaration ¶ 77).

¹⁴⁹ Id. (citing Lynch, Potts, and O'Kula Declaration ¶¶ 79-88).

¹⁵⁰ Id. at 42-43 (citing Lynch, Potts, and O'Kula Declaration ¶¶ 83, 85-87).

Entergy points out that Dr. Thompson “nowhere references, discusses, or otherwise disputes the means by which hydrogen explosion are already considered in the Pilgrim SAMA analysis.”¹⁵¹

Entergy asserts that, as demonstrated in a report prepared by the Government of Japan on the Fukushima accident (the Japanese Government Report) and confirmed by the International Atomic Energy Agency (IAEA) Mission Report on Fukushima, it is clear that the Fukushima hydrogen explosions occurred in the reactor buildings, or secondary containments, of Units 1 and 3.¹⁵² Entergy points out that “[t]his distinction is important because the primary containment is the robust concrete-reinforced steel structure designed to contain radioactive releases from any damage to the reactor vessel.”¹⁵³ At Fukushima Units 1 and 3, Entergy states,

although the leakage pathways have not been identified, hydrogen and radioactive material leaked into the secondary containment and then exploded. The result is that some gases that were intended to be released into the environment first collected in the reactor building and then were released into the environment with the explosion.¹⁵⁴

Entergy states that “[t]his sequence of events stands in stark contrast to what could have occurred had the primary containments themselves suffered catastrophic failures from hydrogen explosions.”¹⁵⁵

¹⁵¹ Id. at 43 (citing Lynch, Potts, and O’Kula Declaration ¶ 88).

¹⁵² Id. at 41 (citing Lynch, Potts, and O’Kula Declaration, Exh. 4, Nuclear Emergency Response Headquarters, Government of Japan, Report of Japanese Government to the IAEA Ministerial Conference on Nuclear Safety – The Accident at TEPCO’s Fukushima Nuclear Power Stations (June 2011) [hereinafter Japanese Government Report] and Lynch, Potts, and O’Kula Declaration, Exh. 5, Michael Weightman et al., IAEA International Fact Finding Expert Mission of the Fukushima Dai-Ichi NPP Accident Following the Great East Japan Earthquake and Tsunami (May 24-June 2, 2011) [hereinafter IAEA Report]).

¹⁵³ Id. at 41-42 (citing Lynch, Potts, and O’Kula Declaration ¶ 73).

¹⁵⁴ Id. at 42 (citing Lynch, Potts, and O’Kula Declaration ¶ 73).

¹⁵⁵ Id. (citing Lynch, Potts, and O’Kula Declaration ¶ 73).

Further, Entergy asserts that Dr. Thompson's claims regarding the alleged secrecy of mitigative measures do not concern either NEPA or SAMA analysis, and are therefore not pertinent here.¹⁵⁶

(iv) Is the motion supported by an expert affidavit?

The Commonwealth asserts, addressing the requirement for an expert affidavit set out in Section 2.326(b), that its motion is supported by the declaration of an expert, Dr. Thompson, that sets forth the factual and/or technical bases for the Commonwealth's claims that the criteria of 10 C.F.R. § 2.326(a) have been satisfied.¹⁵⁷ The Commonwealth further asserts that the Thompson Supplemental Declaration also sets forth those bases.¹⁵⁸

Entergy disagrees, asserting that the Commonwealth's contention is not supported by the requisite expert affidavit, noting that 10 C.F.R. § 2.326(b) requires that a supporting affidavit "be given by competent individuals with knowledge of the facts alleged, or by experts in the disciplines appropriate to the issues raised."¹⁵⁹ Referring us to the principle that the party sponsoring a witness has the burden of demonstrating his or her expertise, Entergy asserts that Dr. Thompson's "Declaration and Curriculum Vitae fail to show that he has the requisite education, training, skill, or experience in the operation of a nuclear power plant or in PRA . . . to support [the] Commonwealth's Contention."¹⁶⁰

¹⁵⁶ Id. at 40.

¹⁵⁷ Motion to Admit and Reopen at 12 (citing Thompson Declaration and Thompson Report).

¹⁵⁸ Motion to Supplement at 11.

¹⁵⁹ Entergy Answer to Waiver Petition and Fukushima Contention at 18 (quoting 10 C.F.R. § 2.326(b)); Entergy Opposition to Motion to Supplement at 20 n.17 (quoting 10 C.F.R. § 2.326(b)).

¹⁶⁰ Entergy Answer to Waiver Petition and Fukushima Contention at 18-19 (quoting Pacific Gas and Electric Company (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-410, 5 NRC 1398, 1405 (1977)).

Entergy avers that Dr. Thompson's "'simplistic' method for calculating CDF entirely disregards the detailed design-, plant type-, and site-specific PRA analysis that identifies initiating events and their likelihood of potentially leading to core damage used to establish the CDF, subsequent reactor containment release, and environmental release conditions."¹⁶¹

b. The Requirements of 10 C.F.R. § 2.309(c)

As to being based upon information which was not previously available, the Commonwealth alleges it demonstrates the Fukushima accident has produced new and significant information (which it has detailed as we noted above) and that "the risk of core melt accident[s] is an order of magnitude higher than estimated in Supp. 29 of the License Renewal GEIS."¹⁶²

They also assert that "the Fukushima accident conclusively showed that the types of mitigative measures that the NRC relied on . . . were ineffective to stop the progression of a very serious spent fuel pool accident,"¹⁶³ but note that "[w]hile affirmative evidence of a pool fire has not emerged at this writing, nothing about the accident has contradicted Dr. Thompson's view that the Pilgrim spent fuel poses a serious risk of fire if water is lost from the pool."¹⁶⁴

As to the requirement that the information on which the contention is based is materially different than information previously available, the Commonwealth asserts (referring to the Thompson report at 14-18) a material difference because their new contention "is based primarily on the actual occurrence and experience of a radiological accident, as contrasted with

¹⁶¹ Id. at 19 (citing Lynch, Potts, and O'Kula Declaration ¶¶ 24-28).

¹⁶² Fukushima Contention at 2. The Commonwealth also asserts that the accident confirmed the Commonwealth's previously aired concerns that spent fuel pools present unacceptable environmental risks. Id.

¹⁶³ Id. at 2-3.

¹⁶⁴ Id. at 2 (citing Thompson Report at 26-27).

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predictions of the behavior of an accident based on probabilistic risk assessment.”¹⁶⁵ The Commonwealth then concludes that “the experience of the Fukushima accident provides new insights into the probability of reactor core melt events, the potential duration of station blackouts, the effectiveness of mitigative measures, and the behavior of spent fuel pools under accident conditions.”¹⁶⁶

And, finally, the Commonwealth asserts that because the releases from Fukushima are ongoing, the NRC is studying the information and the practice of the NRC is to consider filings made within 30 days of an event timely, this filing is timely.¹⁶⁷

Addressing the requirements of 2.309(c), the Commonwealth argues that it satisfies the first and most important factor – “good cause” – because it “filed the contention while information is still being released about the accident, and within the same time frame as the NRC’s initial study of the implications of the Fukushima accident.”¹⁶⁸ As to other factors (all of which are addressed by the Commonwealth), we note that, as to the requirement of 10 C.F.R. § 2.309(c)(1)(vii), the Commonwealth states that “while the Commonwealth’s participation may broaden or delay the proceeding . . . , this factor may not be relied on to exclude the contention, because the NRC has a non-discretionary duty to consider new and significant information that arises before it makes its licensing decisions.”¹⁶⁹

¹⁶⁵ Motion to Admit and Reopen at 3 (citing Thompson Report at 14-18).

¹⁶⁶ Id.

¹⁶⁷ Id. at 4-5.

¹⁶⁸ Id. at 6.

¹⁶⁹ Id. at 8 (citing Marsh v. Oregon Natural Res. Council, 490 U.S. 360 (1989)).

Entergy answers that Commonwealth has not demonstrated good cause for its late filing and the balancing of the remaining factors of Section 2.309(c) does not overcome that failing.¹⁷⁰ Entergy explains that this failure is for the same reasons the contention is not timely under Sections 2.326(a)(1) and 2.309(f)(2) and that the information available from the Fukushima accident is insufficient grounds for lateness.¹⁷¹ Noting that the Commission grants considerable weight to the seventh and eighth factors in performing the balancing of the remaining factors, Entergy observes that: "With regard to the seventh factor, adding a new contention will, without a doubt, significantly delay and broaden this proceeding, which is already into its sixth year. Indeed, the Commonwealth concedes the point."¹⁷² Similarly, Entergy takes the position that the eighth factor also weighs against admission because, it asserts, Dr. Thompson "is not qualified to opine on the issues raised concerning nuclear operations and PRA analysis."¹⁷³ Further, Entergy asserts it has demonstrated that "no materially different result would be likely were the Commonwealth's claims considered."¹⁷⁴ Thus Entergy asserts that this contention fails to satisfy the requirements for admissibility of nontimely contentions.¹⁷⁵

Staff discussed timeliness in its response to the Section 2.326(a)(i) requirements.¹⁷⁶ The essence of Staff's argument is that, because the information is still developing and incomplete

¹⁷⁰ Entergy Answer to Waiver Petition and Fukushima Contention at 54. Entergy also addresses the requirements of Section 2.309(f)(2). Id. at 21-22.

¹⁷¹ Id. at 55.

¹⁷² Id. at 56 (citing Motion to Admit and Reopen at 8).

¹⁷³ Id. at 57.

¹⁷⁴ Id.

¹⁷⁵ See id.

¹⁷⁶ NRC Staff Opposition to Fukushima Contention at 13-16.

(by the Commonwealth's own admission), it is premature to bring this contention and it is therefore not timely.¹⁷⁷

In addition, Staff addresses, in part, the requirements of 2.309(c), although it does not address the dominant "good cause" factor. Staff avers, as to the seventh factor that

though the Commission does not afford 10 C.F.R. § 2.309(c)(1)(vii) the same amount of weight as the good cause factor, the Commission has placed a significant amount of weight on this factor due to the "policy of expediting the handling of license renewal applications – which rests on the lengthy lead time necessary to plan available sources of electricity." Granting a petition to reopen the record and adding a new contention would "necessarily broaden the issues ... and delay the proceeding" thus requiring "the reopening [of] a closed administrative adjudicatory record." The Commission found § 2.309(c)(1)(vii) to weigh against the petitioner.

....

... [Furthermore] the information relied on by [the Commonwealth's] Contention is incomplete and raises spent fuel pool accident claims that have already been rejected. The impact of the events at Fukushima on the Commission's policies, procedures and regulations are unknown at this time and a full report by the NRC Task Force addressing this question is imminent. These issues are not susceptible to resolution in an individual license renewal proceeding and could reach a result that is ultimately inconsistent with the Commission's response to Fukushima.

Assuming [the Commonwealth] was allowed to litigate the ... Contention, the Board would be forced to significantly delay the close of this proceeding and set a second, later schedule for litigation of this new contention that would need to address broad policy and legal issues. Without adequate justification, this scenario runs afoul of the Commission's policy of expediency in these types of proceedings. Thus, the addition of the ... Contention would broaden the issues and unjustifiably delay the proceeding.

Regarding the eighth factor, [the Commonwealth] could not contribute to the development of a sound record for the same reasons that it could not satisfy the seventh factor. And, contrary to [the Commonwealth's] arguments on this factor, Dr. Thompson's report does not demonstrate with sufficient detail how the events at Fukushima would materially alter the current Pilgrim SAMA analysis nor has the report identified additional cost-beneficial SAMAs. Therefore, [the Commonwealth's] participation would not contribute to the development of a sound record.¹⁷⁸

¹⁷⁷ See id. at 13-14.

¹⁷⁸ Id. at 17-19 (internal citations omitted).

Therefore, asserts Staff, "by failing to present a compelling showing on the seventh and eighth factor, [the Commonwealth] has not satisfactorily met the eight factor balancing test," and the Motion should be denied.¹⁷⁹

c. The Requirements of 10 C.F.R. § 2.309(f)(1)

The Commonwealth provided the requisite statement of law or fact to be controverted,¹⁸⁰ and supplies the Thompson Declaration, the Thompson Supplemental Declaration and the Thompson Report which go toward satisfaction of the requirements of 10 C.F.R. § 2.309(f)(1)(ii).¹⁸¹

As regards the requirements for an admissible contention under 10 C.F.R. § 2.309(f)(1)(iii), the Commonwealth asserts the contention is within the scope of this proceeding because it "seeks compliance with a legal requirement for the re-licensing of the Pilgrim NPP, i.e., consideration of new and significant information that could have an effect on the outcome of the environmental analysis for the Pilgrim NPP."¹⁸²

As regards the requirements for an admissible contention under 10 C.F.R. § 2.309(f)(1)(iv), the Commonwealth asserts that the contention is material to the findings the NRC must make because "some previously rejected or ignored SAMAs may prove to be cost effective in light of the experience of the Fukushima accident."¹⁸³

As regards the requirements for an admissible contention under 10 C.F.R. § 2.309(f)(1)(iv) – (vi), the Commonwealth asserts that there is a genuine dispute of material fact because Dr. Thompson's declarations and report

¹⁷⁹ Id. at 19.

¹⁸⁰ See 10 C.F.R. § 2.309(f)(1)(i).

¹⁸¹ Motion to Admit and Reopen at 8.

¹⁸² Id.

¹⁸³ Id. at 9.

demonstrate[] – either conclusively or provisionally – that the environmental impacts of re-licensing the Pilgrim NPP are significantly greater than estimated or assumed by the license applicant and the NRC. Therefore the environmental impact analysis for the Pilgrim NPP should be re-evaluated and the SAMA analysis should be revised to consider mitigative measures that previously may have been ignored or rejected.¹⁸⁴

Entergy answers that the Commonwealth's contention fails to satisfy the criteria for an admissible contention.¹⁸⁵ To begin, Entergy asserts that Dr. Thompson has not provided the necessary support for the contention to satisfy the requirements of Section 2.309(f)(1)(v) that the petition must provide a concise statement of the alleged facts or expert opinions that support the petitioner's position.¹⁸⁶ In this regard, in addition to the challenges earlier set out by Entergy to the qualifications of Dr. Thompson and to the substance of his report, Entergy asserts:

First, as previously discussed, the Commonwealth has failed to meet its burden to demonstrate that Dr. Thompson is competent to address the claims raised in his Report concerning nuclear operations, SAMAs, and PRA analysis. Without expert support for its assertions, the Commonwealth's Contention is not viable:

Further, the Thompson Report lacks reference to any source or support for the factual assertions and opinions contained therein. Specifically, Dr. Thompson's "direct experience" CDF calculation is not supported by any source or reference. Despite Dr. Thompson's proclamation that "[t]he probability of severe core damage and an accompanying radioactive release can be estimated in two ways[.]" he provides no reference or citation to any scientific report, study, analysis, peer-reviewed scientific journal article, or any other document of any type to support his bald claim. Dr. Thompson's methodology has never been used for calculating a CDF for PRA applications and is not a scientifically accepted approach. Under well-established NRC precedent, practice and regulatory guidance, PRAs are based on specific reactor and containment design, operating procedures, and site considerations for evaluating overall vulnerabilities, establishing prioritization of potential improvements, and for purposes of making risk-informed decisions. Dr. Thompson's methodology is novel, fails to adhere to any NRC practice and regulatory guidance, fails to account for operating procedures, and fails to take into account site and design differences. In fact, the Report fails to rely on or cite to any legitimate support, practice or procedure whatsoever.¹⁸⁷

¹⁸⁴ Id. at 10.

¹⁸⁵ Entergy Answer to Waiver Petition and Fukushima Contention at 57-58.

¹⁸⁶ Id. at 59.

¹⁸⁷ Id. at 59-60 (internal citations and footnotes omitted).

Indeed, Entergy further asserts, citing specific examples regarding consideration of hydrogen explosions and implementation of filtered vented containment) in the present LRA, that the contention fails to demonstrate the existence of a genuine dispute because:

Despite its numerous claims that the SAMA analysis needs to be redone, the Contention makes no reference or citation to the Pilgrim LRA and the SAMA analysis purportedly challenged here. Under the NRC's Rules of Practice, "a protestant does not become entitled to an evidentiary hearing merely on request, or on a bald or conclusory allegation that such a dispute exists. The protestant must make a minimal showing that material facts are in dispute, thereby demonstrating that an 'inquiry in depth' is appropriate."¹⁸⁸

Next, Entergy asserts (and, as we noted above, we agree) that all portions of the contention addressing issues regarding spent fuel pools are outside the scope of this proceeding, and therefore those portions fail to satisfy the requirements of 2.309(f)(1)(iii).¹⁸⁹ Also outside the scope of this proceeding, Entergy asserts, are challenges to the current licensing basis set out in the Commonwealth's assertions that "potentially cost beneficial SAMAs be incorporated into the plant's design basis; Pilgrim's spent fuel pool be equipped with low density, open-framed racks; and Pilgrim's DTV be equipped with filtered venting using passive mechanisms."¹⁹⁰

As to Commonwealth's secrecy claim, Entergy avers that the claim fails to satisfy the requirements of 10 C.F.R § 2.309(f)(1)(iv) because it "fails to demonstrate how public disclosure of the mitigative measures put in place after September 11 (referred to also as the EDMG's) is material to the findings the NRC must make" regarding the requested license renewal.¹⁹¹

Entergy points out that "[t]he Commonwealth cites no regulation or other basis showing that

¹⁸⁸ Id. at 62-64 (citation omitted).

¹⁸⁹ Id. at 60-61. The Commission stated in CLI-10-11: "Pilgrim Watch raises numerous new claims relating to spent fuel pool fires, and argues that the SAMA analysis is deficient for failing to address potential spent fuel pool accidents. These claims fall beyond the scope of NRC SAMA analysis and impermissibly challenge our regulations." CLI-10-11, 71 NRC at ___ (slip op. at 33) (internal citations and footnotes omitted).

¹⁹⁰ Id. at 61 (citing Thompson Report at 17-18, 25-26, 28-29).

¹⁹¹ Id. at 62.

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public disclosure of EDMGs is material to license renewal," and asserts that "public disclosure of the EDMG's is irrelevant to NEPA and certainly has no impact on the outcome of the SAMA analysis."¹⁹²

Staff answers that the contention does not satisfy the requirements of 10 C.F.R. § 2.309(f)(1)(iii) ("[d]emonstrate that the issue raised in the contention is within the scope of the proceeding"), (iv) ("[d]emonstrate . . . the contention is material to the findings the NRC must make"), and (vi) ("provide sufficient information to show that a genuine dispute exists with the applicant/licensee on a material issue of law or fact").¹⁹³ Staff also asserts that

[The Commonwealth] relies on the Thompson Report to challenge the Commission's previous findings excluding issues related to on-site storage of spent fuel under 10 C.F.R. Part 51, Subpart A, Appendix B. As discussed above, claims raised in relation to on-site storage of spent fuel are outside the scope of license renewal.¹⁹⁴

Further, Staff asserts that

Until, and unless, [the Commonwealth's] pending Waiver Petition is granted, [the Commonwealth's] claims are not litigable. Accordingly, "secrecy[,"] "operator actions[,"] and "spent fuel pool fires" claims should be dismissed for falling outside of the scope of license renewal. Because the claims are also immaterial to the findings that the Staff must make, the . . . Contention should be dismissed for failing to satisfy 10 C.F.R. § 2.309(f)(1)(iv).¹⁹⁵

Staff calls to our attention binding precedent holding that:

Because the record in this proceeding is closed, [the Commonwealth] must set forth the basis of its . . . Contention with "a degree of particularity in excess of the basis and specificity requirements contained in 10 C.F.R. § 2.714(b) [now § 2.309(f)(1)] for admissible contentions." See . . . Oyster Creek, CLI-08-28, 68 NRC at 668 ("Commission practice holds that the standard for admitting a new contention after the record is closed is higher than for an ordinary late-filed contention."). Support for [the Commonwealth's] Contention must "be more than mere allegations; it must be tantamount to evidence." In other words, the

¹⁹² Id. at 62 (internal citation omitted).

¹⁹³ NRC Staff Opposition to Fukushima Contention at 2.

¹⁹⁴ Id. at 21 (emphasis added).

¹⁹⁵ Id.

evidence must comport with the requirements for admissible evidence at hearing in § 2.337—it must be relevant, material, and reliable.¹⁹⁶

Staff in essence, then argues that the evidence supplied by the Commonwealth does not rise to the necessary standard, asserting, for example, that

[The Commonwealth] bases its contention on the events at Fukushima in Japan, but it does so without establishing the relevance of those events to Pilgrim in Massachusetts. The Thompson Report proposes that a SAMA analysis be redone based on the Fukushima events, because “[o]ne can reasonably find that the licensee has under-estimated the baseline CDF of the Pilgrim plant by an order of magnitude” based on “the occurrence of five core-damage events over a world-wide experience base” However, there is no discussion of how the increased CDF factors, based on all the plant experience throughout the world, would generically apply to an individual plant such as Pilgrim. And, the Thompson Report provides no technical analyses that refute the extensive study of plant-specific hazards and risks at Pilgrim and discussed in its FSEIS. As a result, Dr. Thompson has not shown that an increased CDF would materially alter the Pilgrim SAMA analysis.

The Thompson Report proposes that a SAMA analysis that considers station blackout and loss of power scenarios should be done, but as Dr. Ghosh explained in the affidavit “five of the seven potentially cost-beneficial SAMAs identified in the [Applicant’s Environmental Report] and as a result of the NRC’s SAMA review mitigate the loss-of-power scenarios . . . of which station blackout is a subset.” The Thompson Report does not refute the specific findings or make a demonstration of how an increased CDF baseline using his approach would likely result in identification of an additional potentially cost-beneficial SAMA analysis or that additional potentially cost-beneficial SAMAs will result. Therefore, there is no genuine issue in dispute with the license applicant.

The Thompson Report also asserts that filtered venting should be considered in a redone SAMA analysis for Pilgrim. However, the Pilgrim FSEIS did consider filtered venting as a candidate SAMA and it was determined not to be cost-beneficial. And, the Thompson Report does not refute these findings. . . . [Therefore], the Thompson Report does not demonstrate that the issues raised constitute the “heightened” showing of admissibility needed to reopen the record. Because [the Commonwealth] cannot demonstrate a genuine dispute with the applicant, the contention [fails to satisfy the requirements of 2.309(f)(1)(vi) and therefore] is inadmissible.¹⁹⁷

In its Reply, Commonwealth asserts that this is not the appropriate stage to determine that there is no genuine dispute of material fact by eliminating testimony from Dr. Thompson, noting:

¹⁹⁶ Id. at 20-21 (some citations omitted).

¹⁹⁷ Id. at 22-23 (emphasis added) (citations omitted).

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In their responses, the NRC Staff and Entergy submit expert declarations to dispute the opinions and analysis put forward by the Commonwealth's expert that, in light of the real world events at Fukushima, certain material inputs or assumptions in Entergy's SAMA analysis are flawed, have produced a SAMA that significantly understates the risk of continued plant operation, and do not take account of additional SAMA analysis which could be identified as potentially cost-beneficial. This dispute of expert opinion and fact is the best evidence that a material dispute exists between the parties on an issue (SAMA analysis) material to relicensing.¹⁹⁸

3. Ruling on Commonwealth Fukushima Contention

a. The Commonwealth has not satisfied the requirements of 10 C.F.R. § 2.326(a) for reopening the closed record.

The requirements of 10 C.F.R. § 2.326(a)(1). As to the requirement that the motion must be timely,¹⁹⁹ we agree that Commonwealth has filed a pleading respecting information regarding the accident at Fukushima within the timeframe which would be considered timely if all that were at issue were a claim based wholly upon information produced by the Fukushima accident and/or the Near-Term Task Force Report.²⁰⁰ The Commonwealth asserts, as we mentioned above, that the new information from the Fukushima accident advises that analysis must utilize data respecting the actual occurrence of radiological release rather than the probabilistic analysis used in the present LRA, and the Commonwealth avers that new

¹⁹⁸ Reply for Waiver Petition and Fukushima Contention at 3 (citation omitted).

¹⁹⁹ We address later the proviso that an exceptionally grave issue may be considered in the discretion of the presiding officer even if untimely presented.

²⁰⁰ Although the Staff make powerful arguments that the contention is untimely (premature) because information is still being developed from the accident at Fukushima, NRC Staff Opposition to Fukushima Contention at 13-16; the Commonwealth asserts it is compelled to raise this matter now because of the rapidly approaching date of expiration of the existing license for Pilgrim (or, conversely, the date for commencement of a license renewal term, if the renewal is granted). Fukushima Contention at 4 n.6. All parties recognize that information is continuing to be developed and that it would be preferable to await more complete information. And, we must be cognizant of the Commission's view, stated in this proceeding when it ruled on the petitions to suspend licensing activities, that it is unnecessary to cease current licensing activities at this juncture because it has authority to, and will address, these matters with future rulemaking and requirements to be applied to then-operating plants if the information it obtains from the Fukushima accidents so warrants. See Callaway, CLI-11-05, 74 NRC at ___ (slip op. at 25-26).

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information is now available regarding the probability of core melt, station blackout duration, the effectiveness of mitigation measures (including the potential benefits of filtered containment venting), and the import of spent fuel accidents.²⁰¹

Connecting these events to Pilgrim, Commonwealth asserts that the assumptions used in the Pilgrim SAMA analyses are demonstrated to be in error by the facts of the Fukushima accident and three other core-damaging events which have occurred at commercial power reactors worldwide (i.e., by its "direct experience" information).²⁰² To begin our analysis of the timeliness question and the relevance of the Fukushima-derived information to the present proceeding, we note that, as the IAEA Mission Report and the Japanese Government Report (referred to above) make clear, the root cause of the accident at Fukushima was the beyond-design-basis earthquake that caused the beyond-design-basis Tsunami which resulted in a beyond-design-basis duration of station blackout. The Commonwealth indicates no linkage whatsoever between these events and the potential for a beyond-design-basis duration of station blackout at Pilgrim. Therefore the Commonwealth proffers no new information relevant to the Pilgrim plant regarding station blackout or mitigation measures implemented at Pilgrim to prevent or ameliorate the effects of station blackout. Thus there is no new information respecting Pilgrim regarding those two matters, and it therefore cannot form the basis for an assertion of timeliness for the purposes of Section 2.326.

As we held above, spent fuel accidents are outside the scope of this proceeding; there is, therefore, no relevance to this proceeding of assertions regarding spent fuel accidents, and they cannot form the basis for the timeliness considerations.

Thus we turn to the remaining information asserted to be new and relevant to the Pilgrim SAMA: the Commonwealth's "direct experience" arguments that new information from the

²⁰¹ See Motion to Admit and Reopen at 3 (citing Thompson Report at 14-18).

²⁰² Fukushima Contention at 6.

accident at Fukushima demonstrates that the actual frequency of occurrence of radiological release is considerably higher than the frequency used in the probabilistic analysis set out in the present Pilgrim LRA. Use of this new information, the Commonwealth asserts, could cause revised SAMA analysis to show that other mitigation measures are cost effective for Pilgrim. But as we discussed above, the Commonwealth's assertion is based upon the occurrence of several core-damaging events that have occurred worldwide – not singularly upon information derived from the Fukushima accidents – and two of the accidents forming the foundation for that argument occurred decades ago. Further, the Commonwealth mixes this argument with the assertion that the core damage frequency (CDF) is demonstrated by those accidents to be considerably larger than the numerical values used in the Pilgrim SAMA analysis, but neither challenges any of the scenario-specific CDFs used in the Pilgrim probabilistic safety assessment (PSA) nor provides any explanation or discussion of how its “direct experience” methodology would or could be used to develop a spectrum of CDFs for the variety of scenarios of core damaging event sequences examined at Pilgrim or elsewhere.²⁰³ Thus, to begin with, the Commonwealth's claim has a fatal flaw; it fails completely to indicate how this “direct experience” leads to any data affecting the CDFs for the Pilgrim plant. As Entergy's arguments make consummately clear, the Commonwealth makes no linkage between the macroscopic observation of the overall frequency of material offsite radiological release for nuclear power

²⁰³ The Commonwealth's assertions, as well as those of Dr. Thompson, simply fail to discuss (let alone challenge analysis in the LRA), the use of Core Damage Frequencies for any of the Fukushima Daichi plants or the Pilgrim plant. But, as the LRA demonstrates, CDFs must be developed for the entire spectrum of core damaging events, ranging from those that do minimal damage to those that involve massive core melting such as occurred in the TMI-2 accident, and there is nothing presented by Commonwealth's assertions or the Thompson Report or Affidavits from which we could even infer a relationship between the macroscopic observations from Fukushima, their assertions of massive errors in CDF, and the analysis methodologies used in any SAMA analysis (including that specifically used for Pilgrim). Similarly, the Commonwealth's approach fails to address linkage between core damage and containment failure which is necessary to result in release of radiation to locations offsite, and to discuss how the initiating events at Fukushima (earthquake followed by tsunami, resulting in station blackout) can be expected to occur at Pilgrim, or how those events, if they did occur at Pilgrim, might result in offsite radiation release at Pilgrim.

plants worldwide and the event sequence analysis employed in the Pilgrim SAMA analysis.²⁰⁴ For this reason, the Commonwealth's contention fails to indicate any new information respecting the Pilgrim plant. As Entergy's arguments make plain, the information that the use of probabilities based upon the use of actual macroscopic frequency of occurrence of offsite radiological release would lead to considerably higher probabilities for severe accidents than those used in the Pilgrim SAMA analysis is not new and is in large part based upon the occurrence of previous core-damaging events. As Entergy points out, the use of that approach would have led, based upon earlier events, to a computed frequency of occurrence of 1.6 E-04 (which is well above the threshold for events that must be considered in the plant's licensing basis) prior to the occurrence of the Fukushima accident.²⁰⁵ Thus the issue of whether the "direct experience" method for estimating a macroscopic frequency of occurrence of a severe offsite radiological release from a core damaging accident should be used in the Pilgrim SAMA analysis could have been raised at the time of the submittal of the original LRA²⁰⁶ – the only difference that would be attributable to information arising out of the Fukushima accident is that the macroscopic frequency of occurrence would be a different (but lower) value after the

²⁰⁴ The Pilgrim SAMA analysis is a probabilistic safety analysis whereby probabilities are developed and assigned to each event in the series and those are utilized, in connection with all other event series analyzed, to develop overall release probabilities.

²⁰⁵ Entergy Answer to Waiver Petition and Fukushima Contention at 22-23.

²⁰⁶ Entergy points out – based upon a simple computation that is not disputed and therefore cannot be said to be the subject matter of a "battle of experts" (and as to which it cannot be said we are weighing evidence) – that

at the time the initial opportunity for hearing was announced, the direct experience method would have revealed a CDF of 1.6E-04 per reactor year, or five times more than that assumed in the Pilgrim SAMA analysis. Under Dr. Thompson's rationale, the Pilgrim SAMA analysis CDF has been deficient since the outset of the proceeding

Id. at 23.

Fukushima accident than before it. We agree with Entergy that a challenge on the basis that the Pilgrim SAMA analysis should have used a "direct experience" method (employing actual macroscopic, as opposed to theoretical frequencies of occurrence²⁰⁷), could (and therefore should) have been raised ab initio,²⁰⁸ and therefore is not timely now.

Since the foundation for everything raised by this contention being relevant to this proceeding is the charge that the frequency of occurrence of severe accidents is erroneously underestimated, and that challenge should have been raised at the outset of this license renewal proceeding, we find that the Commonwealth's contention fails to satisfy the requirements of 10 C.F.R. § 2.326(a)(i) as to being timely filed.

Thus, we turn to consideration of whether the challenge raises an "exceptionally grave issue." The Commonwealth does not point us to any definition of when an issue is exceptionally grave, but Entergy points to a plain definition of the phrase set out in the Commission's final rule regarding the standards for reopening a closed record: "'exceptionally grave' means 'a sufficiently grave threat to public safety.'"²⁰⁹

²⁰⁷ Although not explicitly developed, this assertion of a theoretical probability in essence amounts to an assertion that the probability of occurrence of a severe accident developed via PSA techniques because it is based upon, in part, information for the probabilities of specific events in the chain of events analyzed as to which there is not experimental or experiential data, the overall probability of the severe accident is "theoretical." In our view, this is an attempt to compare apples and bricks; the overall macroscopic observation that there have been a certain numerical value of occurrences of severe accidents for all operating reactors worldwide is simply not comparable to the rigorous event chain analysis whereby probabilities are determined for each such event in the chain and then a wide range of possible event sequences are analyzed to develop an overall probability of occurrence of severe accidents.

²⁰⁸ Entergy succinctly puts it as follows: "If the CDF assumed by the Pilgrim SAMA analysis is 'unrealistically low' after the Fukushima accident under Dr. Thompson's direct experience method, it was also unrealistically low long before Fukushima." Id. at 22.

²⁰⁹ Id. at 27 (quoting Criteria for Reopening Records in Formal Licensing Proceedings, 51 Fed. Reg. 19,535, 19,536 (May 30, 1986)) (omitted Entergy's emphasis).

Dr. Thompson states in paragraph 15 of his Declaration that he

believe[s] the Commonwealth's contention addresses exceptionally grave environmental issues, for three reasons. First, the Fukushima accident shows that a severe reactor and/or spent-fuel-pool accident is significantly more likely than estimated or assumed in the NRC's current environmental analyses for the Pilgrim NPP. Second, the experience of the Fukushima accident shows that the accident mitigation measures relied on by the NRC are grossly inadequate to prevent the type of catastrophic damage at Pilgrim that has occurred at Fukushima. Finally, the Fukushima accident shows how corrosive and dangerous is the high level of secrecy that the NRC has maintained with respect to accident mitigation measures, thereby contributing to the use of ineffective measures at Fukushima.²¹⁰

But Dr. Thompson's reasons for his belief fail completely to implicate any particularized threat to public safety at the Pilgrim plant; they fail to offer any specific information that is applicable to, or connects the Fukushima accidents to, the Pilgrim plant, and merely point to reasons why he believes consideration of information from the Fukushima accident would lead to revisions to the Pilgrim SAMA analysis that, in turn, could lead to other SAMAs becoming cost effective. Dr. Thompson's statements respecting the impact of the information from Fukushima are bare and unsupported, and therefore speculative; they cannot provide the requisite support for reopening a closed record.²¹¹

We agree with Entergy and Staff that nothing averred by the Commonwealth, and nothing set out in the Declarations of Dr. Thompson, or in the Thompson Report, supports a proposition that the failure to consider the information from the accident at Fukushima raises any grave threat to public safety respecting the Pilgrim plant. Indeed, the Commission pointed out in ruling on the petitions to suspend all proceedings pending completion of its review of the events at Fukushima that it perceived no necessity to do so because it has other effective and

²¹⁰ Thompson Declaration ¶ 15.

²¹¹ Further, these statements are also precisely the sort of "speculation" that the Commission found insufficient support for the petitioners' request that licensing decisions be put on hold until the Commission has completed its Fukushima studies and developed appropriate information. Callaway, CLI-11-05, 74 NRC at ___ (slip op. at 26-28).

timely mechanisms for implementation of modifications to regulations and plant requirements.²¹²

Thus we find that the Commonwealth contention fails to present any "exceptionally grave issue."

For the foregoing reasons, we find that the Commonwealth contention is inadmissible for failure to satisfy the requirements of 10 C.F.R. § 2.326(a)(1).

Notwithstanding the foregoing finding, we address each of the other admissibility criteria.

The requirements of 10 C.F.R. § 2.326(a)(2). As to whether the Commonwealth has satisfied the requirement that the motion must address a significant safety or environmental issue, determination hinges upon the definition of when a safety or environmental issue is "serious" enough to warrant reopening a closed record. The Commonwealth argues that the issue of potential cost-effectiveness of other severe accident mitigation alternatives rises to that level of seriousness because: (a) NEPA requires the NRC to take a hard look at environmental matters;²¹³ and (b) the SAMA is an alternatives examination performed by the Agency in fulfillment of its obligation under NEPA; and (c) the Council on Environmental Quality (CEQ)

²¹² See, for example, the text accompanying notes 44-45 above, wherein we noted the Commission's view on this matter. The Commission further stated: "[W]e do not believe that an imminent risk will exist during the time period needed to apply any necessary changes to operating plants, whether a license renewal application is pending or not." Callaway, CLI-11-05, 74 NRC at ___ (slip op. at 27). The Commission later stated: "Even for the licenses that the NRC issues before completing its review, any new Fukushima-driven requirements can be imposed later, if necessary to protect the public health and safety." Id. at ___ (slip op. at 29) The Commission also stated:

[W]e directed the Task Force to consider stakeholder input in the development of its recommendations. There will be further opportunities for stakeholder input as the agency's review proceeds, and public and stakeholder participation will be sought consistent with the established processes for any actions that we direct the NRC Staff to undertake.

Id. at ___ (slip op. at 37). And the Commission emphasized its view that it can and will make appropriate adjustments to regulatory requirements again in its recent ruling in Diablo Canyon: Pacific Gas and Electric Company (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-11-11, 74 NRC ___, __ (slip op. at 44) [hereinafter Diablo Canyon].

²¹³ See Reply for Waiver Petition and Fukushima Contention at 7.

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recognizes consideration of alternatives "is the heart of the environmental impact statement",²¹⁴ and (d) the NRC's Severe Reactor Accidents Policy Statement commits the Commission to "take all reasonable steps to reduce the chances of occurrence of a severe accident involving substantial damage to the reactor core and to mitigate the consequences of such an accident should one occur."²¹⁵

Staff avers that the Commission has not explicitly set out a standard for when an environmental issue is significant enough to satisfy this requirement for reopening, but points us to an Atomic Safety and Licensing Appeal Board ruling that held that to demonstrate a significant safety issue, petitioners "must establish either that uncorrected . . . errors endanger safe plant operation, or that there has been a breakdown of the quality assurance program sufficient to raise legitimate doubt as to the plant's capability of being operated safely."²¹⁶

However Entergy has pointed out that the Commission has indeed expressed the standard for when an environmental issue is "significant" for the purposes of reopening a closed record, equating them to its standards for when an EIS is required to be supplemented - there must be new and significant information that will "paint a 'seriously different picture of the environmental landscape."²¹⁷

²¹⁴ See Id. (quoting 40 C.F.R. § 1502.14). In this respect, we note that "longstanding [Commission] policy is that the NRC, as an independent regulatory agency, 'is not bound by those portions of CEQ's NEPA regulations' that . . . 'have a substantive impact on the way in which the Commission performs its regulatory functions.'" Diablo Canyon, CLI-11-11, 74 NRC at ___ (slip op. at 23).

²¹⁵ See Reply for Waiver Petition and Fukushima Contention at 7-8 (quoting Policy Statement on Severe Reactor Accidents Regarding Future Designs and Existing Plants, 50 Fed. Reg. 32,138, 32,139 (Aug. 8, 1985)).

²¹⁶ NRC Staff Opposition to Fukushima Contention at 10-11 (quoting Public Service Company of New Hampshire (Seabrook Station, Units 1 and 2), ALAB-940, 32 NRC 225, 243 (1990)).

²¹⁷ Entergy Answer to Waiver Petition and Fukushima Contention at 28 (quoting Private Fuel Storage II, CLI-06-03, 63 at 29 (holding that claimed additional environmental impacts were "not so significant or central to the FEIS's discussion of environmental impacts that an FEIS
(continuing . . .)

Here, the Commonwealth points to no environmental impact that would, or even might, arise from the failure to revise the SAMA analyses to consider information it asserts arose from the Fukushima accident. Rather, the Commonwealth avers that other SAMAs might become cost effective if implemented – but indicates neither any particular positive environmental impact from any such implementation nor any specific negative environmental impact from failure to do so. The Commonwealth's contention can hardly be said, therefore, to paint the required "seriously different picture of the environmental landscape."²¹⁸ And neither the speculation by the Commonwealth and Dr. Thompson to the effect that other SAMAs might become cost effective and that an operator's mitigative actions could be adversely affected by an accident environment, nor the Commonwealth's intimations regarding other potential alterations that might result from consideration of the Fukushima-derived information, can serve to bootstrap the contention into raising any such different environmental situation.²¹⁹ The Commonwealth's claims simply implicate no specific environmental impact changes.

For the foregoing reasons, we find that the Commonwealth contention is inadmissible for failure to satisfy the requirements of 10 C.F.R. § 2.326(a)(2).

(. . . continued)
 supplement (and the consequent reopening of our adjudicatory record) is reasonable or necessary").

²¹⁸ Indeed the Commission reaffirmed its view of the appropriate threshold when it stated, in CLI-11-05, that the measure is "[t]he new information must present a seriously different picture of the environmental impact of the proposed project from what was previously envisioned," concluding, as do we, that "[t]hat is not the case here, given the current state of information available to us." Callaway, CLI-11-05, 74 NRC at ___ (slip op. at 31) (quoting Hydro Resources, Inc. (2929 Coors Road, Suite 101, Albuquerque, NM 871200), CLI-99-22, 50 NRC 3, 14 (1999)).

²¹⁹ As the Commission has oft repeated, and noted respecting the various petitioner assertions regarding information presently available from Fukushima, "our rules deliberately place a heavy burden on proponents of contentions, who must challenge aspects of license applications with specificity, backed up with substantive technical support; mere conclusions or speculation will not suffice . . . [and an] even heavier burden applies to motions to reopen." Id. at ___ (slip op. at 33).

The requirements of 10 C.F.R. § 2.326(a)(3). As to the requirement that the motion must demonstrate that a materially different result would be or would have been likely had the newly proffered evidence been considered initially, the “result” at issue in this proceeding is the outcome of the SAMA analysis.²²⁰ The Commonwealth asserts that a materially different result would be likely because the NRC would have considered a much broader array of SAMAs, but offers only the bare conclusory statement of its expert to support its assertion, and such unsupported claims do not rise to the requisite level.²²¹ Notwithstanding its assertions that installation of a hardened vent or a filtered vent for the containment might become cost effective,²²² the Commonwealth simply offers nothing which can reasonably be interpreted to “demonstrate” that other SAMAs would have been considered. To do so would have, at least, required the Commonwealth to provide some information indicating how much the mean consequences of the severe accident scenarios could reasonably be expected to change as a result of consideration of the Fukushima-derived information the Commonwealth proposes would alter the outcome of the cost-benefit balancing, together with at least some minimal information as to the cost of implementation of other SAMAs it believes might become cost effective. This is not to say that the Commonwealth must prove its case at this point, but simply that the term “demonstrate” requires much more than the bare speculation and bare assertions

²²⁰ In this case, the Commonwealth asserts that the different result it believes would be obtained is the consideration of other mitigation alternatives, Motion to Admit and Reopen at 11 – and we find that to be the appropriate measure for this case. We decline to make the overbroad determination that the “materially different result” is simply that the NRC would have considered the information from the Near-Term Task Force Report or the information that was presently available from the accidents at Fukushima in preparation of its SAMA analysis. To so require would elevate form over substance.

²²¹ Id. (citing Thompson Declaration ¶ 16 and Thompson Report § VI).

²²² See id.

offered by the Commonwealth.²²³ And Dr. Thompson's assertions regarding hydrogen explosions, operator actions and mitigative procedures and measures not only fail to address the actual consideration of those matters in the LRA, but fail to indicate how those would be affected by consideration of the proposed new information. Thus none of the information provided by either the Commonwealth or its expert, Dr. Thompson, demonstrates that any different result of the Pilgrim SAMA analysis could be obtained by consideration of the asserted new information.

The Commonwealth's contention has not demonstrated that a materially different result would be or would have been likely had the newly proffered evidence been considered initially. We agree with Entergy and Staff that there is only speculation without any demonstration whatsoever that the results of the SAMA analysis would have been, or would have been likely to be, different had the information presented by Commonwealth regarding the Fukushima accident been considered.

For the foregoing reasons, we find that the Commonwealth contention is inadmissible for failure to satisfy the requirements of 10 C.F.R. § 2.326(a)(3).

The requirements of 10 C.F.R. § 2.326(b). This portion of our regulations requires that the motion must be "accompanied by affidavits that set forth the factual and/or technical bases for the movant's claim that the criteria of paragraph (a) of this section have been satisfied. . . . [and that] [e]ach of the criteria must be separately addressed [in that affidavit], with a specific explanation of why it has been met." We find that the Declaration of Dr. Thompson fails to specifically explain, to the level required by the provisions of Section 2.326(b), two

²²³ The Commission recently discussed its view that the required level of demonstration by petitioners of cost effectiveness of other SAMAs is case and issue specific. Diablo Canyon, CLI-11-11, 74 NRC at __ (slip op. at 19-21). In our view, the issue sought to be litigated here requires considerably more than the bare speculation offered by petitioner.

factors: (1) why a materially different result would have been likely had the information presently available from the Fukushima accident been considered ab initio in the Pilgrim SAMA analysis, or (2) why that information presents "a significant safety or environmental issue."²²⁴

As to the likelihood that a materially different result would be obtained, Dr. Thompson's Declaration states, in relevant part:

As discussed in my Report at Section VI, I believe that a materially different result would be likely if the NRC were to thoroughly consider the implications of the Fukushima accident in its environmental analyses for the Pilgrim NPP. In particular, I believe that the NRC would consider a much broader and more rigorous array of severe accident mitigation alternatives (SAMAs) than have been previously considered, including systems for hydrogen control, containment venting, and replacement of high density spent fuel storage racks with low-density, open-frame racks. Also, in view of the high risk of a radioactive release at Pilgrim, any accident-mitigation measure or SAMA that is credited for the future licensed operation of the Pilgrim NPP should be incorporated in the plant's design basis.²²⁵

But this sets out no factual or technical basis; it merely represents a statement of belief on the part of Dr. Thompson. It fails to recognize or address the methodology by which the probabilities of the various chains of events are developed and it fails to discuss how those methodologies might (let alone should) be adapted to utilize the macroscopic information it terms "actual" probabilities of the occurrence of severe accidents that is available from worldwide macroscopic experience. It makes no reference to, and presents no discussion of, how the Pilgrim (or any other) SAMA analysis is performed or how it could be expected that the mean consequences of the spectrum of accident scenarios analyzed for Pilgrim in its SAMA analysis could be so altered as to make additional SAMAs cost effective to implement. Although Dr. Thompson mentions other mitigative mechanisms that he believes would be

²²⁴ We note that Entergy and Staff have raised material issues regarding the qualifications of Dr. Thompson and the validity of the methodology he proposes be used. Because of our findings regarding the substance of the Commonwealth's arguments and Dr. Thompson's statements, we find it unnecessary to address those issues.

²²⁵ Thompson Declaration ¶ 16.

considered, he fails to address their cost – and that is integral to providing a factual or technical basis for the assertion because the present Pilgrim SAMA analysis (which is set out in the LRA), plainly indicates both the cost of the most costly implemented SAMA and that the next most costly not-implemented SAMA that was considered has a cost approximately twice the most costly one that was implemented.²²⁶ To provide a factual basis for the assertion that a materially different result would be obtained requires a comparison of at least estimates of the costs of implementation of the mitigative mechanisms Dr. Thompson suggests might have been considered to the stated costs of implemented SAMAs.²²⁷ And to perform the analysis would require information regarding how much the mean consequences would be altered by consideration of the facts Dr. Thompson asserts are available from the Fukushima accident, because that provides the foundation for the numerical value for the “benefit” against which the cost must be balanced. In particular, Dr. Thompson asserts that there are facts regarding the CDF and the likelihood of hydrogen explosion that should be incorporated in the SAMA analysis, but he fails to even speculate as to how (or how much) those might alter the

²²⁶ E.g., Exh. ENT000001, Testimony of Dr. Kevin R. O’Kula and Dr. Steven R. Hanna on Meteorological Matters Pertaining to Pilgrim Watch Contention 3 (Jan. 3, 2011) at A47.

²²⁷ We reject the premise that the Agency has an obligation under NEPA to consider effects of the accidents at Fukushima when there has been no linkage made between those events and the plant whose license is at issue in this proceeding. While NEPA requires the Agency to “take a hard look” at environmental effects of its pending decision, we see nothing raised here that implicates any environmental impact. Further, although the NRC performs its SAMA analysis in fulfillment of its obligations under NEPA, the mitigation alternatives it examines in its SAMA cost benefit analyses all regard severe accident events which are beyond the design basis of the plant, and therefore have annual probability of occurrence of less than one in a million per year. We note that the NRC more than a decade ago declined to label such events as remote and speculative, which would result in their not being required to be considered under NEPA, because the NRC felt at the time it did not have the database to so determine. But it appears to us that by requiring any chain of events that has an annual frequency of occurrence greater than one in a million to be included within the design basis, the Commission has *de facto* made the frequency of occurrence of all other events (including those resulting in severe accidents) to be less than one in a million per year – a value so low as to certainly not be “reasonably foreseeable” (which would require such events to be considered under NEPA) but also to be reasonably considered remote and speculative in this context.

consequences of the probabilistic computation of the consequences from the entire spectrum of severe accidents considered in the Pilgrim SAMA analysis. And those facts/costs are critical to the basis for his speculation. Thus, we find his Declaration fails to provide the requisite factual and/or scientific basis for the claim that a materially different result would have been likely.

In addition, Dr. Thompson states in his Declaration, as to whether the information available from the Fukushima accident presents a significant safety or environmental issue, the following:

I also believe the Commonwealth's contention addresses exceptionally grave environmental issues, for three reasons. First, the Fukushima accident shows that a severe reactor and/or spent-fuel-pool accident is significantly more likely than estimated or assumed in the NRC's current environmental analyses for the Pilgrim NPP. Second, the experience of the Fukushima accident shows that the accident mitigation measures relied on by the NRC are grossly inadequate to prevent the type of catastrophic damage at Pilgrim that has occurred at Fukushima. Finally, the Fukushima accident shows how corrosive and dangerous is the high level of secrecy that the NRC has maintained with respect to accident mitigation measures, thereby contributing to the use of ineffective measures at Fukushima.²²⁸

This also is in the nature of a statement of belief, and omits to provide facts or scientific explanation that can logically support his conclusory statement of belief that failure to include the information he asserts is now revealed by the Fukushima accident creates an exceptionally grave environmental issue. The question of what threshold is required to create an "exceptionally grave" environmental issue has been discussed by the Parties, and we are not persuaded by the Commonwealth's view that the fact that consideration of alternatives is a very important requirement of NEPA²²⁹ somehow elevates the issue raised here to a "grave" issue.

²²⁸ Thompson Declaration ¶ 15.

²²⁹ The Commonwealth asserts that:

According to the Staff, a SAMA analysis "has no direct safety or environmental significance" because it "merely augments existing programs to identify mitigation alternatives that could 'further reduce the risk at a plant that ha[s] no identified safety vulnerabilities.'" The Staff's position that SAMAs are legally insignificant is incorrect as a matter of law. As the Council on Environmental Quality
(continuing . . .)

Indeed the Commonwealth offers nothing to indicate that there is anything "grave," or any potential grave environmental issue, associated with the possibility that there might turn out to be other alternatives (plant alterations) that would be cost effective to implement to ameliorate effects of accidents that are beyond the design basis.²³⁰ The Commonwealth has offered no link, and Dr. Thompson offers no link, between the issues it or he raises and an environmental issue associated with the implementation (or lack of implementation) of any Severe Accident Mitigation Alternative. Severe accidents are, by their very definition, beyond the design basis of the plant. If the Commonwealth intended to challenge the design basis by its assertions that the probability of a severe accident is much higher than is assumed for the purposes of the NRC's required SAMA analyses, such a challenge would have been inadmissible in (because a challenge to NRC regulations is outside the scope of) this proceeding. If that is not the Commonwealth's challenge, then this Declaration (and its accompanying Report) fails to provide the requisite factual and/or scientific basis for the claim that a grave environmental issue is raised by the Motion.

(... continued)

recognizes, consideration of alternatives "is the heart of the environmental impact statement." Consistent with NEPA's requirement to consider alternatives, the NRC's Severe Reactor Accidents Policy Statement commits the Commission to "take all reasonable steps to reduce the chances of occurrence of a severe accident involving substantial damage to the reactor core and to mitigate the consequences of such an accident should one occur."

Moreover, the Staff misses the point of the Commonwealth's contention, which is that new information shows the existence of previously unconsidered accident vulnerabilities that increase the environmental impacts of re-licensing Pilgrim and therefore the outcome of the cost-benefit analysis of alternatives.

Reply for Waiver Petition and Fukushima Contention at 7-8 (internal citations omitted).

²³⁰ We note that Commonwealth has observed the Near-Term Task Force Report's suggestion that some severe accidents should be included in the design basis, Motion to Supplement at 5, but that result must await scientific investigation and its outcome.

For the foregoing reasons, we find that the Declaration of Dr. Thompson fails to provide the requisite factual and/or technical bases for the movant's claim that the criteria of paragraph (a) of section 2.326 have been satisfied.

b. The Commonwealth has not satisfied the requirements for a Non-Timely filed Contention set out in 10 C.F.R. § 2.309(c)

The Commonwealth bases its assertion that it satisfies the requirements of 2.309(c)(i) (good cause) because it filed its contention while information about the accident is continuing to be released.²³¹ However, the actual singular foundation for this new contention is the argument (discussed with respect to 2.326(a)(1) and below respecting 2.309(f)(2)(ii) and (iii)) based upon worldwide "direct experience" regarding the overall (macroscopic) frequency of occurrence of core damaging accidents. But, as we discussed above, this foundational argument does not rest upon new and materially different information made available anew by the accident at Fukushima. The Commonwealth could (and should) have filed this contention at the outset of this proceeding. Thus we find that this contention fails to satisfy the good cause requirements of 2.309(c)(i).

In addition, balancing the remaining factors of 2.309(c), we are persuaded that the addition of a hearing on the subject matter of this contention will unduly broaden the issues presently being considered²³² and undoubtedly materially delay this proceeding. Thus we find that factor (vii) weighs heavily against granting admission of this contention.

For the foregoing reasons, we find that the contention fails to satisfy the requirements of 10 C.F.R. § 2.309(c).

²³¹ Motion to Admit and Reopen at 6.

²³² This is particularly evident given the status of this proceeding was, at the time this contention was submitted, simply to address the narrow portion of Pilgrim Watch's Contention 3 remanded to us, as to which we have already issued a definitive ruling, and address five new contentions filed by Pilgrim Watch since the remand, all of which were previously resolved or are resolved by this Order.

- c. The Commonwealth's Proposed Contention fails to satisfy the requirements of 10 C.F.R. § 2.309(f)(1) and 10 C.F.R. § 2.309(f)(2) and therefore is inadmissible even if the requirements for reopening had been met.

To begin with, we find that material portions of this contention (challenges to spent fuel pools, challenges to the NRC's assumptions about operators' capability to mitigate an accident at the Pilgrim, challenges to EDMGs, challenges to the NRC's excessive secrecy regarding accident mitigation measures, challenges to the NRC's previous rejection of the Commonwealth's concerns regarding the environmental impacts of high-density pool storage of spent fuel, assertions of a need to implement filtered vented containment, and suppositions/speculation regarding the effectiveness of hydrogen control mechanisms) all fall outside the scope of this proceeding and therefore are inadmissible because they fail to satisfy the requirements of 2.309(f)(1)(iii).

Thus all that remains to consider in the Commonwealth's contention are the assertions respecting the CDF and its potential impact upon the SAMA cost-benefit balancing.²³³ As to the requirements of 2.309(f)(1)(iv), the only possible relevance of this contention to the findings the NRC must make regards the SAMA cost benefit analysis.²³⁴ But the Commonwealth has made only the bare speculation (supported by a similar speculation on the part of its expert) that they believe that "the NRC would consider a much broader and more rigorous array of severe accident mitigation alternatives (SAMAs) than have been previously considered."²³⁵ This plainly

²³³ As we noted above, Commonwealth's assertions regarding the cost effectiveness of mitigation mechanisms, as well as effectiveness of operation or operability of the DTVs, are necessarily resultant from the core-damaging event premise.

²³⁴ As we noted above, we decline to find that the "determination the NRC must make" is a determination to consider, under NEPA, information presently available from the accidents at Fukushima or from the Near-Term Task Force Report. The NRC's determination at issue here is solely that of which SAMAs are cost beneficial to implement for this plant. If and when Fukushima-derived information sheds new light on the Pilgrim SAMA analysis, the NRC has adequate mechanisms for addressing its regulatory impact.

²³⁵ Motion to Admit and Reopen at 11.

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fails to satisfy the requirement of 2.309(f)(1)(iv) that the contention must "demonstrate" that the issue raised is material to the NRC's decision; the speculative assertions of the Commonwealth and its expert simply do not rise to the level of demonstrating the matter. Therefore we find that the Commonwealth's contention fails to satisfy the requirements of 2.309(f)(1)(iv).

Finally, as to the requirements of 2.309(f)(1)(vi), we find that neither the Commonwealth's pleadings nor the Declaration and Report of Dr. Thompson shows that a genuine dispute exists with the applicant on a material issue of law or fact. First, for the fact to be "material," it must affect the NRC's SEIS as it relates to SAMAs, and neither the Commonwealth nor Dr. Thompson has indicated with any specificity how the SAMA analysis results could be affected. Rather the pleadings speculate as to changes that might be found, and we find that fails to provide the requisite sufficient information that would "show" a dispute. Further, neither the Commonwealth nor Dr. Thompson point to or reference any specific portion of the application that is disputed, simply asserting that the SAMA results might be different, and neither indicates any method by which the macroscopic data on the worldwide frequency of occurrence of core-damaging events might be utilized to modify the event-chain analyses used by Pilgrim in its SAMA analysis. The bare assertions based upon the "actual" (macroscopic) information, that the CDFs are erroneous simply does not provide the requisite link to the Pilgrim plant or the SAMA analysis performed for it. If the Commonwealth and Dr. Thompson meant, in the alternative, to point to an omission of consideration of data from the SAMA input, as they might have intended to imply in their reply,²³⁶ they are certainly capable of so doing and have failed.²³⁷ From either perspective, the Commonwealth's contention fails to satisfy the requirements of 2.309(f)(1)(vi).

²³⁶ See Reply for Waiver Petition and Fukushima Contention at 3.

²³⁷ The situation here is directly analogous to that addressed by the Commission in its very recent ruling respecting a challenge raised in the license renewal application for Diablo Canyon. There the Commission held:

(continuing . . .)

For the foregoing reasons, we find that the Commonwealth's Proposed New Contention fails to satisfy the requirements of 10 C.F.R. § 2.309(f)(1) and therefore is inadmissible even if the requirements for reopening and for filing of a non-timely contention had been met (which we found were not).

Finally, had the requirements of 10 C.F.R. § 2.326 respecting reopening a closed record been, as the Commonwealth asserts, inapplicable, the requirements of 10 C.F.R. § 2.309(f)(2) would have applied. As to the requirements of 10 C.F.R. § 2.309(f)(2)(i), the Commonwealth asserts that the new information is derived from the Fukushima accident, and because such information was not previously available, this requirement would have been satisfied.

As to the requirements of 10 C.F.R. § 2.309(f)(2)(ii) that the information on which the contention is based is materially different than information previously available, as we noted above the Commonwealth asserts a material difference because their new contention is based primarily on the actual occurrence and experience of a radiological accident, as contrasted with predictions of the behavior of an accident based on probabilistic risk assessment. The Commonwealth asserts this to be materially different from information that was available at the outset of this license renewal – particularly with respect to the predominant assertion by the Commonwealth that the Fukushima accident provides new information that the CDF used in the Pilgrim SAMA analysis was erroneously low because it failed to use actual experience on the occurrence of severe accidents worldwide. We disagree. For the reasons set out in our ruling on 2.326(a)(1), we find that the contention does not rest upon new materially different

(. . . continued)

Even assuming that [petitioner] intended to challenge the discussion of mitigation measures in PG&E's Environmental Report, [petitioner]'s unsupported statement . . . falls short of the information required to show the existence of a genuine dispute. . . . It is [petitioners]'s responsibility . . . to put others on notice as to the issues it seeks to litigate in the proceeding. We should not have to guess the aspects of the SAMA analysis that [petitioner] is challenging.

Diablo Canyon, CLI-11-11, 74 NRC at ___ (slip op. at 42) (internal footnotes omitted).

information that is timely presented (because the challenge respecting actual vs theoretical CDF should have been raised at the outset based upon information from events that occurred well before the accidents at Fukushima). Therefore, this contention fails to satisfy the requirements of 10 C.F.R. § 2.309(f)(2)(ii).

As to the requirements of 10 C.F.R. §§ 2.309(f)(2)(iii) that the contention be filed in a timely fashion based on the availability of the subsequent information, the Commonwealth asserts that, while it might have been preferable to await a more full understanding of the information presently becoming available continuously from the evolving situation at Fukushima, there is sufficient information upon which to proceed to challenge the SAMA analysis for Pilgrim. Staff takes the view that because the information is continuing to be developed it is premature to litigate the effects and therefore the contention is not timely. As with the requirements of 10 C.F.R. § 2.309(f)(2)(ii), we find that, because the single kernel upon which this contention rests is the premise that Entergy and Staff should use "direct experience" for severe accident probabilities,²³⁸ and that the direct experience demonstrates the CDF probabilities used in the Pilgrim SAMA analyses are too low, since the same direct experience would plainly have permitted precisely the same challenge at the outset of this proceeding, the new information put forth by the Commonwealth is not materially different from the corresponding information available at the outset of this proceeding.²³⁹

²³⁸ It is apparent that, in performance of SAMA analysis, the weighting of the consequences of any severe accident, and the sort of mitigation measures (such as operator activation of the DTVs) that might be effectively deployed to address such accidents, are directly and singularly dependent upon the particular probabilities used in the SAMA analysis for the particular scenarios. Thus, if the probabilities are incorrect, the contribution of the consequences will be inaccurate and the effectiveness of other mitigation measures will be altered. And, stated in the inverse, unless the probabilities are in error, the effectiveness of various mitigation mechanisms will not be called into question.

²³⁹ In this regard, the Commonwealth now asserts that "the Staff misses the point of the Commonwealth's contention, which is that new information shows the existence of previously unconsidered accident vulnerabilities that increase the environmental impacts of re-licensing Pilgrim and therefore the outcome of the cost-benefit analysis of alternatives," Reply for Waiver (continuing . . .)

For the foregoing reasons, we find that the contention fails to satisfy the requirements of 10 C.F.R. § 2.309(f)(2)(iii).

We therefore find that, even if the reopening requirements had not been required to be satisfied (which we find not to be the case), this contention fails to satisfy the timeliness requirements of 10 C.F.R. § 2.309(f)(2).

Finally, we must note that our decision today cannot be based upon the absence of sufficient information to disprove that there could be at some time in the future sufficient information to lead to significantly different results of the Pilgrim environmental analysis. To do so would require proof of a negative and plainly stand adjudicative principles on their head.

Further, as to the question of whether the events at Fukushima present considerations for Pilgrim that must be weighed under NEPA, the black letter law is that NEPA requires consideration of reasonably foreseeable events. While not drawing a definitive line regarding when an event is reasonably foreseeable, the common law has addressed a boundary on the other side of the same coin, finding generally that NEPA does not require consideration of remote and speculative matters.²⁴⁰ As we discussed at length above, there is presently absolutely no information presented from the Fukushima accidents that has been indicated to have any impact on the Pilgrim plant or its environmental impact, and certainly, therefore, has implicated nothing reasonably foreseeable for Pilgrim. It is pure speculation to aver that there is, or that there will be, at some unknown and unknowable time in the future, new significant

(. . . continued)

Petition and Fukushima Contention at 8, but we note that the contention alleges no particularized vulnerability nor does it identify any new and materially different information other than the assertions respecting CDF.

²⁴⁰ There are myriad examples of application of this principle in, for example, codes implemented by agencies at various governmental levels requiring consideration, in the design of structures, of floods and earthquakes with a frequency of occurrence of more than once in a hundred years. This is certainly analogous to the "design basis" requirements of the NRC regarding severe accidents.

information arising from those accidents relevant to Pilgrim running so afoul of the requirement of NEPA and our regulations today so as to require delay of this license renewal decision.²⁴¹

III. CONCLUSION AND ORDER

For the foregoing reasons, we DENY the Commonwealth's Stay Request and its Waiver Request, and, as we noted above, we GRANT the Commonwealth's Motion to Supplement, considering the information presented therewith for its value to this matter, and we find that the Commonwealth's Fukushima Contention filed June 2, 2011 fails to satisfy the requirements of our regulations for reopening a closed record, for admission of a nontimely submitted contention, and the strict requirements for an admissible contention, each of which failures in-and-of-itself would require that we deny the Commonwealth's Motion to Admit. It is, this 28th day of November, 2011, ORDERED that the Commonwealth's Stay Request and Waiver

²⁴¹ As the Commission has noted in ruling on petitioners' NEPA-related assertions, there is simply insufficient information available at this time from Fukushima, and the NRC's processes are intended to accommodate the raising of concerns when and if there is.

[T]he rules cited by the rulemaking petitioners that reach "generic conclusions" regarding severe reactor and spent fuel accidents appear to be those that pertain to license renewal. . . . As we noted in the Pilgrim and Vermont Yankee matters, after considering the rulemaking petitions, the NRC will make a decision whether to deny the petitions, or proceed to make revisions to Part 51. Depending on the timing and outcome of the NRC Staff's resolution of the rulemaking petitions, the Staff itself potentially could seek the Commission's permission to suspend one or more of the generic determinations in the license renewal environmental rules, and include a new analysis in pending, plant-specific environmental impact statements.

Callaway, CLI-11-05, 74 NRC at __ (slip op. at 40) (internal citations and footnotes omitted). And the Commission repeated this message in an even more recent ruling, stating

NRC will develop lessons learned, as it has in the past – that is, the NRC will "evaluate all technical and policy issues related to the event to identify potential research, generic issues, changes to the reactor oversight process, rulemakings, and adjustments to the regulatory framework that should be conducted by NRC." Accordingly, our comprehensive evaluation includes consideration of those facilities that may be subject to seismic activity or tsunamis Further, that evaluation will include consideration of lessons learned that may apply to spent fuel pools that are part of the U.S. nuclear fleet.

Diablo Canyon, CLI-11-11, 74 NRC at __ (slip op. at 36) (citation omitted).

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Request, and its Motion to Admit a proposed new contention are *therefore* DENIED, and the evidentiary record in this proceeding remains closed.

It is so ORDERED.

FOR THE ATOMIC SAFETY
AND LICENSING BOARD²⁴²

/RA/

Dr. Paul B. Abramson
ADMINISTRATIVE JUDGE

/RA/

Dr. Richard F. Cole
ADMINISTRATIVE JUDGE

Rockville, Maryland
November 28, 2011

²⁴² Judge Young concurs with our decision in results only. Her views are set forth on the following pages.

Administrative Judge Ann Marshall Young, Concurring in Results Only

I would not admit the Commonwealth's contention for the reason that I find it to be premature, based on the Commission's decision in *Union Electric Company d/b/a/ Ameren Missouri* (Callaway Plant, Unit 2) *et al.* (hereinafter CLI-11-05),¹ issued September 9, 2011. I would permit the filing of Fukushima-related contentions when relevant information becomes ripe for consideration.

The Commission in CLI-11-05 addressed the petitions of a number of parties to suspend, and take certain other actions with respect to, various nuclear power plant licensing proceedings (including Pilgrim) based on the March 2011 accident at the Fukushima Dai-ichi plant in Japan. The Commission declined to suspend the proceedings, finding among other things that "the mechanisms and consequences of the events at Fukushima [we]re not yet fully understood" and "the full picture of what happened at Fukushima [wa]s still far from clear" on September 9, 2011, thus warranting a conclusion that a request for analysis whether the Fukushima events constitute "new and significant information" under NEPA was then "premature."² Although the Commission in these statements was addressing generic issues, and expressly stated that in individual proceedings "litigants may seek admission of new or amended contentions,"³ its prematurity analysis would reasonably seem also to be applicable in individual proceedings at this time.

¹ *Union Electric Company d/b/a/ Ameren Missouri* (Callaway Plant, Unit 2) *et al.*, CLI-11-05, 74 NRC __ (Sept. 9, 2011).

² *Id.* at __ (slip op. at 29-30).

³ *Id.* at __ (slip op. at 35).

I note that, subsequent to the July 12, 2011, issuance of the Near-Term Task Force Report,⁴ the Commission directed the NRC Staff to "implement without delay" certain of the Task Force's recommendations.⁵ Given, however, that the deadline set by the Commission for completion of this task is the year 2016,⁶ this would not seem to be sufficient to change the Commission's analysis on prematurity as stated in CLI-11-05, or otherwise suggest that the Commonwealth's contention would not fall within its ambit.⁷ I therefore conclude that the Commonwealth's new Fukushima-related contention is premature at this time.

In view of this conclusion, I do not address the various regulatory criteria for reopening the record and admitting the new contention, or for waiving rules relating to spent fuel pool accidents. Nor do I address the Commonwealth's May 2, 2011, Motion to Stay, given that issuance of CLI-11-05 rendered it moot.

I do, however, take this opportunity to touch upon two concepts that I find warrant some attention, given that they have arisen more than once in this proceeding, with respect to more than one contention and more than one regulatory requirement, and may bear on the future conduct of this proceeding. The first of these concepts is that of whether information is "new," so as to make a contention based on it timely; this comes up with any contention filed after the beginning of a proceeding under 10 C.F.R. § 2.309(c) or (f)(2), and also in determining whether

⁴ See Dr. Charles Miller *et al.*, Recommendations for Enhancing Reactor Safety in the 21st Century, The Near-Term Task Force Review of Insight from the Fukushima Dai-Ichi Accident (July 12, 2011) (ADAMS Accession No. ML111861807).

⁵ Staff Requirements Memorandum – SECY-11-0124 – Recommended Actions to be Taken Without Delay from the Near-Term Task Force Report (Oct. 18, 2011) at 1 (ADAMS Accession No. ML1129115710).

⁶ *Id.*

⁷ I would observe, however, that this does not necessarily mean that information on Fukushima could not become sufficiently developed to warrant the filing of new contentions prior to 2016.

a previously closed proceeding should be reopened under 10 C.F.R. § 2.326. The second is the concept of a matter being significant enough to be considered, in one way or another, in a proceeding – a concept that touches on various criteria for admissibility of contentions under 10 C.F.R. § 2.309, the criteria for reopening under § 2.326, as well as requirements under NEPA and NEPA-related NRC law and regulation.

The newness/timeliness issue presents itself with respect to the “direct experience” argument of the Commonwealth. The Commonwealth argues through its expert that data from the body of actual experience with respect to severe accidents at nuclear power plants, now including the Fukushima accident, can provide a “reality check” for PRA estimates of core damage probabilities in the Pilgrim SAMA analysis.⁸ Although, as my colleagues find, this argument might certainly have been raised earlier with respect to experience from all events other than the Fukushima accident, information from Fukushima is clearly “new” information, whatever its significance may be with respect to the Pilgrim SAMA analysis, such that making the argument insofar as it takes into account Fukushima could not have been done earlier. To the same effect as I stated in my Dissent and Concurrence in LBP-11-23, the fact that a contention based on “new” information is also supported by previously-existing information “negates neither the ‘new-ness’ of the Fukushima-related information, nor the value of either sort of information, whatever its worth otherwise.”⁹

⁸ Commonwealth of Massachusetts’ Contention Regarding New and Significant Information Revealed by the Fukushima Radiological Accident (June 2, 2011), Attached Report of Gordon R. Thompson, Institute for Resource and Security Studies, New and Significant Information From the Fukushima Daiichi Accident in the Context of Future Operation of the Pilgrim Nuclear Power Plant (June 1, 2011) at 15; see *id.* at 14-18.

⁹ LBP-11-23, 74 NRC ___, ___, Administrative Judge Ann Marshall Young, Concurring in Part and Dissenting in Part (slip op., Dissent, at 3) (Sept. 8, 2011).

I note, moreover, regarding the SAMA analysis itself, that, as my colleagues point out, this “is a probabilistic safety analysis whereby probabilities are developed and assigned to each event in (continued. . .)

With respect to the issue of significance, I agree that Dr. Thompson is less specific than might be desired in his analysis of the significance of Fukushima-related information and its impact on the Pilgrim SAMA analysis. And of course, as suggested by the Commission in CLI-11-05, the full picture of the Fukushima accident and its aftermath is not yet clear, such that there is insufficient information available at this time to conclude that consideration of issues relating to the Fukushima accident *would* clearly lead to significantly different analyses of environmental consequences in the Pilgrim EIS (including in the SAMA analysis summarized

(...continued)

the series and those are utilized, in connection with all other event series analyzed, to develop overall release probabilities." Majority Decision at 49 n.173. Further, as NRC Staff experts described the SAMA analysis earlier in this proceeding:

The PRA for a commercial power reactor has traditionally been divided into three levels: level 1 is the evaluation of the combinations of plant failures that can lead to core damage; level 2 is the evaluation of core damage progression and possible containment failure resulting in an environmental release for each core-damage sequence identified in level 1; and level 3 is the evaluation of the consequences that would result from the set of environmental releases identified in level 2. All three levels of the PRA are required to perform a SAMA analysis.

NRC Staff Testimony of Nathan E. Bixler and S. Tina Ghosh Concerning the Impact of Alternative Meteorological Models on the Severe Accident Mitigation Alternatives Analysis, Exhibit NRC000014 (June 2, 2011), A11 at 7-8.

How the probabilities used in the analysis are developed and assigned to each input event in a series is key, as the development and assigning of probability values to a large number of possible equipment failures, operator actions, etc., determine the outcome probabilities of the overall analysis. If any of the input values are based on incorrect or incomplete information on past failures, for example, this could call into question the overall analysis and its results. It would thus seem likely that, once information from Fukushima is available, it might well play into the input values used in a SAMA analysis for a Mark I boiling water reactor of the sort that failed at Fukushima, such as the Pilgrim reactor. Of course, a SAMA analysis includes conservatisms that account for some uncertainties; but notwithstanding these conservatisms, until it is known how the inputs into the analysis might change as a result of information learned from Fukushima, it is unclear what the results of the overall analysis might be.

The Pilgrim SAMA analysis is summarized in the EIS and constitutes part of the basis for the conclusions stated therein. See NUREG-1437, Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supp. 29, Regarding Pilgrim Nuclear Power Station, Final Report (July 2007) (ADAMS Accession No. ML063260173) [hereinafter EIS]; see *id.* at Ch. 5.

therein). However, there is obviously at this time also insufficient information to conclude that consideration of relevant Fukushima-related issues *could not* lead to significantly different analyses of the environmental consequences of renewing the Pilgrim operating license.¹⁰ I find that the Commonwealth has shown at least some likelihood that information on Fukushima could have some such impacts,¹¹ such that it cannot be said that consideration of Fukushima-related issues “could not affect” the ultimate decision on the renewal application.¹²

For these reasons, and to ensure basic fairness, I would permit the Commonwealth to file new Fukushima-related contentions at such time as relevant information may be ripe for consideration.¹³

¹⁰ Thus, there is similarly insufficient information to conclude that any and all possible impacts of Fukushima-related information on the analysis of environmental consequences at Pilgrim would be “remote and speculative,” such that no further NEPA analysis would be required. What is “reasonably foreseeable” with respect to Fukushima and the impact of information arising out of it on environmental analyses relating to Pilgrim would also seem to be an open question at this point.

¹¹ I also find that Pilgrim Watch has shown a reasonable likelihood of such impacts. See LBP-11-23, 74 NRC ___, Administrative Judge Ann Marshall Young, Concurring in Part and Dissenting in Part (Sept. 8, 2011).

¹² *Limerick Ecology Action, Inc. v. NRC*, 869 F.2d 719, 737 (3rd Cir. 1989).

¹³ Indeed, it would appear that Fukushima-related issues must be addressed in some manner in this proceeding prior to its conclusion and a final determination on the license renewal request, given (1) the reasonable likelihood that relevant Fukushima-related information *could* in this proceeding lead to significantly different analyses and/or conclusions in the EIS and SAMA analysis; and (2) NEPA’s “dual purpose” [of] ensur[ing] that federal officials *fully* take into account the environmental consequences of a federal action *before* reaching major decisions, and [] inform[ing] the public, Congress, and other agencies of those consequences.” *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-02-25, 56 NRC 340, 348 (2002) (emphasis added) (citing *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989); *Baltimore Gas and Elec. Co. v. Natural Resources Defense Council, Inc.*, 462 U.S. 87, 97 (1983); *Dubois v. US Dept. of Agriculture*, 102 F.3d 1273, 1291 (1st Cir. 1996)).

As suggested in the text, the information to date from Fukushima is insufficiently clear to support a conclusion that the Pilgrim EIS could fairly be said to “fully take into account the environmental consequences” of renewing the Pilgrim operating license, in the absence of consideration of Fukushima-related matters. This is not to say that a decision on the current contention could be (continued. . .)

(. . .continued)

based on the absence of information, but rather simply to comment on the prematurity of Fukushima-related issues at this time, including their effect, one way or the other, on individual plant SAMA analyses and environmental impact statements. In order, however, for license renewal to be a meaningful process with respect to the Pilgrim plant with its Mark I boiling water reactor, and in order to assure that the Commonwealth and its citizens have their understandable concerns and interests addressed, the impact of Fukushima-related issues on the pending application should be analyzed at a time and in a manner that fully takes into account, not "every alternative device and thought conceivable by the mind of man," *Vermont Yankee Nuclear Power Corp. v. NRC*, 435 U.S. 519, 551 (1978), but "every *significant* aspect of the environmental impact" of the sought license renewal, *id.* at 553 (emphasis added), including Fukushima-related impacts, *prior to* an ultimate decision on the application.

It is true that, but for the remand of Contention 3 in CLI-10-11, 71 NRC ___ (Mar. 26, 2010), the Pilgrim renewal application would no doubt have been granted some time ago. But this did not occur, and it happened that the Fukushima accident occurred two days after oral argument on the remanded Contention 3. At that point, or soon thereafter as the severity of the accident began to become apparent (even if only on a preliminary basis), matters relating to severe accidents involving Mark I BWRs, to their mitigation, and to the environmental impacts of continued operation in the very densely-populated coastal area where Pilgrim is located, took on added significance.

It is unclear exactly how Fukushima-related issues will be addressed in every current licensing proceeding. Ultimately this is a question that is to some extent case-specific. *See supra* text accompanying note 3. However, it may be observed that, if the EIS and SAMA analysis are significant enough matters that they are *required* to be completed in connection with the license renewal application itself, logic dictates that they are significant enough that they should *accurately address all truly significant issues* that might reasonably be expected to be relevant to the application, *prior to* action on the application, even if meaningful consideration might need to await some additional development of information from Fukushima. This would seem to be particularly appropriate with respect to proceedings involving Mark I boiling water reactors.

For the preceding reasons, and because the reactor at the Pilgrim plant is a Mark I BWR like the Fukushima reactors, I find this proceeding to be one that would not fall within those cases involving "licenses that the NRC issues before completing its [Fukushima] review."¹³ The existing Pilgrim operating license will, of course, remain in effect until issuance of an ultimate decision on the renewal application. Thus any possible harm to the Applicant, resulting from allowing for consideration of Fukushima-related matters in some manner prior to a final decision on the application, should be minimized. Moreover, it would seem to be in *all parties'* interests to timely assure either that Fukushima-related information would not negatively impact the Pilgrim EIS and/or SAMA analysis and conclusions, or that any potential problems could be effectively identified, addressed and, as appropriate and possible, mitigated.

In any event, it would be desirable to provide some reasonable mechanism for informing parties when the time is ripe for filing new Fukushima-related contentions. *See Callaway*, CLI-11-05, 74 NRC at ___ (slip op. at 36).