[7590-01-P]

NUCLEAR REGULATORY COMMISSION

10 CFR Part 51

[Docket Nos. PRM-51-14, et al.; NRC-2011-0189]

Environmental Impacts of Severe Reactor and Spent Fuel Pool Accidents

AGENCY: Nuclear Regulatory Commission.

ACTION: Petition for rulemaking; denial.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is denying 15 petitions for rulemaking submitted by the petitioners identified in the table in Section IV, "Availability of Documents." The petitioners requested that the NRC rescind its regulations that "reach generic conclusions about the environmental impacts of severe reactor and/or spent fuel pool accidents and therefore prohibit considerations of those impacts in reactor licensing proceedings."

DATES: The dockets for petitions for rulemaking (PRM) PRM-51-14, PRM-51-15, PRM-51-16, PRM-51-17, PRM-51-18, PRM-51-19, PRM-51-20, PRM-51-21, PRM-51-22, PRM-51-23, PRM-51-24, PRM-51-25, PRM-51-26, PRM-51-27, and PRM-51-28 are closed on **[INSERT DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**.

ADDRESSES: Please refer to Docket ID NRC-2011-0189 when contacting the NRC about the availability of information for any of these petitions. You may obtain publicly-available information related to this action by any of the following methods:

- **Federal Rulemaking Web Site:** Go to http://www.regulations.gov and search for Docket ID NRC-2011-0189. Address questions about NRC dockets to Carol Gallagher, telephone: 301-415-3463; e-mail: Carol.Gallagher@nrc.gov. For technical questions, contact the individual listed in the "FOR FURTHER INFORMATION CONTACT" section of this document.

- **NRC's Agencywide Documents Access and Management System (ADAMS):** You may obtain publicly-available documents online in the ADAMS Public Documents collection at http://www.nrc.gov/reading-rm/adams.html. To begin the search, select "ADAMS Public Documents" and then select "Begin Web-based ADAMS Search." For problems with ADAMS, please contact the NRC's Public Document Room (PDR) reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to PDR.resource@nrc.gov. For the convenience of the reader, instructions about obtaining information regarding the 15 petitions and other materials referenced in this document are provided in the "Availability of Documents" section.

- **NRC's PDR:** You may examine and purchase copies of public documents at the NRC's PDR, O1-F21, One White Flint North, 11555 Rockville Pike, Rockville, MD 20852.

FOR FURTHER INFORMATION CONTACT: Jennifer Tobin, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; telephone: 301-415-2328; e-mail: Jennifer.Tobin@nrc.gov.

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I. Background.

The 15 petitions were filed in August 2011 in response to the publication of the NRC's Near-Term Task Force (NTTF) report, "Recommendations for Enhancing Reactor Safety in the 21st Century, NTTF Review of Insights from the Fukushima Dai-ichi Accident," dated July 12, 2011. The NTTF report provided the NRC staff's recommendations to enhance U.S. nuclear power plant safety following the March 11, 2011, Fukushima accident in Japan. Based upon their interpretation of the NTTF report, the petitioners requested that the NRC rescind all regulations in part 51 of Title 10 of the *Code of Federal Regulations* (10 CFR) "to the extent that they reach generic conclusions about the environmental impacts of severe reactor and/or spent fuel pool accidents and therefore prohibit considerations of those impacts in reactor licensing proceedings."[1] The NRC's regulations in 10 CFR part 51 implement Section 102(2) of the National Environmental Policy Act of 1969, as amended (NEPA).[2] The petitioners challenged the regulations that make generic environmental findings for license renewal proceedings regarding the environmental impacts of severe reactor accidents and spent fuel storage.

The NTTF report, the 15 petitions, along with their NRC assigned docket numbers, and other pertinent documents are listed in Section IV, "Availability of Documents," of this document. The NRC published a notice of receipt of the petitions in the *Federal Register* (FR) on

[1] See, e.g., San Luis Obispo Mothers for Peace Petition for Rulemaking, PRM-51-15 at 2 (August 11, 2011). All of the petitions have the same, or essentially the same, request for rulemaking.
[2] 10 CFR 51.1(a).

November 10, 2011 (76 FR 70067).[3] As explained in the November 10, 2011, notice, the Commission stated that it was:

> reviewing the [NTTF report], including the issues presented in the 15 petitions for rulemaking. The petitioners specifically cite the [NTTF report] as rationale for the PRMs [petitions for rulemaking]. The NRC will consider the issues raised by these PRMs through the process the Commission has established for addressing the recommendations from the [NTTF report] and is not providing a separate opportunity for public comment on the PRMs at this time.[4]

As such, the NRC staff placed the 15 petitions into abeyance pending the outcome of deliberations regarding the recommendations from the NTTF report. Although activities related to the NTTF report are ongoing, the NRC staff determined that sufficient information is now available to address the 15 petitions.

A. Nuclear Power Plant License Renewal Actions and Table B-1.

Under NEPA, the NRC must consider the environmental impacts of a major Federal action in an Environmental Impact Statement.[5] The Commission has determined that power plant license renewal is a major Federal action that requires an Environmental Impact Statement.[6] On many environmental issues related to license renewal, the Commission "found that it could draw generic conclusions applicable to all existing nuclear power plants, or to a specific subgroup of plants."[7] Therefore, in accordance with 10 CFR 51.95(c), for nuclear power plant license renewal actions, the NRC relies upon NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants'' (GEIS). This environmental impact

[3] The petitioners also requested a suspension of ongoing reactor licensing proceedings. In its notice of the petitions' receipt, the Commission referenced its September 9, 2011, decision, CLI-11-05, denying the petitioners' suspension requests. 76 FR at 70068 *citing Union Electric Company d/b/a Ameren Missouri (Callaway Plant, Unit 2), et al*, CLI-11-05, 74 NRC 141, 173-76 (2011).
[4] 76 FR 70069.
[5] 42 USC 4332(c).
[6] 10 CFR 51.2(b)(2).
[7] *Florida Power & Light Co.*(Turkey Point Nuclear Generating Plant, Units 3 and 4), CLI-01-17, 54 NRC 3,11(2001).

statement was initially published in May 1996 (1996 GEIS) and then revised and updated in June 2013 (2013 GEIS).[8] The GEIS describes the potential environmental impacts of renewing the operating license of a nuclear power plant for an additional 20 years. The NRC classifies the environmental impacts of license renewal as either generic or site-specific. Generic issues (i.e., environmental impacts common to all nuclear power plants) are addressed in the GEIS. Site-specific issues are addressed initially by the license renewal applicant (i.e., a nuclear power plant licensee seeking a renewal of its operating license under the NRC's license renewal regulations in 10 CFR part 54), in its environmental report, which is required by 10 CFR 51.45, and then by the NRC in the supplemental environmental impact statement (SEIS) to the GEIS prepared for each license renewal application. The criteria for a license renewal applicant's environmental report are set forth in 10 CFR 51.53(c).

Under the NRC's current regulatory framework in 10 CFR part 51 for evaluating the potential environmental impacts of renewing a nuclear power reactor's operating license for an additional 20 years, neither the applicant's environmental report nor the NRC's SEIS are required to address issues previously determined to be generic, as addressed in the GEIS, absent new and significant information. The findings of the GEIS are codified in Table B-1 in appendix B to subpart A of 10 CFR part 51 (Table B-1).[9] In Table B-1, generic issues are designated as "Category 1" issues and site-specific issues are designated as "Category 2" issues. All of the NRC regulations cited by the petitioners pertain, either directly or indirectly, to generic findings in the GEIS that are, in turn, codified in Table B-1. The petitioners object to

[8] The NRC regulation, 10 CFR 51.95(c), requires, for the consideration of potential environmental impacts of renewing a nuclear power plant's operating license under 10 CFR part 54, that the NRC prepare an environmental impact statement, which is a supplement to the Commission's NUREG–1437, ''Generic Environmental Impact Statement for License Renewal of Nuclear Plants,'' issued in June 2013. At the time the petitions were filed in 2011, 10 CFR 51.95(c) referred to the initial 1996 GEIS. The NRC published a notice of issuance for the updated 2013 GEIS on June 20, 2013 (78 FR 37325).

[9] Table B-1 was amended to reflect the June 2013 GEIS update. The NRC rule amending Table B-1 and other 10 CFR part 51 regulations was published in the *Federal Register* on June 20, 2013 (78 FR 37282).

those Table B-1 findings that make generic conclusions with respect to the potential environmental impacts of severe reactor and spent fuel pool accidents, namely, the findings for "Severe accidents" and "Onsite storage of spent nuclear fuel."[10] The NRC defines "severe reactor accidents" as "those that could result in substantial damage to the reactor core, whether or not there are serious off-site consequences."[11]

In accordance with 10 CFR 2.335(a),[12] NRC rules and regulations, such as Table B-1, generally cannot be challenged in NRC adjudicatory proceedings, including site-specific license renewal proceedings for a nuclear power plant before the NRC's Atomic Safety and Licensing Board. Therefore, the petitioners request the rescission of the generic findings in Table B-1 so that they can challenge the NRC environmental impact findings now included in Table B-1 in future license renewal proceedings.

In Table B-1, the "Severe accidents" issue has been classified as a Category 2, or site-specific, issue with an impact level finding of "small."[13] Although not classified as a generic issue, the Table B-1 "Severe accidents" finding states that:

> [t]he *probability-weighted consequences* of atmospheric releases, fallout onto open bodies of water, releases to groundwater, and

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[10] The petitions were filed in August 2011, before the June 2013 final rule that revised Table B-1 and other provisions of 10 CFR part 51 was published. The 2013 amendments to the Table B-1, "Severe accidents" finding, however, were of a minor, editorial nature (consisting of no more than deleting a regulatory reference). Otherwise, the language of Table B-1, "Severe accidents" finding is the same as the language that was in effect when the petitions were filed in 2011.

[11] NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants," Vol.1, Chapter 1 at 1-27 (2013).

[12] The NRC regulation, 10 CFR 2.335(a) states, in pertinent part, that "no rule or regulation of the Commission, or any provision thereof, concerning the licensing of production and utilization facilities, source material, special nuclear material, or byproduct material, is subject to attack by way of discovery, proof, argument, or other means in any adjudicatory proceeding subject to this [10 CFR part 2]." Paragraphs 2.335(b)-(d) provide exceptions to the provision in 10 CFR 2.335(a).

[13] For most Table B-1 NEPA issues, the NRC determined whether the impacts of license renewal would have a small, moderate, or large environmental impact. The statement of considerations for the June 20, 2013, rulemaking stated that "[a] small impact means that the environmental effects are not detectable, or are so minor that they would 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 destabilize, important attributes of the resource. A large impact means that the environmental effects would be clearly noticeable and would be sufficient to destabilize important attributes of the resource" (78 FR 37285).

> societal and economic impacts from severe accidents *are small for all plants*. However, alternatives to mitigate severe accidents must be considered for all plants that have not considered such alternatives.[14]

The Commission has clarified that despite the Category 2 label, the severe-accidents-impact finding in Table B-1 equates to a generic environmental issue resolved by rule.[15]

The Table B-1 "Onsite storage of spent nuclear fuel" issue has been classified as a Category 1, or generic, issue also with an impact level finding of "small" since Table B-1's inception in 1996. The "Onsite storage of spent nuclear fuel" finding states that: the expected increase in the volume of spent fuel from an additional 20 years of operation can be safely accommodated onsite during the license renewal term with small environmental effects through dry or pool storage at all plants. For the period after the licensed life for reactor operations, the impacts of onsite storage of spent nuclear fuel during the continued storage period are discussed in NUREG-2157 and as stated in § 51.23(b), shall be deemed incorporated into this issue.[16]

The 2013 amendments to the Table B-1 "Onsite storage of spent nuclear fuel" finding were made to comport with the U.S. Court of Appeals decision in *New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012), which vacated the NRC's 2010 final rule that updated the NRC's "waste confidence" decision and rule (75 FR 81032, 81037; December 23, 2010). On September 19, 2014, the NRC issued the final "continued storage" rule[17] (formerly known as the waste confidence rule), which addressed the *New York vs. NRC* decision.

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[14] 10 CFR part 51, subpart A, appendix B, Table B-1, "Severe accidents" finding (emphasis added).
[15] *Entergy Nuclear Generating Co. and Entergy Nuclear Operations, Inc.* (Pilgrim Nuclear Power Station), CLI-12-15, 75 NRC 704, 709 (2012).
[16] 10 CFR part 51, subpart A, app. B, Table B-1, "Onsite storage of spent nuclear fuel" finding. Spent fuel is initially stored in spent fuel pools. Following a sufficient period of time to allow the spent fuel to cool, spent fuel may be removed from the pool and placed in large casks on the licensee controlled site ("dry" storage).
[17] 79 FR 56238.

B. NTTF Report.

Following the March 11, 2011, Fukushima Dai-ichi accident, the Commission directed the NRC staff to establish a task force to conduct a methodical and systematic review of NRC 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.[18] The NRC staff formed the NTTF, which submitted the NTTF report to the Commission in SECY-11-0093, "Near-Term Report and Recommendations for Agency Actions Following the Events in Japan," dated July 12, 2011. The 15 petitions were filed in August 2011.

The NTTF report provided various NRC staff recommendations to the Commission concerning the enhancement of reactor safety and a general implementation strategy, which included several proposals for new regulatory requirements. Recognizing that rulemaking and subsequent implementation would take several years to accomplish, the NTTF also recommended interim actions necessary to enhance reactor protection, severe reactor accident mitigation, and emergency preparedness while rulemaking activities were conducted.[19] In addition, the NTTF report concluded that a sequence of events like the Fukushima accident is unlikely to occur in the United States and therefore, ongoing power reactor operations and related licensing activities do not pose an imminent risk to public health and safety.

The NRC staff further refined the NTTF recommendations in SECY-11-0124, "Recommended Actions to be Taken Without Delay from the Near-Term Task Force Report," and SECY-11-0137, "Prioritization of Recommended Actions to be Taken in Response to Fukushima Lessons Learned," both of which described the NRC staff's recommendations for enhancing reactor safety and the priority for implementing those recommendations. Based on

[18] Tasking Memorandum – COMGBJ-11-0002 – NRC Actions Following the Events in Japan, March 21, 2011.
[19] http://www.nrc.gov/reactors/operating/ops-experience/japan-dashboard.html.

those recommendations, the NRC has issued orders and initiated rulemaking activities to enhance the safety of reactors as a result of lessons learned from the Fukushima Dai-ichi accident. The petitioners contend that the recommendations of the NTTF report provide the justification for their request that the NRC rescind regulations in 10 CFR part 51 to the extent that they reach generic conclusions with respect to potential environmental impacts of severe reactor and spent fuel pool accidents and that preclude consideration of those conclusions in individual license renewal proceedings. Specifically, the petitions request that the NRC amend the following regulations: 10 CFR 51.45, 10 CFR 51.53, 10 CFR 51.95, and Table B-1.

C. Other NRC Regulations Identified by the Petitioners.

The NRC regulation, 10 CFR 51.45, sets forth the general requirements for an environmental report, which the NRC defines as a document submitted to the Commission by an applicant for a permit, license, or other form of permission, or an amendment to or renewal of a permit, license or other form of permission, in order to aid the Commission in complying with Section 102(2) of NEPA.[20] Paragraph 51.45(b) requires that the environmental report contain a description of the proposed action, a statement of its purposes, and a description of the environment affected. Section 51.45 also contains a list of items that the environmental report should discuss, such as the impact of the proposed action on the environment, any adverse effects that cannot be avoided if the proposed action were to be implemented, and alternatives to the proposed action.[21]

The NRC regulation, 10 CFR 51.53(c), describes the applicant's preparation of an environmental report for the renewal of a nuclear power plant's operating license. Paragraph 51.53(c)(3)(i) states that the environmental report is not required to include analyses of the

[20] 10 CFR 51.14(a) (definition of "environmental report").
[21] 10 CFR 51.45(b)(1)-(5).

potential environmental impacts identified as Category 1 issues in Table B-1. Paragraphs (c)(3)(ii)(A)-(P) of 10 CFR 51.53, describe the requirement to conduct environmental impact analyses for those Category 2 issues in Table B-1 that must be addressed on a site-specific basis by the license renewal applicant in its environmental report. In addition, paragraph 51.53(c)(3)(iv), requires the environmental report to include any new and significant information regarding the environmental impacts of license renewal of which the applicant is aware.

The NRC regulation, 10 CFR 51.95, describes the preparation of a post-construction environmental impact statement by the NRC, such as at the license renewal stage. Both 10 CFR 51.53 and 10 CFR 51.95 were among the regulations amended by the NRC to reflect the June 2013 update to the GEIS.[22]

D. Several Petitions Concern Actions Outside of License Renewal.

Several of the petitions were filed in relation to new reactor licensing proceedings, as opposed to proceedings concerning the renewal of an existing nuclear power plant's operating license. The petitions filed for combined license (COL) actions are: PRM-51-14, -51-17, -51-18, -51-21, -51-23, -51-24, -51-25, -51-27, and -51-28; PRM-51-16 was filed for an operating license (OL) action. The generic findings to which the petitioners object concern only license renewal actions conducted pursuant to 10 CFR part 54. Specifically, the NRC's 10 CFR part 51 regulations that reach generic conclusions regarding severe accident or spent fuel storage issues in Table B-1 do not apply to new reactor applications made under the provisions of 10 CFR part 52 for either an early site permit (ESP) or a COL, or to a construction permit (CP) or OL application (e.g., the Watts Bar 2 application) made under the provisions of 10 CFR part 50. The NRC makes no generic conclusions about severe reactor and spent fuel pool accidents when preparing environmental impacts statements for ESP, COL, CP, or OL

[22] The NRC rule amending these regulations was published in the *Federal Register* on June 20, 2013 (78 FR 37282).

applications. For these types of applications, the NRC performs a site-specific environmental review to address the potential environmental impacts.

II. Environmental Impacts of Severe Reactor Accidents and Spent Fuel Pool Accidents.

A. Overview.

The petitioners assert that the lessons learned from the Fukushima Dai-ichi event, as documented in the recommendations of the NTTF report, provide "new and significant" information that would affect the NRC's analysis of severe reactor and spent fuel pool accidents when considering whether to renew a nuclear power plant's operating license for an additional 20 years in accordance with the NRC's regulations in 10 CFR part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants." It is upon this basis that the petitioners request that the NRC rescind all regulations in 10 CFR part 51 that "reach generic conclusions about the environmental impacts of severe reactor and/or spent fuel pool accidents and therefore prohibit considerations of those impacts in reactor licensing proceedings."[23]

Under NEPA case law, the standard for considering whether information is "new and significant" is that it must present "a seriously different picture of the environmental impact of the proposed project from what was previously envisioned."[24] If the information is "new and

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[23] See, e.g., San Luis Obispo Mothers for Peace Petition for Rulemaking, PRM-51-15 at 1 (August 11, 2011). All of the petitions have the same, or essentially the same, request for rulemaking.

[24] *Union Electric Company d/b/a Ameren Missouri (Callaway Plant, Unit 2), et al*, CLI-11-05, 74 NRC 141, 167-68 (2011) *quoting Hydro Resources, Inc.*, CLI-99-22, 50 NRC 3, 14 (1999) ("To merit this additional review, information must be both 'new' and 'significant,' and it must bear on the proposed action or its impacts. As we have explained, '[t]he new information must present 'a seriously different picture of the environmental impact of the proposed project from what was previously envisioned'") (alteration in the original.); *Sierra Club v. Froehlke*, 816 F.2d 205, 210 (5th Cir. 1987) ("In making its determination whether to supplement an existing EIS because of new information, the [United States Army, Corps of Engineers] should consider 'the extent to which the new information presents a picture of the likely environmental consequences associated with the proposed action not envisioned by the original EIS'.") (alteration added); *Wisconsin v. Weinberger*, 745 F.2d 412, 418 (7th Cir.1984) (supplementation required where new information "provides a seriously different picture of the environmental landscape."); and *see* NRC Regulatory Guide

significant," and if the agency has not yet taken the proposed action, then the agency is required to supplement its environmental impact statement.[25] The NRC has determined that the NTTF report recommendations do not constitute "new and significant" information.

The NTTF report recommendations do not challenge the generic determinations in Table B-1. The NTTF report did not explicitly consider the complex analysis underlying the determinations in Table B-1, did not recommend changing the generic determinations in Table B-1 regarding severe reactor and spent fuel pool accidents, and did not make any recommendations relating to nuclear power plant license renewals. Any NRC regulatory action that has been taken or could have been taken as a result of the information presented in the NTTF report would not have been deferred to the license renewal stage; any such action would have been taken as part of the NRC's ongoing safety program.

B. Severe Reactor Accidents.

First, the petitioners requested that the NRC rescind all of its regulations that reach generic conclusions about the environmental impacts of severe reactor accidents. As set forth in both Table B-1 and 10 CFR 51.53(c)(3)(ii)(L), "Severe accidents" is listed as a Category 2 or site-specific issue, rather than a generic issue because the Commission determined the agency should consider severe accident mitigation measures on a site-specific basis for those reactors for which the agency had not previously performed a similar analysis. However, as noted above, the Commission has confirmed that because the agency made a generic determination regarding severe accident impacts in the GEIS that is codified in Table B-1, the impacts portion of the issue has been resolved by rule.[26]

4.2, Supplement 1, Revision 1, "Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses," Chapter 5 (June 2013).

[25] 10 CFR 51.92(a).

[26] *Florida Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 and 4), CLI-01-17, 54 NRC 3,11 (2001).

GEIS Severe Accident Analysis

When the NRC promulgated the license renewal rule and the severe accidents finding in Table B-1 in 1996, the NRC conducted a detailed analysis in the GEIS to determine that the probability weighted environmental impacts of severe accidents are small. The Commission summarized this analysis in the associated *Federal Register* notice.

> 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.
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> 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.[27]

In preparing the 2013 GEIS, the NRC staff specifically considered and evaluated severe reactor accidents and found that the conclusions reached in the 1996 GEIS remained valid. Specifically, the NRC staff considered areas where new information showed increases in the consequences of severe accidents and compared them to areas where the new information showed decreases in the impacts from severe accidents.[28] The NRC staff found that information showed that the areas that reflected an increase in impacts could potentially account for a 470 percent increase.[29] But, the NRC staff found that the areas that reflected a decrease in impacts could account for a 500 percent to 10,000 percent reduction.[30]

The petitions for rulemaking and supporting affidavit do not challenge with any specificity the analyses underlying the 1996 GEIS. The NTTF report, upon which the petitioners' rely, largely described the accident sequence at Fukushima, considered the NRC's current regulatory framework, and recommended areas for improvement. Indeed, the NTTF report concluded that a sequence of events like the Fukushima accident is unlikely to occur in the United States and, therefore, ongoing power reactor operations and related licensing activities do not pose an imminent risk to public health and safety. As a result, on their face, the safety conclusions in the NTTF report do not appear to relate to the environmental analysis challenged by the petitioners. Moreover, the petitioners have not demonstrated that any information in the NTTF report undermines the environmental analysis in the GEIS. For example, the petitioners have not shown, or even alleged, that the source terms relied on by the NRC staff were inadequate, that

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[27] 61 FR 28467, 28480. *See also* NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants,'' Vol. 1, Chapter 5 at 5-1 to 5-116 (1996).
[28] NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants,'' Vol. 1, Rev. 1, appendix E at E-46 to E-47 (2013).
[29] Id.
[30] Id.

the analysis ignored or marginalized an exposure pathway, or that the NRC's consideration of evacuation times was unreasonable. Moreover, the petitioners do not suggest that any errors in the severe accident analysis underlying the Table B-1 findings were significant enough to overcome the substantial margins noted by the Commission in 1996 and confirmed by the NRC staff in the 2013 update, let alone provide a "seriously different picture" of the likelihood and consequences of a severe accident beyond that already considered. Therefore, the findings of the NTTF report do not indicate that the NRC should revise the 2013 GEIS, or present a seriously different picture of the environmental consequences of severe accidents beyond those already considered by the agency.

Petitioners' Focus on License Renewal Regulations

The petitioners largely focus their arguments on a claim that currently operating reactors will need to undertake expensive improvements to comply with the NRC's post-Fukushima requirements and that the agency's environmental review must account for these costs. But these arguments reflect a misunderstanding of our regulatory process. As stated in the 2013 GEIS:

> As of the publication date of [the 2013] GEIS, the NRC's evaluation of the consequences of the Fukushima events is ongoing. As such, the NRC will continue to evaluate the need to make improvements to existing regulatory requirements based on the task force report and additional studies and analyses of the Fukushima events as more information is learned. *To the extent that any revisions are made to NRC regulatory requirements, they would be made applicable to nuclear power reactors regardless of whether or not they have a renewed license.* Therefore, no additional analyses have been performed in this GEIS as a result of the Fukushima events. In the event that the NRC identifies information from the Fukushima events that constitutes new and significant information with respect to the environmental impacts of license renewal, the NRC will discuss that information in its site-specific supplemental EISs

> (SEISs) to the GEIS, as it does with all such new and significant information.[31]

As that paragraph from the 2013 GEIS explains, if the NRC finds that an additional requirement should be imposed upon a reactor licensee the NRC will impose that requirement regardless of its license renewal posture. The renewal of a nuclear power plant's operating license does not, in any way, prescribe the NRC's ongoing safety surveillance of that plant. The regulations that the petitioners want rescinded pertain only to license renewal findings, not the NRC's ongoing safety surveillance.

The NRC continues to address severe accident-related issues in the day to day regulatory oversight of nuclear power plant licensees. The NRC's regulatory efforts have reduced severe accident risks beyond what was considered in the 1996 and 2013 GEIS. In some cases, such as the NRC's response to the accident at Fukushima Dai-ichi, these regulatory activities are ongoing. The NRC will continue to evaluate the need to make improvements to existing regulatory requirements as more information is learned.

C. Spent Fuel Pool Accidents.

Last, the petitioners contend that the NTTF report provides new and significant information that warrants rescinding the NRC's regulations codifying the GEIS' generic environmental determinations of the impacts of onsite storage of spent nuclear fuel during the period of license renewal. The evaluation of the environmental impacts of the onsite storage of spent nuclear fuel during the license renewal term, including potential spent fuel pool accidents, was documented in the 1996 GEIS and reaffirmed in the 2013 GEIS. The NRC found that the probability of a fuel cladding fire is low even in the event of a "worst probable cause of a loss of

[31] NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants,'' Vol. 1, Rev. 1, Chapter 1, Section 1.9. at 1-33 and 1-34 (2013) (citations omitted) (emphasis added).

spent-fuel pool coolant (a severe seismic-generated accident causing a catastrophic failure of the pool)."[32] Based on these evaluations, the "Onsite storage of spent nuclear fuel" NEPA issue in Table B-1 has been classified as a Category 1, or generic, issue with an impact level finding of "small." As noted above, the NTTF report primarily focused on describing the Fukushima accident, analyzing the agency's current regulatory structure, and making recommendations for improving the agency's regulatory process. The NTTF report did not specifically address the agency's environmental analysis for on-site spent fuel storage or the agency's prior studies showing that the risk of an accident in a spent fuel pool would be small. Moreover, the petitioners have not provided any specific explanation of how information in the NTTF report would invalidate the findings in the GEIS and thereby call into question the regulations in 10 CFR part 51.

Moreover, the NRC has thoroughly considered the question of spent fuel pool accidents before and after promulgating the 1996 GEIS, and these studies have consistently found that the probability of a spent fuel pool fire is low. Spent fuel pools are large, robust structures that contain thousands of gallons of water. Spent fuel pools have thick, reinforced, concrete walls and floors lined with welded, stainless-steel plates. After removal from the reactor, spent fuel assemblies are placed into these pools and stored under at least 20 feet of water, which provides adequate shielding from radiation. Redundant monitoring, cooling, and make-up water systems are part of the spent fuel pool system. Spent fuel pools at operating U.S. nuclear power plants were designed and licensed to maintain a large inventory of water to protect and cool spent fuel under normal and accident conditions, including earthquakes. Domestic and international operational experience and past NRC studies (e.g., NUREG-1353, NUREG-1738,

[32] See also NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants," Vol. 1, Chapter 6 at 6-72 to 6-75 (1996).

and SECY-13-0112)[33] have borne out that spent fuel pools are effectively designed to prevent accidents that could affect the safe storage of spent fuel. Regarding spent fuel pool accidents, the petitioners' primary concern is a "seismically induced" spent fuel pool fire (i.e., an earthquake damaging the structure of the spent fuel pool and thereby causing a complete or partial drainage of the pool's water.)[34] With respect to the March 2011 Fukushima accident, a Japanese government report, issued in June 2011, found that the Fukushima Dai-ichi, Unit 4 spent fuel pool, the one believed to have sustained the most serious damage, actually remained "nearly undamaged."[35] The report noted that visual inspections found no water leaks or serious damage to the Unit 4 spent fuel pool. On April 25, 2014, the NRC issued a report entitled, "NRC Overview of the Structural Integrity of the Spent Fuel Pool at Fukushima Dai-ichi, Unit 4," which confirmed that the structural integrity of the Unit 4 spent fuel pool was not compromised.

The accident at the Fukushima Dai-ichi nuclear facility in Japan also led to additional questions about the safe storage of spent fuel and whether the NRC should require the expedited transfer of spent fuel from spent fuel pools to dry cask storage at nuclear power plants in the United States. This issue was identified by NRC staff subsequent to the NTTF report along with the understanding that further study was needed to determine if regulatory action was warranted. Consequently, a regulatory analysis was conducted on the expedited

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[33] These studies include NUREG-1353, "Regulatory Analysis for the Resolution of Generic Issue 82, 'Beyond Design Basis Accidents in Spent Fuel Pools'" (April 1989); NUREG-1738, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants" (February 2001); and SECY-13-0112, "Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling-Water Reactor" (October 2013).

[34] Potential spent fuel pool fires caused by a successful terrorist strike were the subject of rulemaking petitions filed in 2006 (PRM-51-10) and 2007 (PRM-51-12). These petitions also requested the rescission of the generic finding in Table B-1 concerning onsite spent fuel storage. The NRC denied these petitions in 2008 (73 FR 46204; August 8, 2008). In its denial notice, the NRC described spent fuel pools as "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)." 73 FR at 46206. The NRC's denials of PRM-51-10 and PRM-51-12 were upheld in court. *New York v. U.S. Nuclear Regulatory Commission*, 589 F.3d 551 (2nd Cir. 2009).

[35] See "Report of Japanese Government to the IAEA Ministerial Conference on Nuclear Safety-The Accident at TEPCO's Fukushima Nuclear Power Stations," IV-91. English version available at http://www.kantei.go.jp/foreign/kan/topics/201106/iaea_houkokusho_e.html, last visited on April 22, 2013.

transfer of spent fuel from pools to dry cask storage. The results of this analysis were provided to the Commission in COMSECY-13-0030, "Staff Evaluation and Recommendation for Japan Lessons Learned Tier 3 Issue on Expedited Transfer of Spent Fuel," dated November 12, 2013. The Commission subsequently concluded that regulatory action need not be pursued in SRM-COMSECY-13-0030, issued on May 23, 2014. Nothing that the petitioners provided in these petitions invalidates this conclusion.

On August 26, 2014, the Commission approved the "continued storage" final rule and its associated generic environmental impact statement amending 10 CFR part 51 to revise the generic determination on the environmental impacts of continued storage of spent nuclear fuel beyond the licensed life for operation of a reactor. The continued storage GEIS[36] also concluded that the environmental impacts from spent fuel pool fires are small during the short-term storage timeframe (the 60 years of continued storage after the end of a reactor's licensed life for operation), which is consistent with the finding of the license renewal GEIS. Therefore, the petitioners have not shown that the NTTF report contains any new and significant information that would alter the analysis of spent fuel pool accidents in the GEIS. On the contrary, the NRC's ongoing studies of this issue have consistently supported the finding in Table B-1 that the environmental impacts of spent fuel pool accidents would be small.

III. **Determination of Petitions.**

For the reasons described in Section II of this document, the NRC has concluded that there is no basis to rescind the NRC's generic conclusions in Table B-1 concerning the

[36] NUREG-2157, Appendix F, Section F.1.3, Page F-16, "Conclusion."

environmental impacts of the “Severe accidents” and “Onsite storage of spent nuclear fuel” issues nor to amend any other NRC regulation. Therefore, the NRC is denying the petitions in accordance with 10 CFR 2.803.

IV. **Availability of Documents.**

The documents identified in the following table are available to interested persons through one or more of the following methods, as indicated. For more information on accessing ADAMS, see the ADDRESSES section of this document.

DOCUMENT	**ADAMS ACCESSION NO. / WEB LINK / *FEDERAL REGISTER* CITATION**
CLI-99-22, *Hydro Resources, Inc.*, July 23, 1999	http://www.nrc.gov/reading-rm/doc-collections/commission/orders/1999/1999-022cli.pdf
CLI-01-17, *Florida Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 and 4), July 19, 2001	http://www.nrc.gov/reading-rm/doc-collections/commission/orders/2001/2001-017cli.pdf
CLI-11-05, Union Electric Company d/b/a Ameren Missouri (Callaway Plant, Unit 2), September 9, 2011	http://www.nrc.gov/reading-rm/doc-collections/commission/orders/2011/2011-05cli.pdf
CLI-12-15, *Entergy Nuclear Generation Company and Entergy Nuclear Operations, Inc. (Pilgrim Nuclear Power Station)*, June 7, 2012	http://www.nrc.gov/reading-rm/doc-collections/commission/orders/2012/2012-15cli.pdf
COMGBJ-11-0002, NRC Actions Following the Events in Japan, March 21, 2011	http://www.nrc.gov/reading-rm/doc-collections/commission/comm-secy/2011/2011-0002comgbj.pdf

COMSECY-13-0030, Staff Evaluation and Recommendation for Japan Lessons-Learned Tier 3 Issue on Expedited Transfer of Spent Fuel, November 12, 2013	ML13329A918
Federal Register notice—Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation, December 23, 2010	75 FR 81032
Federal Register notice—Environmental Review for Renewal of Nuclear Power Plant Operating Licenses, June 5, 1996	61 FR 28467
Federal Register notice—License Renewal of Nuclear Power Plants; Generic Environmental Impact Statement and Standard Review Plans for Environmental Reviews, June 20, 2013	78 FR 37325
Federal Register notice—Revisions to Environmental Review for Renewal of Nuclear Power Plant Operating Licenses, June 20, 2013	78 FR 37282
Federal Register notice—Taxpayers and Ratepayers United, et al.; Environmental Impacts of Severe Reactor and Spent Fuel Pool Accidents, November 10, 2011	76 FR 70067
Federal Register notice—The Attorney General of Commonwealth of Massachusetts, The Attorney General of California; Denial of Petitions for Rulemaking, August 8, 2008	73 FR 46204
Recommendations for Enhancing Reactor Safety in the 21st Century, Recommendations for Enhancing Reactor Safety in the 21st Century, Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident, July 12, 2011	ML111861807
Regulatory Guide 4.2, Supplement 1, Rev. 1, June 2013	ML13067A354
NRC Overview of the Structural Integrity of the Spent Fuel Pool at Fukushima Dai-ichi, Unit 4, April 25, 2014	ML14111A099
NUREG-1353, Regulatory Analysis for the Resolution of Generic Issue 82, Beyond Design Basis Accidents in Spent Fuel Pools, April 1989	ML082330232
NUREG-1437, Generic Environmental Impact Statement for License Renewal of Nuclear Plants, June 20, 2013	ML13107A023
NUREG-1738, Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants, February 2001	ML010430066
NUREG-2157, Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel, September, 2014	ML14196A107
Petition submitted by Commonwealth of Massachusetts (PRM-51-10), September 19, 2006	ML062640409
Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses, Chapter 5, Revision 1, June 20, 2013	ML13106A244

PRM 51-14 submitted by Gene Stilp, on behalf of Taxpayers and Ratepayers United (Bell Bend- COL), August 11, 2011	ML112430559
PRM 51-15 submitted by Diane Curran, on behalf of San Luis Obispo Mothers for Peace (Diablo Canyon- LR), August 11, 2011	ML11236A322
PRM 51-16 submitted by Diane Curran, on behalf of Southern Alliance for Clean Energy (Watts Bar- OL), August 11, 2011	ML11223A291
PRM 51-17 submitted by Mindy Goldstein, on behalf of Center for a Sustainable Coast, Georgia Women's Action for New Directions f/k/a/ Atlanta Women's Action for New Directions, and Southern Alliance for Clean Energy (Vogtle- COL), August 11, 2011	ML11223A043
PRM 51-18 submitted by Mindy Goldstein, on behalf of Southern Alliance for Clean Energy, National Parks Conservation Association, Dan Kipnis, and Mark Oncavage (Turkey Point- COL), August 11, 2011	ML11223A044
PRM 51-19 submitted by Deborah Brancato, on behalf of Riverkeeper, Inc. & Hudson River Sloop Clearwater, Inc. (Indian Point- LR), August 11, 2011	ML11229A712
PRM 51-20 submitted by Paul Gunter, on behalf of Beyond Nuclear, Seacoast Anti-Pollution League and Sierra Club of New Hampshire (Seabrook- LR), August 11, 2011	ML11223A371
PRM 51-21 submitted by Michael Mariotte, on behalf of Nuclear Information and Resource Service, Beyond Nuclear, Public Citizen, and SOMDCARES (Calvert Cliffs- COL), August 11, 2011	ML11223A344
PRM 51-22 submitted by Raymond Shadis, on behalf of Friends of the Coast and New England Coalition (Seabrook- LR), August 11, 2011	ML11223A465
PRM 51-23 submitted by Robert V. Eye, on behalf of Intervenors in South Texas Project Nuclear Operating Co., Application for Units 3 and 4 Combined Operating License (South Texas- COL), August 11, 2011	ML11223A472
PRM 51-24 submitted by Robert V. Eye, on behalf of Intervenors in Luminant Generation Company, LCC, Application for Comanche Peak Nuclear Power Plant Combined License (Comanche Peak- COL), August 11, 2011	ML11223A477
PRM 51-25 submitted by Mary Olson, on behalf of the Ecology Party of Florida, Nuclear Information (Levy- COL), August 11, 2011	ML11224A074
PRM 51-26 submitted by Terry Lodge, on behalf of Beyond Nuclear, Citizens Environment Alliance of Southwestern Ontario, Don't Waste Michigan, and the Green Party of Ohio (Davis-Besse- LR), August 11, 2011	ML112450527

PRM 51-27 submitted by Terry Lodge, on behalf of Beyond Nuclear, Citizens for Alternatives to Chemical Contamination, Citizens Environmental Alliance of Southwestern Ontario, Don't Waste Michigan, Sierra Club, Keith Gunter, Edward McArdle, Henry Newman, Derek Coronado, Sandra Bihn, Harold L. Stokes, Michael J. Keegan, Richard Coronado, George Steinman, Marilyn R. Timmer, Leonard Mandeville, Frank Mantei, Marcee Meyers, and Shirley Steinman (Fermi- COL), August 11, 2011	ML112450528
PRM 51-28 submitted by Barry White, on behalf of Citizens Allied for Safe Energy, Inc (Turkey Point- COL), August 11, 2011	ML11224A232
Report of Japanese Government to the IAEA Ministerial Conference on Nuclear Safety-The Accident at TEPCO's Fukushima Nuclear Power Stations, June 2011	http://www.kantei.go.jp/foreign/kan/topics/201106/iaea_houkokusho_e.html
SECY-11-0093, Near-Term Report and Recommendations for Agency Actions Following the Events in Japan, July 12, 2011	ML11186A959
SECY-11-0124, Recommended Actions to be Taken Without Delay from the Near Term Task Force Report, September 9, 2011	ML11245A127
SECY-11-0137, Prioritization of Recommended Actions to be Taken in Response to Fukushima Lessons Learned, October 3, 2011	ML11269A204
SECY-13-0112, Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling-Water Reactor, October 9, 2013	ML13256A334
SRM-COMSECY-13-0030, Staff Evaluation and Recommendation for Japan Lessons-Learned Tier 3 Issue on Expedited Transfer of Spent Fuel, May 23, 2014	ML14143A360

Dated at Rockville, Maryland, this 4th day of August, 2015.

For the Nuclear Regulatory Commission.

/RA/

Annette L. Vietti-Cook,
Secretary of the Commission.