

[7590-01-P]

**NUCLEAR REGULATORY COMMISSION**

**10 CFR Part 51**

**[Docket Nos. PRM-51-30 and PRM-51-31; NRC-2014-0014 and NRC-2014-0055]**

**Generic Determinations Regarding the Environmental Impacts of Spent Fuel Storage and Disposal when Considering Nuclear Power Reactor License Applications**

**AGENCY:** Nuclear Regulatory Commission.

**ACTION:** Petitions for rulemaking; denial.

**SUMMARY:** The U.S. Nuclear Regulatory Commission (NRC) is denying two petitions for rulemaking (PRMs), PRM-51-30 and PRM-51-31, submitted by Diane Curran on behalf of 34 environmental organizations (the petitioners). The petitioners request that the NRC revise certain regulations that concern the environmental impacts of spent fuel storage and disposal ~~in~~ environmental reviews for nuclear power plant license renewal applications. The NRC is denying the petitions because they provide an insufficient basis to consider a rulemaking to revise such regulations.

**DATES:** The dockets for the petitions for rulemaking, PRM-51-30 and PRM-51-31, are closed on **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

**ADDRESSES:** Please refer to Docket IDs NRC-2014-0014 and NRC-2014-0055, respectively as appropriate, when contacting the NRC about the availability of information regarding these petitions. You can access publicly-available documents related to the petitions using any of the following methods:

- **Federal Rulemaking Web Site:** Go to <http://www.regulations.gov> and search ~~on the~~ ~~petition for~~ Docket IDs NRC-2014-0014 and NRC-2014-0055. Address questions about NRC dockets to Carol Gallagher; telephone: 301-415-3463; e-mail: [Carol.Gallagher@nrc.gov](mailto: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 [pdresource@nrc.gov](mailto:pdresource@nrc.gov). The ADAMS accession number for each document referenced (if it is available in ADAMS) is provided the first time that it is mentioned in the SUPPLEMENTARY INFORMATION section. For the convenience of the reader, instructions about obtaining materials referenced in this document are provided in the Section [IV](#), Availability of Documents.

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

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

**SUPPLEMENTARY INFORMATION:**

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**I. The Petitions.**

Section 2.802 of Title 10 of the *Code of Federal Regulations* (10 CFR), "Petition for rulemaking," provides an opportunity for any interested person to petition the Commission to issue, amend, or rescind any regulation. The NRC has consolidated its response to PRM-51-30 and PRM-51-31 because both petitions make similar rulemaking requests. The NRC did not request public comment on PRM-51-30 and PRM-51-31 because there was sufficient information for review and these issues have been well-vetted in past NRC proceedings.

PRM-51-30

The petitioners filed the first of their two petitions on December 20, 2013, as a part of their comments on the NRC's proposed Continued Storage Rule (formerly known as the Waste Confidence Decision and Rule) and that rule's associated generic environmental impact statement (Continued Storage Generic Environmental Impact Statement (GEIS)).<sup>1</sup> The

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<sup>1</sup> [The Continued Storage GEIS is formally designated as NUREG-2157, "Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel." "Waste Confidence" has been the NRC's generic determination regarding the technical feasibility and environmental impacts of safely storing spent fuel beyond the licensed life for operations of a nuclear power plant \(NUREG-2157, Vol. 1, Section ES-1\).](#) The NRC published the Continued Storage Rule as a proposed rule on September 13, 2013 (78 FR 56776), and as a final rule on September 19, 2014 (79 FR 56238). As part of the final rule, all of the public comments on the proposed rule were addressed in NUREG-2157.

petitioners filed a corrected version of the first petition on January 7, 2014. The NRC published a notice of receipt of the first petition in the *Federal Register* (FR) on April 21, 2014, and assigned it Docket No. PRM-51-30 (79 FR 22055).

The petition requests that the NRC revise certain regulations in 10 CFR part 51 that concern the environmental impacts of spent fuel storage and disposal ~~in environmental reviews~~ for nuclear power plants ~~license renewal applications~~. The NRC implements its responsibilities under the National Environmental Policy Act (NEPA) through its 10 CFR part 51 regulations. The petitioners assert that the NRC's 10 CFR part 51 regulations are "balkanized" and "disparate and inconsistent," and that these regulations should be made into a "cohesive and consistent whole." The petitioners identified the following NRC regulations as being within the scope of their request: 10 CFR 51.53(c),<sup>2</sup> 10 CFR 51.51 (Table S-3),<sup>3</sup> 10 CFR 51.71(d),<sup>4</sup> and Table B-1, "Summary of Findings on NEPA Issues for License Renewal on Nuclear Power Plants,"<sup>5</sup> in appendix B to subpart A of 10 CFR part 51 (Table B-1), as well as the NRC's proposed amendments to 10 CFR 51.23, as set forth in its September 13, 2013, proposed rule (78 FR 56776).<sup>6</sup> ~~Except for 10 CFR 51.23 and Table S-3, these regulations concern the~~

<sup>2</sup> Section 51.53 is entitled "Post-construction environmental reports." Paragraph (c) describes the contents of the required environmental report submitted by an applicant in support of its application to renew a nuclear power plant's operating license.

<sup>3</sup> Table S-3 is entitled "Table of Uranium Fuel Cycle Environmental Data" and is set forth at 10 CFR 51.51. Table S-3 shows the maximum environmental effect per annual fuel requirement for an operating reactor and is the basis for evaluating the contribution of the environmental effects of uranium mining and milling, the production of uranium hexafluoride, isotopic enrichment, fuel fabrication, reprocessing of irradiated fuel, transportation of radioactive materials and management of low-level wastes and high-level wastes related to uranium fuel cycle activities to the environmental costs of licensing ~~the a~~ nuclear power reactor.

<sup>4</sup> Section 51.71 is entitled "Draft environmental impact statement—contents." Paragraph (d) describes the analysis required to be included in ~~the~~ draft environmental impact statements (EIS). For license renewal actions, the supplemental draft EIS relies on the findings and other supporting information in NUREG-1437, Revision 1, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants—Final Report" (2013).

<sup>5</sup> ~~Table B-1 is entitled "Summary of Findings on NEPA Issues for License Renewal of Nuclear Power Plants."~~

<sup>6</sup> The proposed amendments to 10 CFR 51.23 were adopted in ~~a the~~ final rulemaking (79 FR 56238; September 19, 2014). Section 51.23 is entitled "Environmental impacts of continued storage of spent nuclear fuel beyond the licensed life for operation of a reactor" and states that the Commission "has generically determined that the environmental impacts of continued storage of spent nuclear fuel beyond the licensed life for operation of a

~~environmental review undertaken by the NRC staff when considering an application for the renewal of a nuclear power plant's operating license.~~

Sections 51.53(c) and a portion of section 51.71(d) are premised upon NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants," an environmental impact statement (EIS) initially published in May 1996 and then revised and updated in June 2013 (License Renewal GEIS).<sup>7</sup> The License Renewal 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 license renewal issues described in the License Renewal GEIS as either generic or site-specific. Generic issues concern environmental impacts that are common to all nuclear power plants. 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 its supplemental environmental impact statement (SEIS) to the License Renewal GEIS prepared for each license renewal application.<sup>8</sup> For any given license renewal action, the License Renewal GEIS together with the site-specific SEIS (along with any other applicable generic EISs) documents the NRC's NEPA analysis.

In Table B-1, generic issues are designated as "Category 1" issues and site-specific issues are designated as "Category 2" issues. Absent new and significant information, Category 1 issues are not required to be re-analyzed for an applicant's environmental report or

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reactor are those impacts identified in NUREG-2157 [the Continued Storage GEIS]" (10 CFR 51.23(a)).

<sup>7</sup> The current version of the License Renewal GEIS is NUREG-1437, Revision 1.

<sup>8</sup> ~~Section 10 CFR 51.95(c) requires, for the consideration of potential environmental impacts of renewing a nuclear power plant's operating license, that the NRC prepare an environmental impact statement that is a supplement to the Commission's NUREG-1437, Rev. 1, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (June 2013).~~

the staff's SEIS. Table B-1 codifies the findings of the License Renewal GEIS and is wholly concerned with nuclear power plant license renewal.<sup>9</sup>

The purpose of Table S-3 is to support the environmental review for new reactor [license](#) applications. In addition to considering the environmental impacts of the construction and operation of a commercial nuclear power reactor, the NRC considers the contributions from the uranium fuel cycle activities.<sup>10</sup> Table S-3 identifies the uranium fuel cycle impacts, generically, for new reactor [license](#) applications.

The petitioners [also](#) assert that the NRC's proposed amendments to 10 CFR 51.23, as set forth in the NRC's proposed rule of September 13, 2013 (~~78~~ FR 56776), are "confusing" to the extent that the proposed [continued storage](#) regulation included safety findings, which should be placed in either 10 CFR parts 50 or 52, and because the proposed regulation no longer includes the "reasonable assurance" finding. The petitioners also assert that Table S-3 has been "repudiated" and that it is inconsistent with the findings in Table B-1. In addition, the petitioners assert that Table B-1 does not include a finding as to whether offsite spent fuel disposal impacts are significant or not.

The petitioners further assert that 10 CFR 51.53(c) and 51.71(d) "excuse" license renewal applicants and the NRC, respectively, from addressing spent fuel storage impacts in individual license renewal cases. As both regulatory provisions are premised upon the findings in the License Renewal GEIS, the petitioners, essentially, object to the finding that impacts of spent fuel storage during the license renewal period are a Category 1, or generic, issue, and have a "small" impact. Finally, the petitioners assert that the economic costs of spent fuel

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<sup>9</sup> Table B-1 was amended to reflect the June 2013 [License Renewal](#) 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).

<sup>10</sup> Uranium fuel cycle activities include "uranium mining and milling, the production of uranium hexafluoride, isotopic enrichment, fuel fabrication, spent fuel storage and disposal" (44 FR 45362; August 2, 1979).

storage and disposal should be incorporated into reactor cost-benefit analyses and that the need for power should be considered in license renewal decisions.

PRM-51-31

The petitioners filed their second petition on February 18, 2014. The petitioners' second petition asserts that COMSECY-13-0030, "Staff Evaluation and Recommendation for Japan Lessons-Learned Tier 3 Issue on Expedited Transfer of Spent Fuel"<sup>11</sup> (the expedited spent fuel transfer analysis), and NUREG-2161, "Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling-Water Reactor,"<sup>12</sup> constitute new and significant information. The petitioners ~~further~~ request that the NRC "duly modify NRC's regulations that make or rely on findings regarding the environmental impacts of spent fuel storage during reactor operation, including Table B-1 and all regulations approving standardized reactor designs."

The NRC published a notice of receipt of the second petition in the ~~FR~~ *Federal Register* on May 1, 2014, and assigned it Docket No. PRM-51-31 (79 FR 24595). The petitioners subsequently submitted an "amended petition" for rulemaking on June 26, 2014, seeking to add "the observations made by ~~former~~ Chairman Macfarlane in her dissenting comments" on the expedited ~~transfer of spent fuel~~ [spent fuel transfer analysis](#). The petitioners assert that the former Chairman's dissenting vote on the expedited spent fuel transfer ~~proceeding analysis~~ provides "new and significant" information that would affect the NRC's environmental reviews ~~in~~ [license renewal](#). The NRC treated the "amended petition" as a supplement to the February 18,

<sup>11</sup> COMSECY-13-0030, "Memorandum from Mark Satorius, Executive Director for Operations, to NRC Commissioners Re: Staff Evaluation and Recommendations for [Japan Lessons-Learned Tier 3 Issue on ~~Expected~~ Expedited Transfer of Spent Fuel](#)" (Nov. 12, 2013), and documents cited therein.

<sup>12</sup> NUREG-2161, "Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling-Water Reactor:" [\(Sep. 2014\)](#).

2014, petition and re-noticed the petition, along with the supplement, for informational purposes only (79 FR 42989; July 24, 2014).

## II. Reasons for Denial.

The NRC is denying the petitions because the petitioners have not presented a sufficient basis to amend the regulations. The petitioners largely contend that they present new and significant information that requires the agency to revisit its previous NEPA analyses that form the bases for the challenged regulations. Under Commission precedent, information that provides a “seriously different picture” of the environmental consequences than previously considered is new and significant information.<sup>13</sup> As explained below, the NRC finds that the petitioners’ information does not provide a “seriously different picture” of the environmental consequences of spent fuel storage. As a result, the NRC concludes that the current technical bases for those regulations challenged by the petitioners remain sound.

*The petitioners assert that the NRC’s environmental review regulations are “balkanized”*

The petitioners assert that “[t]he NRC’s piecemeal and disjointed approach to the consideration of spent fuel storage and disposal impacts violates the NEPA principle that an agency may not segment its analysis in a manner that conceals the environmental significance of its action.” Segmentation refers to instances where a Federal agency splits a project into smaller components to avoid preparing an EIS, or where an agency does not consider related

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<sup>13</sup> Hydro Res. Inc., CLI-99-22, 50 NRC 3, 14 (1999) (quoting *Sierra Club v. Froehike*, 816 F.2d 205, 210 (5<sup>th</sup> Cir. 1987)); see generally *Marsh v. Oregon Natural Resources Council*, 490 U.S. 360 (1989).



actions in a single EIS.<sup>14</sup> The NRC does not agree that its approach to the consideration of spent fuel storage and disposal impacts is piecemeal and disjointed or that NRC's environmental review regulations in 10 CFR part 51 are "balkanized" or result in NEPA segmentation.

~~While the petitioners have pointed to some instances where the agency relies on generic analyses as part of its overall NEPA review for certain licensing actions, the petitioners have not shown any case where the NRC artificially divided a licensing action into smaller components. Rather, as discussed below, the NRC fully considers the environmental impacts of each licensing action through a combination of site-specific EISs and, where appropriate, generic EISs. Although addressed in two generic EISs prepared by the NRC (i.e., the License Renewal GEIS and the Continued Storage GEIS), spent fuel storage and disposal impacts are reassessed by the NRC staff during each new reactor and license renewal environmental review to determine if there is new and significant information that could alter the generic conclusions.~~ The use of generic analyses by the NRC to support licensing decisions has been upheld by the United States Supreme Court.<sup>15</sup>

In addition to the License Renewal GEIS and the Continued Storage GEIS, the NRC prepares EISs for all new reactor and license renewal applications. Within the umbrella of both its generic and site-specific EISs, the NRC adequately considers the spent fuel storage impacts of its licensing decisions. The EISs for new nuclear power reactors describe the environmental

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<sup>14</sup> *Delaware Riverkeeper Network v. FERC*, 753 F.3d 1304, 1313 (D.C. Cir. 2014) ("An agency impermissibly 'segments' NEPA review when it divides connected, cumulative, or similar federal actions into separate projects and thereby fails to address the true scope and impact of the activities that should be under consideration."); see *also* Council on Environmental Quality (CEQ) regulation, ~~40-40~~ CFR 1508.25.

<sup>15</sup> In a 1983 decision concerning a challenge to Table S-3, the Supreme Court stated that "[t]he generic method chosen by the agency is clearly an appropriate method of conducting the hard look required by NEPA." *Baltimore Gas & Elec. Co. v. NRDC*, 462 U.S. 87, 101, 103 S.Ct. 2246, 2254 (1983).

impacts from the onsite storage and management of spent nuclear fuel and offsite disposal based on 40 years of reactor operation, which is the maximum initial term of a reactor license.<sup>16</sup> The License Renewal GEIS describes the environmental impacts from the onsite storage and offsite disposal of spent nuclear fuel generated during an additional 20 years of reactor operation (i.e., 20 years beyond the expiration of the initial license).<sup>17</sup> The Continued Storage GEIS describes the environmental impacts of the continued storage of spent nuclear fuel beyond the licensed life for operation of a reactor. Additionally, spent fuel storage and disposal impacts are considered by the NRC staff during each new reactor license and license renewal environmental review to determine if there is new and significant information that could alter the generic conclusions.

Moreover, the underlying technical bases for the consideration of spent fuel storage and disposal impacts in EISs for new nuclear power reactor licenses and the License Renewal GEIS are the same. Combined with the Continued Storage GEIS, these NEPA documents provide a complete analysis of spent fuel storage and disposal environmental impacts. The regulations in 10 CFR part 51 are ~~both~~-premised upon, and support, this NEPA framework of generic EISs supported by site-specific EISs.

The NRC's approach improves the effectiveness of environmental reviews by generically resolving issues that are not substantially different from one ~~proceeding-proposed action~~ to another, while still ensuring that those impacts are considered in subsequent licensing actions. The NRC conducts environmental and safety reviews for the issuance of licenses for the operation of nuclear power plants including the onsite storage of spent nuclear fuel. The NRC

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<sup>16</sup> 10 CFR 52.104.

<sup>17</sup> 10 CFR 54.31.

has also conducted separate environmental and safety reviews for the issuance of specific licenses for the storage of spent nuclear fuel in independent spent fuel storage installations (ISFSIs).<sup>18</sup> With respect to spent fuel disposal, ~~the U.S. Department of Energy (DOE) is responsible for developing~~ an EIS ~~would fully discuss the environmental impacts~~ for spent fuel disposal in a geologic repository ~~at the time of licensing~~. In addition, the NRC has previously determined the potential radiological effects of offsite spent fuel disposal in a permanent repository or some other permanent disposal scenario while evaluating the environmental effects of the uranium fuel cycle.<sup>19</sup>

The consideration of spent fuel storage and disposal ~~environmental~~ impacts builds upon the knowledge gained from previous environmental reviews and associated rulemakings and is consistent throughout the NRC's regulations in that the NRC relies on the same technical bases to make impact determinations. The only differences are ~~in~~ the timeframes in which these impacts occur and whether the impacts occur during continued onsite storage or offsite disposal. In each of these regulatory situations, the technical bases remain the same.

Tables S-3 and B-1 in the NRC's regulations were developed at separate times for different purposes but have common technical bases. The 2014 continued storage rule, and its supporting Continued Storage GEIS, updated the NRC's NEPA findings in Table B-1 for ~~the~~ issues ~~pertaining to~~ "Onsite storage of spent nuclear fuel" and "Offsite radiological impacts of spent nuclear fuel and high-level waste disposal." In doing so, the NRC effectively incorporated the NEPA analysis of continued spent fuel storage into ~~the new reactor, license renewal, and ISFSI impact analyses~~. For new reactors, 10 CFR 51.23(b) directs that the impact

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<sup>18</sup> NRC regulation, 10 CFR 72.3, defines an ISFSI as "a complex designed and constructed for the interim storage of spent nuclear fuel."

<sup>19</sup> See WASH-1248, "Environmental Survey of the Uranium Fuel Cycle," April 1974, and NUREG-0116, "Environmental Survey of the Reprocessing and Waste Management Portions of the LWR Fuel Cycle," October 1976.

determinations in NUREG-2157 shall be deemed incorporated into the associated EIS. And for licensing actions for which an environmental assessment (EA) is being prepared (such as an ISFSI built under a specific license at a site occupied by a nuclear power reactor), 10 CFR 51.30(b) directs that the impacts determinations in NUREG-2157 regarding the continued storage of spent fuel shall be considered, if such impacts are relevant to the proposed action.

For a given future reactor licensing action that relies on the Continued Storage GEIS and rule, the NRC will incorporate the environmental impacts analyzed in the Continued Storage GEIS into the overall licensing decision. The NRC's NEPA review for each licensing action that involves either a new reactor or a license renewal application will fully account for the reasonably foreseeable impacts of spent fuel storage and disposal, including, where applicable, the impacts that have been analyzed generically in the Continued Storage GEIS and License Renewal GEIS.

The NRC concludes that its 10 CFR Part 51 environmental review regulations are not "balkanized," and are consistent. Thus, there is no technical or regulatory reason to amend these regulations.—The NRC concludes that that its 10 CFR Part 51 environmental review regulations are not inappropriately segmented and are consistent and thus there is no reason to amend these regulations.

*The petitioners assert that Table S-3 has been repudiated*

The petitioners' expert, Dr. Arjun Makhijani, in a declaration attached to the petitioners' January 2014 submission, states that the Table S-3 finding regarding the impacts of spent fuel disposal is no longer valid because the finding is based upon the disposal of spent fuel in a

bedded salt repository and that such disposal would result in zero releases of radioactive effluents, and therefore, zero radiological dose. Dr. Makhijani asserts that

[m]oreover, we note that Table S-3 at 10 CFR 51.51 is invalid for estimating high-level waste disposal impacts. Among other things, its underlying assumption of disposal in a bedded salt repository for spent fuel disposal was repudiated by the NRC itself in 2008.<sup>20</sup>

The petitioners, through Dr. Makhijani's declaration, assert that the NRC must prepare a new analysis concerning the impacts of spent fuel disposal.

Dr. Makhijani's statement evaluates Table S-3 in isolation and does not consider later developments in the NRC's regulatory policy and Supreme Court precedent. The Atomic Energy Commission, the predecessor agency of the NRC, promulgated the initial version of Table S-3 on April 22, 1974 (39 FR 14188). Since the promulgation of Table S-3, the Nuclear Waste Policy Act of 1982 (NWPA) adopted deep geologic disposal as the nation's solution for spent fuel disposal. ~~In addition~~ Nonetheless, in 1983 the United States Supreme Court, in its *Baltimore Gas & Elec. Co. v. NRDC* decision,<sup>21</sup> upheld both Table S-3 and the approach taken by the NRC in using Table S-3 data in individual licensing proceedings. In *Baltimore Gas*, the Supreme Court recognized that the purpose of Table S-3 was not to evaluate or select the most effective long-term waste disposal technology or develop site selection criteria ~~but "to analyze intensively the most probable long-term waste disposal method."~~<sup>22</sup> ~~the~~ The Court noted that the NRC's intent, as stated in the 1979 rule revising Table S-3 (44 FR 45362; August 2, 1979),

<sup>20</sup> "Declaration of Dr. Arjun Makhijani Regarding the Waste Confidence Proposed Rule and Draft Generic Environmental Impact Statement," attached to PRM-51-30 (paragraph 2.8 on p. 6).

<sup>21</sup> *Baltimore Gas & Elec. Co. v. NRDC*, 462 U.S. 87, 103 S.Ct. 2246 (1983).

<sup>22</sup> *Id.*, 462 U.S. at 102, 103 S.Ct. at 2254-55.

was to estimate the impact of the long-term waste disposal method conservatively.<sup>23</sup> This conservative analysis included the NRC's use of the zero release assumption.<sup>24</sup> The Court also noted that other aspects of Table S-3 were premised upon the assumption that "all volatile materials in the fuel would escape to the environment" prior to the sealing of the geologic repository; this assumption balanced the zero-release assumption, an approach that the Court found acceptable.<sup>25</sup> In addition to concluding that it was "not unreasonable" for the NRC to employ the zero release assumption, the Court stated that "the zero-release assumption is but a single figure in an entire Table, which the Commission expressly designed as a risk-averse estimate of the environmental impact of the fuel cycle ... [a] reviewing court should not magnify a single line item beyond its significance as only part of a larger Table."<sup>26</sup>

Following the enactment of the NWPA and the *Baltimore Gas* decision, the NRC issued a Waste eConfidence decision in 1984 (49 FR 34658; August 31, 1984), and subsequently updated this decision in 1990 (55 FR 38472; September 18, 1990) and again in 2010 (75 FR 81032; December 23, 2010). In its 1990 revision, the Commission discussed the relationship of Table S-3 with its Waste Confidence decision. Specifically, the Commission noted that the promulgation of Table S-3 was the outgrowth of efforts to generically evaluate the environmental impacts of the operation of a light water reactor and in so doing, that Table S-3 assigned numerical values for environmental costs resulting from uranium fuel cycle activities to support one year of light water reactor operation. The number of curies indicated for spent fuel disposal in Table S-3 reflects the total volume of waste material, not the amount of radioactivity projected

<sup>23</sup> *Id.*, 462 U.S. at 102, 103 S.Ct. at 2255.

<sup>24</sup> *Id.* ("The zero-release assumption cannot be evaluated in isolation. Rather, it must be assessed in relation to the limited purpose for which the Commission made the assumption.")

<sup>25</sup> *Id.*, 462 U.S. at 103, 103 S.Ct. at 2255.

<sup>26</sup> *Id.*, 462 U.S. at 102-03, 103 S.Ct. at 2255.

to be released from the repository—an issue that is to be addressed in the safety and environmental review for the actual geologic repository itself.

~~Dr. Makhijani's statements regarding the validity of disposal in a bedded salt repository for spent fuel were similar to comments he provided on the NRC's 2010 waste confidence decision update. In response to Dr. Makhijani's comments, the NRC explained that, in considering the disposal of spent nuclear fuel in a geologic repository, its concern was not whether a zero release assumption will be met, but rather that appropriate public health and safety standards are established and met during the construction and operation of a repository. Such standards would ensure that any releases of radioactive material to the environment are not inimical to public health and safety.<sup>27</sup>~~

Table S-3 lists environmental data to be used by applicants and the NRC staff for new reactor license applications under 10 CFR parts 50 and 52. Specifically, Table S-3 is the basis for evaluating the environmental effects of the portions of the uranium fuel cycle for light water reactors that occur before new fuel is delivered to the plant and after spent fuel is removed from the plant site. The NRC has made generic determinations that the radiological impacts of the uranium fuel cycle on individuals off-site will remain at or below the Commission's regulatory limits (e.g., the public dose limits set forth in 10 CFR part 20). The NRC described this generic determination and conclusion in the License Renewal GEIS.<sup>28</sup> Additionally, as part of the new reactor EISs under 10 CFR part 52 and the License Renewal GEIS, the NRC concluded that the assumptions and methodology used in preparing Table S-3 were conservative enough that the impacts described by the use of Table S-3 would still be bounding. In these EISs, the staff

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<sup>27</sup> Continued Storage GEIS section D.2.49.2, p. D-517.

<sup>28</sup> 2013 GEIS section 4.12.1.1, p. 4-185

discussed why the contemporary fuel cycle impacts are below those identified in Table S-3 and as such, Table S-3 remains bounding.<sup>29</sup>

~~Furthermore, the NRC concludes that Table S-3 is bounding because~~, as reflected in section 4.12.1.1 of the License Renewal GEIS, industry practice has shown that the current fleet of reactors uses nuclear fuel more efficiently due to higher fuel burnup. Therefore, less uranium fuel per year of reactor operation is required than in the past to generate the same amount of electricity. Fewer spent fuel assemblies per reactor-year are generated, hence, the waste storage and deep geologic repository impacts are lessened. ~~The NRC is not aware of petitioners have not provided~~ any new information that would cause ~~it the NRC~~ to revisit these conclusions regarding Table S-3. ~~Finally, the NRC has provided ample opportunity for public comment on all new reactor EISs as well as the 2013 revision to the License Renewal GEIS (NUREG-1437, Revision 1) and its related amendments to 10 CFR part 51.~~

~~The issue of concern to the NRC in considering the disposal of spent nuclear fuel in a geologic repository has not been whether a zero-release assumption will be met or ultimately the type of environmental media (e.g., bedded salt, basalt, granite, etc.) selected for the repository but rather that the appropriate standards are established and met, thereby ensuring that any releases of radioactive materials to the environment would not be inimical to public health and safety. The Commission has previously made clear in other proceedings that “[a]lthough a repository has not yet been constructed and its safety and environmental acceptability demonstrated, no fundamental breakthrough in science or technology is needed to implement a successful waste disposal program.”<sup>30</sup> This focus on whether a fundamental~~

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<sup>29</sup> For example, see the Bell Bend Nuclear Power Plant EIS, NUREG 2179, vol. 1, section 6.1, ([April 2015](#)), for a discussion of the NRC determination that Table S-3 remains bounding ~~published in April 2015~~.



~~breakthrough in science or technology is needed has guided the Commission's consideration of the feasibility of the disposal of high level waste and spent nuclear fuel.~~

While the NRC and ~~U.S. Department of Energy~~the DOE have, in the past, concentrated efforts regarding geologic repository research and licensing efforts on a non-bedded salt repository, characterizing the resulting analysis as confirming that there is a risk of “significant” radiation releases and radiation doses from deep geologic disposal is ~~also not valid~~ accurate. As stated in Volume 1, Appendix B of the Continued Storage GEIS, “the consensus within the scientific and technical community engaged in nuclear waste management is that safe geologic disposal is achievable with currently available technology...After decades of research into various geological media, no insurmountable technical or scientific problem has emerged to challenge the conclusion that safe disposal of spent fuel and high-level radioactive waste can be achieved in a mined geologic repository.”<sup>31</sup>

The issue of concern to the NRC in considering the disposal of spent nuclear fuel in a geologic repository has not been whether a zero-release assumption will be met or ultimately the type of environmental media (e.g., bedded salt, basalt, granite, etc.) selected for the repository but rather that the appropriate standards are established and met, thereby ensuring that any releases of radioactive materials to the environment would not be inimical to public health and safety. Radiation dose limits for disposal of radioactive materials are typically no greater than 100 mrem/yr (such as the U.S. Environmental Protection Agency (EPA) limits for the proposed Yucca Mountain geologic repository). Although a geologic repository meeting such radiation dose limits is not a “zero” release facility, compliance with these dose limits would provide adequate protection of public health and safety. -Given the substantial effort developing

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<sup>31</sup> NUREG-2157, pg. 2 of Appendix B, section B.2.1.

repositories, it is reasonable to assume geologic disposal facilities can be developed within a variety of geologic formations and types that would be protective of public health and safety. For example, the NRC-National Academy of Sciences (NAS) study, referred to by Dr. Makhijani, concludes on the overall performance of candidate repositories that “[a]ll radionuclides in unprocessed spent fuel can be adequately contained.”<sup>32</sup> ~~Therefore, under NEPA considerations, this is clearly not a risk for significant radiation releases and radiation doses as demonstrated by the NRC’s recent completion of NUREG-1949, “Safety Evaluation Report Related to Disposal of High-Level Radioactive Wastes in a Geologic Repository at Yucca Mountain, Nevada.”~~ In conclusion, the NRC has determined that Table S-3 is still bounding and ~~that the petitioners have not provided new and significant information that requires the NRC to amend Table S-3 there is little, if any, technical or regulatory benefit to updating it, as the purpose of Table S-3 is to inform the preparation of licensee environmental reports submitted with new reactor applications.~~

*The petitioners assert that Table S-3 and Table B-1 are inconsistent with each other*

The petitioners assert that Table S-3 and Table B-1 are inconsistent with each other. The petitioners state in PRM-51-30, “[t]he inconsistencies and questions raised by comparing Table S-3 and Table B-1 are unacceptable under NEPA’s standard for clarity and rigor of scientific analysis.” In his comments, Dr. Makhijani stated,

Table S-3 summarizes the NRC’s conclusion that the impacts of spent fuel disposal will be zero, based on the assumption that spent fuel will be disposed of in a bedded salt repository. Proposed Table B-1 contradicts Table S-3 by concluding that long-term doses could be as high as 100 millirem per year. But

<sup>32</sup> NRC-National Academies of ScienceNAS Report, “A Study of the Isolation System for Geologic Disposal of Radioactive Wastes,” p. 8 and 11.

the NRC does not attempt to reconcile proposed Table B-1 and Table S-3; ~~nor does it address the fact that in the 2008 Draft Waste Confidence Update, it repudiated bedded salt as a geologic medium for a repository...~~<sup>33</sup>

The environmental effects of operating uranium fuel cycle facilities including radioactive waste disposal at a geologic repository were evaluated in two NRC documents, WASH-1248 and NUREG-0116. The results of ~~this~~ these evaluations were summarized in and promulgated as Table S-3 in 10 CFR 51.51(b). Paragraph (a) in 10 CFR 51.51 states:

[E]very environmental report prepared for the construction permit stage or early site permit stage or combined license stage of a light-water-cooled nuclear power reactor, and submitted on or after September 4, 1979, shall take Table S-3, Table of Uranium Fuel Cycle Environmental Data, as the basis for evaluating the contribution of the environmental effects of uranium mining and milling, the production of uranium hexafluoride, isotopic enrichment, fuel fabrication, reprocessing of irradiated fuel, transportation of radioactive materials and management of low-level wastes and high-level wastes related to uranium fuel cycle activities to the environmental costs of licensing the nuclear power reactor. Table S-3 shall be included in the environmental report and may be supplemented by a discussion of the environmental significance of the data set forth in the table as weighed in the analysis for the proposed facility.

The environmental effects or issues summarized in Table S-3 include: land use; water consumption and thermal effluents; radioactive releases; burial of transuranic, high-level and low-level radioactive wastes; and radiation doses from transportation and occupational exposures. The contributions in Table S-3 for reprocessing, waste management, and transportation of wastes are maximized for either of the two fuel cycles (i.e., a fuel cycle that includes spent fuel reprocessing and one that does not)—the cycle that results in the greater environmental impact, and thus the most conservative analysis, is used. The environmental

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<sup>33</sup> Makhijani Declaration attached to PRM-51-30, p. 9.

impact values are expressed in terms normalized to show the potential impacts attributable to processing the fuel required for the operation of a 1,000-MWe nuclear power plant for one year at an 80 percent availability factor to produce about 800 MW-yr ~~(0.8 GW-yr)~~ of electricity. This normalization is referred to as one reference reactor year. For each environmental consideration, Table S-3 presents a result that has been integrated over the entire uranium fuel cycle except during reactor operations.<sup>34</sup> The environmental impacts of reactor operations are addressed in the EIS prepared for each individual reactor licensing action (i.e., an EIS for a new reactor licensing application or an SEIS for a license renewal application). Although certain fuel cycle operations and fuel management practices have changed over the years, the assumptions and methodology used in preparing Table S-3 were, and continue to be, conservative enough that the impacts described in Table S-3 are still bounding.

In similar fashion, the NRC assessed the generic environmental impacts of renewing the operating license for a nuclear power plant in the License Renewal GEIS. Table B-1 summarizes the Commission's findings on the scope and magnitude of the environmental effects of renewing the operating license for a nuclear power plant, based on technical bases documented in the 2013 update of the License Renewal GEIS. Subject to an evaluation of those Category 2 issues, which require further site-specific analysis, and the identification of possible new and significant information for any Category 1 or Category 2 issue, Table B-1 represents the analysis of the environmental impacts associated with the renewal of any operating license and is to be used in accordance with 10 CFR 51.95(c). On a 10-year cycle,

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<sup>34</sup> The only exception is that the waste quantities listed under the entry called "solids (buried onsite)" also includes wastes generated at the reactor.

the Commission intends to review the findings in Table B-1 and update the table if necessary. The latest review and update was completed in 2013.

Both the License Renewal GEIS and Table B-1 incorporate Table S-3 by reference.<sup>35</sup> Tables S-3 and B-1 were developed at separate times for different purposes. However, the technical bases for the consideration of spent fuel storage and disposal impacts for both tables are the same, and as such, the tables are consistent with each other. The impact of the spent nuclear fuel disposal finding in Table B-1 (i.e., “Offsite radiological impacts of spent nuclear fuel and high-level waste disposal”) is consistent with the solid waste disposal information presented in Table S-3, as the findings in Table B-1 could not be-have been reached without the environmental effects evaluations conducted in WASH-1248 and NUREG-0116, which are summarized in Table S-3.

Moreover, even if there were differences in the assumptions in Table S-3 and Table B-1, those differences are not significant from a NEPA perspective. As noted above, the issue of concern to the NRC in considering the environmental impacts of the disposal of spent nuclear fuel in a geologic repository has not been whether a zero-release assumption will be met or ultimately the type of environmental media (e.g., bedded salt, basalt, granite, etc.) selected for the repository but rather that the appropriate standards are established and met, thereby ensuring that any releases of radioactive materials to the environment would not be inimical to public health and safety. For NEPA purposes, such releases within regulatory limits are clearly not significant radiation releases and radiation doses. The NRC concludes that Tables B-1 and S-3 are consistent with each other and there is no technical or regulatory reason to amend either or-both tables.

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<sup>35</sup> Table B-1 references Table S-3 under the “Uranium Fuel Cycle” section of the table.

*No significance determination for “off-site spent fuel disposal” in Table B-1*

The petitioners assert that Table B-1, which codifies the findings of the License Renewal GEIS, does not include a finding as to whether the impacts of spent fuel disposal are significant or not. The “significance determination” in NEPA is made by an agency in determining whether it is necessary to prepare an EIS for a given proposed action.<sup>36</sup> With respect to the environmental review of reactor license renewal applications, the NRC has already prepared a generic EIS, the License Renewal GEIS. In addition, for each site-specific license renewal action, the NRC prepares a SEIS. Therefore, the lack of a finding as to whether the impacts of spent fuel disposal are “significant” or “not significant” is irrelevant, as the NRC has already satisfied the “significance determination” by preparing a generic EIS and by its regulatory requirement to prepare a site-specific EIS for each reactor license renewal application it considers.

Moreover, the NRC has extensively analyzed spent fuel storage and disposal environmental impacts in Table S-3, and in various EISs, namely, the License Renewal GEIS, ~~in~~ the Continued Storage GEIS, ~~and in~~ SEISs for individual license renewal actions, ~~and in its~~ review, adoption, and supplementation of the DOE’s EISs for Yucca Mountain. The License Renewal GEIS provides the regulatory and technical basis for the Commission’s findings and the associated impact significance levels for each environmental NEPA issue listed in Table B-1. The NRC’s evaluation of the environmental impacts of the issue, “Offsite radiological impacts

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<sup>36</sup> *Lower Alloways Creek Tp. v. Public Service Elec. & Gas Co.*, 687 F.2d 732, 740 (3rd Cir. 1987) (“A n agency must undertake a comprehensive assessment of the expected effects of a proposed action before it can determine whether that action is ‘significant’ for NEPA purposes. . . . [i]f, however, it is clear that the human environment will be ‘significantly’ affected, then a full-scale EIS is mandatory.”); *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1211-14, and 1216 (9th Cir. 1998) (Forest Service made clear error of judgment in its decision to prepare an environmental assessment, rather than an environmental impact statement); see also Mandelker, *NEPA Law and Litigation*, 2d, §§ 8.48-8.58.

of spent nuclear fuel and high-level waste disposal,”<sup>37</sup> was documented in the 1996 License Renewal GEIS, which relied upon the findings of the NRC’s 1990 Waste Confidence Decision and Rule. In addition, the NRC analyzed the EPA’s generic repository standards and dose limits in existence at the time and concluded that offsite radiological impacts warranted a Category 1 (generic) determination (61 FR 28467; June 5, 1996). However, ~~in response due to the D.C. Circuit Court’s decision~~ of the U.S. Court of Appeals for the D.C. Circuit in *New York v. NRC* and its remand of the 2010 Waste Confidence Decision and Rule (75 FR 81032; December 23, 2010), the NRC was not able to complete its review and update of the impact finding for this issue in the 2013 License Renewal GEIS (NUREG-1437, Revision 1) and update of Table B-1. As a result, the 2013 License Renewal GEIS and rule (78 FR 37282; June 20, 2013) reclassified the issue from Category 1 with no impact level assigned, to an uncategorized issue with an uncertain impact level.

On August 26, 2014, the Commission approved the Continued Storage Rule and its associated GEIS (Continued Storage GEIS) 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. In making conforming changes to the Table B–1 entry for the issue “Offsite radiological impacts of spent nuclear fuel and high-level waste disposal,” the final rule restored the Category 1 designation and references the existing radiation protection standards for Yucca Mountain instead of making a single impact finding.

The NRC’s practice, once it has determined to prepare an EIS, has been to assign a significance level to most potential environmental impacts, by resource area or environmental

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<sup>37</sup> This issue was named “Offsite radiological impacts (spent fuel and high level waste disposal)” in the 1996 license renewal GEIS and rule.

issue, arising from the proposed action. These levels are “Small, Moderate, and Large.” The assigning of these levels to any given impact is not required by law; it is solely a matter of NRC practice. Neither the Council on Environmental Quality’s nor the NRC’s regulations for implementing NEPA under 10 CFR part 51 explicitly require an agency to assign a single significance level to environmental impact issues; CEQ regulations state that “[i]mpacts shall be discussed in proportion to their significance” in the context of preparing environmental impact statements for agency actions.<sup>38</sup> Further, NRC does not assign such a level to every resource area or environmental issue covered by a given EIS. The NRC only assigns a single significance level for a generic issue where it is meaningful and appropriate to do so when considering both the context and intensity of a potential environmental impact.<sup>39</sup>

In this regard, the NRC has never assigned a single impact significance level to the issue of “Offsite radiological impacts of spent nuclear fuel and high-level waste disposal.” Although the status of a repository, including a repository at Yucca Mountain, remains uncertain and beyond the control of the NRC, the NRC has adopted EPA’s radiation protection standards (40 CFR part 197) for Yucca Mountain because they are the current standard for ensuring that the ultimate disposal of spent nuclear fuel will present no undue risk to public health and safety. As discussed in the Continued Storage GEIS, it is reasonable to believe that wherever a geologic repository is ultimately sited, ~~the NRC’s and EPA’s environmental and radiological protection standards comparable to those established for Yucca Mountain would will apply be issued if necessary.~~ Given these considerations, the Commission’s narrative finding in Table B-1 with respect to the issue of offsite disposal is likewise appropriate. That finding states “[t]he

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<sup>38</sup> 40 CFR 1502.2(b).

<sup>39</sup> See CEQ regulation 40 CFR 1508.27, which defines the term “significantly,” in relation to both “context” and “intensity.”



Commission concludes that the 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.” Therefore, the Commission, by rule, has determined that a single significance determination is not necessary.

~~Further, neither the Council on Environmental Quality's nor the NRC's regulations for implementing NEPA under 10 CFR part 51 explicitly require an agency to assign a single significance level to environmental impact issues; CEQ regulations state that “[i]mpacts shall be discussed in proportion to their significance” in the context of preparing environmental impact statements for agency actions.<sup>40</sup>~~

~~The NRC concludes that the petitioners' significance determination argument does not provide a “seriously different picture” of the environmental consequences of spent fuel storage and disposal. Instead, based on the above, the NRC concludes that~~~~In conclusion,~~ the petitioners' ~~request and~~ assertion that NEPA requires an agency to assign a single level of significance to the issue in question is ~~not proven without merit~~ and ~~that the petitioners' proposed amendment to the information presented does not provide a sufficient basis to amend~~ the NRC's finding for the issue, “Offsite radiological impacts of spent nuclear fuel and high-level waste disposal,” in Table B-1 in appendix B to subpart A of 10 CFR part 51 is not necessary.

*The petitioners assert that license renewal applicants in 10 CFR 51.53(c) and NRC staff in 51.71(d) are excused from addressing spent fuel storage impacts in license renewal environmental reviews*

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<sup>40</sup>~~40 CFR 1502.2(b).~~

The NRC disagrees with the petitioners' assertion that the NRC's regulations in 10 CFR 51.53(c) and 51.71(d) "excuse license renewal applicants and the NRC from addressing spent fuel storage impacts in license renewal cases." The NRC has determined that the potential environmental impacts of spent fuel storage ~~impacts~~ are of a generic nature and as such, do not need to be re-analyzed for every license renewal action. As mentioned previously, for future reactor license renewal applications that rely on the Continued Storage and License Renewal GEISs, the NRC will incorporate the environmental impacts analyzed in the Continued Storage GEIS as well as in the License Renewal GEIS into the overall NEPA analysis supporting its licensing decision. The Supreme Court has upheld the use of generic environmental analyses by the NRC.<sup>41</sup> Moreover, As part of the its environmental review for each license renewal application, the NRC reviews both generic and site-specific issues for ~~any~~ new and significant information. In the event that the NRC determines that there is new and significant information ~~concerning the generic spent fuel storage impact finding or any other generic finding~~, the NRC will consider such information when preparing the supplemental EIS for that particular licensing action and, if necessary, will also determine whether the License Renewal GEIS or Continued Storage GEIS should be revised accordingly.

Moreover, the quality of the NRC's environmental analysis of spent fuel storage is not dependent on whether the NRC prepares a site-specific or generic analysis. In ~~conducting~~ developing both the License Renewal GEIS and the Continued Storage GEIS, the NRC employed assumptions, including those based upon reactor licensee operating experience, that are sufficiently conservative to bound the predicted impacts such that any variances that may

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<sup>41</sup> *Baltimore Gas*, 462 U.S. at 101, 103 S.Ct. at 2254 ("The generic method chosen by the agency is clearly an appropriate method of conducting the hard look required by NEPA.")

occur from site to site are unlikely to result in environmental impact determinations that are greater than those presented in both GEISs.<sup>42</sup> In addition, recent spent fuel studies (including the expedited spent fuel transfer regulatory analysis included in COMSECY-13-0030 and NUREG-2161) continue to support the findings of the License Renewal GEIS. Though the studies may contain “new” information, the information is not “significant.” for the purpose of the environmental analysis. ~~The~~ NUREG-2161 compared spent fuel pool accident consequences from previous research studies and found-determined that they are-were of the same magnitude. Finally, the Continued Storage GEIS supports-reinforces the Commission’s original determination that supports use of a generic analysis.

The NRC concludes that the petitioners’ arguments regarding 10 CFR 51.53(c) and 51.71(d) do not provide a “seriously different picture” of the environmental consequences of spent fuel storage and disposal. Instead, based on the above, the NRC concludes that spent fuel storage impacts are fully evaluated as part of the NRC’s license renewal actions and that the petitioners’ proposed amendments are not necessary. Thus there is no technical or regulatory reason to amend these regulations.

*The petitioners assert that the need for power and economic costs were excluded in license renewal environmental reviews*

The petitioners assert that NRC regulations in 10 CFR 51.53(c) and 51.71(d) excuse license renewal applicants and the NRC staff from addressing the need for power in license renewal cases. The petitioners state, “[b]y excluding need for power from consideration in relicensing decisions, the [Continued Storage] GEIS cripples its ability to assess the

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<sup>42</sup> Statements of Consideration for 1996 (61 FR 28467, 28479-480) and 2013 (78 FR 37282, 37310) License Renewal GEISs.

environmental impacts of storing spent fuel...This results in an 'unbounded' analysis of radiological risk." The petitioners also assert that "it is essential to incorporate the economic costs of spent fuel storage and disposal in reactor cost-benefit analyses."

In conjunction with the issuance of the License Renewal GEIS in 1996, the Commission amended its ~~environmental protection~~ regulations concerning environmental reviews for nuclear power plant license renewal actions.<sup>43</sup> These amendments defined the generic environmental impacts addressed in the License Renewal GEIS and the environmental impacts for which nuclear plant site-specific analyses were to be performed. The Commission stated in the June 5, 1996 final rule for the "Environmental Review for Renewal of Nuclear Power Plant Operating Licenses,"

[T]he 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. [The] 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.<sup>44</sup>

As stated in the 2013 License Renewal GEIS,

~~The~~ purpose and need for the proposed action (issuance of a renewed license) is to provide an option that allows for baseload power generation capability beyond the term of the current nuclear power plant operating license to meet future system generating needs. Such needs may be determined by other energy-planning decision-makers, such as State, utility, and, where authorized, Federal agencies (other than ~~the~~ NRC). Unless there are findings

<sup>43</sup> 61 FR 28467; June 5, 1996.

<sup>44</sup> 61 FR at 28472.

in the safety review required by the Atomic Energy Act of 1954, as amended (AEA), or the NEPA environmental review that would lead the NRC to reject a license renewal application, the NRC does not have a role in the energy-planning decisions of whether a particular nuclear power plant should continue to operate.<sup>45</sup>

As shown by these statements, it has been the NRC's longstanding position not to consider the need for power or economic costs in making its license renewal decisions.

Consideration of the need for power or the economic cost of renewing the operating license of a nuclear reactor is beyond the NRC's statutory and regulatory purview; rather, such consideration is the responsibility of State and local authorities and, where appropriate, Federal ~~agencies/entities~~ such as the Federal Energy Regulatory Commission or the Tennessee Valley Authority. The petitioners' assertion that NRC's regulatory approach of excluding need for power from consideration in ~~re-licensing license renewal~~ decisions "cripples" NRC's ability to assess the environmental impacts of storing spent fuel is not new and significant information ~~and thus does not provide a proven and does not provide a sufficient regulatory basis to for~~ amending the ~~NRC's~~ regulations.

*"Reasonable assurance" findings not included in proposed section 51.23*

In commenting upon the NRC's proposed Continued Storage rule (78 FR 56776; September 13, 2013), the petitioners asserted that the NRC's proposal to remove the "reasonable assurance" statement from 10 CFR 51.23(a) was improper. Prior to the promulgation of the Continued Storage final rule (79 FR 56238; September 19, 2014), 10 CFR 51.23(a) stated, in part, that "the Commission believes there is reasonable assurance

<sup>45</sup> License Renewal GEIS, NUREG-1437, Revision 1 (2013), Section 1.3, p. 1-3 – 1-4.

that sufficient mined geologic repository capacity will be available to dispose of the commercial high-level radioactive waste and spent fuel generated in any reactor when necessary.”<sup>46</sup> In the final Continued Storage rule, the NRC removed the “reasonable assurance” statement.<sup>47</sup> The statements of consideration of the final Continued Storage rule explained that 10 CFR 51.23(a) sets forth the NRC’s generic determination that the environmental impacts of the continued storage of spent nuclear fuel beyond the licensed life for operation of a reactor are those impacts identified in NUREG-2157 (the Continued Storage GEIS). In particular, the statements of consideration noted that,

NEPA is a procedural statute directed at Federal agencies, and 10 CFR 51.23 (including the additional clarifying amendments) addresses the manner by which the NRC complies with NEPA with respect to the subject of continued storage. These amendments do not require action by any person or entity regulated by the NRC, nor do these amendments modify the substantive responsibilities of any person or entity regulated by the NRC.<sup>48</sup>

Consequently, there ~~is~~ no need to retain the “reasonable assurance” statement, which is a safety finding, as 10 CFR 51.23(a) stated only the generic environmental determination and the remainder of 10 CFR 51.23 ~~concerned~~ concerns the NRC’s NEPA compliance. In this regard, the statements of consideration explained,

The [Continued Storage] GEIS fulfills the NRC’s NEPA obligations and provides a regulatory basis for the rule rather than addressing the agency’s responsibilities to protect public health and safety under the Atomic Energy Act (AEA), of 1954 as amended. Further, Appendix B of the [Continued Storage] GEIS discusses the technical feasibility of continued safe storage. It is important to note that, in adopting revised 10 CFR 51.23 and publishing the [Continued Storage] GEIS, the NRC is not making a safety determination under the AEA to allow for the continued storage of spent fuel. AEA safety determinations associated with licensing of

<sup>46</sup> 10 CFR 51.23(a) (2013).

<sup>47</sup> 79 FR at 56260.

<sup>48</sup> 79 FR at 56253.

these activities are contained in the appropriate regulatory provision addressing licensing requirements and in the specific licenses for facilities. Further, there is not any legal requirement for the NRC to codify a generic safety conclusion in the rule text. By not including a safety policy statement in the rule text, the NRC does not imply that spent fuel cannot be stored safely. To the contrary, the analysis documented in the [Continued Storage] GEIS is predicated on the ability to store spent fuel safely over the short-term, long-term, and indefinite timeframes. This understanding is based upon the technical feasibility analysis in Appendix B of the [Continued Storage] GEIS and the NRC's decades-long experience with spent fuel storage and development of regulatory requirements for licensing of storage facilities that are focused on safe operation of such facilities, which have provided substantial technical knowledge about storage of spent fuel. Further, spent fuel is currently being stored safely at reactor and storage sites across the country, which supports the NRC's conclusion that it is feasible for spent fuel to be stored safely for the timeframes considered in the [Continued Storage] GEIS.<sup>49</sup>

The petitions do not present any new and significant information that would form a technical or regulatory basis to amend 10 CFR 51.23, particularly in light of the September 19, 2014, Continued Storage rulemaking.

*The petitioners assert that expedited spent fuel transfer analysis is "new and significant information"*

The petitioners request that the NRC "consider, in all pending and future reactor licensing and re-licensing decisions, new and significant information bearing on the environmental impacts of high-density pool storage in reactor pools and alternatives for avoiding or mitigating those impacts." The petitioners assert that the NRC ~~staff~~ generated new and significant information during its post-Fukushima Expedited Spent Fuel Transfer proceeding.

~~Specifically, o~~On October 9, 2013, the NRC released NUREG-2161, "Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I

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<sup>49</sup> 79 FR at 56254-55.

Boiling Water Reactor” and, on November 12, 2013, the NRC delivered a regulatory analysis in COMSECY-13-0030, “Staff Evaluation and Recommendation for Japan Lessons-Learned Tier 3 Issue on Expedited Transfer of Spent Fuel.” These documents concluded that spent fuel pools are very robust structures with large safety margins, and that proposed regulatory actions for spent fuel pool safety improvements were not warranted. This conclusion not only covers spent fuel pools at operating reactors applying for license renewal but also spent fuel pools that would be constructed at new reactor sites. Citing the low risk to public health and safety from spent fuel pool storage, the Commission subsequently concluded that regulatory action need not be pursued in Staff Requirements Memorandum (SRM), SRM-COMSECY-13-0030, issued on May 23, 2014.

The petitioners believed-contend that former Chairman Allison Macfarlane’s comments on COMSECY-13-0030, also provide new and significant information that requires the NRC to reconsider its impact findings in the 2013 license renewal GEIS. The former Chairman’s comments were considered by the other Commissioners in the development of the SRM on this issue. However, the other four NRC Commissioners Commission at that time determined in SRM-COMSECY-13-0030, that no further generic assessments concerning the expedited transfer of spent fuel to dry cask storage should be pursued. Notably, the SRM supported the staff’s approach of using the NRC’s Safety Goal Policy Statement of 1986 as a screening metric. The SRM COMSECY-13-0030 is the agency’s determination on this issue.

Nonetheless, the petitioners contend that NUREG-2161 and COMSECY-13-0030 constitute new and significant information based on those documents’ discussion of the severity of the impact of a spent fuel pool accident, sensitivity studies showing that some mitigation measures could be cost beneficial, and the possibility that a reactor accident could impact the likelihood of a spent fuel pool fire. However, none of these sources of information provides “a



seriously different picture” of the environmental consequences of spent fuel storage. First, as noted above, the NRC has frequently recognized that the consequences of a spent fuel pool accident could be large but has determined that the overall risk of spent fuel pool accidents is small in light of the low probability of such an event.<sup>50</sup> Thus, the petitioners have not shown that the size-magnitude of the consequences of a spent fuel pool accident constitutes new and significant information. Rather, NUREG-2161’s and COMSECY-13-0030’s recognition that the consequences of a spent fuel pool accident could be large but that the overall risk from such an event is small in light of the low probability of such an event comports with the agency’s previous considerations of this issue. Second, while the sensitivity studies may have shown that some mitigation measures could be cost-beneficial, they are based on alternate assumptions that do not represent the NRC’s analysis of the most likely impacts of a spent fuel pool accident. In any event, petitioners have not shown with specificity that any information in these sensitivity studies would undermine the agency’s overall conclusion that, despite potentially large consequences, the low probability renders the overall risk of a spent fuel pool accident to be low. Finally, contrary to petitioners’ assertions, the NRC has frequently responded to claims that the probability of a reactor accident could impact the probability of a spent fuel pool accident and repeatedly found that such a probability is very low.<sup>51</sup>

In conclusion, Consequently, the NRC concludes that neither COMSECY 13-0030 nor NUREG-2161, COMSECY-13-0030, nor SRM-COMSECY-13-0030 constitutes “new and significant information” requiring the NRC to supplement any of its prior EISs, whether generic or specific. Similarly, the NRC concludes that there is no technical or regulatory basis to

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<sup>50</sup> License Renewal GEIS, NUREG-1437, Revision 1 (2013), Appendix E, p. E-34 to -39; NUREG-1437, Rev. 1, at E-34 to -39.

<sup>51</sup> 73 FR at 46210; 2013 GEIS at E-38; NUREG-2157 at D-438 to D-440; COMSECY-13-0030, Enclosure 1 at 138.

amend those ~~of its~~ regulations that make or rely on findings regarding the environmental impacts of spent fuel storage during reactor operation, including Table B-1 and all regulations approving standardized reactor designs.”

### III. Determination of Petitions.

For the reasons cited in Section II of this document, the NRC has concluded that petitioners have not provided new and significant information that would form a basis to amend the NRC regulations identified in the PRM-51-30 and PRM-51-31. ~~has concluded that there is no technical or regulatory basis to amend the NRC regulations identified in the PRM-51-30 and PRM-51-31. Therefore, the NRC is denying PRM-51-30 and PRM-51-31.~~

#### *Earlier Part 51 PRMs*

Several of the regulations identified by the petitioners have been the subject of prior rulemaking petitions (i.e., PRM-51-1, PRM-51-10, PRM-51-12, and PRMs-51-14 to 51-28) and issues similar to those raised by the petitioners were considered by the Commission in these prior petitions, ~~and~~ thus, these issues have been ~~well-vetted~~ thoroughly evaluated by the Commission. The PRM-51-1 petitioner asserted~~eds~~ that Table S-3 “seriously understate[d]” the impact on human health and safety from the uranium fuel cycle and that the Table S-3 values should be revised accordingly.<sup>52</sup> The NRC denied PRM-51-1 based upon the Commission’s “generic determination that the radiological impacts of the uranium fuel cycle ... on individuals off-site will remain at or below the Commission’s regulatory limits, and as such, are of small

<sup>52</sup> 73 FR 14946; March 20, 2008.

significance.<sup>53</sup> The NRC described this generic determination in Chapter 6 of the 1996 version of the License Renewal GEIS; the generic determination was based upon findings made in various NRC and EPA rulemakings.<sup>54</sup>

The petitioners in PRM-51-10 and PRM-51-12 challenged the generic findings for spent fuel storage impacts codified in Table B-1 and requested a rulemaking to remove this finding.<sup>55</sup> The petitioners raised the prospect of a fire at a nuclear power reactor's spent fuel pool and the resulting release of radioactive material to the environment. According to the petitioners' scenario, the spent fuel pool fire would be initiated by either an accident or a successful terrorist strike that would cause a partial or complete drain of the cooling water in the spent fuel pool. The petitioners requested the amendment of several of the regulations that are the subject of PRM-51-30 and PRM-51-31, namely, Table B-1, 10 CFR 51.23, 51.53(c) and 51.95(c).<sup>56</sup> The petitioners requested that the impacts of spent fuel storage be considered on a site-specific basis, in license renewal cases, rather than generically, due to this potential threat. The Commission denied PRM-51-10 and PRM-51-12, and concluded concluding that the risk of such a spent fuel pool fire was very low and that, given the safety and security requirements that applied to all plants, as well as the physical robustness of spent fuel pools, the environmental impacts of spent fuel pool storage could be handled generically.<sup>57</sup> The NRC's denial of PRM-51-10 and PRM-51-12 was upheld in court by the Court of Appeals for the Second Circuit.<sup>58</sup>

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<sup>53</sup> 73 FR at 14947.

<sup>54</sup> *Id.* at 14948.

<sup>55</sup> 73 FR 46204; August 8, 2008.

<sup>56</sup> *Id.* at 46205.

<sup>57</sup> *Id.* at 46206-12.

<sup>58</sup> *New York v. U.S. Nuclear Regulatory Commission*, 589 F.3d 551 (2nd Cir. 2009).

Finally, in a series of virtually identical petitions, docketed as PRM-51-14 through PRM-51-28, ~~the~~ petitioners requested that the NRC rescind all regulations that reach generic environmental impact conclusions regarding severe reactor accidents and spent fuel pool accidents, which would include various provisions of Table B-1 and 10 CFR 51.53. The PRM-51-14 through PRM-51-28 petitions were filed shortly after the NRC issued its Near-Term Task Force (NTTF) report, "Recommendations for Enhancing Reactor Safety in the 21st Century, ~~the~~ 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. After determining that the NTTF report did not constitute new and significant information and further, that the petitioners had provided ~~no~~ insufficient technical or regulatory basis to amend any of the NRC regulations in question, the NRC denied the PRM-51-14 through PRM-51-28 petitions.<sup>59</sup>

#### 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.

**Commented [LR1]:** Update and correct tables, including formatting, as necessary.

DOCUMENT	ADAMS ACCESSION NO. / WEB LINK / FEDERAL REGISTER CITATION
Blue Ribbon Commission on America's Nuclear Future- Final Report, January 2012.	<a href="http://energy.gov/sites/prod/files/2013/04/f0/brc_finalreport_jan2012.pdf">http://energy.gov/sites/prod/files/2013/04/f0/brc_finalreport_jan2012.pdf</a>

<sup>59</sup> 80 FR 480235 (August 12, 2015).

CLI-14-07, DTE Electric Co., et al., July 17, 2014.	<a href="http://www.nrc.gov/reading-rm/doc-collections/commission/orders/2014/2014-07cli.pdf">http://www.nrc.gov/reading-rm/doc-collections/commission/orders/2014/2014-07cli.pdf</a>
"Comments by Environmental Organizations on Draft Waste Confidence Generic Environmental Impact Statement [GEIS] and Proposed Waste Confidence Rule and Petition to Revise and Integrate All Safety and Environmental Regulations Related to Spent Fuel Storage and Disposal," January 7, 2014.	ML14029A124 ML14029A169 ML14029A154
COMSECY-13-0030, Staff Evaluation and Recommendation for Japan Lessons-Learned Tier 3 Issue on Expedited Transfer of Spent Fuel, November 12, 2013.	ML13273A601
COMSECY-13-0030 Vote Sheet, Staff Evaluation and Recommendation for Japan Lessons-Learned Tier 3 Issue on Expedited Transfer of Spent Fuel, April 8, 2014.	<a href="http://www.nrc.gov/reading-rm/doc-collections/commission/com-secy/2013/2013-0030comvtr.pdf">http://www.nrc.gov/reading-rm/doc-collections/commission/com-secy/2013/2013-0030comvtr.pdf</a>
<i>Federal Register</i> notice -- Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation, December 23, 2010.	75 FR 81032
<i>Federal Register</i> notice - <del>Waste Confidence</del> —Continued Storage of Spent Nuclear Fuel (proposed rule), September 13, 2013.	78 FR 56776
<i>Federal Register</i> notice – Environmental Effects of the Uranium Fuel Cycle, April 22, 1974.	39 FR 14188
<i>Federal Register</i> notice – Licensing and Regulatory Policy and Procedures for Environmental Protection; Uranium Fuel Cycle Impacts From Spent Fuel Reprocessing and Radioactive Waste Management, August 2, 1979.	44 FR 45362
<i>Federal Register</i> notice – Waste Confidence Decision, August 31, 1984.	49 FR 34658
<i>Federal Register</i> notice – Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation, September 18, 1990.	55 FR 38472
<i>Federal Register</i> notice – Environmental Review for Renewal of Nuclear Power Plant Operating Licenses, June 5, 1996.	61 FR 28467
<i>Federal Register</i> notice – Waste Confidence Decision Update, December 23, 2010.	75 FR 81037
<i>Federal Register</i> notice - Continued Storage of Spent Nuclear Fuel (final rule), September 19, 2014.	79 FR 56238

<i>Federal Register</i> notice— -- Revisions to Environmental Review for Renewal of Nuclear Power Plant Operating Licenses, June 20, 2013.	78 FR 37282
<i>Federal Register</i> notice - Revise and Integrate All Safety and Environmental Regulations Related to Spent Fuel Storage and Disposal, April 21, 2014.	79 FR 22055
<i>Federal Register</i> notice - Environmental Impacts of Spent Fuel Storage During Reactor Operation, May 1, 2014.	79 FR 24595
<i>Federal Register</i> notice - Environmental Impacts of Spent Fuel Storage During Reactor Operation, <u>July 24, 2014</u> .	79 FR 42989
<i>Federal Register</i> notice - New England Coalition on Nuclear Pollution; Denial of Petition for Rulemaking, March 20, 2008.	73 FR 14946
<i>Federal Register</i> notice - The Attorney General of Commonwealth of Massachusetts, The Attorney General of California; Denial of Petitions for Rulemaking, August 8, 2008.	73 FR 46204
<i>Federal Register</i> notice - Environmental Review for Renewal of Operating Licenses ( <u>p</u> Proposed <u>r</u> Rule), September 17, 1991.	56 FR 47016
<i>Federal Register</i> notice - Environmental Review for Renewal of Nuclear Power Plant Operating Licenses ( <u>f</u> Final <u>r</u> Rule), June 5, 1996.	61 FR 28467
IAEA (International Atomic Energy Agency). 2005. Radioactive Waste Management <u>Studies-Status</u> and Trends. IAEA/WMDB/ST/4, Vienna, Austria.	<a href="http://www-pub.iaea.org/MTCD/publications/PDF/WMDB-ST-4.pdf">http://www-pub.iaea.org/MTCD/publications/PDF/WMDB-ST-4.pdf</a>
Makhijani, Arjun, Comments <u>of the Institute for Energy and Environmental Research on the U.S. Nuclear Regulatory Commission's on the</u> Proposed Waste Confidence Rule Update and Proposed Rule Regarding Environmental Impacts of Temporary Spent Fuel Storage.	ML091310195
NRC-National Academies of Science Report, "A Study of the Isolation System for Geologic Disposal of Radioactive Wastes," 1983.	ML033040264
NUREG-0116, "Environmental Survey of the Reprocessing and Waste Management Portions of the LWR Fuel Cycle," October 1976.	ML14098A013

NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants," June 20, 2013.	ML13107A023
NUREG-1949, "Safety Evaluation Report Related to Disposal of High-Level Radioactive Wastes in a Geologic Repository at Yucca Mountain, Nevada," various dates.	ML102440298 (vol. 1) ML15022A146 (vol. 2) ML14288A121 (vol. 3) ML14346A071 (vol. 4) ML15022A488 (vol. 5)
NUREG-2161, "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
NUREG-2157, "Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel," September 2014.	ML14196A105 (vol. 1) ML14196A107 (vol. 2)
PRM-51-30, "Petition <del>for Rulemaking</del> to Revise and Integrate All Safety and Environmental Regulations Related to Spent Fuel Storage and Disposal," Submitted by Diane Curran on behalf of 34 <del>e</del> Environmental <del>o</del> rganizations," January 7 <del>28</del> , 2014.	ML14029A124
PRM-51-31, " <del>Environmental Organizations'</del> Petition <del>for Rulemaking</del> to Consider New <del>and</del> Significant Information <del>Regarding</del> Environmental Impacts of High-Density Spent Fuel Storage <del>and</del> Mitigation Alternatives in Licensing Proceedings for New Reactors <del>and</del> License Renewal Proceedings <del>for</del> Existing Reactors <del>and</del> Duly Modify All NRC Regulations Regarding <del>Environmental Impacts of Spent Fuel Storage During Reactor Operation</del> ," <del>March-February 4218</del> , 2014.	ML14071A382
PRM-51-31, " <del>Environmental Organizations'</del> Amended Petition to Consider New <del>and</del> Significant Information <del>Regarding</del> Environmental Impacts of High-Density Spent Fuel Storage <del>and</del> Mitigation Alternatives in Licensing Proceedings for New Reactors <del>and</del> License Renewal Proceedings <del>for</del> Existing Reactors <del>and</del> Duly Modify All NRC Regulations Regarding <del>Environmental Impacts of Spent Fuel Storage During Reactor Operation</del> ," June 26, 2014.	ML14177A660
<del>Safety Goals for the Operations of Nuclear Power Plants; Policy Statement; Republication</del> Safety Goal Policy Statement of 1986, August 21, 1986.	51 FR 30028
SRM-SECY-14-0072, "Continued Storage of Spent Nuclear Fuel," August 26, 2014.	ML14238A219

WASH-1248, "Environmental Survey of the Uranium Fuel Cycle," April 1974.
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ML14092A628
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Dated at Rockville, Maryland, this       day of       , 2015.

For the Nuclear Regulatory Commission.

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



PRM-51-30, "Petition for Rulemaking to Revise and Integrate All Safety and Environmental Regulations Related to Spent Fuel Storage and Disposal, Submitted by Diane Curran on behalf of 34 Environmental Organizations," January 28, 2014.	ML14029A124
PRM-51-31, "Petition for Rulemaking to Consider New & Significant Information Re Environmental Impacts of High-Density Spent Fuel Storage & Mitigation Alternatives in Licensing Proceedings for New Reactors & License Renewal Proceedings of Existing Reactors, March 12, 2014.	ML14071A382
PRM-51-31, "Amended Petition to Consider New & Significant Information Re Environmental Impacts of High-Density Spent Fuel Storage & Mitigation Alternatives in Licensing Proceedings for New Reactors & License Renewal Proceedings of Existing Reactors, June 26, 2014	ML14177A660
Safety Goal Policy Statement of 1986, August 21, 1986.	51 FR 30028
SRM- SECY-14-0072, Continued Storage of Spent Nuclear Fuel, August 26, 2014.	ML14238A219
WASH-1248, "Environmental Survey of the Uranium Fuel Cycle," April 1974.	ML14092A628

Dated at Rockville, Maryland, this            day of            , 2015.

For the Nuclear Regulatory Commission.

Annette L. Vietti-Cook,  
Secretary of the Commission

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