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**From:** RulemakingComments Resource  
**Sent:** Thursday, December 26, 2013 9:40 AM  
**To:** Rulemaking1CEM Resource  
**Subject:** FW: Docket ID No. NRC-2012-0246 - Entergy Comments on Proposed Waste Confidence Rule and DGEIS  
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**TITLE:** Waste Confidence—Continued Storage of Spent Nuclear Fuel  
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**From:** Kuyler, Raphael Philip [<mailto:rkuyler@morganlewis.com>]  
**Sent:** Friday, December 20, 2013 4:13 PM  
**To:** RulemakingComments Resource  
**Cc:** Bessette, Paul M.  
**Subject:** Docket ID No. NRC-2012-0246 - Entergy Comments on Proposed Waste Confidence Rule and DGEIS

Please see the enclosed comments on behalf of Entergy Nuclear Operations, Inc.

Regards,

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December 20, 2013

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Subject:       **Docket ID No. NRC-2012-0246, RIN 3150-AJ20**  
                  **Entergy Comments on the Proposed Rule for “Waste Confidence—**  
                  **Continued Storage of Spent Nuclear Fuel,” 78 Fed. Reg. 56,776, and the**  
                  **Draft Waste Confidence Generic Environmental Impact Statement, NUREG-**  
                  **2157**

On September 13, 2013, the U.S. Nuclear Regulatory Commission (“NRC”) published a proposed rule in the *Federal Register* (78 Fed. Reg. 56,776) regarding “Waste Confidence—Continued Storage of Spent Nuclear Fuel” (“Proposed Rule”). The Proposed Rule revises the NRC’s generic determination on the environmental impacts of the continued storage of spent nuclear fuel beyond a reactor’s licensed life for operation and prior to ultimate disposal. The NRC also prepared a Draft Generic Environmental Impact Statement (“DGEIS”) to support the Proposed Rule. *See* NUREG-2157, Waste Confidence Generic Environmental Impact Statement, Draft Report for Comment (Sept. 2013). The NRC requested comments on both the Proposed Rule (78 Fed. Reg. at 56,776) and the DGEIS (NUREG-2157 at ii).

We respectfully submit the attached comments on the Proposed Rule and the DGEIS on behalf of Entergy Nuclear Operations, Inc. (“Entergy”). In summary, Entergy agrees with the Proposed Rule and the conclusions in the DGEIS that it is eminently feasible to safely store spent nuclear fuel beyond the licensed life for operation of a reactor and to have a mined geologic repository within 60 years following the licensed life for operation of a reactor. Entergy further agrees with the conclusions in the DGEIS that the environmental impacts of continued at-reactor storage of spent fuel are generally small, including the impacts from spent fuel pool leaks and fires.

Secretary  
December 20, 2013  
Page 2

Additionally, Entergy fully supports the comments submitted by the Nuclear Energy Institute on behalf of the nuclear power industry. In particular, Entergy agrees that the NRC's use of a generic rulemaking to address the waste confidence issues is logical and appropriate and consistent with applicable law, and the NRC has fully addressed the issues identified by the U.S. Court of Appeals for the District of Columbia Circuit in *New York v. NRC*.

Entergy provides the attached additional comments that confirm that the NRC's analysis of spent fuel storage impacts is fully applicable to Entergy's nuclear plants, including the Indian Point Energy Center.

In addition, as discussed in the attached comments, Entergy recommends certain changes and additions to the DGEIS, including recommendations for additional detail or topics in places to more fully support NRC's conclusions that environmental impacts are small and appropriately apply to all U.S. nuclear plants. In summary, Entergy's comments demonstrate that there is no need for a site-specific Environmental Impact Statement for Indian Point Energy Center, or any Entergy plant with a pending license application.

Finally, Entergy notes that the NRC placed a high priority on the review and analysis of the rulemaking and that it is being performed in an open and transparent manner. Entergy urges the Commission to complete the rulemaking in a timely manner and on the original schedule. This action is vital to completion of ongoing licensing activities, including the renewal of the Indian Point operating licenses.

Entergy appreciates the opportunity to provide the above comments on the Proposed Rule and the DGEIS. If any additional information is needed for the issues raised in this letter, please contact me.

Sincerely,



Paul M. Bessette  
Raphael P. Kuyler  
Counsel for Entergy Nuclear Operations, Inc.

Attachment

**Entergy’s Comments on the Proposed Waste Confidence Rule and the Draft Waste Confidence Generic Environmental Impact Statement**

**I. Introduction and Background**

Entergy Nuclear Operations, Inc. (“Entergy”) is the operator and holder of the NRC operating license for the Indian Point Energy Center (“Indian Point” or “IPEC”), Units 2 and 3 (“IP2” and “IP3,” respectively) located in the Village of Buchanan, New York. Entergy and its affiliates own and operate nine other nuclear power plants at eight sites: (1) Arkansas Nuclear One, Units 1 and 2 in Russellville, Arkansas; (2) James A. Fitzpatrick Nuclear Power Plant in Scriba, New York; (3) Grand Gulf Nuclear Station in Port Gibson, Mississippi; (4) Palisades Power Plant, in Covert Township, Michigan; (5) Pilgrim Nuclear Power Station, in Plymouth, Massachusetts; (6) River Bend Nuclear Station, in St. Francisville, Louisiana; (7) Vermont Yankee Nuclear Power Plant, in Windham County, Vermont; and (8) Waterford 3 Steam Electric Station, in Killona, Louisiana. In the comments below, Entergy provides additional information on IPEC given the pending license renewals for IP2 and IP3.

IP2 began commercial operation in 1974, and IP3 began commercial operation in 1976. The IPEC site also includes the retired Unit 1 reactor (“IP1”), which operated from 1962 to 1974. IP1 is currently in a safe storage condition (“SAFSTOR”). Entergy submitted a license renewal application for IP2 and IP3 to the U.S. Nuclear Regulatory Commission (“NRC”) in 2007, which remains under review at this time.

During the NRC’s ongoing review of the IP2 and IP3 license renewal application, the U.S. Court of Appeals for the District of Columbia Circuit issued a decision vacating and remanding certain aspects of the 2010 update to the NRC’s Waste Confidence Decision and Temporary Storage Rule (10 C.F.R. § 51.23), as contrary to the National Environmental Policy Act (“NEPA”).<sup>1</sup>

The NRC published a Proposed Rule in the *Federal Register* on September 13, 2013 in response to the D.C. Circuit decision.<sup>2</sup> The Proposed Rule revises the NRC’s generic determination on the environmental impacts of the continued storage of spent nuclear fuel (“SNF” or “spent fuel”) beyond a reactor’s licensed life for operation and prior to ultimate disposal. The NRC also prepared a Draft Generic Environmental Impact Statement (“DGEIS”) to support the Proposed Rule.<sup>3</sup>

The Proposed Rule would revise 10 C.F.R. § 51.23 as follows:

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<sup>1</sup> *New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012). A more detailed history of this decision is described in the NRC’s Proposed Rule. See Proposed Rule, Waste Confidence—Continued Storage of Spent Nuclear Fuel, 78 Fed. Reg. 56,776, 56,779 (Sept. 13, 2013) (“Proposed Rule”).

<sup>2</sup> Proposed Rule, 78 Fed. Reg. at 56,776.

<sup>3</sup> See NUREG-2157, Waste Confidence Generic Environmental Impact Statement, Draft Report for Comment (Sept. 2013) (“DGEIS”).

(a) The Commission has developed a generic environmental impact statement (NUREG–2157) analyzing the environmental impacts of storage of spent nuclear fuel beyond the licensed life for operation of a reactor. The Commission has concluded the following:

(1) The analysis in NUREG–2157 generically addresses the environmental impacts of storage of spent nuclear fuel beyond the licensed life for operation of a reactor; and

(2) The analysis in NUREG–2157 supports the Commission’s determinations that it is feasible to:

(i) Safely store spent nuclear fuel following the licensed life for operation of a reactor and

(ii) have a mined geologic repository within 60 years following the licensed life for operation of a reactor.<sup>4</sup>

Based on these conclusions, the NEPA analyses for future reactor and spent fuel storage facility licensing actions would not need to consider the environmental impacts of continued storage on a site-specific basis.<sup>5</sup>

Entergy notes the substantial effort of the NRC Staff and Commission on the Proposed Rule and DGEIS and provides these comments. Entergy’s comments generally focus on the environmental impacts of continued storage of SNF at IPEC, including additional discussion and examples of small environmental impacts associated with the continued storage of spent fuel at IPEC.

In summary, the Proposed Rule states that the Commission has determined that it is feasible to safely store SNF following the licensed life for operation of a reactor, either in spent fuel pools (“SFPs”) or dry casks, and to have a mined geologic repository within 60 years following the licensed life for operation of a reactor. The Proposed Rule is supported by the DGEIS conclusions that the environmental impacts of continued at-reactor storage of spent fuel in a SFP or ISFSI are SMALL.<sup>6</sup> Entergy agrees with and fully supports these conclusions and the NRC’s supporting explanation. As the NRC correctly concludes:

- Reactor licensees, including Entergy, continue to develop and successfully use onsite SNF storage capacity in the form of SFPs and dry cask storage in a safe and environmentally sound fashion. Substantial technical understanding and decades of experience demonstrate the technical feasibility of safe storage of spent fuel in SFPs and in dry casks, based on their robust physical integrity over long periods of time.<sup>7</sup>
- The storage of SNF in any combination of SFPs or dry casks will continue as a licensed activity under regulatory controls and oversight. Regulatory oversight continues to enhance

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<sup>4</sup> Proposed Rule, 78 Fed. Reg. at 56,804.

<sup>5</sup> *Id.* at 56,776.

<sup>6</sup> *See* DGEIS at 4-90.

<sup>7</sup> *See* Proposed Rule, 78 Fed. Reg. at 56,799.

the safety of both wet and dry spent fuel storage as concerns and information evolve over time. For example, events such as the September 11, 2001 terrorist attacks and the March 2011 Fukushima Dai-ichi accident have led to implementation of numerous security and safety enhancements.<sup>8</sup>

- Safe and environmentally-sound spent fuel storage would continue if necessary beyond 60 years after the end of the reactor’s licensed operating life under an NRC-approved aging management program to ensure that monitoring and maintenance are adequately performed. The DGEIS assumes that, at an appropriate time, Independent Spent Fuel Storage Installation (“ISFSI”) structures, systems, and components (“SSCs”) would be replaced as part of an approved aging management program. Continued experience with storing spent fuel will guide and inform aging management plans.<sup>9</sup>

Additionally, as discussed in Section II below, Entergy fully supports the comments of the Nuclear Energy Institute (“NEI”) that were submitted on behalf of the U.S. nuclear power industry. In particular, Entergy agrees that the NRC’s use of a generic rulemaking is appropriate; the NRC’s rulemaking process has fostered considerable transparency and public participation; the Proposed Rule and the DGEIS specifically address the issues identified by the D.C. Circuit as requiring further evaluation in an Environmental Impact Statement (“EIS”); and the Proposed Rule and DGEIS consider appropriate timeframes for continued SNF storage. NEI’s comments demonstrate that the NRC should proceed with timely issuance of the Final Rule.

As discussed in Section III below, the NRC’s generic analysis of spent fuel storage impacts is fully applicable to Entergy’s plants, including IPEC. This includes consideration of the DGEIS assumptions, such as the reference facility described in Chapter 2, the affected environment in Chapter 3, the environmental impacts in Chapter 4, consideration of continued safe storage of spent fuel in Appendix B, consideration of SFP leaks in Appendix E, and consideration of SFP fires in Appendix F. Therefore, the DGEIS evaluations and conclusions apply fully to Entergy’s plants.

Finally, as discussed in Section IV, Entergy addresses various specific issues that members of the public have raised to date in comments regarding the applicability of this and other generic environmental analyses to the IPEC site. Entergy demonstrates that the DGEIS generic conclusions are applicable to IPEC, such that no additional site-specific analysis is necessary to evaluate the environmental impacts of long-term storage of SNF at IPEC.

## **II. Entergy Fully Supports the Industry’s Comments on the Proposed Rule and DGEIS**

NEI has prepared detailed comments on the Proposed Rule and DGEIS on behalf of the nuclear power industry.<sup>10</sup> Entergy discusses a few of the key comments below.

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<sup>8</sup> *Id.* at 56,788.

<sup>9</sup> *Id.* at 56,788-789.

<sup>10</sup> NEI Comments on Proposed Waste Confidence Rule and Generic Environmental Impact Statement (Dec. 20, 2013) (“NEI Comments”).

**A. The NRC’s Use of Generic Rulemaking Is Appropriate and Complies with NEPA**

The Proposed Rule is a generic determination regarding the potential environmental impacts from the continued storage of SNF after the end of a reactor’s licensed life for operation and before the SNF is placed in a repository.<sup>11</sup> The NRC explained in the Proposed Rule that addressing the environmental impacts of continued storage generically “will enhance the NRC’s efficiency in individual licensing reviews by addressing a set of issues that are the same or largely similar or can be reasonably predicted.”<sup>12</sup> Similarly, NEI noted that the use of a generic approach to evaluating waste confidence issues will obviate duplicative and inefficient site-specific reviews and is consistent with long-standing agency practice and judicial precedent.<sup>13</sup> Entergy fully agrees with the NRC’s and NEI’s conclusions that a generic approach is appropriate and would result in increased efficiency. Entergy’s conclusions are supported by the following:

- As the NRC correctly notes, the impacts of continued storage can be assessed generically because: (1) continued storage will involve SNF storage facilities for which the environmental impacts of operation are sufficiently understood as a result of lessons learned and knowledge gained from decades of operating experience (including use of common storage technologies); (2) activities associated with continued storage are expected to be within this well-understood range of operating experience and, thus, environmental impacts can be reasonably predicted; and (3) changes in the environment around SNF storage facilities, including those existing or planned for IPEC, are sufficiently gradual and predictable to be addressed generically.<sup>14</sup>
- The advantage of a generic rulemaking in these circumstances is clear and well-established, and expressly stated in the Proposed Rule: to enhance efficiency in individual licensing reviews by comprehensively analyzing environmental impacts that are the same or largely similar for each nuclear power reactor or storage site, thereby avoiding the need to “repeat the identical or substantially similar analysis in individual licensing actions.”<sup>15</sup>
- This is consistent with the Commission’s longstanding practice to address long-term waste storage issues generically by rulemaking rather than on a case-by-case adjudicatory basis.<sup>16</sup>

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<sup>11</sup> Proposed Rule, 78 Fed. Reg. at 56,776.

<sup>12</sup> *Id.* at 56,780.

<sup>13</sup> *See* NEI Comments.

<sup>14</sup> Proposed Rule, 78 Fed. Reg. at 56,781.

<sup>15</sup> *Id.* at 56,784.

<sup>16</sup> *See Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 &3), CLI-10-19, 72 NRC 98, 99-100 (2010) (citing *Duke Energy Corp.* (Oconee Nuclear Station, Units 1, 2, & 3), CLI-99-11, 49 NRC 328, 343 (1999); *Kelley v. Selin*, 42 F.3d 1501, 1512-13 (6th Cir. 1995)) (directing denial of the admission of waste confidence contentions that were the subject of general rulemaking).



- Use of a generic rulemaking also has been sanctioned by the federal courts, including the D.C. Circuit in *New York v. NRC*,<sup>17</sup> and avoids the obvious inefficiencies attendant to case-by-case adjudication of fundamentally generic environmental issues. The D.C. Circuit stated: “Both the Supreme Court and this court have endorsed the Commission’s longstanding practice of considering environmental issues through general rulemaking in appropriate circumstances” and “we see no reason that a comprehensive general analysis would be insufficient to examine on-site risks that are essentially common to all plants.”<sup>18</sup> The NRC has not identified any impacts that call into question this practice for continuing storage of SNF.
- The Commission’s explanation in the *Oconee* license renewal proceeding about generic treatment of high-level waste disposal issues applies here as well:

The Commission sensibly has chosen to address high-level waste disposal generically rather than unnecessarily to revisit the same waste disposal questions, license-by-license, when reviewing individual applications. High-level waste storage and disposal, we have said, “is a national problem of essentially the same degree of complexity and uncertainty for every renewal application and it would not be useful to have a repetitive reconsideration of the matter.” 61 Fed. Reg. 66,537, 66,538 (Dec. 11, 1996).<sup>19</sup>

- As discussed further below, the conclusions in the DGEIS regarding the SMALL environmental impacts of continued storage of SNF apply to Entergy’s plants, including IPEC. Thus, there is no need for or benefit of a site-specific analysis for issuance of renewed licenses for IP2 and IP3 or other pending or future Entergy licensing actions.

In summary, the use of a generic rulemaking and a generic EIS is entirely appropriate for the waste confidence issues under consideration in the Proposed Rule and DGEIS, and has been justified by the NRC.

**B. The NRC’s Rulemaking Process Has Complied with NEPA and Fostered Considerable Transparency and Public Participation**

Entergy also agrees that the NRC’s waste confidence rulemaking process fully satisfies NEPA in that it has included transparency and public participation. As NEI notes, the process has been “a model of transparency in agency action.”<sup>20</sup> The NRC has afforded all stakeholders numerous and timely opportunities to participate directly in the rulemaking process. For example, the NRC has held numerous meetings, conferences, and workshops to inform the public about the rulemaking and to solicit input, including comments on the Proposed Rule.

<sup>17</sup> See *New York*, 681 F.3d at 480; see also *Baltimore Gas & Elec. Co. v. Natural Res. Def. Council, Inc.*, 462 U.S. 87, 101 (1983) (“The generic method chosen by the agency is clearly an appropriate method of conducting the hard look required by NEPA.”); *Minnesota v. NRC*, 602 F.2d 412, 416-17 (D.C. Cir. 1979).

<sup>18</sup> *New York*, 681 F.3d at 480.

<sup>19</sup> *Oconee*, CLI-99-11, 49 NRC at 345; see also *Indian Point*, CLI-10-19, 72 NRC at 100.

<sup>20</sup> NEI Comments (Cover Letter).

Some specific examples of substantial transparency and public participation are provided below:

- On October 25, 2012, the NRC published a notice in the *Federal Register* announcing its intent to conduct a NEPA “scoping process” in support of the planned GEIS that would accompany its updated Waste Confidence Rule.<sup>21</sup> The NRC held public meetings and webinars in late 2012 as part of the scoping process. The notice established a January 2, 2013 deadline for the submittal of public comments on the scope of the waste confidence environmental review.<sup>22</sup> The NRC Staff issued its GEIS Scoping Summary Report on March 5, 2013.<sup>23</sup> Many groups participated in the scoping process. For example, the Attorney Generals of the States of Vermont and New York (“New York”) submitted comments.<sup>24</sup> Also, attorneys submitted comments on behalf of a collection of organizations, including Riverkeeper, Inc. (“Riverkeeper”) and Hudson River Sloop Clearwater (“Clearwater”), both intervenors in the IPEC license renewal proceeding.<sup>25</sup> As documented in the GEIS Scoping Summary Report, the NRC received and considered those comments as required by NEPA.<sup>26</sup>

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<sup>21</sup> Proposed Rule, Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation, 77 Fed. Reg. 65,137 (Oct. 25, 2012).

<sup>22</sup> *Id.*

<sup>23</sup> Waste Confidence Generic Environmental Impact Statement Scoping Process Summary Report (Mar. 5, 2013) (“GEIS Scoping Summary Report”), *available at* ADAMS Accession No. ML13060A128.

<sup>24</sup> Comments Submitted by the Office of the Attorneys General of the State of Vermont with the Vermont Department of Public Service, and by the Office of the Attorney General of the State of New York Concerning Scope of Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation (Jan. 2, 2013), *available at* ADAMS Accession No. ML13007A398.

<sup>25</sup> Comments by Alliance for Nuclear Accountability, Beyond Nuclear, Blue Ridge Environmental Defense League, Center for a Sustainable Coast, Citizens Allied for Safe Energy, Citizens Environmental Alliance, Don’t Waste Michigan, Ecology Party of Florida, Friends of the Earth, Georgia Women’s Action for New Directions, Hudson River Sloop Clearwater, Missouri Coalition for the Environment, NC WARN, Nevada Nuclear Waste Task Force, New England Coalition, Nuclear Information and Resource Service, Nuclear Watch South, Physicians for Social Responsibility, Public Citizen, Riverkeeper, San Luis Obispo Mothers for Peace, SEED Coalition, Sierra Club Nuclear Free Campaign, and Southern Alliance for Clean Energy on Scope of Waste Confidence Environmental Impact Statement (Jan. 2, 2013), *available at* ADAMS Accession No. ML13007A441; *see also* Supplemental Comments on Scope of Waste Confidence Environmental Impact Statement by Alliance for Nuclear Accountability, Beyond Nuclear, Blue Ridge Environmental Defense League, Center for a Sustainable Coast, Citizens Allied for Safe Energy, Citizens Environmental Awareness of Southern Ontario, Don’t Waste Michigan, Ecology Party of Florida, Friends of the Earth, Georgia Women’s Action for New Directions, Hudson River Sloop Clearwater, Missouri Coalition for the Environment, NC WARN, Nevada Nuclear Waste Task Force, New England Coalition, Nuclear Information and Resource Service, Nuclear Watch South, Physicians for Social Responsibility, Public Citizen, Riverkeeper, San Luis Obispo Mothers for Peace, SEED Coalition, Sierra Club Nuclear Free Campaign, Southern Alliance for Clean Energy, and Natural Resources Defense Council (Jan. 15, 2013), *available at* ADAMS Accession No. ML13017A404.

<sup>26</sup> GEIS Scoping Summary Report at 15-51, 55, 59. The DGEIS also has considered those scoping comments. For example, the DGEIS appropriately addresses a number of different comments, including proposed additional requirements on spent fuel storage (*e.g.*, special hardened onsite storage, reducing SFP density, and accelerating the transfer of spent fuel from pools to dry casks). *See* DGEIS at xxvi.

- On June 7, 2013, the Staff issued SECY-13-0061, in which it requested Commission approval of a Proposed Rule that would revise the generic determination on the environmental impacts of continued storage of SNF.<sup>27</sup> In SRM-SECY-13-0061, issued on August 5, 2013, the Commission approved issuance of the Proposed Rule in the *Federal Register*, subject to the Staff's inclusion of certain modifications specified in the SRM.<sup>28</sup> Thus, the NRC provided drafts of the Proposed Rule and DGEIS well in advance of the formal comment period, thereby allowing substantially more time for public review of the documents.
- The NRC published the Proposed Rule in the *Federal Register* on September 13, 2013,<sup>29</sup> and subsequently extended the time for public comment from November 27, 2013 to December 20, 2013 due to the government shutdown.<sup>30</sup> Thus, the NRC provided almost an entire month extension to the comment period based on a much shorter duration NRC shutdown. In total, the draft Proposed Rule and DGEIS have been available for over six months since issuance of SECY-13-0061.
- The NRC has held 13 public meetings (one of which was only a public teleconference) at a wide range of geographic locations to receive comments on the Proposed Rule and DGEIS.<sup>31</sup> Two of the meetings have included a teleconference to ensure the widest possible participation by the public.<sup>32</sup> The NRC transcribed the public meetings and stated that it would consider statements at the meeting as comments on the Proposed Rule and DGEIS. For example, the NRC transcribed an October 30, 2013 public meeting in Tarrytown, New York.<sup>33</sup>

In summary, the NRC has conducted the waste confidence rulemaking fully in accordance with NEPA requirements in an open and transparent manner and with numerous opportunities for substantial public involvement.

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<sup>27</sup> SECY-13-0061, Proposed Rule: Waste Confidence – Continued Storage of Spent Nuclear Fuel (RIN 3150-AJ20) (June 7, 2013).

<sup>28</sup> Staff Requirements – SRM-SECY-13-061 – Proposed Rule: Waste Confidence – Continued Storage of Spent Nuclear Fuel (RIN 3150-AJ20) at 1-2 (Aug. 5, 2013).

<sup>29</sup> Proposed Rule, 78 Fed. Reg. at 56,776.

<sup>30</sup> Proposed Rule, Waste Confidence—Continued Storage of Spent Nuclear Fuel, 78 Fed. Reg. 66,858, 66,858 (Nov. 7, 2013).

<sup>31</sup> See Public Involvement in Waste Confidence, <http://www.nrc.gov/waste/spent-fuel-storage/wcd/pub-involve.html#schedule> (last visited Dec. 17, 2013).

<sup>32</sup> See *id.*

<sup>33</sup> See Transcript of October 30, 2013 Tarrytown, New York Waste Confidence Public Meeting (“Tarrytown Meeting Transcript”), available at ADAMS Accession No. ML13318A129.

**C. The Proposed Rule and DGEIS Directly Address the Issues Identified by the D.C. Circuit as Requiring Further Evaluation in an EIS**

The Proposed Rule and the supporting DGEIS directly address the three deficiencies identified by the D.C. Circuit in its remand order,<sup>34</sup> and do so in a manner that thoroughly and reasonably addresses the environmental impacts of continued storage of SNF for all reactors—including those at Entergy’s plants.<sup>35</sup>

With regard to the first issue identified by the court (the impacts of failure to secure permanent government disposal),<sup>36</sup> the DGEIS analyzes the impacts of three timeframes that represent various scenarios for the length of time for which continued spent fuel storage may be required.<sup>37</sup> In particular, the “indefinite” timeframe assumes, for analysis purposes, that a repository never becomes available, and that spent fuel must be stored indefinitely in either at-reactor or away-from reactor storage facilities.<sup>38</sup> This is highly conservative and unlikely. Nonetheless, the NRC evaluated the indefinite storage scenario to “fully cover any likely environmental impacts associated with continued storage” and in direct response to the D.C. Circuit’s recent ruling.<sup>39</sup> As stated in the DGEIS, “[f]or most of the resource areas, the impact determinations for all three timeframes are SMALL.”<sup>40</sup> There is nothing unique or different at Entergy’s plants that calls into question the applicability of these impact determinations.

With regard to the second issue cited by the court (probability and consequences of future SFP leaks),<sup>41</sup> DGEIS Appendix E analyzes in detail the potential offsite impacts of SFP leaks to groundwater, surface water, soils, and public health during the short-term storage timeframe. Consistent with decades of operating experience and environmental monitoring, including Entergy’s own operating experience, that analysis concludes that the impacts are SMALL.<sup>42</sup> As discussed below, the SMALL finding regarding the potential offsite impacts of SFP leaks is sound and applies to potential impacts at Entergy’s plants.

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<sup>34</sup> *New York*, 681 F.3d at 478-79.

<sup>35</sup> *See* Proposed Rule, 78 Fed. Reg. at 56,780 (“[T]he Commission instructed NRC staff to proceed with a generic EIS to analyze the environmental impacts of continued storage and address the issues raised in the Court’s decision and to update the Waste Confidence rule in accordance with the analysis in the EIS. The DGEIS and the proposed rule implement the Commission’s direction.”); *id.* at 56,784 (“The analysis in the GEIS constitutes a regulatory basis for the proposed rule at 10 CFR 51.23, which codifies the NRC’s conclusions in the GEIS on the environmental impacts of continued storage, including the Commission’s expectations on the availability of a geologic repository.”).

<sup>36</sup> *See New York*, 681 F.3d at 477-79.

<sup>37</sup> *See* Proposed Rule, 78 Fed. Reg. at 56,784, 56,789.

<sup>38</sup> *See id.*

<sup>39</sup> *See id.* at 56,785; *see also id.* at 56,779 (“[T]he Court held that the Commission needed to include an evaluation of the environmental effects of failing to secure permanent disposal since there was a degree of uncertainty regarding whether a repository would be built.”).

<sup>40</sup> DGEIS at 4-90.

<sup>41</sup> *See New York*, 681 F.3d at 479-81.

<sup>42</sup> *See* Proposed Rule, 78 Fed. Reg. at 56,797; DGEIS, App. E at E-19.

Finally, to address the court's third area of concern (the probability and consequences of SFP fires),<sup>43</sup> the DGEIS contains a detailed analysis of SFP fires, and concludes that the probability-weighted impacts (*i.e.*, overall risk) of SFP fires during the short-term storage timeframe is SMALL for all plants.<sup>44</sup> Also as discussed below, the SMALL finding regarding the risk of SFP fires applies to potential impacts at Entergy's plants. But as discussed further in Section III.H below, the NRC's analysis is highly conservative, particularly given that the risk diminishes significantly shortly after permanent shutdown; thus, minimal or negligible risk exists for the vast majority of the post-shutdown period

In summary, the NRC has taken reasonable and appropriate actions, in the form of the DGEIS and a proposed generically-applicable rule, to address the deficiencies in 10 C.F.R. § 51.23 identified by the D.C. Circuit.

#### **D. The Proposed Rule and DGEIS Consider Appropriate Timeframes for Continued SNF Storage**

The Proposed Rule and DGEIS analyze the impacts of three timeframes that represent various conservative scenarios for the length of continued SNF storage that may be required.

- The *short-term* timeframe analyzes 60 years of continued storage after the end of a reactor's licensed operating life. Short-term storage of SNF includes: (1) continued storage in SFPs (at-reactor only) and ISFSIs; (2) routine maintenance of SFPs and ISFSIs (*e.g.*, maintenance of concrete pads); and (3) handling and transfer of spent fuel from SFPs to ISFSIs (all SNF is assumed to be removed from the SFP by the end of the short-term period).<sup>45</sup> The assumptions within the short-term timeframe are reasonable and appropriate for Entergy's nuclear plants, including IPEC.<sup>46</sup>
- The *long-term* timeframe considers the environmental impacts of continued SNF storage for a total of 160 years after the end of a reactor's licensed life for operation. The DGEIS assumes that *all* spent fuel has been transferred from the SFP to an ISFSI by the end of the short-term timeframe. Long-term storage activities include: (1) continued storage of spent fuel in ISFSIs, including routine maintenance; (2) one-time replacement of ISFSIs and spent fuel canisters and casks; and (3) construction, operation, and one replacement of a dry

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<sup>43</sup> See *New York*, 681 F.3d at 479-82.

<sup>44</sup> See DGEIS, App. F at F-12. As discussed in DGEIS Section 1.8, the NRC assumes that all spent fuel is removed from the pools and placed in dry-cask storage by the end of the short-term storage timeframe. Appendix F, therefore, does not analyze the impacts of SFP fires after the short-term storage timeframe because a SFP will not be used to store spent fuel after that time. As discussed in Sections III.H and IV.C of these comments, this is a reasonable and appropriate assumption for IPEC.

<sup>45</sup> Proposed Rule, 78 Fed. Reg. at 56,784.

<sup>46</sup> See Entergy Letter NL-08-144, "Unit 1 & 2 Program for Maintenance of Irradiated Fuel and Preliminary Decommissioning Cost Analysis in accordance with 10 CFR 50.54 (bb) and 10 CFR 50.75(f)(3)," Attach. 1 at 2 (Oct. 23, 2008) ("IP2 IFMP"), available at ADAMS Accession No. ML083040378; Entergy Letter NL-10-123, "Unit 3 Program for Maintenance of Irradiated Fuel and Preliminary Decommissioning Cost Analysis in accordance with 10 CFR 50.54 (bb) and 10 CFR 50.75(f)(3)," Attach. 2. at 2 (Dec. 10, 2010) ("IP3 IFMP"), available at ADAMS Accession No. ML103540233.

transfer system (“DTS”) facility.<sup>47</sup> The assumptions within the long-term timeframe are also reasonable or conservative for Entergy’s nuclear plants, including IPEC.

- The indefinite timeframe analyzed in the DGEIS assumes that a repository never becomes available. During this timeframe, the DGEIS assumes: (1) continued storage of spent fuel in ISFSIs including routine maintenance; (2) replacement of ISFSIs and spent fuel canisters every 100 years; and (3) construction and operation of a DTS, including replacement every 100 years.<sup>48</sup> These assumptions also are reasonable or conservative for Entergy’s nuclear plants, including IPEC.

While NRC’s analyses of the three timeframes are thorough and supported by substantial evidence, Entergy agrees with the NRC Staff<sup>49</sup> and NEI<sup>50</sup> that the indefinite storage scenario is not likely to occur. In fact, as NEI notes, the indefinite storage (or “no repository”) scenario is remote and speculative, because it is contrary to existing federal law and assumes a complete and permanent government failure to fulfill the clear need and obligation to develop a repository.<sup>51</sup> In that regard, the “no repository” scenario arguably is a “worst-case scenario” that should not need to be considered under NEPA.<sup>52</sup>

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<sup>47</sup> Proposed Rule, 78 Fed. Reg. at 56,784.

<sup>48</sup> *Id.* at 56,784-785.

<sup>49</sup> *Id.*

<sup>50</sup> NEI Comments.

<sup>51</sup> *Id.* Ultimate disposal of spent fuel is the Federal Government’s statutory responsibility under the Nuclear Waste Policy Act, not the responsibility of individual NRC licensees of nuclear reactors. It is therefore reasonable under NEPA to assume that the Federal Government ultimately will accept responsibility for Entergy’s and other commercial SNF. Indeed, the D.C. Circuit recently granted a petition for a writ of mandamus, which required the NRC to comply with the Nuclear Waste Policy Act and continue with its review of the proposed high-level waste repository at Yucca Mountain. *See In Re Aiken County*, No. 11-1271 (D. C. Cir. Aug. 13, 2013). The Government’s statutory responsibility was confirmed again by the D.C. Circuit in November 2013 when the Court concluded that DOE cannot collect fees from licensees for the disposal of spent fuel in part because DOE has not satisfied its statutory obligations. *Nat’l Ass’n of Regulatory Util. Comm’rs*, No. 11-1066 (D. C. Cir. Nov. 19, 2013). The Court, however, also acknowledged the significant funds that have already been collected and that the ruling does not relieve licensees from their obligation to ultimately pay for the cost of their waste disposal. Thus, the ruling does not affect the conclusion that the indefinite storage scenario is not likely to occur.

<sup>52</sup> *See Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 354-56 & n.17 (1989) (citing NEPA Regulations, Proposed Rules, 50 Fed. Reg. at 32,236 (“the [previous rule requiring a “worst case analysis”] has proved counterproductive, because it has led to agencies being required to devote substantial time and resources to preparation of analyses which are not considered useful to decisionmakers and divert the EIS process from its intended purpose”)); *Private Fuel Storage, L.L.C.* (Indep. Spent Fuel Storage Installation), CLI-02-25, 56 NRC 340, 347 (2002) (“The purpose of an EIS is to inform the decisionmaking agency and the public of a broad range of environmental impacts that will result, with a fair degree of likelihood, from a proposed project, rather than to speculate about ‘worst-case’ scenarios and how to prevent them.”); *id.* at 348-49 (“It is well established that NEPA requires only a discussion of ‘reasonably foreseeable’ impacts. Grappling with this concept, various courts have described it as a ‘rule of reason,’ or ‘rule of reasonableness,’ which excludes ‘remote and speculative’ impacts or ‘worst-case’ scenarios.”) (citations omitted).

Nonetheless, the D.C. Circuit specifically directed the agency to assess the environmental impacts of failing to establish a permanent repository, and Entergy agrees with NEI that the NRC's consideration of an indefinite storage timeframe appropriately addresses the remand on this issue. Furthermore, inclusion of the indefinite storage scenario in the analysis helps the DGEIS to fully cover any possible environmental impacts associated with continued storage of spent fuel.

Accordingly, the timeframes considered by the NRC are reasonable and conservative given the direction of the D.C. Circuit, particularly within the context of an analysis performed under NEPA, which is governed by a "rule of reason" and allows for the exercise of agency discretion (particularly where highly technical matters such as spent fuel storage are involved). Here, the NRC has considered a broad spectrum of potential scenarios and made informed scientific judgments based on substantial available data, experience, and analyses about the possible impacts stemming from each storage scenario. Indeed, some assumptions, such as the 100 year replacement assumption and the need to construct a DTS at every site, are very conservative, and add further support for the robust nature of the NRC's response to the D.C. Circuit decision.

As discussed further below, the NRC's analysis of possible impacts from each storage scenario is applicable to Entergy's nuclear plants, including IPEC and any incremental impacts associated with issuance of renewed operating licenses for IP2 and IP3.

### **III. The NRC Staff's Generic Analysis of Spent Fuel Storage Impacts Is Fully Applicable to Entergy's Nuclear Plants, Including IPEC**

This section confirms that the NRC's generic analysis of spent fuel storage impacts in the Proposed Rule and DGEIS is fully applicable to Entergy's nuclear plants, including IPEC. Any site-specific differences are not expected to have any new or significant environmental impacts. Therefore, the NRC has completed a reasonable and thorough generic evaluation that fully satisfies NEPA and no site-specific evaluation of spent fuel storage impacts is necessary or warranted for any of Entergy's plants, including IPEC.

#### **A. The Scope of the Proposed Rule and DGEIS Is Appropriately Narrow**

Entergy first notes that the scope of the Proposed Rule and the DGEIS is appropriate. The scope includes the environmental impacts of continued storage of SNF from the end of a reactor's licensed life for operation until disposal of the SNF.<sup>53</sup> This scope encompasses spent fuel storage issues applicable to Entergy's nuclear plants.

The DGEIS explains that certain issues are eliminated from review in the GEIS, including foreign spent fuel, need for nuclear power, and reprocessing of commercial spent fuel.<sup>54</sup> The DGEIS also explains that the waste confidence rulemaking does not include whether NRC licensing activities and operation of commercial reactors should continue and does not include

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<sup>53</sup> DGEIS at 1-4 to 1-5.

<sup>54</sup> *Id.* at 1-23 to 1-24.

whether the NRC should impose additional requirements on spent fuel storage.<sup>55</sup> Specifically, the DGEIS states:

Imposing new regulatory requirements, such as requiring licensees to implement hardened at-reactor storage systems, reduce the density of spent fuel in pools, or expedite transfer of spent fuel from pools to ISFSIs, is outside the scope of this proposed action, which includes alternatives that improve the efficiency of the NRC’s licensing process by generically addressing the environmental impacts of continued storage. Adoption of a revised 10 CFR 51.23, supported by this draft GEIS, is not a licensing action, and does not impose new requirements on licensees or applicants. Therefore, the NRC cannot impose new requirements or regulations on the duration of spent fuel storage in pools through this proposed action.<sup>56</sup>

Entergy agrees that these issues are outside the scope of the waste confidence rulemaking. Additionally, the exclusion of any of these topics does not impact the applicability of the Proposed Rule and DGEIS to Entergy’s plants.

**B. The IPEC Wet and Dry Spent Fuel Storage Facilities Are Comparable to the General or “Reference” Facilities Described in the DGEIS (Chapter 2)**

DGEIS Chapter 2 discusses “typical facility characteristics and activities” that the NRC used to assess environmental impacts that may occur from continued storage of SNF.<sup>57</sup> These characteristics and activities are generally comparable to those for the IPEC site. Some example characteristics and activities are provided below. Again, any site-specific differences are not expected to have any new or significant environmental impacts.

IPEC Characteristics

IP2 and IP2 are two Westinghouse-designed commercial pressurized light water reactors (PWRs). Westinghouse-designed PWRs are widely used in the U.S. and worldwide. As previously noted, IP2 began commercial operation in 1974, and IP3 in 1976. The characteristics of IP2 and IP3, including facility description, reactor core size, fuel design, enrichment, and burn-up are generally comparable to the reactor description assumptions in Section 2.1 of the GEIS.

IP1 was a PWR that operated with a maximum steady state power level of 615 thermal megawatts. As previously noted, it began commercial operation in 1962 and ceased operation in 1974. All spent fuel from IP1 has been moved to dry storage, and the IP1 SFPs have been drained. Thus, there is no risk of SFP leaks or SFP fires at IP1 during the short-term timeframe.

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<sup>55</sup> *Id.* at xxvi, 1-9 to 1-10.

<sup>56</sup> *Id.* at 1-9.

<sup>57</sup> *See* DGEIS at 2-1.



## IPEC SFPs

IP2 and IP3 each have an independent SFP. As discussed below, the IP2 and IP3 SFPs are consistent with the SFP designs discussed in the DGEIS:

- The SFPs are reinforced concrete structures with stainless steel liners for leak tightness. Each storage pool is located within a fuel storage building. The SFPs, storage racks, and refueling canals are seismic Class I structures.
- The IPEC SFPs and spent fuel storage racks maintain the spent fuel assemblies in a subcritical array during all credible storage conditions, and the water in the SFP serves the purposes of cooling for radioactive decay and shielding.
- The steps of moving the SNF into dry cask storage are a series of carefully controlled and monitored steps developed based on cask manufacturer specifications and IPEC fuel handling procedures. The procedures and programs developed during the operating period, including procedures governing the loading of spent fuel assemblies into canisters and transfer casks within the pool for transfer to the ISFSI, will remain in place for the continued use of the SFP until all SNF is transferred to the ISFSI.
- The IP2 SFP consists of both the fuel pool itself and an integral Transfer Canal. During construction, a grid of steel “T-beams” was embedded in the interior surface of the 4- to 6-foot-thick concrete pool walls and the 3-foot thick floor slab which provides substantial structural support. The IP2 SFP includes a 1/4-inch-thick stainless steel liner.<sup>58</sup>
- The more recently-constructed IP3 SFP includes a stainless steel liner (consistent with the IP2 design). The IP3 SFP also contains a leak detection telltale drain system. The purpose of the telltale drain system is to capture water that might leak through the stainless steel liner and channel it to a collection pipe as an indication of a liner leak. The IP3 SFP telltale system is regularly monitored for leakage accumulation, and is also routinely inspected to verify it is in good working condition.<sup>59</sup>
- In addition to the IP3 leak detection system, water samples are also collected from drain lines in several manholes on site to characterize discharge from foundation drains around and below both IP2 and IP3 structures. These drains are part of an early leak detection monitoring network. The SFP cooling system is designed so that the probability of inadvertently draining the water from the cooling loop is exceedingly low. Further, SFP system piping is arranged so that failure of any pipeline cannot drain the SFP below the

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<sup>58</sup> See Testimony of Entergy Witnesses Donald M. Mayer, Alan B. Cox, Thomas C. Esselman, Matthew J. Barvenik, Carl J. Paperiello, and F. Owen Hoffman Regarding Consolidated Contention RK-EC-3/CW-EC-1 (Spent Fuel Pool Leaks), at 40 (A64) (Mar. 29, 2012) (citing Lucius Pitkin, Inc. “Discussion on Aging of the Indian Point 2 Spent Fuel Pit,” Report No: A11357-R001 (Feb. 2012) (“Lucius Pitkin Report”), available at ADAMS Accession No. ML12338A670) (“Entergy Spent Fuel Pool Testimony”), available at ADAMS Accession No. ML12338A621.

<sup>59</sup> See Entergy Spent Fuel Pool Testimony at 41 (A65) (citing Indian Point Hydrogeologic Site Investigation Report (Jan. 7, 2008) (“Site Investigation Report”), available at ADAMS Accession No. ML080320540).

water level required for radiation shielding. The design of the IP2 and IP3 SFPs are therefore consistent with Section 2.1.2.1 of the DGEIS.

- The pool liners and rack structures at both plants are of welded stainless steel construction and components in the SFP are constructed of alloys that have a low differential galvanic potential between them and have a high resistance to general corrosion, localized corrosion, and galvanic corrosion. As indicated in the DGEIS, the SFP storage racks provide storage for approximately 1374 fuel assemblies at IP2 and 1345 fuel assemblies at IP3, with a storage capacity of approximately 687 and 672.5 MTUs, respectively.<sup>60</sup>
- As part of the license renewal review for IP2 and IP3, NRC evaluated whether there was any new and significant information regarding the environmental impacts of onsite spent fuel storage at IPEC. The NRC Staff did not identify any new and significant information.<sup>61</sup>
- The DGEIS notes that the terrorist attacks on September 11, 2011 resulted in changes to NRC requirements for physical security and the safety operation of SFPs.<sup>62</sup> Entergy has implemented the additional security measures applicable to SFPs. These activities provide additional assurances of the safety of continued storage of spent fuel.
- The DGEIS also notes that the response to the March 2011 Fukushima event impacts the NRC requirements applicable to SFPs.<sup>63</sup> In response to the events at Fukushima, NRC issued orders in March 2012, one of which requires licensees, including Entergy, to have a reliable means of remotely monitoring wide-range SFP levels to support effective prioritization of event mitigation and recovery actions in the event of a beyond-design-basis external event.<sup>64</sup> An additional order requires licensees to have a three-phase approach for mitigating beyond-design-basis external events, including use of installed equipment and resources to maintain or restore core cooling, containment, and SFP cooling.<sup>65</sup> Entergy is on track to implement these requirements at IPEC by the required deadlines. These activities also provide additional assurances of the safety of continued storage of spent fuel.
  - With respect to potential flooding on site, flood models and calculations are updated as needed to take into account updated historical meteorological records,

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<sup>60</sup> DGEIS at G-4 (Table G-1).

<sup>61</sup> See NUREG-1437, Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supp. 38, Regarding Indian Point Nuclear Generating Unit Nos. 2 and 3, at 6-7 to 6-8 (Dec. 2010) (“IPEC FSEIS”), available at ADAMS Accession No. ML103350405.

<sup>62</sup> DGEIS at 2-11.

<sup>63</sup> *Id.* at 2-11 to 2-12.

<sup>64</sup> See EA-12-051, Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Effective Immediately) (Mar. 12, 2012).

<sup>65</sup> See EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Effective Immediately) (Mar. 12, 2012).

changes in hydrological features in the area, and other pertinent considerations. Changes are documented in the updated final safety analysis report (“UFSAR”), as necessary.

### ISFSIs

DGEIS Section 2.1.2.2 describes example at-reactor ISFSIs. Entergy’s at-reactor ISFSIs, including the IPEC ISFSI, are fully consistent with those described in the DGEIS. Entergy also concurs with the NRC’s assumption that an ISFSI of sufficient size to hold all spent fuel generated during licensed life for operation will be constructed.<sup>66</sup>

The design and construction of the IPEC ISFSI fully conforms to all applicable NRC regulatory design and licensing criteria. The ISFSI design considers site-specific parameters, including flooding, aircraft, fire, and seismic hazards. Entergy maintains a written evaluation pursuant to 10 C.F.R. § 72.212 for construction and operation of the IPEC ISFSI pursuant to a general NRC license.<sup>67</sup> That evaluation provides a detailed analysis of Entergy’s compliance with the pertinent requirements of 10 C.F.R. Part 72, including the following specific requirements of Section 72.212:

- The dry cask storage pads and areas have been designed to support the static and dynamic loads of the stored casks, considering potential amplification of earthquakes through soil-structure interaction, and soil liquefaction potential or other soil instability due to vibratory ground motion.
- All regulatory requirements for radioactive materials in the form of both effluents and direct radiation and offsite dose limits from the ISFSI during normal and anticipated occurrences are met.
- Reactor site parameters, including analyses of earthquake intensity and tornado missiles, are enveloped by the cask design bases as documented in the applicable cask Certificate of Conformance and related NRC Safety Evaluation Report.
- Measures are taken to protect the spent fuel against the design basis threat of radiological sabotage. In this regard, Entergy has complied with all security orders issued after the September 11, 2001 terrorist attacks that relate to ISFSIs.

Finally, the IPEC ISFSI will be under institutional control for the duration of SNF storage at IPEC. This institutional control will be both active (monitoring, surveillance, remedial work) and passive (land use control), and will involve corrective or enforcement measures as necessary. Future mandates for controls and extended storage would be expected to evolve over time, but as license holder for IPEC, Entergy would implement necessary changes to maintain compliance with future regulation and maintain the health and safety of the public as long as necessary.

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<sup>66</sup> See DGEIS at 2-17.

<sup>67</sup> As NEI notes in its comments, “[o]ver the last 30 years the nuclear industry has safely loaded over 1700 dry cask storage systems. All of these systems are still in service today and there has been no release of their radioactive contents.” NEI Comments.

## Generic Activities for SFPs and ISFSIs

DGEIS Section 2.2 discusses generic activities for SFPs and ISFSIs for each of the timeframes considered in the DGEIS. Specifically, for the short-term storage timeframe, the DGEIS considers decommissioning activities of plant SSCs not required for continued storage of spent fuel, routine maintenance of the SFP and ISFSI, and transfer of spent fuel from the SFP to the at-reactor or away-from-reactor ISFSI.<sup>68</sup> During the long-term storage timeframe, the DGEIS considers continued facility maintenance, construction and operation of a DTS, and storage facility replacement.<sup>69</sup> During the indefinite storage timeframe, the DGEIS states that activities described for the long-term storage timeframe are assumed to continue indefinitely, including replacement of storage facilities once every 100 years.<sup>70</sup>

Entergy has not identified any activities that it plans to conduct that would be inconsistent with those discussed in DGEIS Section 2.2. For example, the DGEIS assumes timely decommissioning of reactors in accordance with 10 C.F.R. §§ 50.82 and 52.110(c), and that all spent fuel would be moved from SFPs to dry storage by the end of the short-term timeframe (*i.e.*, within 60 years beyond the licensed life for reactor operations).<sup>71</sup> Such assumptions are reasonable and applicable to Entergy's nuclear plants, including IPEC.

Finally, Entergy also agrees with NEI's comments that the NRC should add further discussion to the GEIS of the lessons learned from the Fukushima event regarding the robustness of SFP and ISFSI storage, and that this operating experience is significant evidence of the substantial safety assurance provided by SFPs and dry cask storage.<sup>72</sup>

### **C. The DGEIS (Chapter 3) Provides a Reasonable Description of the "Affected Environment" and Is Comparable to the IPEC Site and Its Environs**

DGEIS Chapter 3 discusses the "affected environment" around facilities with SFPs/spent fuel storage. Notably, Chapter 3 states that the Staff has relied on the comprehensive description of the affected environment during operation that is contained in the license renewal GEIS (NUREG-1437).<sup>73</sup> The license renewal GEIS, which is a final document that was subject to public comment, is intended to encompass all plants, including Entergy's plants. Chapter 3 includes a discussion of: land use; socioeconomics; environmental justice; climate and air quality; geology and soils; surface water quality and use; groundwater quality and use; terrestrial

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<sup>68</sup> DGEIS at 2-22 to 2-27.

<sup>69</sup> *Id.* at 2-27 to 2-29.

<sup>70</sup> *Id.* at 2-29.

<sup>71</sup> *Id.* at 2-26. An ISFSI facility is relatively simple to construct and would be relatively simple to deconstruct. Replacement of the ISFSI would be a short-term project with little radioactive material requiring disposal. Once all loaded casks are transferred to replacement storage overpacks on a new ISFSI pad, the original ISFSI would be decommissioned in a short time frame. The decommissioning plan would be prepared and approved prior to any decommissioning, and the site of the decommissioned ISFSI would be available for future use as a replacement ISFSI.

<sup>72</sup> NEI Comments.

<sup>73</sup> DGEIS at 3-1.

resources; aquatic ecology; special status species and habitats; historic and cultural resources; noise, aesthetics; waste management; transportation; and public and occupational health.

Entergy concludes that this DGEIS Chapter 3 provides a reasonable description of the affected environment for consideration of the issues in the DGEIS, and that this description is comparable to Entergy's plants, including IPEC, for the purposes of the DGEIS. Additionally, Entergy's nuclear plants have been subject to numerous environmental analyses conducted by the NRC and other regulatory agencies. These analyses have resulted in an extensive environmental record that fully supports NRC's analyses and conclusions. For example, the NRC issued the IPEC FSEIS for license renewal, which includes hundreds of pages of environmental analysis, and the associated adjudicatory proceeding has addressed multiple contested environmental issues, producing an extensive record on topics including severe accident mitigation alternatives, spent fuel pool leaks, environmental justice, and land use.<sup>74</sup>

**D. The Staff's Evaluation in the DGEIS (Chapter 4) of the Environmental Impacts of At-Reactor Continued Storage of Spent Fuel Is Reasonable and Applicable to Entergy**

DGEIS Chapter 4 evaluates in detail the environmental impacts of continued at-reactor storage of spent fuel in a SFP or ISFSI, including during the short-term, long-term, and indefinite timeframes described above. The resources areas reviewed in Chapter 4 include: land use; socioeconomics; environmental justice; air quality; climate change; geology and soils; surface-water quality and use; groundwater quality and use; terrestrial resources; aquatic ecology; special status species and habitat; historic and cultural resources; noise; aesthetics; waste management; transportation; public and occupational health; environmental impacts of postulated accidents; and potential acts of sabotage or terrorism. DGEIS Table 4-2 provides a summary of the environmental impacts of continued at-reactor storage for these resource areas.<sup>75</sup> As shown in that table, the NRC concluded that the impacts for all of the resources would be SMALL for all three timeframes with a few exceptions.

- The first exception is that the environmental impacts for historic and cultural resources would be SMALL, MODERATE, or LARGE for long-term and indefinite storage timeframes. The magnitude of adverse effect on historic properties and impact on historic and cultural resources largely depends on what resources are present, the extent of proposed land disturbance, whether the area has been previously surveyed to identify historic and cultural resources, and whether the licensee has management plans and procedures that are protective of historic and cultural resources.<sup>76</sup>

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<sup>74</sup> See *Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 & 3), LBP-13-13, 78 NRC \_\_\_, slip op. at 388 (Nov. 27, 2013).

<sup>75</sup> DGEIS at 4-90 to 4-91.

<sup>76</sup> *Id.* at 4-50.

- The second is that the environmental impacts for waste management of nonradioactive waste would be SMALL to MODERATE for indefinite storage, because it is difficult to accurately estimate the amount that would be generated over an indefinite timeframe.<sup>77</sup>

These general conclusions regarding environmental impacts apply to Entergy's plants, although Entergy believes that all impacts would be SMALL. A few of the specific conclusions are discussed below.

- DGEIS Section 4.1 concludes that land use impacts would be SMALL because storage would only affect a small fraction of the land committed for a nuclear power plant.<sup>78</sup> Entergy agrees with this conclusion. Entergy anticipates that the extended storage facilities for IPEC would be within the area of potential effect associated with IPEC and restricted to existing disturbed portions of the plant property.
- As noted in DGEIS Sections 4.6, 4.7, and 4.8, SFP leaks could result in radiological contamination of soils, groundwater and surface water. Entergy agrees that the environmental impacts of continued spent fuel storage at its nuclear plants, including IPEC, on these environmental areas would be SMALL. These conclusions are described further in Section III.G below.
- As discussed above, DGEIS Section 4.12 assumes that the environmental impacts for historic and cultural resources could be SMALL, MODERATE, or LARGE for long-term and indefinite storage timeframes. Entergy agrees with NEI's comment that this impact should be SMALL for all continued storage scenarios.<sup>79</sup> Specifically, Entergy already has a large area of previously disturbed land at its sites that could be used for the construction of any expanded storage facilities. Entergy would also mitigate any adverse effects on historic resources. Entergy has appropriate management plans and procedures that are protective of historic and cultural resources, and these activities would be subject to further consideration of historic and cultural impacts during future regulatory activities.
  - The SMALL impact is further supported by the extensive environmental analyses performed for Entergy's plants, including IPEC. For example, the IPEC FSEIS includes background information on the historic and cultural resources and then concludes that the impacts are SMALL.<sup>80</sup> The construction of any new extended storage facilities would require investigation by a professional archaeologist, and the implementation of appropriate mitigation measures in accordance with Entergy's procedures, if necessary.<sup>81</sup>
- DGEIS Section 4.17 concludes that radiological impacts from public and occupational doses would be SMALL because the doses would continue to remain below the regulatory dose

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<sup>77</sup> *Id.* at 4-61.

<sup>78</sup> *Id.* at 4-4 to 4-6.

<sup>79</sup> NEI Comments.

<sup>80</sup> *See* IPEC FSEIS at 2-134 to 2-139, 4-47 to 4-49.

<sup>81</sup> *See id.* at 4-49.

limits.<sup>82</sup> Entergy agrees. After all the SNF is in dry cask storage and decommissioning is complete, the ISFSI facility would be the only source of public dose from the exposure pathway of direct radiation. A program of monitoring the ISFSI would remain in place to ensure the health and safety of the public, the workers, and the security of the spent fuel. Entergy would minimize doses by the use of shielding, distance, and reduced stay time around the material. The expected dose from the ISFSI alone would be a decrease from the dose during the decommissioning phase. The public dose estimates for SNF management in dry cask storage would be expected to be well below the required limits for dose to members of the public. The potential impacts from dose exposure offsite would be insignificant and decreasing with each year of radioactive decay.

- As described in DGEIS Sections 4.18.1 and 4.18.2, the environmental risks of continued storage of spent fuel associated with postulated accident conditions, including design basis events for SFPs and dry cask storage systems, hazards from natural phenomenon such as earthquakes, floods, and tornadoes, and severe accidents, are SMALL. These conclusions apply to Entergy’s plants, including IPEC. For example, as discussed above in Section III.B, the IPEC SFPs include seismically qualified pool structures, racks, and cooling systems that would help protect it during postulated design basis events. These protections have been and will continue to be further enhanced following the September 11 terrorist attacks and the Fukushima event.
  - Furthermore, as discussed above in Section III.B, Entergy’s at-reactor ISFSIs, including the IPEC ISFSI, are fully consistent with those described in the DGEIS. These ISFSIs are designed to rigorous seismic and flooding criteria, as required by the NRC regulations. Moreover, the significant robust protection from external events has been demonstrated by real world events, including the August 23, 2011 Mineral, Virginia earthquake near the North Anna nuclear power plant and the March 11, 2011 earthquake and subsequent tsunami that damaged the Fukushima Dai-ichi nuclear power plant. Neither event resulted in significant damage to or the release of radionuclides from the dry cask storage containers. With respect to the earthquake near North Anna, Entergy’s ISFSIs, including the IPEC ISFSI, similarly use NRC-approved casks and comply fully with the requirements of 10 C.F.R. Part 72.
  - A recent paper prepared by one of the NRC Staff’s lead structural engineers and reviewers (acting in individual capacity as an engineer) supports the robust nature of ISFSIs.<sup>83</sup> That paper concludes, with “a high degree of confidence,” that spent fuel assemblies stored in ISFSI locations within the most seismically-active regions in the Central and Eastern U.S. will not pose undue radiological hazards, in large part because greater seismic inertia loads are bounded by other design loads.<sup>84</sup> According to the paper, “[t]he built in defense-in-depth for the analysis/design of these casks, and rigorous

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<sup>82</sup> DGEIS at 4-64 to 4-67.

<sup>83</sup> See Tripathi, B. P., “Overview of Independent Spent Fuel Storage Installation (ISFSIs) in the New Madrid Seismic Zone (NMSZ) and Wabash Valley Seismic Zone (WVSZ),” *Transactions*, SMiRT-22, San Francisco, CA (Aug. 2013), available at ADAMS Accession No. ML13120A648.

<sup>84</sup> *Id.* at 9.

construction and periodic maintenance of these facilities required by the applicable regulations provide reasonable assurance that these facilities are safe.”<sup>85</sup>

- Additionally, as discussed above, Entergy is taking actions to implement the requirements of the NRC’s orders and other requirements following the March 2011 Fukushima event, including requirements for seismic and flooding reevaluations. These reevaluations are discussed in the DGEIS.<sup>86</sup> Entergy’s actions and plans are consistent with the statements in the DGEIS, and further demonstrate that the Entergy ISFSIs will comply with regulatory requirements to ensure safe and environmentally sound spent fuel storage. Entergy will submit its further evaluations for IPEC when required and take any further action as required by NRC regulations.
- DGEIS Section 4.19 discusses potential acts of sabotage or terrorism on SFPs and ISFSIs. The probability and consequences of attacks on SFPs is considered only during the short-term timeframe, because the spent fuel would be transferred to ISFSIs by that time.<sup>87</sup> The probability and consequences of attacks on ISFSIs are considered for all timeframes.<sup>88</sup> Based on the very low probability of a successful attack, the DGEIS concludes that the environmental risk is SMALL, and the “continued storage of spent fuel will not constitute an unreasonable risk to the public health and safety from acts of radiological sabotage theft or diversion of special nuclear material.”<sup>89</sup> Nonetheless, as discussed in the DGEIS, there is a dispute among the U.S. Courts of Appeals as to whether NEPA analyses require consideration of terrorist attacks, with the Court of Appeals for the Ninth Circuit holding that the NRC must consider terrorism in its NEPA reviews.<sup>90</sup> Because Entergy’s nuclear plants are not located in the Ninth Circuit, this consideration of the environmental impacts is unnecessary. This position is consistent with the Court of Appeals for the Third Circuit’s holding in *New Jersey Department of Environmental Protection v. NRC*, 561 F.3d 132 (3d Cir. 2009) where the court held that the NRC was not required to prepare an EIS concerning the effects of terrorist attacks as part of a license renewal application. Nevertheless, the conclusions about SMALL impacts from sabotage or terrorism apply to Entergy’s plants, particularly because Entergy has taken the required measures following the September 11 terrorist attacks.
- With respect to security, the IPEC ISFSI is in compliance with NRC regulations requiring physical protection of stored SNF (10 C.F.R. § 73.51). Furthermore, the IPEC ISFSI design and location will be in compliance with security-based limits and vehicle physical barrier requirements to protect against terrorist attack or sabotage, and other security-related events.

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<sup>85</sup> *Id.*

<sup>86</sup> DGEIS at 4-72 to 4-73.

<sup>87</sup> *Id.* at 4-84 to 4-85.

<sup>88</sup> *Id.* at 4-85.

<sup>89</sup> *Id.* at 4-89 to 4-90.

<sup>90</sup> *Id.* at 4-84.



- The NRC has developed a set of rules specifically aimed at protecting the public from harm that could result from sabotage of SNF casks. There are numerous physical protection and safeguards regulations (*i.e.*, 10 C.F.R. § 73.37; 10 C.F.R. § 73.51) that apply. The dry storage cask safety features that provide containment, shielding and thermal protection also provide protection against sabotage.

In summary, and as more fully explained throughout these comments, Entergy is not aware of any aspects of its plants that would place them outside the generic evaluation of the environmental impacts of continued at-reactor continued storage of spent fuel that is provided in the DGEIS. In this regard, Entergy concludes that the potential impacts from extended storage at the IPEC site are not expected to increase or substantially change from those identified in previous environmental documents, and no additional mitigation measures beyond those already being implemented, committed to, or added in the future would be required. Additionally, Entergy is not aware of any comments submitted to date, either during scoping or during public meetings, that would change this conclusion.

**E. The NRC Staff's Discussion of the Technical Feasibility of Continued Safe Storage of Spent Fuel Is Fully Applicable to Entergy (DGEIS Appendix B)**

DGEIS Appendix B addresses the technical feasibility of continued safe storage of spent fuel, including the technical feasibility of wet storage (Section B.3.1) and the technical feasibility of dry cask storage (Section B.3.2).

As described further below, Entergy has not identified anything in these sections of the DGEIS that is inconsistent with its own substantial spent fuel storage experiences and plans. For example:

- There is nothing unique about the fuel used at IP2 and IP3, and the IPEC SFPs comply with applicable regulatory requirements. Therefore, NRC's analysis and assumptions in DGEIS Section B.3.1.1 regarding the integrity of spent fuel and cladding in SFPs applies to IPEC and Entergy's other nuclear sites.<sup>91</sup>
- Also as discussed above, the IPEC SFPs are reinforced concrete structures with stainless steel liners for leak tightness. The SFPs are seismic Class 1 structures. Each storage pool is located within a fuel storage building that protects against a wide-range of natural and human-induced challenges, including the maximum potential earthquake stresses for the region where the plant is sited.

Therefore, NRC's analysis and assumptions in Section B.3.1.2 regarding the robust structural design of SFPs applies to IPEC and Entergy's other nuclear sites.

Similarly, Entergy's own experience with dry cask storage fully supports the NRC's conclusions that dry cask storage is technically feasible for the timeframes considered in the DGEIS.<sup>92</sup> In fact, Entergy believes that the NRC's assumption of replacing dry casks every 100 years of

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<sup>91</sup> *Id.* at B-8 to B-9.

<sup>92</sup> *Id.* at B-11 to B-15.

service life is very conservative, and that due to their robust design the casks could last much longer without substantial maintenance.

**F. The NRC’s Discussion of Its Continuing Regulatory Oversight of Wet and Dry Spent Fuel Storage Is Fully Applicable to Entergy**

DGEIS Appendix B discusses a number of ongoing regulatory programs related to the safety and security of spent fuel storage. Specifically, DGEIS Section B.3.3 discusses how the NRC’s regulatory program has addressed potential safety and security concerns and routine operations, and concludes that “the vitality and evolution of the NRC’s regulatory requirements support a reasonable conclusion that continued storage, even over extended periods of time beyond those regarded as most likely, will continue to be safe with the same or fewer environmental impacts.”<sup>93</sup> Entergy is subject to this continuing oversight, which provides further assurance of continued safe and secure spent fuel storage.

Some examples of specific regulatory actions and oversight discussed in Section B.3.3 and how they apply to Entergy are provided below:

- Section B.3.3.1 describes extensive regulatory actions related to routine operations, accidents, and terrorist activity. For example, the NRC describes extensive actions it has taken to improve spent fuel safety and security following the terrorist attacks of September 11, 2001, including in orders requiring additional security measures, such as increased patrols, augmented security forces and capabilities, and more restrictive site-access controls.<sup>94</sup> Entergy has fully complied with those NRC orders. Another example is the NRC’s March 2012 orders and other requirements related to the Fukushima event.<sup>95</sup> Entergy has undertaken significant efforts to comply with those orders and other requirements, including activities related to SFP instrumentation and mitigative strategies, as well as ongoing seismic and flood reevaluations.
- Section B.3.3.2 discusses regulatory oversight of SFP leaks. That section identifies specific changes to NRC requirements and guidance with respect to SFP leaks. As discussed further in Sections III.H and IV.B, below, Entergy has addressed previous SFP leaks at IPEC, and will continue to comply with applicable NRC requirements with respect to such leaks.
- Section B.3.3.3 discusses the regulatory framework for dry cask storage. That section discusses the evolution of the framework based on the need for dry cask storage. Entergy has complied and will continue to comply with applicable NRC requirements with respect to dry cask storage. For example, Entergy submitted the required regulatory

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<sup>93</sup> *Id.* at B-15 to B-16.

<sup>94</sup> *Id.* at B-16.

<sup>95</sup> *Id.* at B-16 to B-17.

reports for the IPEC ISFSI to demonstrate compliance with the regulatory framework for ISFSIs.<sup>96</sup>

These regulatory requirements and the NRC's continued oversight and evolution of the requirements in response to new information or developments provide additional assurance that spent fuel will be stored and managed in a safe and secure manner. This provides further demonstration of Entergy's ability to safely store spent fuel.

**G. The NRC's Analysis of SFP Leaks Is Fully Applicable to Entergy**

DGEIS Appendix E describes the environmental impacts of SFP leaks that may occur during the short-term storage timeframe, and concludes that the environmental impacts from leaks on groundwater, surface water, soils, and public health would be SMALL. Appendix E of the DGEIS includes a detailed analysis of the environmental impacts of SFP leaks. The NRC's analysis considers, among other things: (1) NEI's 2006 Groundwater Protection Initiative, which all power reactor licensees, including Entergy, have committed to follow;<sup>97</sup> (2) NRC's 2006 Groundwater Task Force, which systematically reviewed the lessons learned from unplanned, unmonitored releases that had occurred in the industry, including at IPEC, and concluded that environmental and public health impacts had been minimal.<sup>98</sup> The DGEIS concludes that the impacts on groundwater, surface water, soils, and public health would be SMALL for all plants.<sup>99</sup>

Entergy has confirmed that these conclusions regarding the impacts of SFP leaks apply to its nuclear plants, including IPEC. For example, as discussed above, the IPEC SFPs have a robust design, stainless steel liner, and, for IP3, leak detection.

Entergy would also continue monitoring for radioactive contamination through its Radiological Environmental Monitoring Program ("REMP") during the time that the SFPs remain in service until it is decommissioned to ensure that environmental impacts are monitored and appropriate mitigation measures can be enacted if a need is indicated. As discussed below, the IPEC system of monitoring wells was expanded substantially when leaks were discovered in 2005.

Most importantly, the radionuclide leaks from the IP1 and IP2 SFPs into the groundwater and Hudson River ecosystem have had minimal or non-detectable impacts. Entergy has been proactive in identifying and addressing SFP leaks, and the environmental impacts from SFP leaks have been and will continue to be not significant. The NRC reached this conclusion in its FSEIS for IPEC license renewal,<sup>100</sup> and Entergy's expert witnesses submitted extensive

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<sup>96</sup> See NL-03-190, Letter from J. Comiotes, Entergy, to NRC, Notification of Plans for an Independent Spent Fuel Storage Installation at Indian Point Energy Center (Dec. 29, 2003), *available at* ADAMS Accession No. ML040020316.

<sup>97</sup> See DGEIS at E-6 (citing NEI 07-07, "Industry Ground Water Protection Initiative - Final Guidance Document").

<sup>98</sup> See *id.* at E-15, E-21.

<sup>99</sup> *Id.* at E-19.

<sup>100</sup> See IPEC FSEIS at 4-56.

testimony clearly confirming the NRC's conclusions.<sup>101</sup> This conclusion is based on multiple, independent sources. Specifically:

- The historical leaks from the IP1 SFPs were permanently stopped when Entergy removed all the spent fuel from the IP1 SFPs in late 2008 and subsequently drained the pool water.<sup>102</sup> Likewise, Entergy conducted extensive investigations of potential SFP leakage sources from 2005 to 2007, after the discovery in August 2005 of shrinkage cracks exhibiting moisture on an excavated exterior IP2 SFP wall.<sup>103</sup> These investigations led to the identification of a pinhole leak in a single weld imperfection in the SFP transfer canal liner.<sup>104</sup> The IP2 transfer canal leak likely released tritiated pool water into the interstitial space between the SFP liner plates and the SFP walls when the transfer canal was filled above the elevation of the imperfection.<sup>105</sup> Entergy repaired this leak in December 2007, and following these repairs, the overall quarterly groundwater monitoring data indicate that tritium activity in the IP2 SFP plume have been undergoing long-term, overall reductions.<sup>106</sup> Entergy has identified no leaks from the IP3 SFP.<sup>107</sup>
- Following the discovery of the IP2 SFP hairline cracks in September 2005, Entergy conducted a comprehensive, multi-year groundwater investigation of all three Indian Point reactor units and surrounding areas.<sup>108</sup> The purpose of the investigation was to identify the nature and extent of radiological groundwater contamination and, by using state-of-the-practice science and technology, assess the hydrogeologic implications and extent of radiological groundwater contamination.<sup>109</sup> This led to the development of the Site Investigation Report submitted to the NRC in January 2008.<sup>110</sup> A key component of

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<sup>101</sup> See generally Entergy Spent Fuel Pool Testimony. As explained in Section IV.B, below, although the parties submitted pre-filed written testimony on an admitted environmental contention related to spent fuel pool leaks, designated Riverkeeper (“RK”)-EC-3/Clearwater (“CW”)-EC-1, the parties settled the contention before the oral hearing. But this testimony, which is available in ADAMS (ML12338A621), provides a comprehensive review of the history and environmental impacts of spent fuel pool leakage at IPEC.

<sup>102</sup> See Entergy Spent Fuel Pool Testimony at 43 (A66); see also E-mail from D. Mayer, Entergy, to J. White, NRC, “Indian Point 1” (Nov. 5, 2008), available at ADAMS Accession No. ML12089A661. Even so, Entergy continues to operate and maintain the IP1 foundation collection drains and treatment system to capture a majority of the residual contamination partitioning off of the subsurface materials into the groundwater. See Entergy Spent Fuel Pool Testimony at 20 (A38).

<sup>103</sup> See Entergy Spent Fuel Pool Testimony at 48 (A71). Entergy installed a leak collection device over the cracks to address this issue. *Id.* at 45 (A69).

<sup>104</sup> *Id.* at 46 (A69).

<sup>105</sup> *Id.*

<sup>106</sup> See *id.* at 45-46 (A69-70).

<sup>107</sup> *Id.* at 51 (A76).

<sup>108</sup> *Id.* at 52 (A77).

<sup>109</sup> *Id.*

<sup>110</sup> *Id.* at 2 (A4); see also Site Investigation Report.

this report was the Conceptual Site Model, which provides a thorough understanding of site groundwater flow and radionuclide transport at Indian Point.<sup>111</sup>

- These investigations provided the foundation necessary for Entergy to establish a Long-Term Groundwater Monitoring Program, which allows Entergy to monitor the existing plumes and to monitor for potential future releases to the subsurface.<sup>112</sup> The groundwater monitoring network is extensive and robust—it contains numerous depth-specific sampling locations, which allows Entergy to sample groundwater at various depths from the groundwater surface to well below the top of the bedrock.<sup>113</sup> Under the Long-Term Groundwater Monitoring Program, Entergy conducts groundwater monitoring and sampling activities, and evaluates the data for four primary purposes: dose computations, SSC leak detection, off-site migration monitoring, and plume attenuation monitoring.<sup>114</sup> Pursuant to the requirements of its 10 C.F.R. Part 50 license, Entergy will continue environmental monitoring during the post-shutdown period.
  - As a result of the hydrogeologic investigation and continued groundwater monitoring, Entergy determined that groundwater flows into the Indian Point power block area from the north, east and south, and then flows to the Hudson River to the west; *i.e.*, groundwater, and any radionuclides contained in the groundwater, do not flow off the site from the power block area, except to the Hudson River.<sup>115</sup> The migration of low-level radionuclides to the Hudson River, however, has had no adverse radiological impact on the surrounding environment.<sup>116</sup>
    - Because there are no adverse impacts to the Hudson River ecosystem, and because calculations show that dose rates from releases of Indian Point groundwater to the Hudson River are orders of magnitude below guidelines used to assess the potential for ecologically significant impacts,<sup>117</sup> impacts to the Hudson River aquatic ecosystem are minimal and are expected to remain so.
  - There are two distinct “plumes” of groundwater containing radionuclides: one containing principally tritium from the IP2 SFP, and one containing principally strontium from past releases from the IP1 SFPs.<sup>118</sup> The worst-case plumes existed prior to termination of the historic releases from the IP1 and IP2 SFPs, but that the

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<sup>111</sup> Entergy Spent Fuel Pool Testimony at 64 (A94).

<sup>112</sup> *Id.* at 63-66 (A93-95).

<sup>113</sup> *Id.* at 66 (A95).

<sup>114</sup> *Id.* at 63 (A93).

<sup>115</sup> *Id.* at 67 (A96).

<sup>116</sup> *See* IPEC FSEIS at 2-105; *see also* Site Investigation Report at 127, 130.

<sup>117</sup> *See* Dr. F. Hoffman, Entergy Aquatic Biota Calculations (Feb. 10, 2012), *available at* ADAMS Accession No. ML12089A641; L. Skinner and T. Sinnot, Measurement of Strontium (90Sr) and Other Radionuclides in Edible Tissues and Bone/Carapace of Fish and Blue Crabs from the Lower Hudson River at 8 (Nov. 2009) (“NYSDEC Strontium Study”), *available at* ADAMS Accession No. ML12089A652.

<sup>118</sup> *See* Entergy Spent Fuel Pool Testimony at 67 (A97), 70 (A100).

total activity of these two plumes has subsequently been generally decreasing substantially.<sup>119</sup>

- The extensive monitoring systems remain in place, so Entergy can readily detect future releases of radionuclides to groundwater that are substantially smaller than the historically-identified and corrected IP2 SFP leaks.<sup>120</sup> Specifically, the groundwater monitoring program is capable of detecting a SFP leak of less than approximately 10 to 30 gallons per day, which is well below the approximately 100 gallons per day assumed by the NRC in the “model leak” analysis in the DGEIS.<sup>121</sup> Entergy will therefore be able to take appropriate corrective actions if any such future releases are detected. To the extent that any small, undetected leak may still exist at IP2, it must be smaller than those identified and repaired by Entergy, given the subsequent attenuation of the tritium plume.<sup>122</sup> Thus, future impacts are likely to be bounded by the impacts in previous evaluations (*i.e.*, they are likely to be SMALL).<sup>123</sup>
- Entergy is in compliance with applicable dose limits at IPEC—by a very wide margin—including all NRC 10 C.F.R. Part 20 and Part 50, Appendix I requirements, and U.S. Environmental Protection Agency (“EPA”) 40 C.F.R. Part 190 requirements.<sup>124</sup> For example, the combined groundwater and storm water dose to the maximally exposed member of the public is less than 0.1 percent of the As Low As Reasonably Achievable (“ALARA”) guidelines in Appendix I of 10 C.F.R. Part 50.<sup>125</sup> In addition, Entergy’s dose calculations conservatively account for potential bioaccumulation.<sup>126</sup>
- The NRC (with support from the United States Geological Survey (“USGS”)) and the New York State Department of Environmental Conservation (“NYSDEC”) (with support from the New York State Department of Health (“NYSDOH”)) independently verified Entergy’s SFP leaks evaluations and conclusions regarding insignificant public health and environment impacts.
  - The NRC Staff reviewed Entergy’s Site Investigation Report and concluded that: (1) Entergy had properly identified the source of groundwater releases as the IP1 and IP2 SFPs; (2) no releases were observed or detected from IP3; (3) Entergy’s hydrogeologic site characterization studies provide sufficiently-detailed field observations, monitoring, and test data; (4) the Conceptual Site Model provides a reasonable basis to support the finding that liquid effluent releases from the SFPs migrate west towards the Hudson River and do not otherwise migrate offsite; (5)

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<sup>119</sup> *Id.* at 69 (A99), 70 (A100).

<sup>120</sup> *Id.* at 71 (A101).

<sup>121</sup> DGEIS at E-10.

<sup>122</sup> *See* Entergy Spent Fuel Pool Testimony at 21 (A38).

<sup>123</sup> *Id.* at 50-51 (A74).

<sup>124</sup> *Id.* at 86 (A118).

<sup>125</sup> *Id.*

<sup>126</sup> *Id.* at 118-21 (A151-53).

- there are no drinking water sources that can be impacted by the contaminated groundwater; (6) the annual calculated exposure to the hypothetical maximally-exposed individual relative to the liquid effluent aquatic food exposure pathway is currently, and is expected to remain, less than 0.1 percent of the ALARA guidelines in Appendix I of 10 C.F.R. Part 50, which are considered to be negligible with respect to public health, safety, and the environment; and (7) there is no evidence of any significant leak or loss of radioactive water inventory from the site that was discernable in the offsite environment; and Entergy's remediation approach and plans for long-term monitoring were reasonable.<sup>127</sup>
- NYSDEC performed its own independent assessment of public health and environmental impacts due to the SFP leaks, and reached conclusion that are consistent with Entergy's findings in its Site Investigation Report, as confirmed by the NRC Staff.<sup>128</sup> Among other things, NYSDEC's findings confirm that there is no effect on fish from the radionuclide releases to groundwater, and no public health concern.<sup>129</sup>
  - Riverkeeper also commissioned its own study of Hudson River shellfish and sediment to assess the long-term environmental impacts from Indian Point radiological releases and found that radionuclides in shellfish and sediment were below detection levels and not elevated, respectively.<sup>130</sup>

For all these reasons, the NRC appropriately concluded in the Final Supplemental Environmental Impact Statement ("FSEIS") for IPEC license renewal that that human health, groundwater quality, and the Hudson River ecosystem impacts have been and will continue to be SMALL, as defined in NRC regulations, *i.e.*, impacts are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.<sup>131</sup> Likewise, the NRC Staff's expert witnesses concluded that the SFP leaks "do not have a significant environmental

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<sup>127</sup> See Indian Point Nuclear Generating Units 1 & 2 - NRC Inspection Report Nos. 05000003/200710, 05000247/2007010 at vi to viii (May 13, 2008), *available at* ADAMS Accession No. ML081340425; Entergy Spent Fuel Pool Testimony at 78-80 (A112).

<sup>128</sup> See Entergy Spent Fuel Pool Testimony at 82 (A114-15); IPEC FSEIS at 2-112; NYSDEC 2007 Community Fact Sheet (Sept. 2007), *available at* ADAMS Accession No. ML12089A648; NYSDEC Strontium Study.

<sup>129</sup> See NYSDEC 2007 Community Fact Sheet at 1.

<sup>130</sup> See E-mail from C. J. Gobler, Ph.D., Stony Brook Univ., to S. Cullen, Riverkeeper (Aug. 17, 2007), *available at* ADAMS Accession No. ML12089A672; Study of Hudson River Finfish, Shellfish and Sediment to Assess the Long-term Environmental Impacts of Liquid Radiological Releases from Indian Point on the Hudson River Biota, *available at* ADAMS Accession No. ML12090A527; E-mail from C. J. Gobler, Stony Brook Univ., to P. Musegaas, Riverkeeper, "RE: IP Sampling" (July 10, 2008), *available at* ADAMS Accession No. ML12089A678.

<sup>131</sup> See IPEC FSEIS at 2-113 to 2-114.

impact and are unlikely to have a significant environmental impact if the IPEC licenses are renewed.”<sup>132</sup>

This experience fully supports and confirms the NRC’s conclusion that: “based on the low probability of a leak with sufficient quantity and duration to reach offsite locations, the detection and monitoring mechanisms available to licensees and the NRC, and the hydrologic characteristics at typical SFP sites, the NRC concludes that the radiological impacts to groundwater quality resulting from a SFP leak during short-term timeframe would be SMALL.”<sup>133</sup>

#### **H. The NRC Staff’s Analysis of SFP Fires Is Fully Applicable to Entergy’s Storage of Spent Fuel**

DGEIS Appendix F examines the environmental impacts of postulated SFP fires during the short-term storage timeframe, and concludes that the environmental impacts from SFP fires are SMALL. The DGEIS only looks at the short-term timeframe because it assumes that all spent fuel will be moved out of the pools by the end of that timeframe.<sup>134</sup> Appendix F concludes that “the probability-weighted impacts, or risk, from a spent fuel pool fire for the short-term storage timeframe are SMALL because, while the consequences from a spent fuel pool fire could be significant and destabilizing, the probability of such an event is extremely remote.”<sup>135</sup>

The conclusions in the DGEIS Appendix F analysis apply to Entergy’s nuclear plants, including IPEC.<sup>136</sup> For example, the DGEIS Appendix F analysis relies on a number of existing NRC reports, including WASH-1400, NUREG-1353, and NUREG-1738.<sup>137</sup> Additionally, the NRC’s analysis of SFP fires includes significant conservatisms, many of which are specifically identified in the DGEIS. Some of these conservatisms include:

- **Recent Mitigation Improvements:** In general, since the NRC completed the NUREG-1738 study in 2001, it has issued numerous regulations and orders that further reduce the likelihood of an already-unlikely SFP fire. These additional reductions in the likelihood of an SFP fire mean that the risks are lower now than those NRC reported in its 2001 study. Further, no new information has emerged that would cause the NRC to question the results of this study.<sup>138</sup> Some examples of this include:

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<sup>132</sup> NRC Staff Testimony of Stephen P. Klementowicz and James D. Noggle Concerning Contention Riverkeeper EC-3/Clearwater EC-1 (Spent Fuel Pool Leaks) at 55 (A40) (Mar. 30, 2012), *available at* ADAMS Accession No. ML12090A894.

<sup>133</sup> DGEIS at E-16 to E-17.

<sup>134</sup> *Id.* at F-1 n.1.

<sup>135</sup> *Id.* at F-1.

<sup>136</sup> There appears to be a typographical error on page F-2 of the DGEIS. The reference to “radioactive heat transfer” should be either “radiation” or “radiative” heat transfer.

<sup>137</sup> DGEIS at F-15.

<sup>138</sup> *Id.* at F-3, F-12.



- **Security improvements:** After the September 2001 terrorist attacks, the NRC issued orders to licensees to implement additional security measures, including increased patrols, augmented security forces and capabilities, and more restrictive site-access controls to reduce the likelihood of an accident, including those that might induce a SFP fire accident, resulting from a terrorist-initiated event.<sup>139</sup>
- **Mitigation Measures:** Also after the September 2001 terrorist attacks, the NRC issued orders to licenses that required site specific assessment of SFP vulnerabilities and required the implementation of additional mitigation strategies that can be effective in maintaining SFP cooling in the event of pool draining and pool water is reduced or lost entirely. NEI has published these generic strategies for SFP cooling in NEI-06-12, Rev. 2, and this has been endorsed by the NRC. The NRC has since codified these requirements for licensees to implement mitigating measures to maintain or restore SFP cooling capability in the event of loss of large areas of the plant due to fires or explosions, which further decreases the probability of a SFP fire.<sup>140</sup>
- **Post-Fukushima Measures:** In Order EA-12-049, the NRC required licensees to implement mitigating strategies to ensure that SFP cooling can be accomplished through alternative means to prevent fuel damage. In addition, in Order EA-12-051, the NRC determined that commercial power reactor licensees must have a reliable means to remotely monitor a wide range of SFP levels to support effective prioritization of event mitigation and recovery actions in the event of a beyond-design-basis external event.<sup>141</sup>
- **Fuel Uncovery Time:** NUREG-1738 assumed that the zirconium fuel cladding would start to burn and was nonrecoverable as soon as the water level in the SFP fell to within 0.9 m (3 ft) of the top of the fuel assemblies. However, a 2008 analysis showed that there would be significant time between the initiating event and the spent fuel assemblies becoming partially or completely uncovered. Thus, more time would be available for operator intervention, which would lower the probability of a drain-down event leading to a SFP fire.<sup>142</sup>
- **Decay Time and Discharge Time from Reactor:** As the fuel continues to age after reactor shutdown, it will become less hazardous due to radioactive decay and the reduction of the heat generated by the spent fuel.<sup>143</sup> NUREG-1738 concluded that it

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<sup>139</sup> *Id.* at F-11.

<sup>140</sup> *Id.* (citing 58 Fed. Reg. at 13,926). The *Federal Register* citation in the GEIS appears to be incorrect; the correct reference appears to be: Final Rule, Power Reactor Security Requirements, 74 Fed. Reg. 13,926, 13,955 (Mar. 27, 2009).

<sup>141</sup> DGEIS at F-12.

<sup>142</sup> *See id.* at F-10 to F-11 (citing The Attorney General of Commonwealth of Massachusetts, The Attorney General of California; Denial of Petitions for Rulemaking, 73 Fed. Reg. 46,204 (Aug. 8, 2008) (“Rulemaking Denial”).

<sup>143</sup> DGEIS at F-8 to F-9.

would take more than four days for a pressurized water reactor SFP and more than six days for a boiling water reactor (assuming a 60-day decay time for the fuel) for the water to reach within 0.9 m (3 ft.) of the top of the fuel assemblies due to heating, boiling, and evaporation of the SFP water. However, if a two-year decay time for the spent nuclear fuel were assumed, then the time for the water to reach within 0.9 m (3 ft.) of the top of the fuel assemblies would be more than 11 days for a pressurized water reactor and more than 14 days for a boiling water reactor. This provides additional time to take mitigating action to prevent a SFP fire.<sup>144</sup>

- **Decay Time and Likelihood of a SFP Fire over the Duration of the 60-year Short-Term Period:** The likelihood, extent, and therefore the release magnitude associated with a SFP fire decreases dramatically over the initial years of the 60-year short term period. NUREG-1738 notes that fire propagation is expected to be limited to less than two full cores within one year following plant shutdown. This reduction in the amount of fuel participating in the zirconium fire is due to the lower heat generation rate associated with the fuel assemblies as radioactive decay continues throughout the 60-year period. Spent fuel is generally able to be removed from SFPs for dry storage following a 5-year wet storage period, demonstrating the reduced cooling requirements as a function of time. The risk of a SFP fire by year 10 of the 60-year period would be expected to be very small, and any associated consequences considerably smaller than that represented by NUREG-1738.
  - The NRC has also concluded that air-cooling of spent fuel would be sufficient to prevent SFP zirconium fires at a point much earlier following fuel offload from the reactor than was considered in the NUREG-1738.<sup>145</sup>
- **Fukushima Evidence:** Finally, as the DGEIS notes, the Fukushima event led to a substantial release of radioactive material, but the fuel stored in the SFPs was not uncovered and the event did not lead to a SFP fire. Information on the event indicates that SFP cooling was lost for all SFPs following the loss of offsite power. However, subsequent analyses and inspections confirmed that the SFP water levels did not drop below the top of the fuel in any of the SFPs and no significant damage occurred to the fuel in the pools. These events demonstrate that, even without spent fuel cooling for multiple days, the pools were able to maintain cooling.<sup>146</sup>

Entergy agrees with the conclusions in the DGEIS and is in compliance or currently addressing the NRC's various orders and requests, including those related to the Fukushima event. For these reasons, and for the additional reasons stated in Section IV.C, below, the conclusions in Appendix F regarding SFP fires are fully applicable to Entergy's plants, and demonstrate that environmental impacts of SFP fires during the short-term storage timeframe are SMALL.<sup>147</sup>

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<sup>144</sup> See *id.* at F-11.

<sup>145</sup> See *id.* at F-11 (citing Rulemaking Denial, 73 Fed. Reg. at 46,204).

<sup>146</sup> DGEIS at F-12.

<sup>147</sup> Entergy also agrees with NEI's comment that the NRC should update DGEIS Appendix F to reference the NRC's recent SFP "Consequence Study." Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a US Mark I Boiling Water Reactor (June 2013), *available at* ADAMS

Although the DGEIS already discusses the conservative nature of the SFP fires analysis, Entergy requests that the NRC further highlight the significant conservatisms in that analysis that are discussed above to further support the SMALL impacts from SFP fires.

#### **IV. The Various Concerns Stated by Opponents of the IPEC License Renewal About Continued Spent Fuel Storage at the Site Lack Factual and Technical Merit**

This section demonstrates that the issues raised by members of the public, including parties to the IPEC license renewal proceeding,<sup>148</sup> regarding the continued storage of spent fuel at IPEC during the scoping period, during the October 30 public meeting, and in other fora, are either already addressed by the DGEIS or are not applicable to IPEC. This section demonstrates that the DGEIS generic conclusions are applicable to IPEC, such that no additional site-specific analysis is necessary to evaluate the environmental impacts of long-term storage of SNF at IPEC.

##### **A. Entergy Has Sufficient Spent Fuel Storage Capacity and an Acceptable Spent Fuel Management Plan**

New York has alleged that Entergy has no current plans to construct an additional dry cask storage area, even though Entergy estimates that by the end of operation under a 20-year extension of the current operating licenses, existing dry cask storage area and IP2 and IP3 SFPs would be filled to capacity.<sup>149</sup>

In its October 30, 2013 comments on Entergy's Coastal Zone Management Act ("CZMA") consistency certification, Riverkeeper claimed that even though "Entergy can feasibly construct additional dry casks and store more spent fuel in such casks, Entergy instead chooses to pack the pools in a highly dense fashion to get as much spent fuel into them as possible."<sup>150</sup>

##### Entergy's Response

Contrary to New York's claim, and as noted in Section III.D, the IPEC Programs for Maintenance of Irradiated Fuel, submitted in compliance with 10 C.F.R. §§ 50.54(bb) and 50.75(f)(3), show that Entergy has plans to move all spent fuel to an ISFSI (either the existing

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Accession No. ML13256A342. As concluded in that study, "spent fuel is only susceptible to a radiological release within a few months after the fuel is moved from the reactor into the spent fuel pool." *Id.* at vii.

<sup>148</sup> The parties to that proceeding include the State of New York ("New York"), Riverkeeper, Inc. ("Riverkeeper"), and Hudson River Sloop Clearwater, Inc. ("Clearwater").

<sup>149</sup> See Presentation of the State of New York: Storage of Spent Nuclear Fuel & Waste Confidence Rulemaking at 11 (Nov. 14, 2012) ("NYS Comments on WC Scoping"), available at ADAMS Accession No. ML12334A382; State of New York, Riverkeeper, Inc., and Hudson River Sloop Clearwater's Joint Contention NYS-39/RK-EC-9/CW-EC- 10 Concerning the On-Site Storage of Nuclear Waste at Indian Point, ¶ 32 (Jul. 8, 2012), available at ADAMS Accession No. ML12190A002.

<sup>150</sup> Comments of Riverkeeper, Inc. on NYS DOS Public Notice F-2012-1028 – Application of Entergy for Coastal Consistency Certification for the Proposed Relicensing of Indian Point, Encl. at 43 (Oct. 30, 2013) ("Riverkeeper CZM Comments"), available at <http://www.riverkeeper.org/wp-content/uploads/2013/10/2013.10.30.Riverkeeper-Comments-on-NYSDOS-Public-Notice-F-2012-1028-Indian-Point-Coastal-Consistency.pdf> (last visited Dec. 17, 2013).

ISFSI or a new ISFSI) after the cessation of operations.<sup>151</sup> Thus, the assumption in the DGEIS that all spent fuel has been transferred from the SFP to an ISFSI by the end of the short-term timeframe (*i.e.*, by 60 years after the end of licensed reactor operating life) is reasonable and applies to IPEC. The NRC Staff has reviewed and preliminarily approved the IPEC Irradiated Fuel Maintenance Programs, as reflected in its associated safety evaluations.<sup>152</sup>

Entergy's Irradiated Fuel Maintenance Program reports also show that IPEC has adequate current and planned spent fuel storage capacity.<sup>153</sup> This is confirmed in the NRC's safety evaluation for IP3,<sup>154</sup> and in the 2008 IPEC Independent Safety Evaluation.<sup>155</sup> If the operating licenses are renewed (and assuming the SNF is not removed off-site), then Entergy will need to license and construct an additional pad as an extension of the existing ISFSI.<sup>156</sup>

The claim that the current SFP configurations at IPEC are unsafe also lacks foundation. The NRC has reviewed and approved, via license amendments, the total capacity of the IPEC SFPs and the specific configurations used.<sup>157</sup> Entergy abides by the requirements established by its licenses, thereby ensuring the safety of the SFPs.

Finally, as discussed in Section II.C above, the 2013 Proposed Rule and DGEIS fully address New York's previously-stated concerns about the lack of environmental impact findings beyond 60 years after plant shutdown. The DGEIS analyzes, in a bounding fashion, the impacts of three timeframes that represent various scenarios for the length of continued SNF storage that may be required.

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<sup>151</sup> See IP2 IFMP; IP3 IFMP. This evidence contradicts the statements of Riverkeeper's representative that "I've never heard Entergy commit to removing all the waste from the pools and there's no sign that they will do so in those 60 years." Tarrytown Meeting Transcript at 33 (Musegaas).

<sup>152</sup> See Indian Point Nuclear Generating Unit Nos. 1 and 2 – Safety Evaluation re: Spent Fuel Management Program and Preliminary Decommissioning Cost Estimate (Mar. 17, 2010), *available at* ADAMS Accession No. ML100280544; Indian Point Nuclear Generating Unit No. 3 – Safety Evaluation re: Spent Fuel Management Program and Preliminary Decommissioning Cost Estimate (June 22, 2011) ("NRC IP3 Safety Evaluation"), *available at* ADAMS Accession No. ML12088A310.

<sup>153</sup> See NL-10-123, Att. 2 at 3 ("The decommissioning scenario assumes that the existing ISFSI will need to be supplemented with capacity from a new ISFSI to accommodate the spent fuel remaining in the IP-3 pool at shutdown.")

<sup>154</sup> See NRC IP3 Safety Evaluation, Encl. at 4. ("A second ISFSI will be required and is included as part of the \$121.11 million direct cost."); see also Entergy Letter NL-11-029, "Response to Request for Additional Information Regarding the Review of the Spent Fuel Management Program and the Preliminary Decommissioning Cost Estimate," Attach. 1 at 3 (Apr. 1, 2011) (explaining that the costs for ISFSI expansion and IP3 spent fuel transfer and maintenance are included in Entergy's estimates), *available at* ADAMS Accession No. ML111020400.

<sup>155</sup> See Indian Point Independent Safety Evaluation (ISE) at 122 (July 30, 2008), *available at* ADAMS Accession No. ML12089A664.

<sup>156</sup> See *id.*

<sup>157</sup> See, *e.g.*, Letter from D. Brinkman, NRC, to S. Bram, Consolidated Edison Co. of NY, Issuance of Amendment (Apr. 19, 1990), *available at* ADAMS Accession No. ML003778320; Letter from J. Neighbors, NRC, to J. Brons, Power Auth. of State of NY, Issuance of Amendment (Oct. 12, 1989), *available at* ADAMS Accession No. ML003778816.

In summary, the public record fully addresses New York's and Riverkeeper's concerns regarding the spent fuel storage capacity at IPEC and Entergy's overall plans for managing spent fuel.

**B. Entergy Has Fully Investigated and Addressed Prior SFP Leaks at the IPEC Site, Such that the DGEIS Conclusions on SFP Leaks Apply to IPEC**

Riverkeeper and Clearwater have claimed that the site-specific experience of leaks at Indian Point shows that there will be significant impacts on human health, groundwater quality, and ecological resources.<sup>158</sup> Such claims were the subject of an admitted contention on which the parties to the Indian Point license renewal proceeding submitted pre-filed written testimony, but the ASLB subsequently approved the same parties' settlement of the contention and dismissed it.<sup>159</sup>

In its October 30, 2013 comments on Entergy's CZMA consistency certification, Riverkeeper reiterated many of its prior claims with respect to the alleged environmental impacts of SFP leaks at IPEC, despite its decision last year not to pursue its related license renewal contention at hearing. Broadly speaking, Riverkeeper alleges that there is extensive and persistent contamination of the groundwater beneath Indian Point and surface waters of the Hudson River.<sup>160</sup>

Similarly, New York has stated in public comments that radionuclides from Indian Point's SFPs have contaminated groundwater at the site and reached the Hudson River, and that the contamination has exceeded national drinking water standards.<sup>161</sup> New York also has argued that the NRC Staff's decision to classify the impacts of *radionuclide releases to groundwater* as a site-specific issue in the revised license renewal GEIS ("LR GEIS") as an apparent admission that that *spent fuel storage impacts* cannot be evaluated on a generic basis.<sup>162</sup>

Entergy's Response

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<sup>158</sup> Consolidated Contention of Petitioners Riverkeeper, Inc. (EC-3) and Hudson River Sloop Clearwater, Inc. (EC-1)-Spent Fuel Pool Leaks at 2-4 (Aug. 21, 2008) ("Consolidated Contention"), available at ADAMS Accession No. ML082420284.

<sup>159</sup> See *Indian Point*, LBP-13-13, slip op. at 1 n.3. Notably, the DGEIS mentions the settlement agreement, which reflects Entergy's commitment to continued regular groundwater monitoring at IPEC and to sharing the resulting data with the regulator and stakeholders alike. The DGEIS states:

Licensees might perform additional site-specific monitoring and reporting, based on State or local requirements, or agreements between the licensee and other interested parties. For example, as part of its settlement of spent fuel pool issues raised by parties to the Indian Point Units 2 and 3 relicensing proceeding, the licensee committed to publish the results of groundwater monitoring at Indian Point on a quarterly basis to a publicly available website, and to conduct additional fish sampling in accordance with its monitoring plan.

DGEIS at E-6.

<sup>160</sup> See Riverkeeper CZM Comments at 45.

<sup>161</sup> See Letter from J. Sipos, NYS Office of the Attorney General, to S. Turk, NRC, "Indian Point Nuclear Generating Station, Unit 2 and Unit 3," at 21 (Mar. 28, 2012) ("Sipos Letter"), available at ADAMS Accession No. ML12090A609.

<sup>162</sup> See *id.* at 3.

Beyond the detailed generic analysis presented in the DGEIS, there is substantial additional evidence demonstrating that its conclusions specifically apply to IPEC. In particular, as explained in Section III.G, above, prior to the settlement of the contention in the IPEC license renewal proceeding, Entergy experts with substantial technical and regulatory expertise as well as familiarity with the IPEC site submitted written testimony fully refuting Riverkeeper's and Clearwater's claims regarding the alleged environmental impacts of historical SFP leaks at Indian Point.<sup>163</sup> This detailed testimony, supported by extensive documentation, confirms that the DGEIS's generic conclusions of SMALL environmental impacts from SFP leaks apply to the IPEC site.

While members of the public have made various contrary allegations, such claims do not stand up to scrutiny. For example:

- There is no “extensive and persistent contamination of the groundwater beneath Indian Point, in violation of state water quality standards,” nor is there evidence that Entergy is failing to protect groundwater resources.<sup>164</sup> On the contrary, there are no current or reasonably anticipated uses of onsite groundwater or nearby water wells for potable purposes.<sup>165</sup> Indian Point is not a drinking water provider, and no plant-related radionuclides attributable to the Indian Point leakage have affected drinking water in the vicinity of Indian Point, let alone in excess of EPA Maximum Contaminant Levels.<sup>166</sup> The NYSDEC itself has concluded that “[t]here are no known impacts to any drinking water sources [from Indian Point leaks.]”<sup>167</sup>
- There is no “extensive and persistent contamination of the groundwater beneath Indian Point which indisputably leaches into and causes impacts to the surface waters of the Hudson River.”<sup>168</sup> NYSDEC has concluded that any radionuclides reaching the Hudson River as a result of the radionuclide releases into groundwater do not violate state and federal drinking water limits.<sup>169</sup>
- While members of the public have expressed concern about the potential impacts of IPEC on the use of the Hudson River as a drinking water source,<sup>170</sup> such concerns lack basis. The proposed desalination plant on the Hudson River near IPEC will be regulated by NYSDEC.

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<sup>163</sup> See generally Entergy Spent Fuel Pool Testimony.

<sup>164</sup> Riverkeeper CZM Comments at 45-46; see also Sipos Letter at 21 (“Existing radioactive leaks at Indian Point have already far exceeded national drinking water standards.”).

<sup>165</sup> See Site Investigation Report at 13-14.

<sup>166</sup> Entergy Spent Fuel Pool Testimony at 105 (A143).

<sup>167</sup> See NYSDEC 2007 Community Fact Sheet at 1.

<sup>168</sup> Riverkeeper CZM Comments at 46.

<sup>169</sup> See Entergy Spent Fuel Pool Testimony at 83 (A115); NYSDEC 2007 Community Fact Sheet at 1.

<sup>170</sup> See, e.g., Letter from D. Madronero to A. Macfarlane, NRC Chairman, “Proposed desalination plant for drinking water near Indian Point in Rockland County NY” (June 3, 2013), available at ADAMS Accession No. ML13156A186; Hudson River Sloop Clearwater, Inc.’s Petition to File a New Contention Based Upon New Information (Mar. 19, 2009), available at ADAMS Accession No. ML090861002.

- The NRC has stated that although it is not directly regulating the proposed plant, it ensures that radiological releases to the environment by nuclear power plants are monitored, reported, and confirmed to be within regulatory limits.<sup>171</sup> In responding to such concerns, the NRC confirmed that the most recent information confirms that the total releases from IPEC did not exceed environmental background levels.<sup>172</sup> In fact, radionuclide levels in the drinking water produced by the proposed water treatment facility would be a very small fraction of the EPA’s drinking water standards, any increase in dose to the public would be minimal, and that dose would be unconnected to IP2 or IP3.<sup>173</sup>
- Contrary to New York’s claim, the NRC’s decision to classify the impacts of *radionuclide releases to groundwater during the period of a renewed operating license* as a site-specific issue in the revised license renewal GEIS (“LR GEIS”) is not an apparent admission that that *spent fuel storage impacts during the period following the licensed term of operation* cannot be evaluated on a generic basis.<sup>174</sup> The DGEIS concludes that the radiological impacts on groundwater quality from a SFP leak for the short-term timeframe (*i.e.*, between the cessation of operations and 60 years thereafter) would be SMALL.<sup>175</sup> As previously noted in Section III.G, this generic conclusion is reasonable and appropriate, and it applies to Entergy’s plants, including IPEC. In any event, there already has been a comprehensive, site-specific evaluation of the environmental impacts of radionuclide releases to groundwater at the IPEC site, and that evaluation determined that such impacts are SMALL.<sup>176</sup>

In summary, there is extensive, uncontroverted evidence in the public record to show that the DGEIS’s generic conclusions of SMALL environmental impacts from SFP leaks fully apply to the IPEC site.

**C. NRC’s Conclusions Regarding the Probability-Weighted Consequences of SFP Fires Apply to IPEC, and Further Site-Specific Analysis Is Not Required**

New York and Riverkeeper have claimed that the severe accident studies supporting the DGEIS actually show that SFP fires could be catastrophic and therefore warrant site-specific consideration.<sup>177</sup> They have also claimed that the risks that SFPs catch on fire are affected by

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<sup>171</sup> Letter from R. Beall, NRC, to D. Maldonado at 2 (July 6, 2013), *available at* ADAMS Accession No. ML13189A121.

<sup>172</sup> *See id.* at 1-2.

<sup>173</sup> *See* Entergy Spent Fuel Pool Testimony at 114-18 (A149-50).

<sup>174</sup> *See* Sipos Letter at 3.

<sup>175</sup> *See* DGEIS at 4-26.

<sup>176</sup> *See* IPEC FSEIS at 4-41 to 4-42; Entergy Spent Fuel Pool Testimony at 92 (A128).

<sup>177</sup> *See, e.g.*, Sipos Letter at 4-5; *see also* DGEIS at F-1 (acknowledging that the consequences from a spent fuel pool fire could be significant and destabilizing”).

site-specific factors, and that the consequences would be much greater at IPEC due to unique site-specific considerations (*e.g.*, larger population).<sup>178</sup>

During oral comments made during the October 30, 2013 meeting in Tarrytown, New York’s counsel signaled the State’s intent to challenge the DGEIS Appendix F comparison of the frequency-weighted consequences of a severe reactor accident and a SFP fire.<sup>179</sup> The State’s concerns apparently also include the alleged need to analyze accident consequence factors on a site-specific basis, such as surrounding population, building density, critical infrastructure, and proximity to significant surface drinking water supplies.<sup>180</sup> According to New York, either the NRC must conduct site-specific analysis of environmental impacts of a severe accident at the Indian Point SFPs or use the Indian Point site and not less populated sites as its baseline for SFP accident risk nationwide.<sup>181</sup>

### Entergy’s Response

As explained in Section III.H, above, the analysis of the environmental impacts of SFP fires in the DGEIS contains numerous conservatisms and satisfies NEPA by taking the requisite “hard look” at environmental impacts on a generic basis. As the ASLB in the Indian Point license renewal proceeding very recently explained, an “agency’s environmental analysis need only consider environmental impacts that are reasonably foreseeable, and need not consider remote and speculative scenarios.”<sup>182</sup> As the Board further reiterated:

NEPA “should be construed in the light of reason if it is not to demand” virtually infinite study and resources. Nor is an environmental impact statement intended to be a “research document,” reflecting the frontiers of scientific methodology, studies and data. . . . And while there “will always be more data that could be gathered,” agencies “must have some discretion to draw the line and move forward with decisionmaking.” In short, NEPA allows agencies “to select their own methodology as long as that methodology is reasonable.”<sup>183</sup>

The DGEIS analysis of the probability-weighted consequences of a SFP fire meets this rule of reason, reinforces prior Commission conclusions, and includes consideration of updated

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<sup>178</sup> See Corrected Proof Brief for States of New York, Vermont, Connecticut, and New Jersey, and the Prairie Island Indian Community, *New York v. NRC*, Nos. 11-1045, 11-1051, 11-1056, 11-1057, at 27 (D.C. Cir. Sept. 15, 2011) (“The risks that spent-fuel pools will leak or catch on fire are affected by site-specific factors.”) (“NYS DC Circuit Brief”), available at ADAMS Accession No. ML11262A315.

<sup>179</sup> See Tarrytown Meeting Transcript at 29 (Dean).

<sup>180</sup> See *id.*

<sup>181</sup> See *id.*

<sup>182</sup> See *Indian Point*, LBP-13-13, slip op. at 32-33 (quoting *Exelon Nuclear Tex. Holdings, L.L.C.* (Victoria County Station Site), LBP-11-15, 73 NRC 645, 690–91 (2011)).

<sup>183</sup> *Id.* at 263 (quoting *Entergy Nuclear Generation Co. & Entergy Nuclear Operations, Inc.* (Pilgrim Nuclear Power Station), CLI-10-11, 71 NRC 287, 315-16 (2010) (internal citations omitted)).



information and additional analysis. This analysis is reasonable and appropriate for IPEC for several reasons.

First, as shown in Section III.H, the analysis of SFP fires in the DGEIS shows that the probability of such an event is very low, and the probability estimates contain numerous substantial conservatisms, such that even the very low estimated probabilities are likely to be significantly overestimated. Nothing about the IPEC facility is unique in this regard, or significantly different from the reference plant used for the DGEIS analysis.

Second, as the DGEIS explains, the probability-weighted consequences of a SFP fire are generally commensurate with or less than the risks associated with severe accidents,<sup>184</sup> particularly considering the numerous significant conservatisms in the SFP evaluation described in Section III.H, above.

Third, some of the measures of probability-weighted consequences of accidents used in the DGEIS, such as the individual risk metrics listed in Table F-2, are relatively insensitive to site-specific differences in population surrounding the plant.<sup>185</sup> The Commission has established Safety Goals for these individual risk metrics, and, even considering the site-specific differences between IPEC and the Surry plant used as a reference plant in the DGEIS, the probability-weighted consequences of a SFP fire at IPEC would be small in comparison to those Safety Goals.<sup>186</sup> For the population risk metrics, which are more sensitive to site-specific population differences and for which there are no specified Safety Goals, the probability-weighted consequences of a SFP fire at IPEC would remain comparable to or less than the consequences of a severe reactor accident at the site. Given that the Commission has long concluded on a bounding, generic basis that the environmental impacts of severe accidents are SMALL for all plants,<sup>187</sup> and that the SFP risk level is generally less than that for a reactor accident,<sup>188</sup> the impacts of a postulated SFP fire at IPEC would also be small during the short-term storage timeframe. As noted above in Section III.H above, this point would especially be the case after ten years cooling time for the fuel after reactor discharge (Decay Time and Likelihood of a SFP Fire over the Duration of the 60-year Short-Term Period).

In addition, NRC and the courts have rejected prior attempts to challenge the Commission's earlier determinations that the probability-weighted environmental impacts of postulated SFP accidents are SMALL because the probability of such an event is extremely remote. The DGEIS confirms the applicability of those prior determinations to the short-term storage timeframe.

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<sup>184</sup> See DGEIS at F-8 (Table F-2), F-10.

<sup>185</sup> See DGEIS at F-6 n.4.

<sup>186</sup> See DGEIS at F-6 n.4, F-8 (Table F-2), F-10.

<sup>187</sup> 10 C.F.R. Pt. 51, Subpt. A, App. B, Tbl. B-1 (Postulated Accidents; Severe accidents); *see also Entergy Nuclear Generation Co. and Entergy Nuclear Operations, Inc.* (Pilgrim Nuclear Power Station), CLI-12-15, 75 NRC \_\_\_, slip op. at 5-6 (Jun. 7, 2012).

<sup>188</sup> See Rulemaking Denial at 46,212.

As noted in the DGEIS,<sup>189</sup> a comprehensive explanation of the basis for this determination can be found in the Commission’s denial of two rulemaking petitions filed by the Attorney General of the Commonwealth of Massachusetts and the Attorney General for the State of California, respectively, in 2006. Those petitions requested that the Commission consider purported “new and significant information” showing that the license renewal GEIS mischaracterized the impacts of spent fuel storage as insignificant, and revoke the regulations that codify this conclusion so as to exclude consideration of spent fuel storage impacts in plant-specific NEPA review documents.<sup>190</sup>

- In rejecting the petitions, the Commission examined the information relied upon by the petitioners, including, *inter alia*, NUREG-1738, the 2006 NAS Report, and a 2006 report prepared by Gordon Thompson.<sup>191</sup>
  - The Commission found that none of petitioner’s information was new and significant. Among other things, the Commission concluded that the NRC’s regulatory approach for maintaining the safety and security of power reactors, and thus SFPs, is based upon robust designs that are coupled with a strategic triad of preventive/protective systems, mitigative systems, and emergency-preparedness and response.<sup>192</sup> In addition, past NRC studies of spent fuel heatup and zirconium fire initiation conservatively did not consider certain natural heat-transfer mechanisms which would serve to limit heatup of the spent fuel assemblies and prevent a zirconium fire.<sup>193</sup>
  - Studies performed by Sandia National Laboratories indicate that there may be a significant amount of time between the initiating event (*i.e.*, the event that causes the SFP water level to drop) and the spent fuel assemblies becoming partially or completely uncovered. In addition, there is also a significant amount of time between the spent fuel becoming uncovered and the possible onset of such a zirconium fire, thereby providing a substantial opportunity for both operator and system event mitigation.<sup>194</sup>
  - The Sandia studies, which more fully account for relevant heat transfer and fluid flow mechanisms, also indicated that air-cooling of spent fuel would be sufficient to prevent SFP zirconium fires at a point much earlier following fuel offload from the reactor than previously considered (*e.g.*, in NUREG–1738). Thus, the fuel is more easily cooled, and the likelihood of an SFP fire is therefore reduced. The

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<sup>189</sup> See DGEIS at 4-85.

<sup>190</sup> Rulemaking Denial at 46,204.

<sup>191</sup> *Id.* at 46,208-10.

<sup>192</sup> See *id.* at 46,207.

<sup>193</sup> See *id.* at 46,208.

<sup>194</sup> *Id.*

2006 NAS Report reached a similar conclusion that air cooling is an effective, passive mechanism for cooling.<sup>195</sup>

- Additional mitigation strategies implemented subsequent to September 11, 2001, further enhance spent fuel coolability and the potential to recover SFP water level and cooling prior to a potential SFP zirconium fire.
- Thus, the Commission disagreed with the assertion that fuel will burn regardless of age, determined the risk of an SFP zirconium fire initiation to be very low, and, with respect to random events (*i.e.*, excluding acts of malice), found the 2006 Thompson Report relied upon by the petitioners to be speculative and overly conservative.
- In denying the states' rulemaking petition, the Commission also relied upon its decision in the proceeding on the expansion of the SFP at the Shearon Harris nuclear plant, where the ASLB found that the occurrence of a severe reactor accident causing an SFP zirconium fire "falls within the category of remote and speculative matters."<sup>196</sup> The Commission affirmed the ASLB's decision, and the U.S. Court of Appeals for D.C. Circuit upheld the Commission decision.<sup>197</sup>

In addition, Riverkeeper and other entities have relied upon a variety of discredited reports to support their claims that the NRC has underestimated the consequences of SFP fires,<sup>198</sup> and for the proposition that an intentional attack leading to a SFP fire must be evaluated.<sup>199</sup> The Commission, however, has considered and rejected the argument that its NEPA analyses must consider intentional attacks. NEPA "imposes no legal duty on the NRC to consider intentional malevolent acts . . . in conjunction with commercial power reactor license renewal applications."<sup>200</sup> The U.S. Court of Appeals for the Third Circuit affirmed these Commission findings in rejecting an appeal of the Commission's *Oyster Creek* decision,<sup>201</sup> In any event, the

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<sup>195</sup> *Id.*

<sup>196</sup> *Carolina Power Light Co.* (Shearon Harris Nuclear Power Plant), LBP-01-9, 53 NRC 239, 268 (2001).

<sup>197</sup> *Carolina Power Light Co.* (Shearon Harris Nuclear Power Plant), CLI-01-11, 53 NRC 370 (2001), *pet. for review denied, sub nom, Orange County, NC v. NRC*, 2002 WL 31098379 (D.C. Cir. 2002).

<sup>198</sup> See Riverkeeper, Inc.'s Comments on the U.S. Nuclear Regulatory Commission's Proposed Revisions to NUREG-1437, Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants at 20 (Jan. 12, 2010) (citing Exh. G, Edwin S. Lyman, Chernobyl on the Hudson? The Health & Economic Impacts of a Terrorist Attack at the Indian Point Nuclear Power Plant (Sept. 2004), *available at* ADAMS Accession No. ML12090A691), *available at* ADAMS Accession No. ML100250236.

<sup>199</sup> See New York State Notice of Intention to Participate and Petition to Intervene at 237 (Nov. 30, 2007) *available at* ADAMS Accession No. ML073400187.

<sup>200</sup> *Energys Nuclear Generation Co.* (Pilgrim Nuclear Power Station), CLI-10-14, 71 NRC 449 (2010) (citing *AmerGen Energy Co.* (Oyster Creek Nuclear Generating Station), CLI-07-8, 65 NRC 124, 129 (2007)).

<sup>201</sup> See *N.J. Dep't of Env'tl. Prot. v. NRC*, 561 F.3d 132, 136-44 (3rd Cir. 2009) (holding that the NRC was not required to consider the environmental effects of potential airborne attacks on the Oyster Creek plant in reviewing the applicant's license renewal application, including the applicant's SAMA analysis).

report by Dr. Lyman contains numerous inaccuracies and faulty assumptions that render its conclusions invalid.<sup>202</sup>

Finally, as previously noted, since the publication of the DGEIS, in October 2013 the NRC published its final report on potential seismic risks to SFPs: “Consequence Study of a Beyond-Design-Basis Earthquake Affecting the SFP for a U.S. Mark I Boiling Water Reactor.”<sup>203</sup> Seismic risks are considered to be a main contributor to potential SFP accidents.<sup>204</sup> While this report specifically studied a BWR SFP,<sup>205</sup> it refutes the claim that SFPs are generally vulnerable to seismic risks.<sup>206</sup> Specifically, as stated in the Abstract, the report concludes:

The U.S. Nuclear Regulatory Commission performed this consequence study to continue its examination of the risks and consequences of postulated spent fuel pool accidents. The study provides publicly available consequence estimates of a hypothetical spent fuel pool accident initiated by a low likelihood *seismic event* at a specific reference plant. The study compares high-density and low-density loading conditions and assesses the benefits of post 9/11 mitigation measures. Past risk studies have shown that storage of spent fuel in a high-density configuration is safe and risk of a large release due to an accident is very low. *This study’s results are consistent with earlier research conclusions that spent fuel pools are robust structures that are likely to withstand severe earthquakes without leaking.* The NRC continues to believe, based on this study and previous studies that spent fuel pools protect public health and safety. The study’s results will help inform a broader regulatory analysis of the spent fuel pools at U.S. nuclear reactors as part of the Japan Lessons-learned Tier 3 plan.<sup>207</sup>

The draft report further states that the “regulatory analysis for this study indicates that expediting movement of spent fuel from the pool does *not* provide a substantial safety enhancement for the

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<sup>202</sup> See RBR Consultants, Inc., Critique of “Chernobyl on the Hudson?” (July 6, 2008), *available at* ADAMS Accession No. ML081910460.

<sup>203</sup> Consequence Study of a Beyond-Design-Basis Earthquake Affecting the SFP for a U.S. Mark I Boiling Water Reactor (Oct. 2013) (“Consequence Study”), *available at* ADAMS Accession No. ML13256A342.

<sup>204</sup> See DGEIS at F-5.

<sup>205</sup> See Consequence Study at 4 (“A BWR plant was chosen for this analysis for a mix of reasons including . . . a perception of greater stakeholder interest in elevated (relative to grade) SFPs”).

<sup>206</sup> The Office of the Attorney General of the State of New York submitted comments on the draft study. See Letter from J. Sipos, NYS Office of the Attorney General, to C. Bladey, NRC, “State of New York Comments, Draft Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor (Aug. 1, 2013), *available at* ADAMS Accession No. ML13217A134. The authors of the study fully addressed New York’s comments and found that none of them warranted changes to the final report. See Consequence Study at E-80 to E-82.

<sup>207</sup> Consequence Study at v.

reference plant.”<sup>208</sup> This is a key point, insofar as New York has claimed that the “density and manner in which spent fuel is packed into the spent fuel pool” is an “important factor[] in evaluating the potential environmental impacts from increased spent fuel storage . . . .”<sup>209</sup>

In summary, the generic analysis of the environmental impacts of SFP fires in the DGEIS is well-supported, is conservative, satisfies NEPA, and is fully applicable to IPEC.

**D. No Severe Accident Mitigation Alternatives (“SAMA”) Analysis of SFP Accidents Is Required for License Renewal or for the Waste Confidence Rulemaking**

New York has alleged that there are gaps in the SAMA analysis required for license renewal, in that: (1) the SAMA analysis does not consider SFP accidents, but rather only accidents originating from the reactor core,<sup>210</sup> and (2) an alleged need to consider aqueous releases following a severe accident.<sup>211</sup> New York may submit comments on the DGEIS suggesting that such an analysis be undertaken as part of the waste confidence rulemaking.

Entergy’s Response

New York’s claims are invalid as a general matter and inapplicable to the waste confidence DGEIS. As a threshold matter, the SAMA analysis is separate from the waste confidence analysis. As explained in Section IV.C, above, the Commission has concluded on a generic basis that the probability-weighted environmental impacts of severe reactor accidents are SMALL for all plants.<sup>212</sup> The SAMA analysis is a specific environmental mitigation analysis that must be undertaken once in the life of a plant, to identify potentially cost-effective mitigation measures.<sup>213</sup> During the post-operational period relevant to the waste confidence rulemaking, the SAMA analysis, which considers reactor accidents, is superfluous.<sup>214</sup>

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<sup>208</sup> *Id.* at iv.

<sup>209</sup> Sipos Letter at 6.

<sup>210</sup> See NYS Comments on WC Scoping at 5; Supplemental Comments Submitted by the Office of the Attorney General of the State of New York at 5 (Mar. 5, 2012) (“NYS 2012 Supplemental Comments”), available at ADAMS Accession No. ML12068A193.

<sup>211</sup> Letter from J. Sipos, NYS Office of the Attorney General, to S. Turk, NRC, “Aqueous Releases Following Severe Accidents at Indian Point Facilities,” at 4 (Aug. 20, 2013) (“NYS Aqueous Releases Comments”) (stating that such releases “would be of particular concern at Indian Point, which sits on the Hudson River,” and would therefore have the potential to contaminate the “waters, riverbanks, riverbed and sediment, adjacent freshwater tidal wetlands, and fish and other aquatic organisms and impacts to the environment and human health could exceed the impacts flowing from the aqueous releases into the Pacific Ocean at Fukushima”), available at ADAMS Accession No. ML13239A522.

<sup>212</sup> 10 C.F.R. Pt. 51, Subpt. A, App. B, Tbl. B-1 (Postulated Accidents; Severe accidents).

<sup>213</sup> See *Exelon Generation Co., LLC* (Limerick Generating Station, Units 1 & 2), CLI-13-07, \_\_ NRC \_\_, slip op. at 13 (Oct. 31, 2013) (explaining that the regulations governing SAMA analyses “reflect our view that one SAMA analysis, as a general matter, satisfies our NEPA obligation”).

<sup>214</sup> Most plants that will enter the post-operational period in the future—including IPEC—will also have already completed the SAMA analysis.

As to the risks of a SFP fire, or the need to consider aqueous releases in a SAMA analysis, the Commission has rejected both of these claims.

First, in the 2008 rulemaking petition denial discussed in Section IV.C, above, the Commission specifically addressed the issue of whether SFP fires should be evaluated in the SAMA analysis, in response to claims from the States of Massachusetts and California. The Commission concluded as follows:

Given that the SFP risk level is less than that for a reactor accident, a SAMA that addresses SFP accidents would not be expected to have a significant impact on total risk for the site. Despite the low level of risk from fuel stored in SFPs, additional SFP mitigative measures have been implemented by licensees since September 11, 2001. These mitigative measures further reduce the risk from SFP zirconium fires, and make it even more unlikely that additional SFP safety enhancements could substantially reduce risk or be cost-beneficial.<sup>215</sup>

Similarly, there is no basis to require consideration of mitigation alternatives for a SFP fire during the short-term timeframe considered in the DGEIS, particularly given that, as explained in Section IV.C, above, the risks from a SFP fire during most of the post-operational period will be comparable to and likely lower than the risk during plant operation.

Second, on the question of whether a SAMA analysis must evaluate aqueous releases, the ASLB and Commission rejected such a proposal during the license renewal proceeding for Entergy's Pilgrim plant. Specifically, the uncontroverted expert declarations submitted by Entergy showed that the consideration of potential aqueous releases would not materially increase severe accident costs or change the conclusions of the SAMA analysis.<sup>216</sup> While this evaluation was done for the Pilgrim plant, the same principles would generally apply to the SAMA analysis done for IPEC.

**E. The IPEC Facility and Site Present No Unique Seismic Considerations Not Already Evaluated in and Bounded by the DGEIS**

New York has urged NRC “to allow seismic risks to be taken into consideration in the facility relicensing process by conducting a site-specific review of seismicity risks for spent fuel

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<sup>215</sup> Rulemaking Denial at 46,212.

<sup>216</sup> *See Pilgrim*, CLI-12-15, at 10-11, 19 (citing “Declaration of Mr. Joseph R. Lynch and Dr. Kevin R. O’Kula in Support of Entergy’s Answer Opposing Pilgrim Watch Request for Hearing on a New Contention Regarding Inadequacy of Environmental Report, Post-Fukushima,” (Dec. 13, 2011), *available at* ADAMS Accession No. ML11347A456).

pools.”<sup>217</sup> Riverkeeper has also made similar assertions regarding the alleged need to account for site-specific seismic risks at IPEC.<sup>218</sup>

### Entergy’s Response

As an initial matter, issues relevant to current operation are beyond the scope of this rulemaking. Further, the DGEIS appropriately addresses earthquake hazards in the context of wet and dry storage as well as the inherent robustness of SFPs and ISFSI on a generic basis.<sup>219</sup> As discussed in the DGEIS, the NRC identified the seismic issue as Generic Issue 199 (GI-199) and completed a limited scope screening analysis in December 2007, which culminated in the issuance of a safety/risk assessment in August 2010. “In the 2010 assessment, the NRC chose seismic core damage frequency as the appropriate risk metric to changes in the seismic hazard. For each power plant, the NRC estimated the change in seismic core damage frequency as a result of the updated seismic hazard. *This analysis confirmed that operating nuclear power plants remain safe with no need for immediate action.*”<sup>220</sup>

However, as part of this effort, the NRC identified IP3 as the plant with the largest calculated Seismic Core Damage Frequency (“SCDF”). To address this issue Entergy assembled a Seismic Review Team.

On June 26, 2013, Entergy submitted to the NRC Entergy Nuclear Engineering Report No. IP-RPT-11-00012, “Reassessment of Indian Point 3 Seismic Core Damage Frequency.”<sup>221</sup> That report, which contains a detailed discussion of site-specific seismic hazard and design consideration, demonstrates a larger plant-level seismic capacity than that used in the NRC assessment and supports removal of IP3 from further seismic evaluation screening.<sup>222</sup> Thus, any claims that there are unaddressed seismic risks at IPEC are groundless.

Further, the NRC took regulatory action after Fukushima. In March 2012, the NRC issued a request for information to all U.S. nuclear power plants asking licensees to (1) conduct walkdowns of their plants, including the SFPs, to identify and address plant-specific vulnerabilities (through their corrective action programs) and verify the adequacies of monitoring and maintenance procedures; and (2) re-evaluate the seismic hazards at the plants

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<sup>217</sup> NYS 2012 Supplemental Comments at 45; *see also* New York State Department of Environmental Conservation, Comments on the NRC Staff’s Final Supplemental Environmental Impact Statement for the License Renewal of Indian Point Units 2 and 3, Buchanan, New York at 7-8 (May 26, 2011) (asserting that the IPEC site has unique seismic risks), *available at* ADAMS Accession No. ML11159A236. .

<sup>218</sup> *See* Riverkeeper, Inc.’s Comments on the U.S. Nuclear Regulatory Commission’s Proposed Revisions to NUREG-1437, Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants at 20 (Jan. 12, 2010), *available at* ADAMS Accession No. ML100250236.

<sup>219</sup> *See generally* DGEIS Appendix B.

<sup>220</sup> *Id.* at 4-72 (emphasis added).

<sup>221</sup> Entergy Letter NL-13-084, from J. Ventosa, Entergy, to NRC, “Indian Point Nuclear Power Plant Units 2 and 3 Reassessment of the Seismic Core Damage Frequency” (June 26, 2013), *available at* ADAMS Accession No. ML13183A279.

<sup>222</sup> *See id.* at 2.

against present-day NRC requirements and guidance.<sup>223</sup> These assessments may make use of new consensus seismic hazard estimates for the power plants in the central and eastern United States developed by the DOE, EPRI, and NRC.

Entergy has conducted post-Fukushima seismic walkdowns at IPEC and provided its initial Seismic Walkdown Report to the NRC.<sup>224</sup> Entergy's initial walkdown report identified no immediate operability concerns, and all potentially adverse seismic conditions were evaluated in the corrective action program.<sup>225</sup> Additional seismic analyses remain in progress. Entergy will submit its further evaluations for IPEC when required and take any further action as required by NRC regulations.

With respect to ISFSIs, the DGEIS explains that ISFSIs are inherently robust and highly resistant to damage, and that NRC and licensee experience with ISFSIs and cask certification indicates that spent fuel can be safely and effectively stored using passive dry cask storage technology.<sup>226</sup> This evaluation applies to Entergy's plants, including IPEC. This issue is further addressed in Section III.D, above.

In summary, no site-specific seismic hazards exist at IPEC that would call into question the DGEIS's generic evaluation of seismic hazards for wet and dry storage.

#### **F. The Continued Storage of Spent Fuel at IPEC Will Not Have Adverse Impacts on Surrounding Land Uses and Property Values**

New York has also claimed, in a variety of proceedings, that the long-term storage of spent fuel will have a negative impact on local property values near IPEC, and that this issue must be evaluated on a site-specific basis.<sup>227</sup>

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<sup>223</sup> See Letter from E. Leeds, NRC, to All Power Reactor Licensees and Holder of Construction Permits in Active or Deferred Status, "Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-term Task Force Review of Insights from the Fukushima Dai-ichi Accident" (Mar. 12, 2012), *available at* ADAMS Accession No. ML12053A340.

<sup>224</sup> Letter from J. Ventosa to NRC, "Seismic Walkdown Report – Entergy's Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding the Seismic Aspects of Recommendation 2.3 of the Near-Term Task force Review of Insights from the Fukushima Dai-Ichi Accident" (Nov. 27, 2012) ("Entergy Walkdown Report"), *available at* ADAMS Accession No. ML12346A341. The report remains under NRC review, as Entergy has recently responded to a set of generic Staff requests for additional information ("RAIs") sent to numerous licensees, to determine whether there were differences in how various licensees conducted their walkdowns and performed peer reviews. See Letter from R. Beall, NRC, to Enclosed List, "Request for Additional Information Associated with Near-Term Task Force Recommendation 2.3, Seismic Walkdowns" (Nov. 1, 2013), *available at* ADAMS Accession No. ML13304B418; Entergy Letter NL-13-146, from J. Ventosa to NRC, "Supplemental Information Pursuant to 10 CFR 50.54(f) Regarding the Seismic Hazard Walkdowns Conducted to Verify Compliance with the Current Licensing [B]asis (CLB) for Seismic Requirements" (Dec. 2, 2013), *available at* ADAMS Accession No. ML133343A145.

<sup>225</sup> See Entergy Walkdown Report at 1.

<sup>226</sup> See DGEIS at B-13.

<sup>227</sup> See Comments Submitted by the Offices of the Attorneys General of the States of New York, and Vermont and the Commonwealth of Massachusetts Concerning the Nuclear Regulatory Commission's Proposed



## Entergy's Response

As a general matter, property value impacts that may occur based on a fear of spent fuel storage are not environmental impacts requiring evaluation under NEPA.<sup>228</sup> In any case, the evidence does not support New York's position that the impacts of spent fuel storage on land use must be evaluated on a site-specific basis.

Section 4.1 of the DGEIS evaluates the land use impacts of short-term storage, long-term storage, and indefinite at-reactor storage. For all three periods, the Staff concludes that land use impacts will be SMALL, primarily because relatively little or no disturbance of new land will be required for continued storage of spent fuel at reactor sites.<sup>229</sup>

Entergy's position on this issue and its responses to New York's arguments regarding the impacts of IPEC on local property values are set forth in its testimony and filings on Contention NYS-17B in the Indian Point license renewal proceeding.<sup>230</sup> That contention alleged that the FSEIS for IPEC license renewal failed to address the impact of continued operation on real estate values in the area surrounding IPEC.<sup>231</sup> The ASLB recently resolved this contention against New York and in favor of the NRC Staff and Entergy.<sup>232</sup>

Consistent with Entergy's arguments, the ASLB found that the analysis proffered by New York in support of its claim that the plant causes significant adverse impacts on property values "contains numerous flaws that render its conclusions unreliable."<sup>233</sup> The Staff's qualitative analysis of land use impacts was sufficient for NEPA purposes because an environmental impact statement is not intended to be a "research document, reflecting the frontiers of scientific

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Waste Confidence Decision Update at 36 (Feb. 6, 2009), *available at* ADAMS Accession No. ML090410559 ("off-site land impacts will now have to be considered for each plant"); NYS DC Circuit Brief at 29 ("The Indian Point spent-fuel pools are in a densely populated area and may impact property values."); New York Contention 17B at 4 (alleging that the IPEC LR "FSEIS contains no analysis of the environmental impact on adjacent land values that will be associated with the construction and long term operation of a dry cask storage facility at the Indian Point site").

<sup>228</sup> *See Metro. Edison Co. v. People Against Nuclear Energy*, 460 U.S. 766, 772-74 (1983) (holding that NEPA does not require an agency to assess every impact on a project, but only those that have a "reasonably close causal relationship" with "a change in the physical environment").

<sup>229</sup> *See* DGEIS at 4-4 to 4-6.

<sup>230</sup> *See, e.g.*, Entergy's Statement of Position on Contention NYS-17B (Property Values) (Mar. 28, 2012), *available at* ADAMS Accession No. ML12335A681; Testimony of Entergy Witnesses Donald P. Cleary, C. William Reamer, and George S. Tolley Regarding Contention NYS-17B (Property Values) (Mar. 28, 2012), *available at* ADAMS Accession No. ML12335A691; George Tolley, Property Value Effects of Indian Point License Renewal (Mar. 2012), *available at* ADAMS Accession No. ML12335A692; Entergy's Proposed Findings of Fact and Conclusions of Law for Contention NYS-17B (Property Values) (Mar. 22, 2013), *available at* ADAMS Accession No. ML13081A764.

<sup>231</sup> *See Indian Point*, LBP-13-13, slip op. at 314.

<sup>232</sup> *See id.* at 336.

<sup>233</sup> *See id.* at 324.

methodology.”<sup>234</sup> Similarly, any claim that the land use and property values impacts of continued storage of spent fuel must be evaluated quantitatively or on a site-specific basis must be rejected under NEPA.

In summary, the generic evaluation of land use impacts in the DGEIS is sufficient for all plants, including IPEC.

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<sup>234</sup> *Id.* at 335 (citations and internal quotations omitted).