

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION  
ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Ann Marshall Young, Chair  
Dr. Paul B. Abramson  
Dr. Richard F. Cole

In the Matter of:

ENTERGY NUCLEAR GENERATION  
COMPANY and ENTERGY NUCLEAR  
OPERATIONS, INC.  
(Pilgrim Nuclear Power Station)

Docket No. 50-293-LR

ASLBP No. 06-848-02-LR

December 13, 2011

MEMORANDUM AND ORDER

(Corrected Version of September 8, 2011 Memorandum and Order  
Denying Pilgrim Watch's Requests for Hearing on  
New Contentions Relating to Fukushima Accident)

In this Order and Memorandum, we address the two proposed new contentions Pilgrim Watch filed on May 12, 2011<sup>1</sup> and June 1, 2011<sup>2</sup> concerning Entergy's<sup>3</sup> application for a twenty-year extension of its operating license for the Pilgrim Nuclear Power Station (Pilgrim).<sup>4</sup> In 2006, this Board granted Pilgrim Watch's earlier petition to intervene<sup>5</sup> and admitted two contentions—Contention 1, challenging Entergy's aging management program for buried piping, and Contention 3, challenging Entergy's analysis of severe accident mitigation alternatives.<sup>6</sup> The

<sup>1</sup> Pilgrim Watch Request for Hearing on Post-Fukushima SAMA Contention (May 12, 2011) [hereinafter Fukushima Recriticality Contention].

<sup>2</sup> Pilgrim Watch Request for Hearing on a New Contention Regarding Inadequacy of Environmental Report, Post-Fukushima (June 1, 2011) [hereinafter Fukushima DTV Contention].

<sup>3</sup> The Applicant Entergy comprises two entities, Entergy Nuclear Generation Company and Entergy Nuclear Operations, Inc.

<sup>4</sup> See 71 Fed. Reg. 15,222, 15,222 (Mar. 27, 2006).

<sup>5</sup> Request for Hearing and Petition to Intervene by Pilgrim Watch (May 25, 2006) [hereinafter Petition to Intervene].

<sup>6</sup> See LBP-06-23, 64 NRC 257, 348-49 (2006).

Board closed the evidentiary record and terminated these proceedings in 2008<sup>7</sup> after dismissing Contention 3 on summary disposition<sup>8</sup> and holding an evidentiary hearing on the merits of Contention 1.<sup>9</sup> On March 26, 2010, the Commission remanded a narrow portion of Contention 3 to this Board for reconsideration in accordance with specific instructions.<sup>10</sup> The parties agreed that the remanded portion of Contention 3 could be resolved on the evidentiary record – as supplemented by their written evidentiary submissions – without an oral evidentiary hearing.<sup>11</sup> The Board heard oral argument on Contention 3<sup>12</sup> and ruled in favor of Entergy as to the remanded matter by order issued July 19, 2011 (Remanded Issue Order).<sup>13</sup>

In the time between the remand and the ruling on Contention 3, Pilgrim Watch filed requests for hearing on five new contentions and made a number of related filings.<sup>14</sup> In our

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<sup>7</sup> LBP-08-22, 68 NRC 590, 596 (2008); Board Memorandum and Order (Ruling on Pilgrim Watch Motions Regarding Testimony and Proposed Additional Evidence Relating to Pilgrim Watch Contention 1) (June 4, 2008) at 3-4 (unpublished).

<sup>8</sup> LBP-07-13, 66 NRC 131, 137 (2007).

<sup>9</sup> Tr. at 557-874.

<sup>10</sup> See CLI-10-11, 71 NRC \_\_, \_\_ (slip op. at 3) (Mar. 26, 2010).

<sup>11</sup> Joint Motion Requesting Resolution of Contention 3 Meteorological Issues on Written Submissions (Feb. 16, 2011) at 1.

<sup>12</sup> Tr. at 784-1018.

<sup>13</sup> LBP-11-18, 74 NRC \_\_, \_\_ (slip op. at 32-33) (July 19, 2011).

<sup>14</sup> The Commonwealth of Massachusetts (Commonwealth) also filed several pleadings before us and the Commission, including one new contention. On May 2, 2011, the Commonwealth moved for the Board to temporarily set aside this proceeding while the Commission considered a petition to suspend filed by the Commonwealth. Commonwealth of Massachusetts Motion to Hold Licensing Decision in Abeyance Pending Commission Decision Whether to Suspend the Pilgrim Proceeding to Review the Lessons of the Fukushima Accident (May 2, 2011). On June 2, 2011, the Commonwealth filed a hearing request for a new contention challenging the Entergy SAMA analysis because of asserted new information regarding both Spent Fuel Pool (SFP) accidents and severe accident probabilities based upon the events at Fukushima. Commonwealth of Massachusetts' Contention Regarding New and Significant Information Revealed by the Fukushima Radiological Accident (June 2, 2011) at 5-8; see also Commonwealth of Massachusetts' Motion to Admit Contention and, If Necessary, to Reopen Record Regarding New and Significant Information Revealed By Fukushima Accident ) (June 2, 2011) at 1. Also on June 2, the Commonwealth requested waiver of our regulations providing that SFP issues are outside the scope of a license renewal proceeding such as this. Commonwealth of Massachusetts' Petition for Waiver of 10 C.F.R. Part 51 Subpart A, Appendix B or, in the Alternative, Petition for Rulemaking to Rescind Regulations Excluding Consideration (continued . . .)

Order dated August 11, 2011 (Pre-Fukushima Order), we ruled in favor of Entergy as to three proposed new contentions that Pilgrim Watch filed prior to the accident at Fukushima.<sup>15</sup> We herein deny admission to the two proposed new contentions that Pilgrim Watch filed after the accident.

**I. PERTINENT BACKGROUND**

The general history of this proceeding is thoroughly discussed in our Remanded Issue Order and in our Pre-Fukushima Order, and we do not repeat that discussion here. As to Fukushima-related pleadings and contentions, after the oral argument, on March 12 and 28, 2011, Pilgrim Watch submitted two filings arguing that we should consider concerns related to the recent events at the Fukushima Nuclear Power Plants in Japan in connection with the matters then currently pending before us.<sup>16</sup> Neither of those two filings stated a new contention.<sup>17</sup> In the second of those filings Pilgrim Watch argued that the events in question constituted relevant new information of which we should take judicial notice,<sup>18</sup> and that we should, on the same basis, accept the three new contentions addressed in our Pre-Fukushima Order, require further analysis of the Pilgrim SAMA analysis, and delay any decision on the License Renewal Application “until NRC has evaluated the lessons learned from Fukushima to

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(. . . continued)

of Spent Fuel Storage Impacts From License Renewal Environmental Review (June 2, 2011). Most recently, the Commonwealth moved to supplement its proposed new contention to address an NRC task force report on Fukushima. Commonwealth of Massachusetts Motion to Supplement Bases to Commonwealth Contention to Address NRC Task Force Report on Lessons Learned from the Radiological Accident at Fukushima (Aug. 11, 2011) at 1-2 (citing Dr. Charles Miller et al., Recommendations for Enhancing Reactor Safety in the 21st Century, The Near-Term Task Force Review of Insight from the Fukushima Dai-Ichi Accident (July 12, 2011) (ADAMS Accession No. 111861807) [hereinafter Near-Term Task Force Report]). We will address matters relating to the Commonwealth in a future order.

<sup>15</sup> LBP-11-20, 74 NRC \_\_, \_\_ (slip op. at 2-3) (Aug. 11, 2011).

<sup>16</sup> Pilgrim Watch Memorandum Regarding Fukushima (Mar. 12, 2011) at 1 [hereinafter Fukushima Memo I]; Pilgrim Watch Post-Hearing Memorandum (Mar. 28, 2011) at 1 [hereinafter Fukushima Memo II].

<sup>17</sup> Fukushima Memo I; Fukushima Memo II.

<sup>18</sup> Fukushima Memo II at 1.

be assured that the Aging Management Programs for Pilgrim are appropriate.”<sup>19</sup> Attached to that latter filing was an editorial from the Boston Globe newspaper, urging among other things that “a badly needed reappraisal of nuclear energy safety in the United States” should “start with [the] Pilgrim nuclear station in Plymouth,” including revisiting “concerns about the aging cables at Pilgrim and the plant’s security.”<sup>20</sup> NRC Staff and Entergy opposed those filings.<sup>21</sup> Our colleague discussed, briefly, in her Dissent to our Pre-Fukushima Order, her views regarding the Fukushima-related information submitted in regards to that Order,<sup>22</sup> views which we now address in connection with all of the Fukushima-related information in this Order.

As mentioned above, Pilgrim Watch filed two Fukushima-related proposed new contentions on May 12, 2011 (Fukushima Recriticality Contention) and June 1, 2011 (Fukushima DTV Contention). Entergy and the NRC Staff filed answers to the Fukushima Recriticality Contention on June 6, 2011<sup>23</sup> and to the Fukushima DTV Contention on June 27, 2011.<sup>24</sup> Pilgrim Watch filed replies regarding the Fukushima Recriticality Contention on June

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<sup>19</sup> Id. at 3.

<sup>20</sup> Id., Att. 1, At Pilgrim, NRC must address fuel rods, cables, safety plan, Boston Globe, Mar. 27, 2011 (emphasis omitted).

<sup>21</sup> Entergy’s Reply to Pilgrim Watch Post-Hearing Memorandum (Apr. 7, 2011) at 1; NRC Staff’s Response to Pilgrim Watch Post-Hearing Memorandum (Apr. 7, 2011) at 1; Entergy’s Objection to Pilgrim Watch’s Post-Hearing Memoranda and Other Unauthorized Filings (Apr. 22, 2011) at 1.

<sup>22</sup> Separate Statement of Administrative Judge Ann Marshall Young, LBP-11-18, 74 NRC \_\_\_, \_\_ (slip op. at 3-4) (July 19, 2011).

<sup>23</sup> Entergy’s Answer Opposing Pilgrim Watch Request for Hearing on Post-Fukushima SAMA Contention (June 6, 2011) [hereinafter Entergy Answer to Fukushima Recriticality Contention]; NRC Staff’s Answer in Opposition to Pilgrim Watch’s Request for Hearing on Post[-]Fukushima SAMA Contention (June 6, 2011) [hereinafter NRC Staff Answer to Fukushima Recriticality Contention].

<sup>24</sup> Entergy’s Answer Opposing Pilgrim Watch Request for Hearing on a New Contention Regarding Inadequacy of Environmental Report, Post-Fukushima (June 27, 2011) [hereinafter Entergy Answer to Fukushima DTV Contention]; NRC Staff’s Answer in Opposition to Pilgrim Watch’s Request for Hearing on a New Contention Regarding Inadequacy of Environmental Report, Post Fukushima (June 27, 2011) [hereinafter NRC Staff Answer to Fukushima DTV Contention].

13, 2011<sup>25</sup> and regarding the Fukushima DTV Contention on July 5, 2011.<sup>26</sup> Entergy moved to strike portions of Pilgrim Watch's reply regarding the Fukushima DTV Contention on July 15, 2011,<sup>27</sup> and Pilgrim Watch responded to this motion to strike on July 18, 2011.<sup>28</sup>

On August 8, 2011, Pilgrim Watch filed a memorandum presenting excerpts from an NRC task force report on Fukushima (Near-Term Task Force Report).<sup>29</sup> Pilgrim Watch states that these excerpts are "new significant and material information relevant to [the Fukushima DTV Contention]."<sup>30</sup> We have, in reaching the decisions rendered herein, examined and considered all of the information contained in the pleadings (including that memorandum and the document to which it referred).

## II. ANALYSIS

For either of the proposed new contentions to be admitted, Pilgrim Watch must satisfy the Commission's demanding regulatory requirements for reopening the record.<sup>31</sup>

Pilgrim Watch, as with its earlier new contentions addressed in our Pre-Fukushima Order, did not file a motion to reopen with regard to either of its Fukushima-related new contentions, instead taking the position it has steadfastly maintained that no such action is required. Pilgrim Watch argues that it "does not seek to reopen anything" because it "does not

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<sup>25</sup> Pilgrim Watch Reply to Entergy's and NRC Staff's Answers to Pilgrim Watch Request for Hearing on Post[-]Fukushima SAMA Contention (June 13, 2011) [hereinafter Reply for Fukushima Recriticality Contention].

<sup>26</sup> Pilgrim Watch Reply to Entergy's and NRC Staff's Answers to Pilgrim Watch Request for Hearing on [a] New Contention Regarding Inadequacy of Environmental Report, Post Fukushima (July 5, 2011) [hereinafter Reply for Fukushima DTV Contention].

<sup>27</sup> Entergy Motion to Strike Portions of Pilgrim Watch Reply to Entergy and the NRC Staff Answers Opposing Pilgrim Watch Request for Hearing on a New Contention (July 15, 2011).

<sup>28</sup> Pilgrim Watch Reply to Entergy's Motion to Strike Portions of Pilgrim Watch Reply to Entergy and the NRC Staff Answers Opposing Pilgrim Watch's Request for Hearing on a New Contention (07/15/11) (July 18, 2011).

<sup>29</sup> Pilgrim Watch Request for Leave to Supplement Pilgrim Watch Request for Hearing on a New Contention Regarding the Inadequacy of the Environmental Report, Post-Fukushima filed June 1, 2011 (Aug. 8, 2011) at 1 (citing Near-Term Task Force Report).

<sup>30</sup> Id.

<sup>31</sup> See 10 C.F.R. § 2.326.

believe that the record in this proceeding has closed.”<sup>32</sup> Moreover, as before, it did not file the required affidavits setting forth the factual and/or technical bases for the claim that the criteria of 10 C.F.R. § 2.326(a) have been met.<sup>33</sup> Pilgrim Watch explains that the “new and significant information from the ongoing Fukushima crisis” it presented “was not part of and was not and could not have been litigated in connection with, either Contention 1 or Contention 3.”<sup>34</sup> Pilgrim

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<sup>32</sup> Reply for Fukushima Recriticality Contention at 2; accord Fukushima DTV Contention at 30 (stating Pilgrim Watch “does not seek to reopen the record” and arguing that Section 2.326 “does not apply here, for a simple reason – the record in this proceeding has not been closed” (capitalization altered)). According to Pilgrim Watch, “[t]he record in this proceeding (as contrasted with the record for Contention 1) unquestionably has not been closed.” Fukushima DTV Contention at 30.

<sup>33</sup> Pilgrim Watch’s Fukushima Recriticality Contention is accompanied by a Statement of David Chanin, which fails to address the reopening standards of § 2.326; instead Mr. Chanin merely states “I have read and reviewed the enclosed proposed contention and fully support all its statements.” Fukushima Recriticality Contention, Att., Statement of David Chanin at 21 (May 12, 2011). And, although Pilgrim Watch’s petition refers us to a document posted on the Gerson Lehrman Group website, id. at 8-9 (quoting <http://www.glggroup.com/News/TEPCO-Data-Shows-Ongoing-Criticalities-Inside-Leaking-Fukushima-Daiichi-Unit-2-53751.html?cb=1>), which, upon examination appears to have been authored by Mr. Chanin, even if the content of that document had been part of a proper affidavit from Mr. Chanin, it also fails to address any of the reopening standards. Similarly, Pilgrim Watch’s Fukushima DTV Contention is accompanied by an affidavit of Arnold Gunderson failing to address reopening standards, stating, in relevant part:

8. My declaration is intended to support Pilgrim Watch’s Request for Hearing and is specific to issues regarding the inadequacy of Pilgrim’s SAMA analysis. The SAMA does not consider new and significant issues raised at Fukushima regarding the lack of containment integrity of Pilgrim’s Mark I and demonstrated failure of the direct torus vent designed to save containment during pressure buildup.

9. I have reviewed the Request for Hearing and support its content.

10. I am qualified to testify in support of this Request for Hearing.

11. I served as an expert witness for Pilgrim Watch’s motion to intervene regarding the insufficiency of the aging management plan for buried pipes/tanks; and became familiar with Pilgrim Station’s subsurface environment and its effect on corrosion. This applies directly to Pilgrim’s buried DTV piping.

Fukushima DTV Contention, App. A, Affidavit of Arnold Gundersen ¶¶ 8-11 (June 1, 2011) [hereinafter Gundersen Affidavit].

<sup>34</sup> Reply for Fukushima Recriticality Contention at 2-3. Pilgrim Watch explicitly states that its filing is not “an attempt to show that a materially different result would be or would have been likely had the newly proffered evidence been considered initially.” Id. at 3. Pilgrim Watch clarifies that what it seeks “is a hearing on a new contention that raises an issue that was not been [sic] litigated, and could not have been litigated, as part of either Contention 1 or

Watch asserts that although “[t]he record in Contention 1 may be closed, and the scope of Contention 3 limited,” Entergy Nuclear Vermont Yankee, L.L.C. (Vermont Yankee Nuclear Power Station) provides that “the proceeding will remain open during the pendency of the remand.”<sup>35</sup> Further, Pilgrim Watch pleads that:

[T]his contention should be accepted even if the record had been closed. This Board has the duty to reopen “sua sponte . . . when [it] becomes aware, from any source, of a significant unresolved safety issue or of possible major changes in facts material to the resolution of major environmental issues.”<sup>36</sup>

However, Entergy points out, and the NRC Staff agrees, that “[t]he standards for reopening apply not only when a party is seeking to introduce new evidence on a previously admitted contention after the evidentiary record is closed, but also when a party is seeking to introduce a new contention after the record has been closed.”<sup>37</sup> Entergy also observes that Pilgrim Watch errs in “claiming that the Commission’s procedural requirements for late-filed contentions and reopening a closed record cannot be applied here because they are overridden by NEPA.”<sup>38</sup> We agree with Entergy and Staff that, as with the first three contentions discussed in our Pre-Fukushima Order, Pilgrim Watch must, as a threshold matter, meet the reopening

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Contention 3 until the events at Fukushima brought forward the MACCS2 code’s incapability to model what we now have learned is a credible accident scenario.” Id. at 3-4.

<sup>35</sup> Id. at 3 (quoting CLI-10-17, 72 NRC \_\_\_, \_\_\_ (slip op. at 10 n.37) (July 8, 2010)); accord Fukushima DTV Contention at 30 (arguing that although “[t]he evidentiary record relating to Contention 1 was . . . closed some time ago,” Pilgrim Watch “does not seek to introduce any new evidence as to Contention 1; rather it seeks to add a new, in scope, contention to the proceeding”). Pilgrim Watch provides a lengthy explanation of its theory of the regulatory requirements and its view that the present circumstances do not require reopening the record. Reply for Fukushima Recriticality Contention at 5-8.

<sup>36</sup> Fukushima DTV Contention at 31 (quoting Office of General Counsel, United States Nuclear Regulatory Commission Staff Practice and Procedure Digest, NUREG-0386, Post Hearing Matters § 4.4 at 11-12 (Digest 15 Mar. 2010) (ADAMS Accession No. 101000014)).

<sup>37</sup> Entergy Answer to Fukushima Recriticality Contention at 10 (citing 10 C.F.R. § 2.326(d) (“[a] motion to reopen which relates to a contention not previously in controversy among the parties must also satisfy the requirements for nontimely contentions in § 2.309(c)")); Entergy Answer to Fukushima DTV Contention at 10; NRC Staff Answer to Fukushima DTV Contention at 3 (“[T]he Commission’s regulations and case law clearly indicate that once the record closes, a party seeking to litigate a genuinely new issue must meet the requirements for reopening the record in 10 C.F.R. § 2.326.”).

<sup>38</sup> Entergy Answer to Fukushima DTV Contention at 10-11.

standards with respect to each of the proposed new contentions we address today for it to be admissible.<sup>39</sup>

Also, as we noted in our earlier orders, the Commission emphasized, in this proceeding, the need for affidavits to support any motion to reopen, holding that intervenors' speculation that further review of certain issues "might" change some conclusions in the final safety evaluation report did not justify restarting the hearing process.<sup>40</sup>

**A. Legal Standards Governing Motion to Reopen the Record**

We addressed in depth the standards for reopening a record in our Pre-Fukushima Order, and do not repeat that entire discussion here; rather we hereby incorporate that discussion by reference and set out only particular points.

The standards for reopening the record under 10 C.F.R. § 2.326(a) are as follows:

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

And, as we noted in our previous rulings, a motion to reopen must be "accompanied by affidavits that set forth the factual and/or technical bases for the movant's claim that the criteria of paragraph (a) of this section have been satisfied."<sup>41</sup> In such affidavits, "[e]ach of the criteria must be separately addressed, with a specific explanation of why it has been met."<sup>42</sup>

Additionally, where a motion to reopen relates to a contention not previously in controversy, section 2.326(d) requires that the motion demonstrate that the balance of the

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<sup>39</sup> See LBP-11-20, 74 NRC at \_\_\_ (slip op. at 3).

<sup>40</sup> AmerGen Energy Co., LLC (Oyster Creek Nuclear Generating Station), CLI-08-23, 68 NRC 461, 486 (2008). The CLI-08-23 order involved four NRC proceedings, including the Pilgrim proceeding.

<sup>41</sup> 10 C.F.R. § 2.326(b).

<sup>42</sup> Id.



nontimely filing factors (see 10 C.F.R. § 2.309(c)) favors granting the motion to reopen. The Section 2.309(c) factors are as follows:

- (i) Good cause, if any, for the failure to file on time;
- (ii) The nature of the requestor's/petitioner's right under the Act to be made a party to the proceeding;
- (iii) The nature and extent of the requestor's/petitioner's property, financial or other interest in the proceeding;
- (iv) The possible effect of any order that may be entered in the proceeding on the requestor's/petitioner's interest;
- (v) The availability of other means whereby the requestor's/petitioner's interest will be protected;
- (vi) The extent to which the requestor's/petitioner's interests will be represented by existing parties;
- (vii) The extent to which the requestor's/petitioner's participation will broaden the issues or delay the proceeding; and
- (viii) The extent to which the requestor's/petitioner's participation may reasonably be expected to assist in developing a sound record.

Finally, the new contention must also meet the standards for contention admissibility under 10 C.F.R. § 2.309(f)(1).

**B. Rulings on new contentions**

**1. Pilgrim Watch's May 12 Fukushima Recriticality Contention**

Pilgrim Watch's Fukushima Recriticality Contention alleges that:

The Environmental Report is inadequate post Fukushima Daiichi because Entergy's SAMA analysis ignores new and significant lessons learned regarding the possible off-site radiological and economic consequences in a severe accident.<sup>43</sup>

Pilgrim Watch asserts that "a longer [radioactive] release can cause offsite consequences that will affect cost-benefit analyses" and that "[t]he Fukushima crisis . . . shows that releases can extend into many days, weeks, and months."<sup>44</sup> Its concern, Pilgrim Watch explains, is that "[d]ata from TEPCO Unit 2 shows that its nuclear chain reaction continued to generate high levels of I-131 for over a month after scram . . . [whereas] Pilgrim's SAMA source terms have

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<sup>43</sup> Fukushima Recriticality Contention at 1.

<sup>44</sup> Id. at 3.

durations of at most 24 hours . . . , the maximum plume duration allowed by the MACCS2 code.”<sup>45</sup> Pilgrim Watch claims its views are supported by the document it refers to from the Gerson Lehrman Group website.<sup>46</sup> Pilgrim Watch concludes that this Board “has an obvious duty to re-evaluate the Applicant’s SAMA analysis on the basis on this new and significant information and the public health and safety consequences.”<sup>47</sup>

To begin with, Pilgrim Watch fails to satisfy the requirements of Section 2.326(a)(1) because it does not demonstrate that its motion is timely and fails to make the alternative demonstration that it raises an exceptionally grave issue.

Whether the information is timely in satisfaction of Section 2.326(a)(1) turns on whether there is new information, which, because of the specific questions raised by this contention, depends upon how recently the information to support new challenges respecting matters of recriticality and sustained releases from severe accidents (and the characteristics of the MACCS2 code in this regard) was raised. Pilgrim Watch asserts that the information that forms the foundation for its contention is new because the Fukushima Recriticality Contention could not be litigated “until the events at Fukushima brought forward the MACCS2 code’s incapability to model what we now have learned is a credible accident scenario.”<sup>48</sup> In this regard, however, Pilgrim Watch offers up only generalized (macroscopic) information respecting measurements of radiation; no information is offered, and nothing appears, from the record of this proceeding,

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<sup>45</sup> Id. at 1. Pilgrim Watch also asserts

The code limits the total duration of a radioactive release to no more than four (4) days, if the Applicant chooses to use four plumes occurring sequentially over a four day period. Entergy chose not to take that option and limited its analysis to a single plume having a total duration of the maximum-allowed 24 hours.

Id. at 3 (internal footnotes omitted). Further, Pilgrim Watch asserts “MACCS2 is completely unable to model the impacts of an 8-week release, with the accident at Fukushima Daachi [sic] now entering its third month with no end to the release in sight” and that “this is a generic shortcoming.” Id. at 6.

<sup>46</sup> Id. at 8-9.

<sup>47</sup> Id. at 4.

<sup>48</sup> Reply for Fukushima Recriticality Contention at 4.

to be available, that would provide any reasonably definitive information regarding what was actually going on in the reactor core, the reactor vessel or the containment as these accidents evolved. Thus, the foundation for Pilgrim Watch's assertion of timeliness is not that there is new information respecting the actual occurrence of recriticality or what went on within the reactor core, but simply that they just learned that these characteristics of a severe accident are "credible" and that they just learned that the MACCS2 code is incapable of modeling them.<sup>49</sup> Indeed Pilgrim Watch asserts that the "new and significant" information upon which this contention rests is that data at two of the Fukushima plants demonstrates ongoing

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<sup>49</sup> Our colleague finds that both of Pilgrim Watch's new contentions "meet the . . . standards . . . [of] §§ 2.326(a)(1) and (a)(2), that they be timely filed and raise significant issues." Administrative Judge Ann Marshall Young, Concurring in Part and Dissenting in Part (Sept. 8, 2011) at 1 [hereinafter Concurrence and Dissent]. While accepting the fact that "[a]s to Pilgrim Watch's May 2011 'Fukushima Recriticality' contention, . . . it appears that these issues are not themselves new," *id.* at 2, she finds that 2.326(a)(1) is satisfied because

What is new, of course, is the fact of the accident at the Fukushima Daiichi nuclear power plant in Japan, and whatever practical, "real-world" information it provides to enable improved understanding of matters that may not in themselves be new. The contentions arise out of such new, "real-world" information on the Fukushima accident. Whatever the merits of this information as to any other required criteria, the "newness" and timeliness of it is a separate matter, and this sort of reality-based information is obviously qualitatively different than predictions of accident factors, probabilities, and progressions, no matter how well-founded. The information, whatever other shortcomings it may have, is manifestly "new."

*Id.* at 2. But, as we noted, and our colleague explicitly acknowledged, the data presently available from the events at the Fukushima reactors is sparse and inconclusive. And, notwithstanding her detailed examination of the information provided by experts in the context of consideration of whether or not the challenge could withstand a motion for summary disposition, her own careful repetition in her dissent of that information makes plain that nothing is provided by Pilgrim Watch that can reasonably be considered to be new information respecting the analysis assumptions or analytical methodologies and inputs for SAMA analysis at Pilgrim. Indeed her conclusion that the challenge fails for failure to demonstrate a materially different result is or could be likely if Pilgrim Watch's assertedly new information were considered, implies that there is no explicit new Fukushima-derived information that could be utilized in any SAMA analysis (or to revise any present analysis), and Pilgrim Watch has proffered nothing to suggest any path toward any such revised analysis. Rather both Pilgrim Watch and our colleague simply plead that the reality of the releases at Fukushima (which are purely macroscopic observations without supporting microscopic data or information) must somehow be included in Pilgrim's SAMA analyses, without suggesting anything respecting how the methods of Pilgrim SAMA analyses might be altered to adapt the macroscopic observations from the Fukushima Accidents to the microscopic input, assumptions and modeling required for SAMA analysis.

recriticalities.<sup>50</sup> The NRC Staff answers that “the time to assert that the SAMA analysis was deficient was when the original contentions were filed in this matter, over five years ago.”<sup>51</sup> Similarly, Entergy answers that the MACCS2 code’s asserted inability to model releases longer than 24 hours and to model secondary criticality (recriticality) have been part of the code from the outset of this proceeding.<sup>52</sup> Entergy points out that the MACCS2 User’s Guide, which Pilgrim Watch cites to show that the code cannot model a release longer than four days, was available and examined by Pilgrim Watch at commencement of this proceeding because it was published in 1998 and was cited in Pilgrim Watch’s initial pleadings in 2006.<sup>53</sup> Entergy also points to studies published in 1975 and 1990 that analyzed the potential for recriticality.<sup>54</sup> Entergy asserts that therefore none of the information that Pilgrim Watch would have us consider to satisfy the requirements of Section 2.326(a)(1) is new.<sup>55</sup> Pilgrim Watch replies that the studies Entergy and the NRC Staff cite “refer to a potential or theoretical ‘possibility’ of re-

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<sup>50</sup> Pilgrim Watch states

[W]e know that criticality is continuing at Fukushima Units 2 and Unit 1, to a lesser extent, because of the continued high findings of I-131 reported by TEPCO. This new and significant information requires a reanalysis of Pilgrim’s SAMA, updating and correcting its assumption that there will be no continued criticality.

Fukushima Recriticality Contention at 7-8.

<sup>51</sup> NRC Staff Answer to Fukushima Recriticality Contention at 8.

<sup>52</sup> Entergy Answer to Fukushima Recriticality Contention at 11-12.

<sup>53</sup> Id. at 13 (citing D. Chanin & M.L. Young, Code Manual for MACCS2; User’s Guide, NUREG/CR-6613, Vol. 1 (May 1998) (ADAMS Accession No. ML063550020) and Petition to Intervene at 32-33). Entergy also notes that its ER summarizes the MACCS2 code analysis performed for the Pilgrim license renewal, discusses the Pilgrim SAMA analysis, and provides “the release durations for each of the 19 collapsed accident progression bins . . . considered in the SAMA analysis.” Id. (citing Entergy, License Renewal Application, Pilgrim Nuclear Power Station, Appendix E; Applicant’s Environmental Report § 4.21.5.1.3, tbl. E.1-11 (Jan. 2006) (ADAMS Accession No. ML060300029)).

<sup>54</sup> Id. at 12 (citing Reactor Safety Study: An Assessment of Accident Risks in U.S. Commercial Nuclear Power Plants, NUREG-75/014 (WASH-1400) (Oct. 1975) (ADAMS Accession No. ML083570090); Office of Nuclear Regulatory Research, Severe Accident Risks for Five U.S. Nuclear Power Plants, NUREG-1150, Vol. 1 (Dec. 1990); and Recriticality in a BWR Following a Core Damage Event, NUREG/CR-5653 (Dec. 1990)).

<sup>55</sup> Id. at 11-13.

criticality, but what is now new and significant is, it asserts, that the accidents at Fukushima show that what can really happen is ongoing releases extending into months - not only at Fukushima but also at the sister reactor Pilgrim.<sup>56</sup> But if, as our colleague states,<sup>57</sup> and Pilgrim Watch asserts,<sup>58</sup> Pilgrim Watch's expert, Mr. Chanin, is expert in SAMA analysis and the ins-and-outs of the MACCS2 computer code used for the Pilgrim SAMA analyses, he has been aware of the limitation on release durations since the inception of the code itself (which is many years before commencement of this proceeding), and it cannot be rationally asserted that the fact of the code's inability to model these longer releases is new. Moreover, the phenomena of continuing criticalities (recriticalities) and extended duration off-site radiation releases or even radiation levels in locations on-site are separate; there is no causal link between the possibility for recriticalities and the longer release times, as there could certainly be recriticalities without reactor vessel or containment failure and longer term releases without recriticalities.

Considering these two phenomena separately: first, it is plain that the shortcoming of the MACCS2 code (and therefore of the Pilgrim SAMA analysis) regarding modeling long term releases is not new, and was known at inception of this proceeding; and second, it is clear that there is nothing offered by Pilgrim Watch that supports their view that the phenomena of ongoing criticalities in a reactor core is new.<sup>59</sup> We conclude, as Entergy did, that the Fukushima Recriticality Contention, in which "Pilgrim Watch contends that the Fukushima Daiichi accident has revealed that radioactive releases can extend in duration beyond the time period assumed by the MACCS2 Code, and that a damaged reactor core can be subject to recriticality,"<sup>60</sup> which

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<sup>56</sup> Reply for Fukushima Recriticality Contention at 9 (emphasis omitted).

<sup>57</sup> Concurrence and Dissent at 12.

<sup>58</sup> Fukushima Recriticality Contention at 6.

<sup>59</sup> And we cannot ignore our colleague's repetition of portions of the expert affidavits submitted by the Parties respecting observations from the accidents at Fukushima that plainly demonstrate that it is not obvious that there were any ongoing criticalities. Concurrence and Dissent at 16-25 and 32-33.

<sup>60</sup> In the context of this contention, "recriticality" means a secondary criticality condition of the reactor core occurring after the initial shutdown. No particular condition is suggested to be the

is not contemplated by the MACCS2 Code,” regards limitations and phenomena that were widely known, and should have been known to Pilgrim Watch, at the outset of this proceeding, and “thus could have been raised long ago, rendering [it] untimely now.”<sup>61</sup>

Nonetheless, as we noted above, even where a proposed new contention is not timely, Section 3.326(a)(1) would permit its admission if it raises an exceptionally grave issue. In this respect, Entergy points out that Pilgrim Watch does not demonstrate the existence of a significant safety or environmental issue, “let alone an ‘exceptionally grave’ issue required for untimely motions to reopen.”<sup>62</sup> Entergy avers that Pilgrim Watch’s “unsupported speculation” that “a ‘fresh’ SAMA analysis taking into account continuing radiological releases and (purported) post-scrum criticality” might lead the NRC to “require additional mitigation measures” simply does not rise to the level required to raise a significant safety issue or a fortiori an exceptionally grave issue.<sup>63</sup>

The NRC Staff also argues that the Fukushima Recriticality Contention does not raise an exceptionally grave issue.<sup>64</sup> Staff asserts, that, because SAMA analysis is a cost-benefit analysis (which has no direct safety significance) and is not a direct safety analysis, it does not, and by its very nature cannot, raise any exceptionally grave issue.<sup>65</sup> Following this line of thought, Staff observes that the Commission, in this proceeding has ruled that “NRC SAMA analyses are not a substitute for, and do not represent, the NRC NEPA analysis of

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(. . . continued)

reason for that return to some critical configuration, but early studies referred to by the Parties treat it as having occurred due to disruption of the core configuration as it heated up, and reconfigured into some new critical configuration.

<sup>61</sup> Entergy Answer to Fukushima Recriticality Contention at 11. Further, as we discuss supra page 14, there is no generic causal relationship between the possibility of secondary criticalities and releases of longer duration, and there is no support for the postulate that there were secondary criticalities and the limitation respecting modeling extended releases is not new.

<sup>62</sup> Entergy Answer to Fukushima Recriticality Contention at 14.

<sup>63</sup> Id.

<sup>64</sup> NRC Staff Answer to Fukushima Recriticality Contention at 9.

<sup>65</sup> Id. at 9.

potential impacts of severe accidents.”<sup>66</sup> The NRC Staff asserts that “reference to the recent events at the Fukushima Daiichi Nuclear Plant in Japan, serious as those events are, does not establish that the contention itself raises an exceptionally grave issue.”<sup>67</sup>

We agree with Entergy and Staff that Pilgrim Watch has not shown the existence of an exceptionally grave safety or environmental issue.

Nor does Pilgrim Watch satisfy the requirement of Section 2.326(a)(2) that the Fukushima Recriticality Contention must address a significant safety or environmental issue. As Entergy points out in its answer to the Fukushima DTV Contention, the Commission has indicated that the standard for when an issue is “significant” in the context of reopening a closed record is the same as the standard for when supplementation of an EIS is required, i.e., the “new and significant information must ‘paint a “seriously different picture of the environmental landscape.’”<sup>68</sup> We agree with Entergy that this is an appropriate measure to apply to determine whether an issue raised is significant enough to satisfy the requirements of this provision. This contention contains only unsupported speculation respecting the underlying assertedly new information (recriticality); it does not “paint” any “picture of the environmental landscape,” let alone a “seriously different” one. Further, we note that severe accidents are, by their very definition, beyond the design basis of the plant and therefore, have a probability of

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<sup>66</sup> Id. at 12 (citing CLI-10-11, 71 NRC at \_\_\_ (slip op. at 37)). We agree with Staff’s observation that the NRC’s NEPA related safety and environmental impact analyses are conducted separately from its NEPA alternatives analyses, the latter of these including its SAMA analysis and the former not being required to include remote and speculative events such as severe accidents.

<sup>67</sup> Id. at 1.

<sup>68</sup> Entergy Answer to DTV Contention (quoting Private Fuel Storage, L.L.C. (Independent Spent Fuel Storage Installation), CLI-06-3, 63 NRC 19, 28 (2006)) (emphasis omitted).

occurrence of less than one in a million per year.<sup>69</sup> As our colleague recognizes,<sup>70</sup> the consequences of severe accidents are not included within the NRC's environmental impacts analyses; rather the NRC examines potential plant modifications that might be cost-effective to implement to mitigate such consequences when it performs its SAMA analyses.<sup>71</sup> And here, Pilgrim Watch challenges the results of the Pilgrim SAMA analysis by speculating that there might be other cost-effective mitigation mechanisms if its speculation respecting recriticalities were correct and those recriticalities were somehow included in the SAMA analysis through their speculated increased probabilities of longer term releases. Moreover, Pilgrim Watch offers nothing to link the events at Fukushima to the Pilgrim plant other than the similarity of their designs. We find that the Fukushima Recriticality Contention fails to implicate any alteration in the environmental impacts of the

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<sup>69</sup> See, e.g., Policy Statement on Severe Reactor Accidents Regarding Future designs and Existing Plants, 50 Fed. Reg. 32183 (Aug. 8, 1985); Nuclear Energy Institute; Denial of Petition for Rulemaking, 60 Fed. Reg. 10834 (Feb. 20, 2001) [hereinafter NEI].

Even though severe accidents have such a low probability of occurrence, the Commission declined in 2001 to determine that severe accidents are remote and speculative events and thereby excepted from the scope of the NRC's NEPA review, because it had "not yet established an agency record that severe accidents may be eliminated from NRC's NEPA reviews . . . the NRC staff ha[d] not developed the necessary basis for concluding that such occurrences are remote and speculative and thus inappropriate for NRC review under NEPA." NEI at 10839 (emphasis added). For this reason, we believe, although the Commission does not require severe accidents to be included within the design basis of a plant, it perceived a need, under NEPA, to investigate mechanisms for mitigation of such events and require their implementation if such was cost effective.

<sup>70</sup> Concurrence and Dissent at 8.

<sup>71</sup> Our colleague analogizes this situation to that analyzed by a licensing board in Calvert Cliffs. Id. at 10 (quoting Calvert Cliffs 3 Nuclear Project, LLC (Calvert Cliffs Nuclear Power Plant Unit 3), Memorandum and Order (Denying Summary Judgment of Contention 10C, Denying Amended Contention 10C, and Deferring Ruling on Contention 1) (Aug. 26, 2011) (unpublished) at 17-18). But the analogy is inapposite; the issue addressed by that licensing board regarded the question of whether or not alternatives to generation of power via a nuclear power plant should be investigated as part of the applicant's (and ultimately the Staff's) NEPA obligations to examine alternatives to the proposed action of granting the license for a nuclear power plant. The present situation involves no such obligation; it regards, as we noted, the consideration of consequences of very low probability events investigated by the NRC as part of its fulfillment of its NEPA obligations.



Pilgrim plant, and therefore fails to pass this hurdle.<sup>72</sup> Moreover, although the foregoing failure in-and-of itself causes this contention to fail to raise a significant safety or environmental issue, it also fails to do so for the reasons noted above in relation to the exceptionally grave issue criterion. Thus, we conclude that this contention does not raise a significant safety or environmental issue.

Pilgrim Watch also fails to satisfy the requirements of Section 2.326(a)(3) to demonstrate that a materially different result would have been likely had the evidence proffered in the Fukushima Recriticality Contention been considered initially. Entergy correctly argues that because Pilgrim Watch does not provide an affidavit addressing the matter, the contention fails to demonstrate that a materially different result would have been likely in this proceeding.<sup>73</sup> The NRC Staff argues, and we agree, that the bare unsupported assertions do not (and cannot) demonstrate that a materially different result would have been likely and thus will not support reopening.<sup>74</sup>

Finally, Pilgrim Watch fails to satisfy the requirements of Section 2.326(b) to provide an affidavit specifically addressing each reopening criteria. Instead of filing such an affidavit, Pilgrim Watch offers with the un-notarized "Statement of David Chanin," which merely sets forth Mr. Chanin's professional experience and states that he has "read and reviewed the enclosed

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<sup>72</sup> Our colleague summarily declares, without explanation, that this contention does paint that level of a seriously different picture of the environmental landscape. Concurrence and Dissent at 8.

<sup>73</sup> See Entergy Answer to Fukushima Recriticality Contention at 15.

<sup>74</sup> NRC Staff Answer to Fukushima Recriticality Contention at 6. Although we do not undertake any evaluation of the relative merits of the expert testimony (because, as our colleague has off pointed out, it is inappropriate at the contention admissibility stage to evaluate a battle of experts – which is to be addressed in a hearing on the merits), we note that whereas Pilgrim Watch's supporting documentation fails to provide any support for the proposition that a materially different result would be found (nothing provided by Pilgrim Watch either directly or indirectly attributable to Mr. Chanin addresses the matter), Staff proffers sworn affidavits of experts (Dr. Nathan E. Bixler and Dr. S. Tina Ghosh) who provide testimony indicating no different SAMA result could have been likely, Id. at 6, 7, and Entergy, similarly, provided sworn Declaration from Drs. Sowdon and O'Kula who testify to the same result. Entergy Answer to Fukushima Recriticality Contention at 17-21.

proposed contention and fully support[s] all its statements.”<sup>75</sup> Entergy points out that the Chanin Statement is not a sworn document, does not address Section 2.326(a), and does not demonstrate that Chanin is competent under Section 2.326(b) to address the reopening standards.<sup>76</sup> Like Entergy, the NRC Staff asserts that the Chanin Statement does not qualify as the opinion of an expert in the field of nuclear chemistry and ongoing criticality.<sup>77</sup> Staff, in addition, points out that the information excerpted from the Gerson Lehrman Group fails to meet minimal requirements for admissible evidence in this proceeding.<sup>78</sup> We find that the statement from Mr. Chanin taken together with the document referred to by Pilgrim Watch for support, apparently authored by Mr. Chanin, and found on the Gerson Lehrman Group website, evaluated in their totality and given maximum value, fail to address any of the criteria of Section 2.326(a), and therefore fail on their face to satisfy the requirements of Section 2.326(b). Thus, resolution by us is not a matter of ignoring the reality of what occurred, or considering form over substance,<sup>79</sup> but simply the result of a plain and obvious failure by Pilgrim Watch to satisfy the regulatory requirements.

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<sup>75</sup> Id., Att. Statement of David Chanin (May 12, 2011) ¶ 7. We note that the “document” to which Pilgrim Watch refers us on the Gerson Lehrman Group website appears to be authored by Mr. Chanin, but that document, as we discuss in more depth supra in note 84, also fails completely to address any of these criteria, so that if it had been incorporated by Mr. Chanin into his “Statement,” the combination would still have failed to satisfy the affidavit requirements of Section 2.326. Further, if the matter had been relevant, Mr. Chanin’s biographical information found on his website states the following as education and relevant proficiencies: “Education: 1980 B.S. in Mathematics, University of New Mexico, Computer Proficiencies: C, C++, FORTRAN 77/90/95, Java, PHP, XHTML, and UNIX scripting/sysadmin/security.” Thus, if we were to evaluate the relative merits of the supporting documentation provided by Entergy and Staff and that proffered by Pilgrim Watch (which is not necessary for our finding herein), we would agree with Entergy and Staff that we cannot accept Mr. Chanin’s statements in the document referred to by Pilgrim Watch on the Gerson Lehrman Group website, or in his Statement, as anything more than speculation by a person without relevant expertise.

<sup>76</sup> Entergy Answer to Fukushima Recriticality Contention at 9.

<sup>77</sup> NRC Staff Answer to Fukushima Recriticality Contention at 4-5.

<sup>78</sup> Id. at 4. We agree with Staff; it is appropriate to require that evidence put forth to support a motion satisfy the Commission’s admissibility standards in 10 C.F.R. § 2.337(a), which requires that it be relevant, material, and reliable, and there is no demonstration thereof in this instance.

<sup>79</sup> E.g., Concurrence and Dissent at 52.

Because Pilgrim Watch failed to meet the requirements of Section 2.326 for reopening this closed record, we rule that the Fukushima Recriticality Contention is inadmissible.

Although Pilgrim Watch's failure to satisfy Section 2.326 independently requires us to deny this request for hearing, we nonetheless consider the Fukushima Recriticality Contention under the standards of Sections 2.309(f)(1) and 2.309(c)(1).

Pilgrim Watch addresses three of the key criteria of Section 2.309(f)(1), asserting that:

(a) the contention satisfies the requirements of Section 2.309(f)(1)(iii) to be within the scope of the proceeding because it addresses a flaw in the SAMA analysis, which is a Category 2 issue.<sup>80</sup> Pilgrim Watch explains that this contention seeks compliance with NEPA<sup>81</sup> and observes that the purpose of NEPA "is to 'help public officials make decisions that are based on understanding of environmental consequences, and take decisions that protect, restore and enhance the environment'",<sup>82</sup>

(b) the contention satisfies the Section 2.309(f)(1)(iv) requirement to raise an issue material to the decision the NRC must make because:

The deficiency highlighted in this contention has enormous independent health and safety significance. Further analysis to evaluate how changes to assumptions discussed herein are likely to significantly increase offsite costs that [sic] justifies requiring Entergy to add mitigation to reduce the risk of a severe accident such as adding plant modifications, operational changes and training to increa[s]e public safety during license renewal.<sup>83</sup>

and

(c) the contention provides the alleged facts or expert support required by Section 2.309(f)(1)(v) through its reference to the Gerson Lehrman document and the Chanin Statement.<sup>84</sup>

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<sup>80</sup> Id. at 4.

<sup>81</sup> Id. at 5 (citing 10 C.F.R. § 2.309(f)(2)).

<sup>82</sup> Fukushima Recriticality Contention at 4 (quoting 40 C.F.R. § 1500.1(c) (emphasis by Pilgrim Watch omitted)).

<sup>83</sup> Id. at 5-6.

<sup>84</sup> For support for this assertion, Pilgrim Watch refers to a document from the Gerson Lehrman Group dated April 28, 2011, id. at 8, which Pilgrim Watch fails to provide, instead providing a

Entergy argues that the Fukushima Recriticality Contention “fails to meet the standards for an admissible contention because it raises issues immaterial to this proceeding, lacks specificity, lacks sufficient support, and fails to demonstrate a genuine dispute with the Pilgrim license renewal application.”<sup>85</sup> The NRC Staff agrees that the Fukushima Recriticality Contention does not satisfy Section 2.309(f)(1), arguing: “[T]he contention lacks a factual and legal basis; it is unsupported by expert opinion; and it does not raise a material issue in dispute.”<sup>86</sup> The NRC Staff argues that Pilgrim Watch “fails to meet the basis requirement” under Section 2.309(c)(1)(ii) because “it does not explain why the events at Fukushima are relevant to Pilgrim.”<sup>87</sup>

Regarding scope and materiality, Entergy observes that “Pilgrim Watch in fact appears to be arguing that Entergy must implement SAMAs in order to protect the public health and safety,” which the NRC’s license renewal rules do not require applicants to do.<sup>88</sup> Entergy argues that for this reason the Fukushima Recriticality Contention “exceeds the limited scope of

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web address. We have previously advised Pilgrim Watch that we do not accord any weight to references to articles that have not been submitted as exhibits. LBP-11-18, 74 NRC at \_\_\_ (slip op. at 28 n.126). Nevertheless, we have examined the document to which Pilgrim Watch referred and find that it seems to be an unreviewed website-posted-document from David Chanin in which he makes statements that are apparently quoted by Pilgrim Watch on pages 8 and 9 of their request for hearing on this proposed new contention. These statements are conclusory and, even if taken together with the Chanin “statement” avowing support for the statements in the pleading, fail to either address any of the Section 2.326 criteria or to provide any information that would enable us to conclude that (or even address whether) Pilgrim Watch satisfied the requirements of Section 2.326(a)(3) to demonstrate that a materially different result would have been likely had the evidence proffered in the Fukushima Recriticality Contention been considered initially. Thus even evaluating the information from the Gerson Lehrman website along with the Chanin Statement and giving it maximum value, the contention fails to satisfy the reopening requirements.

<sup>85</sup> Entergy Answer to Fukushima Recriticality Contention at 2.

<sup>86</sup> NRC Staff Answer to Fukushima Recriticality Contention at 1-2.

<sup>87</sup> Id. at 12.

<sup>88</sup> Entergy Answer to Fukushima Recriticality Contention at 27-28 (noting Pilgrim Watch’s assertion that “[t]he deficiency highlighted in this contention has enormous independent health and safety significance” and that “further analysis . . . justifies requiring Entergy to add mitigation . . . to increase public safety” (quoting Fukushima Recriticality Contention at 5-6)).

the safety review in a license renewal proceeding” under Section 2.309(f)(1)(iii)<sup>89</sup> and has not been demonstrated to be “material to the findings that the NRC must make to support license renewal” under Section 2.309(f)(1)(iv).<sup>90</sup> The NRC Staff also argues that the Fukushima Recriticality Contention does not raise a material issue.<sup>91</sup> Staff also notes that although Pilgrim Watch asserts that if the SAMA analysis addressed “releases [that] extend into days, weeks and even months, the offsite consequence will be larger, and this will affect the cost-benefit analysis,” Pilgrim Watch does not provide support for this bare assertion which, Pilgrim Watch asserts, demonstrates materiality.<sup>92</sup>

Regarding support, we agree with Entergy and the NRC Staff who argue that the Fukushima Recriticality Contention fails to satisfy the requirements of Section 2.309(f)(1)(v) because it is not supported by a concise statement of alleged fact or expert opinion.<sup>93</sup> More particularly, we agree with the NRC Staff’s argument that Pilgrim Watch’s assertion that recriticality is demonstrated by the relative quantities of radionuclides released “is not self-evident and is clearly of the class of statements that must be supported by expert opinion.”<sup>94</sup> The Staff concludes, and we agree, that neither the Gerson Lehrman Group document nor the Chanin Statement provides the requisite support respecting issues of recriticality because neither sets out credentials showing that its author is an expert on nuclear chemistry or criticality.<sup>95</sup> Additionally, we concur with Entergy’s argument that Pilgrim Watch’s vague claim that it will rely on testimony from Mr. Chanin and government documents does not provide the

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<sup>89</sup> Id. at 27.

<sup>90</sup> Id. at 28.

<sup>91</sup> NRC Staff Answer to Fukushima Recriticality Contention at 14-15.

<sup>92</sup> Id. at 6.

<sup>93</sup> Id. at 15; Entergy Answer to Fukushima Recriticality Contention at 29.

<sup>94</sup> NRC Staff Answer to Fukushima Recriticality Contention at 4 (citing Nuclear Mgmt. Co., LLC (Palisades Nuclear Plant), LBP-06-10, 63 NRC 314, 352 (2006)).

<sup>95</sup> Id. at 4-5

requisite concise statement of facts or expert opinion,<sup>96</sup> and those of both Entergy and the NRC Staff that the document posted to the Gerson Lehrman Group website is insufficient to support admission of a contention.<sup>97</sup>

Next we turn to the requirements of Section 2.309(f)(1)(vi) that the petitioner must provide sufficient information to show that a genuine dispute exists with respect to a material issue of law or fact. The NRC Staff notes that Pilgrim Watch “ignores the portions of the Pilgrim SAMA analysis that address the station blackout issues that triggered the events at Fukushima.”<sup>98</sup> We agree with Entergy’s observation that the Commission has defined a “material” issue as meaning one where “resolution of the dispute would make a difference in the outcome of the licensing proceeding.”<sup>99</sup> Entergy argues that Pilgrim Watch’s vague speculation that other SAMAs might become cost effective and its assertions that extended releases and recriticalities are possible, without indication of the size of changes in consequences that could be expected from these alterations, fails to establish that the asserted deficiencies would, if accounted for as requested by Pilgrim Watch, alter the result of the SAMA analysis.<sup>100</sup> We agree, and therefore concur with Entergy who asserts that, because it fails to show it would change the outcome of the SAMA cost-benefit balancing at issue in this portion of this proceeding, and therefore to satisfy the definition of what is material in this context, the contention fails to satisfy the requirements to show a genuine dispute with the application on a material issue.<sup>101</sup>

Finally, we note that there is absolutely nothing in front of us, in any pleading in this proceeding, nor is there anything we have found on Mr. Chanin’s website (which we understand

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<sup>96</sup> Entergy Answer to Fukushima Recriticality Contention at 29.

<sup>97</sup> Id. at 29.

<sup>98</sup> NRC Staff Answer to Fukushima Recriticality Contention at 12.

<sup>99</sup> Entergy Answer to Fukushima Recriticality Contention at 30 (quoting 54 Fed. Reg. at 33,172).

<sup>100</sup> See id. at 30-32.

<sup>101</sup> Id. at 30.

to be [www.chaninconsulting.com](http://www.chaninconsulting.com)) that can reasonably be interpreted to advise us that Mr. Chanin has any expertise in physics, reactor physics, the thermohydraulics of core disruption during a core melt accident, the modeling of core disruption phenomena, or the modeling or analysis of the physics of a core whose geometry has been disrupted, all of which are obvious requisite expertises for understanding the potential for a recriticality of a reactor core whose original geometry has been altered by the phenomena that Mr. Chanin speculates (and, perhaps TEPCO believes) has occurred. Thus we agree with Staff and Entergy that, insofar as Mr. Chanin's statements in the document referred to by Pilgrim Watch on the Gerson Lehrman Group website, or in his Statement, address matters of recriticality, we cannot accept them as anything more than speculation by a person without relevant expertise, and therefore Pilgrim Watch fails to satisfy the requirement to provide sufficient information to show that a genuine dispute exists with respect to a material issue of law or fact respecting recriticality issues.<sup>102</sup>

We agree with Entergy and Staff that the Fukushima Recriticality Contention fails to satisfy the requirements of Section 2.309(f)(1), and is therefore inadmissible. More particularly, it fails to satisfy the requirements of Sections 2.309(f)(1)(iii) and 2.309(f)(1)(iv) to demonstrate that the issue raised is within the scope of this proceeding and material to the decision the NRC must make. Additionally, the proffered contention fails to satisfy the requirements of Section 2.309(f)(1)(v) to provide a concise statement of alleged facts or expert opinions together with references to specific sources and documents,<sup>103</sup> and it fails to satisfy the requirements of Section 2.309(f)(1)(vi) to "show" that a genuine dispute exists with the licensee on a material issue of law or fact, any one of which failures is fatal to admissibility of this contention.

Finally, as to the requirements of Section 2.309(c)(1) respecting nontimely filed contentions, Pilgrim Watch asserts that all of the factors weigh in its favor.<sup>104</sup> Entergy answers

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<sup>102</sup> We note that there simply is no dispute respecting the inability of the MACCS2 code to model longer term releases.

<sup>103</sup> The combination of the Chanin Statement and the document attributed to him on the Gerson Lehrman Group website fails to provide the support required by Sections 2.309(f)(1)(v) and (vi).

<sup>104</sup> Fukushima Recriticality Contention at 14-19.

that “factors one, seven and eight – the three most significant factors – count heavily against Pilgrim Watch” and that the less important factors cannot outweigh these three.<sup>105</sup>

Regarding the first and most important factor, good cause for failing to file on time, Pilgrim Watch asserts:

The Fukushima disaster began on March 11, 2011. The information upon which this contention is based is not yet fully available. However sufficient information has been released by TEPCO to file this request.<sup>106</sup>

Entergy argues that “Pilgrim Watch has failed to demonstrate good cause for its very late-filed contention” “[f]or the same reasons that the contention is not timely under [S]ection[] 2.326(a)(1).”<sup>107</sup> Agreeing with Entergy, the NRC Staff maintains that Pilgrim Watch “has not shown good cause” because it “has failed to show that it could not have raised the contention previously.”<sup>108</sup>

Regarding the seventh factor, Entergy argues that the proposed new contention would delay the proceeding, which “has entered its sixth year, notwithstanding the Commission’s goal to complete license renewal proceedings in two and one half years.”<sup>109</sup> Entergy notes that the NRC issued the final environmental and safety review documents in 2007.<sup>110</sup> Concerning the eighth factor, Entergy argues Pilgrim Watch cannot reasonably be expected to assist in developing a sound record because it “fails to set out with any particularity the precise issues it plans to cover or what its expert testimony will address” and “nowhere identifies any witness or summarizes any witness testimony for its many assertions regarding ongoing radioactive releases and purported recriticalities.”<sup>111</sup> On these points, Pilgrim Watch argues that the

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<sup>105</sup> Entergy Answer to Fukushima Recriticality Contention at 25.

<sup>106</sup> Fukushima Recriticality Contention at 14.

<sup>107</sup> Entergy Answer to Fukushima Recriticality Contention at 23.

<sup>108</sup> NRC Staff Answer to Fukushima Recriticality Contention at 8.

<sup>109</sup> Entergy Answer to Fukushima Recriticality Contention at 24.

<sup>110</sup> Id.

<sup>111</sup> Id. at 24-25.



Fukushima Recriticality Contention will not delay the proceeding because Pilgrim Watch has not been “tardy” in responding to information about Fukushima and that its participation is necessary to develop a sound record regarding the subject of the proposed new contention.<sup>112</sup>

For the same reasons that we found the Fukushima Recriticality Contention untimely under Section 2.326(a)(1), we agree with Entergy and Staff that Pilgrim Watch fails to have the good cause required under Section 2.309(c)(1)(i). As we discussed at length above, the possibilities that there could be longer release times and extended periods of recriticalities are simply not new, and the fact of these occurrences at the Fukushima reactors, even if true, has not been linked to the possibilities for similar occurrences at Pilgrim except by the generalized claim that the reactor designs are similar.

Accordingly, we turn to examination of whether Pilgrim Watch has made the requisite compelling showing that the remaining Section 2.309(c) criteria weigh in favor of admission this non-timely contention. For the reasons expressed by Entergy,<sup>113</sup> we find they do not. Thus, we find that, in addition to being inadmissible for failure to satisfy the requirements of Sections 2.326 and inadmissible for failure to satisfy the requirements of 2.309(f)(1), this contention is also inadmissible for failure to satisfy the requirements of 2.309(c).

## **2. Pilgrim Watch’ June 1, 2011 Fukushima DTV Contention**

Pilgrim Watch’s Fukushima DTV Contention alleges that:

Based on new and significant information from Fukushima, the Environmental Report is inadequate post Fukushima Daiichi. Entergy’s SAMA analysis ignores new and significant issues raised by Fukushima regarding the probability of both containment failure, and subsequent larger off-site consequences due to failure of the direct torus vent (DTV) to operate.<sup>114</sup>

The DTV, Pilgrim Watch explains, “is designed to relieve high pressure generated during a severe accident, and to avoid containment failure/explosion.”<sup>115</sup> Pilgrim Watch asserts that

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<sup>112</sup> Fukushima Recriticality Contention at 15-19.

<sup>113</sup> Entergy Answer to Fukushima Recriticality Contention at 24-25.

<sup>114</sup> Fukushima DTV Contention at 1.

<sup>115</sup> Id. at 7.

“[p]ost Fukushima Daiichi, it plainly is necessary to redo Pilgrim’s SAMA analysis to take into account new and significant information”<sup>116</sup> “concerning the likely failure of the DTV to prevent containment failure.”<sup>117</sup> Specifically, Pilgrim Watch asserts that at Fukushima:

- (1) Properly trained operators decided not to open the DTV when they should have because they feared the effects offsite of significant unfiltered releases;
- (2) When the operators finally decided to open the DTV, they were unable to do so;
- (3) The failure of the DTV to vent led to containment failure/explosions that resulted in significant ongoing offsite consequences.<sup>118</sup>

Pilgrim Watch goes on to assert that the Pilgrim plant requires a DTV filter because the lack of such a filter at Fukushima “had significant negative unintended consequences” when use of the vents was delayed while “managers agonized over whether to resort to emergency measures that would allow a substantial amount of radioactive materials to escape into the air.”<sup>119</sup> Pilgrim Watch also asserts that Pilgrim’s SAMA analysis should require redesign of the DTV so that it is not “dependent on electric power and worker’s ability to operate critical valves because power might be cut in an emergency and workers might be incapacitated.”<sup>120</sup> Pilgrim Watch concludes that “[t]he offsite consequences of containment failure would be huge.”<sup>121</sup>

Referring to Appendix E of the LRA, Pilgrim Watch makes its sole explicit challenge to the License Renewal Application when it observes that the Applicant’s SAMA

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<sup>116</sup> Id. at 2.

<sup>117</sup> Id. at 6.

<sup>118</sup> Id.

<sup>119</sup> Id. at 8 (quoting id., Exh. 7, Hidden Dangers: Japanese Officials Ignored or Concealed Dangers, N.Y. Times, May 17, 2011).

<sup>120</sup> Id. at 12-13 (quoting id., Exh. 10, Matthew Wald, U.S. Was Warned on Vents Before Failure at Japan’s Plant, N.Y. Times, May 18, 2011)

<sup>121</sup> Id. at 24.

analyses included events wherein the DTV was not opened because the operator failed to operate it, but did not include events wherein the operator declined to operate it.<sup>122</sup>

Pilgrim Watch asserts that NEPA requires the NRC to consider this new information so that important effects will not be overlooked or underestimated and that the Board must consider the Fukushima events because they impact the quality of the environment and that we cannot rely upon Entergy's SAMA analysis which ignores that data.<sup>123</sup>

As support for its submittal and its assertions, Pilgrim Watch refers to articles in the New York Times, a blog on the Internet and a variety of articles and papers dating from the middle 1970s to the early 1980s.<sup>124</sup> Pilgrim Watch also provides the Affidavit of Arnold Gunderson, who states, in relevant part, and without addressing at all the reopening criteria of 2.326:

8. My declaration is intended to support Pilgrim Watch's Request for Hearing and is specific to issues regarding the inadequacy of Pilgrim's SAMA analysis. The SAMA does not consider new and significant issues raised at Fukushima regarding the lack of containment integrity of Pilgrim's Mark I and demonstrated failure of the direct torus vent designed to save containment during pressure buildup.

...

9. I have reviewed the Request for Hearing and support its content.

...

13. The explosions at Fukushima show that Pilgrim's DTV is unlikely to save Pilgrim's containment and huge amounts of radiation will be released. The subsequent offsite costs incurred from such an event justify additional mitigations to reduce the risk of DTV failure and loss of containment.<sup>125</sup>

Mr. Gundersen provides no technical information, provides nothing explicit regarding operator actions or operation of, and provides no information as to operability or non-operability of the DTVs either at Pilgrim or at the Fukushima plants. Nor does he provide any specific information respecting offsite consequences of severe accidents of any sort nor link anything which occurred at Fukushima to the Pilgrim Plant.

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<sup>122</sup> Id. at 23

<sup>123</sup> Id. at 3-4.

<sup>124</sup> Id. at 8-21.

<sup>125</sup> Id., app. A, Affidavit of Arnold Gundersen at 34.

Both Entergy and Staff assert that admission of this contention should be denied because, among other failures, Pilgrim Watch has not satisfied the standards for reopening a closed record.<sup>126</sup>

Entergy answers that Pilgrim Watch's request should be denied because: (a) neither the Request nor the appended Gundersen Affidavit address nor meet the standards for reopening a closed record; (b) it fails to meet the standards governing a non-timely contention; and (c) it fails to meet the standards for an admissible contention because it raises issues immaterial to this proceeding, lacks sufficient support, and fails to demonstrate a genuine dispute with the Pilgrim license renewal application.<sup>127</sup>

As to failure to satisfy the requirements of Section 2.326, Entergy argues generally that:

Pilgrim Watch's Request and claims are factually incorrect because the Pilgrim SAMA analysis is based on a site specific estimate of accident probabilities that fully takes into account pressure build-up within the containment, operator error in failing to vent the containment, failure or inoperability of the DTV itself, and catastrophic failure of the containment. Each of these topics is fully addressed in the Pilgrim SAMA analysis, and nowhere in its contention does Pilgrim Watch challenge the adequacy of the SAMA analysis of these issues. As such, Pilgrim Watch fails to meet the standards governing reopening a closed hearing record, considering a late-filed contention, and admitting a contention.<sup>128</sup>

Entergy then asserts that the contention fails to satisfy the requirements of Section 2.326 for reopening a closed record, including noting that not only did Pilgrim Watch elect not to address those criteria, but the Gundersen Affidavit fails entirely to address (as is required by Section 2.326(b)) the required elements thereof.<sup>129</sup>

Addressing the requirements of section 2.326(a)(1), Entergy asserts that this contention is untimely because it regards the buildup of containment pressure, hydrogen explosion, operator error in failure or delay in attempting to vent the containment, DTV failure or

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<sup>126</sup> Entergy Answer to Fukushima DTV Contention at 9; NRC Staff Answer to Fukushima DTV Contention at 2.

<sup>127</sup> Entergy Answer to Fukushima DTV Contention at 1-2.

<sup>128</sup> Id. at 9.

<sup>129</sup> Id. at 9-10.

inoperability, potential containment failure or breach, and resulting large offsite consequences, all of which are addressed in the original LRA SAMA analysis and therefore could (and should) have been challenged at that time (rendering such challenges untimely now).<sup>130</sup> Entergy also points out that Pilgrim Watch challenged the absence of a filtered vented containment at the outset of this proceeding and those claims were rejected.<sup>131</sup> Pilgrim Watch asserts it is new and significant information that “an unfiltered vent . . . makes operators hesitant to use the vent until perhaps too late, upping the probability of containment failure/explosion.”<sup>132</sup> Pilgrim Watch asserts that “the likelihood that the DTV simply won’t work when release is required to save the containment” is “new and significant information” because prior to Fukushima, concerns with DTV operational safety focused on preventing operator error from activating the DTV and “mistakenly releas[ing] unfiltered radiation into the environment.”<sup>133</sup> The Staff agrees with Entergy that the Fukushima DTV Contention is untimely, arguing that Pilgrim Watch’s own pleadings demonstrate that DTV issues have been discussed for decades. Staff asserts that any indication that the Fukushima accident demonstrates that DTVs are problematic does not present the sort of new information sufficient to overcome the timeliness requirements of our regulations.<sup>134</sup>

Turning to the proviso in Section 2.326(a)(1) that an untimely contention could be sufficient if it raises an exceptionally grave issue, Entergy asserts that neither Pilgrim Watch nor Mr. Gundersen have demonstrated (indeed, Mr. Gundersen did not even address the matter and Pilgrim Watch offers no support for such a proposition) that there is an “exceptionally grave” issue raised by this contention.<sup>135</sup> Further, Entergy asserts that Pilgrim Watch’s argument that

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<sup>130</sup> Id. at 13-17.

<sup>131</sup> Id. at 16.

<sup>132</sup> Fukushima DTV Contention at 21.

<sup>133</sup> Id. at 6.

<sup>134</sup> NRC Staff Answer to Fukushima DTV Contention at 8-10.

<sup>135</sup> Entergy Answer to Fukushima DTV Contention at 16-18.

redoing the SAMA analysis might result in additional SAMAs becoming cost-effective (which we construe, for this particular portion of our analysis, to also address the question of whether there is an exceptionally grave issue) is nothing more than bare speculation.<sup>136</sup>

As to the requirements of Section 2.326(a)(2) that the motion address a significant safety or environmental issue, Entergy refers us to CLI-06-03 wherein the Commission held, in the context of reopening a closed record, that “new and significant information must “paint a ‘seriously different picture of the environmental landscape,” asserting that should be the standard for when an issue is “significant” within the meaning of this regulation. Pointing to Commission precedent, Entergy avers that the bare speculative assertions of Pilgrim Watch that a reperformance of the SAMA analysis considering the phenomena raised by Pilgrim Watch might result in a requirement for additional SAMA implementation fails to satisfy this standard.<sup>137</sup> Staff agrees with Entergy that the Fukushima DTV Contention does not rise to the level of a serious safety or environmental issue which would satisfy the requirements of 10 C.F.R. § 2.326(a)(2), explaining that the issue regards a SAMA analysis which Staff’s experts characterize in their affidavits as being aimed at “further reduc[ing] the risk from a plant that ha[s] no identified safety vulnerabilities.”<sup>138</sup> Rather, it is, Staff argues, an issue that has already

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<sup>136</sup> Id. at 18-19. Entergy states that:

. . . Pilgrim Watch makes no attempt to quantify, nor makes any showing, that further accounting for DTV inoperability or the costs associated with the would-be containment failure could make any difference in the Pilgrim SAMA analysis. Similarly insufficient is Pilgrim Watch’s unsupported claim of an “increased probability of a severe accident and larger offsite consequences, both justifying additional mitigation.” Pilgrim Watch never comes forward with anything other than unsupported, bare assertions and mere speculation that significant increases in offsite consequences are possible and that the SAMA results might be different. Such bare assertions are insufficient to show an exceptionally grave issue for reopening the record.

Id. at 19 (quoting Fukushima DTV Contention at 5 and Oyster Creek, CLI-09-7, 69 N.R.C. at 287 (citing CLI-08-28, 68 N.R.C. at 674).)

<sup>137</sup> Id. at 17-18.

<sup>138</sup> NRC Staff Answer to Fukushima DTV Contention at 11 (quoting Affidavit of Dr. Nathan E. Bixler and Dr. S. Tina Ghosh in Support of the NRC Staff’s Answer in Opposition to Pilgrim Watch’s Request for Hearing on Post Fukushima SAMA Contention at 4-5 (June 6, 2011)).

been thoroughly examined and is presently being examined by the NRC Task Force on Fukushima.<sup>139</sup>

Staff argues that, contrary to Pilgrim Watch's assertion Section 2.326(a)'s third criteria does not apply because the contention does not challenge any prior result of this proceeding, this contention challenges the Staff's conclusions on which SAMAs would be cost-beneficial (which is a "prior result"), and therefore the materially different result criterion applies.<sup>140</sup> Staff reasons that "to reopen the record under 10 C.F.R. § 2.326(a), Pilgrim Watch must demonstrate that the issues raised by the New Contention would likely change the cost-benefit conclusions in the Pilgrim SAMA analysis by at least a factor of 2," but observes that Pilgrim Watch failed to produce any evidence that there would be any change in the cost-benefit weighing.<sup>141</sup> Staff reasons that Pilgrim Watch's allegations are the sort of bare assertions that the Commission has found insufficient to satisfy the reopening standards.<sup>142</sup>

With regard to Pilgrim Watch's bare assertion that it has satisfied the requirements of Section 2.326(a)(3) to demonstrate that a materially different result would be likely had this new and significant information been available to consider initially because "offsite consequences . . . would far outweigh the cost of mitigations to reduce risk of containment Failure,"<sup>143</sup> Entergy argues that the Affidavit of Mr. Gundersen fails to provide any support (let alone the specific level of support required by 2.326(b)) for that proposition.<sup>144</sup> In addition, Entergy points out, the articles to which Pilgrim Watch refers for support provide no evidentiary weight.<sup>145</sup> Entergy goes on to challenge the expertise of Mr. Gundersen in SAMA, containment failure and DTV matters,

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<sup>139</sup> Id. at 11-13.

<sup>140</sup> Id. at 3.

<sup>141</sup> Id. at 6-8.

<sup>142</sup> Id. at 8.

<sup>143</sup> Fukushima DTV Contention at 29 (citation omitted).

<sup>144</sup> Entergy Answer to Fukushima DTV Contention at 20.

<sup>145</sup> Id.

concluding that he is not an appropriate sponsor for the matters Pilgrim Watch raises in this contention.<sup>146</sup> Moreover, like Entergy, Staff asserts and explains its logic why, the contention fails to satisfy the requirements of 10 C.F.R. § 2.326(b) to be supported by an expert affidavit; asserting that Mr. Gundersen has not demonstrated expertise in the areas raised by this contention. Further, Staff asserts that Mr. Gundersen's affidavit fails to provide technical or factual support to enable this pleading to satisfy the requirements of § 2.326(a).<sup>147</sup>

As to the requirements of Sections 2.326(a) and (b), we find that Pilgrim Watch's contention is not timely because all of the information it asserts to be newly derived from the accidents at Fukushima, except, possibly their assertion that operators at Fukushima intentionally failed to operate the DTVs, regard issues respecting plant configuration, equipment, components and operations and operator performance that were analyzed in the original LRA and regard issues that have been widely recognized for many years. To the extent that Pilgrim Watch raises the possibility that the Fukushima operators intentionally decided to not open the DTVs at the proper time or the DTVs themselves did not work at Fukushima, Pilgrim Watch offers nothing to link either the asserted failure of the Fukushima DTVs to operate or the operator actions at the Fukushima plants to what might reasonably be expected of the DTVs at Pilgrim or of operators of the Pilgrim Plant as they comply with the plant procedures and their training, nor does it offer anything to support its implication that adding this possibility would alter the probability associated with DTV failure and thereby materially alter the SAMA cost-benefit analysis. This latter concern is pure speculation. Thus we do not find any "new" information in Pilgrim Watch's observations or challenges to Pilgrim in this contention. We disagree with our colleague who, despite undertaking an extensive discussion and some limited analysis of the statements of experts on the topic of DTV operation and operability, finds that the performance of the operators and plants at Fukushima demonstrate that there is new and significant (with respect to the Pilgrim license renewal application, and therefore specifically to

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<sup>146</sup> Id. at 20-22

<sup>147</sup> Id. at 13-15



the Pilgrim Plant) information.<sup>148</sup> Although our colleague observes that “Pilgrim Watch maintains that Entergy’s ‘theoretical assumption’ that the DTV would work was the ‘underpinning of its assumed probabilities in accident consequences,’” and that Pilgrim Watch asserts that the “‘new and significant issue is the likelihood that the DTV simply won’t work when release is required to save the containment,’”<sup>149</sup> the Dissent errs in its analysis; Pilgrim Watch fails to offer any new information to support that speculation and none is provided by its experts or any of the references it cites. Thus we find no foundation for our colleague’s finding that Pilgrim Watch “has shown that there are genuine disputes on material facts regarding increased probability of containment failure and large release, the role of the DTV in this, and the cost-effectiveness of upgrading the DTV.”<sup>150</sup> There is simply no substance to our colleague’s postulate that looking at the reality of what occurred leads to admissibility, because there is no supporting information, nor is there any definitive data, respecting the occurrences at the Fukushima plants, let alone any information provided that relates these possibilities to the Pilgrim Plant or its operations or operability. Contrary to our colleague’s notion that our approach to this Order elevates form over substance,<sup>151</sup> we have looked only to facts, information and data presented in this proceeding and adhered to solid principles of statutory construction. Thus, we find this contention fails to satisfy the requirements of Section 2.326(a)(1) regarding timeliness. In addition, we find, for the reasons set out by Staff and Entergy, that Pilgrim Watch has failed to raise an exceptionally grave issue, and therefore we decline to exercise the discretion granted to us in this portion of our regulations to consider this issue. We similarly find that the motion fails to address a significant safety or environmental

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<sup>148</sup> Concurrence and Dissent at 31-48.

<sup>149</sup> Id. at 34 (quoting Fukushima DTV Contention at 5-6).

<sup>150</sup> Id. at 49.

<sup>151</sup> Id. at 52.

issue as required by Section 2.326(a)(2)<sup>152</sup> and that it fails to demonstrate that a materially different result would be or would have been likely had the evidence proffered by Pilgrim Watch been considered as is required by Section 2.326(a)(3). With regard to both of these findings, we disagree with the view of our colleague that the affidavit of Mr. Gundersen provided by Pilgrim Watch “provid[es] support that is sufficient to warrant further inquiry, and sufficient to show the likelihood of a materially different result, by demonstrating a genuine dispute on material issues of fact,”<sup>153</sup> finding it to fail utterly to provide any technical support for this contention and to fail completely to address not only the foundation necessary to establish either a genuine dispute with the application on any material issue of fact or the likelihood of a different result, but also failing to address any of the relevant provisions of Section 2.326(a). Further, none of the other sources of information to which Pilgrim Watch refers provides any support whatsoever for these matters. Thus the affidavit of Mr. Gundersen, even when we consider it together with all substance of other information to which Pilgrim Watch refers, fails to satisfy the requirements of Section 2.326(b), thus depriving us of any ability to weigh the otherwise bare claims of Pilgrim Watch. There is no basis whatsoever for us to find that the requirements of Section 2.326(a) are addressed, let alone satisfied, by any of these documents.

For the foregoing reasons, we find that Pilgrim Watch’s Fukushima DTV Contention is inadmissible for failure to satisfy the requirements of Section 2.326.

As with our ruling on Pilgrim Watch’s Fukushima Recriticality Contention, although the Fukushima DTV Contention is inadmissible for the foregoing reasons, we now turn to consideration of the requirements of Sections 2.309(c) and 2.309(f)(1).

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<sup>152</sup> As we noted above respecting the Fukushima Recriticality Contention, we agree with Entergy that the standard set out in CLI 06-03 is the relevant measure for determining whether an issue is significant under the requirements of Section 2.326(a)(2), and that the Fukushima DTV Contention not only fails to satisfy this criterion, but also fails because it offers only unsupported qualitative speculation, entirely without quantification or challenge to the existing LRA, as to the impact of the issues raised.

<sup>153</sup> Concurrence and Dissent at 52.

As to the requirements of 2.309(c), we are persuaded that the information that Pilgrim Watch asserts to be newly derived from the Fukushima accidents (respecting the buildup of containment pressure, hydrogen explosion, DTV failure or inoperability, failure or delay in attempting to vent the containment because of operator error, potential containment failure, and the resulting offsite consequences), does not involve issues for the Pilgrim Plant that are new (i.e., despite the data presently available from events at Fukushima, it is not based upon, or related to, information as to aspects of the Pilgrim plant, personnel actions and analysis that was not previously available). Rather, with the single exception mentioned above, those matters were all part of the plant analysis from the outset of this proceeding, and the shortcomings that Pilgrim Watch now seeks to raise were considered and examined many years ago. As to the particular assertions that the Fukushima operators intentionally did not open the DTVs when it was appropriate to do so, and that the Fukushima DTVs failed to operate when called upon, and therefore the Pilgrim SAMA analysis should be redone to include the possibility that the Pilgrim operators or Pilgrim DTVs might similarly fail, Pilgrim Watch offered no support for their speculation respecting how the Pilgrim operators would react, failed to examine or challenge anything respecting the Pilgrim plant's DTV function or anything in either Pilgrim operator training or Pilgrim operating manuals and failed to support their view that the Pilgrim operators would behave as they assert the Fukushima operators behaved or the Pilgrim DTVs would fail as they assert the Fukushima DTVs did, and therefore failed to base its challenge on any new information regarding the Pilgrim plant or the license renewal application. The mere facts, if true, that the Fukushima operators intentionally failed to open DTVs when appropriate is not related in any fashion by Pilgrim Watch to operator actions at the Pilgrim plant, and the same is true respecting the failure of DTVs, and therefore these asserted failures at the Fukushima plants cannot be deemed to represent "new" information respecting this license renewal application. Therefore, we find that Pilgrim Watch does not have good cause for its failure to file a timely contention. As to the other factors, we agree with Entergy, for the reasons it stated, that admission of this contention at this late stage in this proceeding will substantially broaden and delay the proceeding as specified in 10 C.F.R. § 2.309(c)(1)(vii). Therefore we

find that Pilgrim Watch has not overcome the deficiency of failure to have good cause by making a compelling showing regarding the remainder of the factors of 2.309(c). And, we agree with the Staff who argue that Pilgrim Watch's claims about DTV pipe corrosion are not timely raised because the topic of buried and inaccessible piping has already been litigated in this proceeding.<sup>154</sup> Thus we find that the Fukushima DTV Contention is also inadmissible for failure to satisfy the requirements of Section 2.309(c) for nontimely contentions.

Turning, finally, to whether the Fukushima DTV Contention satisfies the requirements of Section 2.309(f)(1), we focus upon a few critical elements of that regulation. Pilgrim Watch claims that this contention is material because it highlights a deficiency of "enormous independent health and safety significance."<sup>155</sup>

Entergy concludes with an analysis that it asserts shows that Pilgrim Watch has not demonstrated that the factors of 10 C.F.R. § 2.309(c) support admission of this contention<sup>156</sup> and that the strict criteria of 10 C.F.R. § 2.309(f)(1) regarding admissibility of a contention are not satisfied.<sup>157</sup> Importantly, along this vein, we agree with Entergy's assertion, for the reasons it sets out, that Pilgrim Watch has not shown that its claims are material in the context of this contention, which would require that the matters raised would alter the SAMA cost-benefit outcome.<sup>158</sup> Similarly, the Staff asserts that Pilgrim Watch has not demonstrated that the

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<sup>154</sup> NRC Staff Answer to Fukushima DTV Contention at 21-22.

<sup>155</sup> Fukushima DTV Contention at 5.

<sup>156</sup> Entergy Answer to Fukushima DTV Contention at 26-31.

<sup>157</sup> Id. at 31-36.

<sup>158</sup> Id. at 36-37. Entergy asserts:

Pilgrim Watch asserts no facts and provides no explanation showing that, were its concerns accounted for, the risk averted would even approach that mark . . . Pilgrim Watch fails to dispute or otherwise challenge, in light of Fukushima, the adequacy of the severe accident releases evaluated in the Pilgrim SAMA analysis. The severe accident releases used for the Pilgrim SAMA analysis represent a range of releases from small to very large based on the different possible severe accident scenarios for the Pilgrim plant, and include releases that are many times greater than the releases that occurred at the Fukushima reactors. The severe accident releases assumed for the Pilgrim SAMA analysis more than bound the reported releases from Fukushima.

contention is material or supported by an adequate factual basis. Thus, the Staff asserts, it also fails to meet the admissibility requirements applicable to all contentions.<sup>159</sup>

Further, the Staff asserts that Pilgrim Watch's speculation that the DTV vent piping is corroded because it is buried cannot support admissibility of this contention.<sup>160</sup> In any event, we agree with the Staff that Pilgrim Watch has drawn no connection between the possibility of corrosion of that piping and the asserted flaws in the SAMA analysis made in this contention.

As regards the requirements of 2.309(f)(1)(v), Entergy asserts that:

The late-filed contention is also inadmissible because it is not supported by a concise statement of alleged fact or expert opinion, in contravention of 10 C.F.R. §§ 2.309(f)(1)(v). Pilgrim Watch does not present any expert opinion supporting its new contention. Pilgrim Watch claims that it will rely on testimony from Mr. Gundersen (whose Affidavit accompanying the Request says nothing other than that he supports the Pilgrim Watch Request statements), government documents, and discovery documents from Contention 1. . . . These vague references do not provide the requisite, concise statement of facts or expert opinion. A mere reference to documents, without any explanation of their implications or significance, does not provide an adequate basis for a contention<sup>161</sup>

In this regard, Entergy repeats its assertion that Pilgrim Watch's intent to rely upon documents it identified from websites also fails to satisfy these requirements.

Staff echoes the assertions of Entergy, averring that, and supporting its arguments by going through Pilgrim Watch's claims point-by-point. We agree with Staff's analysis and its conclusion, for the reasons set out by the Staff and Entergy, that Pilgrim Watch's contention lacks adequate basis, instead relying upon speculation and non-expert information, and, that Pilgrim Watch failed to connect their underlying information to the Pilgrim SAMA analysis.<sup>162</sup>

As to the requirements of Section 2.309(f)(1)(vi) to show a genuine dispute with the applicant over a material issue of law or fact, we agree with Entergy and Staff, for the reasons

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(. . . continued)

Id. at 37 (citing to Entergy Decl. ¶¶ 47, 63-69).

<sup>159</sup> NRC Staff Answer to Fukushima DTV Contention at 2.

<sup>160</sup> Id. at 10.

<sup>161</sup> Entergy Answer to Fukushima DTV Contention at 35.

<sup>162</sup> NRC Staff Answer to Fukushima DTV Contention at 18-22.

they set out, who both assert that Pilgrim Watch has failed to show that consideration of the matters concerning it would affect the outcome of the NRC SAMA analysis and therefore do not create a material dispute.<sup>163</sup> Pilgrim Watch has simply offered nothing to support its bare speculation. Although we decline to consider competing expert views (as that is only appropriate for a hearing on the merits not for contention admissibility, or for weighing in consideration of satisfaction of reopening requirements vis-a-vis the standards for a grant of summary disposition), and such consideration has not played any part in reaching our decision, Entergy asserts that the attached declarations of its experts demonstrate that there is no genuine issue of material fact raised by this contention,<sup>164</sup> and that this demonstration is dispositive under relevant Commission case law.<sup>165</sup>

We agree with Staff and Entergy that Pilgrim Watch has failed to satisfy the requirements of these two provisions with respect to the Fukushima DTV Contention, and therefore, even if it had not been inadmissible for failure to satisfy the requirements of 2.326,<sup>166</sup>

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<sup>163</sup> Entergy Answer to Fukushima DTV Contention at 35-36; NRC Staff Answer to Fukushima DTV Contention at 17-18.

<sup>164</sup> Specifically, Entergy's experts testify that DTV venting was successful at two of the three Fukushima plants where Pilgrim Watch asserts DTV venting failed, and that containment does not appear to have failed at all three plants. Id. at 23-24. Entergy points out that its experts testify that the Pilgrim SAMA analysis includes scenarios wherein a great deal more radioactive products are released than were released in the Fukushima Dai-Ichi accidents, thus making plain the error in Pilgrim Watch's (and Mr. Gundersen's) bare respective assertions that the "offsite consequences of containment failure would be huge" and "huge amounts of radiation will be released," and that such huge consequences were not properly factored into Entergy's SAMA analysis. Id. at 25-26.

<sup>165</sup> See infra, note 169 and accompanying text.

<sup>166</sup> We fail to see any logical factual or legal basis for our colleague's finding "that Pilgrim Watch has shown the likelihood of a materially different result in this proceeding, as required by 10 C.F.R. § 2.32[6](a)(3) and (b), by demonstrating genuine disputes on material issues of fact, concerning the increased probabilities of containment failure and large releases as a result of information arising out of the Fukushima accident, as well as the potential cost-effectiveness of upgrading the DTV as Pilgrim Watch asserts." The argument that there exists, "through the quite detailed support provided for the contention, which Mr. Gundersen supports and effectively adopts as his own," is without foundation, and therefore we disagree with our colleague's conclusion that "Pilgrim Watch has shown that it could defeat a summary disposition motion on the 'complex, fact-intensive issues' that are involved in Pilgrim Watch's June Fukushima DTV Contention." Concurrence and Dissent at 53.

or for failure to satisfy the requirements of 2.309(c), it is inadmissible for failure to satisfy the requirements of 2.309(f)(1).

Finally we note that Pilgrim Watch's assertions that the DTVs should be modified and that a filter should be added are matters challenging the design of the Pilgrim plant and are outside the scope of this proceeding.

### **3. Ruling on Both Pilgrim Watch Contentions**

With respect to both of its post-Fukushima contentions, Pilgrim Watch contends that its new contentions: (1) need not satisfy the standards for reopening the record in 10 C.F.R. § 2.326; (2) satisfy the contention admissibility standards in 10 C.F.R. § 2.309(f)(1); and (3) satisfy the standards for untimely new contentions in 10 C.F.R. § 2.309(c).<sup>167</sup> Although Pilgrim Watch did indeed deliver affidavits in connection with the two new contentions, neither addresses, as is required by the Commission's regulations, the reopening standards of § 2.326. The Commission has emphasized, in this docket, the need for affidavits to support any motion to reopen and has held that intervenors' speculation that further review of certain issues "might" change some conclusions in the final safety evaluation report does not justify restarting the hearing process.<sup>168</sup>

For the reasons we discussed at length in our Pre-Fukushima Order regarding three other new contentions filed by Pilgrim Watch and repeated at some length here, neither of these two new contentions may be admitted without satisfaction of all of the requirements for reopening a record, and Pilgrim Watch has intentionally failed to do so. And here, even though there are affidavits (or the like) provided, the actual substance of the supplied information fails

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<sup>167</sup> Compare Pilgrim Watch Request for Hearing on a New Contention: Inadequacy of Entergy's Aging Management of Non-Environmentally Qualified (EQ) Inaccessible Cables (Splices) at Pilgrim Station at 53, 58 (Jan. 20, 2011) with Reply for Fukushima Recriticality Contention at 2, 8, 14 and Fukushima DTV Contention at 4, 24, 30.

<sup>168</sup> Amergen Energy Co., LLC (Oyster Creek Nuclear Generating Station), CLI-08-23, 68 NRC 461, 486 (2008). The Commission also held that "Bare assertions and speculation . . . do not supply the requisite support." Oyster Creek, CLI-09-7, 69 N.R.C. at 287 (citing Oyster Creek, CLI-08-28, 68 N.R.C. at 674). This case involved four NRC proceedings, including the Pilgrim proceeding.

objectively to address the requirements of Section 2.326. As we stated in our Pre-Fukushima Order, the absence of a competent affidavit, as required by 10 C.F.R. § 2.326(b) deprives us of the ability (even the opportunity) substantively to consider whether a materially different result would be obtained (as is required by the regulatory reopening standards).<sup>169</sup> Because Pilgrim Watch has failed to satisfy the requirements of Section 2.326 with respect to either its Fukushima Recriticality Contention or its Fukushima DTV Contention, we deny Pilgrim Watch's request for a hearing on both. And, as we noted above, even had we found that Pilgrim Watch had satisfied the requirements of Section 2.326 with respect to either of these contentions, neither satisfies the requirements of Section 2.309(c) regarding nontimely contentions and neither presents an admissible contention when judged by the criteria of Section 2.309(f)(1).

Finally, as to our colleague's *sua sponte* recommendations to the Commission, we note the following. The issues presented by the Fukushima accident present broad issues that the NRC is addressing on an industry-wide (i.e. generic) basis. As to the risk to public health and safety presented by continuing operation of United States Nuclear Power Plants, the NRC's Near Term Task Force on the Accident at Fukushima has already reported:

The current regulatory approach, and more importantly, the resultant plant capabilities allow the Task Force to conclude that a sequence of events like the Fukushima accident is unlikely to occur in the United States and some appropriate mitigation measures have been implemented, reducing the likelihood of core damage and radiological releases. Therefore, continued operation and continued licensing activities do not pose an imminent risk to public health and safety.

However, the Task Force also concludes that a more balanced application of the Commission's defense-in-depth philosophy using risk insights would provide an enhanced regulatory framework that is logical, systematic, coherent, and better understood.<sup>170</sup>

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<sup>169</sup> This standard is measured using the Commission's test of whether it has been shown that a motion for summary disposition could be defeated. See Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc. (Vermont Yankee Nuclear Power Station), CLI-11-02, 73 NRC \_\_, \_\_ (slip op. at 15) (Mar. 10, 2011).

<sup>170</sup> Near-Term Task Force Report at vii-viii.



And, directly addressing the foundation for these contentions, the Task Force concluded:

[T]he current regulatory approach and regulatory requirements continue to serve as a basis for the reasonable assurance of adequate protection of public health and safety until the actions set forth below have been implemented.<sup>171</sup>

And the Task Force envisions a future expanded comprehensive regulatory framework based upon the existing design basis framework, “complemented with new requirements to establish a more balanced and effective application of defense-in-depth”, including the possible expansion of the use of SAMGs (Severe Accident Mitigation Guidelines).<sup>172</sup> But all these respect current licensing basis issues and portend future activities based upon development of a comprehensive understanding of the events at Fukushima – a matter which, if history is any teacher, will take at least several years. In the interim, unless the Commission finds that there is some unique link between the Fukushima accidents and the expected performance of the Pilgrim plant during its period of extended operation (which, it seems to us, would fall within the broad view of the Task Force that “*continued operation and continued licensing activities do not pose an imminent risk to public health and safety*”), we believe it would be counterproductive for the Commission to single out the Pilgrim plant for particular examination specifically because its license renewal application is presently being litigated or considered by the Commission. The Pilgrim plant is simply one of over twenty BWR Mark-I plants operating in the United States, and, to the extent there are issues raised by the events at Fukushima that have implications for Pilgrim because it is a Mark-I plant, every one of those other plants seems to us to be similarly situated, making such consideration appropriate for generic resolution, not for the “one-off” resolution presented by this proceeding.

### III. **CONCLUSION AND ORDER**

For the foregoing reasons, we find that Pilgrim Watch’s new contentions filed May 12, 2011 and June 1, 2011 fail to satisfy the criteria for reopening under 10 C.F.R. § 2.326, the standards for untimely contentions under 10 C.F.R. § 2.309(c), and the contention admissibility

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<sup>171</sup> Id. at 73.

<sup>172</sup> Id. at 21, 49.

criteria of 10 C.F.R. § 2.309(f)(1), each of which failures is in-and-of-itself fatal to admissibility, and their admission is therefore DENIED.

It is so ORDERED.

THE ATOMIC SAFETY  
AND LICENSING BOARD<sup>173</sup>  
*/RA/*

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Dr. Paul B. Abramson  
ADMINISTRATIVE JUDGE

*/RA/*

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Dr. Richard F. Cole  
ADMINISTRATIVE JUDGE

Rockville, Maryland  
December 13, 2011

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<sup>173</sup> Judge Young's separate opinion concurring in part and dissenting in part is attached hereto.

## **Administrative Judge Ann Marshall Young, Concurring in Part and Dissenting in Part**

### **Introduction**

Again, I agree with some, but not all, of my colleagues' conclusions, and provide my own reasoning herein. Specifically, as in my concurrence and dissent to the majority decision in LBP-11-20, I find that the reopening standards of 10 C.F.R. § 2.326 are applicable to the new contentions filed by Intervenor Pilgrim Watch in May and June of 2011. I further find that both of Pilgrim Watch's new contentions, relating to the Pilgrim severe accident mitigation alternatives (SAMA) analysis and how certain new information arising out of the accident at the Fukushima Daiichi nuclear power plant in Japan may inform this analysis, meet the first two of these standards, under §§ 2.326(a)(1) and (a)(2), that they be timely filed and raise significant issues. I also find that both contentions meet the requirements of 10 C.F.R. § 2.309(c), (f)(1), and (f)(2).

I find that the May "Fukushima Recriticality" Contention does not meet the exacting requirement of demonstrating that a materially different result would be likely, using the standard of showing an ability to defeat a summary disposition motion.<sup>1</sup> But I find that the June "Fukushima DTV" Contention does meet this standard. I also in any case, however, *sua sponte* would recommend to the Commission that it assure that the Staff take a "hard look" at the matters at issue in both contentions, along with any other issues arising out of the Fukushima Daiichi accident that relate particularly to General Electric Mark I BWR reactors. I would further suggest, in the interest of better assuring both public safety and public trust in the process, that this be done prior to deciding whether to grant the pending Application for license renewal, rather than wait to have such matters addressed (generically or otherwise) as operating issues under the plant's current licensing basis.

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<sup>1</sup> See *infra* note 19.

Before addressing the specifics of the two pending contentions, I begin my analysis with short overviews of some basic concepts that are applicable to the current inquiry.

### The Fukushima Daiichi Accident as “New” Information; Timeliness of New Contentions

There are in the pleadings relating to the two new contentions various arguments about whether the information on which the contentions are based is truly “new,” so as to support their timeliness, given that some of the technical issues put forward in support of the contentions have been analyzed and considered in various contexts over the years. As to Pilgrim Watch’s May 2011 “Fukushima Recriticality” contention, which concerns the Pilgrim SAMA analysis with respect to offsite consequences of a severe accident and the possibility of continuing generation of radiological releases for some period of time after an accident, it appears that these issues are not themselves new, given that they have been addressed in a number of contexts over the years. With respect to Intervenor’s June 2011 “Fukushima DTV” contention, which concerns the SAMA analysis and issues surrounding possible operator failure and/or inoperability of the Direct Torus Vent (DTV) at the Pilgrim plant, it likewise appears that various issues relating to the DTV are not new and have in fact been addressed by the NRC and the industry, as argued by Applicant and NRC Staff.

What is new, of course, is the fact of the accident at the Fukushima Daiichi nuclear power plant in Japan, and whatever practical, “real-world” information it provides that may enable improved understanding of issues that may not in themselves be new. The contentions arise out of such new, “real-world” information on the Fukushima accident. Whatever the merits of this information as to any other required criteria, the “newness” and timeliness of it is a separate matter, and this sort of reality-based information is obviously qualitatively different than predictions of accident factors, probabilities, and progressions, no matter how well-founded. The information, whatever other shortcomings it may have, is manifestly “new.”

Pilgrim Watch’s contentions are also supported by other, previously-existing information that serves as context and provides additional bases for the contentions. But this circumstance

negates neither the “new-ness” of the Fukushima-related information, nor the value of either sort of information, whatever its worth otherwise. Looking at the situation in the plain light of day, I find that Applicant and Staff in their arguments seem to have developed a somewhat purposeful blind spot in this regard and, as with some of their other arguments, tend to fall into a sort of overzealous, “overkill” syndrome (which can at times undermine their overall credibility). The accident at Fukushima happened, and it happened at reactors of the same model as the Pilgrim reactor. In this light, not to consider information concerning the *severe accident* at the Fukushima plant as “new” information that is relevant to the Pilgrim SAMA analysis – the *severe accident* mitigation alternatives analysis – including those aspects of it that concern containment failure, offsite consequences, and the functioning and use of the DTV, would seem to be short-sighted, if not indeed absurd.

I note Entergy’s and Staff’s arguments that the contentions are based on information found in articles that are not all in the best form for evidentiary purposes. Under the circumstances, however, I am not inclined to exclude contentions on this basis alone, or find reliance on such articles to be unreasonable *per se*, when as a practical matter there appears at this time to be relatively less of the sort of more direct and reliable information that would be preferable, for the obvious reason that information and analysis on the accident will proceed at a rate dependent on when new facts become available. Nor does this circumstance negate the “new-ness” of the Fukushima-related information.

It may be that in the end, after all possible information from Fukushima is available and analyzed in detail from all angles, Entergy and the NRC Staff may be proven right in arguing in effect that no new information that would be even arguably useful in a SAMA analysis (even one concerning a 40-year-old Mark I BWR reactor) will be forthcoming. But at the present time, it would seem to me that the better part of wisdom suggests at least *considering* the information and whether it might lead to revisions in the Pilgrim SAMA analysis and in the end to greater assurance of public safety. Moreover, while I note that the NRC Staff has been directed by the

Commission to produce papers prioritizing the Near-Term Task Force's recommendations<sup>2</sup> and outlining which ones should be implemented without delay, this does not automatically mandate the denial of any contentions addressing Fukushima-related (and indeed Task Force-related) subjects – particularly since the Commission has allowed for 18 months to “consider the Task Force's first and broadest recommendation, a call for revising the NRC's regulatory approach.”<sup>3</sup>

I further note, with respect to the Near-Term Task Force recommendations and the June 2011 Fukushima DTV contention, that Applicant argues *inter alia* that “a cursory review of [the Task Force Report] information indicates that it is neither new nor materially different than the information Pilgrim Watch included in its request for hearing on [the DTV] issue,” that “the factors that led to [the] Fukushima accident are specific to that site and would not occur at Pilgrim,” and that “Pilgrim Watch cannot credibly contend that further consideration of the Fukushima accident scenario would materially alter the results of the Pilgrim SAMA analysis.”<sup>4</sup> Pilgrim Watch argues *inter alia* to the effect that information from Fukushima could change the probabilities that are assigned to various items in the SAMA analysis, as well as the cost-benefit conclusions, in contrast to Entergy's apparent view that even the probabilities would not be changed one whit. Although I do not find by any means that Pilgrim Watch has shown that it will prevail on the one contention I would admit, I do find it has made a sufficient showing with respect to that contention, and would doubt in any event that information from either Fukushima or the Task Force would be irrelevant and useless to analysis of the issues raised in both of Pilgrim Watch's contentions. I would, rather, think that erring on the side of caution and at least

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<sup>2</sup> See Dr. Charles Miller *et al.*, Recommendations for Enhancing Reactor Safety in the 21st Century, The Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident (July 12, 2011) (ADAMS Accession No. ML111861807).

<sup>3</sup> NRC News Release, *Commission Seeks Prompt Action on Japan Task Force Recommendations* (Aug. 19, 2011).

<sup>4</sup> Entergy's Opposition to Pilgrim Watch's Request to Supplement Request for Hearing on Contention Concerning the Direct Torus Vent (Aug. 18, 2011) at 3-5.

looking at the information would be in order, except to the extent that the matters are about to become the subject of rule-making.<sup>5</sup>

Such consideration would seem to be particularly appropriate given that the Pilgrim plant is in the unique position of being the *only* General Electric Mark I BWR plant whose license renewal application is currently pending. Applicant and Staff essentially argue to the effect that license renewal is a relatively insignificant step in the larger context of continuing operation under the current licensing basis, and that any issues arising out of the Fukushima accident will be handled in that context. But this approach may err on the side of giving insufficient attention to a decision whether to take the affirmative step of renewing, for an additional 20 years, a license for a 40-year-old plant that would, but for such renewal, expire.

I realize that, for the Applicant, having earlier knowledge of the outcome of this process would be better for it from a business planning perspective, and that, particularly in these economic times, this concern is not to be underestimated. However, the license remains in effect until the license renewal decision is ultimately rendered, and taking the time to ensure that due regard is given to any lessons learned from Fukushima appears to me to be fully appropriate. Given the fact of the Fukushima accident, and the fact that it involved – and continues to involve – reactors of the same design as the Pilgrim reactor, I find that taking the time to pause and consider whatever information is available at this point and in the near future should ensure a more informed decision on the license renewal application, and one which will better assure the public that all relevant issues arising out of the Fukushima accident have been seriously considered and taken into account.

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<sup>5</sup> See *Duke Energy Corp.* (Oconee Nuclear Station, Units 1, 2, & 3), CLI-99-11, 49 NRC 328, 345 (1999). I note in addition that, were a 95<sup>th</sup> percentile rather than the mean used in the SAMA analysis, as I have previously discussed, this, together with other relevant issues, including those currently raised, might indeed change the SAMA cost-benefit conclusions. See LBP-11-18, Separate Statement of Administrative Judge Ann Marshall Young at 3 n.11 [hereinafter LBP-11-18 Separate Statement].

More specifically on the timeliness of the new contentions, I note first, regarding the May 2011 “Fukushima Recriticality” contention, Pilgrim Watch’s observation that the “Fukushima disaster began on March 11, 2011,” and that the “information upon which this contention is based is not yet fully available,” and its further assertions that “sufficient information has been released by TEPCO to file this request,” that it could not have presented the information earlier, and that it “acted reasonably and promptly after learning of the new information,” which constitutes good cause for not filing it earlier.<sup>6</sup> Similarly, regarding its June “Fukushima DTV” contention, Intervenor states that the information on which it is based “is new and could not have been presented earlier, and that Pilgrim Watch acted promptly after learning of the new information.”<sup>7</sup>

Based on the foregoing, I find that, because both of Pilgrim Watch’s contentions are centrally based on Fukushima-related information in one form or another, with other information merely providing additional context and basis to show the significance of the central Fukushima-related asserted facts, they were timely-filed as required by § 2.326(a)(1); timely submitted and based on not-previously-available information that is materially different than any prior information, as required by § 2.309(f)(2)(i)-(iii); and that such prior unavailability in any event constitutes good cause for the time of filing as required by § 2.309(c)(1)(i).

As to the other subsections of § 2.309(c)(1), I also find in Pilgrim Watch’s favor, with the exception of subpart (vii) and possibly subpart (viii). It has already been determined that Pilgrim

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<sup>6</sup> Pilgrim Watch Request for Hearing on Post Fukushima SAMA Contention (May 12, 2011) at 14-15 [hereinafter May 2011 or Fukushima Recriticality Contention] (citing *Texas Utilities Electric Co.* (Comanche Peak Steam Electric Station, Units 1 and 2), CLI-92-12, 36 N.R.C. 62, 69-73 (1992)).

<sup>7</sup> Pilgrim Watch Request for Hearing on a New Contention Regarding Inadequ[a]cy of Environmental Report, Post Fukushima (June 1, 2011) at 25 [hereinafter June 2011 Contention or Fukushima DTV Contention].



Watch has an interest and right as a party to this proceeding,<sup>8</sup> which carries with it the reality that whatever order is ultimately issued in this proceeding will affect such interest, and there appears to be no other party raising the concerns stated in the contention. Obviously, admitting the contention would delay the proceeding somewhat,<sup>9</sup> but I would not find this consideration outweighs the good cause provision of subpart (i), the factor given the greatest weight in a § 2.309(c) analysis.<sup>10</sup> And on subpart (viii), it is clear that Pilgrim Watch is limited in its resources, but I would also note that it appears to have a combination of experts – a nuclear engineer and an expert in the MACCS2 Code used in the SAMA analysis – who would likely be able together to address very well all relevant issues in both contentions sufficiently to warrant the granting of a hearing.

#### The Fukushima Daiichi Accident as Supporting the “Significance” of the New Contentions

I would further find that information regarding the Fukushima accident is clearly “significant,” as required at 10 C.F.R. § 2.326(a)(2), both as a matter of obvious fact, and with specific reference to the Pilgrim SAMA analysis, including those aspects of it that concern containment failure, offsite consequences, and the functioning and use of the DTV (the latter of which, I note, was one circumstance that, early on after the accident, was cited as a distinguishing factor between U.S. plants and Fukushima Daiichi, given that the latter reactors did not have such vents – before it was discovered that they did in fact have them).

This is not to say that there are no issues with respect to the quality and completeness of available information provided by Intervenor that relates to the Fukushima accident, or that

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<sup>8</sup> LBP-06-23, 64 NRC 257, 271, 348 (2006).

<sup>9</sup> Of course, as I have previously observed, the fact that the Applicant may continue to operate pending a final decision on its license renewal application, see 10 C.F.R. § 2.109, minimizes the negative impact of any delay. See LBP-11-18 Separate Statement at 13 n.46.

<sup>10</sup> See, e.g., *Entergy Nuclear Vermont Yankee L.L.C.* (Vermont Yankee Nuclear Power Station), CLI-10-17, 72 NRC \_\_, \_\_ (slip op. at 67 n.304) (July 8, 2010).

Pilgrim Watch has raised these issues in a faultless manner. But not to take into account information arising out of the Fukushima accident that might, as I discuss above, provide new insights on aspects of the Pilgrim SAMA analysis seems, again, to be short-sighted. However “significance” is defined, the Fukushima accident and its aftermath has (as any such severe accident would do) clearly “paint[ed] a ‘seriously different picture of the environmental landscape’”<sup>11</sup> with respect to nuclear power reactors, particularly Mark I BWRs such as the Pilgrim plant.

#### Principles Relating to SAMA Analyses and NEPA

I note Pilgrim Watch’s arguments based on the Supreme Court’s *Marsh* decision, that:

The NRC must consider new and significant information arising from the accident at Fukushima before relicensing Pilgrim NPS whether or not that information ultimately leads to modification of licensing requirements. “Regardless of its eventual assessment of the significance of the information, the [agency] ha[s] a duty to take a hard look at the proffered evidence.” . . . .

The fundamental purpose of the National Environmental Policy Act, NEPA, is to “help public officials make decisions that are based on understanding of environmental consequences, and take decisions that protect, restore and enhance the environment.”<sup>12</sup>

Also, as the Commission stated in CLI-10-11,

There is no NEPA requirement to use the best scientific methodology, and 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. . . .

Significantly, NRC SAMA analyses are not a substitute for, and do not represent, the NRC NEPA analysis of potential impacts of severe accidents. The NRC’s GEIS for license renewal provides a generic evaluation of severe accident impacts and the technical basis for the NRC’s conclusion that “the probability-

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<sup>11</sup> See Entergy’s Answer Opposing Pilgrim Watch Request for Hearing on a New Contention Regarding Inadequacy of Environmental Report, Post-Fukushima (June 27, 2011) at 18 (quoting *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-06-3, 63 NRC 19, 28 (2006)).

<sup>12</sup> June 2011 “Fukushima DTV” Contention at 3 (citing *Marsh v Oregon Natural Resources Council*, 490 U.S. 360, 385 (1989); 42 USC § 4332; 40 CFR § 1500.1(c)).

weighted consequences of atmospheric releases, fallout onto open bodies of water, releases to groundwater, and societal and economic impacts from severe accidents are small for all plants.” . . . . Because the GEIS provides a severe accident impacts analysis that envelopes the potential impacts at *all* existing plants, the environmental impacts of severe accidents during the license renewal term already have been addressed generically in bounding fashion.

The SAMA analysis is a site-specific *mitigation* analysis. For a mitigation analysis, NEPA “demands ‘no fully developed plan’ or ‘detailed examination of specific measures which will be employed’ to mitigate adverse environmental effects.” . . . .<sup>13</sup>

I do not read the Commission’s discussion to mean that it will not take the requisite “hard look” at the SAMA analysis, and indeed the NRC Staff does address the SAMA analysis in the EIS for the Pilgrim Plant.<sup>14</sup> I note also that, while NEPA “does not mandate particular results,” its purposes include

ensur[ing] that the agency, in reaching its decision, will have available, and will carefully consider, detailed information concerning significant environmental impacts; it also guarantees that the relevant information will be made available to the larger audience that may also play a role in both the decisionmaking process and the implementation of that decision.<sup>15</sup>

Thus, it may well be argued, as Pilgrim Watch does, that the NRC should supplement the Pilgrim EIS to incorporate consideration of any information reasonably available from and relating to the Fukushima accident, given that the reactors there are of the same model as the Pilgrim reactor. Of course, NEPA “does not mandate *how* [an] agency must fulfill its obligations”

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<sup>13</sup> CLI-10-11, 71 NRC \_\_\_, \_\_\_ (slip op. at 37-38) (Mar. 26, 2010) (citing *Hells Canyon Alliance v. United States Forest Serv.*, 227 F.3d 1170, 1185 (9th Cir. 2000); *Natural Resources Defense Council v. Hodel*, 865 F.2d 288, 294 (D.C. Cir. 1988); *Town of Winthrop v. FAA*, 535 F.3d 1, 11-13 (1st Cir. 2008); 10 C.F.R. Part 51, Subpart A, Appendix B, Table B-1 (regarding “severe accidents”); GEIS, Final Report, Vol.1 at 5-12 to 5-106; *Catawba/McGuire*, CLI-03-17, 58 NRC at 431 (quoting *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 353 (1989)).

<sup>14</sup> See Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 29, Regarding Pilgrim Nuclear Power Station, Final Report (July 2007) at § 5.2; Appendix G.

<sup>15</sup> *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349-50 (1989).

under the statute.<sup>16</sup> Therefore, unless Pilgrim Watch meets all of the relevant requirements (which I have listed in the Introduction above), this board may not order a hearing on these NEPA issues.

I do note, however, in this regard, the reasoning of another Licensing Board in the *Calvert Cliffs* proceeding, addressing the applicant's argument that in that case that

no remedy is necessary because revising the FEIS would not alter the NRC Staff's conclusions. This is in substance an argument for the application of the doctrine of harmless error. That doctrine, however, has only limited application in NEPA cases, and none where the agency has failed to take the required hard look at environmental consequences and alternatives. . . .

NRC Staff cannot evade its NEPA obligation to thoroughly explore reasonable alternatives by claiming that doing so would not change its conclusions. Even if the Staff's conclusions would in fact remain unchanged, one of NEPA's primary goals is fostering informed public participation in the decision making process. Providing the public with accurate and complete information concerning the environmental consequences of the proposed action and alternatives is essential to fulfilling that goal. . . . "[w]ithout substantive, comparative environmental impact information regarding other possible courses of action, the ability of an EIS to inform agency deliberation and facilitate public involvement would be greatly degraded."<sup>17</sup>

The *Calvert Cliffs* Board applied this standard in determining whether to grant summary disposition of a contention involving alternatives to that proposed project, and denied the motion, based in part on the quoted reasoning.<sup>18</sup> Following this logic, it would seem to be arguable that, where an adjudicatory proceeding has commenced and a NEPA-related issue

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<sup>16</sup> *Massachusetts v. NRC*, 522 F.3d 115, 130 (1st Cir. 2008) (emphasis in original) (citing 42 U.S.C. § 4332; *Balt. Gas & Elec. Co.*, 462 U.S. 87, 100-01, 103 (1983); *Vt. Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519, 548 (1978)).

<sup>17</sup> *Calvert Cliffs 3 Nuclear Project, LLC, and Unistar Nuclear Operating Services, LLC* (Calvert Cliffs Nuclear Power Plant Unit 3), Memorandum and Order (Denying Summary Judgment of Contention 10C, Denying Amended Contention 10C, and Deferring Ruling on Contention 1) (Aug. 26, 2011) (unpublished) at 17-18 (citing *California Wilderness Coalition v. U.S. Dept. of Energy*, 631 F.3d 1072, 1105-06 (9th Cir. 2011); *Robertson*, 490 U.S. at 349-50; *New Mexico ex rel. Richardson v. Bureau of Land Management*, 565 F.3d 683, 708 (10th Cir. 2009)).

<sup>18</sup> *Id.* at 20.

has arisen in that context, the matter must be addressed in that same context. I address the impact of the preceding principle in my discussion below of Pilgrim Watch's June 2011 "Fukushima DTV" Contention.

Principles Relating to the Materially Different Result and Affidavit Requirements of 10 C.F.R. § 2.326(a)(3) and (b), and the Expert Support Provided by Intervenor

As I have previously observed, the Commission has stated that the standard for determining whether a party has met the "materially different result" requirements of 10 C.F.R. § 2.326(a)(3) and (b) is whether the party can defeat a motion for summary disposition.<sup>19</sup> I note also the Commission's summary of principles relating to summary disposition in CLI-10-11,<sup>20</sup> as well as its finding that "complex, fact-intensive issues [are] best left for the Board's consideration in the first instance."<sup>21</sup>

On the other hand, with respect to Entergy's and Staff's arguments that Pilgrim Watch's experts do not demonstrate their expertise in all relevant subject areas, there is also some early Appeal Board case law quoting, from 10 C.F.R. § 2.749(b) as it then read, the following language: "Affidavits shall set forth such facts as would be admissible in evidence and shall show affirmatively that the affiant is competent to testify to the matters stated therein."<sup>22</sup> At the present time, there are two pertinent provisions relating to summary disposition, that at 10

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<sup>19</sup> See *Entergy Nuclear Vermont Yankee, LLC* (Vermont Yankee Nuclear Power Station), CLI-11-02, 73 NRC \_\_, \_\_ (slip op. at 15) (Mar. 10, 2011); LBP-11-20, Administrative Judge Ann Marshall Young, Concurring in Part and Dissenting in Part, at 17-18 and n.72.

<sup>20</sup> See CLI-10-11, 71 NRC at \_\_ (slip op. at 11-13).

<sup>21</sup> *Id.* at \_\_ (slip op. at 23).

<sup>22</sup> *Cleveland Elec. Illuminating Co.* (Perry Nuclear Power Plant, Units 1 & 2), ALAB-443, 6 NRC 741, 755 (1977). The Appeal Board in *Fla. Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 & 4), ALAB-950, 33 NRC 492, 500-01 (1991), also noted § 2.749(b), indicating as well that a licensing board was not in error in finding a person not "competent" to address technical issues in responding to a motion for summary disposition, whether under that section or the general NRC evidentiary standard of evidence having to be "relevant, material, and reliable." *Id.* at 501 (emphasis in original).

C.F.R. § 2.1205, requiring “affidavits to support statements of fact” and that in ruling on such motions the standards of subpart G shall apply; and 10 C.F.R. § 2.710 (part of subpart G), which contains two somewhat contradictory provisions: First, it states at subsection (a) that parties opposing summary disposition may file an answer “with or without affidavits.” Then, in subsection (b), it states that “Affidavits must set forth the facts that would be admissible in evidence and must demonstrate affirmatively that the affiant is competent to testify to the matters stated in the affidavit.” It does not specify what an answer filed “without affidavits” must show.

As I indicate above, Pilgrim Watch has two experts who together would seem to have the expertise to address on some level all the issues raised in the two contentions at issue. However, Mr. David Chanin, the expert for the May “Fukushima Recriticality” contention, speaks not only to the SAMA analysis, on which he appears to me to be undisputedly an expert as one of the developers of the MACCS2 Code, but also to issues of criticality and interpreting the significance of various levels of Iodine-131 in this regard, matters clearly more in the area of expertise of a nuclear engineer.<sup>23</sup> Nonetheless, I do not necessarily find that Mr. Chanin is not competent to testify on nuclear criticality issues; although outside his normal areas of expertise,

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<sup>23</sup> I note that, when I say the expert “speaks to” various issues, I am referring to his essentially adopting the basis provided for the contention as his own, as well as being the author of an article quoted by Intervenor in the May 2011 Fukushima Recriticality Contention. The same applies to Mr. Gunderson’s adopting as his own the basis provided by Intervenor for the contention. Although the better form would obviously be to produce a separate and precise sworn Affidavit, I would tend to look to the substance rather than the form, particularly with a *pro se* intervenor, so long as what is presented meets a reasonable level of clarity, and other parties are not unduly prejudiced. As I noted in my concurrence and dissent to LBP-11-20, at 7 n.26, in NRC proceedings, *pro se* litigants are generally not held to the same high standards of pleading and practice as parties with counsel. See, e.g., *Vermont Yankee I*, CLI-10-17, 72 NRC at \_\_\_ (slip op. at 56 n.246); *U.S. Enrichment Corp.* (Paducah, Kentucky Gaseous Diffusion Plant), CLI-01-23, 54 NRC 267, 272 (2001); *Consolidated Edison Co. of N.Y.* (Indian Point, Unit 2) and *Power Authority of N.Y.* (Indian Point, Unit No. 3), LBP-83-5, 17 NRC 134, 136 (1983).

it appears he has some familiarity with, and expertise on, the other concepts involved in the May Fukushima Recriticality contention, based on his long experience working in the nuclear arena.

As for the expert for the June “Fukushima DTV” contention, Mr. Gundersen is a nuclear engineer, who appears to have broad experience that I find is sufficient to enable him to speak with some expertise on the subject of the June 2011 Fukushima DTV contention.

In the end, in any event, I do not base my conclusion with respect to the May contention and the “materially different result” issue of § 2.326(a)(3) on the expertise issue, and merely note the issue here in the interest of clarity, given that it has been rather extensively argued by both Entergy and the Staff. I base the conclusion, rather, on the failure of Pilgrim Watch to demonstrate in the May contention, as required in a summary disposition context, the existence of a genuine issue of material fact with respect to the complex matters in question. Mr. Chanin makes statements that purport to dispute Entergy’s position. But their less detailed, more conclusory, and at times imprecise quality undermines the message they impart when considered in terms of disputing the relatively complex, detailed, and precise presentations of facts Entergy and Staff experts put forward. From a summary disposition perspective, which is the one the Commission has defined for meeting the requirement of 10 C.F.R. § 2.326(a)(3), it is difficult to conclude that Pilgrim Watch has sufficiently demonstrated a genuine dispute with the statements of fact presented by Entergy and the NRC Staff through their experts, with respect to the May 2011 Fukushima Recriticality contention.<sup>24</sup>

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<sup>24</sup> Pilgrim Watch in effect concedes this, remarking in more than one place in its pleadings that this proceeding is not now at the summary disposition stage. *See, e.g.*, Pilgrim Watch Reply to Entergy’s and NRC Staff’s Answers to Pilgrim Watch Request for Hearing on Post Fukushima SAMA Contention (June 13, 2011) [hereinafter PW 6/13/11 Reply]; Pilgrim Watch Reply to Entergy’s and NRC Staff’s Answers to Pilgrim Watch Request for Hearing on A New Contention Regarding Inadequacy of Environmental Report, Post Fukushima (July 5, 2011) at 16 n.8, 24 [hereinafter PW 7/5/11 Reply].

I turn now to the specifics of Pilgrim Watch's May and June contentions and the extent to which they meet the requirements of 10 C.F.R. §§ 2.309(f)(1) and 2.326(a)(3) and (b).

Pilgrim Watch May 12, 2011, "Fukushima Recriticality" Contention

Pilgrim Watch in this contention states:

The Environmental Report is inadequate post Fukushima Daiichi because Entergy's SAMA analysis ignores new and significant lessons learned regarding the possible off-site radiological and economic consequences in a severe accident.<sup>25</sup>

More specifically, Intervenor asserts as follows:

Data from TEPCO Unit 2 [(a GE Mark 1 reactor very similar to Pilgrim)] shows that its nuclear chain reaction continued to generate high levels of I-131 for over a month after scram despite the efforts of TEPCO to terminate chain reaction by injection of borated water. Pilgrim's SAMA source terms have durations of at most 24 hours duration, the maximum plume duration allowed by the MACCS2 code, which assumes that once the accident begins with reactor scram, a reactor completely ceases production of "fresh" shortlived iodines, such as I-131, which pose great radiological hazard if inhaled or ingested. By design, MACCS2 is unable to model the consequences of an accident at a reactor where the fission chain reaction continues apace despite reactor scram.<sup>26</sup>

Intervenor states that "[t]his phenomenon was also noted at the Chernobyl Unit 4 accident of April 26, 1986," in which "the nuclear chain reaction was observed to greatly accelerate and reach a peak on May 1, 1986, which resulted in large unanticipated radiation exposures at the May Day parade in Kiev."<sup>27</sup> Intervenor further argues:

It seems possible that the accident containment measures taken at both Chernobyl and Fukushima introduced neutron moderators which allowed the fission reaction that had probably been stopped to later begin anew. Because of the huge design differences between the two reactors, their ongoing chain reactions indicate a fundamental shortcoming in not just the MACCS2 code, but with all PRAs conducted using tools based on the NRC's PRA Procedures Guide. All known reactor accident analysis codes assume that I-131 available for release from a reactor core's inventory decreases according to its 8-day radiological half-life. No consequence code in the world allows the modeling of releases from reactor cores where the fission chain reaction continues many

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<sup>25</sup> Fukushima Recriticality Contention at 1.

<sup>26</sup> *Id.* at 1-2.

<sup>27</sup> *Id.* at 2.



weeks after scram. While the resumption of fission at Chernobyl may have been ascribed to the graphite-moderated design, such is not the case at Fukushima and Pilgrim.<sup>28</sup>

Positing that the “purpose of a SAMA review is to ensure that any plant changes that have a potential for significantly improving severe accident safety performance are identified and addressed,”<sup>29</sup> Pilgrim Watch observes that, “[i]n the SAMA analysis process, the applicant analyzes costs of damages and costs of clean-up,” but argues that “NRC policy permits the Applicant to use a SAMA analysis code (MACCS2) that underestimates consequences . . . .”<sup>30</sup> Examples suggested by Intervenor include the inability of the MACCS2 Code to model a release lasting longer than four days (with the Pilgrim SAMA analysis limiting the duration to 24 hours), and the inability of the code to model “the continual production of I-131 and I-134,” which prevents it from showing the costs of such contaminants “get[ting] to people both by milk and by fresh leafy-vegetable consumption.”<sup>31</sup>

Pilgrim Watch urges that its May 2011 contention is within the scope of this proceeding because it relates to the SAMA analysis, a category 2 issue, and argues that it also falls under the National Environmental Policy Act’s (NEPA’s) “fundamental purpose” of “help[ing] public officials make decisions that are based on understanding of environmental consequences, and take decisions that protect, restore and enhance the environment.”<sup>32</sup> Intervenor further argues that “reasonably foreseeable” environmental impacts that have “catastrophic consequences, even if their probability of occurrence is low,” must be considered in the Pilgrim EIS.<sup>33</sup>

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<sup>28</sup> *Id.*

<sup>29</sup> *Id.*

<sup>30</sup> *Id.* at 3.

<sup>31</sup> *Id.* at 4.

<sup>32</sup> *Id.* (quoting 40 C.F.R. § 1500.1(c) (emphasis added by Intervenor)).

<sup>33</sup> *Id.* at 4-5 (quoting 40 C.F.R. § 1502.22(b)(1)).

Moreover, Intervenor contends, “NRC regulations require that ‘to the extent that there are important qualitative considerations or factors that cannot be quantified, these considerations or factors will be discussed in qualitative terms.’”<sup>34</sup>

Citing certain licensing board decisions for the proposition that “[w]here a contention alleges a deficiency or error in the application, the deficiency or error must have some independent health and safety significance,” Intervenor argues that the “deficiency highlighted in this contention has enormous independent health and safety significance,” and is material under 10 C.F.R. § 2.309(f)(1)(iv).<sup>35</sup> Thus, it is argued:

Further analysis to evaluate how changes to assumptions [as posed by the contention] are likely to significantly increase offsite costs that justifies requiring Entergy to add mitigation to reduce the risk of a severe accident such as adding plant modifications, operational changes and training to increase [sic] public safety during license renewal.<sup>36</sup>

Supported by the statement of Mr. Chanin, Pilgrim Watch explains how the code is unable to model the impacts of a release of more than four days, citing this as part of the basis for the contention.<sup>37</sup> The other part of the basis cited for the contention is the asserted fact that “criticality is continuing at Fukushima . . . because of the continued high findings of I-131 reported by TEPCO,” which is characterized as “new and significant information” that “requires a reanalysis of Pilgrim’s SAMA, updating and correcting its assumption that there will be no

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<sup>34</sup> *Id.* at 5 (quoting 10 C.F.R. § 51.71(d)).

<sup>35</sup> *Id.* (quoting *Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Units 2 and 3), LBP-04-15, 60 NRC 81, 89 (2004); citing *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), LBP- 98-7, 47 NRC 142, 179-80 (1998), *aff’d in part*, CLI-98-13, 48 NRC 26 (1998)).

<sup>36</sup> *Id.* at 5-6.

<sup>37</sup> *Id.* at 6; Attached Statement of David Chanin, at 20.

continued criticality.”<sup>38</sup> Pilgrim Watch supports this argument with an online article authored by Mr. Chanin.<sup>39</sup>

To illustrate the relative levels of detail and precision of the parties’ respective expert offerings of the parties, I quote extensively herein from their expert statements, starting with that of Mr. Chanin, who in his article states as follows:

Data released on April 28, 2011 by TEPCO is now unequivocal in showing ongoing criticalities at Unit 2, with a peak on April 13. TEPCO graphs of radioactivity versus-time in water under each of the six reactors show an ongoing nuclear chain reaction creating high levels of “fresh” I-131 in Unit 2, the same reactor pressure vessel (RPV) with a leak path to reactor floor, aux building, and outdoor trenches, that is uncontrollably leaking high levels of I-131, Cs-134, Cs-137 into the Pacific Ocean.

### **Analysis**

When a nuclear reactor goes “critical” the fissioning of U-235 or Pu-239 becomes a self-sustaining process, called a chain reaction. Fissile material hit by a neutron splits (or fissions) into two atoms with atomic numbers between ~90 and ~140 while “throwing off” a few neutrons which then hit other fissile atoms, and the reaction then continues until it’s stopped, usually by dropping the control rods, or reactor scram.

During normal reactor operation, short-lived nuclides like I-131 (8 day) that pose high radiological hazard are created, but they decay quickly. The half-life of I-131 is much shorter than the refueling cycle, and I-131 reaches an equilibrium value quickly. In contrast, the cesium radionuclides that are created decay much more slowly. Reactor inventories of Cs-134 (2 years) and Cs-137 (30 years) gradually rise during the cycle, reaching a maximum at end of cycle.

When Units 1-3 were all scrammed on March 11, 2011 because of the earthquake caused station blackout, the chain reaction of splitting fissile U-235 and Pu-239 into numerous fission products came to an immediate stop. Reactor scram means that neutron-absorbing control rods are dropped into the reactor core to absorb enough neutrons that the chain reaction ceases. Because I-131 has no long-lived “parent” to “feed it” by parent decay, the levels of I-131 in scrammed reactors with intact geometry will decrease exponentially with an 8-day half-life; after 5 half-lives (40 days) the I-131 levels are only 3% of what they were at scram.

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<sup>38</sup> May 2011 Contention at 7-8.

<sup>39</sup> *Id.* at 8-9 (quoting from article found at <http://www.glggroup.com/News/TEPCO-Data-Shows-Ongoing-Criticalities-Inside-Leaking-Fukushima-Daiichi-Unit-2-53751.html?cb=1> [hereinafter GLG article]).

But instead of seeing that expected decrease in I-131 levels relative to Cs-134 and Cs-137 in the regular TEPCO press releases, I-131 was seen to be increasing, instead of decreasing as the physics said it should.

Before TEPCO's [sic] April 28 press release with accompanying graphs and table, it seemed that something strange was happening with the elevated I-131 levels, but until this latest news, it was impossible to know where, exactly, was the source of the high I-131 levels.

The answer is clear if you look at the graphs of groundwater radioactivity measurements from all six reactors. "Outlier" Unit 2 is very different; it has I-131 levels roughly 20 times its levels of Cs-134/137. The only possible source of I-131 would be "pockets" of molten core in the Unit 2 RPV settled in such a way that the boron in the injected water is insufficient to stop the localized criticalities.<sup>40</sup>

The referenced graphs are reproduced to support the arguments made in the article.<sup>41</sup>

Pilgrim Watch summarizes its continuing criticality argument as follows:

In summary, the reactors scrambled on March 11. Once that happened, U-235 should have no longer fissioned, and I-131 should have had no "parent" which would decay to create more I-131 as an ongoing process. At the time of the scam (t-0) the Bq of I-131 and Cs-134 and Cs-137 would all have been approximately equal; after five I-131 half-lives, the "reactor density" radioactivity of I-131 should be only about 3% of the original.

But the above data by TEPCO reported, for example, on April 19, 2011 show instead of the level of I-131 being **below** the levels of the two cesium nuclides, I-131 is often twice as high as the two cesium nuclides reported.

The only apparent explanation is that, after almost two months, at least one of the scrambled [sic] reactors (likely reactor 2) is still critical. This Lesson learned at Fukushima, that continued criticality can continue long after a reactor is scrambled, requires [sic] Entergy to perform a fresh analysis to evaluate how these changes to assumptions and the resulting uncertainties would affect the overall cost benefit analysis.<sup>42</sup>

In conclusion, Intervenor states:

Pilgrim Watch intends principally to rely upon government documents and testimony from David I. Chanin. It would be unreasonable at this date to expect a totally unfunded group to provide detailed testimony from these experts at this time. If it were so required, most members of the public, non-profit public interest

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<sup>40</sup> *Id.* (quoting GLG article).

<sup>41</sup> *Id.* at 10-13.

<sup>42</sup> *Id.* at 13.

groups, and local governments would be unable to file due to lack of resources. Resources for these groups necessarily must be preserved for expert witnesses required at the summary disposition and hearing stage of these proceedings. We trust that it is not the intent of the Commission to restrict participation only to insiders with deep pockets.

With respect to adequate assurance of public health and safety, we respectfully request that the Board accepts this Request for Hearing so that public health and safety will be properly protected.<sup>43</sup>

I find the most significant challenges raised by the NRC Staff and Entergy to be those concerning (1) the extent to which the May 2011 contention meets the requirement at 10 C.F.R. § 2.326(a)(3) that it demonstrate the likelihood of a materially different result, and (2) the sufficiency of the expert support for the allegation of continuing criticality and releases, and the underlying claim that the information cited about levels of I-131 in comparison to cesium establish ongoing criticality. As indicated above, both Staff and Applicant claim that Mr. Chanin has not shown that he is an expert for purposes of addressing criticality issues.<sup>44</sup> In addition, both Staff and Entergy argue that it is not clear in any event that there was significant continuing criticality at Fukushima, where most of the release occurred early in the accident, and that

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<sup>43</sup> *Id.* I note that Mr. Chanin's experience is impressive, and includes "more than 25 years of professional experience in the development, application, maintenance, and verification/validation of large scientific codes, primarily for assessing the environmental impacts of radiological releases, and have worked with various federal agencies and contractors, including the United States Department of Energy (DOE), the United States Nuclear Regulatory Commission (NRC), and Sandia National Laboratories, as a senior risk analyst, project leader, and as a consulting expert, to review, evaluate, and develop risk models to assess the economic and environmental impacts of radiological releases in commercial, military, and government sectors." *Id.* at 20, Statement of David Chanin. He also indicates among other things in his Statement that he "consult[s] as an independent expert to assess the consequences of accidental or intentional releases of radioactive materials to the atmosphere," and that he has "read and reviewed the enclosed proposed contention and fully support[s] all its statements." *Id.* at 20-21.

<sup>44</sup> See NRC Staff's Answer in Opposition to Pilgrim Watch's Request for Hearing on Post-Fukushima SAMA Contention (June 6, 2011) at 1-9, 15 [hereinafter Staff Answer to May 2011 Contention]; Entergy's Answer Opposing Pilgrim Watch Request for Hearing on Post-Fukushima SAMA Contention (June 6, 2011) at 16 [hereinafter Entergy Answer to May 2011 Contention].

Intervenor's assertions do not demonstrate that a materially different result would be likely, because it is not shown that any new cost-beneficial SAMAs would result from changing the input to the SAMA analysis.<sup>45</sup> According to Staff, any possible such continuing criticality would only "slightly change the source terms for a small subset of accidents in the SAMA analysis."<sup>46</sup>

NRC Staff provides the Affidavit of its experts, Dr. Nathan E. Bixler and Dr. S. Tina Ghosh, who provide a 10-page discussion of, among other things, the fact that the Pilgrim SAMA analysis considers station blackout and includes, among seven potentially cost-beneficial SAMAs, five that are mitigation measures for loss-of-power scenarios.<sup>47</sup> They state that "re-criticality is unlikely and the assertions [of Pilgrim Watch and Mr. Chanin] are more simply explained from the known and well studied methods for iodine and cesium behavior during an accident," including the following:

In a typical BWR at the middle of fuel cycle, there would be about  $3 \times 10^{18}$  bequerels of  $^{131}\text{I}$ ,  $4 \times 10^{17}$  bequerels of  $^{134}\text{Cs}$ , and  $4 \times 10^{17}$  of  $^{137}\text{Cs}$ . Thus, there is almost 10 times more  $^{131}\text{I}$  than there is of either of the cesium isotopes mentioned in the PW contention. Because the rate of buildup of these isotopes differs during normal operation of the reactor, this ratio would be even higher early in the fuel cycle and would diminish to a factor of about 5 at end of fuel cycle (just before refueling). There is no point during the fuel cycle that the activity of  $^{131}\text{I}$  would be roughly equal to the activities of the cesium isotopes.

Following reactor shutdown, these isotopes would decay according to their half lives, which are 8 days for  $^{131}\text{I}$ , 2 years for  $^{134}\text{Cs}$ , and 30 years for  $^{137}\text{Cs}$ . Because the half lives of the two cesium isotopes are much longer than the timeframe discussed in the PW contention, their activities would diminish only a little. On the other hand, the activity of  $^{131}\text{I}$  would decrease by half over each 8-day period. That means that at 16 days after reactor shutdown, the activity of  $^{131}\text{I}$  in the reactor would still be about twice that of the cesium isotopes; at 32 days after reactor shutdown, the activity of  $^{131}\text{I}$  in the reactor would be about half that of the cesium isotopes; at 48 days after reactor shutdown, the activity of  $^{131}\text{I}$  in the

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<sup>45</sup> See, e.g., Staff Answer to May 2011 Contention at 6-7; Entergy Answer to May 2011 Contention at 17.

<sup>46</sup> Staff Answer to May 2011 Contention at 7, 12.

<sup>47</sup> Affidavit of Dr. Nathan E. Bixler and Dr. S. Tina Ghosh in Support of the NRC Staff's Answer in Opposition to Pilgrim Watch's Request for Hearing on Post Fukushima SAMA Contention (June 6, 2011) at 1-2.

reactor would be about one tenth that of the cesium isotopes. It is important to understand that these ratios only apply under the assumption that ratios of iodine and cesium utilize the entire core inventory or that the source being measured is proportional to the iodine to cesium ratios found in the core.

The plots of sub-drain activities provided in the PW contention extend to 4/27, which is 47 days after the accident began on 3/11/2011. If the releases of the iodine and cesium isotopes from the containment were in proportion to their activities in the reactor core, then we would expect the  $^{131}\text{I}$  would be about one tenth that of the cesium isotopes on 4/27. But, iodine can be released in a variety of chemical forms, of which only one is bound with cesium. The current models predict that much of the late release of iodine from the containment is in the form of molecular iodine ( $\text{I}_2$ ), which tends to evolve from the iodine dissolved in the aqueous solution in the wet well of the containment. Molecular iodine is very volatile. This increased volatility over forms of cesium results in more efficient transport of the iodine into the environment than the less volatile cesium. Transport of molecular iodine from the containment increases the level of iodine contamination in the vicinity of the plant, but does not increase the level of cesium contamination.

The likely explanation for the larger activity of  $^{131}\text{I}$  compared with  $^{134}\text{Cs}$  and  $^{137}\text{Cs}$  observed in the groundwater collected in the sub-drain at Unit 2 . . . is that greater quantities of iodine continued to be released into the groundwater than of cesium due to the more efficient transport mechanisms for iodine. This explanation agrees very well with our current understanding of how molecular iodine evolves from the aqueous solution in the wet well over an extended period. On the other hand, there is little continuing release of cesium from the wet well because cesium tends to remain dissolved in the aqueous solution.

The activities represented in the samples drawn from the groundwater discussed in the PW contention represent an extremely tiny fraction of the remaining  $^{131}\text{I}$  activity in the reactor. The observed groundwater activities can easily be explained by continuing evolution of iodine from the containment. Thus, there is no reason to believe that a nuclear chain reaction was required to produce the  $^{131}\text{I}$  found in these samples. As stated above, it is far more likely that continuing evolution of molecular iodine from the wet well caused the elevated levels of  $^{131}\text{I}$  in the groundwater samples.<sup>48</sup>

In addition, Staff experts state the following on possible re-criticality:

Even if re-criticality were to occur, it would not have a material effect on the SAMA analysis. Achieving sustained critical reaction in a light-water reactor core of US design requires: (1) favorable geometry and (2) sufficient moderator (water). During a severe accident, when the core materials are melted and geometry is lost, it is not easy to achieve good conditions for re-criticality. Control rod materials (poisons) will be part of the fuel melt too, and sufficient water and

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<sup>48</sup> *Id.* ¶¶ 12-16.

the right configuration (geometry) must be present to sustain a chain reaction. Although re-criticality might occur in very small isolated pockets of slumped (melted) fuel where sufficient water is present. Such conditions, if possible, would occur in only small localized regions, for short periods of time. It would be nothing like producing 100% power from the entire core.

The net effect of re-criticality (if it occurred) would be to slightly change the source terms for a small subset of accidents in the SAMA analysis. For these accidents, the change in source term would be a small fraction of the total source term (e.g., small increase in short-lived isotopes such as  $^{131}\text{I}$  later in time from the start of the accident). The subset of accidents that might be affected is also limited to a small fraction. Hence the net effect on source term is expected to be a small fraction of a small fraction, resulting in no appreciable change in the SAMA results (which we previously noted would require at least a doubling of benefits before the next SAMA on the list could become potentially cost-beneficial. . . .).<sup>49</sup>

Entergy provides the affidavit of Dr. Thomas L. Sowdon, who has a bachelor's degree in nuclear engineering, a master's in radiation health physics, and a doctorate in occupation and environmental epidemiology, and Dr. Kevin R. O'Kula, who has a bachelor's degree in applied and engineering physics and master's and doctoral degrees in nuclear engineering.<sup>50</sup> Supporting their assertions with several tables, these gentlemen state among other things the following:

While it is possible that a recritical configuration developed periodically or intermittently in small, localized portions of the reactor core debris, many other phenomena could give rise to the relatively higher levels of I-131 reported in some locations at Fukushima. For example, the melting and boiling point differences and other chemical property differences between iodine and cesium, the timing of fuel becoming uncovered and percentage of fuel becoming damaged, thermal conditions, the geometry of the fuel, and other factors can all play a role.

In particular, it is well known that iodine and cesium behave very differently in both wet and dry environments. . . .

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<sup>49</sup> *Id.* ¶¶ 17-18.

<sup>50</sup> Declaration of Dr. Thomas L. Sowdon and Dr. Kevin R. O'Kula in Support of Entergy's Answer Opposing Pilgrim Watch Request for Hearing on Post-Fukushima Contention (June 6, 2011), ¶¶ 2, 6.



Any post-scrum recriticality events that may have occurred or are still occurring at Fukushima would add little to the overall releases caused by the energetic events, such as the hydrogen explosions that occurred at the Fukushima facilities in the first week after the earthquake and tsunami. Similarly, any post-scrum recriticality events would add little to the overall releases due to the energetic events assumed in the Pilgrim SAMA analysis. This arises from a host of technical reasons not recognized or addressed in Pilgrim Watch's proposed new contention. These include the following:

- The low-enriched uranium fuel assemblies used in light water reactors, such as Pilgrim, require precise spacing and geometry, the absence of control materials or "poisons" and an appropriate ratio of water to fuel to sustain criticality and generate steady-state power during normal operation. Water is a necessary moderator for criticality to proceed. If changing conditions that occur in the reactor core as the fuel undergoes fission and is consumed are not managed during reactor operation, the nuclear chain reaction will terminate because all of these requirements will not be met.
- Core degradation under severe accident conditions destroys the carefully designed geometry of the fuel assemblies and changes the water to fuel ratio needed to maintain the chain reaction. The melting and mixing of the fuel with the fuel cladding, control material, and other reactor components in the core will act to stop the chain reaction as the core becomes molten, loses its shape, and becomes more diluted.
- The molten core, now better described as core debris, flows into the lower parts of the reactor vessel. As the molten core debris cools into irregular shape(s) and porosity it is difficult to sustain fission through the overwhelming majority of the core debris.
- The addition of water onto the core debris may infrequently lead to conditions favoring recriticality, but these will tend to be near the surface of the core debris, irregularly occurring and localized in pockets. At best, these portions of the core would be very small fractions of the fully functional core. Accordingly, the levels of I-131, Cs-137, and other radionuclides generated from potential intermittent recriticality in the core debris would at best be many orders of magnitude below the levels of radionuclides produced in a fully functional reactor where all requirements are met over the full core volume. This situation sharply contrasts with the fully functional reactor core inventory assumed under the severe accident conditions for the Pilgrim SAMA analysis.
- In addition, if a chain reaction does occur, it will not be sustainable for very long. The water-to-fuel atom ratio will be favorable only momentarily and other geometry factors such as lack of efficient transfer of the energy from the reaction will tend to stop the nuclear chain reaction. In this respect, recritical events tend to be selfdispersive in nature such that once recritical, the energetics of the criticality are sufficient to break apart the critical combination of materials, thereby ceasing the chain reaction.

- . Moreover, aside from the evolution of noble gases from the limited recriticality events, most of the fission products will be contained by the overlying water layer over the core debris that is necessary for recriticality. In other words, the fission products produced by the recriticality will be largely removed or “scrubbed” by the same water that gives rise to the recriticality.
- . Finally, the energetics of this event in the core debris is significantly less than those accompanying the severe accidents considered in the Pilgrim SAMA analysis. The analysis in NUREG/CR-5635 suggested that favorable conditions might exist for a more energetic recriticality in the first day following an initiating event. Given the length of time that has passed since the Fukushima initiating event took place, the level of energy release from potential recriticality events will be very small at best, short term, and negligible compared to the large, elevated release source terms due to the energetic events that are the basis for the Pilgrim SAMA analysis.

[T]he doses that the public would receive from a low-level release occurring over an extended period of time is greatly exceeded by the larger, elevated releases due to the energetic events analyzed in the Pilgrim SAMA analysis. In this respect, the source terms assumed for the radioactive releases in the Pilgrim SAMA analysis have significant margin in severity over that represented by the events at Fukushima, even assuming the longer term, but low-magnitude, radioactive releases, including those from potential intermittent recriticality events.

The overall source term in the case of a severe accident includes the type and amount of radionuclides, the heat energy in the plume associated with the release (which will cause the plume to rise), the height of the release, the timing of release, and the maximum plume duration considered. A separate source term is developed for each of the 19 postulated accident scenarios from the Pilgrim PSA [probabilistic safety assessment] or CAPBs [collapsed accident progression bins] . . . . The 19 CAPBs are based on the plant-specific Pilgrim PSA and account for postulated system, structure, and component failures, the status of the reactor pressure vessel, the status of the containment, and accident sequence timing. Each CAPB represents a different combination of plant feature status and release mechanism and have a characteristic frequency and source term release based on attributes of the accident. The CAPBs represent a range of plant radioactivity releases from small to very large and have different characteristics to describe the occurrence of core damage, the occurrence of vessel breach, primary system pressure at vessel breach, the location of containment failure, the timing of containment failure, and the occurrence of core-concrete interactions. The CAPBs used for the Pilgrim SAMA analysis include accident releases that are far more severe in magnitude and are immediately airborne compared to those from any intermittent recriticality releases from Fukushima

In summary, the Pilgrim SAMA analysis source term is quantitatively larger than, and bounds the combined releases from, all of the Fukushima damaged reactor facilities and would more than bound any continuing low-level releases from

Fukushima. When accounting for the fact that Fukushima involves more than one damaged reactor, the large margin in the Pilgrim SAMA analysis is even more pronounced when considered on a per reactor basis. Because of the large margins in the Pilgrim SAMA analysis, Pilgrim Watch's claims are immaterial to, and would have no impact on, the results of the Pilgrim SAMA analysis.<sup>51</sup>

Both Staff and Entergy argue that, in light of the expert affidavits they provide, Pilgrim Watch's poorly-supported arguments fail to show that a materially different result could result with respect to the subjects of its May 2011 Contention.<sup>52</sup> In addition, Staff urges, any deficiency in the SAMA analysis is "inherent in the analysis itself," which Staff contends Intervenor in effect recognizes in referring to "a fundamental shortcoming in not just the MACCS2 code but all PRAs [probabilistic risk assessments] conducted using tools based on the NRC's PRA Procedure Guide."<sup>53</sup> Staff insists that "[i]f the deficiency is inherent in the SAMA analysis, it is a deficiency that has existed since the [filing of the ER, which] included that allegedly deficient analysis."<sup>54</sup> Moreover, Staff states that the SAMA analysis considers potential challenges from seismic/tsunami events that could trigger station blackout and includes SAMAs that mitigate loss-of-power scenarios including station blackout, and points out that Intervenor does not address these or explain why they are not sufficient in light of Fukushima.<sup>55</sup> In any event, Staff argues, "as the Commission has made clear, the SAMA analysis is not supposed to

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<sup>51</sup> *Id.* ¶¶ 14, 15, 29, 35-36, 41.

<sup>52</sup> Staff Answer to May 2011 Contention at 6-7; Entergy Answer to May 2011 Contention at 15-21.

<sup>53</sup> Staff Answer to May 2011 Contention at 8 (citing May 2011 Contention at 2).

<sup>54</sup> *Id.* Staff also cites CLI-10-11 for the proposition that the Commission has "explicitly held that the MACCS2 Code is acceptable for the purposes of preparing SAMA analyses." *Id.* at 14 (citing CLI-10-11, 71 NRC at \_\_\_ (slip op. at 4)). I note, however, that this argument conveniently ignores that the Commission in CLI-10-11 actually remanded part of a contention, expressly permitting Pilgrim Watch to challenge part of the MACCS2 Code.

<sup>55</sup> Staff Answer to May 2011 Contention at 11-12.

model actual severe accidents; it is a tool to be used for the purpose of identifying potentially cost-beneficial severe accident mitigation alternatives.”<sup>56</sup>

As to concerns about contaminated food and water, these are, according to Entergy, immaterial because more than 80% of the population dose in the current SAMA analysis is incurred in the long-term phase after the accident, and contaminated food and water can be interdicted by authorities until contamination levels are sufficiently safe. The food and water ingestion pathway would thus not contribute significantly to the SAMA cost-benefit analysis.<sup>57</sup>

I note finally the following novel argument of Staff: Staff admits that its experts agree that “there is no computer code capable of modeling severe accidents for a SAMA analysis that is currently capable of modeling an extended but slow release over 8 weeks.”<sup>58</sup> According to Staff, its experts note that some codes “can model extended releases,” but point out that such models “are more appropriate for emergency planning modeling of specific plumes in actual accidents, rather than the modeling that occurs in a SAMA analysis.”<sup>59</sup> Staff goes on:

If no code can model the kind of release it claims is occurring at Fukushima, then PW is raising an issue that, by its own admission, cannot change the SAMA analysis. If the MACCS2 Code cannot be changed easily to address PW’s concerns, there can be no material change in the resulting SAMA cost-benefit analysis, and the contention is inadmissible for failing to raise a material issue in dispute. . . . It is also inadmissible as it raises an issue that is not susceptible of resolution in this proceeding.<sup>60</sup>

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<sup>56</sup> *Id.* at 14 (citing CLI-10-11, 71 NRC at \_\_\_ (slip op. at 3-4)).

<sup>57</sup> Entergy Answer to May 2011 Contention at 19 (citing Entergy Decl. at ¶ 32).

<sup>58</sup> Staff Answer to May 2011 Contention at 14-15.

<sup>59</sup> *Id.* at 15.

<sup>60</sup> *Id.* (citing CLI-10-11, 71 NRC \_\_\_ (slip op. at 39); *Peach Bottom*, ALAB-216, 8 AEC at 20-21). With respect to this argument it might be observed that Pilgrim Watch states that no code is “currently capable of modeling an extended but slow release,” as Staff recognizes. This does not, of course, address future capability, or mean that “there can be no material change in the resulting SAMA cost-benefit analysis.” Just as the Commission in remanding parts of Contention 3 permitted Intervenor to challenge aspects of the MACCS2 code, with sufficient support it would appear a challenge to the aspects of the code currently in question might well be appropriate.

In the end, Staff contends that Pilgrim Watch does not support its claim “that the ratio of iodine to cesium establishes ongoing criticality at Fukushima” with expert support.<sup>61</sup>

Entergy concludes on the criticality issue as follows:

[T]he severe accident releases used for the Pilgrim SAMA analysis represent a range of releases from small to very large based on the different possible severe accident scenarios for the Pilgrim plant, and include releases that are many times greater than the releases that occurred at the Fukushima reactors. . . . The severe accident releases assumed for the Pilgrim SAMA analysis more than bound the releases from Fukushima many times over, and would more than bound any continuing low-level releases such as those from postulated intermittent recriticality. . . . The overall source term in the case of a severe accident includes the type and amount of radionuclides, the heat energy in the plume associated with the release, the height of the release, the timing of release, and the maximum plume duration. . . . Pilgrim Watch does not even address the type and amount of radionuclides contained in releases, the heat energy in the plume associated with a releases, the height of releases, and the timing of releases considered in the SAMA analysis. Nor does Pilgrim Watch make any showing that consideration of its concerns would increase the benefit (risk averted) by a factor of more than two that is necessary to change the results of the SAMA analysis. As such, Pilgrim Watch’s newly proffered contention fails to raise a material dispute.<sup>62</sup>

Pilgrim Watch in its Reply to Entergy and the Staff again insists that it does not seek to reopen the record and argues among other things that “[t]he only reasonable hypothesis is that releases in a severe accident that are not limited to 24 hours but rather extend into days, weeks and months will increase offsite consequences affecting the cost-benefit analysis.”<sup>63</sup> With respect to studies cited by Entergy and Staff on re-criticality, Intervenor say that they “beg the issue,” because:

The studies that they cite refer to a potential or theoretical “possibility” of re-criticality, but what is now new and significant is that, as shown at Fukushima, what can really happen is ongoing releases extending into months – not only at Fukushima but also at the sister reactor Pilgrim. In discussing the “theoretical” possibility of re-criticality, the studies referred to by Entergy and Staff never talk about the duration of releases – the key dispute.

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<sup>61</sup> *Id.* at 15.

<sup>62</sup> Entergy Answer to May 2011 Contention at 31 (citing Entergy Decl. at ¶¶ 34-42).

<sup>63</sup> PW 6/13/11 Reply at 3.

**. . . . The maximum release duration that Entergy indicates that they modeled is 2½ hours.**<sup>64</sup>

Intervenor also suggests that the studies Entergy and Staff reference indicate knowledge on their part of re-criticality, which was never disclosed by them in the SAMA and MACCS2 code context.<sup>65</sup> Reiterating that “further analysis” is needed, Intervenor also cites an early study by the NRC that it says countered the argument in some of the studies referenced by Entergy and Staff claiming little or no recriticality. Specifically, although Pilgrim Watch refers to the document it cites as “NUREG-07,” I have determined that they apparently intended to cite NUREG-0772, a 1981 document issued by the Staff, in which it was among other things found that radionuclide releases from certain accident sequences studied in the 1975 Reactor Safety Study (which is cited by Entergy’s experts in their Declaration<sup>66</sup>) “may have been significantly overpredicted,” but that others were not.<sup>67</sup>

Pilgrim Watch contends that Entergy’s arguments and those of its experts are overly optimistic, challenges the lack of basis for the statement in Entergy’s expert Declaration that “there would simply be a ‘low-level release occurring over [the] extended period,’” and doubts the accidents analyzed in Entergy’s Pilgrim SAMA analysis involve “much larger” releases than at Fukushima.<sup>68</sup> It argues that

It is clear that Pilgrim Watch is not required to prove whether there would or would not be additional mitigation required after a reanalysis that modeled releases of longer duration and varied magnitude. This is because (i) the proceeding has not developed to summary disposition; and (ii) Entergy has not

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<sup>64</sup> *Id.* at 9-10 (emphasis in original).

<sup>65</sup> *Id.* at 11.

<sup>66</sup> See Entergy Decl. ¶ 20 (citing WASH-1400 (NUREG-75/014), Reactor Safety Study, An Assessment of Accident Risks in U.S. Commercial Nuclear Power Plants (Oct. 1975)).

<sup>67</sup> Technical Bases for Estimating Fission Product Behavior During LWR Accidents, NUREG-0772 (June 1981), Abstract at ii.

<sup>68</sup> PW 6/13/11 Reply at 17-18.

done the reanalysis now required. Therefore neither Pilgrim Watch nor Entergy can show that “there would be no changes in the results of the SAMA analysis” because the reanalysis required by NEPA to consider the new and significant information has not been done.<sup>69</sup>

Further, in addition to arguing that this is not the stage for summary disposition, Intervenor argues that, even if it is, if there is any doubt it should be denied, and that there are material facts in dispute.<sup>70</sup>

Arguing that the contention does establish a dispute, Intervenor characterizes such dispute as being “about the MACCS2 code used by Entergy in its SAMA is insufficient because it is unable to model releases of sufficient duration; and that they are required to figure out how to do this because releases of much longer duration are credible events post Fukushima – new and significant information.”<sup>71</sup> I note finally Pilgrim Watch’s argument challenging Entergy’s assertion that Intervenor did not show that its claim would affect the outcome and that to change the cost-benefit analysis the risk averted would need to be doubled. Intervenor again raises its earlier arguments, in support of that part of Contention 3 recently ruled on, about the SAMA analysis using “inadequate assumptions/limitations in the [MACCS2] code and Entergy’s inputs into the code.”<sup>72</sup>

#### Conclusions on May 2011 Fukushima Recriticality Contention

First, I find that the Fukushima Recriticality Contention meets the requirements of 10 C.F.R. § 2.309(f)(1). It is evident that Pilgrim Watch provides the specific statement of the issue and the brief explanation of the basis for the contention required by § 2.309(f)(1)(i) and (ii). Further, the SAMA-related issues the contention raises are clearly within the scope of this

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<sup>69</sup> *Id.* at 19.

<sup>70</sup> *Id.* at 25.

<sup>71</sup> *Id.* at 21.

<sup>72</sup> *Id.* at 23.

proceeding, as required under subsection (iii). Next, the contention is also sufficiently supported to meet the requirements of subsection (v). Finally, regarding the requirements of subsection (iv) and (vi) on materiality and showing a genuine dispute on a material issue of law or fact, whether or not the contention meets the “materially different result” reopening standard, I find Pilgrim Watch has provided enough for purposes of contention admissibility to demonstrate that the issues it raised are material to the findings the NRC must make in this license renewal proceeding, and to show a genuine dispute on a material issue. Mr. Chanin’s article, along with the other exposition put forward in the contention and adopted as his own by Mr. Chanin, raise issues that are significant, relevant and material, and that demonstrate a genuine dispute, sufficiently to warrant further inquiry and analysis.

Where the contention is weak is on the requirements of 10 C.F.R. §§ 2.326(a)(3) and (b) for a showing of a materially different result, and for an affidavit that meets certain requirements. Again, I look to the reality and not just the form, but here, I find the contention does not measure up, notwithstanding that I find it raises issues that do indeed warrant further inquiry, exploration and analysis. I can also appreciate many of Pilgrim Watch’s arguments, notwithstanding that they are not presented in the best manner and that many broad underlying arguments, such as that the standards for reopening do not apply, are in error. For example, in a sense Staff and Applicant’s arguments on continuing criticality seem counterintuitive, in that it would seem that months of releases would have to be significant on some level. And it is difficult to believe that information from Fukushima would not change *any* inputs on probability of various accident scenarios and related inputs.

However, when the respective presentations of Intervenor, NRC Staff, and Entergy are considered in the context of summary disposition and whether a genuine dispute on a material issue has been shown, Pilgrim Watch has a higher hurdle to overcome, as it recognizes in its arguments that “this is not summary disposition.” Too much of its presentation indeed consists of indications that further analysis is in order, or of what appears to be true, or bare assertions



such as what “the only reasonable hypothesis” would be. The positions of Entergy and the Staff on issues of recriticality and how significant any releases resulting from it would be may not be correct, and may in fact be overoptimistic. But even though others might at some point do so, Pilgrim Watch has not demonstrated a genuine dispute on these matters, based on the information presented in support of its May 2011 contention.

Pilgrim Watch June 1, 2011, Contention

In this contention Pilgrim Watch asserts the following:

Based on new and significant information from Fukushima, the Environmental Report is inadequate post Fukushima Daiichi. Entergy’s SAMA analysis ignores new and significant issues raised by Fukushima regarding the probability of both containment failure, and subsequent larger off-site consequences due to failure of the direct torus vent (DTV) to operate.<sup>73</sup>

Intervenor goes on to state that, “[i]n its SAMA analysis for PNPS, Entergy followed conventional NRC practice and assumed very low probabilities, not only that any accident would occur at all, but also that in the event of an accident there would not be:”

- (i) Pressure-build up within the containment;
- (ii) A significant delay in even attempting to vent the containment because of operator error;
- (iii) Failure/Inoperability of the Direct Torus Vent; and
- (iv) Catastrophic failure of the containment.<sup>74</sup>

Asserting that the “NRC years ago recognized that ‘Mark I failure within the first few hours following core melt would appear rather likely;’ a 90% likelihood of containment failure,” Pilgrim Watch contends that “[t]he events at Fukushima showed that there is an equally high likelihood that the supposed ‘fix,’ the DTV, will fail also.”<sup>75</sup> Intervenor states that “[t]hree direct torus vents should have opened, one at each of the three Fukushima Mark I reactors,” but that “[a]ll three

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<sup>73</sup> June 2011 Contention at 1.

<sup>74</sup> *Id.* at 1-2.

<sup>75</sup> *Id.* at 2.

failed to do so; and, as expected, all three containments failed.”<sup>76</sup> Based on this, it is alleged that “Entergy’s prior SAMA analysis, based on hopeful, purely theoretical ‘facts’ was plainly Inadequate,” and thus “[i]t must be required to conduct a new analysis – based on what Fukushima has taught about reality.”<sup>77</sup>

Pilgrim Watch supports its June contention with the Affidavit of Arnold Gundersen<sup>78</sup> and a number of other documents including the 1992 Pilgrim Individual Plant Examination for Internal Events Per GL-88-20,<sup>79</sup> various NRC and Atomic Energy Commission documents relating to pressure in containments and direct torus vents,<sup>80</sup> correspondence between the NRC and the Pilgrim station regarding issues including the DTV,<sup>81</sup> and various articles relating to Fukushima and filtered vents.<sup>82</sup> Mr. Gundersen has bachelor’s and master’s degrees in nuclear engineering, more than 35 years of professional nuclear experience, and states further as follows:

My declaration is intended to support Pilgrim Watch’s Request for Hearing and is specific to issues regarding the inadequacy of Pilgrim’s SAMA analysis. The SAMA does not consider new and significant issues raised at Fukushima regarding the lack of containment integrity of Pilgrim’s Mark I and demonstrated failure of the direct torus vent designed to save containment during pressure buildup.

I have reviewed the Request for Hearing and support its content.

. . . .

[F]or more than six years, I have disputed the NRC’s stand that containment systems simply do not and cannot leak, in testimony and in correspondence with the NRC; events at Fukushima have proven my testimony as true.

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<sup>76</sup> *Id.*

<sup>77</sup> *Id.*

<sup>78</sup> June 2011 Fukushima DTV Contention at 33.

<sup>79</sup> *Id.*, Exhibit 1.

<sup>80</sup> *Id.*, Exhibits 3A-3C, 5.

<sup>81</sup> *Id.*, Exhibits 11, 12.

<sup>82</sup> *Id.*, Exhibits 4, 6-10.

The explosions at Fukushima show that Pilgrim's DTV is unlikely to save Pilgrim's containment and huge amounts of radiation will be released. The subsequent offsite costs incurred from such an event justify additional mitigations to reduce the risk of DTV failure and loss of containment.<sup>83</sup>

Stating that the "purpose of a SAMA review is to ensure that any plant changes that have a potential for significantly improving severe accident safety performance are identified and addressed," Pilgrim Watch contends that "it plainly is necessary to redo Pilgrim's SAMA analysis to take into account new and significant information learned from Fukushima regarding the probability of containment failure in the event of an accident and the concomitant probability of a significantly larger volume of off-site radiological releases."<sup>84</sup> It argues *inter alia* that even if not quantifiable, important qualitative considerations must also be addressed in an EIS,<sup>85</sup> and that we "must consider issues raised by Fukushima prior to relicensing . . . because those events "plainly show that, even if they are not yet all conclusively understood, the environmental impacts of . . . relicensing . . . may 'affect the quality of the human environment in a significant manner or to a significant extent not already considered.'"<sup>86</sup> Because NEPA requires that agencies consider environmental impacts before decisions are made to ensure that "important effects will not be overlooked or underestimated only to be discovered after resources have been committed," we are urged not to rely on Entergy's 2006 SAMA analysis for the Pilgrim plant.<sup>87</sup>

Pilgrim Watch recounts that almost 40 years ago a "serious design flaw" was discovered in GE Mark I BWR reactors, for which the direct torus vent was then required by the NRC "to

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<sup>83</sup> *Id.* at 34, Affidavit of Arnold Gundersen ¶¶ 8-9, 12-13.

<sup>84</sup> June 2011 Fukushima DTV Contention at 2.

<sup>85</sup> *Id.* at 3 (citing 10 C.F.R. § 51.71).

<sup>86</sup> *Id.* at 4 (citing *Marsh*, 490 U.S. at 374, 372-3).

<sup>87</sup> *Id.* (citing *Robertson*, 490 U.S. at 349).

relieve pressure in order to save the containment by releasing unfiltered material directly into the air.”<sup>88</sup> Pilgrim Watch maintains that Entergy’s “theoretical assumption” that the DTV would work was the “underpinning of its assumed probabilities in accident consequences.”<sup>89</sup> Pilgrim Watch asserts that the “only real tests of the DTV – Unit 1, Unit 2, and Unit 3 at Fukushima, Marsh 2011 – all failed.”<sup>90</sup> It asserts that the “new and significant information concerning the likely failure of the DTV to prevent containment failure that now must be considered in Pilgrim’s SAMA analysis includes:

- (1) Properly trained operators decided not to open the DTV when they should have because they feared the effects offsite of significant unfiltered releases;
- (2) When the operators finally decided to open the DTV, they were unable to do so;
- (3) The failure of the DTV to vent led to containment failure/explosions that resulted in significant ongoing offsite consequences.<sup>91</sup>

In addition, the “new and significant issue is the likelihood that the DTV simply won’t work when release is required to save the containment.”<sup>92</sup>

Pilgrim Watch notes that as early as 1972, Dr. Stephen Hanauer, an AEC safety official, recommended:

[T]hat the Mark 1 pressure suppression system be discontinued and any further designs not be accepted for construction permits. Hanauer’s boss, Joseph Hendrie (later an NRC Commissioner) essentially agreed with Hanauer, but denied the recommendation on the grounds that it could mean the end the nuclear power industry in the U.S.<sup>93</sup>

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<sup>88</sup> *Id.* at 5.

<sup>89</sup> *Id.*

<sup>90</sup> *Id.* at 6.

<sup>91</sup> *Id.*

<sup>92</sup> *Id.*

<sup>93</sup> *Id.* at 7 (citing memoranda Exhibit 3 to June 2011 Contention) (ADAMS Accession No’s. ML1115304441, ML1115304431, ML1115304461).

Also, Intervenor states that three GE Nuclear engineers publicly resigned, “citing dangerous shortcomings in the GE design,”<sup>94</sup> and claims that an “NRC analysis of the potential failure of the Mark I under accident conditions concluded in a 1985 report that, ‘Mark I failure within the first few hours following core melt would appear rather likely.’”<sup>95</sup> In addition, Intervenor notes the past and present opposition of Harold Denton, a well-respected former NRC official, to the Mark I containment.<sup>96</sup>

Asserting that Fukushima proved these concerns to be correct, Intervenor also provides the following quotation from a 1990 NRC Staff response to an inquiry about the DTV, which follows discussion about the DTV:

During some ATWS [anticipated transient without scram] events, the pressure in the containment will rapidly increase. Venting pressure could be reached in a matter of minutes rather than hours. Therefore, venting may not prevent containment failure because of the high containment pressurization rate but would provide additional time to scram the reactor and delay the core melt.<sup>97</sup>

Pilgrim Watch alleges that “[a]s a result of GE’s design deficiency, the original design for a passive containment system was compromised in favor of a system that relied entirely on human control, despite all the associate risks of error and technical failure,” and further that the “design was further compromised by the NRC’s now highly questionable decision not to require that any release be filtered.”<sup>98</sup> Despite a recommendation on filtered venting, Pilgrim Watch avers, the NRC never followed up on this, and the

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<sup>94</sup> June 2011 Contention at 7 (citing Exhibit 4, found at [Http://www.bellona.org/articles/articles\\_2011/faulty\\_hydrogen\\_vents](http://www.bellona.org/articles/articles_2011/faulty_hydrogen_vents)).

<sup>95</sup> *Id.*

<sup>96</sup> *Id.* at 7-8 (citing “Reactor design in Japan has long been questioned,” NYT, March 15, 2011, in which Tom Zeller referenced “Denton Urges NRC to Settle Doubts About Mark I Containment,” Inside NRC, McGraw-Hill, Vol. 8, No. 12, June 9, 1986).

<sup>97</sup> *Id.* at 8 (quoting from Chairman Kenneth M. Carr, Responses to Concerns raised by W.R. Griffin, June 21, 1990, Enclosure 2, Response to Question 12, page 5 (Exh. 5 to June 2011 Contention) (ADAMS Accession No. 1115304410)).

<sup>98</sup> *Id.* at 9.

absence of such a filter at Fukushima caused “significant negative unintended consequences” that were in part due to a “several-hour delay in a decision to used the vents, as . . . managers agonized over whether to resort to emergency measures that would allow a substantial amount of radioactive materials to escape into the air.”<sup>99</sup>

Intervenor notes that “Entergy’s estimate of the cost of filtering the DTV at Pilgrim is \$3 million, . . . peanut[s] when compared to the damage from an unfiltered release, to say nothing of the costs of a containment failure occasioned by an intentional decision not to vent.”<sup>100</sup> Stating that an engineer at a Minnesota reactor warned about these problems and recommended “rupture disks, relatively thin sheets of steel that break and allows venting without any operator command or moving parts when the pressure reaches a specified level,” Pilgrim Watch further asserts that the NRC “gave into” the industry who questioned how a disk could be closed after an event.<sup>101</sup> Intervenor nonetheless notes that the Pilgrim DTV has a rupture disk, but points out that it is “downstream of valves” that “are normally closed and are designed to be opened either remotely from the control room or manually,”<sup>102</sup> and that the DTV “will vent excess pressure from the containment *only* if [these] normally closed valves . . . can be opened.”<sup>103</sup>

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<sup>99</sup> *Id.* (citing *Hidden Dangers: Japanese Officials Ignored or Concealed Danger*, New York Times, Hiroko Tabuchi, Keith Bradher, Matthew L. Wald (May 17, 2011) (Exhibit 7 to June 2011 Contention)).

<sup>100</sup> *Id.* at 9 n.8.

<sup>101</sup> *Id.* at 12.

<sup>102</sup> *Id.*

<sup>103</sup> *Id.* at 16.

At Fukushima, Intervenor states, personnel were “unable to open the normally closed valves in all three DTVs.”<sup>104</sup> The normally closed valves could not be opened from the control room, making the next step “to try to open the isolation valves manually – but this also proved impossible at Fukushima since radiation levels were too high.”<sup>105</sup> Thus, Intervenor suggests, at Pilgrim, where the control room has “2 key locked switches in series that have to be opened manually when the need to use the DTV occurs,” the same thing could occur.<sup>106</sup> Pilgrim Watch states that, contrary to initial reports that the Fukushima reactors did not have DTVs, its understanding is that they had the same unfiltered vents that Pilgrim has.<sup>107</sup>

Pilgrim Watch supports this contention with references to NUREG-0772, noted above,<sup>108</sup> as well as additional articles, one stating that three mechanisms the industry and the NRC use to “falsely trivialize offsite consequences” actually work as follows:

For accidents in which the damage is sufficient to open large pathways from the core to the containment, there will not be sufficient water available to trap the radioactive materials of concern, nor will the pathway be so torturous that a significant amount will [s]tick to surfaces before reaching the containment atmosphere. Similarly [i]f the containment fails early enough, there will be insufficient time for aerosols to settle in the reactor building floor.<sup>109</sup>

Intervenor suggests that redundancy to the DTV valves is not present but should be, and that two DC batteries should be required for the DTV, a 125VDC Bus “A” and a 125VDC

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<sup>104</sup> *Id.* at 17.

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

<sup>106</sup> *Id.*

<sup>107</sup> *Id.* at 12.

<sup>108</sup> See *supra* note 67 and accompanying text.

<sup>109</sup> June 2011 Fukushima DTV Contention at 19 (citing Bulletin of Atomic Scientists: Containment of a Reactor Meltdown, Frank von Hippel, March 15, 2011, n. 16 (Exhibit 6 to Contention)).

Bus “B.”<sup>110</sup> Intervenor also suggests that piping related to the DTV is buried underground and is therefore susceptible to corrosion.<sup>111</sup>

Summarizing and concluding its arguments and facts in support of its June 2011 contention, Pilgrim Watch advocates “new probability calculations, and contends that the NRC should, as members of the Near-Term Task Force indicated it was doing, “look[ ] at the effectiveness of the containment venting strategies,” based on two new significant pieces of information from Fukushima: First, “that we now know that an unfiltered vent has unintended consequences beyond poisoning unnecessarily offsite neighborhoods – It makes operators hesitant to use the vent until perhaps too late, upping the probability of containment failure/explosions.” Second, the “likely failure of the DTV itself,” based on the three failures of the DTVs at Fukushima.” Further, Intervenor contends:

The final cost of the Fukushima disaster remains to be calculated, but it is clearly billions of dollars. Entergy did not properly factor either reasonable probabilities of DTV failure, or the likely cost of failure, into its SAMA. Had Entergy done so, more SAMAs (such as DTV filters and redundant vent lines) are likely to be justified and the risk for the public will be reduced significantly.<sup>112</sup>

Pilgrim Watch notes the Application’s consideration of an accident sequence in which there is “operator failure to recognize the need to vent the torus,” but argues that “Entergy’s SAMA does not consider what actually happened at Fukushima – operators consciously deciding not to open the DTV for fear of serious contamination offsite, or failure of the DTV itself.”<sup>113</sup> Cited as supporting a finding of a “materially different result” is the assertion that “[t]he offsite consequences, without addressing the deficiencies

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<sup>110</sup> *Id.* at 20 (citing *Id.*, Exhibit 1).

<sup>111</sup> *Id.*

<sup>112</sup> *Id.* at 22.

<sup>113</sup> *Id.* at 23.



cited in the foregoing, would far outweigh the cost of mitigations to reduce risk of containment failure.”<sup>114</sup> Further:

In its SAMA analysis for PNPS, Entergy assumed very low probabilities, not only that any accident would occur at all, but also that in the event of an accident there would not be: pressure-build up within the containment; a significant delay in even attempting to vent the containment because of operator error; failure/inoperability of the Direct Torus Vent; and catastrophic failure of the containment and offsite consequences/costs. The NRC years ago recognized that “Mark I failure within the first few hours following core melt would appear rather likely;” a 90% likelihood of containment failure.

The events at Fukushima showed that there is an equally high likelihood that the supposed “fix,” the DTV, will fail also. Three Direct Torus Vents should have opened, one at each of three Fukushima Mark I reactors. All three failed to do so; and, as expected, all three containments failed.

Entergy’s prior SAMA analysis, based on hopeful, purely theoretical “facts” was plainly inadequate. It must be required to conduct a new analysis – based on what Fukushima has taught about reality. And in so doing, the “fixes” recommended would be cost effective to reduce very significant and unnecessary risk.<sup>115</sup>

Finally, Pilgrim Watch suggests that we have a duty to reopen the proceeding *sua sponte*.<sup>116</sup>

The NRC Staff argues that Pilgrim Watch’s June 2011 Fukushima DTV Contention does not meet the reopening requirements of 10 C.F.R. § 2.326, is not based on evidence that would likely change the outcome of the proceeding, is not timely, does not concern a significant safety issue, is not accompanied by an appropriate affidavit from an appropriate expert, and is not material or supported by an adequate factual basis.<sup>117</sup> Staff insists that Pilgrim Watch does not demonstrate a likely change in the cost-benefit conclusions of the SAMA analysis, which would

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<sup>114</sup> *Id.* at 29.

<sup>115</sup> *Id.* at 29-30.

<sup>116</sup> *Id.* at 31.

<sup>117</sup> NRC Staff ‘s Answer in Opposition to Pilgrim Watch’s Request for Hearing on a new Contention Regarding Inadequacy of Environmental Report, Post Fukushima (June 27, 2011) at 2.

require a doubling of averted costs or benefits,<sup>118</sup> but rather just “vaguely alleges that some additional SAMAs ‘are likely to be justified.’”<sup>119</sup> Noting the age of some of Pilgrim Watch’s sources, Staff asserts that the DTV contention could have been raised in the initial hearing request.<sup>120</sup> Reiterating its experts’ explanation of what a SAMA analysis is, Staff avers that “the SAMA analysis has no direct safety significance [and] merely augments existing programs to identify environmental mitigation alternatives that could ‘*further reduce* the risk at a plant that ha[s] no identified safety vulnerabilities.’ Accordingly, it does not, and indeed it cannot, raise an exceptionally serious issue.”<sup>121</sup>

In addition, Staff argues, the work of the Near-Term Task Force, “further decreases the significance of Pilgrim Watch’s claims” and illustrates that it is “duplicative,” addressing only “issues that have already been thoroughly studied and are being studied by the NRC in other contexts.”<sup>122</sup> Next, Staff questions the expertise of Mr. Gundersen in the subject of SAMA analyses, which “require modeling of extremely complex time and physical condition dependent phenomena.”<sup>123</sup> Because Pilgrim Watch has not demonstrated any “additional, potentially cost-beneficial SAMAs,” Staff asserts, it does not raise a material issue in the June contention.<sup>124</sup>

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<sup>118</sup> *Id.* at 6-7. Staff notes that the SAMA analysis, while not finding that installation of a filtered vent would reduce core damage frequency, did find that it “would reduce population dose by 18%,” with a benefit ranging from \$827,000 to \$1,220,000. *Id.* at 7 n.4..

<sup>119</sup> *Id.* at 8 (citing June 2011 Contention at 29).

<sup>120</sup> *Id.* at 10.

<sup>121</sup> *Id.* at 11 (citing Bixler and Ghost Affidavit responding to May 2011 Contention at 4-5).

<sup>122</sup> *Id.* at 12-13. Staff also denies that Pilgrim Watch has “not demonstrated that the information in the New Contention provides a ‘seriously different picture of the environmental impact’ of relicensing.” *Id.* at 13 n.9.

<sup>123</sup> *Id.* at 15.

<sup>124</sup> *Id.* at 18.

Nor, Staff urges, does the contention have an adequate factual basis, providing only “bare assertions and speculation” and unreliable articles.<sup>125</sup> Staff argues:

Moreover, even if United States operators refrained from venting, the SAMA analysis already contains an uncertainty factor that accounts for human error. Pilgrim Watch has not attempted to show how the facts cited in the newspaper article would impact the existing provision for human error in the uncertainty factor.<sup>126</sup>

Characterizing Pilgrim Watch’s discussion of the unpredicted failure of the DTVs in Japan as speculation, Staff faults Pilgrim Watch for “not provid[ing] any information or testimony to indicate how that speculation will impact the SAMA analysis.”<sup>127</sup> In addition, the reference to corrosion in underground pipes is speculative and unconnected to the SAMA analysis, Staff argues.<sup>128</sup>

Entergy likewise argues that the June 2011 Fukushima DTV Contention fails to demonstrate a genuine dispute with the Application, in addition to not addressing or meeting the reopening or late-filed contention standards, failing to show materiality, and lacking sufficient support.<sup>129</sup> Entergy claims that Pilgrim Watch is “factually incorrect because the Pilgrim SAMA analysis is based on a site specific estimate of accident probabilities that fully takes in to account pressure build-up within the containment, operator error in failing to vent the containment, failure or inoperability of the DTV itself, and catastrophic failure of the

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<sup>125</sup> *Id.* at 18-20.

<sup>126</sup> *Id.* at 20 (citing Pilgrim Nuclear Power Station, Applicant’s Environmental Report, Operating License Renewal Sage, Attachment E, at E.1-2 (Jan. 27, 2006) (ADAMS Accession No. ML060300029)).

<sup>127</sup> *Id.*

<sup>128</sup> *Id.* at 21-22.

<sup>129</sup> Entergy Answer to June 2011 Fukushima DTV Contention at 1-2.

containment.”<sup>130</sup> Applicant also notes that “how” NEPA requirements are met are in the discretion of the agency, and a hearing is not mandated.<sup>131</sup>

Further, in addition to making various arguments on timeliness and the standard for significance that are similar to ones previously made and which I will not recount here, Entergy criticizes Pilgrim Watch for failing to quantify costs associated with DTV inoperability, and engaging in mere speculation and bare assertions, with no support.<sup>132</sup> Challenging the expertise of Mr. Gundersen, Entergy takes issue with the exact experience that he had, suggesting that he overstates it by claiming to be a “Senior Vice President for nuclear licensee,” when in fact this was for a materials licensee and not a power plant licensee, and claims he lacks expertise in DTV reliability, containment failure, and SAMA analysis.<sup>133</sup>

Entergy provides in support of its own arguments an official report of the Government of Japan, which indicates that DTV operations, although difficult, were “successfully undertaken” at two of the reactor units, and that, although two of the secondary containments were damaged, only one unit suffered primary containment failure.<sup>134</sup> Entergy goes on to claim that the Pilgrim SAMA analysis “fully address[es]” pressure build-up, operator error and DTV failure, hydrogen explosion, containment breach, and much larger radioactive releases than at Fukushima.<sup>135</sup>

Entergy also provides the Declaration of Dr. O’Kula, Joseph R. Lynch, and Lori Ann Potts, the latter two of whom hold bachelor’s degrees in mechanical engineering and nuclear

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<sup>130</sup> *Id.* at 9.

<sup>131</sup> *Id.* at 11.

<sup>132</sup> *Id.* at 19-20.

<sup>133</sup> *Id.* at 21-22.

<sup>134</sup> *Id.* at 23-24.

<sup>135</sup> *Id.* at 24-25.

engineering, respectively.<sup>136</sup> They provide a very detailed exposition of the Pilgrim SAMA analysis as it relates to DTV operation and failure, containment failure, and hydrogen explosions, among other things. They assert that Pilgrim Watch's characterization of Fukushima as involving a catastrophic failure of the primary containments for all three units is incorrect, citing the Report of the Japanese Government noted above.<sup>137</sup> They acknowledge that the report is a "preliminary" report, but put it forward as providing a comprehensive and relatively accurate portrayal of the accident that summarizes "known facts concerning the accident."<sup>138</sup> They state that this report summarizes its results as follows:

DTVs were successfully operated for at least Units 1 and 3. Furthermore, while it is clear that the reactor building structures, or secondary containments, of Units 1 and 3 were damaged by explosions likely caused by hydrogen accumulation and ignition within those structures, there is absolutely no evidence suggesting "catastrophic" failures of those units' primary containments, which house the reactor vessels. These units' primary containments continue to contain the overwhelming majority of their respective core inventories. Indeed, it is estimated that for Fukushima Units 1 and 3, approximately 99% of the radionuclide content remains contained. Report at IV-42 – IV-43, IV- 75 (estimating core inventory release fractions for Fukushima Units 1 and 3). Although the known facts are less clear with respect to whether the Unit 2 DTV was operated and the status of its primary containment, the Report estimates that 93%-99% of the radionuclide inventory remains contained. See Report at IV-42 – IV-43, IV-59, IV-75 (estimating core inventory release fractions for Fukushima Units 1-3).<sup>139</sup>

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<sup>136</sup> Declaration of Joseph R. Lynch, Lori Ann Potts, 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 (June 27, 2011) at 1-3.

<sup>137</sup> *Id.* at 6 (citing Report of Japanese Government to the IAEA Ministerial Conference on Nuclear Safety – The Accident at TEPCO's Fukushima Nuclear Power Stations, Nuclear Emergency Response Headquarters, Government of Japan (June 2011)( Exhibit 4 to Declaration)). The declarants also cite an International Atomic Energy Agency (IAEA) Report that is consistent with the Japanese report, entitled "Mission Report: The Great East Japan Earthquake Expert Mission," IAEA International Fact Finding Expert Mission of the Fukushima Daiichi NPP Accident Following the Great East Japan Earthquake Tsunami (May 24 -June 2, 2011). *Id.* at 7 n.4.

<sup>138</sup> *Id.* ¶ 14.

<sup>139</sup> *Id.*

Declarants state that, “[c]omparatively, the releases assumed in the Pilgrim SAMA analysis for containment failure are much larger than the apparent releases from all three Fukushima units combined.”<sup>140</sup>

Describing the Pilgrim DTV, declarants state:

Venting through the DTV requires no external power as the primary containment pressure provides the motive force. The system lineup is achieved by opening two separate valves, whose normal electrical and pneumatic power are “essential” (i.e., supported by multiple, redundant, dedicated electrical and pneumatic supplies), and the system is also designed to be operated manually. A 30 pound-force per square inch gauge (“psig”) rupture disk is in the flowpath to preclude inadvertent releases from the system. The Control Room Shift Manager has the authority to direct operation of the system in accordance with Pilgrim specific procedures. The system was designed, installed, and approved between 1986 and 1989 and has been subject to routine and regular maintenance. Training on the operation of the system is part of the licensed operator training program.

The NRC’s Extensive Damage Mitigation Guidelines (“EDMGs”), which are a series of requirements implemented by the NRC following the events of September 11, 2001, further enhance operators’ ability to utilize the DTV and address other severe accident mitigation parameters in circumstances where no external power sources may be available. Procedural guidance, trained and licensed personnel, and pre-staged equipment are available for manual, local operation of both DTV valves, should the diverse and redundantly powered valves of the normal system, the containment atmospheric control system, and the DTV system not be available because of loss of power.<sup>141</sup>

Noting that the Japanese Report details when and how DTV venting operations were undertaken for each unit, the declarants point out that it indicates that work at Unit 1 was difficult but judged to have been accomplished when pressure was reduced, and that similarly it was difficult to achieve in Unit 3, but confirmed by increased radiation levels and decreased pressure. They indicate the Report says it is not clear whether the DTV in Unit 2 was

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<sup>140</sup> *Id.*

<sup>141</sup> *Id.* ¶¶ 17-18.

successfully operated.<sup>142</sup> Further, they note that the Report “questions the effectiveness of the venting system.”<sup>143</sup>

Entergy’s experts also state that Pilgrim’s DTV differs from the Fukushima DTVs, undercutting the comparisons made by Pilgrim Watch.<sup>144</sup> Specifically, they state:

First, Pilgrim is a single unit plant that does not share vent lines with other units. Second, the Pilgrim DTV was constructed of welded piping over its entire length, and designed, built, and qualified to the same criteria as the Pilgrim primary containment, and this level of quality is maintained until the piping exits the secondary containment. This means that the DTV pipe does not connect with any other systems until exiting the secondary containment, thus minimizing the potential for any leakage of gases into the secondary containment (i.e., reactor building) such as which occurred at Fukushima. . . . In addition, Pilgrim has diverse, redundant sources of offsite power {and its] design is different. The external electrical sources utilize different physical routing, and are spatially isolated from each other, with overhead and underground routes precluding failures of one source adversely affecting the other source.<sup>145</sup>

In addition, they state:

Pilgrim’s procedures for DTV operation differ significantly from those governing the Fukushima DTVs. The Report’s description of how those procedures were carried out at Fukushima also varies significantly from how Pilgrim’s procedures would be carried out under similar circumstances.

. . . .  
the Fukushima procedures call for DTV operation before maximum operating pressure is reached when RHR is available, or, if RHR is unavailable, the procedures call for DTV use before twice the maximum operating pressure is reached. In both cases, the DTV can be used only with authorization from the chief of emergency response headquarters.<sup>146</sup>

In describing Pilgrim’s procedures, they state the following:

First, Entergy’s operational and severe accident procedures clearly identify the actions that are to be undertaken by plant personnel under different plant circumstances. These procedures require Entergy to vent the primary containment using the DTV long before the Fukushima operators attempted that

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<sup>142</sup> *Id.* ¶¶ 23-24.

<sup>143</sup> *Id.* ¶ 25.

<sup>144</sup> *Id.* ¶ 26.

<sup>145</sup> *Id.* ¶ 27 (citing Japanese Report at 9).

<sup>146</sup> *Id.* ¶ 28.

same operation. Pilgrim Emergency Operating Procedures EOP-03 and 5.4.6 detail the steps that operators are to follow, starting at a containment pressures of 2.2 psig, for venting using the standby gas treatment system (“SGTS”) to restore containment pressure to less than 2.2 psig. Multiple piping pathways are available to reduce containment pressure below 2.2 psig.

Second, Pilgrim’s procedures provide the Control Room Shift Manager with the authority and direction to utilize the DTV long before reaching a level that could challenge the primary containment, so that authorization from someone outside the plant is not needed. Based on multiple references in the Japanese Government Report, the level of authority required to allow use of the DTVs at Fukushima was a “Minister” level in the government. With multiple nuclear units involved, and infrastructure unavailable because of the earthquake, tsunami, and nuclear emergency, the delays in operating the DTV are therefore explainable, but would not be analogous to Pilgrim, where the decision and authority to operate the DTV rest with the control room Shift Manager.<sup>147</sup>

Declarants state that the Pilgrim SAMA analysis “assumed realistic probabilities that an accident would occur, and considered pressure buildup within the primary containment, operator error . . . , failure of the DTV to operate as intended, primary containment breach, and large radioactive releases,” and provides a great amount of detail explaining how these factors are identified and taken into account.<sup>148</sup>

One illustrative example addresses human reliability factors, a concern of Pilgrim Watch’s. On this, Entergy experts state:

[T]he probability that the operators will fail to vent containment using the DTV is considered in basic event CIV-XHE-FO-DTV. The failure probability for this event was calculated using PRA Human Reliability Analysis (“HRA”) techniques. HRA evaluates the individual tasks necessary to perform an action, the time available to perform the action, the time it takes to perform the action, and factors which influence the ability of the operators to successfully perform the action. The factors influencing the ability of an operator to successfully perform an action are called performance shaping factors. Consideration of the impact of each performance shaping factor is plant-specific and sequence-specific. Also, the influences are confirmed by such techniques as talk-throughs, walkdowns, field observations, simulations, and examination of past events in order to be realistic. Examples of performance shaping factors considered in the Pilgrim HRA include the following:

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<sup>147</sup> *Id.* ¶¶ 31-32.

<sup>148</sup> *Id.* ¶ 42, ¶¶ 43-53.



- Applicability and suitability of training and experience.
- Suitability of relevant procedures and administrative controls.
- Availability and clarity of instrumentation (cues to take actions as well as to confirm expected plant response to the action).
- Time available and time required to complete the action, including the impact of concurrent and competing activities.
- Complexity of required diagnosis and response.
- Workload, time pressure and stress.
- Team/crew dynamics and crew characteristics.
- Available staffing and resources.
- Ergonomic quality of human-system interface.
- Environment in which the action needs to be performed.
- Accessibility and operability of equipment to be manipulated.
- The need for special tools (keys, ladders, hoses, clothing such as to enter a radiation area).
- Communications (strategy and coordination) as well as whether one can be easily heard.
- Special fitness needs for situations expected to involve the use of heavy or awkward tools/equipment, carrying hoses, climbing, etc.
- Consideration of “realistic” accident sequence diversions and deviations (e.g., extraneous alarms, failed instruments, outside discussions, sequence evolution not exactly like that trained on).

Thus, the Pilgrim SAMA analysis considers a wide range of factors affecting human performance.<sup>149</sup>

Declarants describe how the SAMA analysis does consider early containment breach and hydrogen explosions, as well as large releases, which they state “bound several times over the releases that occurred from Fukushima.”<sup>150</sup> They also note the following change in information as it became available:

Subsequent to the development of the comparisons in the Sowdon/O’Kula Declaration, the Japanese authorities increased their estimate of the radioactive release from Fukushima by about 22% above the estimates used in the

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<sup>149</sup> *Id.* ¶¶ 56-57.

<sup>150</sup> *Id.* ¶ 63; ¶¶ 58-59.

Sowdon/O’Kula Declaration. This increase has no effect on the conclusions drawn from the comparisons made in Table 5 of the Sowdon/O’Kula Declaration. As noted there, “even if Fukushima radionuclide release estimates were to double, CAPB-15 (which contributes over 80% of the PDR and OECR to the Pilgrim SAMA analysis) would still bound the estimated I-131 releases from all of the Fukushima facilities by about a factor of two (1.78) and the estimated Cs-137 releases by about a factor of three (2.66). Thus, the radionuclide releases assumed in the Pilgrim SAMA analysis far exceed actual releases at Fukushima.

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In addition, the fraction of the Fukushima Units’ core inventories released into the environment, based on measurements and computer model backed calculations reported to date by the Japanese government, Report at IV-42 – IV-43, IV-59, IV-75, is more than bounded by the Pilgrim SAMA-basis CAPBs.<sup>151</sup>

In reply, Pilgrim Watch contends that a dispute exists on at least the increased probability of containment failure and a large release, and the cost-effectiveness of upgrading the DTV,<sup>152</sup> and argues that it has provided sufficient information to establish a dispute “regarding the probability of containment failure and subsequent larger off-site consequences due to failure of the [DTV].”<sup>153</sup>

#### Conclusions on June 2011 Fukushima DTV Contention

I find Intervenor has made all the requisite showings in this contention, notwithstanding the information provided in the Entergy experts’ Declaration, including their explanation of information from the preliminary Japanese report on, for example, which DTVs operators were able to open, and how quickly and successfully. Of course, the information from that report, which provides useful detail on what occurred during the accident, should not be discounted, but

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<sup>151</sup> *Id.* ¶¶ 66-67 (citing Sowdon/O’Kula Declaration at 24 n.16).

<sup>152</sup> PW 7/5/11 Reply at 16.

<sup>153</sup> *Id.* at 26. I do not address Entergy’s Motion to Strike Portions of Pilgrim Watch Reply to Entergy and the NRC Staff Answers Opposing Pilgrim Watch Request for Hearing on a New Contention (July 15, 2011), because I do not find the information at issue to be necessary to my conclusions. If there were ever to be a hearing on the matters at issue in the June 2011 Contention, however, some of the information Entergy challenges might well be relevant such that it should be considered along with any other relevant evidence. In any event, whatever the ultimate outcome on the matters at issue, it would seem inappropriate not to consider whatever evidence is available and relevant on any issue in dispute.

it should also be recognized that it is also not finally determinative on all issues it addresses.

The question is, whether a dispute on any issues has been shown by Pilgrim Watch.

I find that Intervenor has shown that there are genuine disputes on material facts regarding increased probability of containment failure and a large release, the role of the DTV in this, and the cost-effectiveness of upgrading the DTV. Intervenor demonstrates these disputes through information relating to the Fukushima accident, as well as older information that provides additional insights on aspects of the accident and on any accident that might occur at another Mark I BWR like Pilgrim.

The Fukushima-related information is not quantified, but as Intervenor argues, citing 10 C.F.R. § 51.71, this rule requires that, “[t]o the extent that there are important qualitative considerations or factors that cannot be quantified, these considerations or factors will be discussed in qualitative terms.”<sup>154</sup> Intervenor urge that, “it plainly is necessary to redo Pilgrim’s SAMA analysis to take into account new and significant information learned from Fukushima regarding the probability of containment failure in the event of an accident and the concomitant probability of a significantly larger volume of off-site radiological releases.”<sup>155</sup>

It would indeed seem to me to be “plain” and almost self-evident that a severe accident involving the same type of reactor, even one occurring in a foreign country where earthquakes and tsunamis may be more likely, would need at least to be taken into account in determining the probabilities to assign to various accidents and consequences analyzed in the SAMA analysis, as well as to the cost-benefit analysis relating to the DTV filter mitigation alternative. As the Licensing Board in the *Calvert Cliffs* proceeding observed, “NRC Staff cannot evade its NEPA obligation to thoroughly explore reasonable alternatives by claiming that doing so would

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<sup>154</sup> 10 C.F.R. § 51.71(d).

<sup>155</sup> June 2011 Fukushima DTV Contention at 2.

not change its conclusions,”<sup>156</sup> and the same would reasonably seem to apply in the SAMA analysis context of the June contention. In this instance this NEPA obligation might or might not mandate that the Staff require Entergy to redo the SAMA analysis, taking what is known about the Fukushima accident into account with respect to the probabilities questioned by Pilgrim Watch. I find, however, that it does warrant a further “hard look” by the Staff with respect to the SAMA analysis, and possible supplementation of the EIS, prior to a decision on the License Renewal Application.

Again, I realize that to do this would cause additional delay in this proceeding, which I agree should be avoided to the extent possible and reasonable. However, I find that Pilgrim Watch has shown that the Fukushima accident constitutes good cause for reexamining the probability calculations in the SAMA analysis.

Entergy has provided a great deal of information on what the status quo is with respect to the Pilgrim SAMA analysis, including human reliability factors, as well as information suggesting that only one DTV failed and only one primary containment failed. But matters of human reliability and training are, of course, dependent on how well they are implemented, and most of the other information provided by Entergy, while describing what is included in the Pilgrim SAMA analysis, does not necessarily indicate that the provisions of the SAMA analysis are immune to challenge, or unchangeable in the face of new information. And while information on the fact of the Fukushima accident and some of its consequences is becoming clearer, even if not quantifiable, the Japanese report on the extent of the DTV failures is preliminary.

I do not find that any of the information provided by Entergy negates any dispute on the issues in question in Pilgrim Watch’s June 2011 contention. Nor, I find, do the Staff’s

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<sup>156</sup> See *supra* text accompanying note 17.

arguments – including those relating to, for example, the need to show a “doubling of averted costs or benefits,” and to the expertise of Mr. Gundersen – negate a dispute. Also, as I note *supra*, it is possible that using the 95<sup>th</sup> percentile rather than the mean in the SAMA analysis could make a difference, and this issue is still before the Commission on appeal.<sup>157</sup>

In reaching the preceding conclusions, I look back to our consideration of Contention 3, which was initially admitted based on information that was on a par with the current information provided by Pilgrim Watch, and which was ultimately remanded by the Commission after summary disposition was granted by a majority of the board, based on a similar level of evidence. Just as in this instance, Pilgrim Watch was unable with respect to Contention 3 to show whether or how the outcome of the SAMA cost-benefit conclusions would be changed,<sup>158</sup> but the Commission nonetheless reversed the summary disposition ruling and remanded for a new hearing on parts of the original contention. That ruling implicitly acknowledged that it is, as a practical matter, unreasonable to expect, even in a reopening context, any intervenor, even one with large resources, to challenge particular minute and complex calculations and computer modeling in a SAMA analysis on the level Entergy and Staff seek to require at this point. Nor can this Intervenor be expected to be precisely correct on every fact arising out of the Fukushima accident, given the progressive nature of the production of such information, which even the Japanese report recognizes.

But Pilgrim Watch does provide detailed challenges, with support, on the issues raised in its June 2011 contention. Mr. Gundersen is a nuclear engineer with years of experience in multiple areas including nuclear plant operation, nuclear safety assessments, reliability

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<sup>157</sup> See *supra* note 5.

<sup>158</sup> See CLI-10-11, 71 NRC at \_\_\_ (slip op. at 18-19).

engineering, and criticality analysis, to name just a few.<sup>159</sup> He adopts the whole of Pilgrim Watch's June 2011 contention and basis as his own, and I would accept this as reasonable given Pilgrim Watch's *pro se* status, just as I would accept as legitimate support for the contention the sources Intervenor uses, whether or not they are all as authoritative as the Japanese and IAEA reports Entergy provides, the first of which, as Entergy concedes, is admittedly "preliminary," and the second of which must certainly be so as well. This is not to say that I accept Pilgrim Watch's sources as true, merely that I accept them as providing support that is sufficient to warrant further inquiry, and sufficient to show the likelihood of a materially different result, by demonstrating a genuine dispute on material issues of fact.

Again, as with Pilgrim Watch's January 2011 Cables Contention, I look at the substance and reality of what Pilgrim Watch provides, and do not find it appropriate to deny its June 2011 contention on the basis that Intervenor did not file a formal motion to reopen or that Mr. Gundersen did not include in his Affidavit everything that he clearly indicates he supports in the contention and its basis, or formally swear to his Affidavit's truthfulness, an easily curable defect, to the extent it is a defect. To so deny the contention would again, in my view, be to elevate form over substance, and fail to appropriately take into account Pilgrim Watch's *pro se* status. And to proceed in this manner does not violate any regulatory provisions or reasonable standards of fair play, nor does it constitute supplying for the intervenor any required elements.

To be sure, much of the information Pilgrim Watch provides in support of the contention is old, but as indicated above, this information merely provides context and support for its central premise that new information from Fukushima raises significant issues with respect to the probability of containment failure, large releases, DTV failure, and whether the DTV should be upgraded by adding a filter.

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<sup>159</sup> June 2011 Contention at 33.

In sum, I find that Pilgrim Watch has shown the likelihood of a materially different result in this proceeding, as required by 10 C.F.R. § 2.326(a)(3) and (b), by demonstrating genuine disputes on material issues of fact, concerning the increased probabilities of DTV failure, containment failure, and large releases, as a result of information arising out of the Fukushima accident, as well as the potential need for and cost-effectiveness of upgrading the DTV as Pilgrim Watch asserts. I find that, through the quite detailed support provided for the contention, which Mr. Gundersen supports and effectively adopts as his own, Pilgrim Watch has shown that it could defeat a summary disposition motion on the “complex, fact-intensive issues”<sup>160</sup> that are involved in Pilgrim Watch’s June Fukushima DTV Contention. As the Commission observed in CLI-10-11, “genuine factual questions remain” with respect to the complex – and important – matters at issue.<sup>161</sup>

I also find that the June 2011 DTV Contention meets the requirements of 10 C.F.R. § 2.309(f)(1). Again, it is evident that Pilgrim Watch provides the specific statement of the issue and the brief explanation of the basis for the contention required by § 2.309(f)(1)(i) and (ii). Further, the SAMA-related issues the contention raises are clearly within the scope of this proceeding, as required under subsection (iii). Next, as discussed above, the contention is also sufficiently supported to meet the requirements of subsection (v). Finally, regarding the requirements of subsection (iv) and (vi) on materiality and showing a genuine dispute on a material issue of law or fact, as discussed with reference to the “materially different result” reopening standard, I find Pilgrim Watch has provided enough to demonstrate a genuine dispute on material issues of fact.

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<sup>160</sup> See CLI-10-11, 71 NRC at \_\_ (slip op. at 23).

<sup>161</sup> *Id.* at \_\_ (slip op. at 25).

I would therefore admit the June 2011 “Fukushima DTV” contention, unless, as a result of the Near-Term Task Force Recommendations, it is in the near future determined that the matters at issue will soon be the subject of rulemaking.

*Sua Sponte Recommendation*

In conclusion, NRC case law supports the practice of licensing boards *sua sponte* raising significant environmental and safety issues.<sup>162</sup> This practice should be used sparingly, of course, but when issues are deemed sufficiently significant, precedent supports it as a responsibility. Therefore, with all due respect for both the NRC Staff and the Applicant, as well as for the Commission and its time in these days of challenging circumstances on several fronts, I find that there are significant issues warranting my *sua sponte* making the following recommendation to the Commission:

That, to the extent that the issues raised by Pilgrim Watch in its May and June 2011 Fukushima-related contentions do not ultimately through appeal end up again before this Licensing Board, the Commission consider having the Staff look more closely – take a “hard look” – into the issues raised in these contentions, as well as any other issues arising out of the Fukushima Daiichi accident that relate particularly to Mark I BWR reactors, prior to any decision on the license renewal application, for the purpose of supplementing at least the SAMA analysis part of the Pilgrim EIS, as appropriate based on new and significant information arising out of the accident at the Fukushima Daiichi nuclear power plant, as informed by existing information. I believe this would serve the interests of both public safety and public trust in the process the NRC utilizes for attending to such safety and environmental issues, which I find is particularly warranted given the seriousness of the Fukushima accident and the effect it has had on public perceptions of the safety of nuclear power – a public who must trust those responsible for regulating this very complex and important area of human enterprise, which can serve the public well, but can also threaten it in the event of accidents like that at Fukushima. Whatever the outcome of such an inquiry, in my view taking such a “hard look” would provide an important public service, in addition to satisfying relevant NEPA requirements.

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<sup>162</sup> See, e.g., *Consol. Edison Co. of N.Y.* (Indian Point Nuclear Generating Units 1, 2 & 3), ALAB-319, 3 NRC 188, 190 (1976); *Tenn. Valley Auth.* (Hartsville Nuclear Plant, Units 1A, 2A, 1B & 2B), ALAB-380, 5 NRC 572 (1977); *Houston Lighting & Power Co.* (South Texas Project, Units 1 & 2), LBP-85-8, 21 NRC 516, 519 (1985).



I understand the time implications of this, and do not recommend it lightly, but find these issues to be sufficiently significant to warrant such action.

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter of )  
)  
ENTERGY NUCLEAR GENERATION CO. )  
AND )  
ENTERGY NUCLEAR OPERATIONS, INC. ) Docket No. 50-293-LR  
)  
(Pilgrim Nuclear Power Station) )

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing MEMORANDUM AND ORDER (CORRECTED VERSION OF SEPTEMBER 8, 2011 MEMORANDUM AND ORDER DENYING PILGRIM WATCH'S REQUESTS FOR HEARING ON NEW CONTENTIONS RELATING TO FUKUSHIMA ACCIDENT) (LBP-11-23) have been served upon the following persons by Electronic Information Exchange (EIE) and by electronic mail as indicated by an asterisk\*.

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Dated at Rockville, Maryland  
this 13<sup>th</sup> day of December 2011