

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

Before Administrative Judges:

Ann Marshall Young, Chair  
 Dr. Gary S. Arnold  
 Dr. Alice C. Mignerey

In the Matter of

LUMINANT GENERATION COMPANY, LLC  
 (Comanche Peak Nuclear Power Plant,  
 Units 3 and 4)

Docket Nos. 52-034-COL and 52-035-COL

ASLBP No. 09-886-09-COL-BD01

June 25, 2010

**MEMORANDUM and ORDER**  
**(Ruling on Mootness of Contentions 13 and 18, and New Environmental Contentions)**

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## I. Introduction and Background

The Licensing Board rules herein on various matters relating to two of the Intervenor's original contentions in this proceeding, which involves the Combined Operating License (COL) Application of Luminant Generation Company (Luminant or Applicant) for two new nuclear reactors at its Comanche Peak site.<sup>1</sup> Intervenor Sustainable Energy and Economic Development (SEED) Coalition, Public Citizen, True Cost of Nukes, and Texas State Representative Lon Burnam have challenged this Application and shown standing to participate collectively as a party in the proceeding.<sup>2</sup> The only two contentions admitted in the proceeding prior to our rulings herein concern the Applicant's alleged failure, or omission, to include consideration of certain information in its Environmental Report (ER), having to do with the impacts of a severe radiological accident at one unit on operation of the other units also located at the Comanche Peak site (original Contention 13), and with alternatives to the proposed new units consisting of combinations of renewable energy sources such as wind and solar power with certain storage methods and supplemental use of natural gas to create baseload power (original Contention 18).<sup>3</sup> Applicant subsequently amended its ER to include discussion related to these issues, and moved to dismiss the two original admitted contentions on the basis of mootness.<sup>4</sup> Intervenor contest the mootness of the original contentions and present new

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<sup>1</sup> See Letter Transmitting Combined License Application for Comanche Peak Nuclear Power Plant, Units 3 & 4 (Sept. 19, 2008) (ADAMS Accession No. ML082680250); <http://www.nrc.gov/reactors/new-reactors/col/comanche-peak/documents.html> [hereinafter Application or COLA]; see also Notice of Receipt and Availability of Application for a Combined License, 73 Fed. Reg. 66,276 (Nov. 7, 2008).

<sup>2</sup> See *Luminant Generation Co., LLC* (Comanche Peak Nuclear Power Plant, Units 3 and 4), LBP-09-17, 70 NRC \_\_, \_\_ (slip op. at 84) (Aug. 6, 2009).

<sup>3</sup> See *id.* at \_\_, \_\_, \_\_ - \_\_ (slip op. at 68, 82, 84-85).

<sup>4</sup> See Letter from Jonathan M. Rund, Counsel for Luminant, to Ann Marshall Young *et al.* (Dec. 8, 2009), with attached Letter from Rafael Flores to NRC Document Control Desk (Dec. 8, 2009), with attached COL Application Part 3, Environmental Report Revision 1, Update Tracking Report Revision 0 (Dec. 7, 2009) (ADAMS Accession No. ML093440179) [hereinafter

contentions challenging the Applicant's amendments to its ER,<sup>5</sup> in regard to which Responses and Replies have been filed.<sup>6</sup>

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Alternatives ER Revision or ER Revision]; Luminant's Motion to Dismiss Contention 18 as Moot (Dec. 14, 2009) [hereinafter Motion to Dismiss Contention 18]; Letter from Jonathan M. Rund, Counsel for Luminant, to Ann Marshall Young *et al.* (Jan. 15, 2010), with attached Letter from Rafael Flores to NRC Document Control Desk (Jan. 15, 2010), with attached COL Application Part 3, Environmental Report Revision 1, Update Tracking Report, Contention 13 (Jan. 15, 2010) (ADAMS Accession No. ML100191529); Letter from Jonathan M. Rund, Counsel for Luminant, to Ann Marshall Young *et al.* (Jan. 19, 2010), with attached Letter from Rafael Flores to NRC Document Control Desk (Jan. 19, 2010), with attached COL Application Part 3, Environmental Report Revision 1, Update Tracking Report Revision 2 (Jan. 19, 2010) (ADAMS Accession No. ML100192101) [hereinafter Co-Location ER Revision or ER Revision]; Luminant's Motion to Dismiss Contention 13 as Moot (Jan. 25, 2009) [hereinafter Motion to Dismiss Contention 13].

<sup>5</sup> See Intervenors' Response Opposing Applicant's Motion to Dismiss Contention 18 as Moot (Jan. 4, 2010) [hereinafter Intervenors' Mootness Response Contention 18]; Letter from Robert V. Eye, Counsel for Intervenors, to Ann Marshall Young *et al.* (Jan. 7, 2010); Intervenors' Response to Applicant's Motion to Dismiss Contention 13 as Moot (Feb. 4, 2010) [hereinafter Intervenors' Mootness Response Contention 13]; Intervenors' Contentions Regarding Applicant's Revisions to Environmental Report Concerning Alternatives to Nuclear Power (Jan. 15, 2010) [hereinafter Alternatives Contentions] (attaching Raymond H. Dean, Ph.D., Comments Regarding Luminant's Revision to the Comanche Peak Nuclear Power Plant, Units 3 & 4 COL Application Part 3 – Environmental Report [hereinafter Dean Report]); Declaration of Arjun Makhijani regarding the revision of Luminant's Environmental Report concerning Comanche Peak Units 3 and 4 (Attachment to the Dec. 8, 2009 letter from Jonathan Rund to the NRC) [sic] [hereinafter Makhijani Declaration]; Analysis of Alternative Energy Section Rebuttal by Luminant Generation Company in Defense of Comanche Peak Licensing Application (written by Paul Robbins) (Jan. 15, 2010) (ADAMS Accession No. ML100151735) [hereinafter Robbins Report]; Resume of Paul Robbins, Research Associate (Jan. 15, 2010); National Renewable Energy Laboratory, U.S. Dept. of Energy, Office of Energy Efficiency and Renewable Energy, Creating Baseload Wind Power Systems Using Advanced Compressed Air Energy Storage Concepts (Oct. 1, 2006) (NREL/PO-640-40674) ([http://rasei.colorado.edu/pdf/denholm\\_poster.pdf](http://rasei.colorado.edu/pdf/denholm_poster.pdf) (last visited June 24, 2010)) [hereinafter NREL Baseload Factsheet]; Intervenors' Motion for Leave to File New Contentions (Feb. 16, 2010); Intervenors' Proposed Contentions Regarding Applicant's Environmental Report Revisions and Request for Hearing [sic] (Feb. 16, 2010) [hereinafter Co-Location Contentions].

<sup>6</sup> NRC Staff Consolidated Response to Intervenors' Amended Contention 18 and Proposed Contentions Concerning Alternatives to Nuclear Power (Feb. 3, 2010) [hereinafter Staff's Alternatives Response]; Luminant's Answer Opposing New and Modified Contentions Regarding Alternative Energy Sources (Feb. 4, 2010) [hereinafter Applicant's Alternatives Answer]; Intervenors' Consolidated Response to NRC Staff's and Applicant's Answers to Alternatives Contentions (Feb. 12, 2010) [hereinafter Intervenors' Alternatives Reply]; Luminant's Answer Opposing New Severe Accident Contentions (Mar. 8, 2010) [hereinafter Applicant's Co-Location Answer]; NRC Staff's Answer to Intervenors' Proposed Contentions Regarding Applicant's Environmental Report Revisions and Request for Hearing (Mar. 8, 2010)

The Board concludes that Contention 13 is moot, that Contention 18 is moot in part, that all of the new Co-Location Contentions relating to severe accidents are inadmissible, that new Alternatives Contentions 4, 5 and 6 are inadmissible, and that portions of new Alternatives Contentions 1 through 3 are inadmissible. These conclusions are based on the analysis that follows. This analysis also includes the Board majority's conclusions that a part of Contention 18 is not moot, and that parts of new Alternatives Contentions 1 through 3 – specifically, as they relate to a four-part combination of wind energy, solar energy, energy storage, and supplemental natural gas – are admissible, as limited and reformulated by the Board majority. On these latter conclusions, Judge Arnold files a dissenting opinion, which is found at the end of this Memorandum and Order.

## **II. Mootness of Contentions 13 and 18**

Since our admission of Contentions 13 and 18, Applicant has revised its ER by adding two new sections, and on the basis of the information in these new sections moves that the contentions in question be dismissed because the new information renders them moot. These contentions concern the Applicant's asserted failure, or omission, to consider certain information in its ER and, as admitted, state as follows:

Contention 13 - Impacts from a severe radiological accident at any one unit on operation of other units at the Comanche Peak site have not been, and should be, considered in the Environmental Report.<sup>7</sup>

Contention 18 - The Comanche Peak Environmental Report is inadequate because it fails to include consideration of alternatives to the proposed Comanche Peak Units 3 and 4, consisting of combinations of renewable energy sources such as wind and solar power, with technological advances in storage methods and supplemental use of natural gas, to create baseload power.<sup>8</sup>

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[hereinafter Staff's Co-Location Answer]; Intervenor's Consolidated Response to NRC Staff's and Applicant's Answers to Intervenor's Proposed Co-location Contentions (Mar. 15, 2010) [hereinafter Intervenor's Co-Location Reply].

<sup>7</sup> LBP-09-17, 70 NRC at \_\_, \_\_ (slip op. at 68, 85).

<sup>8</sup> *Id.* at \_\_, \_\_ (slip op. at 82, 85).

Applicant filed new ER Section 7.5 (and associated subparts and table) for the express purpose of addressing the issues raised in Contention 13,<sup>9</sup> and new ER Section 9.2.2.11 (and associated subparts and references) for the express purpose of addressing the issues raised in Contention 18.<sup>10</sup> In its Motion to Dismiss Contention 13 as Moot, Applicant states that it “evaluates the impacts that a severe accident at one of the new or existing units at the Comanche Peak site would have on the other units at the site.”<sup>11</sup> In its Motion to Dismiss Contention 18 as Moot, Applicant states that it “evaluates alternative generation sources consisting of combinations of renewable energy sources, energy storage, and natural gas power generation.”<sup>12</sup>

In ruling on Applicant’s motions, we are guided by Commission precedent in a 2002 *Duke Energy* decision to the effect that, “[w]here a contention alleges the omission of particular information or an issue from an application, and the information is later supplied by the applicant . . . the contention is moot,” and “Intervenors must timely file a new or amended contention . . . in order to raise specific challenges regarding the new information.”<sup>13</sup> Although, as indicated above, Intervenors have filed new contentions challenging the new sections of Applicant’s ER in various particulars, they also contest the mootness of the original contentions Applicant’s new sections are purported to address, arguing that the Applicant does not in its ER revisions actually address certain information that was part of the original contentions.

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<sup>9</sup> See Flores Jan. 19, 2010, Letter at 1.

<sup>10</sup> See Flores Dec. 8, 2009, Letter at 1.

<sup>11</sup> Motion to Dismiss Contention 13 at 3.

<sup>12</sup> Motion to Dismiss Contention 18 at 3.

<sup>13</sup> See *Duke Energy Corp.* (McGuire Nuclear Station, Units 1 & 2; Catawba Nuclear Station, Units 1 & 2), CLI-02-28, 56 NRC 373, 383 (2002).

As correctly argued by Intervenors, mootness occurs “when a justiciable controversy no longer exists.”<sup>14</sup> Put differently, when an issue is no longer “live,” such that a party no longer has a legal interest in the issue, then it is moot.<sup>15</sup> Applying this principle to this proceeding, the admission of Contentions 13 and 18 may be said to have established a legal interest on the part of Intervenors in those contentions being resolved in a legally appropriate manner. If all matters at issue in a contention of omission are addressed by an applicant through the actual (not “purport[ed]” or “claim[ed]”<sup>16</sup>) provision of information on all such matters, then no legal interest in that contention remains, and the contention is moot. The information need not be such that an intervenor agrees with it, but it must actually address in some way *all* of the issues encompassed within the admitted contention it purports to moot. If, on the other hand, not all matters at issue in such a contention are addressed in information submitted by Applicant, then Intervenors retain a legal interest in having any unaddressed matter(s) appropriately resolved.

We must therefore look to whether all of “the information” alleged in Contentions 13 and 18 to have been omitted from the Application was in fact “later supplied by the Applicant,”<sup>17</sup> such that all matters at issue have been addressed, leaving no remaining legal interest on the part of Intervenors. On this issue, as Applicant and Staff agree,<sup>18</sup> Applicant as the movant bears the burden of persuasion. This is an important consideration that the Dissent does not appear to appreciate. The Dissent in effect suggests that Intervenors have the same legal interest at stake in (1) submitting new contentions, as they do in (2) maintaining in a “live” state any part of

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<sup>14</sup> Intervenors’ Mootness Response Contention 18 at 1 (citing *Georgia Inst. of Tech.* (Georgia Tech Research Reactor), LBP-95-19, 42 NRC 191, 194 (1995)).

<sup>15</sup> *Texas Utilities Elec. Co.* (Comanche Peak Steam Elec. Station, Unit 2), CLI-93-10, 37 NRC 192, 200 (1993); see Intervenors’ Mootness Response Contention 18 at 1.

<sup>16</sup> See *infra* J. Arnold Dissent at 90.

<sup>17</sup> See *supra* text accompanying note 13.

<sup>18</sup> Tr. at 739-41.

a contention not actually addressed in Applicant's new submission. But the Dissent's approach is incorrect, legally. To the contrary, it completely ignores the actual legal standards for ruling on mootness motions, as summarized above, as well as the significant legal interest Intervenors have in the burden of persuasion being on the Applicant in the mootness context, as opposed to it being on themselves in a contention admissibility context – where it is well-recognized that the standards are quite strict.

With the preceding principles in mind, we address the two mootness motions filed by Applicant, involving original Contentions 13 and 18.

#### **A. Contention 13**

Intervenors argue that Contention 13 is not moot because Applicant actually “avoids addressing the impacts of a severe accident at one unit on co-located units [by assuming that] operators would have sufficient warning to complete safe shutdown of unaffected units,”<sup>19</sup> and “does not discuss the impacts on safe shutdown in the absence of sufficient warning or environmental impacts if there is inadequate time to complete safe shutdown.”<sup>20</sup> Intervenors urge that “consideration of the relative probabilities/frequencies of large releases is qualitatively different from consideration of their impacts,” and contend that Applicant “overlooks the requirement that even remote and speculative events require analysis in some circumstances.”<sup>21</sup> An example posited by Intervenors is the need to consider “accident scenarios anticipated under 10 C.F.R. § 50.150 and § 50.54(hh),” the omission of which is “contrary to the requirements of 42 U.S.C. § 2133(d).”<sup>22</sup> In addition, in a footnote, Intervenors

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<sup>19</sup> Intervenors' Mootness Response Contention 13 at 1.

<sup>20</sup> *Id.* at 2.

<sup>21</sup> *Id.* at 3.

<sup>22</sup> *Id.* at 4 (citing *Druid Hills Civil Ass'n v. Fed. Hwy. Admin.*, 772 F.2d 700, 709 (11th Cir. 1985); *Ohio River Valley Env'tl. Coal. v. Kempthorne*, 473 F.2d 94, 102 (4th Cir. 2006)). Intervenors also state that they “incorporate by reference their arguments and authorities related to the

aver that, “[i]n addition to the accident scenarios the Applicant has disregarded as remote and speculative, the ER Revision does not address accident scenarios involving the spent fuel pool.”<sup>23</sup>

At oral argument Applicant maintained that, although it did not specifically address in the Co-Location ER Revision any impacts on operators and equipment, it did provide a bounding analysis by addressing severe accidents at all four units simultaneously.<sup>24</sup> Moreover, Applicant argued, this analysis essentially assumes “that you have an accident that is one that immediately causes an accident at . . . the other three units, because you wouldn’t have time to shut down.”<sup>25</sup> Intervenors through counsel agreed to an extent that Applicant’s bounding analysis addressed the issues in Contention 13, but challenged the presentation of impacts in terms of risk and core damage frequency, which they contend “is a different and more narrow impact analysis than the impact analysis that was anticipated in the contention as it was admitted.”<sup>26</sup> In addition, Intervenors assert that Applicant’s analysis does not “factor[ ] in spent fuel pool releases,” which they contend is a “rather large potential source of doses.”<sup>27</sup> Intervenors were unable to “quantify the difference [this] would make,” but argued that omitting spent fuel pool releases from the analysis “understates the . . . total dose that might be anticipated.”<sup>28</sup> Although neither spent fuel pool accidents nor spent fuel pool releases were discussed in, or in support of, Contention 13, Intervenors argued that the subject was

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Mitigative Strategies (MS) Contentions related to compliance with 10 C.F.R. § 50.54(hh)(2), August 10, 2009.” *Id.* at 4 n.15.

<sup>23</sup> *Id.* at 4 n.14.

<sup>24</sup> Tr. at 794.

<sup>25</sup> *Id.* at 796.

<sup>26</sup> *Id.* at 803.

<sup>27</sup> *Id.* at 805.

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

encompassed within the contention.<sup>29</sup> Applicant responded that Intervenors had provided no basis to “indicate that any accidents involving spent fuel pools would be significant relative to the accidents in reactor[s].”<sup>30</sup>

We conclude that Contention 13 is moot. Although Intervenors express some reservations about the presentation of impacts in terms of core damage frequency, and suggest that Applicant’s bounding analysis of severe accidents at all four units simultaneously does not take into account any spent fuel pool releases, we do not find that either argument overcomes the practical effect of Applicant’s bounding analysis. Even assuming that the original contention, in its reference to “impacts from a severe radiological accident,” conceptually includes impacts from spent fuel pool accidents, Intervenors’ arguments are not persuasive in light of the bounding analysis provided by Applicant. No support is provided in original Contention 13, in the brief reference to spent fuel pool accidents in the aforementioned footnote in Intervenors’ Mootness Response,<sup>31</sup> or in oral argument, for the suggestion that consideration of the impacts of such accidents would add meaningfully to the Applicant’s bounding analysis of severe accidents at all four units simultaneously. And we consider Intervenors’ questions about the presentation of impacts in terms of risk and core damage frequency to be more in the nature of questioning the manner in which, or the adequacy with which, Applicant addresses the matters at issue.

We therefore grant Applicant’s Motion to Dismiss Contention 13.

## **B. Contention 18**

In response to Applicant’s Motion to Dismiss Contention 18, Intervenors argue that the contention is not moot because, although the Applicant in Section 9.2.2.11 purports to consider

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<sup>29</sup> *Id.* at 812-13.

<sup>30</sup> *Id.* at 816.

<sup>31</sup> *See supra* note 23.

“combinations of renewable energy sources such as wind and solar power, with technological advances in storage methods and supplemental use of natural gas, to create baseload power,” as stated in the contention, it did not do so. Instead, according to Intervenors, Applicant considered each technology separately; “preemptively” dismissed them; did not “consider whether baseload capacity could be supplied with combinations of wind and solar power coupled with advanced storage methods supplemented with natural gas”; and “did not consider the combination of wind (relatively more productive at night) and solar (productive during the day) to produce a uniform generating profile,” or “discuss the structure and function of integrated systems.”<sup>32</sup> Intervenors make additional arguments that go more to the adequacy of *how* Applicant addresses alternatives consisting of combinations of renewable energy sources, storage methods, and natural gas to create baseload power, which we do not find effectively overcome the conclusion that Applicant has indeed considered most such combinations. We do, however, find persuasive Intervenors’ argument that Applicant did not consider a combination that includes both wind *and* solar.

Applicant does not argue that it *did* consider this “information” – *i.e.*, any “combination[ ] of renewable energy sources . . . storage methods and supplemental use of natural gas, to create baseload power,”<sup>33</sup> that would include both solar and wind energy sources. Rather, it argues, such a combination was not raised in Contention 18.<sup>34</sup> Moreover, Applicant argues, even if such a combination were to be considered, the overall impacts of this combination would not be significantly different from the impacts of either solar or wind in combination with storage methods and natural gas.<sup>35</sup> NRC Staff supports Applicant’s arguments.<sup>36</sup>

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<sup>32</sup> Intervenors’ Mootness Response Contention 18 at 2, 3, 8; *see id.* at 2-8.

<sup>33</sup> *See supra* text accompanying note 8.

<sup>34</sup> *See, e.g.*, Tr. at 746, 757

<sup>35</sup> *Id.* at 749-50.

In admitting Contention 18, we limited it to alternatives “consisting of combinations of renewable energy sources such as wind *and* solar power, with technological advances in storage methods and supplemental use of natural gas, to create baseload power.”<sup>37</sup> So stated, the contention is arguably somewhat ambiguous as to whether a combination including both wind and solar is included among those combinations encompassed within it. To resolve this ambiguity, we look to other language in our ruling, and to the original contention and the support Intervenor provided for it.

In this regard, the Board clearly stated in LBP-09-17, in referring to a report by Dr. Arjun Makhijani and others that was submitted in support of Contention 18, that “[i]t is suggested [in this report] that a *combination of* natural gas, wind, solar *and* storage sites in Texas could also produce baseload power.”<sup>38</sup> We further note that, in the Makhijani Report (in addition to extensive discussion of renewable energy sources as energy alternatives), it is also stated that “[i]t is also important to coordinate solar and wind investments; this reduces the requirements for added reserve capacity.”<sup>39</sup> Based on these statements the following may be concluded: First, Intervenor may reasonably be said to have raised in the contention the specific alternative of combining wind *and* solar with storage methods and natural gas to create baseload power.

Second, particularly given the actual language of the Board’s own statement quoted above from LBP-09-17 (referring to the Makhijani Report and the four-part combination of solar, wind, storage and natural gas), it would be unreasonable and logically inconsistent to read

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<sup>36</sup> See *id.* at 760-64; Staff’s Alternatives Response at 7-12.

<sup>37</sup> LBP-09-17, 70 NRC at \_\_\_ (slip op. at 82) (emphasis added).

<sup>38</sup> *Id.* at \_\_\_ (slip op. at 78) (citing Arjun Makhijani and SEED Coalition, Nuclear Costs and Alternatives at 42 (2009) [hereinafter Makhijani Report] (attached to original Petition for Intervention and Request for Hearing (Apr. 6, 2009)) (emphasis added).

<sup>39</sup> Makhijani Report at 35.

Contention 18 as *not* encompassing combinations *including* a combination of wind, solar, energy storage and natural gas supplementation. Indeed, to read it as encompassing virtually all combinations *except* one including all four parts included in the formulation of the contention, would be to exclude the one combination that would obviously be *most likely to have any chance of achieving the goal of producing baseload power*.<sup>40</sup> This would, moreover, require overlooking the Board's unequivocal statement in LBP-09-17 that is quoted above, referring to the four-part combination. In any event, that statement by the Board fits clearly within the statement of the contention itself, as admitted, which we repeat here for the convenience of the reader:

Contention 18 - The Comanche Peak Environmental Report is inadequate because it fails to include consideration of alternatives to the proposed Comanche Peak Units 3 and 4, consisting of combinations of renewable energy sources such as wind and solar power, with technological advances in storage methods and supplemental use of natural gas, to create baseload power.<sup>41</sup>

The next step in our analysis takes us to what alternatives the Applicant, in its Alternatives ER Revision on which its Motion to Dismiss Contention 18 is based, actually considers. We note that Applicant's Alternatives ER Revision does briefly, in passing, refer to "natural gas, wind, and solar, either individually or in combination with each other and energy storage," at 9.2-31, and to "natural gas, wind, solar; [sic] and energy storage either individually or in combination," at 9.2-50, not being "viable alternatives." The four-part combination is not, however, specifically considered or evaluated, and there is no heading for it as there are for other combinations involving wind *or* solar. Nor, contrary to Judge Arnold's statement that "the solar/wind/storage/natural gas option appears to have been, at least superficially, evaluated in

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<sup>40</sup> To the effect implicitly suggested by Intervenors, *see supra* text accompanying note 32, there would seem to be some obvious level of merit, and at the very least some plausible common sense, in considering a combination of "wind (relatively more productive at night) and solar (productive during the day)" to overcome the comparative intermittency problems of each. *See also infra* note 302 and accompanying text.

<sup>41</sup> *Id.* at \_\_ , \_\_ (slip op. at 82, 85).

the ER in Section 9.2.2.11.14.1,<sup>42</sup> does the Applicant in this section in any way evaluate the four-part combination including wind and solar.

The only use of the words “wind and solar” in § 9.2.2.11.4.1 comes in the following paragraph:

The concept behind this alternative is that the primary baseload power could be produced by solar or wind units with some of the excess energy placed into storage and from the charged energy storage facility. The natural gas plant could be activated when the wind and solar power is interrupted and the stored energy supply exhausted. The natural gas plant could also be used as supplemental load when the energy available from either the renewable energy source or energy storage facility is at some level below the targeted 3200 MW.<sup>43</sup>

In contrast, in the section at issue, the terms “wind” (or “wind power with storage [or CAES]”) and “solar” (or “solar power with storage [or molten salt storage]”) are used in conjunction with each other with the word “or” or the word “nor” between them eleven times.<sup>44</sup> All analyses are stated in terms of using *either one or the other* of “wind”/“wind with storage”/“wind with CAES” or “solar”/“solar with storage”/“solar with molten salt storage.”<sup>45</sup> And perhaps most importantly, Applicant itself does not claim to have included any consideration or evaluation of a combination including both wind and solar power with storage methods and natural gas supplementation.<sup>46</sup>

Under these circumstances, we do not consider the few passing references to “wind and solar” in the Alternatives ER Revision to constitute any significant consideration of the four-part alternative of wind, solar, energy storage, and natural gas supplementation. And we find that, not having “included consideration” of this four-part combination in its ER Revision, Applicant did not supply all of “the information” alleged to have been omitted from its original ER. Based

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<sup>42</sup> J. Arnold Dissent at 90 note 8.

<sup>43</sup> Alternatives ER Revision at 9.2-45 (emphasis added).

<sup>44</sup> See *generally* Alternatives ER Revision, § 9.2.2.11.4.1 at 9.2-45 – 47.

<sup>45</sup> See *id.*

<sup>46</sup> See *generally* Luminant’s Motion to Dismiss Contention 18 as Moot; Tr. at 746-59.

on this finding, we conclude that, while Contention 18 is moot with regard to all of the other combinations actually addressed in the Alternatives ER Revision, Applicant has not shown it to be moot with regard to the alternative of combining wind, solar, energy storage, and natural gas supplementation to create baseload power.<sup>47</sup> We address the extent to which this part of the original contention remains in the proceeding for litigation in Section III.I below, in which we summarize and formalize our conclusions on the admissible parts of the first three NEPA alternatives contentions, focusing most directly on questions of feasibility.

### III. New Contentions

All of Intervenors' new contentions, like their original Contentions 13 and 18, concern environmental issues under the National Environmental Policy Act (NEPA). We note in this regard that, although the requirements of NEPA are directed to Federal agencies and the primary duties of NEPA accordingly fall on the NRC Staff in NRC proceedings, the initial requirement to analyze the environmental impacts of an action is directed to applicants under 10 C.F.R. § 51.45. Thus, at the outset of a proceeding, NEPA-related contentions are to be filed based on an applicant's environmental report (ER), under 10 C.F.R. § 2.309(f)(2). Thereafter, the NRC Staff's issuance of its draft and final environmental impact statements (EISs) may lead to the filing of additional contentions if the data or conclusions contained in them are significantly different from the data or conclusions found in the applicant's documents.<sup>48</sup>

Five of Intervenors' new contentions, like their original Contention 13, concern severe accident impacts, and six, like their original Contention 18, concern the analysis of alternatives

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<sup>47</sup> In reaching this conclusion we make no findings or statements regarding the adequacy of *how* Applicant addressed any of the alternatives in question, and address questions of adequacy in considering Intervenors' new Alternatives Contentions *infra*.

<sup>48</sup> See 10 C.F.R. §§ 51.45, 2.309(f)(2).

to the proposed new units under NEPA.<sup>49</sup> We consider the severe accident contentions first, then address the alternatives contentions.

#### **A. Co-Location Contention 1 – Externally Initiated Accident Scenarios**

In the first of their severe accident contentions Intervenor's assert:

The Applicant's failure to address externally initiated accident scenarios is a material omission from the Environmental Report.<sup>50</sup>

In support of this contention Intervenor's argue, citing the ER Update revisions at 7.5-2 and 10 C.F.R. § 52.79(a)(29)(ii), that the Co-Location ER Revision considers only internally initiated events in the severe accident scenarios, and that the "failure to address externally initiated events is a material omission in the context of dealing with emergencies." Stating that this contention is one of omission, Intervenor's challenge the adequacy of the ER Revision based on the preceding alleged omission.<sup>51</sup>

Intervenor's suggest that the "contention is within the scope of the proceeding because the Board's order admitting Contention 13 recognized that accident impacts at one unit may materially affect other units," and urge that the contention "bears on the requirements of 10 C.F.R. § 52.79(a)(29)(ii) [which deals with plans for coping with emergencies] and the Atomic Energy Act [at] 42 USC 2133(d)."<sup>52</sup> According to Intervenor's, "categorically excluding external

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<sup>49</sup> We note that Intervenor's in their Response to Applicant's Motion to Dismiss Contention 18 suggest that, as an alternative to ruling against Applicant's Motion altogether, Contention 18 "should advance in a modified version that requires the Applicant to: 1) at a minimum, actually consider combinations of wind and solar with CAES supplemented with natural gas; 2) consider molten-salt storage by itself and in combination with CAES; and 3) address the geological advantages presented in the ERCOT area that favor deployment of CAES in tandem with wind and solar power sources." Intervenor's Mootness Response Contention 18 at 8-9. Because our rulings on Intervenor's new Alternatives Contentions essentially address all these issues, we issue no separate rulings herein on these three suggested modifications to original Contention 18.

<sup>50</sup> Intervenor's Co-Location Contentions at 2.

<sup>51</sup> *Id.*

<sup>52</sup> *Id.* at 3.

events such as aircraft impacts from accident scenarios” is contrary to the requirement of § 2133(d) that the “health and safety of the public be protected in the context of nuclear plant licensing,” and in addition, “failure to consider the large release scenario on safe shutdown ignores an obvious factor that bears on impacts on co-located units.”<sup>53</sup> Intervenor’s contention is “material to findings the NRC must make in this proceeding related to the adequacy of Applicant’s capacity to safely shut down reactors and its ability to deal with accidents.”<sup>54</sup>

Intervenor’s point to indications in the Co-Location ER Revision that it would take ten to twelve hours to reach cold shutdown at the proposed plants, and assert that the ER Revision does not “evaluate externally initiated, rapid onset, catastrophic events that would cause large releases of radiation before the 10/12 hours required to bring co-located units into cold shutdown status.”<sup>55</sup> They assert that Applicant did not consider such external events because it “assumed that release frequencies for external events are ‘negligible.’”<sup>56</sup> Intervenor’s challenge this assumption and argue that the failure to consider external events “excludes an entire set of accident scenarios that form the basis for the NRC’s adoption of 10 C.F.R. § 50.150 regarding aircraft impact design requirements,” as well as “the mitigation requirements of 10 C.F.R. § 50.54(hh) to deal with loss of large areas of nuclear plant(s) due to events such as aircraft impact(s).”<sup>57</sup> Intervenor’s argue that Applicant’s approach ignores these requirements, which

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<sup>53</sup> *Id.* at 4 n.14 (citing *Druid Hills*, 772 F.2d at 709; *Ohio River Valley*, 473 F.3d at 102, for the principle that “Administrative Procedure Act directs review of agency action to determine if decision is product of consideration of relevant factors and whether a clear error of judgment has occurred”).

<sup>54</sup> *Id.* at 3 (citing 10 C.F.R. § 52.79(a)(29)(ii); 42 U.S.C. § 2133(d); 10 C.F.R. § 2.309(f)(1)(iii), (iv)).

<sup>55</sup> *Id.* (citing Co-Location ER Revision, § 7.5.2 at 7.5-2).

<sup>56</sup> *Id.* (citing Co-Location ER Revision, § 7.5.2 at 7.5-2).

<sup>57</sup> *Id.* at 3-4.

they assert “recogni[ze]” that risk profiles for severe accidents have changed since the events of September 11, 2001.<sup>58</sup> They also challenge Applicant’s references to its conclusion in its FSAR<sup>59</sup> that “unintentional aircraft accidents” are “not credible events.”<sup>60</sup>

Finally, Intervenors cite the 1989 case of *Limerick Ecology Action v. N.R.C.*,<sup>61</sup> in which the court “confronted a similar problem in the context of whether the location of a nuclear plant in a densely populated area allowed adoption of generic risk factors and a SAMDA (severe accident mitigation design alternatives) decision supported by a policy statement rather than a rulemaking.” Intervenors argue the following:

The court rejected the NRC’s argument that its policy statement addressing SAMDAs satisfied NEPA. The court noted that “(1) after Three Mile Island, it would be irrational for the NRC to maintain that severe accident risks are too remote to require consideration; (2) the NRC itself has devoted \$50 million to studying such risks, not to mention the expenditures for evacuation plans; and (3) the NRC’s own interpretation of its NEPA requirements requires consideration of such risks.” Similarly in this case, categorical exclusion of aircraft impact initiating event scenarios that could cause a large radiation release before an unaffected unit could reach safe shutdown is a reasonable basis to consider whether a license should issue. (10 C.F.R. § 2.309(f)(1)(v)). The *Limerick* court’s observation that disregarding serious accident scenarios after TMI would be “irrational” is also pertinent here. After the aircraft attacks of September 11, 2001, it would be irrational to conclude similar attacks on nuclear plants are too remote for inclusion in the ER. And the use of NRC resources to study aircraft attacks/impacts on nuclear plants is similar to the regulatory response to TMI referenced in *Limerick*. Finally, the NRC’s recognition that aircraft impacts are to be analyzed for some regulatory purposes (impact design and mitigation strategies) is an interpretation of the NRC’s requirements that the risks are not remote. (10 C.F.R. § 2.309(f)(1)(v)).<sup>62</sup>

Intervenors insist that a genuine dispute exists on whether the Applicant should have included in its ER revisions “accident scenarios that are characterized by rapid onset of

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<sup>58</sup> *Id.* at 4.

<sup>59</sup> FSAR is an acronym for Final Safety Analysis Report.

<sup>60</sup> Intervenors’ Co-Location Contentions at 4 (citing Co-Location ER Revision, § 7.5.1).

<sup>61</sup> *Id.* at 5 (citing *Limerick Ecology Action v. NRC*, 869 F. 2d 719, 739-40 (3d Cir. 1989)).

<sup>62</sup> *Id.*

externally initiated events that result in large uncontrolled/unmitigated releases of radiation caused by, for example, explosions and fires from impact(s) of a large commercial airliner(s).<sup>63</sup>

Applicant argues that Co-Location Contention 1 is inadmissible, first, because “the ER explicitly addresses external events,” and therefore the contention fails to raise a genuine dispute with the Application.<sup>64</sup> Second, Applicant points to the NRC’s “longstanding view that NEPA demands no terrorism inquiry,” which the Board relied on in rejecting Intervenors’ original Contention 19, and concludes that Applicant need not address intentional aircraft impacts in its ER.<sup>65</sup> Applicant criticizes Intervenors’ reading of *Limerick*, noting that “[i]n fact, that decision upheld NRC’s decision not to analyze risks of sabotage under NEPA where a petitioner did not propose a meaningful way to analyze that risk.”<sup>66</sup> Third, to the extent Intervenors attack Luminant’s compliance with 10 C.F.R. § 52.79(a)(29)(ii), Applicant argues that any attempt to raise safety and emergency planning concerns in the context of this environmental contention is an untimely attempt to broaden Contention 13 to include safety and emergency planning issues.<sup>67</sup> In any case, Applicant asserts, its FSAR specifically “assessed the risk due to aircraft hazards, concluding that the probable accidental rate of an aircraft affecting the site was less than the threshold ‘one-in-ten-million’ probability stated in our guidance.”<sup>68</sup> Also, as required by § 52.79(a)(29)(ii), the FSAR “includes ‘[p]lans for coping with emergencies, other than the plans

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<sup>63</sup> *Id.*

<sup>64</sup> Applicant’s Co-Location Answer at 9-10 (citing *id.* at 17-21, which cites Co-Location ER Revision at 7.5-4, 7.5-9).

<sup>65</sup> *Id.* at 10-11 (quoting LBP-09-17, 70 NRC at \_\_\_ (slip op. at 84) (quoting *Amergen Energy Co., LLC* (Oyster Creek Nuclear Generating Station), CLI-07-08, 65 NRC 124, 126 (2007))).

<sup>66</sup> *Id.* at 10 n.48.

<sup>67</sup> *Id.* at 11.

<sup>68</sup> *Id.* (citing Comanche Peak Nuclear Power Plant, Units 3 & 4, COL Application, Part 2, Final Safety Analysis Report (FSAR), Rev. 1, FSAR Chapter 3, Design of Structures, Systems, Components, and Equipment (Nov. 20, 2009) at 3.5-2 (ADAMS Accession No. ML100082052) [hereinafter FSAR]).

required by § 52.79(a)(21).”<sup>69</sup> Finally, Applicant contends that Intervenor offer no factual support for their assertion that “an external event could cause a large release before 10 to 12 hours.”<sup>70</sup>

The NRC Staff also objects to the admission of Co-Location Contention 1, arguing that it falls outside the scope of the proceeding and that Intervenor provide no supporting legal basis.<sup>71</sup> The Staff points out that “Applicant has addressed externally initiated accident scenarios in the ER” and concluded that such events are “remote and speculative.”<sup>72</sup> According to Staff, Intervenor provide no legal basis for the notion that Applicant must consider such remote and speculative scenarios in the ER. On the contrary, the Staff notes, the Third Circuit in *Limerick* affirmed that “[i]t is undisputed that NEPA does not require consideration of remote and speculative risks.”<sup>73</sup> Like Applicant, Staff also notes that this Board already rejected Intervenor’s argument in Contention 19 that Applicant must consider intentional aircraft impacts in the ER.<sup>74</sup> Finally, the Staff urges that Contention 1 is untimely to the extent it challenges Applicant’s assumption that “release frequencies for external events are ‘negligible’ compared to internal events.” According to the Staff, this assumption appears in the unrevised portion of Applicant’s ER and could have been challenged in Intervenor’s original Petition to Intervene.<sup>75</sup>

In their Reply, Intervenor reiterate their argument that exclusion of external events from the ER “is not credible in light of the inclusion of other externally generated events such as

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<sup>69</sup> *Id.* at 12 (citing FSAR, § 13.5.2.1).

<sup>70</sup> *Id.* at 12.

<sup>71</sup> NRC Staff’s Co-Location Answer at 8-9.

<sup>72</sup> *Id.* at 7 (citing Co-Location ER Revision at 7.5-4).

<sup>73</sup> *Id.* (quoting *Limerick*, 869 F.2d at 739).

<sup>74</sup> *Id.* at 8-9 (citing *Comanche Peak*, LBP-09-17, 70 NRC at \_\_\_ (slip op. at 84)).

<sup>75</sup> *Id.* at 10 (citing Comanche Peak Nuclear Power Plant, Units 3 & 4, COL Application, Part 3, Environmental Report, Rev. 1 (Non-Proprietary Version) (Nov. 20, 2009) § 7.2.2 at 7.2-4 (ADAMS Accession No. ML 100080530) [hereinafter ER]).

aircraft impacts and seismic events in other contexts of the COLA.”<sup>76</sup> Citing a discussion of the NRC’s emergency planning regulations in *Limerick*, Intervenors further argue that “[i]t is not only the statistical improbability of a severe accident that bears on the determination whether, in a given circumstance, a severe accident should be anticipated and thereby considered in the context of the COLA.”<sup>77</sup> Intervenors also repeat their argument that a co-location accident analysis in the ER would be consistent with the Commission’s recent adoption of 10 C.F.R. §§ 50.150 and 50.54(hh)(2), “both of which are premised on external events.” Intervenors claim as well that the requirements of 10 C.F.R. § 2.309(f)(1)(v) do not apply to a contention of omission, thus obviating Applicant’s argument that Contention 1 – a contention of omission – lacks factual support.<sup>78</sup>

We note in addressing Co-Location Contention 1 that a central argument of Intervenors in its support is that the Commission in adopting 10 C.F.R. §§ 50.150 and 50.54(hh) essentially changed the “risk profiles” for certain types of severe accidents, thereby rendering accidents that may in the past have been considered “remote and speculative” less so, such that they require analysis in the Applicant’s ER. The accidents at issue in this contention are those that are externally initiated, which are asserted to require analysis under this rationale. As stated, the contention concerns Applicant’s asserted “failure to address externally initiated accident scenarios,” which is argued to constitute a “material omission” from the ER. Intervenors actually, however, in their somewhat rambling and poorly-organized arguments, appear to recognize that Applicant did in fact consider external events to the extent of stating that the “release frequency for [such] external events . . . are [sic] negligible compared to internal events

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<sup>76</sup> Intervenors’ Co-Location Reply at 2.

<sup>77</sup> *Id.* at 3 (citing *Philadelphia Elec. Co.* (Limerick Generating Station, Units 1 & 2), ALAB-819, 22 NRC 681, 713 (1985)); see also Tr. at 819-26.

<sup>78</sup> Intervenors’ Co-Location Reply at 6-7.

. . . [and] too low to warrant further consideration ([because] these events are remote and speculative).”<sup>79</sup>

As Applicant maintains, however, Intervenors have not provided any evidence to dispute Applicant’s conclusion that the release frequency for such external events is “negligible compared to internal events.”<sup>80</sup> Intervenors argue that the contention is one of omission and as such requires no factual support,<sup>81</sup> but this argument is unpersuasive to the extent that they themselves implicitly recognize that Applicant *does* address externally initiated accidents, even if in less detail than they would like. To the extent, however, that the contention is considered as an omission contention based on the omission of more extensive consideration of external events, Intervenors must, under 10 C.F.R. § 2.309(f)(1)(vi), show that what is allegedly omitted is “required by law.” And in this regard, they argue that 10 C.F.R. §§ 50.150 and 50.54(hh) require such consideration, citing as well the *Limerick* decision.

It is true that the Third Circuit in *Limerick* found persuasive the argument that, after Three Mile Island, it was “irrational for the NRC to maintain that severe accident risks are too remote to require consideration.”<sup>82</sup> As NRC Staff points out, however, in the Third Circuit’s later 2009 decision in *New Jersey v. NRC*, the Court upheld the denial of a contention challenging the failure to include in the EIS for the Oyster Creek license renewal any consideration of the effects of an aircraft attack.<sup>83</sup> In reaching its decision, indeed, the Court cited the *Limerick* decision in pointing out that New Jersey had “not provided any evidence to challenge” the NRC’s

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<sup>79</sup> Co-Location ER Revision at 7.5-4. Intervenors in their Co-Location Contentions at 3 refer to the Applicant’s “negligible” reference, but appear to mis-cite it, citing the Co-Location ER Revision at 7.5-2, rather than at 7.5-4, cited by both Applicant and NRC Staff in their Answers.

<sup>80</sup> Nor have Intervenors provided any support for their argument that “an external event could cause a large release before 10 to 12 hours.” Intervenors’ Co-Location Contentions at 3.

<sup>81</sup> Intervenors Co-Location Reply at 6-7.

<sup>82</sup> *Limerick*, 869 F.2d at 741.

<sup>83</sup> N.J. Dept. of Env’t. l Protection v. NRC, 561 F.3d 132 (2009).

conclusion that “the environmental effects of a hypothetical terrorist attack on a nuclear plant” would be “no worse than those caused by a severe accident.”<sup>84</sup> We note that the Court in *New Jersey* did not take into account the Commission’s promulgation, four days prior to the decision’s issuance, of 10 C.F.R. §§ 50.54(hh) and 50.150.<sup>85</sup> Intervenors have, however, provided no argument to support the proposition that the Commission in adopting those rules intended that they should appropriately be read as “changing the risk profiles” of the accidents addressed in the rules, or that they would change the NRC’s conclusion that was upheld in *New Jersey*.<sup>86</sup> Intervenors merely assert, with no supporting authority, that the requirements of the new rules are “recognitions that the risk profile has changed.”<sup>87</sup>

It is also true, as argued by Intervenors, that in ruling original Contention 13 admissible, we observed that NUREG-1555 includes the statement that “[t]he events arising from causes external to the plant that are considered possible contributors to the risk associated with the plant should be discussed.”<sup>88</sup> However, as Intervenors themselves appear to recognize to an extent, Applicant has at least “discussed” external events, both in the original ER and in the

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<sup>84</sup> *Id.* at 136-37 (citing *Limerick*, 869 F.2d at 744 & n.31).

<sup>85</sup> See 74 Fed. Reg. 13,926 (Mar. 27, 2009). The *New Jersey* decision was issued March 31, 2009. See *supra* note 83.

<sup>86</sup> We note also in this regard the NRC Staff’s citation of the Commission’s statement in *Private Fuel Storage* that, in deciding against including terrorist attacks within NEPA reviews, this “does not mean that we plan to rule out the possibility of a terrorism attack against NRC-regulated facilities,” but that it saw no “practical benefit in conducting that review, case-by-case, under the rubric of NEPA,” nor did it consider that it had any legal duty to do this. NRC Staff’s Co-Location Answer at 9 (citing *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-02-25, 56 NRC 340, 347-48 (2002)). Intervenors have provided nothing to suggest the Commission has changed its approach in this regard.

<sup>87</sup> Intervenors Co-Location Reply at 4.

<sup>88</sup> LBP-09-17, 70 NRC at \_\_ (slip op. at 67)). Office of Nuclear Reactor Regulation, Standard Review Plans for Environmental Reviews for Nuclear Power Plants, NUREG-1555 at 7.2-3 (Oct. 1999) [hereinafter NUREG-1555].

recent ER Revision,<sup>89</sup> and Intervenors have provided no facts to dispute Applicant's statements in this discussion.

With respect to the safety and emergency planning concerns raised in this contention, all parties appear to agree that these matters are addressed by Applicant – just not in the ER. Intervenors have not, however, provided any persuasive argument to support the idea that, simply because matters are addressed in those contexts and in the FSAR, the same matters must necessarily also be addressed in the ER. And regarding Applicant's argument that Intervenors are in any event untimely in their attempt to raise safety and emergency planning concerns in the context of this environmental contention and thereby broaden the scope of original Contention 13, Intervenors' response is likewise unpersuasive. They urge that the Board use its "discretion to accept nontimely contentions under section 2.309(c)(1) upon a showing of 'good cause' for failure to file such in a timely manner and a weighing of a number of other factors," but pose no such good cause, other than to argue that the ER Revisions constitute "new information" justifying such arguments.<sup>90</sup> We find this bare argument to be insufficient to demonstrate the requisite "good cause."

Finally, regarding Intervenors' arguments that Co-Location Contention 1 "bears on the requirements of 10 C.F.R. § 52.79(a)(29)(ii) and 42 U.S.C. § 2133(d),"<sup>91</sup> and that the *Druid Hills* and *Ohio River Valley* decisions support their position,<sup>92</sup> we find these to be unpersuasive as well. None of these support their contention that Applicant should have addressed externally-initiated severe accidents any more than it did in its ER.

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<sup>89</sup> See *supra* note 79; see also Tr. at 839.

<sup>90</sup> Intervenors' Co-Location Reply at 7.

<sup>91</sup> See *supra* note 52.

<sup>92</sup> See *supra* note 53.

Based on the preceding, we conclude that Co-Location Contention 1 does not provide sufficient support or information to show a genuine dispute on a material issue of law or fact, as required at 10 C.F.R. § 2.309(f)(1)(vi), or demonstrate that consideration of externally-initiated accidents to the degree argued by Intervenors is required by law. The contention is inadmissible.

**B. Co-Location Contention 2 – Scenarios with Release Times Shorter than Cold Shutdown Time**

In this contention Intervenors argue:

The Applicant fails to consider and evaluate the impacts of severe accident scenarios, regardless of probability, with release times shorter than the duration needed to achieve cold shutdown.<sup>93</sup>

Here, Intervenors focus on Applicant's approach in the ER Revision to consider only "severe accident scenarios with a probability of more than 1.0 E-6 and eliminate events with a probability less than 1.0 E-6 from further consideration as 'remote and speculative.'" Again, they argue that the "failure to consider radiological impacts of events with a release time shorter than the time needed to achieve cold shutdown is a material omission in the context of dealing with emergencies," and make some of the same arguments made in support of Co-Location Contention 1, relating to 10 C.F.R. § 52.79(a)(29)(ii) and 42 USC § 2133(d).<sup>94</sup>

Intervenors argue that "it is not only the statistical probability of a serious accident that bears on the determination whether, in a given circumstance, such should be anticipated and thereby considered in the context of the ER." They cite the Appeal Board's 1985 decision in the *Limerick* case on the improbability issue, quoting the decision as follows:

...the improbability of PMMC's evacuation and consequent unavailability to receive contaminated injured workers is beside the point. The Commission's emergency planning regulations are premised on the assumption that a serious accident might occur and that evacuation of the EPZ might well be necessary. The adequacy of a given

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<sup>93</sup> Co-Location Contentions at 6.

<sup>94</sup> *Id.*

emergency plan therefore must be adjudged with this underlying assumption in mind. As a corollary, a possible deficiency in an emergency plan cannot properly be disregarded because of the low probability that action pursuant to the plan will ever be necessary. Thus, the Licensing Board majority gave undue weight to the fact that evacuation of PMMC is remote.<sup>95</sup>

Intervenors note that Applicant in its SAMA (severe accident mitigation alternatives) analysis considered the types of events it advocates here, but argue that the reasoning of the Commission in *Limerick* should also apply in the co-location context herein at issue:

Notwithstanding the low probability of a severe accident, Applicant has on-site emergency response capabilities, separation distances between units and independent safety systems. The Applicant has made design decisions and preparations for severe accidents that it claims are so remote and speculative that there is actually no need to anticipate such in the context of severe co-location accident effects. However, evidently, the accidents are not so remote and speculative to obviate the need to account for such in design (10 C.F.R. § 50.150) and accident mitigation responses (10 C.F.R. § 50.54(hh)).<sup>96</sup>

Thus, according to Intervenors, a genuine dispute exists on whether Applicant must address in the ER revisions “severe accident event scenarios that may prevent safe shutdown and/or require additional time to bring co-located units to safe shutdown status.”<sup>97</sup>

Applicant argues that Co-Location Contention 2 is inadmissible, noting first that the ER does exclude as “remote and speculative” certain low-probability severe accident scenarios with a likelihood of “about eight in ten million ( $7.8 \times 10^{-7}$ ) to one in a billion ( $1.03 \times 10^{-9}$ ) per reactor-year.”<sup>98</sup> Applicant argues that Intervenors did not contest these probability calculations, which are contained in Section 7.5 of Applicant’s Co-Location ER Revision, and that Intervenors thus fail to raise a genuine dispute with the Applicant on an issue of material fact.<sup>99</sup> Applicant further

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<sup>95</sup> *Id.* at 7 (citing *Philadelphia Elec. Co.* (Limerick Generating Station, Units 1 & 2), ALAB-819, 22 NRC 681, 713 (1985)).

<sup>96</sup> *Id.* at 8.

<sup>97</sup> *Id.*

<sup>98</sup> Applicant’s Co-Location Answer at 14.

<sup>99</sup> *Id.*

argues that the central premise of Intervenor's arguments in Co-Location Contention 2 is directly contrary to Commission case law holding that "low probability is the key to applying NEPA's rule of reason test to contentions that allege that specified accident scenario presents a significant environmental impact that must be evaluated."<sup>100</sup> Applicant urges, citing a licensing board decision in the *Calvert Cliffs* COL proceeding, that one in a million ( $10^{-6}$ ) per year is the threshold above which accident scenarios should be evaluated for NEPA consideration, and that the Board should therefore reject Co-Location Contention 2 as lacking a legal basis under NEPA to require an evaluation of events with frequencies of less than  $10^{-6}$  per year.<sup>101</sup>

Applicant also claims that this contention is beyond the scope of this proceeding and not material to NRC's NEPA review requirements.<sup>102</sup> Applicant suggests the Appeal Board's *Limerick* decision is not relevant to Co-Location Contention 2 and fails to provide a legal basis for its admission, because it involves AEA emergency planning requirements, not NRC's obligations under NEPA.<sup>103</sup> Finally, Applicant argues that Intervenor's fail to provide sufficient factual information or expert opinion to controvert Applicant's conclusion in section 7.5.5 of its ER that risk-based environmental impacts from simultaneous severe accidents at all four Comanche Peak units would be small given the low probability of such an event, and that the evaluation in § 7.5.5 indeed provides the "very evaluation requested by Intervenor."<sup>104</sup>

NRC Staff argues that Intervenor's fail to state a legal basis for their assertion that Applicant must consider in its ER severe accident initiating sequences with a probability less

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<sup>100</sup> *Id.* at 14-15 (quoting *Vermont Yankee Nuclear Power Corp.* (Vermont Yankee Nuclear Power Station), CLI-90-7, 32 NRC, 129, 131 (1990) (internal quotations omitted)).

<sup>101</sup> *Id.* at 15 (quoting *Calvert Cliffs 3 Nuclear Project, LLC* (Calvert Cliffs Nuclear Power Plant, Unit 3), LBP-09-4, 69 NRC 170, 209 (2009)).

<sup>102</sup> *Id.* at 15-16.

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

<sup>104</sup> *Id.* at 16-17.

than one in a million per reactor-year.<sup>105</sup> Staff claims that Intervenors have not raised a genuine dispute with the Applicant on a material issue of fact, because they do not dispute the probabilities Applicant assigns to events in the ER that are excluded as remote and speculative and thus do not warrant further consideration.<sup>106</sup> Staff urges that Intervenors' citation to 10 C.F.R. § 52.79(a)(29)(ii), as it relates to requirements for an FSAR, is inapposite, fails to establish a legal basis for the contention, and also fails to raise a genuine dispute with Applicant regarding a material issue of law.<sup>107</sup> In addition, Staff suggests, Intervenors' arguments relating to Applicant's Emergency Plan and FSAR Safety Requirements are untimely, as these were part of the original application and are not based on new or materially different information.<sup>108</sup>

Intervenors reply that 42 U.S.C. § 2133(d) is an "overarching requirement" to protect public health and safety that requires Applicants to anticipate catastrophic events that would result in large releases before the ten to twelve hours required to achieve safe shutdown. They submit that NEPA requires Applicants to include discussion of release scenarios that are shorter than the time required to achieve safe shutdown "to fully inform decision makers about the effects of releases that occur prior to safe shutdown of unaffected units," repeating their argument that statistical improbability does not mean that the event is speculative, and referring to the events of September 11, 2001, to lend support to this proposition.<sup>109</sup>

We note that in Co-Location Contention 2 Intervenors essentially restate their arguments in their first co-location contention, to the effect that Applicant should consider and evaluate in its ER impacts of severe accident scenarios, specifically those with release time shorter than

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<sup>105</sup> NRC Staff's Co-Location Answer at 11-12.

<sup>106</sup> *Id.* at 11-12.

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

<sup>108</sup> *Id.* at 11, 15.

<sup>109</sup> Intervenors' Co-Location Reply at 8.

that needed to achieve cold shutdown. For the same reasons discussed in our ruling on Co-Location Contention 1, Intervenors' arguments in this regard are without merit. Intervenors ignore the authority that "low probability is the key to applying NEPA's rule of reason test to contentions" regarding environmental impacts of specific accident scenarios.<sup>110</sup> In addition, they neglect the fact that the ER revisions on which they have predicated their co-location contentions, including this one, involve environmental – not safety or emergency planning – issues, which we have likewise addressed above in our ruling on Co-Location Contention 1. In the end, in this contention as well, Intervenors fail to raise a genuine dispute on a material issue of law or fact, as required under 10 C.F.R. § 2.309(f)(1)(vi). We therefore conclude that Co-Location Contention 2 is inadmissible.

**C. Co-Location Contention 3 – Impact of Earthquake Resulting in Common-Cause Failures at Multiple Units**

In this contention Intervenors assert:

The Applicant fails to evaluate the impact of a severe accident at one CP unit on the other units when the initiating event of the accident is an external event, such as an earthquake, that could result in common-cause failures of systems at one or more of the other units, potentially extending the time necessary for operators to put the units into stable long-term decay heat removal configurations.<sup>111</sup>

In addition to making arguments similar to those made in support of Co-Location Contentions 1 and 2, Intervenors postulate that an external event such as an earthquake could lead to "common-cause failures of safety systems at one or more co-located units," in which "additional time may be required to restore operability of safety systems and achieve stable long-term configurations, increasing the risk that stable shutdown will not be achieved and core-melt may occur at one of the other units."<sup>112</sup> Intervenors again cite 10 C.F.R. § 52.79(a)(29)(ii)

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<sup>110</sup> See *Natural Res. Def. Council v. Morton*, 458 F.2d 827, 834 (D.C.Cir. 1972); *Vermont Yankee*, CLI-90-4, 32 NRC at 131..

<sup>111</sup> Co-Location Contentions at 8.

<sup>112</sup> *Id.* at 9.

and 42 U.S.C. § 2133(d), and argue that “failure to consider the large release scenario on safe shutdown ignores an obvious factor that bears on impacts on co-located units.”<sup>113</sup>

Applicant argues that Intervenors fail to raise a genuine dispute on a material issue of fact in this contention, because external events, including seismic events, are addressed in Section 7.5 of the ER.<sup>114</sup> Applicant therein determines that, because the Comanche Peak site is located in a low seismicity region, “the release frequency for external events, including seismic, [is] negligible,” or “remote and speculative” as “compared to internal events,” and is thus “too low to warrant further consideration.”<sup>115</sup> In support of its argument that its decision to exclude certain improbable events from further impact evaluation is appropriate, Applicant again cites the Commission’s *Vermont Yankee* decision holding that “low probability is the key to applying NEPA’s rule of reason test to contentions that allege that a specified accident scenario presents a significant environmental impact that must be evaluated.”<sup>116</sup> Thus, Applicant urges, as Intervenors “do not contest the frequencies of external events” provided in the ER Revision, Co-Location Contention 3 is beyond the scope of this proceeding and not material to the NEPA findings the NRC must make in this proceeding.<sup>117</sup>

Applicant emphasizes that Intervenors offer no facts, documents, or expert opinion to support their “bare assertions” and “speculative claims.”<sup>118</sup> Thus, Applicant argues, they fail to show a genuine dispute with the Applicant on a material issue of fact.<sup>119</sup> Applicant states that it in fact considered in Section 7.5.5 of the ER a hypothetical evaluation assuming simultaneous

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<sup>113</sup> *Id.* at 9 & n.32 (citing *Druid Hills*, 772 F.2d at 709; *Ohio River Valley*, 473 F.3d at 102).

<sup>114</sup> Applicant’s Co-Location Answer at 18-19.

<sup>115</sup> *Id.* at 18-19 (citing its ER at 7.5-5).

<sup>116</sup> *Id.* at 19 (quoting *Vermont Yankee*, CLI-90-7 at 131).

<sup>117</sup> *Id.* at 19.

<sup>118</sup> *Id.* at 20.

<sup>119</sup> *Id.*

accidents at all four reactors on the Comanche Peak site, which encompasses Intervenor's arguments on impacts of external events on co-located units. For this reason also, Applicant argues, Intervenor's fail to satisfy the requirement at 10 C.F.R. § 2.309(f)(1)(vi) that they show a genuine issue on a material issue of law or fact with the Application.<sup>120</sup>

Staff also points to Applicant's consideration of external events such as seismic events, floods, hurricanes and tornadoes in its ER, arguing that Intervenor's thus fail to show a genuine dispute on a material issue of law or fact.<sup>121</sup> Staff as well notes Applicant's discussion of simultaneous accidents at all four units, the impacts of which are the same regardless of the cause of the accident, whether external or internal, and which bounds the impacts argued by Intervenor's.<sup>122</sup> Moreover, Staff notes, contrary to Intervenor's assertion, Applicant's ER Revision at 7.5 does address common cause failures by explaining that there are no shared systems between the adjacent units on the Comanche Peak site, and that there is thus no direct mechanism for a severe accident at one unit to propagate and cause an accident at an adjacent unit.<sup>123</sup> Because Intervenor's do not explain why this information is inadequate or deficient, and provide only vague and unsupported assertions about what might potentially happen, Staff contends that Intervenor's fail to provide sufficient information to demonstrate any genuine dispute about any significant error or omission in the new Co-location ER Revision.<sup>124</sup>

In reply, Intervenor's among other things claim that seismic events and aircraft impacts are "reasonably foreseeable," supporting this argument by generally referencing "the Commission's requirements to design for and mitigate in response to external events."

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

<sup>121</sup> NRC Staff's Co-Location Answer at 16.

<sup>122</sup> *Id.* at 19.

<sup>123</sup> *Id.* at 20.

<sup>124</sup> *Id.* at 20-21.

Intervenors also claim that Applicant's and Staff's arguments are inconsistent, in that they acknowledge requisite consideration of certain events for the FSAR and DCD (design control document), but not for NEPA analyses, and that this inconsistency "does not make sense."<sup>125</sup>

As Applicant and Staff argue, Intervenors in Co-Location Contention 3 overlook sections of Applicant's ER in which external initiating events, specifically including seismic events, are considered. Furthermore, Intervenors overlook Applicant's analysis of simultaneous accidents at all four units, which bounds any impacts of external events on a co-located unit. Intervenors thus fail to raise a genuine dispute on a material issue of law or fact as required under 10 C.F.R. § 2.309(f)(1)(vi), and Co-Location Contention 3 is inadmissible.

**D. Co-Location Contention 4 – Impact on Co-located Units of Accident at Shutdown Unit with Containment Head Removed**

Intervenors in this contention assert:

The Applicant fails to address the radiological impacts of a severe accident at a CP unit during shutdown, when the primary containment head is removed, on the other CP units.<sup>126</sup>

In this contention Intervenors argue that "[f]uel damage events occurring during refueling outages have a much higher risk of early large radiological releases to the environment than when the reactor is at power," and therefore "shutdown events should be of particular concern with regard to any analysis of co-location environmental impacts including impacts on safe shutdown of co-located units."<sup>127</sup> Intervenors challenge Applicant's conclusion that such events are too remote and speculative to justify analysis in the ER. Noting Applicant's reliance on quantitative risk, Intervenors again argue that "[i]t is not only the statistical improbability of a serious accident that bears on the determination whether, in a given circumstance, a severe

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<sup>125</sup> Intervenors' Co-Location Reply at 9.

<sup>126</sup> Co-Location Contentions at 10.

<sup>127</sup> *Id.* at 10-11 (citing ER at 7.5-4, 7).

accident should be anticipated and thereby considered in the context of the COLA.”<sup>128</sup> They argue that Applicant has considered such accidents in the contexts of emergency response capabilities, separation distances between units, independent safety systems, and the requirements of 10 C.F.R. §§ 50.150 and 50.54(hh), and should likewise consider them in the context of co-location accident effects. Again, Intervenors contend that “categorically excluding events during shutdown is contrary to 42 U.S.C. § 2133(d).”<sup>129</sup>

Applicant argues that Intervenors fail to demonstrate a genuine dispute with Applicant regarding a material issue of fact, because their assertions in Co-Location Contention 4 are simply incorrect; it did in fact address shutdown events in Section 7.5 of the ER.<sup>130</sup> Further, Applicant notes its explanation in that section of how the release frequency for shutdown events at Comanche Peak Units 1 and 2 is less than four in one hundred million ( $3.8 \times 10^{-8}$ ) per reactor-year, and two in ten million ( $2 \times 10^{-7}$ ) per reactor-year for units 3 and 4, which are probabilities lower than that which would warrant further consideration.<sup>131</sup> Applicant argues that, to the extent Intervenors demand further consideration of remote and speculative shutdown events, Co-Location Contention 4 conflicts with the Commission’s *Vermont Yankee* ruling that low probability is key to the admissibility of contentions on impacts of specified accident scenarios.<sup>132</sup> As the probabilities involved in Applicant’s analysis of shutdown events that Intervenor proposes in Co-Location Contention 4 are lower than the threshold probability established in the *Calvert Cliffs* case, Applicant argues, Intervenors raise issues in this

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<sup>128</sup> *Id.* at 11 (citing *Limerick*, ALAB-819, 22 NRC at 713).

<sup>129</sup> *Id.* (citing *Druid Hills*, 772 F. 2d at 709; *Ohio River Valley*, 473 F.3d at 102).

<sup>130</sup> Applicant’s Co-Location Answer at 21.

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

<sup>132</sup> *Id.* at 22 (citing *Vermont Yankee*, CLI-90-7, 32 NRC at 131).

contention that go beyond the scope of this proceeding and are not material to the NEPA findings the NRC must make in this proceeding.<sup>133</sup>

Pointing out that Intervenor's reference to the Appeal Board's decision in the *Limerick* case addresses emergency planning requirements, not relevant to NEPA requirements, Applicant contends that this reference fails to provide a legal basis for admission of Co-Location Contention 4.<sup>134</sup> Urging that Intervenor's arguments in this contention fail to show adequate support for their claims that events during shutdown have a much higher risk of early large radiological releases to the environment than when the reactor is at power, Applicant states that its evaluation of simultaneous accidents at all four units, at § 7.5.5 of its Co-Location ER Revision, encompasses Intervenor's arguments regarding shutdown events and their impact on a co-located unit, and provides the "very type of evaluation" the Intervenor request.<sup>135</sup>

Staff agrees that the *Limerick* case does not support Intervenor's assertions and again cites NEPA's "rule of reason."<sup>136</sup> Citing in addition Commission precedent stating the "undisputed" proposition "that NEPA does not require consideration of remote and speculative risks," Staff maintains that Intervenor fail to raise a genuine dispute with the Applicant on a material issue of fact or law.<sup>137</sup> Staff also claims that Applicant evaluated shutdown scenarios in ER Section 7.2.4, which is part of the original application.<sup>138</sup> Thus, Staff urges, Intervenor's arguments in this regard are untimely.<sup>139</sup>

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<sup>133</sup> *Id.*

<sup>134</sup> *Id.*

<sup>135</sup> *Id.* at 22-23.

<sup>136</sup> NRC Staff's Co-Location Answer at 25-26.

<sup>137</sup> *Id.* at 26.

<sup>138</sup> *Id.*

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

Intervenors respond to Staff's untimeliness arguments by noting that Applicant did not consider accident impacts on co-located plants prior to admission of Contention 13, and that while Applicant considered shutdown scenarios in its ER at section 7.2.4, this did not address impacts related to co-location accidents.<sup>140</sup>

We first observe that, contrary to Intervenors' assertions in Co-Location Contention 4, Applicant has considered shutdown events in Section 7.5 of the Co-Location ER Revision, in which it determines that the release frequency for such events is extremely improbable and is thus remote and speculative,<sup>141</sup> which Intervenors do not substantively contest. Furthermore, Intervenors again fail to demonstrate why case law addressing accident scenario analysis in safety and emergency planning contexts should apply in an environmental context. Finally, the impact analysis Intervenors request is also bounded by Applicant's discussion in ER Revision § 7.5.5 of releases from hypothetical simultaneous accidents at all four units. We conclude that Intervenors fail to state a genuine dispute with the Application on a material issue of fact as required under 10 C.F.R. § 2.309(f)(1)(vi), and that Co-Location Contention 4 is therefore inadmissible.

#### **E. Co-Location Contention 5 – Combined Radiological Consequences of Simultaneous Accidents at All Four Units**

In this contention Intervenors allege:

The Applicant fails to fully evaluate the impact of a chain-reaction that leads to more than one unit experiencing a severe accident.<sup>142</sup>

Intervenors contend that Applicant has failed to address radiological impacts of accidents at all four Comanche Peak units, and again argue that this is a "material omission in the context of dealing with emergencies" under 10 C.F.R. § 52.79(a)(29)(ii). They argue that,

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<sup>140</sup> Intervenors' Co-Location Reply at 10.

<sup>141</sup> Co-Location ER Revision at 7.5-4.

<sup>142</sup> Co-Location Contentions at 12.

because “the Board’s order admitting Contention 13 recognized that accident impacts at one unit may materially affect other units,” it “follows that accidents that occur at all four units in close temporal proximity may materially affect capacity of plant operators to achieve safe shutdown of the units.” Again citing 10 C.F.R. § 52.79(a)(29)(ii) and 42 U.S.C. § 2133(d), Intervenor’s argue that, “if a severe accident affecting one would likely lead to comparable accidents in one or more of the co-located units, then the combined radiological consequences could have a significant impact on the US-APWR SAMDA analysis.” Intervenor’s assert that a “genuine dispute exists with the Applicant based on its decision to exclude a full evaluation of the impact of a chain-reaction that leads to more than one unit experiencing a severe accident.”<sup>143</sup>

Applicant claims that, in Co-Location Contention 5, Intervenor’s fail to raise a genuine dispute with Applicant on a material issue of fact, because Applicant did in fact evaluate the potential for an accident with a frequency greater than  $10^{-6}$  per year to impact co-located units and it concluded that a chain reaction among the Comanche Peak units would not occur.<sup>144</sup> Thus, according to Applicant, there was no reason for it to perform a SAMDA analysis assuming simultaneous accidents at all four units. Applicant argues that Intervenor’s provide no facts or expert opinion explaining why this conclusion in their ER is incorrect, nor have Intervenor’s identified any SAMDAs that should be adopted if some unspecified new analysis were performed,<sup>145</sup> nor any cost-beneficial SAMAs.<sup>146</sup> Nor, Applicant claims, have Intervenor’s provided any reason to believe that the results of the SAMA analysis in ER § 7.5.4 would be affected if the approach they suggest were adopted. Applicant argues that Co-Location

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<sup>143</sup> *Id.* at 12-13.

<sup>144</sup> Applicant’s Co-Location Answer at 24 (citing Co-Location ER Revision § 7.5.5).

<sup>145</sup> *Id.* at 25.

<sup>146</sup> *Id.* (quoting *Duke Energy Corp.* (McGuire Nuclear Station Units 1 & 2; Catawba Nuclear Station, Units 1 & 2), CLI-02-17, 56 NRC 1, 7-8 (2002)).

Contention 5 thus lacks adequate support and fails to establish a genuine dispute with Applicant's SAMA analysis on a material issue of law or fact.<sup>147</sup>

Staff also opposes admission of Co-Location Contention 5, arguing that Intervenors fail to show a genuine dispute with the Applicant on a material issue of law or fact, because Applicant in fact has evaluated an event where severe accidents occur simultaneously in all four reactor units at the Comanche Peak site.<sup>148</sup> Thus, Staff claims, Intervenors are mistaken in their assertions in Co-Location Contention 5 and also have not directly controverted the application.<sup>149</sup> Further, Staff argues, the SAMDA analysis is part of the design certification application and thus this part of the contention constitutes an impermissible challenge to a future rulemaking.<sup>150</sup>

Intervenors in their Reply state that Applicant relies on a "flawed underlying analysis" in ER Revision § 7.5.5, and again argue that statistically improbable events must be anticipated in reactor design and LOLA<sup>151</sup> mitigation plans, so they should also be required under NEPA in ERs to avoid "inconsistency."<sup>152</sup>

We find that Intervenors in Co-Location Contention 5 fail to provide facts or expert opinion to challenge Applicant's actual consideration of the potential occurrence of chain reaction events resulting from a simultaneous accident at all four units on the Comanche Peak site. Nor do they demonstrate that Applicant's conclusion that such a chain reaction would not occur is incorrect, or to show that the analysis they request would result in any appropriate new

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<sup>147</sup> *Id.* at 25-26.

<sup>148</sup> *Id.* at 28.

<sup>149</sup> NRC Staff's Co-Location Answer at 28.

<sup>150</sup> *Id.* at 29 (quoting *Duke Energy Corp.* (Oconee Nuclear Station, Units 1, 2, & 3), CLI-99-11, 49 NRC 328, 345 (1999)).

<sup>151</sup> LOLA is an acronym for "loss of large area."

<sup>152</sup> Co-Location Reply at 11.

SAMDA or cost-beneficial SAMA. Intervenors thus fail to provide adequate support to establish any genuine dispute with the Applicant on a material issue of law or fact as required under 10 C.F.R. § 2.309(f)(1)(vi). We therefore conclude that Co-Location Contention 5 is inadmissible.

#### **F. Alternatives Contention 1 – Impacts of Wind and CAES**

Intervenors in their first contention on Applicant's new NEPA alternatives section of its ER state:

The Applicant overstates and mischaracterizes, without substantiation, the impacts of wind power generation and CAES.<sup>153</sup>

There are, in addition, two subheadings, which state as follows:

- A. Applicant substantially overstates wind power and CAES land use impacts.<sup>154</sup>
- B. Applicant does not consider the benefits of using CAES in Texas.<sup>155</sup>

Supported by their expert, Ray Dean, Ph.D.,<sup>156</sup> Intervenors accuse Applicant of using “misleading statements about environmentally impacted areas,” thereby overstating the negative environmental land use impacts from wind generation and compressed air energy storage (CAES).<sup>157</sup> Also, according to Intervenors, Applicant fails to acknowledge negative environmental impacts of nuclear power, and various regulatory requirements relating to “security of nuclear plants . . . water use, radioactive waste management, radioactive contamination of air, water and soil, and radiation monitoring,” which “do not apply to

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<sup>153</sup> Alternatives Contentions at 3.

<sup>154</sup> *Id.*

<sup>155</sup> *Id.* at 4.

<sup>156</sup> According to his Resume, Dr. Dean is Professor Emeritus in Electrical Engineering and Computer Science at the University of Kansas, has an M.S. in nuclear reactor design, and pre-retirement was a Registered Professional Engineer. See Resume of Raymond H. Dean (Jan. 4, 2010).

<sup>157</sup> Alternatives Contentions at 3 (citing Dean Report at 5).

wind/CAES.”<sup>158</sup> According to Intervenor, “Applicant’s attenuated comparison of the environmental impacts of nuclear and wind/CAES is inadequate to adequately inform decision makers about the competing choices.”<sup>159</sup>

Intervenor challenge Applicant’s estimate in its ER amendments that, in order to generate 3200 megawatts of energy a wind farm would take up 452,000 to 816,000 acres of land, claiming that these numbers “overstate the environmental impact by two orders of magnitude.”<sup>160</sup> They suggest, with the support of Dr. Dean as well as that of Arjun Makhijani, Ph.D.,<sup>161</sup> and Mr. Paul Robbins,<sup>162</sup> that the wind turbines, associated roads and buildings in a wind farm occupy a “very small fraction” of the land area, leaving the remaining 96.5% of the area usable for farming and ranching, with roads also usable for other purposes.<sup>163</sup> Intervenor also contest Applicant’s description of the CAES facility covering “between 63,289 and 114,420 acres,”<sup>164</sup> stating that Applicant includes in these figures an underground reservoir “as part of the above-ground footprint,” and provide the following from Dr. Dean’s Report:

The CASE (sic) facility would not cover that amount of land. The indicated area is the area of a 10-meter thick aquifer, which is two or three thousand feet underground. The only above-ground impacts of CAES are the building that houses the compressors, expanders, heat exchangers, and combustors, plus scattered well heads and (probably) buried pipes connecting those well heads to the building. Since the net power coming out of a CAES expander is two or three times greater than the net power coming out of a

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<sup>158</sup> *Id.* (citing 10 C.F.R. §§ 50.54(hh), 50.150).

<sup>159</sup> *Id.* (citing *Dep’t of Transp. v. Pub. Citizen*, 541 U.S. 752, 768-69 (2004)).

<sup>160</sup> *Id.* at 4 (quoting Dean Report at 6 (citing Alternatives ER Revision at 9.2-40)).

<sup>161</sup> According to his Curriculum Vita, Dr. Makhijani has a Ph.D. in electrical engineering, specializing in plasma physics as applied to controlled nuclear fusion, and has authored numerous articles on energy and environment-related issues. See Curriculum Vita of Arjun Makhijani (Feb. 17, 2009).

<sup>162</sup> According to his Resume, Mr. Robbins does research and writing on environmental issues, energy policy and technology. See Resume of Paul Robbins (Jan. 15, 2010).

<sup>163</sup> *Id.* (quoting Dean Report at 6); see also *id.* (citing Robbins Report at 3; Makhijani Declaration at 2).

<sup>164</sup> *Id.* (quoting Alternatives ER Revision at 9.2-40).

combustion turbine having the same diameter, the CAES equipment building will be substantially smaller than a building housing conventional combustion turbines capable of the same electrical output.<sup>165</sup>

. . . .

The site for Comanche Peak's reactors and related facilities occupies 7950 acres. The area actually occupied by the foundations of the 4000 wind turbines could range from 1000 to 2000 acres, plus the area of the CAES facility and scattered CAES well heads. The Applicant's use of the term "LARGE" to describe the relative environmental impact of an alternative wind-and-storage system is not justified.<sup>166</sup>

In the second part of the contention, Intervenor's suggest that "Applicant does not consider the benefits of using CAES in Texas," citing the Dean Report for the observation that underestimation of such benefits may arise from experience of slow development in a porous aquifer in Iowa, whereas the existence of old gas wells and a "vast amount" of geological data from their development would support much easier development of CAES in Texas. They cite the Robbins Report for similar "inherent advantages of developing CAES in Texas."<sup>167</sup>

Applicant suggests that Intervenor's arguments on land use of wind power are untimely under 10 C.F.R. § 2.309(c) or (f)(2), because its ER has "always" contained the statements about wind power's impact on land use being "large" and involving "approximately 452,800-816,000 acres of land."<sup>168</sup> Moreover, Applicant points out, the ER already acknowledges that some of the land used for a wind farm could also be used for other purposes such as agriculture.<sup>169</sup> Given these acknowledgements, Intervenor's land use arguments do not, according to Applicant, raise a genuine issue of material fact as required at 10 C.F.R.

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<sup>165</sup> *Id.* (quoting Dean Report at 6-7; citing Robbins Report at 3).

<sup>166</sup> *Id.* (quoting Dean Report at 7).

<sup>167</sup> *Id.* at 4-5 (quoting Dean Report at 3-4; citing Robbins Report at 3-4).

<sup>168</sup> Applicant's Alternatives Answer at 8-9 (citing ER § 9.2.2.1).

<sup>169</sup> *Id.* at 11 (citing ER at 9.2-8).

§ 2.309(f)(1)(vi).<sup>170</sup> On the land use of CAES, Applicant characterizes Intervenor's arguments on what area the CAES would "cover" as "flyspecking," given that Intervenor does not dispute the need for the area Applicant specifies, and that the ER Update clearly states that the CAES would involve "large scale underground storage capacity."<sup>171</sup>

In addition, Applicant argues, whatever the advantages of developing CAES facilities in Texas, the reason Applicant rejected a wind-CAES combination is that "the economics and feasibilities of such a system in Texas are speculative," and Intervenor fails to show that wind power combined with CAES is feasible, or "developed, proven, and available to supply baseload power."<sup>172</sup> Thus, Applicant argues, Intervenor's argument on "the relative ease of developing CAES in Texas is simply not material," and fails to demonstrate a genuine issue of material fact.<sup>173</sup>

NRC Staff challenges Intervenor's land use arguments on the basis that they fail to refer to sections of the ER dealing with land use, and fail to "identify or describe the current types of land use at the site."<sup>174</sup> Moreover, Staff argues, "[e]ven assuming that the Applicant overestimated the amount of land that would be necessary for wind generation, such a facility would likely extend beyond the boundaries of the proposed facility and affect land uses that would not otherwise be impacted," citing as an example the ER's indication that there are 144,425 acres of farmland in the vicinity of the site but that construction of the proposed new units would not affect them, in contrast to greater impacts of a wind farm.<sup>175</sup> In addition, among other things Staff argues that, "[w]hile NEPA requires that the EIS identify and address 'all

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<sup>170</sup> *Id.*

<sup>171</sup> *Id.* at 11 (citing Alternatives ER Revision at 9.2-34, 40).

<sup>172</sup> *Id.* at 12 (citing Alternatives ER Revision at 9.2-34, 40); see *also* NUREG-1555 at 9.2.2-4.

<sup>173</sup> Applicant's Alternatives Answer at 12.

<sup>174</sup> Staff's Alternatives Response at 13.

<sup>175</sup> *Id.* (citing ER, § 4.1.1.2 at 4.1-3).

reasonable alternatives,' this does not mean that every conceivable alternative must be included in the EIS."<sup>176</sup> Staff agrees that an EIS must "[r]igorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated."<sup>177</sup> But Staff further contends, citing the NEPA "rule of reason," that, "if the Applicant eliminates an alternative from consideration, NEPA does not require a detailed discussion of the rejected alternative's environmental impacts."<sup>178</sup> Staff insists that Intervenors in Alternatives Contention 1 have failed to show a genuine dispute with the Applicant on a material issue of law or fact, and have thus failed to meet the requirements of 10 CFR § 2.309(f)(1)(iv) and (vi). Finally, Staff also challenges Intervenors' incorporation by reference of arguments in their Response to Applicant's Motion to Dismiss Contention 18,<sup>179</sup> as well as their citation and excerpting of the Dean Report concerning the "geological advantages that weigh in favor of CAES in Texas," arguing that the latter argument "fails to support the Intervenors' contention that the Applicant *mischaracterizes* the impacts of wind power generation and CAES," and fails to controvert any information in the ER Revision at issue.<sup>180</sup>

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<sup>176</sup> *Id.* at 14 (citing *Progress Energy Florida, Inc.* (Combined License Application for Levy County Nuclear Power Plant, Units 1 & 2), LBP-09-10, 70 NRC \_\_, \_\_ (slip op. at 80) (July 8, 2009) (quoting *Vermont Yankee Nuclear Power Corp. v. Natural Res. Def. Council*, 435 U.S. 519, 551 (1978)).

<sup>177</sup> *Id.* (citing 40 C.F.R. § 1502.14).

<sup>178</sup> *Id.*

<sup>179</sup> *Id.* at 15 (citing *Commonwealth Edison Co.* (Zion Nuclear Power Station, Units 1 & 2), CLI-99-4, 49 NRC 185, 194 (1999), *pet. for rev. den. sub nom. Dienenthal v. NRC*, 203 F.3d 52 (D.C. Cir. 2000) ("We do not expect our adjudicatory Boards, unaided by the parties, to sift through the parties' pleadings to uncover and resolve arguments not advanced by litigants themselves."); *Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Units 2 & 3), LBP-04-15, 60 NRC 81, 89 (2004) (arguing that a "petitioner cannot include a reference as support without showing why the reference provides a basis to support its contention").

<sup>180</sup> *Id.* at 15-16.

Intervenors respond to Applicant and Staff by arguing among other things that their land use challenges are not untimely, as the Applicant's land use information did not apply to the combination of wind power and CAES until the filing of the ER Revisions, and that in any event the Board has the discretion to consider them for good cause under 10 C.F.R. § 2.309(c)(1)(ii)-(viii).<sup>181</sup> In addition, Intervenors contend Applicant has not taken the NEPA-required "hard look" at alternatives, and that its contention does not "flyspeck" but rather points out distortions that "frustrates a fair comparison of alternatives."<sup>182</sup> They argue that, contrary to Applicant's and Staff's arguments, they show through their expert, Dr. Dean, that the wind-CAES combination is feasible and not speculative.<sup>183</sup> Finally, we note Intervenors' argument, in response to Staff,<sup>184</sup> that they have no obligation to "identify or describe the current types of land use at the site," because Alternatives Contention 1 is an "omission contention," alleging that "Applicant has omitted a discussion of impacts based on an accurate land use projection."<sup>185</sup>

Addressing this final argument first, we note that it appears to be based on Intervenors' view that filing "omission contentions" relieves them of as much as possible in the way of logical and factual support for such contentions. In this instance, such a view is facially supported by the second sub-heading of Alternatives Contention 1, which states that "Applicant *does not consider* the benefits of using CAES in Texas." But the overall thrust and substance of the contention concerns not omissions, but rather the manner in which, and the adequacy with which, Applicant addresses the impacts of wind generation and CAES – as evidenced by the introductory language of the contention to the effect that Applicant "overstates and

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<sup>181</sup> Intervenors' Alternatives Reply at 2-3.

<sup>182</sup> *Id.* at 3-4.

<sup>183</sup> *Id.* at 4-5.

<sup>184</sup> See *supra* text accompanying note 174.

<sup>185</sup> *Id.* at 3.

mischaracterizes” the impacts of wind power generation and CAES. Although an omission of “substantiation” is asserted, this is secondary to the central assertion made in the contention. As to how Applicant does characterize the impacts of wind power generation and CAES, we note at the outset that it *does consider* the wind-CAES combination. Intervenors challenge the *adequacy* of how Applicant analyzes this combination and its impacts, as to land use impacts and other particulars. But to argue that the land use projections Applicant uses are inadequate or incorrect is one thing; to characterize such projections as “omitt[ing] a discussion of impacts based on an accurate land use projection” is another, bordering on the frivolous.

Turning to the issue of land use impacts, we must agree with Applicant that Intervenors’ land use arguments as to wind power itself are untimely, insofar as they concern estimates of acreages that would be required for a wind farm. Notwithstanding Intervenors’ arguments that their new land use challenges relate only to the combination of wind and CAES, they have shown no good cause why they could not have earlier addressed these acreage estimates provided by Applicant in its ER. Indeed, in their original Petition, in their support of original Contention 18, Intervenors rely on parts of Chapter 9 of Applicant’s ER, and make a reference to “Environmental Report, p. 9.2-1 *et seq.*” – but do not address the land use statements regarding acreage made at page 9.2-9 thereof.<sup>186</sup> In addition, Dr. Makhijani in his April 2009 46-page report, “Nuclear Costs and Alternatives,” refers to section 9.2.1.3 of the ER,<sup>187</sup> which indicates that he had access to the ER, but nowhere addresses the land use statements in the ER that relate to wind power alone, which could presumably have been done in the preparation of the extensive report. In these circumstances, we do not find good cause under 10 C.F.R. § 2.309(c) for Intervenors not earlier raising their challenges to the acreage figures for land use

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<sup>186</sup> Petition at 42 (citing ER at 9.2-1).

<sup>187</sup> Makhijani Report at 3.

alone. We therefore find that part of Alternatives Contention 1 that concerns land use of wind power, insofar as it concerns acreage figures, to be inadmissible.

Intervenors are correct, however, that the CAES land use figures were not in the original ER, and we find Intervenors challenges amount to more than “flyspecking,” and meet the requirements of 10 C.F.R. § 2.309(f)(1)(i)-(vi). We also find persuasive Intervenors’ arguments with respect to that part of the contention on land being usable for multiple purposes. Applicant makes a passing, one-sentence reference to this in the ER, in a section related to analysis of wind power alone,<sup>188</sup> not in combination with CAES. We find this wind-CAES aspect to raise the multiple use argument to a new level, showing a genuine dispute with the Applicant on this material issue of fact and warranting admission of this part of the contention under § 2.309(f)(1).

In addition, insofar as this contention concerns questions of the feasibility of developing wind power and CAES in Texas, we also find, based on the support offered from the Dean and Robbins Reports on the relative advantages and ease of development of a wind-CAES combination in Texas, this issue to be admissible, to the limited extent that it may, when considered with the admissible parts of Alternatives Contentions 2 and 3, be relevant in the context of a combination alternative made up of wind and solar energy, energy storage methods, and natural gas supplementation. In conclusion, to the preceding limited extent, insofar as Alternatives Contention 1 concerns (1) the feasibility of developing wind and CAES together in Texas, (2) land use relating to CAES, and (3) multiple, overlapping uses of land, we find it admissible under 10 C.F.R. § 2.309(f)(1)(i)-(vi), as further defined in section III.I below, in our Summary of Rulings on Admissible Parts of Alternatives Contentions 1 Through 3.

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<sup>188</sup> In the ER at 9.2-8 the only sentence referring to multiple uses of land is, “Some of this land could be used for other purposes, such as agriculture.” See *supra* note 169 and accompanying text.

## G. Alternatives Contention 2 – Impacts of Solar with Storage

In their second alternatives contention Intervenor's state:

The Applicant inadequately characterizes, without substantiation, the impacts of solar with storage.<sup>189</sup>

Alternatives Contention 2 has two subheadings, which state as follows:

- A. Applicant inappropriately characterizes and overstates adverse socioeconomic impacts and ignores the potential positive socioeconomic impacts of solar with storage.<sup>190</sup>
- B. Applicant overstates solar with storage land use impacts and fails to consider solar technologies with no land use impacts.<sup>191</sup>

Citing their Robbins and Dean Reports, Intervenor's challenge Applicant's assertion of adverse socioeconomic impact based on "economic losses the company would incur due to energy stored during peak hours being sold for a lower cost at non-peak hour prices," suggesting that socioeconomic impacts should be considered to include social as well as economic factors, and that the latter include "the cost savings and reliability gained with storage," which Applicant does not consider.<sup>192</sup> According to Intervenor's, thermal storage actually allows for reduction of "O&M" costs and options on when to sell, with resulting additional potential revenue.<sup>193</sup> Moreover, they argue, Comanche Peak generates less profit as a baseload plant than it would if it produced power at peak.<sup>194</sup>

Intervenor's also argue that solar energy "could have positive local economic impacts in terms of jobs," citing a study estimating that "a 100-MW solar plant [could create] . . . a minimum of 1,588 jobs . . . in the two-year period of construction, which would generate \$57.4 million in

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<sup>189</sup> Alternatives Contentions at 5.

<sup>190</sup> *Id.*

<sup>191</sup> *Id.* at 8.

<sup>192</sup> *Id.* at 5 (citing Alternatives ER Revisions at 9.2-43).

<sup>193</sup> *Id.* at 5-6 (citing Robbins Report at 5-6).

<sup>194</sup> *Id.* at 6 (citing Robbins Report at 6).

wages,” and that 85 jobs would be created during operation, “which would generate \$3.1 million in wages.”<sup>195</sup>

Contending that solar “is a viable baseload source alternative,” Intervenors argue, citing the website of a German company, that “SCCS Integrated Solar Combined Cycle Systems are the newest integrated solution for applying solar solutions to baseload needs,” and are “attractive where a suitable fossil fuel (natural gas is preferred though fuel oil can be used) is available due to excellent performance, cost and emission characteristics.”<sup>196</sup> Intervenors cite another website for the argument that solar-powered “steam augmentation technology” can “deliver solar steam to conventional power stations that would enable the production of additional electricity without additional fuel,” suggesting that this could be “integrated into the Applicant’s existing steam electric plants,” with “minimal impact on land use” and increased efficiency, “another option that the Applicant has neglected.”<sup>197</sup>

Supported by the Robbins Report, Intervenors question Applicant’s estimate of 55,510 to 76,000 acres for a solar facility, which Robbins equates to 86.73 to 118.75 square miles, and which “is far from the reality of the Mojave Solar Park, set to be completed in 2011.” According to Robbins, this “553 MW solar thermal facility will take up 9 square miles of land, so even if storage facilities were added, it would be no where [sic] close to the 86.73 to 118.75 square miles claimed by the applicant.”<sup>198</sup> Intervenors argue that Applicant “also ignores the possible

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

<sup>196</sup> *Id.* (citing [http://www.flagsol-gmbh.com/flagsol/cms/front\\_content.php?idcat=19](http://www.flagsol-gmbh.com/flagsol/cms/front_content.php?idcat=19) (last visited June 24, 2010)).

<sup>197</sup> *Id.* at 7 (citing <http://www.ausra.com/products/augmentation.html> (last visited June 24, 2010)).

<sup>198</sup> *Id.* at 8 (citing Robbins Report at 5).

contributions to capacity from rooftop solar applications, which would involve no additional land use.”<sup>199</sup>

Finally, we note that part of Alternatives Contention 2, supported by the Dean Report, asserting that thermal energy storage “overcomes the variability of sunlight as a constraint on baseload,” and, when combined with wind generation and an “integrated gas turbine,” can “provide a seamless transition to the load need by providing energy when the production of both technologies is overlapped.”<sup>200</sup>

Applicant argues that solar with storage to produce baseload power has not been shown to be feasible, which Intervenor do not, in Applicant’s view, dispute with any “supporting information that contradicts any conclusion in the ER or that otherwise indicates that solar power generation in combination with storage is an economically or technologically proven way to provide baseload power.”<sup>201</sup> This, Applicant argues, renders the part of the contention dealing with “O&M,” or operations and maintenance costs, inadmissible, and any economic impacts are therefore immaterial.<sup>202</sup> Applicant also cites a recent Commission decision in the *Summer* proceeding for the proposition that “issues related to costs only become relevant if an intervenor identifies an environmentally preferable, reasonable alternative.”<sup>203</sup>

As to positive job impacts of solar, Applicant argues that these are likewise immaterial, and also points out that the ER Update does in any event acknowledge such positive impacts.<sup>204</sup> Further, Applicant argues, Intervenor’s peaking arguments are immaterial, as Comanche Peak

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<sup>199</sup> *Id.*

<sup>200</sup> *Id.* at 7-8 (citing Dean Report at 1-2; [http://www.flagsol-gmbh.com/flagsol/cms/front\\_content.php?idcat=45](http://www.flagsol-gmbh.com/flagsol/cms/front_content.php?idcat=45) (last visited June 24, 2010)).

<sup>201</sup> Applicant’s Alternatives Answer at 15.

<sup>202</sup> *Id.* at 14-15.

<sup>203</sup> *Id.* at 15 (citing *South Carolina Elec. & Gas Co.* (Virgil C. Summer Nuclear Station, Units 2 & 3), CLI-10-1, 71 NRC \_\_, \_\_ (slip op. at 30-31) (Jan. 7, 2010)).

<sup>204</sup> *Id.* at 15-16 (citing Alternatives ER Revision at 9.2-43 – 44).

is a baseload power plant, and the ER Update already explicitly evaluates solar and natural gas combinations.<sup>205</sup> On intervenors' land use arguments, Applicant points out that these, like those related to wind, are untimely, because the ER has "always estimated the amount of land required for a solar power project by scaling up the amount of land needed to the 553-MW Mojave Solar Park," and in any event any discrepancies intervenors assert are relatively small, such that their arguments amount to "flyspecking."<sup>206</sup> As to rooftop solar, Applicant argues that intervenors fail to show that this could either produce baseload power or be practicable for a merchant generator.<sup>207</sup> And finally, concerning intervenors' arguments on solar and gas, as in the German system referenced by intervenors, this should not be admitted, because Applicant evaluates a solar-gas combination, which intervenors do not cite or address.

NRC Staff argues that Alternatives Contention 2 "does not sufficiently allege why the Applicant's analysis of alternatives is deficient under NEPA" and therefore fails to show a genuine dispute on a material issue of law or fact.<sup>208</sup> Because Applicant dismissed solar with storage as not a viable alternative, Staff argues, this alternative does not meet NEPA's "rule of reason."<sup>209</sup> Moreover, Staff suggests, intervenors "fail to recognize that the Applicant's discussion of alternatives is bounded by feasibility."<sup>210</sup> Staff asserts that intervenors "appear to confuse land use impacts with the *amount* of land required for the operation of a power generation facility," that they "merely challenge" Applicant's acreage estimate for a solar facility, that they fail to show how "the *incomplete* Mojave Solar Park" would "provide a *viable* alternative," that they do not "directly challenge any of the information contained in the ER

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<sup>205</sup> *Id.* at 16-17 (citing Alternatives ER REvision at 9.2-40 –50).

<sup>206</sup> *Id.* at 18-19 (citing ER at 9.2-11).

<sup>207</sup> *Id.* at 19.

<sup>208</sup> Staff's Alternatives Response at 18.

<sup>209</sup> *Id.* at 17 (citing *Pub. Citizen*, 541 U.S. at 754).

<sup>210</sup> *Id.* at 18, 19 (citing *Vermont Yankee*, 435 U.S. at 551).

related to the types of land use at the site,” and that they fail to “show how the effects of solar power generation with storage would not negatively affect current land uses.<sup>211</sup> Therefore, Staff urges, Alternatives Contention 2 fails to show a genuine dispute on a material issue of law or fact as required at 10 C.F.R. § 2.309(f)(1)(vi) and should be rejected.<sup>212</sup>

Intervenors respond that Applicant’s analysis of solar power with storage is flawed, and “inappropriately weighted the economic parameter at the expense of the more complete socioeconomic analysis,” which should be done because this combination is feasible and nonspeculative.<sup>213</sup>

As with the land use impacts of wind, Intervenors’ arguments on land use impacts of solar power are untimely under 10 C.F.R. § 2.309(c). In addition, we find arguments related to peaking power, steam augmentation, and rooftop solar power to be outside the scope of the proceeding and not to present a genuine dispute on a material issue, as required at 10 C.F.R. § 2.309(f)(1)(iii) and (vi), as they have not been shown to be related to baseload power, which we have already determined defines the scope of relevant issues relating to renewable fuels.<sup>214</sup> In addition, because Intervenors do not address that part of the ER Revision in which Applicant does acknowledge positive job impacts of solar, we find this part of Alternatives Contention 2 to be inadmissible under § 2.309(f)(1)(vi). Finally, regarding Intervenors’ arguments on the new German solar-gas Combined Cycle Systems, as Applicant argues, Intervenors fail to refer to the part of the ER Revision addressing solar-gas combinations, and we therefore find this part of the contention inadmissible under § 2.309(f)(1)(vi).

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<sup>211</sup> *Id.* at 17-18 (emphasis in original).

<sup>212</sup> *Id.* at 18.

<sup>213</sup> Intervenors’ Alternatives Reply at 5.

<sup>214</sup> See LBP-09-17, 70 NRC at \_\_ (slip op. at 81-82).

Intervenors do provide, however, a fact-based argument, supported by their expert, Dr. Dean, to support the contention insofar as it concerns the feasibility of thermal energy storage “overcome[ing] the variability of sunlight as a constraint on baseload,” and combining solar and thermal energy storage with wind generation and an “integrated gas turbine” to “provide a seamless transition to the load need by providing energy when the production of both technologies is overlapped.”<sup>215</sup> We find this to be sufficient to meet the admissibility requirements of 10 C.F.R. § 2.309(f)(1), including presenting a genuine dispute with the Applicant, who has not addressed such a combination alternative, on a material issue of fact, as required at § 2.309(f)(1)(vi).

In addition, we do not agree with Applicant that issues relating to operation and maintenance costs of solar in comparison to the proposed new nuclear units are necessarily immaterial, based on the argument that cost issues are relevant only if an alternative is “environmentally preferable.” We note the Commission’s *Summer* decision, cited by Applicant, in which the Commission quoted the following from the 1978 Appeal Board decision in *Midland*:

[N]either NEPA nor any other statute gives us the authority to reject an applicant's proposal solely because an alternative might prove less costly financially. Monetary considerations come into play in only the opposite fashion — i.e., if an alternative to the applicant's proposal is environmentally preferable, then we must determine whether the environmental benefits conferred by that alternative are worthwhile enough to outweigh any additional cost needed to achieve them.<sup>216</sup>

In reaching its decision to remand the *Summer* case, however, the Commission stated, significantly, that it would be “premature” to find that *Midland* applied to *Summer*, because it was remanding one of the *Summer* Licensing Board’s contention admissibility rulings, and until the Board made its determination on whether to admit the contention in question – and, if admitted,

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<sup>215</sup> See *supra* text accompanying note 200.

<sup>216</sup> *Summer*, CLI-10-1, 71 NRC at \_\_\_ (slip op. at 31) (citing *Consumers Power Co. (Midland Plant, Units 1 & 2)*, ALAB-458, 7 NRC 155, 162 (1978)).

until a hearing on the matter was held – it was impossible to “say with certainty at this time that all parties have failed to identify an environmentally preferable alternative.”<sup>217</sup>

In this proceeding, once Intervenors’ arguments on peaking power and rooftop solar are taken out of the mix, we cannot say that Intervenors state in so many words that solar with storage is actually environmentally preferable to the proposed new units, notwithstanding their clear arguments to this effect throughout. They explicitly, however, make an argument that combining solar with thermal energy storage, wind generation, and an “integrated gas turbine,” has positive benefits.<sup>218</sup> Moreover, Intervenors clearly challenge the position that nuclear is preferable to a wind-solar-storage-natural gas supplementation combination. As further discussed in our Summary of Rulings on Admissible Parts of Alternatives Contentions 1 Through 3, we find that Intervenors’ arguments fairly bring into question Applicant’s argument based on *Summer* and *Midland*. Indeed, the situation herein is more akin to that facing the Commission when it found it premature to find the *Midland* rationale applicable in the *Summer* case.

**H. Alternatives Contention 3 – Impacts Comparison:  
Nuclear and Renewable with Storage**

In this contention Intervenors assert:

The Applicant’s determination that nuclear is environmentally preferable to renewable energy with storage, supplemented by natural gas is based on fundamentally flawed assumptions about the nature and extent of environmental impacts related thereto.<sup>219</sup>

Alternatives Contention 3 has three subheadings, in which Intervenors state as follows:

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<sup>217</sup> Id.

<sup>218</sup> See *supra* text accompanying note 200.

<sup>219</sup> Alternatives Contentions at 8.

- A. By assuming that each technology needs to be capable of generating 3200 MW “individually,” the Applicant overstates the environmental impacts of the combinations of wind and CAES.<sup>220</sup>
- B. The Applicant uses inadequate characterizations of the impacts of renewable energy with storage to conclude that renewable energy with storage, supplemented by natural gas is not environmentally preferable to nuclear power.<sup>221</sup>
- C. The Applicant did not consider wind *and* solar energy combined.<sup>222</sup>

Intervenors challenge Applicant’s assertion, at ER § 9.2.2.11.4.1, that renewable energy with storage supplemented by natural gas would result in “cumulative impacts since each technology would have to have the capacity to produce 3200 MW of power individually,” as overstating the environmental impacts of “combinations of wind and CAES, supplemented by natural gas or solar and storage supplemented by natural gas.”<sup>223</sup> They state that “Applicant’s claim that a natural gas plant of 3200 MW would be needed is directly contradicted by Drs. Dean and Makhijani, who opine that wind and CAES alone can suffice as baseload.”<sup>224</sup> In addition, they argue that Applicant’s “premise is questionable in light of NUREG-1555, which states, ‘a competitive alternative could be composed of combinations of individual alternatives.’”<sup>225</sup> Thus, Intervenors argue, Applicant’s conclusion, that renewable energy with storage supplemented by natural gas is not environmentally preferable to nuclear, is flawed.<sup>226</sup> They contend that, by overstating land requirements, Applicant also overstates the environmental impacts of “wind/solar/CAES,” and again assert “the well-known fact that wind

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<sup>220</sup> *Id.*

<sup>221</sup> *Id.* at 10.

<sup>222</sup> *Id.*

<sup>223</sup> *Id.* at 8-9 & n.26 (citing Alternatives ER Revisions at 9.2-46).

<sup>224</sup> *Id.* at 9 n.26.

<sup>225</sup> *Id.* at 9 (citing NUREG-1555 at 9.2.3-1).

<sup>226</sup> *Id.*

generation allows multiple uses of the same land including farming and ranching that has the effect of minimizing consequential socioeconomic dislocations.”<sup>227</sup>

“Adopting the Applicant’s methodology,” Intervenor urge, “would cause the analysis of the viability of renewable fuels in combination with storage technologies and/or natural gas to be considered in an overly restrictive and artificial way. . . . [and] ignore substantial evidence that contradicts the Applicant’s assertion.”<sup>228</sup> In fact, Intervenor argue, Applicant is incorrect in not recognizing the environmental preferability of renewable energy with storage supplemented by natural gas; they assert that “solar with storage could have a positive socioeconomic impact and wind with CAES could have a positive impact on land use.”<sup>229</sup>

In addition, Intervenor contend, Applicant in its analyses in the ER Revision considered combinations including wind *or* solar, but did not consider combinations including both wind *and* solar energy.<sup>230</sup> According to Intervenor, “[t]he introduction of coastal wind, which has production curves that closely match the fall off in solar production, allows the production curve to match the load curve.”<sup>231</sup> They state, citing the Dean Report:

North and West Texas wind provide energy in the night load hours, solar with storage provides for peak demand production and coastal wind can provide overlap in the production curve in the late afternoon and early evening hours to provide a smooth generation curve that closely follows the load need.<sup>232</sup>

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<sup>227</sup> *Id.* (referring to their Response to Motion to Dismiss Contention 18 at 5-6).

<sup>228</sup> *Id.* (citing *Druid Hills*, 772 F.2d at 709; *Ohio River Valley*, 473 F.3d at 102).

<sup>229</sup> *Id.* at 10 (citing ER Revision at 9.2-47).

<sup>230</sup> *Id.* We take Intervenor’s reference to Applicant’s analyses to include its analyses of renewable energy sources combined with storage and natural gas, whether as supplemental or the main energy source.

<sup>231</sup> *Id.*

<sup>232</sup> *Id.* Intervenor also cite parts of the Dean Report addressing issues including wind and solar as complementary components, the feasibility of using aquifers for CAES storage, and related costs issues.

Finally, Intervenors conclude, “[t]he Applicant’s questionable analysis and determination that nuclear is environmentally preferable to the alternatives [Intervenors propose] allows the Applicant to avoid an economic cost comparison.”<sup>233</sup> In explanation of this conclusion, they provide the following additional quotation from the Dean Report:

The Applicant tries to justify its position with four tricks: (1) They restrict the alternatives considered. (2) They frame evaluation criteria narrowly around the form of the CP COL ER's desired solution (a large nuclear power plant) rather than its function (providing the requisite electricity), even though this form has significant problems that other forms do not have. (3) They argue in contradictory ways at different times. (4) They use quantitative facts out of proper context and stretch truths beyond reasonable limits.<sup>234</sup>

Applicant argues that new Alternatives Contention 3 is unsupported, immaterial, and fails to raise a genuine issue, and that the contention that wind and solar should have been considered together is untimely, as original Contention 18 did not include any solar and wind combination arguments.<sup>235</sup> In addition, according to Applicant, the contention is speculative, and Intervenors do not provide support for the idea of using solar-wind combinations for baseload power.<sup>236</sup> In any event, argues Applicant, given its analysis of the options separately and conclusions that each would have a large impact on land use and aesthetics and a moderate impact on ecological and other resources, Intervenors have shown no reason to believe that combined wind and solar energy would have any different impacts, and have not put forward an alternative that is significantly distinguishable from those already considered.<sup>237</sup>

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<sup>233</sup> *Id.* at 10-11 (citing NUREG-1555’s description at 9.2.3-2 of a two-step process consisting of “(1) comparing the environmental and health impacts of the competitive alternatives to the proposed action, and (2) comparing the economic costs of any competitive alternatives found to be environmentally preferable to the proposed action”).

<sup>234</sup> *Id.* at 10-11 n.32.

<sup>235</sup> Applicant’s Alternatives Answer at 21-23.

<sup>236</sup> *Id.* at 23.

<sup>237</sup> *Id.* at 23-24.

NRC Staff argues that Alternatives Contention 3 is inadmissible because it fails to demonstrate a material issue, is inadequately supported, fails to reference a specific portion of the application that the Intervenors dispute, and fails to show a genuine dispute with the Applicant on a material issue of law or fact.<sup>238</sup> Regarding Intervenors' argument on each technology needing 3200 MW capacity, Staff argues that "Applicant did not limit its analysis by requiring each energy source to produce 3200 MW," but instead referred to "natural gas replaced by amounts *up to* 3200 MW of renewable power (either wind or solar) and *up to* 3200 MW of storage (either CAES or molten salt)," and thus no genuine dispute is presented by Intervenors.<sup>239</sup> Nor, argues Staff, do Intervenors address Applicant's actual analysis in Section 9.2.2.11.4.2 of the ER Revision, concerning "Natural Gas Power Generation Supplemented by Renewable Energy Sources Combined with Storage."<sup>240</sup> Staff also challenges Intervenors' contention that wind and CAES could supply baseload power, based on Intervenors' failure to address ER § 9.2.2.11.3.1.<sup>241</sup>

On land use impacts, Staff avers that, "even assuming the information from the Intervenors is correct," Intervenors do not provide facts or expert opinion on the actual impacts to current land usage.<sup>242</sup> Staff points out that the ER actually discusses, in addition to the total area that would be affected by the proposed units, "impacts to land uses such as: 'undisturbed woodland,' 'floodplain,' 'wetland habitats,' 'National Wild and Scenic Rivers,' 'historic properties,'

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<sup>238</sup> Staff's Alternatives Response at 19-20.

<sup>239</sup> *Id.* at 20 (emphasis in original) (citing Alternatives ER Revision § 9.2.2.11.4.2 at 9.2-37, 9.2-47).

<sup>240</sup> *Id.*

<sup>241</sup> *Id.*

<sup>242</sup> *Id.* at 21; *see id.* at 22.

'tribal lands,' and 'prime farmland,'"<sup>243</sup> as well as construction impacts to land use in the vicinity of the proposed plant.<sup>244</sup>

Staff argues that Intervenors' support for Alternatives Contention 3 "does not demonstrate that a wind facility could be environmentally preferable to the construction and operation of the proposed units at the site," and therefore does not demonstrate a genuine dispute with the Applicant on a material issue of law or fact.<sup>245</sup> In addition, according to Staff:

If the Intervenors are proposing in this contention that the wind facility could be constructed at a different location than the proposed site, they still have not provided any facts or expert opinion to show what the impacts on land uses would be at that different location, other than to establish generally that the wind facility land could have a dual use for wind power and ranching or farming.<sup>246</sup>

Nor, Staff argues, do Intervenors raise a material dispute with Applicant on the viability of a solar with storage alternative, or "provide facts or expert opinion describing what the actual land use impacts of wind with CAES would be and thereby do not comply with 10 C.F.R.

§ 2.309(f)(1)(v) and (vi)."<sup>247</sup>

Regarding Intervenors' proposed combination of North/West Texas wind, coastal wind, solar and storage, Staff urges that Intervenors fail to meet the requirements of § 2.309(f)(1)(iv), (v), and (vi),<sup>248</sup> and challenges Intervenors' arguments based on the *Druid Hills* and *Ohio River Valley* cases, arguing that they do not override the NEPA "rule of reason."<sup>249</sup> "Not every conceivable alternative is required to be examined," Staff argues, and under CEQ regulations,<sup>250</sup>

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<sup>243</sup> *Id.* at 21 (citing ER at Table 2.2-1, ER at 2.2-10, 4.1-1 to 4.1-10, 4.1-1 to 4.1-3).

<sup>244</sup> *See id.* (citing ER at 4.1-3 to 4.1-10).

<sup>245</sup> *Id.* at 22.

<sup>246</sup> *Id.*

<sup>247</sup> *Id.* at 23-24.

<sup>248</sup> Staff's Alternatives Response at 24.

<sup>249</sup> *Id.* at 23.

<sup>250</sup> The Council on Environmental Quality (CEQ) promulgates NEPA-related regulations, found

all reasonable alternatives are to be “[r]igorously explore[d] and objectively evaluate[d],” but for alternatives eliminated from detailed study, only a brief discussion of the reasons for their having been eliminated is required.<sup>251</sup> Staff contends that Intervenors fail to demonstrate that this proposed alternative is a reasonable one that requires NEPA analysis.<sup>252</sup>

Staff states that the ER at Section 9.2.2.11.4 “shows that the Applicant already determined that a three part combination alternative would not be environmentally preferable to the proposed project due to the cumulative and additive impacts from each part,” and argues that Intervenors provide no “facts or expert opinions challenging the Applicant’s assertion that in a multi-part combination alternative (e.g. wind, storage, natural gas), the impacts from each part of the alternative would result in additive and cumulative impacts.”<sup>253</sup> Without such information, Staff argues, Intervenors have failed to demonstrate “that analysis of their proposed alternative is required under NEPA or that the Applicant’s failure to consider it was unreasonable.”<sup>254</sup> For this reason, Staff insists, Intervenors fail to meet the requirements of § 2.309(f)(1)(iv) and (vi).<sup>255</sup>

In addition, Staff urges, Intervenors provide no facts or expert opinions “beyond assertions about what the expected impacts would be” from the North/West Texas wind, coastal wind, solar and storage combination, and as a result fail to meet the support requirement of § 2.309(f)(1)(v).<sup>256</sup> Specifically, Staff faults the expert statements provided by Intervenors as merely stating conclusions “(e.g., the application is ‘deficient,’ ‘inadequate,’ or ‘wrong’)” that

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at 40 C.F.R. Chapter V. See, e.g., 40 C.F.R. § 1500.1 *et seq.*

<sup>251</sup> *Id.* at 24 (citing *Vermont Yankee*, 435 U.S. at 551; *NRDC*, 458 F.2d at 837; 40 C.F.R. § 1502.14).

<sup>252</sup> *Id.*

<sup>253</sup> *Id.* at 24-25 (citing ER at 9.2-47, 9.2-49).

<sup>254</sup> *Id.* at 25.

<sup>255</sup> *Id.*

<sup>256</sup> *Id.*

provide no “reasoned basis or explanation” for such conclusions, and which therefore do not meet the requirement of § 2.309(f)(1)(v).<sup>257</sup>

As discussed *supra*, we find that part of Intervenor’s original Contention 18 is not moot, because the contention as raised and admitted included the four-part combination of wind, solar, storage methods, and natural gas supplementation. Applicant’s untimeliness arguments are therefore without merit. And while Applicant and Staff may ultimately prove to be correct with regard to many of their arguments on feasibility and related issues, we find that Intervenor has provided sufficient facts and expert opinion to merit going forward with parts of this contention, at least on the question of the feasibility of the combination of solar and wind power with storage methods, insofar as it fits within the four-part combination of solar/wind/energy storage/natural gas supplementation, as addressed in Alternatives Contention 2 and in our Summary section below. As we observe there, the idea of combining wind and solar energy, as stated in subpart C of Alternatives Contention 3, is not an unreasonable concept.

We do find parts of the contention to be inadmissible, including those relating to land use, for the same reasons discussed with regard to New Alternatives Contentions 1 and 2 above, as well as Intervenor’s arguments on each technology needing 3200 MW capacity, for the reasons put forward by the Staff. With regard, however, to NRC Staff’s argument that Intervenor’s fail to address Sections 9.2.2.11.3.1 and 9.2.2.11.4.2, Dr. Dean in his Report, relied upon by Intervenor, does reference parts of these sections,<sup>258</sup> and in any event Intervenor address the substance of their contents, even if they do not specifically mention the section number in the text of their contention.

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<sup>257</sup> *Id.* at 25-26 (citing *USEC, Inc. (American Centrifuge Plant)*, CLI-06-10, 63 NRC 451, 472 (2006)).

<sup>258</sup> See, e.g., Dean Report at 1-2, nn.2, 7; 3 n.14; 5 n. 7.

We note one further argument raised by the NRC Staff – the claim that Intervenors' experts merely state conclusions, without any reasoned basis for such conclusions. We disagree. Although the information provided by the experts in question is not extensive, we find that it is not devoid of reasoned bases for any conclusions drawn or suggested. For example, Dr. Dean addresses, among other things, the complementarity of wind and solar energy, their feasibility for baseload power, the use of aquifers for storage, and related cost issues. Although the amount and quality of information provided by Intervenors and their experts to this point would obviously not be sufficient as evidence for a hearing, all they need to provide at this point is a reasoned presentation sufficient to warrant further inquiry,<sup>259</sup> and we find they have done that, on the solar-wind combination proposed in this contention, and met the requirements of 10 C.F.R. § 2.309(f)(1)(i)-(vi).

#### **I. Summary of Rulings on Admissible Parts of Alternatives Contentions 1 Through 3**

As indicated in our separate discussions of Alternatives Contentions 1 through 3, we have concluded that significant parts of these contentions do not meet all of the requirements of 10 C.F.R. § 2.309(f)(1) and are therefore inadmissible. We have, however, found other aspects of these contentions to meet the contention admissibility requirements sufficiently to warrant further inquiry. We provide this Summary section as a means for stating, in one place and in greater detail and depth than might practically and efficiently be done in separate rulings on Contentions 1 through 3, our rationale for concluding that those matters falling into the second category should be admitted, in a reformulated form. We note at the outset here, as we recognized in our discussion of Co-Location Contention 1, that Intervenors, despite being

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<sup>259</sup> See *Yankee Atomic Elec. Co.* (Yankee Nuclear Power Station), CLI-96-7, 43 NRC 235, 249 (1996) (citing *Georgia Inst. of Tech.* (Georgia Tech Research Reactor, Atlanta, Ga.), CLI-95-12, 42 NRC 111, 118 (1995); *Vermont Yankee*, 435 U.S. at 554; *Connecticut Bankers Ass'n v. Bd. of Governors*, 627 F.2d 245, 251 (D.C.Cir. 1980).

represented by counsel, present their contentions and support therefor in a somewhat rambling and poorly-organized form. We nonetheless find that some of their arguments have merit.

We address first the legal context for the matters at issue in these contentions, all of which concern NEPA “alternatives.” Applicant acknowledges that NEPA requires that an EIS must discuss “alternatives to the proposed action,”<sup>260</sup> and that this discussion must incorporate a “hard look” at alternatives to a proposed action.<sup>261</sup> Applicant points out, however, that this “hard look” is subject to a “rule of reason,” such that it is not necessary to “look at every conceivable alternative to the proposed licensing action, but only *reasonable* alternatives – namely, those that are *feasible*,” and “reasonably related to the scope and goals of the proposed action.”<sup>262</sup> Applicant argues that this means that “the NRC need only consider a range of alternatives”<sup>263</sup> that are “*technologically feasible and economically practicable* – in this case *commercially viable* alternatives for producing baseload power.”<sup>264</sup> Furthermore, Applicant argues, “NEPA does not require a separate analysis of alternatives which are not significantly distinguishable from alternatives actually considered, or which have substantially similar

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<sup>260</sup> Applicant’s Alternatives Answer at 6 (quoting 42 U.S.C. § 4332(2)(C)(iii)).

<sup>261</sup> *Id.* (citing *Envtl. Law & Policy Ctr. v. NRC*, 470 F.3d 676, 685 (7th Cir. 2006); *Louisiana Energy Servs., L.P.* (Claiborne Enrichment Center), CLI-98-3, 47 NRC 77, 87-88 (1998)).

<sup>262</sup> *Id.* (citing *Louisiana Energy Servs., L.P.* (Nat’l Enrichment Facility), LBP-06-8, 63 NRC 241, 258 (2006); *Vermont Yankee*, 435 U.S. at 551; *Morton*, 458 F.2d at 837; *City of Carmel-by-the-Sea v. Dep’t of Transp.*, 123 F.3d 1142, 1155 (9th Cir. 1997)).

<sup>263</sup> *Id.* (citing *City of Grapevine v. Dep’t of Transp.*, 17 F.3d 1502, 1506 (D.C. Cir. 1994); *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190, 195 (D.C. Cir. 1991), cert. denied, 502 U.S. 994 (1991); *Louisiana Wildlife Fed’n, Inc. v. York*, 761 F.2d 1044, 1048 (5th Cir. 1985); *Exelon Generation Co., LLC* (Early Site Permit for Clinton ESP Site), CLI-05-29, 62 NRC 801, 806-08 (2005), *aff’d sub nom. Env’tl. Law & Policy Ctr.*, 470 F.3d at 685).

<sup>264</sup> *Id.* (citing *Kelley v. Selin*, 42 F.3d 1501, 1521 (6th Cir. 1995); *Communities, Inc. v. Busey*, 956 F.2d 619, 627 (6th Cir. 1992); *Morton*, 458 F.2d at 837; Forty Most Asked Questions Concerning CEQ’s National Environmental Policy Act Regulations, 46 Fed. Reg. 18,026, 18,027 (Mar. 23, 1981)).

consequences.”<sup>265</sup> Quoting the Commission for the principle that “significant inaccuracies and omissions from the ER” are proper subjects of contentions but that adding “details or nuances” are not (nor are boards to “flyspeck” environmental documents), Applicant argues that Intervenor’s Alternatives Contentions request consideration of alternatives that are neither “reasonable” nor significantly different from those it has already considered.<sup>266</sup>

The NRC Staff has also argued, as indicated above, that, although NEPA does require identification, “rigorous[ ] explor[ation],” and “objective[ ] evaluat[ion]” of “all reasonable alternatives,” this does not mean that every conceivable alternative must be included in the EIS.<sup>267</sup> Staff argues that, for alternatives that are eliminated from detailed study, the reasons for their having been eliminated must be only “briefly discuss[ed],”<sup>268</sup> and cites the NEPA “rule of reason” for the proposition that “NEPA does not require a detailed discussion of the rejected alternative’s environmental impacts.”<sup>269</sup> Like Applicant, Staff points out that a discussion of alternatives is “bounded by feasibility,” citing the 1978 Supreme Court *Vermont Yankee* decision.<sup>270</sup>

We note further that Applicant has prepared its ER in reliance on NUREG-1555,

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<sup>265</sup> *Id.* at 7 (citing *Headwaters, Inc. v. Bureau of Land Mgmt.*, 914 F.2d 1174, 1181 (9th Cir. 1990)).

<sup>266</sup> *Id.* (citing *Sys. Energy Res., Inc.* (Early Site Permit for Grand Gulf ESP Site), CLI-05-4, 61 NRC 10, 13 (2005); *Exelon Generation Co., LLC* (Early Site Permit for Clinton ESP Site), CLI-05-29, 62 NRC 801, 811 (2005); *Duke Energy Corp.* (McGuire Nuclear Station, Units 1 and 2, Catawba Nuclear Station, Units 1 and 2), CLI-03-17, 58 NRC 419, 431 (2003) (“NRC adjudicatory hearings are not EIS editing sessions. Our busy boards do not sit to parse and fine-tune EISs.”)).

<sup>267</sup> Staff’s Alternatives Response at 14 (citing *Levy*, LBP-09-10, 70 NRC at \_\_\_ (slip op. at 80) (quoting *Vermont Yankee*, 435 U.S. at 551; citing 40 C.F.R. § 1502.14).

<sup>268</sup> *Id.* (citing 40 C.F.R. § 1502.14).

<sup>269</sup> *Id.*

<sup>270</sup> *Id.* at 18 (citing *Vermont Yankee*, 435 U.S. at 551); see also *id.* at 28.

and relies on a provision therein providing that one of the criteria for evaluating “*competitive alternatives*” is that an alternative be “*developed, proven, and available in the relevant region.*”<sup>271</sup> Applicant has concluded that combinations of wind or solar with storage and natural gas are not reasonable, or “developed, proven, and available” for production of baseload power;<sup>272</sup> and that “combining a natural gas power plant with a renewable power plant with a renewable power technology (such as wind or solar power) in combination with a storage technology (such as CAES or molten salt batteries) is not a reasonable energy alternative” because it is not “developed, proven, and available in the relevant region” and because

such a combination . . . as a single project, with the capacity to generate baseload power equivalent to [the proposed new Comanche Peak units 3 and 4] is not considered to be available during the same time frame as the proposed project unless the vast majority of the power is generated from natural gas.<sup>273</sup>

The central issue we find admissible from Alternatives Contentions 1 through 3 is the feasibility of the four-part wind-solar-storage-natural gas supplementation combination alternative proposed by Intervenors. All other admissible issues relate to this “feasibility” issue in one way or another. Of course, as demonstrated by the parties’ references to this term throughout their filings on the Alternatives Contentions to this term, both what is “feasible” and what is “reasonable” in any given context are subject to varying interpretations. We do not find that these interpretations are necessarily inconsistent with each other. We do consider that further edification on the subject is in order.

We begin our inquiry into this matter by recalling the fundamental principles that the NEPA alternatives analysis is the “heart of the environmental impact statement,” and that all

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<sup>271</sup> Applicant’s Alternatives Answer at 6-7 (citing NUREG-1555 at 9.2.2-4 and characterizing this as “noting that to be considered a competitive (*i.e.*, reasonable) alternative, an ‘energy conversion technology should be developed, proven, and available in the relevant region’”) (emphasis added).

<sup>272</sup> See, e.g., Alternatives ER Revision at 9.2-40, 9.2-43; see also *id.* at 9.2-50.

<sup>273</sup> *Id.* at 9.2-49 – 50.

“reasonable alternatives” must be identified and discussed in such analysis, under a “rule of reason.”<sup>274</sup> The goals – the central one in this case being the production of baseload power – of an applicant are accorded substantial weight in determining what is “reasonable,” but such goals may not be “define[d] so narrowly as to unreasonably circumscribe the range of alternatives” considered.<sup>275</sup>

For further guidance on what constitutes a “reasonable” alternative that must be considered, we look to the Supreme Court’s 1978 decision in *Vermont Yankee*. As touched on by Applicant and Staff, the Court therein observed that, in order to “make an impact statement something more than an exercise in frivolous boilerplate the concept of alternatives must be bounded by some notion of feasibility.”<sup>276</sup> Alternatives that are “remote and speculative” do not require detailed discussion, and a “‘detailed statement of alternatives’ cannot be found wanting simply because [not] every alternative device and thought conceivable by the mind of Man” has not been included.<sup>277</sup> Moreover, while “the concept of ‘alternatives’ is an evolving one, requiring the agency to explore more or fewer alternatives as they become better known and understood,” it is “incumbent upon intervenors who wish to participate to structure their participation so that it is meaningful [and] alerts the agency to the intervenors’ position and

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<sup>274</sup> See LBP-09-17, 70 NRC at \_\_\_ (slip op. at 80-81) (quoting *Levy*, LBP-09-10, 70 NRC at \_\_\_ (slip op. at 79-81)). As we therein noted,

The duty to consider alternatives originates with two provisions of NEPA – (1) 42 U.S.C. § 4322(2)(C)(iii), which requires that an agency’s environmental impact statement (EIS) include “a detailed statement [of the] alternatives to the proposed action,” and (2) 42 U.S.C. § 4322(2)(E), which requires that an agency “study, develop and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.”

Id.

<sup>275</sup> Id.

<sup>276</sup> *Vermont Yankee*, 435 U.S. at 551.

<sup>277</sup> Id.

contentions.”<sup>278</sup> Comments “must be significant enough to step over a threshold requirement of materiality . . . [,] cannot merely state that a particular mistake was made[, but] must show why the mistake was of possible significance.”<sup>279</sup> And “[i]ndeed, administrative proceedings should not be a game or a forum to engage in unjustified obstructionism by making cryptic and obscure references to matters that ‘ought to be’ considered.”<sup>280</sup> The Court viewed favorably the Commission’s statement that an intervenor should not be held to a *prima facie* burden at the contention admissibility stage of a proceeding, but that “the showing should be sufficient to require reasonable minds to inquire further.”<sup>281</sup> Based on these principles, the Court reversed the Court of Appeals’ holding that intervenors’ proposed alternative of energy conservation, which did not meet certain Commission requirements including that it was “reasonably available,” was wrongfully rejected by the Commission.<sup>282</sup>

The D.C. Circuit Court of Appeals, prior to the *Vermont Yankee* decision, had also referred to a standard of an alternative being “reasonably available,” in the *NRDC v. Morton* case (cited by Applicant and Staff).<sup>283</sup> Based on this authority, we find it reasonable to conclude that the “notion of feasibility” includes the concept of “reasonable availability.” The question arises, whether “reasonably available” is essentially the same concept as “developed, proven

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<sup>278</sup> *Id.* at 552-53.

<sup>279</sup> *Id.* at 553 (quoting *Portland Cement Assn. v. Ruckelshaus*, 486 F.2d 375, 394 (1973), cert denied sub nom. *Portland Cement Corp. v. EPA*, 417 U.S. 921 (1974)).

<sup>280</sup> *Id.* at 553-54.

<sup>281</sup> *Id.* at 554 (quoting Commission Appellate Brief).

<sup>282</sup> *Id.* at 555; *see also id.* at 533-35, 549.

<sup>283</sup> *Morton*, 458 F.2d at 834; *see, e.g., supra* notes 251, 262. The Court in *Morton* also stated that it did not agree that alternatives had to be limited to measures that the agency itself could adopt, or that alternatives that did not offer a “complete solution to the problem” could be disregarded. *Id.* at 834, 836. *See also* 10 C.F.R. Part 51, Subpart A, Appendix A § 5, which provides that “[a]n otherwise reasonable alternative will not be excluded from discussion solely on the ground that it is not within the jurisdiction of the NRC.”

and available,” as used in NUREG-1555 – which, as a guidance document, does not have the binding force of law but is entitled to some level of deference.<sup>284</sup>

We observe, in the context of appropriately defining terms and reconciling concepts such as “reasonable,” “feasible,” “reasonably available,” etc., that the D.C. Circuit has also noted that a “problem for agencies” is that even the term “alternatives” is “not self-defining.”<sup>285</sup> With regard to the term “reasonable,” the Court stated the following: “Recognizing the harm that an unbounded understanding of alternatives might cause, CEQ regulations oblige agencies to discuss only alternatives that are feasible, or (much the same thing) reasonable. But the adjective ‘reasonable’ is no more self-defining than the noun that it modifies.”<sup>286</sup> Moreover, the “rule of reason governs ‘both *which* alternatives [must be discussed] and the *extent* to which [they must be discussed].”<sup>287</sup> As to the former, several Circuit Courts of Appeals have observed that if an alternative is “viable,” it may not be rejected as not “reasonable” without appropriate examination or evaluation.<sup>288</sup> Thus, to the extent that Staff, in making statements to the effect that if the Applicant rejects an alternative it is not required to do a detailed discussion of its

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<sup>284</sup> See *Curators of the Univ. of Missouri* (TRUMP-5 Project), CLI-95-1, 41 NRC 71, 98 (1995);

<sup>285</sup> *Citizens Against Burlington*, 938 F.2d at 195.

<sup>286</sup> *Id.*

<sup>287</sup> *Id.*

<sup>288</sup> See *Dallas v. Hall*, 562 F.2d 712, 718 (5th Cir. 2009) (“rejection of even viable and reasonable alternatives, after an appropriate evaluation, is not arbitrary and capricious”); *Friends of the Boundary Waters Wilderness v. Dombeck*, 164 F.3d 1115, 1128 (8th Cir. 1999) (“[e]xistence of a viable but unexamined alternative renders an environmental impact statement inadequate”); *Westlands Water Dist. v. U.S. Dep’t of Interior*, 376 F.3d 853, 868 (9th Cir. 2004) (“existence of a viable but unexamined alternative renders an environmental impact statement inadequate”); *Coalition on Sensible Transp. v. Dole*, 642 F.Supp 573 (D.D.C. 1986) (“NEPA is not violated so long as the agency takes a ‘hard look’ at alternatives and explains its reasons for rejecting them”), *aff’d* 826 F.2d 60 (D.C. Cir. 1987).

impacts,<sup>289</sup> appears to imply that Applicant's elimination of alternatives from consideration is essentially beyond challenge, this is in error.

With the preceding in mind, we look back to the alternatives addressed by both Applicant and Intervenors with regard to Alternatives Contentions 1 through 3. In this endeavor, we consider questions of "feasibility" as well as "reasonable availability." As to NUREG-1555's "developed, proven, and available" standard, we find that we should consider this in a context of reasonableness. And in this regard we note the specific context for the standard in question, which appears in a section titled "Review Procedures" and contains among other things the following:

The reviewer should review the alternative energy sources and combinations of sources available to the applicant, and categorize them as either competitive or noncompetitive with the proposed project. A competitive alternative is one that is *feasible* and compares favorably with the proposed project in terms of environmental and health impacts. If the proposed project is intended to supply baseload power, a competitive alternative would also need to be capable of supplying baseload power. A competitive alternative could be composed of combinations of individual alternatives.

For competitive alternatives, the reviewer should ensure that the energy source or system meets the following criteria:

- The energy conversion technology should be *developed, proven, and available* in the relevant region.<sup>(a)</sup>
- The alternative energy source should provide generating capacity substantially equivalent to the capacity need established by the reviewer of ESRP 8.4.
- The capacity should be available within the timeframe determined for the proposed project.
- Use of the energy source is in accord with national policy goals for energy use.
- Federal, State, or local regulations do not prohibit or restrict the use of the energy source.
- There are no unusual environmental impacts or exceptional costs associated with the energy source that would make it impractical.
- The reviewer should ensure that the following energy sources have been considered by the applicant:
  - *wind*
  - geothermal
  - natural gas
  - hydropower

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<sup>289</sup> See, e.g., *supra* text accompanying notes 178, 209, 251.

- municipal solid wastes
  - biomass
  - coal
  - photovoltaic cells
  - *solar thermal power*
  - wood waste
  - energy crops
  - other advanced systems (e.g. fuel cells, synthetic fuels, etc.).
- The reviewer should ensure that all alternative energy sources available have been evaluated using the criteria listed above to determine if the alternatives can be considered competitive with the proposed project.

(a) Current reports on specific technologies may be identified from the DOE's program offices' websites (<http://www.doe.gov>).<sup>290</sup>

Applicant in its ER Revision has separate sections evaluating the feasibility of wind energy combined with CAES storage,<sup>291</sup> solar energy with molten salt storage,<sup>292</sup> and each of the preceding combined with natural gas.<sup>293</sup> Applicant concludes that a wind-CAES combination is not reasonable because it is neither "developed, proven, and available in the relevant region" nor feasible as baseload power, based on a fairly substantial analysis of factors including its own project with Shell-Wind Energy to evaluate the possibility of wind farms in Texas.<sup>294</sup> The solar-storage alternative is also found not to be developed, proven or available in the relevant region,<sup>295</sup> and both are determined to have various negative environmental impacts relating to land use, socio-economic, and other factors.<sup>296</sup> We note also Applicant's determination that combinations consisting of wind *or* solar with storage are not capable of providing baseload power on their own, based primarily on there being "periods of time at which

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<sup>290</sup> NUREG-1555 at 9.2.2-3 – 4 (emphasis added).

<sup>291</sup> Alternatives ER Revision at 9.2-34, 9.2-37 – 40.

<sup>292</sup> *Id.* at 9.2-36, 9.2-41 – 44.

<sup>293</sup> *Id.* at 9.2-44 – 50.

<sup>294</sup> *Id.* at 9.2-40, 9.2-39.

<sup>295</sup> *Id.* at 9.2-43 – 44.

<sup>296</sup> *Id.* at 9.2-39 – 40; 9.2-43.

the renewable source may be unavailable and the storage units are depleted,” thus requiring a 3200 MW natural gas plant “to generate power when the renewable resource not available [sic] and the storage units are depleted and the baseload power cannot be generated.”<sup>297</sup>

Intervenors challenge these conclusions, offering in support of such challenges fact-based arguments and statements of their experts on (1) the relative ease of developing wind and CAES in Texas; (2) the feasibility and benefits of using wind and solar energy to complement each other, with solar available more in the daytime, and wind available more at night in Texas; and (3) the feasibility of using thermal energy storage to overcome the variability of sunlight and combining solar and thermal storage with wind generation and natural gas and using overlapping technologies to create baseload power; and related issues.

Applicant and NRC Staff insist that such approaches are not feasible or reasonable, but many of their arguments in this regard go to the merits of the question. At this stage of this proceeding, we look to whether the Intervenors have satisfied the contention admissibility rule, which does not mandate that they “establish” their assertions of fact, but rather that they satisfy the requirements of 10 C.F.R. § 2.309(f)(1).<sup>298</sup>

We find that Intervenors in their new contentions provide sufficient information to meet these requirements and to warrant “further inquiry”<sup>299</sup> on the feasibility and reasonable availability of the four-part alternative of wind and solar energy combined with storage (including CAES and molten salt) and natural gas supplementation. Indeed, the lack of significant consideration of this four-part combination<sup>300</sup> is a rather obvious one – the combination is hardly

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<sup>297</sup> *Id.* at 9.2-45.

<sup>298</sup> See LBP-09-17, 70 NRC at \_\_\_ (slip op. at 10-16) (discussion of contention admissibility standards).

<sup>299</sup> See *supra* note 259.

<sup>300</sup> As indicated in our ruling on Luminant’s Motion to Dismiss Contention 18 as Moot, we note that Applicant does make passing reference to the four-part combination in question at

the sort of far-fetched alternative posited by the Court in *Vermont Yankee*,<sup>301</sup> particularly given the self-evident reality, acknowledged by Applicant, of the greater availability of solar power during the daytime and the “diurnal nature of the wind resource in Texas,” with “wind being the strongest during the nighttime and early morning hours and weakest during the daytime hours.”<sup>302</sup>

We note Applicant’s and Staff’s arguments that combining solar and wind together with storage and gas supplementation would have additive and cumulative land use impacts as compared to either alone. However, as we have also noted, and as is to an extent also self-evident, it is also likely that there may be overlapping uses of land, as argued by Intervenors. More importantly, what we are admitting is the issue of the feasibility of this four-part alternative. As touched on above, relevant to this issue is the extent to which this combination, or separate parts of it that may reasonably be combined,<sup>303</sup> are “reasonably available.” And to the extent that NUREG-1555’s standard of “developed, proven, and available in the relevant region” directs the inquiry to the question of reasonableness, this standard is relevant to the determination of “reasonable availability” and feasibility, and ultimately, to that of the overall reasonableness of the four-part combination. But to the extent this standard from NUREG-1555 would require a more narrow inquiry, it cannot, of course, overcome the legal principles of reasonableness, feasibility, and “reasonable availability” that are found in binding case law.

We are cognizant that there are no existing four-part wind/solar/energy storage/natural gas supplementation combinations currently producing baseload power. As noted above,

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Alternatives ER Revision §§ 9.2-31 and 9.2-50, but does not purport to seriously consider or evaluate it.

<sup>301</sup> See *Vermont Yankee*, 435 U.S. at 551.

<sup>302</sup> Alternatives ER Revision at 9.2-37.

<sup>303</sup> See NUREG-1555 at 9.2.2-3; *Morton*, 458 F.2d at 836 (“Nor is it appropriate . . . to disregard alternatives merely because they do not offer a complete solution to the problem.”).

however, just because one or more parts taken separately would not be feasible as baseload power, if it is feasible to combine aspects of existing separate parts, which together might reasonably be able to produce baseload power, then the combination is an alternative that must be considered.<sup>304</sup> We conclude that Intervenors have provided sufficient support for going forward on the feasibility and reasonable availability of this four-part combination, through expert reports and fact-based arguments.

Although not necessary to our ruling, we would observe, regarding the circumstance that some of the parts of the combination alternative at issue are relatively new and have not yet been tested or implemented in combination,<sup>305</sup> that the renewable energy parts of the combination are currently the subject of significant and focused attention as a matter of national policy,<sup>306</sup> as the nation attempts to address energy policy in an age of over-reliance on foreign oil, concerns about global warming and associated negative effects of carbon sources of energy, and the recent disaster of the worst oil spill in our history in the Gulf of Mexico. Nuclear power appears to be approaching a “renaissance,” but in the preceding circumstances it is also understood that renewable fuels should also be relied on to the extent possible. In this context, and given the support that Intervenors have provided – even if not optimal at this point – it is most appropriate to permit further inquiry into the feasibility and reasonable availability under NEPA of the alternative of a combination of wind and solar energy with storage and natural gas supplementation to produce baseload power.

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<sup>304</sup> See *id.*

<sup>305</sup> Although not necessary for our decision herein, we note Intervenors’ arguments in new Alternatives Contention 6 to the effect that, indeed, the design for the applied-for units does not yet exist in final form.

<sup>306</sup> For example, the Department of Energy has an Office of Energy Efficiency and Renewable Energy, which, according to the Department’s website at <http://www.energy.gov/energysources/renewables.htm> (last visited June 24, 2010), “invests in clean energy technologies that strengthen the economy, protect the environment, and reduce dependence on foreign oil.” See *also supra* text accompanying n.290.

Intervenors may be said to have a “hard row to hoe,” and it is of course possible that they may not prevail in the end in showing the admitted combination to be feasible, but we do not find that any of those parts of their first three Alternatives Contentions that we herein admit are so “remote and speculative” as to foreclose further inquiry. Unlike energy conservation, at issue in *Vermont Yankee*, it may be said that each part of the combination at issue appears to have been shown to be feasible as well as “reasonably available” for less than baseload power. Based on this, and on the support the Intervenors have shown for those parts of Contentions 1 through 3 that we find to be admissible, we find these parts to pose at least a plausibly “reasonable” combination alternative for baseload power, the relevant goal of the Applicant. Intervenors’ arguments regarding such combinations and their components are not, perhaps, as well-organized as they might be, but they are also neither cryptic nor obscure, and rather provide a sufficient showing to “require reasonable minds to inquire further.”<sup>307</sup>

As part of the litigation of this issue, as noted above we do not permit Intervenors to contest the land use acreage estimates for wind and solar provided by Applicant,<sup>308</sup> nor are issues concerning job impacts of solar energy, new solar technologies relating to combined cycle systems and steam augmentation technology, peaking power and rooftop solar, and each technology requiring up to 3200 MW capacity, admissible. But we do find reasonable, and admissible, the issue of the feasibility and reasonable availability of the four-part wind/solar/storage/natural gas supplementation combination to produce baseload power, as set forth in Alternatives Contention 2 and to an extent in Alternatives Contention 3; the related issues of the feasibility of wind power and CAES in Texas, CAES land usage, and concurrent

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<sup>307</sup> See *supra* note 281 and accompanying text.

<sup>308</sup> Notwithstanding our finding land use acreage figures to be inadmissible, we note indications in the Staff’s Alternatives Answer that it may also have questions about the accuracy of Applicant’s acreage figures, see, e.g., *supra* text accompanying notes 175, 242, and if the Staff in its EIS ultimately concludes that smaller figures are appropriate, these would be the figures that could be used in a hearing.

overlapping usage of land for more than one purpose, as set forth in Alternatives Contention 1; and the operation and maintenance cost issues related to solar energy, as set forth in Alternatives Contention 2 and addressed and limited in our discussion thereof.

With respect to each of the preceding, we find that Intervenors have provided a reasonably specific statement of the issue they seek to raise and a brief explanation of the basis for the contention, as required at 10 C.F.R. § 2.309(f)(1)(i) and (ii). A mere cursory glance at NUREG-1555's discussion of the review process for alternatives demonstrates that it is unquestionable that these wind- and solar-power-related issues are within the scope of the hearing, as required at § 2.309(f)(1)(iii), and that the issues are material to the findings the NRC must make to support the Application at issue, as required at § 2.309(f)(1)(iv). As addressed in our discussion of the three individual Alternatives Contentions 1 through 3, Intervenors have provided concise statements of the alleged facts and expert opinions supporting their positions, together with references to specific sources and documents on which they intend to rely, with regard to each, as required at § 2.309(f)(1)(v). And, finally, they have provided sufficient information to show that a genuine dispute exists with the Applicant on the following material issues of fact, as required at § 2.309(f)(1)(vi):

- (1) the feasibility and reasonable availability of a four-part combination of wind and solar power with CAES, thermal energy storage, and natural gas supplementation to produce baseload power;
- (2) the feasibility of wind and CAES in Texas in the context of the four-part combination described in (1), as parts of a baseload power system;
- (3) land use related to CAES, and overlapping land uses in the context of (1); and
- (4) operation and maintenance costs of solar in the context of (1), as limited herein and in our discussion of Alternatives Contention 2.

We thus conclude that those parts of Intervenor's new Alternatives Contentions that concern the preceding four issues to be admissible.<sup>309</sup>

In order to simplify and expedite this proceeding to the extent reasonably possible, we find it appropriate to consolidate all of the preceding related admissible issues from the Intervenor's first three Alternatives Contentions, as discussed herein, and reformulate them into one admitted contention. Although Intervenor is represented by counsel, in contrast to other cases in which contentions submitted in *pro se* petitions have been reformulated by boards, such representation does not preclude reformulation of contentions where appropriate. While an intervenor's representational status is one factor in determining whether reformulation is appropriate, and *pro se* status may provide additional cause for reformulation,<sup>310</sup> the two primary grounds for reformulation in NRC proceedings have been "to *eliminate extraneous issues* or to *consolidate related issues for a more efficient proceeding*."<sup>311</sup> Our reformulation herein is based primarily on the second of these grounds.

It is also based on common sense, a factor the Commission has recently found to be a relevant consideration in determining whether to reformulate contentions.<sup>312</sup> We find that both

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<sup>309</sup> Regarding Judge Arnold's argument in his Dissent, see text accompanying Dissent notes 10-11, to the effect that Intervenor does not challenge the Applicant's determinations that the alternatives it addresses in its ER Revision are unreasonable, we would simply observe that, to the extent any such challenges are not explicit, implicit in all of Intervenor's Alternatives Contentions (not just those we admit parts of) is the clear assertion that virtually all of the Applicant's determinations on the reasonableness of alternatives involving renewable energy sources are incorrect. We do not find all such assertions to warrant the admission of contentions or parts thereof, but we do not find the Dissent's rationale to constitute an appropriate basis for denying any parts of contentions that we admit herein. Nor, we note, except to the extent that we recount and summarize any such arguments, do Applicant and Staff appear to make the argument utilized by the Dissent as justification for denying contentions.

<sup>310</sup> See, e.g., *Shaw Areva MOX Services* (Mixed Oxide Fuel Fabrication Facility), LBP-08-11, 67 NRC 460, 482 (2008).

<sup>311</sup> *Id.* (emphasis in original).

<sup>312</sup> *Progress Energy Florida* (Combined License Application, Levy County Nuclear Power Plant,

common sense and the interest in efficiency in this proceeding support reformulation. To proceed otherwise, and admit as separate contentions (but individually reformulated to eliminate extraneous non-admitted portions thereof) those parts of new Alternatives Contentions 1 through 3 that we find admissible, would result in a piecemeal approach to adjudicating issues that are closely related, which would lead in turn to much less efficient and effective consideration of the issues, whether in a pre-hearing, hearing, or post-hearing context.

We therefore admit the preceding admissible issues from new Alternatives Contentions 1 through 3, reformulated into the following one contention, which we designate as

Alternatives Contention A:

The Applicant has not considered the feasibility under NEPA of an alternative consisting of a combination of solar and wind energy, energy storage methods including CAES and molten salt storage, and natural gas supplementation, to produce baseload power, with specific regard to:

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Units 1 & 2), CLI-10-02, 71 NRC \_\_, \_\_ (slip op. at 11) (Jan. 7, 2010). The Commission therein observed that the NRC's contention pleading standards, while strict, are not so strict as "to require [a] Board to abandon a common-sense approach to consideration of . . . contention[s]." *Id.* See also *id.* at \_\_, \_\_ - \_\_ (slip op. at 6 & n.21, 9-11). In *Levy*, the Commission upheld reformulation of the admissible portions of 16 parts of a contention submitted by *pro se* petitioners, see *id.* at 12 (which the applicant therein argued were actually separate contentions, see *id.* at 9). See generally *id.* at 2-11. The Commission in *Levy* also referred to its earlier decision in the *Crow Butte* proceeding, in which it had found "no fault" with that Board's decision to reorganize and reformulate two submitted contentions, one of which concerned alleged contamination of groundwater resources and the other of which concerned alleged environmental and health impacts, into two separate admitted contentions, one concerned with NEPA-related issues, and the other concerned with safety-related issues. *Id.* at 6 (citing *Crow Butte Resources, Inc.* (North Trend Expansion Area), CLI-09-12, 69 NRC \_\_, \_\_ (slip op. at 23) (June 25, 2009); *Crow Butte*, LBP-08-6, 67 NRC 241 (2008)); see *Crow Butte*, LBP-08-6, 67 NRC at 294-323. (In *Crow Butte* the initial petition was prepared and submitted by unrepresented petitioners, who had by the time of oral argument on the petition obtained counsel. See *id.* at 252-53.) The Commission in *Levy* stated that the *Crow Butte* Board had not, however, "identifi[ed] clearly which of the diffuse and, in some cases, unsupported claims were admitted for hearing." *Levy*, CLI-10-02, 71 NRC at \_\_ (slip op. at 6). Here, in order to comply with the Commission's analysis in *Levy* and *Crow Butte*, we specify which parts, of the three original separate contentions that we re-organize into one reformulated contention, are admissible and which are not, including only those parts we find to be admissible in the one reformulated contention.

- (a) the reasonable availability of the four parts of such combination for consolidation into an integrated system to produce baseload power;<sup>313</sup>
- (b) the feasibility of the use of such combination in the area of Texas served by the Comanche Peak plant;<sup>314</sup>
- (c) the extent to which there may be efficiencies arising from overlapping uses of land for each of the four parts of the combination as well as for other reasonable purposes;<sup>315</sup> and
- (d) if it is shown that such an alternative is environmentally preferable, the extent to which operation and maintenance costs of solar in such combination may be a comparative benefit.<sup>316</sup>

We conclude this portion of our Memorandum by noting, as stated above,<sup>317</sup> that the portion of original Contention 18 that we find not to be moot is essentially the same contention as admitted Alternatives Contention A above, except that the contention admitted here is more limited than the original open-ended Contention 18 as it defined the four-part combination of wind and solar energy with energy storage methods and supplemental natural gas. Based on the same arguments relating to this admitted contention, however, we conclude that the part of original Contention 18 that we find is not moot should likewise be limited to the issues encompassed within Alternatives Contention A. Moreover, as the two contentions are as a result identical, there is no need to discuss further the contentions as separate and apart from each other, except that Alternatives Contention A may be viewed as being supported by both

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<sup>313</sup> See *supra* text accompanying note 303.

<sup>314</sup> Although, strictly speaking, the only admissible part of the contention that concerned feasibility in Texas was that relating to wind and CAES, we find it appropriate and efficient to limit the entire admitted contention to the issue of feasibility of the four-part combination in Texas, given that the project is in Texas, and what is therefore relevant is the question of feasibility in that location.

<sup>315</sup> This portion of the admitted contention does not encompass challenges to Applicant's land use acreage figures for wind or solar power, as discussed in our rulings on new Alternatives Contentions 1 and 2.

<sup>316</sup> See *supra* text accompanying notes 216-218.

<sup>317</sup> See *supra* section II.B of this Memorandum and Order.

our mootness ruling on original Contention 18, as well as our rulings on new Alternatives Contentions 1 through 3.

Finally, we note that it is likely that Applicant may well, in response to our admission of this contention, provide an additional revision to their ER and move to dismiss Alternatives Contention A for mootness, which is of course Applicant's prerogative. And Intervenors, faced with another revision to the ER and related motion to dismiss for mootness, will no doubt, with the assistance of their experts, file new contentions challenging any such ER revision, which is their prerogative. We wish to emphasize, however, that questions of feasibility, as are involved in the contention we admit herein, are at bottom factual issues that go to the merits of the alternative at issue, which may well be most efficiently addressed by moving this proceeding forward in the most expeditious manner possible to resolution of such matters in the setting of a hearing on such factual merits questions. Such a course would seem to further the interests of efficiency in adjudication, a policy consideration that the Commission has on more than one occasion highlighted as one to be desired and adhered to as much as possible.<sup>318</sup>

#### **J. Alternatives Contention 4 – Viability of Baseload Wind System**

In this contention Intervenors state:

The Applicant's assertion that renewable energy sources and energy storage options are not viable baseload generating options ignores the United States Department of Energy National Renewable Energy Laboratory (NREL) findings that "Wind energy systems that combine wind turbine generation with energy storage and long-distance transmission may overcome these obstacles and provide a source of power that is functionally equivalent to a conventional baseload electric power plant. A "baseload wind" system can produce a stable, reliable output that can replace a conventional fossil or nuclear baseload plant, instead of merely supplementing its output. This type of system could provide a large fraction of a region's electricity demand, far beyond the 10-20% often

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<sup>318</sup> See, e.g., Final Rule, Rules of Practice for Domestic Licensing Proceedings – Procedural Changes in the Hearing Process, 54 Fed. Reg. 33,168, 33,179 (Aug. 11, 1989); Changes to Adjudicatory Process, Nuclear Regulatory Commission, 69 Fed. Reg. 2,182 (Jan. 14, 2004).

suggested as an economic upper limit for conventional wind generation deployed without storage.”<sup>319</sup>

Intervenors challenge Applicant’s assertions that “options which rely on renewable energy sources and energy storage are best suited for power peaking or stabilizing purposes [and that] [r]enewable energy sources and energy storage options are not currently, or projected to be, used for baseload power applications.”<sup>320</sup> In response Intervenors point out what they claim is a “diametrically opposed conclusion” of the U.S. Department of Energy National Renewable Energy Laboratory (NREL) – namely, a one-page document in which the following language, reproduced in this contention, is stated: “A ‘baseload wind’ system can produce a stable, reliable output that can replace a conventional fossil or nuclear baseload plant, instead of merely supplementing its output.”<sup>321</sup>

Observing that the Applicant’s view may have been “plausible . . . in the past,” Intervenors aver, citing NREL and Drs. Dean and Makhijani, that “renewables and storage technologies such as CAES and molten salt are capable of meeting baseload generation requirements.”<sup>322</sup> Intervenors argue that “Applicant’s premise that wind/solar/storage are not capable of providing baseload generation skews its analysis of the viability of renewable fuels in combination with storage technologies and/or natural gas,” and constitutes an “overly restrictive methodology with artificial constraints,” which “ignores substantial evidence that contradicts the Applicant’s assertion.”<sup>323</sup> Applicant’s premise is “pervasive throughout its discussion about alternatives to nuclear power” and “colors [its] entire analysis,” Intervenors contend. In short, in Intervenors’ view, Applicant “makes no attempt to show how combined/ integrated renewable

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<sup>319</sup> Alternatives Contentions at 11 (citing and quoting NREL Baseload Factsheet]).

<sup>320</sup> *Id.* (citing Alternatives ER Revisions, § 9.2.2.11.5 at 9.2-50).

<sup>321</sup> *Id.* at n.36 (quoting NREL Baseload Factsheet]).

<sup>322</sup> *Id.* at 12.

<sup>323</sup> *Id.* (citing *Druid Hills*, 772 F.2d at 709; *Ohio River Valley*, 473 F.3d at 102).

fuel systems augmented by storage and . . . natural gas can meet baseload requirements,” and the contention should be admitted in order to consider whether such combinations are “viable alternative[s].”<sup>324</sup>

Applicant, citing case law for the proposition that any supporting material offered by Intervenor is “subject to Board scrutiny ‘both for what it does and does not show,’” suggests that the NREL Fact Sheet makes clear that a combination of wind and storage to provide baseload power is still “only a ‘concept’” – in agreement with Applicant’s point that the option is “not currently a proven technology for generating baseload power.”<sup>325</sup>

NRC Staff submits that Alternatives Contention 4 does not comply with 10 C.F.R. § 2.309(f)(1)(iv), (v), and (vi) and is inadmissible. According to Staff, Intervenor “simply contradict” Applicant’s assertions at ER Section 9.2.2.11.3 that “(1) there are no large scale baseload combination renewable and storage facilities in existence; (2) this combination as a baseload power source has not been proven or demonstrated; and (3) the projects being proposed operate as either peaking or intermediate, intermittent power source.”<sup>326</sup> They also, Staff argues, “overstate [the conclusions of the NREL Baseload Factsheet] regarding the viability of wind combined with CAES to provide baseload power,” a review of which “indicates that it is more equivocal in its discussion of the feasibility of using advanced compressed air energy storage concepts.”<sup>327</sup> Staff contends that “[n]either Drs. Dean nor Makhijani provide any facts in their reports to contravene [Applicant’s] assertions and show that a renewable combination is available for baseload supply rather than a peaking supply,” and therefore

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<sup>324</sup> *Id.*

<sup>325</sup> Applicant’s Alternatives Answer at 25 (citing *Yankee Atomic Elec. Co.* (Yankee Nuclear Power Station), LBP-96-2, 43 NRC 61, 90 (1996), *rev’d in part on other grounds*, CLI-96-7, 43 NRC 235 (1996)).

<sup>326</sup> Staff Alternatives Response at 27 (citing ER at 9.2-37).

<sup>327</sup> *Id.* (citing NREL Baseload Factsheet (“Background/Overview,” “Technical and Environmental Performance,” and “Advanced Wind/CAES Concepts”)).

Intervenors do not meet the requirement for facts or expert opinion at 10 C.F.R. § 2.309(f)(1)(v).<sup>328</sup> Nor, insist Staff, do Intervenors demonstrate that the issues raised in the contention are material as required at § 2.309(f)(1)(iv).<sup>329</sup>

Finally, Staff cites the NEPA “rule of reason,” and quotes from the *Vermont Yankee* case the principle that NEPA does not require:

detailed discussion of the environmental effects of ‘alternatives’ put forward . . . when these effects cannot be readily ascertained and the alternatives are deemed only remote and speculative possibilities, in view of basic changes required in statutes and policies of other agencies - making them available, if at all, only after protracted debate and litigation not meaningfully compatible with the time-frame of the needs to which the underlying proposal is addressed.<sup>330</sup>

Staff argues that Intervenors “do not establish that the proposed alternative is viable, and thereby do not show how examination of this proposed alternative is required under NEPA,” and that as a result they do not comply with the materiality requirement of § 2.309(f)(1)(iv), or the genuine dispute on a material issue of law or fact requirement of § 2.309(f)(1)(vi).<sup>331</sup>

Intervenors respond by, among other things, arguing that, “[w]hile the NREL study acknowledges that this alternative requires additional development there is no indication that it is a speculative and infeasible alternative,” and “[a]ccordingly, its analysis . . . is required.”<sup>332</sup>

We conclude that Intervenors in Alternatives Contention 4 fail to provide sufficient factual support for their contention that a baseload wind system is a feasible alternative. Although, as discussed in our rulings above on the admissible parts of Alternatives Contentions 1 through 3, some of Dr. Dean’s and Dr. Makhijani’s analyses support admission of a contention on a combination including both wind and solar energy, we do not find it sufficient to show a genuine

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<sup>328</sup> *Id.*

<sup>329</sup> *Id.* at 28.

<sup>330</sup> *Id.* (quoting *Vermont Yankee*, 435 U.S. at 551; citing *Morton*, 458 F.2d at 837-838).

<sup>331</sup> *Id.*

<sup>332</sup> Intervenors’ Alternatives Reply at 8.

dispute on a material issue of law or fact, as required at 10 C.F.R. § 2.309(f)(1)(vi), on a baseload wind system. We find significant in this regard that the primary support for this contention, the four-year-old, one-page NREL Baseload Factsheet, states, in addition to the quotation used by Intervenors in Alternatives Contention 4, that “[d]evelopment of the ‘baseload’ wind concept will require a greater understanding of the local geologic compatibility of air storage, and additional work will be required to examine the feasibility of advanced wind/CAES concepts described here.” In light of this, we find that the Factsheet, even taken in combination with the minimal additional support provided by Intervenors, fails to supply the requisite support to warrant further inquiry. We therefore deny admission of Alternatives Contention 4.

#### **K. Alternatives Contention 5 – New ERCOT Demand Data and Renewable with Storage**

Intervenors in this contention allege:

In evaluating alternatives, the Applicant has not taken into account new ERCOT demand data and the positive impacts of modular additions of renewable/storage combinations in meeting a declining and uncertain demand.<sup>333</sup>

In this contention Intervenors address criteria for evaluating alternatives, asserting a discrepancy between one of the Applicant’s own criteria (Applicant’s Criterion 2, “Capacity equivalent to the planned generation”) and the criterion in NUREG-1555 that “the alternative energy source should provide generating capacity substantially equivalent to the capacity need established.”<sup>334</sup> Intervenors cite the reports of their experts Dean and Makhijani as addressing the “economic risks of pursuing a large nuclear power plant project rather than a phased approach of renewable combinations which can be adjusted with changing demand.” They argue that Applicant in its recent ER revisions “failed to consider the benefits of a modular approach over nuclear in meeting the need for power in an uncertain demand environment.”<sup>335</sup>

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<sup>333</sup> Alternatives Contentions at 13.

<sup>334</sup> *Id.* (citing Alternatives ER Revision at 9.2-38, 42, 46, 48; NUREG-1555 at 9.2.2-4).

<sup>335</sup> *Id.* (citing Rebecca Smith, Turmoil in Power Sector, Falling Electricity Demand Trips Up

Intervenors quote from Dr. Dean's report the following:

The misleading "Large Project" concept:

The application abuses *Criterion 2 – Capacity equivalent to the planned generation*. The application also abuses *Criterion 3 – Available during the same time frame*. Although micro-nuclear systems have been informally proposed, commercial nuclear power needs to be very large to be economically viable. However, large size is also an economic liability. It creates a very large financial gamble on projected future electrical-energy demand, and it minimizes real options. Compared to a typical wind farm, a large nuclear plant takes a relatively long time to build. So the large initial investment must be made a long time before the benefits of that investment can start to be realized. Moreover, when a large nuclear power plant does finally come on line, it changes the generating capacity of the system by a very large amount in one big step. In contrast, market demand does not change in giant steps widely separated in time. So a nuclear plant's large size is inherently poorly matched to changes in actual market demand. On the other hand, combinations of gas, renewable energy sources, and storage can be committed to and installed gradually over time – with ongoing flexibility in the size of the ultimate commitment and ongoing flexibility in the detailed mix of components. In spite of the inherent riskiness (and suppression of real options) in a single large fixed investment in a nuclear plant, the Applicant essentially infers that the ability to implement wind-storage-gas systems gradually over time as market demand develops disqualifies those wind-storage-gas systems alternatives. In effect, they claim that the most conservative approach to a large long-duration hard-to-estimate future need should be "not allowed" because it is different from a more reckless approach that happens to be the only approach available to nuclear power. The applicant's demand that proposed alternatives to nuclear power must similarly put "all their eggs in one big basket" is very unreasonable.<sup>336</sup>

In addition, they quote Dr. Makhijani, as follows:

Finally, the fact that CPNPP is an order of magnitude larger than existing CAES facilities is also technically irrelevant; in fact, it could be economically very advantageous. Facilities that are in the ~100 MW to 300 MW range can be scaled up or, preferably, be built on a modular basis. Given the great uncertainties in demand projections eight to ten years hence, a modular approach is much less risky since growth in supply can be more closely tailored to growth in demand. The one requirement that this strategy would require is the acquisition of a suitable number of sites for wind and CAES development.

Solar thermal with heat storage facilities are currently being built on a scale that modules could be built that would add up to the equivalent of CPNPP. There is no technical reason for a ~3,000 MW facility to consist of just one or two units.<sup>337</sup>

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Utilities' Plans for Infrastructure Projects, Wall St. J., Jan. 14, 2010).

<sup>336</sup> *Id.* at 13-14 (quoting Dean Report at 5).

<sup>337</sup> *Id.* at 14 (quoting Makhijani Declaration at 2-3).

Intervenors claim that “Applicant’s restrictive assumption that a one-time addition of 3200 MW is the most prudent way to meet demand fails to recognize that growth in demand is declining,” and suggest that “a phased approach that can be achieved with smaller increments of renewable fuels generating capacity that can more closely match actual demand increases.”<sup>338</sup> Thus, they argue, there is a “material dispute about whether meeting the projected demand *via* renewable fuels/storage makes the renewable option environmentally preferable.”<sup>339</sup>

Applicant argues that new Alternatives Contention is untimely under 10 C.F.R. §§ 2.309(c) and (f)(2), as it could have been raised earlier by Intervenors, when they filed their original contention.<sup>340</sup> Nor do Intervenors dispute or controvert Applicant’s “need-for-power discussion in ER Chapter 8, which discussed the bases for the [ERCOT] conclusion that a significant amount of new generation is needed to meet the demand in the region.”<sup>341</sup> In any event, such business strategies and any challenges to them are outside the scope of this proceeding.<sup>342</sup>

NRC Staff also, among other things, challenges Intervenors’ failure to raise these issues related to the need for power earlier, and their failure to address specifically Chapter 8 of Applicant’s ER, which has been available since 2008 when the Application was filed, and which contains analysis of ERCOT demand data and projections – none of which Intervenors have

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<sup>338</sup> *Id.* (citing Dean Report and Makhijani Declaration).

<sup>339</sup> *Id.*

<sup>340</sup> Applicant’s Alternatives Answer at 26-27.

<sup>341</sup> *Id.* at 27.

<sup>342</sup> *Id.* (citing *Louisiana Energy Servs., L.P.* (National Enrichment Facility), CLI-05-28, 62 NRC 721, 726 (2005)).

challenged.<sup>343</sup> Staff argues that Intervenor's contention regarding a modular approach is outside the scope of this proceeding and immaterial, because the Application at issue does not deal with modular reactors.<sup>344</sup> Intervenor also, in Staff's view, do not show that any such consideration of a modular approach is required by law, or that it would meet the purpose and need of the Applicant's goals, including its economic goals.<sup>345</sup>

Intervenor respond to the timeliness arguments of Applicant and Staff by stating that the issues they raise in Alternatives Contention 5 are new because they are based on Applicant's ER Revisions. We do not, however, find this response to be persuasive. Chapter 8 of the ER, dealing with and headed "Need for Power," has been available since 2008, and Alternatives Contention 5 clearly deals with the need for power in the area. Intervenor have neither seriously argued, nor shown, good cause to permit the issue to be brought at this time, when it could obviously have been raised at a much earlier time. We therefore find Alternatives Contention 5 to be inadmissible because it is untimely under 10 C.F.R. § 2.309(c).

#### **L. Alternatives Contention 6 – US-APWR Development Status**

Intervenor in this contention assert:

Applicant does not meet Criterion 1: Developed, proven, and available in the relevant region ERCOT.<sup>346</sup>

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<sup>343</sup> Staff's Alternatives Response at 29-32.

<sup>344</sup> *Id.* at 32.

<sup>345</sup> *Id.* at 32-33 (citing, *inter alia*, *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-04-22, 60 NRC 125, 146 (2004) ("[i]n considering alternatives under NEPA, an agency must 'take into account the needs and goals of the parties involved in the application'" (quoting *Citizens Against Burlington*, 938 F.2d at 199)).

<sup>346</sup> Alternatives Contentions at 14. ERCOT stands for "Electric Reliability Council of Texas." According to its website:

[ERCOT] manages the flow of electric power to 22 million Texas customers - representing 85 percent of the state's electric load and 75 percent of the Texas land area. As the independent system operator for the region, ERCOT schedules power on an electric grid that connects 40,000 miles of transmission lines and more than 550 generation units. ERCOT also manages financial settlement for the competitive wholesale bulk-power market and administers customer switching for 6.5 million Texans in competitive choice areas.

Intervenors criticize Applicant for measuring “renewables/storage against the criteria that the alternative be developed, proven, and available in the relevant region ERCOT,” when, according to Intervenors, “CPNPP Units 3 & 4 clearly do not meet this criterion.”<sup>347</sup> Quoting Dr. Dean, Intervenors state that “the US-APWR reactor design ‘has never been built before, it has never been designed before, and the design that is being worked on now is not likely to be certified until after 2011.’”<sup>348</sup> They cite all three of their experts for pointing out that Applicant “fails to account for the fact that the US-APWR reactor design is not yet certified by the NRC,” and thus “[t]he proposed reactors themselves fail to meet Criterion 1 although this is the standard the Applicant applies to all other technologies.”<sup>349</sup> Intervenors characterize Applicant’s “silen[ce] on the point that the US-APWR is not developed, proven or available” as “a material omission,” which should result in the contention being admitted for adjudication.<sup>350</sup>

Applicant argues that new Alternatives Contention 6 is untimely and beyond the scope of original Contention 18, as it is “unrelated to the ER Update” and could have been raised in their original Petition.<sup>351</sup> In any event, the US-APWR is “similar to current operating U.S. four-loop plants,” and “Intervenors provide no technical analysis that suggests that any of the parameters or systems [involved in it] present any safety or environmental problems that might somehow

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<http://www.ercot.com/about/> (last visited June 24, 2010).

<sup>347</sup> *Id.*

<sup>348</sup> *Id.* at 15 (citing Dean Report).

<sup>349</sup> *Id.* (citing Dean Report at 8-10, Makhijani Declaration at 2, Robbins Report at 1).

<sup>350</sup> *Id.* (citing *Virginia Elec & Power Co.* (North Anna Power Station, Unit 3), LBP-08-15, 68 NRC 294, 317-18 (2008) (quoting *Pa’ina Hawaii, LLC* (Materials License Application), LBP-06-12, 63 NRC 403, 414 (2006))).

<sup>351</sup> Applicant’s Alternatives Answer at 28.

limit the deployment of this technology.”<sup>352</sup> In addition, the certification of the design is required prior to licensure, so this argument raises no material dispute.<sup>353</sup>

NRC Staff also objects to Contention 6, for reasons including timeliness, given that the information on which it is based has been available since 2008, and because it challenges an NRC regulation.<sup>354</sup> In support of the latter argument, Staff points out that the Commission has ruled that issues concerning a design certification application are to be resolved in the design certification rulemaking, not in an adjudication on the COL.<sup>355</sup> In addition, Staff argues, Applicant’s business decisions are outside the scope of the proceeding, and Intervenors do not provide sufficient information to show that a genuine dispute exists with the Applicant on a material issue of law or fact, and thus the contention is inadmissible under 10 C.F.R. § 2.309 (f)(1)(iii), (iv), and (vi).<sup>356</sup>

Notwithstanding a certain level of superficial cleverness in Intervenors’ arguments in some respects in support of Alternatives Contention 6, we find that they could have been raised earlier, and that Intervenors have shown no good cause for not doing so. Alternatives Contention 6 is therefore untimely. Moreover, based on some of the same reasons we found similar issues raised by Intervenors at the outset of this proceeding to be inadmissible, we must agree that Intervenors have not shown that Alternatives Contention 6 is within the scope of the proceeding or shown a genuine dispute on a material issue of fact or law.<sup>357</sup> We therefore find Alternatives Contention 6 to be inadmissible in this proceeding.

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<sup>352</sup> *Id.* at 28-29.

<sup>353</sup> *Id.* at 29.

<sup>354</sup> Staff’s Alternatives Response at 36.

<sup>355</sup> *Id.* at 37 (citing *Progress Energy Carolinas, Inc.* (Shearon Harris Nuclear Power Plant, Units 2 & 3), CLI-08-15, 68 NRC 1, 4 (2008)).

<sup>356</sup> *Id.* at 38.

<sup>357</sup> See LBP-09-17, 70 NRC at \_\_\_ - \_\_\_ (slip op. at 18-24).

#### **IV. Conclusion and Order**

Having found Intervenors' original Contentions 13 to be moot, and their original Contention 18 to be moot in part and not moot in part, and that Intervenors have demonstrated that parts of their new Alternatives Contentions 1 through 3 are admissible, but that they have not demonstrated that the remaining new contentions are admissible, we hereby ORDER the following:

- A. Intervenors' original Contentions 13 is dismissed.
- B. Intervenors' original Contention 18 is dismissed, except to the extent that the contention concerns a NEPA alternative consisting of a combination of solar and wind energy with storage methods and supplemental natural gas, limited to the issues stated in Paragraph D below.
- C. Intervenors new Co-Location Contentions, and new Alternatives Contentions 4 through 6, are dismissed.
- D. A hearing is granted with respect to the following limited and reformulated parts of new Alternatives Contentions 1 through 3:

##### **Alternatives Contention A**

The Applicant has not considered the feasibility under NEPA of an alternative consisting of a combination of solar and wind energy, energy storage methods including CAES and molten salt storage, and natural gas supplementation, to produce baseload power, with specific regard to

- (a) the reasonable availability of the four parts of such combination for consolidation into an integrated system to produce baseload power;
- (b) the feasibility of the use of such combination in the area of Texas served by the Comanche Peak plant;
- (c) the extent to which there may be efficiencies arising from overlapping uses of land for each of the four parts of the combination as well as for other reasonable purposes; and

- (d) if it is shown that such an alternative is environmentally preferable, the extent to which operation and maintenance costs of solar in such combination may be a comparative benefit.
- E. The above statement of Alternatives Contention A is co-extensive with that part of original Contention 18 that is not rendered moot by Applicant's Alternatives ER Revision and that we find warrants adjudication in this proceeding, as explained in section III.I above and limited as stated in Paragraphs B and D above, and the matters encompassed within the remaining part of Contention 18 and within Alternatives Contention A shall be adjudicated as one contention.
- F. Interlocutory review of the Order may be requested as provided at 10 C.F.R. § 2.341(f)(2).

It is so ORDERED.

THE ATOMIC SAFETY  
AND LICENSING BOARD

*/RA/*

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Ann Marshall Young, Chair  
ADMINISTRATIVE JUDGE

*/RA/*

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Dr. Gary S. Arnold  
ADMINISTRATIVE JUDGE

*/RA by Edward R. Hawkens for/*

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Dr. Alice C. Mignerey  
ADMINISTRATIVE JUDGE

Rockville, Maryland  
June 25, 2010<sup>358</sup>

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<sup>358</sup> Copies of this Order were filed this date with the agency's E-filing system for service to all parties.

## **Dissenting Opinion of Judge Gary S. Arnold**

I agree with this Board's decision on co-location issues. However I am unable to concur with my colleagues on original Contention 18 and new Alternatives Contentions 1 through 3. In the following, I discuss the reasoning for my opinion that Contention 18 is moot and that contentions Alt-1 through Alt-3 are inadmissible. In addition, I discuss what I perceive as irregularities in the process by which the Board reformulated contentions.

### **I. Mootness of Contention 18**

I find it necessary, before considering new alternatives contentions, to address the concept of reasonable versus feasible. The majority of this Board appears to treat the two terms as sufficiently closely related that they may be used interchangeably in evaluating alternatives. As cited in this Board Order, the Supreme Court in the *Vermont Yankee* decision stated that "the concept of alternatives must be bounded by some notion of feasibility."<sup>1</sup> As noted in this Board Order, there is a plethora of case law attempting to make a usable interpretation of this statement.<sup>2</sup>

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<sup>1</sup> *Vermont Yankee Nuclear Power Corp. v. Natural Res. Def. Council, Inc.*, 435 U.S. 519, 551 (1978); see also *supra* section III.I.

<sup>2</sup> See *Vermont Yankee*, 435 U.S. at 551 (The alternatives discussion in NEPA analysis is bounded by the notion of feasibility. NEPA was not meant to require a detailed discussion of environmental effects of alternatives when these effects cannot be readily ascertained and are deemed to result from only remote and speculative possibilities. "Common sense teaches us that the detailed statement of alternatives cannot be found wanting simply because the agency failed to include every alternative device and thought conceivable by the mind of man. . . . Time and resources are simply too limited to hold that an impact statement fails because the agency failed to ferret out every possible alternative, regardless of how uncommon or unknown that alternative may have been at the time the project was approved); *Natural Resources Defense Council, Inc. v. Morton*, 458 F.2d 827, 837-38 (DC Cir. 1972) (Implicit in NEPA is a rule of reason, under which the agency may limit the alternatives discussion where there is no environmental effect or where an effect is simply not significant. Congress did not intend for NEPA analyses to discuss the environmental impact of alternatives that are so remote from reality as to depend on something extreme (ie, total repeal of antitrust laws); see also *Aeschliman v. U.S. NRC*, 547 F.2d 622, 626 (DC Cir. 1977) (The impact of proposed energy conservation alternatives (regarding demand for energy) must be susceptible to a reasonable degree of proof. Largely speculative and remote possibilities need not be weighed against a convincing projection of demand).

I note that in 10 C.F.R. Part 51, in the eight places where “alternatives” is linked to a relevant adjective, the word appears as “reasonable alternatives.” There are no instances of alternatives being described in a broader sense as feasible, viable, possible or practical. Also, in Commission adjudication, the Commission appears to scrupulously avoid describing “alternatives” with any word other than “reasonable.”<sup>3</sup> After consulting several dictionaries on words such as reasonable, viable, speculative, feasible, possible, etc., a practical definition of the word reasonable for use when selecting alternative concepts would be an alternative is reasonable if it is both feasible (possible, viable) *and* non-speculative.<sup>4</sup> The non-speculative component of this means that to some extent the resources, capabilities, skills and time required to effectuate the alternative are known so that development and construction of the concept can, at least, be estimated.

In our original decision admitting Contention 18, we reworded the contention to state that the Environmental Report (ER) “fails to include consideration of alternatives to the proposed Comanche Peak Units 3 and 4, consisting of combinations of renewable energy sources such as wind and solar power, with technological advances in storage methods and supplemental use of natural gas, to create baseload power.”<sup>5</sup> We admitted the contention as one alleging

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<sup>3</sup> See *Dominion Nuclear North Anna, LLC* (Early Site Permit for North Anna ESP Site), CLI-07-27, 66 NRC 215, 223 (2007) (An ER must identify all reasonable alternatives); *Louisiana Energy Servs., L.P. (Claiborne Enrichment Center)*, CLI-98-3, 47 NRC 77, 88 (1998) (an EIS must describe the potential environmental impact of a proposed action and discuss any reasonable alternatives); *Long Island Lighting Co. (Shoreham Nuclear Power Station)* CLI-91-2, 33 NRC 61, 65 (1991) (quoting *Citizens for a Better Henderson v. Hodel*, 768 F.2d 1051, 1057 (9th Cir. 1985)) (“An agency’s environmental review ‘must consider not every possible alternative, but every reasonable alternative’”).

<sup>4</sup> Webster’s II New College Dictionary (2001); Webster’s Third New International Dictionary of the English Language (Unabridged) (1986). I found no definition of “reasonable” that clearly fits this situation, but the definition I provide above has some support in case law and appears to encompass the essential difference between reasonable and feasible provided by the dictionaries. (*Piedmont Heights Civil Club, Inc. v. Moreland*, 637 F.2d 430, 436 (5th Cir.1981) (NEPA “requires consideration only of feasible, non-speculative alternatives.”).

<sup>5</sup> *Luminant Generation Co., LLC* (Comanche Peak Nuclear Power Plant, Units 3 & 4), LBP-09-

purely omission from the ER—that evaluation of the identified alternatives was missing in its entirety. With Applicant’s supplement to the ER, this information is no longer missing in its entirety.

The Commission has stated, regarding contentions of omission:

Where a contention alleges the omission of particular information or an issue from an application, and the information is later supplied by the applicant or considered by the Staff in a draft EIS, the contention is moot. Intervenors must timely file a new or amended contention that addresses the factors in section 2.714(b) in order to raise specific challenges regarding the new information.<sup>6</sup>

The question remains, to what extent does “the information is later supplied” require a board to determine whether the later-supplied information completely fills the alleged omission. The Commission decision in *Duke Energy* enables boards to avoid this question. For contentions alleging a total omission, once a party supplies information purporting to fill the alleged omission, the original contention should be considered moot. Then petitioners may sift through the supplemental information to identify items still missing.<sup>7</sup> This permits the parties to identify continued omissions.

Because Applicant in this proceeding supplied information that they claim fills the omission alleged in Contention 18, Contention 18 is now moot. Intervenors had the opportunity to propose new contentions based on Applicant’s supplement to Contention 18 (revisions to the Environmental Report), and in response they timely proposed six new contentions (Alternatives Contentions 1 through 6 ) based on this supplement.<sup>8</sup>

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17, 70 NRC \_\_, \_\_ (slip op. at 82) (Aug. 6, 2009).

<sup>6</sup> *Duke Energy Corp.* (McGuire Nuclear Station, Units 1 & 2, Catawba Nuclear Station, Units 1 & 2) CLI-02-28, 56 NRC 371, 382-83 (2002).

<sup>7</sup> *Id.*

<sup>8</sup> Furthermore, the solar/wind/storage/natural gas option appears to have been, at least superficially, evaluated in the ER in Section 9.2.2.11.14.1 “Renewable Energy Sources Combined with Storage and Supplemented by Natural Gas Power Generation”. So as a contention of omission, this one fails.

## II. New Alternatives Contentions

Examination of new Alternatives Contentions 1 through 6 reveals a sparsity of details, and a plethora of inferences. None of Alternatives Contentions 1 through 6 fully satisfies all of the contention admissibility requirements of 10 C.F.R. § 2.309(f)(1). Below I consider the first three<sup>9</sup> of these contentions and briefly describe which of the contention admissibility requirements of 10 C.F.R. § 2.309(f)(1) these new contentions fail to satisfy.

### **a. Alternatives Contention 1: The Applicant overstates and mischaracterizes, without substantiation, the impacts of wind power generation and CAES.**

This contention was in response to the four-page evaluation of a wind/CAES storage alternative provided by Applicant in Section 9.2.2.11.3.1 of its revised ER. It provides a concise statement of the issue, challenging how Applicant characterized impacts of the wind/CAES alternative. However, reading the ER reveals that Applicant evaluated this alternative using the evaluation methodology of NUREG-1555 and determined that this alternative was unreasonable.<sup>10</sup> A prerequisite to challenging the adequacy of Applicant's characterization of impacts is a challenge of Applicant's determination that this alternative is unreasonable. Intervenors provide information to suggest that they do not agree with Applicant's ultimate determination but they never directly challenge the validity of this determination. Therefore, none of the bases Intervenors provide in Alternatives Contention 1 offers any reason why Applicant must provide a better characterization of the wind/CAES alternative. Hence, although this issue is within the scope of adjudication, Intervenors have not demonstrated how this contention is material to the findings the NRC must make in order to issue the license in this

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<sup>9</sup> I do not address Alternatives Contentions 4, 5, and 6, because I am in substantial agreement with the Board that these contentions are entirely inadmissible.

<sup>10</sup> See Alternatives ER Revision at 9.2-40 § 9.2.2.11.3.1; see also Office of Nuclear Reactor Regulation, Standard Review Plans for Environmental Reviews for Nuclear Power Plants, NUREG-1555 at 9.2.2-4 (Oct. 1999) (to be considered "competitive" with the proposed project, "[t]he energy conversion technology should be developed, proven, and available in the relevant region").

proceeding.<sup>11</sup> The facts provided in this contention indicate that characterizations of the wind/CAES alternative other than that provided in the ER are possible, but they do not controvert what Applicant has said. The only reference to portions of the ER being challenged, as required by 10 C.F.R. § 2.309(f)(1)(vi), is ER page 9.2-40,<sup>12</sup> and its discussion of the amount of land required. Even the Board has decided that this land use issue is not admissible. Therefore, Intervenors fail to show that a genuine dispute exists, and this contention is inadmissible.

**b. Alternatives Contention 2: The Applicant inadequately characterizes, without substantiation, the impacts of solar with storage.**

Intervenors provide a concise statement of the contention clearly indicating they challenge Applicant's characterization of impacts of the solar/storage alternative. Similar to the previous contention, Intervenors fail to challenge Applicant's reasoned decision that solar/storage is not a reasonable alternative. None of the possible basis provided addresses why, given the unchallenged unreasonableness of the alternative, any further characterization of solar/storage option is required. This issue is within the scope of adjudication, but given the unchallenged unreasonableness of this alternative, Intervenors do not demonstrate that this contention is material. Thus this contention does not satisfy 10 C.F.R. § 2.309(f)(1)(iv).

Intervenors allege that there are ways to characterize impacts of solar/storage other than that provided in the ER, but do not dispute Applicant's characterization. Intervenors also introduce a new power alternative—that of a combined cycle solar power system. In sum, although alleged facts are provided by Intervenors, in total they do not provide adequate support to demonstrate a genuine dispute with the ER, and thus fail to satisfy 10 C.F.R. § 2.309(f)(1)(vi).

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<sup>11</sup> See 10 C.F.R. § 2.309(f)(1)(iv).

<sup>12</sup> Intervenors' Contentions Regarding Applicant's Revisions to Environmental Report Concerning Alternatives to Nuclear Power (Jan. 15, 2010) at 4.

Furthermore, the only part of the ER that Intervenors reference is ER page 9.2-43,<sup>13</sup> which discusses socioeconomic impacts. Considering the unchallenged unreasonableness of this alternative, this final challenge appears to “flyspeck” the ER.<sup>14</sup> This contention is not admissible.

**c. Alternatives Contention 3: The Applicant’s determination that nuclear is environmentally preferable to renewable energy with storage, supplemented by natural gas is based on fundamentally flawed assumptions about the nature and extent of environmental impacts related thereto.**

Intervenors provide a concise statement of the contention. However, this statement flies directly in the face of information provided in the Application that Intervenors do not challenge. ER Section 9.2.2.11.4.1 provides the allegedly missing evaluation of this alternative. The last paragraph of this section of the ER states unequivocally that this alternative was ruled out as being not reasonable. Because Intervenors do not challenge this determination, there appears to be no requirement for any further assessment of environmental impacts. The three bases provided are (1) Applicant’s assumption that each technology in a multi-technology alternative must be capable of producing 3200 MW unreasonably distorts the impacts, (2) Applicant inadequately characterizes impacts of renewable with storage alternatives, and (3) Applicant did not consider a wind *and* solar alternative. None of these bases addresses the fundamental fault of this contention—that Intervenors do not demonstrate why Applicant must discuss further environmental impacts. The third basis is flatly incorrect, as ER Section 9.2.2.11.4.1 includes this alternative. This contention is within scope, but as with Alternatives Contentions 1 and 2, it fails to demonstrate that the issue is material given Applicant’s undisputed determination that the alternative is not reasonable. Although some supporting facts are provided, none of them

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<sup>13</sup> *Id.* at 5.

<sup>14</sup> *Sys. Energy Res., Inc.* (Early Site Permit for Grand Gulf ESP Site), CLI-05-4, 61 NRC 10, 13 (2005); *Yankee Atomic Elec. Co.* (Yankee Nuclear Power Station), CLI-96-7, 43 NRC 235, 259 (1996) (boards do not sit to “flyspeck” environmental documents or to add details or nuances).

supports that an evaluation of impacts is required. Thus, Alternatives Contention 3 does not establish a genuine dispute with the ER as required under 10 C.F.R. § 2.309(f)(1)(vi) and is not admissible.

### **III. The Board Has Improperly Reformulated Contentions**

Boards are within their discretion to limit contentions by weeding out inadmissible portions, and even to reformulate contentions when they have been poorly organized or drafted. In this case, I think the Board has aided Intervenors to an impermissible extent. Intervenors, in this case, include a statewide organization and a nationwide organization with experience in NRC adjudications. They are represented by an attorney. Their contentions should be fairly well organized and not in need of reformulation by the Board.<sup>15</sup> Instead, disparate, undeveloped and unrelated concepts have been reassembled by the Board and reorganized in the appearance of an admissible contention. This has required an extended extrapolation of what Intervenors actually said to what the Board believes Intervenors intended. The final contention statement that the Board admits in the majority decision bears only a loose, if any, relationship to the contention statements that Intervenors provided. Instead, the Board's reformulated contentions reflect what the Board thinks Intervenors intended. I believe that the Board relies too heavily on the interpretation that a reasonable alternative is one that is feasible, i.e., merely possible—an idea that I believe to be incorrect.

I believe that each individual step the Board took in reformulating the contentions is well-intended and has the appearance of being reasonable and justified. I could not argue against many of the specific steps. However, so many such steps have been taken that the gestalt is an unreasonable and unrecognizable distortion of the contentions Intervenors actually

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<sup>15</sup> See *Shieldalloy Metallurgical Corp.* (Cambridge, Ohio Facility), CLI-99-12, 49 NRC 347, 354 (1999) (Parties "represented by counsel are generally held to a higher standard than *pro se* litigants.").

submitted. The Board has thus exceeded any reasonable limit in its reformulation of Intervenor Alternatives Contentions.

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter of )  
)  
LUMINANT GENERATION COMPANY, LLC ) Docket Nos. 52-034-COL  
) and 52-035-COL  
)  
)  
(Comanche Peak Nuclear Power Plant, )  
Units 3 and 4) )

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing MEMORANDUM AND ORDER (RULING ON MOOTNESS OF CONTENTIONS 13 AND 18, AND NEW ENVIRONMENTAL CONTENTIONS) (LBP-10-10) have been served upon the following persons by Electronic Information Exchange.

Office of Commission Appellate  
Adjudication  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001  
E-mail: [ocaamail@nrc.gov](mailto:ocaamail@nrc.gov)

U.S. Nuclear Regulatory Commission  
Office of the Secretary of the Commission  
Rulemakings & Adjudications Staff  
Mail Stop O-16C1  
Washington, DC 20555-0001  
E-mail: [hearingdocket@nrc.gov](mailto:hearingdocket@nrc.gov)

U.S. Nuclear Regulatory Commission.  
Atomic Safety and Licensing Board Panel  
Mail Stop T-3F23  
Washington, DC 20555-0001

U.S. Nuclear Regulatory Commission  
Office of the General Counsel  
Mail Stop - O-15 D21  
Washington, DC 20555-0001  
Marian Zabler, Esq.  
Laura Goldin, Esq.  
James P. Biggins, Esq.  
Susan Vrahoretis, Esq.  
Sara Kirkwood, Esq.

Ann Marshall Young, Chairman  
Administrative Judge  
E-mail: [ann.young@nrc.gov](mailto:ann.young@nrc.gov)

E-mail:  
[marian.zabler@nrc.gov](mailto:marian.zabler@nrc.gov)  
[laura.goldin@nrc.gov](mailto:laura.goldin@nrc.gov)  
[james.biggins@nrc.gov](mailto:james.biggins@nrc.gov)  
[susan.vrahoretis@nrc.gov](mailto:susan.vrahoretis@nrc.gov)  
[Sara.Kirkwood@nrc.gov](mailto:Sara.Kirkwood@nrc.gov)

Gary S. Arnold  
Administrative Judge  
E-mail: [gxa1@nrc.gov](mailto:gxa1@nrc.gov)

Alice C. Mignerey  
Administrative Judge  
E-mail: [acm3@nrc.gov](mailto:acm3@nrc.gov)

Matthew F. Rotman, Law Clerk  
E-mail: [matthew.rotman@nrc.gov](mailto:matthew.rotman@nrc.gov)  
Ann Hove, Law Clerk  
E-mail: [ann.hove@nrc.gov](mailto:ann.hove@nrc.gov)

OGC Mail Center : [OGCMailCenter@nrc.gov](mailto:OGCMailCenter@nrc.gov)

Docket Nos. 52-034-COL and 52-035-COL  
MEMORANDUM AND ORDER (RULING ON MOOTNESS OF CONTENTIONS 13 AND 18,  
AND NEW ENVIRONMENTAL CONTENTIONS) (LBP-10-10)

Morgan, Lewis & Bockius, LLP  
1111 Pennsylvania Ave., NW  
Washington, DC 20004  
Stephen Burdick, Esq.  
Steven P. Frantz, Esq.  
Jonathan M. Rund, Esq.  
Timothy P. Matthews, Esq.  
Martin O'Neill, Esq.  
Jane T. Diecker, Esq.

E-mail: [sburdick@morganlewis.com](mailto:sburdick@morganlewis.com)  
[sfrantz@morganlewis.com](mailto:sfrantz@morganlewis.com);  
[jrund@morganlewis.com](mailto:jrund@morganlewis.com)  
[tmatthews@morganlewis.com](mailto:tmatthews@morganlewis.com)  
[martin.oneill@morganlewis.com](mailto:martin.oneill@morganlewis.com)  
[jdiecker@morganlewis.com](mailto:jdiecker@morganlewis.com)

True Cost of Nukes  
1067 W. Magnolia  
Fort Worth, TX 76014  
John N. Fischer  
E-mail: [jnilefischer@sbcglobal.net](mailto:jnilefischer@sbcglobal.net)

Sustainable Energy and Economic  
Development (SEED) Coalition  
Robert V. Eye, Esq.  
Kauffman & Eye  
112 SW 6<sup>th</sup> Avenue, Suite 202  
Topeka, Kansas 66603  
E-mail: [bob@kauffmaneye.com](mailto:bob@kauffmaneye.com)

Pillsbury Winthrop Shaw Pittman, LLP  
2300 N. Street, NW  
Washington, DC 20037-1122  
Counsel for Progress Energy  
R. Budd Haemer, Esq.  
Jason B. Parker, Esq.  
Matias F. Travieso-Diaz, Esq.  
Maria D. Webb, Senior Energy Legal  
Analyst/Paralegal Coordinator  
E-mail:

[robert.haemer@pillsburylaw.com](mailto:robert.haemer@pillsburylaw.com)  
[jason.parker@pillsburylaw.com](mailto:jason.parker@pillsburylaw.com)  
[matias.travieso-diaz@pillsburylaw.com](mailto:matias.travieso-diaz@pillsburylaw.com)  
[maria.webb@pillsburylaw.com](mailto:maria.webb@pillsburylaw.com)

Sustainable Energy & Economic Development  
(SEED) Coalition  
1303 San Antonio #100  
Austin, Texas 78701  
Eliza Brown, Clean Energy Advocate  
E-mail: [eliza.seedcoalition@gmail.com](mailto:eliza.seedcoalition@gmail.com)

[Original signed by Nancy Greathead]  
Office of the Secretary of the Commission

Dated at Rockville, Maryland  
this 25<sup>th</sup> day of June 2010