

**UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION**

**BEFORE THE COMMISSION**

In the Matter of	)	
FIRSTENERGY NUCLEAR OPERATING COMPANY	)	Docket No. 50-346-LR
(Davis-Besse Nuclear Power Station, Unit 1)	)	May 6, 2011
	)	

**FIRSTENERGY’S NOTICE OF APPEAL OF LBP-11-13**

Pursuant to 10 C.F.R. § 2.311, FirstEnergy Nuclear Operating Company (“FirstEnergy” or “FENOC”) hereby files this Notice of Appeal of the Atomic Safety and Licensing Board’s (“Board”) April 26, 2011 Memorandum and Order (“LBP-11-13”). The latter granted Petitioners’<sup>1</sup> petition to intervene<sup>2</sup> and admitted for litigation two contentions related to FirstEnergy’s application for a renewed operating license for the Davis-Besse Nuclear Power Station, Unit 1 (“Davis-Besse”), located in Ohio. Specifically, the Board admitted: (1) a reformulated and consolidated version of Contentions 1, 2, and 3 regarding renewable energy alternatives, and (2) a narrowed version of Contention 4 regarding severe accident mitigation alternatives (“SAMAs”). As demonstrated in FirstEnergy’s accompanying Brief in Support of the Appeal of LBP-11-13, the Board clearly erred in admitting these two contentions, because they do not satisfy the requirements of 10 C.F.R. § 2.309(f)(1), and clearly erred in granting the Petition. Pursuant to 10 C.F.R. § 2.311(d)(1), FirstEnergy appeals the admission of these contentions.

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<sup>1</sup> The Petitioners are Beyond Nuclear, Citizens Environment Alliance of Southwestern Ontario, Don’t Waste Michigan, and the Green Party of Ohio.

<sup>2</sup> Request for Public Hearing and Petition for Leave to Intervene (December 27 and 28, 2010) (“Petition”).

Respectfully submitted,

*Signed (electronically) by Alex S. Polonsky*

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Dated in Washington, D.C.  
this 6th day of May 2011

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**FIRSTENERGY'S BRIEF IN SUPPORT OF THE APPEAL OF LBP-11-13**

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**FIRSTENERGY’S BRIEF IN SUPPORT OF THE APPEAL OF LBP-11-13**

**I. INTRODUCTION**

In accordance with 10 C.F.R. § 2.311, FirstEnergy Nuclear Operating Company (“FirstEnergy” or “FENOC”) hereby timely appeals the Atomic Safety and Licensing Board’s (“Board”) April 26, 2011 Memorandum and Order (“LBP-11-13”). It admitted two contentions related to FirstEnergy’s license renewal application (“LRA”) for the Davis-Besse Nuclear Power Station, Unit 1 (“Davis-Besse”): (1) a reformulated and consolidated version of Contentions 1, 2, and 3 regarding renewable energy alternatives; and (2) a revised and narrowed version of Contention 4 regarding severe accident mitigation alternatives (“SAMAs”). In doing so, the Board granted the December 27 and 28, 2010 “Request for Public Hearing and Petition for Leave to Intervene” (“Petition”) submitted by Beyond Nuclear, Citizens Environment Alliance of Southwestern Ontario, Don’t Waste Michigan, and the Green Party of Ohio (“Petitioners”).

As demonstrated below, the Board erred—either through clear error or abuse of discretion—in admitting the two contentions because they do not satisfy the requirements of 10 C.F.R. § 2.309(f)(1). Thus, FirstEnergy respectfully requests that the Commission reverse the Board’s admission of the contentions in LBP-11-13 and deny the Petition in its entirety.

## II. BACKGROUND

Davis-Besse is located in Ohio and generates 908 MWe of baseload electrical power.<sup>3</sup> The current operating license for Davis-Besse expires at midnight on April 22, 2017.<sup>4</sup> On August 27, 2010, FirstEnergy submitted its LRA,<sup>5</sup> requesting that the U.S. Nuclear Regulatory Commission (“NRC” or “Commission”) renew the operating license for Davis-Besse for twenty more years (*i.e.*, through April 22, 2037).<sup>6</sup> The NRC accepted the LRA for docketing and published a Hearing Notice on October 25, 2010.<sup>7</sup> The Hearing Notice stated that any person whose interest may be affected by this proceeding and who wishes to participate as a party must file a petition for leave to intervene under 10 C.F.R. § 2.309 by December 27, 2010. Petitioners filed their Petition on December 27 and 28, 2010, as well as an errata on January 5, 2011.<sup>8</sup>

FirstEnergy and the NRC Staff filed answers opposing the Petition on January 21, 2011.<sup>9</sup> The Petitioners filed a combined reply on January 28.<sup>10</sup> On March 1, the Board heard oral argument in Port Clinton, Ohio.<sup>11</sup> On April 26, the Board issued LBP-11-13, ruling that the Petitioners have standing and finding the two above-described contentions were admissible. In

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<sup>3</sup> Applicant’s Environmental Report, Operating License Renewal Stage, Davis-Besse Nuclear Power Station, at 3.1-1, 7.2-1 (Aug. 2010) (“ER”), *available at* <http://www.nrc.gov/reactors/operating/licensing/renewal/applications/davis-besse/davis-besse-enviro.pdf>.

<sup>4</sup> *Id.* at 1.1-1.

<sup>5</sup> Notice of Acceptance for Docketing of the Application, Notice of Opportunity for Hearing for Facility Operating License No. NPF-003 for an Additional 20-Year Period; FirstEnergy Nuclear Operating Company, Davis-Besse Nuclear Power Station, 75 Fed. Reg. 65,528, 65,529 (Oct. 25, 2010) (“Hearing Notice”).

<sup>6</sup> ER at 1.1-1.

<sup>7</sup> *See* Hearing Notice, 75 Fed. Reg. at 65,528-29.

<sup>8</sup> Letter from K. Kamps (Beyond Nuclear) to A. Cook (NRC), Errata re: “Request for Public Hearing and Petition for Leave to Intervene in the Matter of FirstEnergy’s Application to Relicense Davis-Besse Nuclear Power Plant (Facility Operating License No-NFP-003, Docket No. 50-346, NRC-2010-0299) for 20 Additional Years of Extended Operation,” as filed Dec. 27, 2010 (Jan. 5, 2011). (“Errata”).

<sup>9</sup> FirstEnergy’s Answer Opposing Request for Public Hearing and Petition for Leave to Intervene (Jan. 21, 2011) (“FENOC Answer”); NRC Staff’s Answer to Joint Petitioners’ Request for a Hearing and Petition for Leave to Intervene (Jan. 21, 2011) (“NRC Staff Answer”).

<sup>10</sup> Joint Intervenors’ Combined Reply in Support of Petition for Leave to Intervene (Jan. 28, 2011) (“Reply”). Petitioners also filed a set of errata to the Reply on February 10, 2011.

<sup>11</sup> *See* Transcript of Oral Argument at 1-239 (Mar. 1, 2011) (“Tr.”).

accordance with the Board's order<sup>12</sup> and 10 C.F.R. § 2.311, FirstEnergy hereby appeals.

### III. LEGAL STANDARDS

#### A. Standard of Review

10 C.F.R. § 2.311(d)(1) allows an applicant to appeal an order granting a petition to intervene on the question as to “[w]hether the request for hearing or petition to intervene should have been wholly denied.” To intervene in an NRC licensing proceeding, a petitioner must demonstrate standing and must propose at least one admissible contention that meets the criteria specified in 10 C.F.R. § 2.309(f)(1).<sup>13</sup> A board decision granting a petition to intervene may be appealed under 10 C.F.R. § 2.311(d)(1) if the applicant or the NRC Staff disputes the board's admission of all contentions.<sup>14</sup>

The Commission generally defers to board decisions on contention admissibility, but will reverse if there is “clear error or abuse of discretion.”<sup>15</sup> It has held that allowing boards “to entertain contentions grounded on little more than guesswork would waste the scarce adjudicatory resources of all involved.”<sup>16</sup>

#### B. Contention Admissibility Standards

The Commission's rules on contention admissibility are “strict by design.”<sup>17</sup> The rules were “toughened . . . in 1989 because in prior years ‘licensing boards had admitted and litigated

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<sup>12</sup> *FirstEnergy Nuclear Operating Co.* (Davis-Besse Nuclear Power Station, Unit 1), LBP-11-13, slip op. at 65 (Apr. 26, 2011).

<sup>13</sup> *See* 10 C.F.R. § 2.309(a) 2011.

<sup>14</sup> *See AmerGen Energy Co.* (Oyster Creek Nuclear Generating Station), CLI-06-24, 64 NRC 111, 119 (2006); *Pa'ina Haw., LLC* (Material License Application), CLI-06-13, 63 NRC 508, 509 (2006).

<sup>15</sup> *See, e.g., Progress Energy Carolinas, Inc.* (Shearon Harris Nuclear Power Plant, Units 2 & 3), CLI-09-8, 69 NRC 317, 324 (2009).

<sup>16</sup> *Crow Butte Res., Inc.* (N. Trend Expansion Area), CLI-09-12, 69 NRC 535, 552 (2009); *see also Crow Butte Res., Inc.* (License Renewal for In Situ Leach Facility, Crawford, Nebraska), CLI-09-9, 69 NRC 331, 363-364 (2009) (arguments that are speculative “do not form the basis for a litigable contention”).

<sup>17</sup> *Dominion Nuclear Conn., Inc.* (Millstone Nuclear Power Station, Units 2 & 3), CLI-01-24, 54 NRC 349, 358 (2001) (citing *Duke Energy Corp.* (Oconee Nuclear Station, Units 1, 2, & 3), CLI-99-11, 49 NRC 328, 334 (1999)).

numerous contentions that appeared to be based on little more than speculation.”<sup>18</sup> The Commission has emphasized that the “contention pleading rules are designed to ensure both that only well-defined issues are admitted for hearing and that parties admitted to litigate sophisticated technical issues are qualified to do so.”<sup>19</sup> Failure to comply with any one of the six admissibility criteria in 10 C.F.R. § 2.309(f)(1) is grounds for rejecting a proposed contention.<sup>20</sup>

In applying these standards, the Commission has made clear that cloning contentions from other proceedings does not meet the NRC’s *current* contention pleading requirements:

[T]he NRC toughened its contention-pleading rule in 1989, to avoid the admission of contentions based on “little more than speculation.” Prior to the amended rule, it was possible for intervenors to be admitted to hearing after merely “copying contentions from another proceeding involving another reactor.” Hearings should serve the purpose for which they are intended: “to adjudicate genuine, substantive safety and environmental issues placed in contention by qualified intervenors.”<sup>21</sup>

In short, the Commission’s current contention pleading requirements are intended to avoid the admission of “frivolous contentions” where the petitioner “may not fully understand a contention” or does not “adequately identify the issues that [it] seeks to litigate.”<sup>22</sup>

#### IV. ARGUMENT

The two NEPA contentions that the Board admitted in this proceeding should be very familiar to the Commission. As Petitioners admit, they are essentially clones of contentions submitted in other proceedings: “we have relied heavily on colleagues at the Seabrook

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<sup>18</sup> *Millstone*, CLI-01-24, 54 NRC at 358 (citing *Oconee*, CLI-99-11, 49 NRC at 334).

<sup>19</sup> *North Trend*, CLI-09-12, 69 NRC at 552 (citations omitted).

<sup>20</sup> *Private Fuel Storage, L.L.C.* (Indep. Spent Fuel Storage Installation), CLI-99-10, 49 NRC 318, 325 (1999).

<sup>21</sup> *Fla. Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 & 4), CLI-01-17, 54 NRC 3, 19 (2001) (internal citations omitted).

<sup>22</sup> Proposed Rule, Rules of Practice for Domestic Licensing Proceedings-Procedural Changes in the Hearing Process, 51 Fed. Reg. 24,365, 24,366 (July 3, 1986).

proceeding and the Pilgrim proceeding as well as Indian Point.”<sup>23</sup> Where other Boards admitted essentially identical SAMA contentions, the contentions were supported by expert reports and/or site-specific evaluations.<sup>24</sup> Here, however, they are not.

To support both contentions, Petitioners here have cobbled together—and the Board has relied upon—an internet blog,<sup>25</sup> draft reports,<sup>26</sup> generic analyses,<sup>27</sup> and “concept” papers,<sup>28</sup> among others—in an attempt to demonstrate that there are reasonable energy or severe accident mitigation alternatives that must be considered under NEPA. The Board has committed reversible error by accepting this approach as providing a foundation for Petitioners’ contentions. As demonstrated below, the Board erred in granting the Petition, because the admitted contentions clearly do not satisfy the requirements of 10 C.F.R. § 2.309(f)(1).

**A. The Board Erred in Admitting a Reformulated Contention Regarding Energy Alternatives**

The Board’s reformulated contention alleges that FirstEnergy’s Environmental Report

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<sup>23</sup> Tr. at 180 (Kamps). Petitioners even forgot to remove other applicants’ names. *See* Errata, Encl. (indicating that numerous references in the Petition to “NextEra” (for the Seabrook proceeding) or “Entergy” (for the Indian Point and Pilgrim proceedings) should be to “FENOC”).

<sup>24</sup> The *Seabrook* Petitioners did not support their SAMA contentions with an expert affidavit, but the Board’s decision to admit those contentions also is on appeal to the Commission. *See* NextEra Energy Seabrook LLC’s Notice of Appeal of LBP-11-02 As to the New England Coalition and Friends of the Coast (Feb. 25, 2011). *Entergy Nuclear Operations, Inc.* (Indian Point, Units 2 & 3), LBP-08-13, 68 NRC 43, 187 (2008) (rejecting a nearly-identical SAMA contention even though it was supported by a site-specific expert report). *See also* FENOC Answer at 119 & nn. 516-519 (discussing Board’s admitting challenges to the Indian Point and Pilgrim license renewal applicants’ SAMA-related determination of offsite decontamination costs where the petitioners had relied on site-specific reports and arguments).

<sup>25</sup> LBP-11-13, slip op. at 56 (discussing the website of “Weather Doctor” Keith C. Heidorn. This website is the personal blog of a Canadian meteorologist/artist. Keith C. Heidorn, Weather Doctor, Weather Almanac for May 2000: Great Lake Breezes (May 10, 2000) <http://www.islandnet.com/~see/weather/almanac/arc2000/alm00may2.htm>).

<sup>26</sup> *See e.g.*, LBP-11-13, slip op. at 29 (discussing Jacques Beaudry-Losique et al., Creating an Offshore Wind Industry in the United States: A Strategic Work Plan for the United States Department of Energy, Fiscal Years 2011-2015 (Sept. 2, 2010) (Petition Exhibit 42) (predecisional draft)).

<sup>27</sup> *See e.g.*, LBP-11-13 slip op. at 50, 51 n.310 (discussing generic source terms evaluated in NUREG-1465, L.Soffer et al., Accident Source Terms for Light-Water Nuclear Power Plants, NUREG-1465 (Feb. 1995)).

<sup>28</sup> *See e.g.*, LBP-11-13, slip op. at 28 (discussing National Renewable Energy Laboratory, United States Department of Energy, *Creating Baseload Wind Power Systems Using Advanced Compressed Air Energy Storage Concepts* (Oct. 3, 2006) (“Petition Exhibit 20”)).

“ER”) should have considered renewable energy sources in a more comprehensive manner.<sup>29</sup> Proposed Contention 1 focused on wind power,<sup>30</sup> Proposed Contention 2 on solar power,<sup>31</sup> and Proposed Contention 3 on a “Combination of commercial wind-generated baseload power, combined with solar photovoltaic-generated baseload power.”<sup>32</sup> While recognizing that the “Petition is generally unfocused and includes numerous exhibits irrelevant and immaterial to this proceeding,”<sup>33</sup> and that “many of the Joint Petitioners’ exhibits do not specifically address FirstEnergy’s region of interest,” the Board nevertheless ruled that Petitioners provided the required “minimal” factual support.<sup>34</sup>

The Board consolidated, restated, and admitted Contentions 1, 2, and 3 as follows:

[FENOC’s ER] fails to adequately evaluate the full potential for renewable energy sources, specifically wind power in the form of interconnected wind farms and/or solar photovoltaic power, in combination with compressed air energy storage, to offset the loss of energy production from Davis-Besse, and to make the requested license renewal action unnecessary. The FENOC Environmental Report (§ 7.2) treats all of the alternatives to license renewal except for natural gas and coal plants as unreasonable and does not provide a substantial analysis of the potential for significant alternatives in the Region of Interest.

The scope of the contention is not clear. The most reasonable reading is that it covers a combined alternative that includes compressed air energy storage (“CAES”).<sup>35</sup> However, in case

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<sup>29</sup> See LBP-11-13, slip op. at 17.

<sup>30</sup> See *id.* (citing Petition at 10).

<sup>31</sup> See *id.* (citing Petition at 68-69).

<sup>32</sup> *Id.* (quoting Petition at 93).

<sup>33</sup> *Id.* at 34.

<sup>34</sup> *Id.* at 30.

<sup>35</sup> If the Board wanted otherwise, then it would have crafted the contention to state: “wind power in the form of interconnected wind farms and/or solar photovoltaic power, *alone or* in combination with compressed air energy storage.” See also LBP-11-13, slip op. at 31 (“We are not persuaded that, as a matter of law, a distributed combination of wind farms, solar arrays, *and* [CAES] could not constitute a reasonable alternative”) (emphasis added). However, the Board referred to these alternatives jointly. This admitted combined alternative therefore covers wind with CAES, solar with CAES, or a combination of all three. *Id.*; see also Tr. at 76 (Lodge) (CAES with wind farms); *Id.* at 77 & 104 (Lodge) (solar and CAES).

it also covers an alternative of interconnected wind farms without CAES,<sup>36</sup> we address that alternative in this appeal as well.

Davis-Besse is a 908 MWe plant in Ohio. To be successful on appeal, therefore, FirstEnergy need only show that Petitioners failed to provide adequate facts to support the likely existence of 908 MWe of baseload energy from either CAES or connected wind farms by April 2017 in the Davis-Besse Region of Interest. FirstEnergy makes this showing below.

FirstEnergy also shows below that the Petition failed to acknowledge, let alone refute, FirstEnergy's analysis of combinations of alternatives in the ER, and that the contention applies the wrong legal standard; raising the question of whether license renewal is "unnecessary," when the relevant test is whether preserving the option of license renewal would be "unreasonable." Accordingly, the Board's admission of the contention is reversible error.

**1. The Reformulated Contention Would Require the Evaluation of a Remote and Speculative Alternative**

*a. Scope of Energy Alternatives Under NEPA*

NEPA requires consideration of the potential environmental effects of any proposed "major Federal action significantly affecting the quality of the human environment,"<sup>37</sup> including license renewal. 10 C.F.R. § 51.45 states that the ER "should contain sufficient data to aid the Commission in its development of an independent analysis."<sup>38</sup> The ER must contain "a description of the proposed action, a statement of its purposes, [and] a description of the environment affected,"<sup>39</sup> and consider "[a]lternatives to the proposed action."<sup>40</sup>

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<sup>36</sup> Tr. at 81 (Lodge). The alternative cannot include just solar energy because the sun only shines during the day.

<sup>37</sup> 10 C.F.R. § 51.20(a)(1) (2011); *see also* 42 U.S.C. § 4321 *et seq.* (2006).

<sup>38</sup> 10 C.F.R. § 51.45(c) (2011).

<sup>39</sup> *Id.* § 51.45(b).

<sup>40</sup> *Id.* § 51.45(b)(3).

Only “reasonable alternatives” need be considered, however.<sup>41</sup> The duty under NEPA is to study alternatives that appear reasonable and appropriate for study at the time of the agency’s NEPA evaluation.<sup>42</sup> Accordingly, the Board correctly limited the inquiry to whether the energy alternative is available now or in the immediate future, *i.e.*, by 2017. The Commission recently held that an applicant’s ER is not a “research document,” stating that:

NEPA does not require agencies to use technologies and methodologies that are still ‘emerging’ and under development, or to study phenomena ‘for which there are not yet standard methods of measurement or analysis.’ And while there ‘will always be more data that could be gathered,’ agencies ‘must have some discretion to draw the line and move forward with decisionmaking.’<sup>43</sup>

Further, “an agency need follow only a ‘rule of reason’ in preparing an EIS,” and “this rule of reason governs both *which* alternatives the agency must discuss, and the *extent* to which it must discuss them.”<sup>44</sup> The U.S. Supreme Court has held that an alternatives review “must be bounded by some notion of feasibility” and “cannot be found wanting simply because the agency failed to include every alternative device and thought conceivable by the mind of man.”<sup>45</sup> “[R]easonable alternatives” are those that “will bring about the ends” of the proposed action, and the NRC must take into account the “economic goals” of a private applicant.<sup>46</sup>

For the foregoing reasons, to be a reasonable alternative for nuclear power plant license

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<sup>41</sup> *Id.* § 51.71(f).

<sup>42</sup> *See Vt. Yankee Nuclear Power Corp. v. Natural Res. Def. Council*, 435 U.S. 519, 553 (1978) (requiring a licensing board’s consideration of energy alternatives to be “judged by the information then available to it”).

<sup>43</sup> *Entergy Nuclear Generation Co. (Pilgrim Nuclear Power Station)*, CLI-10-11, slip op. at 37 (Mar. 26, 2010).

<sup>44</sup> *Citizens Against Burlington v. Busey*, 938 F.2d 190, 195 (D.C. Cir. 1991) (internal quotations omitted); *see* 40 C.F.R. § 1502.14(a) (2010) (directing applicants and agencies to “[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.*”) (emphasis added).

<sup>45</sup> *Vt. Yankee*, 435 U.S. at 551; *see also Nuclear Mgmt. Co.*, (Monticello Nuclear Generating Plant), LBP-05-31, 62 NRC 735, 753 (2005) (holding that “there is no requirement for an applicant to look at every conceivable alternative to its proposed action”).

<sup>46</sup> *See Hydro Res. Inc.* (P.O. Box 15910, Rio Ranch, N.M. 87174), CLI-01-4, 53 NRC 31, 55-56 (2001) (citing *Busey*, 938 F.2d at 195-96; *City of Grapevine v. Dep’t of Transp.*, 17 F.3d 1502, 1506 (D.C. Cir. 1994)).

renewal, an energy source must: (1) accomplish the purpose of the proposed project, which, as explained below, includes being in the plant's ROI; (2) be technically feasible now or in the immediate future; and (3) be commercially viable now or in the immediate future. In this proceeding, therefore, a reasonable alternative is one that can replace Davis-Besse's rated output of approximately 908 MWe of baseload power, in Ohio, before April 2017 when Davis-Besse would enter the period of extended operation.<sup>47</sup>

b. *Development of Sufficient Compressed Air Energy Storage Capability By 2017 Is Remote and Speculative*

As admitted by the Board, the contention would require CAES at a capacity equal to Davis-Besse (*i.e.*, 908 MWe) for those days when the wind does not blow sufficiently (for connected wind farms), or when the sun does not shine, or at night (for solar). In other words, the CAES itself must be capable of providing 908 MWe of baseload generation. Petitioners' own documents, as cited by the Board, however, show the opposite; namely that 908 MWe of baseload power through CAES is remote and speculative now and through April 2017. While Petitioners proffered numerous exhibits, the Board discusses only a small number of documents to support its ruling. These documents, alone and together, fail to provide adequate support for the admitted contention.

The Board first points to Petitioners' Exhibit 33, a June 2010 National Renewable Energy Laboratory ("NREL") Report, which Petitioners allege shows that "within FirstEnergy's ROI, 'there is a *total resource* of 155.5 gigawatts (GW) of offshore and deepwater wind alone . . . .'"<sup>48</sup> This document, however, is explicitly an assessment of "the offshore wind *resource potential*" in

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<sup>47</sup> See ER at 3.1-1 (showing Davis-Besse is rated at 908 MWE); *id.* at 7.2-1.

<sup>48</sup> *Id.* at 28 (quoting Petition at 52) (citing Marc Schwartz et al., *Assessment of Offshore Wind Energy Resources for the United States* at 3 tbl. 1 (June 2010) (Petition Exhibit 33) (emphasis added)).

the United States.<sup>49</sup> Similarly, Petitioners' Exhibit 42, also cited by the Board, evaluates the "theoretical capacity" of offshore wind resources.<sup>50</sup> Neither of these Exhibits even mentions baseload power as a possible use of wind energy resources, particularly in the Davis-Besse ROI, which is limited to Ohio and the wholesale power market there.<sup>51</sup> These exhibits simply demonstrate that the wind blows, which FirstEnergy does not dispute.<sup>52</sup>

Next, the Board cites to Petitioners' Exhibit 20,<sup>53</sup> a single-page NREL paper titled "Creating Baseload Wind Power Systems Using Advanced Compressed Air Energy Storage Concepts" (Oct. 3, 2006) (emphasis added). This paper demonstrates that using CAES to provide baseload wind power is only a concept: "additional work will be required to examine the feasibility of advanced wind/CAES concepts described here." This also is clear from the text quoted by the Board: "Wind energy systems that combine wind-turbine generation with energy storage *may* overcome these obstacles [*i.e.*, the intermittent nature of wind and the remote location of high-value wind resources] and provide a source of power that is functionally equivalent to a conventional baseload electric power plant."<sup>54</sup>

The Board then cites to a FirstEnergy press release (Petitioners' Exhibit 54) about FirstEnergy's Norton Energy Storage Project.<sup>55</sup> Unlike Petitioner's allegations that wind farms and solar panels can be sited almost anywhere in Ohio and Pennsylvania, the only CAES facility

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<sup>49</sup> Petition Exhibit 33 at 1 (emphasis added).

<sup>50</sup> See LBP-11-13, slip op. at 30 (quoting Jacques Beaudry-Losique, et al., *Creating an Offshore Wind Industry in the United States: A Strategic Work Plan for the United States Department of Energy, Fiscal Years 2011-2015* at 3 (Sept. 2, 2010) (predecisional draft) (Petition Exhibit 42) (emphasis added).

<sup>51</sup> Tr. at 83 (Polonsky) (discussing first page of Section 7.2 of the ER).

<sup>52</sup> See ER at 7.2-9 ("Thus, wind power in coastal Ohio along Lake Erie and along ridgelines in Pennsylvania and West Virginia is a feasible alternative to Davis-Besse license renewal *in theory*. However, wind power by itself is not suitable for large base-load capacity.") (emphasis added).

<sup>53</sup> See LBP-11-13, slip op. at 28.

<sup>54</sup> LBP-11-13, slip op. at 28 (quoting Petition Exhibit 20) (emphasis added).

<sup>55</sup> See *id.* at 29. Petition Exhibit 21, discussed by the Board on pages 28-29 is addressed in Section IV.A.1.c, below.

contemplated by Petitioners as part of the combined energy alternative is the Norton Energy Project located in Norton, Ohio.<sup>56</sup> There are two reasons why this Project does not support an admissible energy alternatives contention. First, this CAES project would store energy at night for use during the day during peak demand.<sup>57</sup> This does not meet the definition of baseload power, which is energy intended to continuously produce electricity at or near full capacity, with high availability.<sup>58</sup>

Second, LBP-11-13 is silent to the fact that the Norton Project in its initial phase would only result in 268 MWe of capacity, far less than the 908 MWe from Davis-Besse.<sup>59</sup> Indeed, there are only two existing commercial-scale compressed air energy storage facilities in the world.<sup>60</sup> One is a *110 MW* plant in Alabama that began operation in 1991, which “is used to store off-peak power, generate peak power and provide spinning reserve.”<sup>61</sup> The other is a *290 MW* plant in Germany that began operation in 1978, which “is used to provide peak shaving, spinning reserves and [Volt-Amps-Reactive] support.”<sup>62</sup> These facilities do not provide *baseload* power, and they are considerably smaller than Davis-Besse’s 908 MWe output.

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<sup>56</sup> Tr. at 92 (Lodge) (“Exhibit 54 . . . it’s a press release dated November 23rd, 2009 from FirstEnergy. It announces the acquisition of the Norton Energy Storage Project, the CAES that we’re-talking about.”). Indeed, because CAES is a geologic-specific energy storage mechanism that requires an existing subsurface caven, CAES facilities cannot be sited anywhere. Tr. at 85 (Polonsky).

<sup>57</sup> FENOC Answer at 40; Press Release, FirstEnergy Generation Corp., FirstEnergy Acquires Rights to Norton Energy Storage Project (Nov. 23, 2009) (“Petition Exhibit 54”).

<sup>58</sup> See FENOC Answer at 35 & n. 148, citing *Envtl. Law & Policy Ctr. v. NRC*, 470 F.3d 676, 679 (2006) (emphasis added); see also *Consumers Power Co.* (Midland Plant, Units 1 and 2), ALAB-452, 6 NRC 892, 951 n.272 (1977) (“‘Baseload’ units are designed to run continuously (except for maintenance) to meet that constant portion of the utility’s load. Intermediate and peaking units are utilized to meet the intermittent demand, with intermediate units generally being used to meet demand that is continuous for 12 or more hours and peaking units being used to meet demand that is less than 12 hours in duration.” (citations omitted)).

<sup>59</sup> Petition at 29; Petition Exhibit 54.

<sup>60</sup> Petition at 29.

<sup>61</sup> See FENOC Answer at 41 (citing Boise State Univ., Sustainability Research, *Overview of Compressed Air Energy Storage*, at 2 (Dec. 2007), available at <http://coen.boisestate.edu/WindEnergy/resources/ER-07-001.pdf>).

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

Likewise, Petitioners' Exhibit 48, a *Scientific American* article that evaluates the potential for solar power to end U.S. dependence on foreign oil by 2050, does not show that CAES can technically achieve baseload wind or solar generation, now or in the immediate future.<sup>63</sup> As is clear from the title, this article discusses the potential for alternative energy to meet U.S. energy needs in 2050, well after the term of the proposed Davis-Besse renewed license would *expire*.

The Board also erred in dismissing FirstEnergy's arguments on these points as improper attacks on the merits.<sup>64</sup> Arguments under Section 2.309(f)(1) evaluating whether Petitioners have met their burden to proffer an adequately-supported contention that raises a genuine dispute do not go to the merits. The regulations were toughened in 1989 because—as in this case—licensing boards had admitted numerous contentions that appeared to be based on “little more than speculation,”<sup>65</sup> or the mere “copying [of] contentions from another proceeding involving another reactor.”<sup>66</sup> Section 2.309(f)(1)(v), in particular, requires a petitioner “to provide the analyses and expert opinion showing *why* its bases support its contention,”<sup>67</sup> and to “provide documents or other factual information or expert opinion that set forth the necessary *technical analysis* to show *why* the proffered bases support its contention.”<sup>68</sup> Under this standard, the Board is expected to examine documents to confirm that they support a proposed contention.<sup>69</sup>

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<sup>63</sup> See LBP-11-13, slip op. at 26-27; Ken Zweibel et al., *By 2050 Solar Power Could End U.S. Dependence on Foreign Oil and Slash Greenhouse Gas Emissions*, *Scientific American*, Jan. 1, 2008, at 64 (Petition Exhibit 48).

<sup>64</sup> See, e.g., LBP-11-13, slip op. at 32-33.

<sup>65</sup> *Millstone*, CLI-01-24, 54 NRC at 358 (citing *Oconee*, CLI-99-11, 49 NRC at 334).

<sup>66</sup> *Turkey Point*, CLI-01-17, 54 NRC at 19.

<sup>67</sup> *Ga. Inst. of Tech.* (Ga. Tech Research Reactor, Atlanta, Ga.), LBP-95- 6, 41 NRC 281, 305, *vacated in part and remanded on other grounds*, CLI-95-10, 42 NRC 1, *and aff'd in part*, CLI-95-12, 42 NRC 111 (1995) (emphasis added).

<sup>68</sup> *Private Fuel Storage, LLC* (Indep. Spent Fuel Storage Installation), LBP-98-7, 47 NRC 142, 181, *aff'd*, CLI-98-13, 48 NRC 26 (1998) (emphasis added).

<sup>69</sup> See *Vt. Yankee Nuclear Power Corp.* (Vt. Yankee Nuclear Power Station), ALAB-919, 30 NRC 29, 48 (1989), *vacated in part on other grounds and remanded*, CLI-90-4, 31 NRC 333 (1990); see also *Yankee Atomic Electric Co.* (Yankee Nuclear Power Station), LBP-96-2, 43 NRC 61, 90 (1996) (supporting material provided

The Board's decision, however, appears to take the position that even the most rudimentary scrutiny of the purported basis and support for Petitioners' allegations goes to the merits.<sup>70</sup> The unworkable standard applied by the Board effectively precludes an applicant from challenging either the relevance of a petitioner's supporting documents or the petitioner's substantive characterization of those documents. Such a standard sanctions mere notice pleading and clearly violates both the letter and intent of 10 C.F.R. § 2.309(f)(1).

*c. Petitioners' Documents Clearly Show that Interconnected Wind Farms Are Remote and Speculative*

Although the Commission has concluded that wind and solar, "by definition" are not always available,<sup>71</sup> the Board's decision could be read to conclude that interconnected wind farms always generate some energy, thus supporting an admissible contention.<sup>72</sup> However, it would be reversible error to admit an allegation that large-scale interconnected wind farms are currently, or could be by April 2017, a viable option to overcome the existing obstacles to baseload generation from wind power.<sup>73</sup> Again, Petitioners' exhibits do not support this proposition. Rather, they clearly demonstrate that wind farms in the Davis-Besse ROI that could deliver baseload power are remote and speculative.

The only document cited by the Board on this point is Petitioners' Exhibit 21, a 2007 Stanford University paper.<sup>74</sup> The Board quotes the study as showing that interconnected wind

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by a petitioner, including those portions thereof not relied upon, is subject to licensing board scrutiny, "both for what it does and does not show").

<sup>70</sup> See LBP-11-13, slip op. at 32-33.

<sup>71</sup> *Exelon Generation Co., LLC* (Early Site Permit for Clinton ESP Site), CLI-05-29, 62 NRC 801, 810-11 (2005) ("Intervenors' various claims fail to come to grips with fundamental points that can't be disputed: solar and wind power, by definition, are not always available . . .").

<sup>72</sup> See Section IV.A., above.

<sup>73</sup> See LBP-11-13, slip op. at 28-29, 34.

<sup>74</sup> See *id.* at 28-29 (citing Cristina L. Archer & Mark Z. Jacobson, *Supplying Baseload Power and Reducing Transmission Requirements by Interconnecting Wind Farms*, 46 J. of Applied Meteorology and Climatology 1701 (Feb. 2007) ("Petition Exhibit 21")).

power is a “solution to improve wind power reliability.”<sup>75</sup> But the very next sentence (omitted by the Board) describes this “solution” as nothing more than an “idea.” Exhibit 21 identifies no location where this “idea” has been implemented, even as a demonstration project. The conclusion of the study simply “implies that *if* interconnected wind is used *on a large scale, a third or more* of its energy can be used for reliable electric power.”<sup>76</sup> This does not provide adequate support for a contention alleging that it would be commercially viable to implement such wind farms by 2017, or that it could be implemented in the relevant ROI.

Thus, Petitioners’ allegations related to interconnected wind farms are speculation, unsupported by facts or expert opinion, fail to raise a genuine dispute on a material issue of law or fact, and inadmissible under 10 C.F.R. § 2.309(f)(1)(v) and (vi). The Board’s apparent decision to admit Petitioners’ contention is clearly in error and should be reversed.

## **2. The Board Erred in Finding that Petitioners Raised a Genuine Dispute with FirstEnergy’s Environmental Report**

The Board erred in reframing the combined contention from one of omission to one challenging the adequacy of the analysis in the ER. FirstEnergy and the NRC Staff argued that Contention 3 was a contention of omission because it unambiguously alleged that a combination of renewable energy alternatives “should be considered”: “Commercial Wind And Solar Photovoltaic Baseload Power Should Be Considered Under NEPA as a Single, Combined-Source Alternative.”<sup>77</sup> During oral argument, the Petitioners clarified that this alternative required CAES,<sup>78</sup> and CAES was added to the text of the contention when it was admitted.

FirstEnergy and the NRC Staff also argued that Contention 3 was inadmissible because

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<sup>75</sup> *Id.* at 28 (quoting Petition Exhibit 21 at 1702).

<sup>76</sup> *See* Petition Exhibit 21 at 1716 (emphasis added).

<sup>77</sup> Petition at 93; FENOC Answer at 64-65; NRC Staff Answer at 40.

<sup>78</sup> Tr. at 56-57 (Lodge) (“we articulated the compressed air storage as sort of a systemic means of maximizing what could be attained from wind and/or photovoltaic”); *see also id.* at 77 & 104 (solar with CAES).

the allegedly missing analysis was in the ER. Although not required by the NRC’s Generic Environmental Impact Statement, NUREG-1437 (May 1996) (“GEIS”), because it is not a single, discrete electric generation source,<sup>79</sup> ER Section 7.2.2.2 nevertheless includes an evaluation of a combination of alternatives as an alternative to Davis-Besse license renewal.<sup>80</sup> It considers a combination of renewable sources, such as wind and solar power, with natural gas generation to ensure baseload generation is provided. The ER concludes that such a combination of alternatives is not reasonable due to the fluctuations of wind and solar resources, the environmental impacts of the large amounts of land required for siting those resources, which would likely exceed the impacts of license renewal for Davis-Besse, and because of the air quality impacts of the natural gas plant that would be required for baseload power.<sup>81</sup> The Board’s decision fails to mention the undisputed fact that CAES requires fossil fuel to operate.<sup>82</sup> Thus, Petitioner’s proposed alternative is effectively *the same* alternative set forth in the ER: a combination of renewable energy, with natural gas generation required for baseload power.<sup>83</sup>

However, Petitioners never once cite the ER’s analysis, either in their Petition or their Reply. To raise a genuine dispute a petitioner must “read the pertinent portions of the license application . . . state the applicant’s position and the petitioner’s opposing view,” and explain why it disagrees with the applicant.<sup>84</sup> The Commission recently reiterated this principle in the *Summer* COL proceeding, in upholding a Board’s denial of a combination of alternatives

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<sup>79</sup> GEIS § 8.1 (emphasis added). The staff’s guidance “is entitled to special weight.” *Private Fuel Storage, L.L.C.* (Indep. Spent Fuel Storage Installation), CLI-01-22, 54 NRC 255, 264 (2001).

<sup>80</sup> See FENOC Answer at 67 (citing ER at 7.2-12 to 7.2-13).

<sup>81</sup> See *id.* at 7.2-13 (“FENOC believes that various combinations of renewable and advanced energy resources with generation equivalent to that of Davis-Besse are not reasonable alternatives . . .”).

<sup>82</sup> See Tr. at 77 (Lodge); see also Pet. Exh. 11, Arjun Makhijani, *Carbon-Free and Nuclear-Free: A Roadmap for U.S. Energy Policy*, at 69 (2007) (explaining that air in the CAES facility must be “heated using natural gas”).

<sup>83</sup> See ER at 7.2-12.

<sup>84</sup> Rules of Practice for Domestic Licensing Proceedings – Procedural Changes in the Hearing Process, 54 Fed. Reg. 33,168, 33,170 (Aug. 11, 1989); see also *Millstone*, CLI-01-24, 54 NRC at 358.

contention. In that case, the ER included an evaluation of a combination of alternatives, including wind and solar.<sup>85</sup> In doing so, the Commission stated that “general assertions, without some effort to show why the assertions undercut findings or analyses in the ER, fail to satisfy the requirements of Section 2.309(f)(1)(vi).”<sup>86</sup>

But in reframing the contention here, the Board impermissibly converted this contention of omission—that “Commercial Wind And Solar Photovoltaic Baseload Power *Should Be Considered*,” into one challenging the adequacy of the ER. The Board’s rationale is in a single sentence: “[I]t appears to this Board that Joint Petitioners’ contention posits that FirstEnergy should have identified a combination of wind and solar power as a *reasonable alternative* and analyzed it as such.”<sup>87</sup> This is a clear error and abuse of discretion because it negates the unambiguous text of the submitted contention.

In addition to this threshold error, the Board does not explain where Petitioners proffer support for the claim that their proposed combination of alternatives would be commercially viable or environmentally preferable by 2017. Rather, the Board dismisses FirstEnergy’s (and the NRC Staff’s) arguments on this point as again “conflating the merits of the contention with the adequacy of its pleading.”<sup>88</sup> But requiring sufficient information to show a genuine dispute with the application under 10 C.F.R. § 2.309(f)(1)(vi) does not go to the merits of a contention. Nor does requiring adequate support for a petitioner’s allegation under Section 2.309(f)(1)(v). The Board clearly erred in dismissing FirstEnergy’s arguments on this point.

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<sup>85</sup> *S.C. Elec. & Gas Co.* (Virgil C. Summer Nuclear Station, Units 2 & 3), LBP-09-02, 69 NRC 87, 110-12 (2009), *remanded on other grounds*, CLI-10-01, slip op. (Jan. 7, 2010); *see also S. Tex. Project Nuclear Operating Co.* (S. Tex. Project Units, 3 & 4), LBP-09-21, 70 NRC 581, 622-27 (2009) (rejecting a combination of alternatives contention because the petitioners overlooked the applicant’s alternatives evaluation in the ER).

<sup>86</sup> *Summer*, CLI-10-01, slip op. at 28.

<sup>87</sup> LBP-11-13, slip op. at 32 (emphasis added).

<sup>88</sup> *Id.*, slip op. at 32; *see also id.*, slip op. at 33.

The Commission therefore should reverse the admission of this contention on any number of grounds.

**3. The Reformulated Contention Applies the Wrong Legal Standard for Evaluation of Alternatives to License Renewal**

The admitted contention is in error as it states that FENOC's ER fails to evaluate an alternative "to make the requested license renewal action *unnecessary*."<sup>89</sup> The Petitioners, and then the Board, erred by using the wrong standard for evaluating alternatives to license renewal.

Under Section 51.95(c)(4), the alternatives analysis mandates that "the NRC staff, *adjudicatory officers*, and Commission shall determine whether or not the adverse environmental impacts of license renewal are so great that preserving the option of license renewal for energy planning decisionmakers *would be unreasonable*."<sup>90</sup> The question, therefore, is not whether an alternative exists that would render license renewal "unnecessary." The agency must instead find that preserving license renewal as an option would be "unreasonable."

Thus, even if Petitioners are able to show that license renewal is unnecessary, this showing would not entitle Petitioners to any relief,<sup>91</sup> and would not "make a difference in the outcome of the licensing proceeding."<sup>92</sup> As a result, the Board clearly erred as a matter of law when it admitted a contention that is not material to the findings that the NRC must make, contrary to 10 C.F.R. § 2.309(f)(1)(iv). The Commission should therefore reverse this decision.

**B. The Board Erred in Admitting Contention 4 Regarding SAMAs**

Contention 4 seeks to challenge the adequacy of FirstEnergy's SAMA analysis for Davis-

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<sup>89</sup> *Id.*, slip op. at 34 (emphasis added).

<sup>90</sup> See also FENOC Answer at 31-32 (citing Final Rule, Environmental Review for Renewal of Operating Licenses, 61 Fed. Reg. 28,467, 28,471-73 (June 5, 1996)) (emphasis added).

<sup>91</sup> See *Duke Energy Corp.* (McGuire Nuclear Station, Units 1 & 2; Catawba Nuclear Station, Units 1 & 2), CLI-02-26, 56 NRC 358, 363 n.10 (2002) (stating that an issue is material "only if it would entitle petitioner to relief").

<sup>92</sup> *Oconee*, CLI-99-11, 49 NRC at 333-334 (1999) (quoting Rules of Practice for Domestic Licensing Proceedings – Procedural Changes in the Hearing Process, 54 Fed. Reg. at 33,172).

Besse. The purpose of a SAMA analysis is to identify potential changes to a nuclear power plant, or its operations, that (1) could further reduce the already very low risk of severe reactor accident scenarios postulated in the NRC's GEIS, and (2) may be cost-beneficial to implement.<sup>93</sup> Consistent with NRC-endorsed guidance in NEI 05-01, Revision A, FirstEnergy used version 2 of the MELCOR Accident Consequence Code System ("MACCS2") computer program to perform its SAMA analysis.<sup>94</sup> Site-specific inputs to MACCS2 include the source terms, and meteorological, projected population, emergency planning, and economic data.<sup>95</sup>

As admitted by the Board, Contention 4 challenges aspects of FirstEnergy's MACCS2 analysis; *viz.*, certain inputs to, and methodologies used by, the MACCS2 code. Specifically, the admitted contention raises issues related to the source terms used by FirstEnergy as inputs to the MACCS2 code (Basis 1); the adequacy of the Gaussian plume segment model (ATMOS) used by MACCS2 and associated meteorological input data (Basis 2); and (3) the manner in which the MACCS2 code estimates offsite decontamination costs (Basis 3).<sup>96</sup>

The Board plainly erred in admitting Contention 4. The Board misapplied the governing law in this context; *i.e.*, the contention admissibility criteria in 10 C.F.R. § 2.309(f)(1)(iv) and (v), as amplified by binding Commission precedent. The Board also abused its discretion as a fact-finder in that it made certain impermissible technical or factual inferences on behalf of Petitioners. Accordingly, the Commission should reverse admission of Contention 4.

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<sup>93</sup> See *Pilgrim*, CLI-10-11, slip op. at 3.

<sup>94</sup> See ER at 4.20-2; *id.* at E-33 to E-42; NEI 05-01, *Severe Accident Mitigation Alternatives (SAMA) Analysis, Guidance Document*, at 13 (Rev. A, Nov. 2005), available at ADAMS Accession No. ML060530203 ("NEI 05-01"). MACCS2 is divided into three primary modules (ATMOS, EARLY, and CHRONC) and supports plume dispersion and transport modeling on a 50-mile radial-polar grid. See NUREG/CR-6613, Vol. 1, SAND97-0594 Code Manual for MACCS2, User's Guide at 2-1, 2-3 (May 1998) ("MACCS2 User's Guide"), available at ADAMS Accession No. ML110030976.

<sup>95</sup> See MACCS2 User's Guide at 2-1 to 2-3.

<sup>96</sup> See LBP-11-13, slip op. at 50, 62.

## 1. The Board Clearly Erred By Not Applying the Correct Materiality Standard

First, the Board fundamentally misapplied the materiality criterion in Section 2.309(f)(1)(iv), as applied by the Commission in the unique context of SAMA contentions. SAMA analysis is a NEPA-derived requirement and governed by NEPA's rule of reason.<sup>97</sup> Any assessment of the materiality of a proffered SAMA contention, therefore, must be informed by controlling NEPA principles, as Commission precedent makes clear. As shown below, the Board's ruling was not so informed.

The Commission set the standard for evaluating the materiality of challenges to an applicant's SAMA analysis.<sup>98</sup> In *McGuire/Catawba*, the Commission stated that "whether a SAMA alternative is worthy of more detailed analysis in an [ER] or SEIS hinges upon *whether it may be cost-beneficial to implement*," and that "[w]ithout any notion of cost, it is difficult to assess whether a SAMA may be cost-beneficial and thus warrant serious consideration."<sup>99</sup>

More recently, the Commission specifically reaffirmed and clarified this standard in the *Pilgrim* license renewal proceeding. In CLI-09-11, the Commission indicated that the key consideration is whether the contention purports to show that an additional SAMA should have been identified as potentially cost-beneficial.<sup>100</sup> In CLI-10-11, it further noted that a petitioner must provide adequate support showing that it is "genuinely plausible" that inclusion of an

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<sup>97</sup> *Duke Energy Corp.* (McGuire Nuclear Station, Units 1 & 2; Catawba Nuclear Station, Units 1 & 2), CLI-03-17, 58 NRC 419, 431 (2003) (quoting *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 352 (1989)).

<sup>98</sup> See FENOC Answer at 76-78 (discussing Commission case law). FirstEnergy has not "exaggerated" the materiality standard or argued that it necessarily "would require an expert affidavit." LBP-11-13, slip op. at 53. That said, while petitioners "need not be technical experts, they must knowledgeably provide some threshold-level factual basis for their contention." *Turkey Point*, CLI-01-17, 54 NRC at 19. Indeed, it is "surely legitimate . . . to screen out contentions of doubtful worth and to avoid starting down the path toward a hearing at the behest of petitioners who themselves have no particular expertise—or expert assistance—and no particularized grievance." *Oconee*, CLI-99-11, 49 NRC at 342.

<sup>99</sup> *Duke Energy Corp.* (McGuire Nuclear Station, Units 1 & 2; Catawba Nuclear Station, Units 1 & 2), CLI-02-17, 56 NRC 1, 12 (2002) (quoting *Vt. Yankee*, 435 U.S. at 551) (rejecting proposed SAMA contention for failure to provide "any notion of cost") (emphasis added).

<sup>100</sup> *Entergy Nuclear Generation Co.* (Pilgrim Nuclear Power Station), CLI-09-11, 69 N.R.C. 529, 532 (2009).

additional factor or use of other assumptions or models may change the cost-benefit conclusions for the SAMA candidates evaluated.<sup>101</sup> Finally, in CLI-10-22, the Commission explained that this showing requires a “reasoned evaluation” of whether and to what extent the petitioner’s allegations “*credibly* could or would alter the [applicant’s] SAMA analysis conclusions on which SAMAs are cost-beneficial to implement.”<sup>102</sup>

Instead of dutifully applying the Commission’s “genuinely plausible” standard, the Board erred by simply *presuming* that the asserted challenges to FirstEnergy’s MACCS2 analysis “might” affect FirstEnergy’s cost-benefit conclusions, without requiring the Petitioners to advance any notion of cost or the requisite reasoned evaluation.<sup>103</sup> The fact that alternative inputs or methodologies may exist is not, by itself, sufficient to show that an applicant’s SAMA analysis—which is governed by NEPA’s rule of reason—is deficient in some material respect.<sup>104</sup> Simply demanding or presenting “an alternative analysis is, without more, insufficient to support a contention alleging that the original analysis failed to meet applicable requirements.”<sup>105</sup> The Commission has held that a petitioner—not the Board—must identify some “direct connection” between the factual information on which it relies and the SAMA analysis cost-benefit results.<sup>106</sup>

Underscoring the Board’s error is Petitioners’ own admission that they failed to meet this

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<sup>101</sup> *Pilgrim*, CLI-10-11, slip op. at 39.

<sup>102</sup> *Entergy Nuclear Generation Co. (Pilgrim Nuclear Power Station)* CLI-10-22, slip op. at 10 (Aug. 27, 2010) (emphasis added).

<sup>103</sup> See, e.g., LBP-11-13, slip op. at 56 (stating that a lake breeze “might be a factor” near Davis-Besse”); *id.* at 57 (stating that the behavior of plumes over water “might be a factor near Davis-Besse”); *id.* at 58 (stating that a lake breeze “might” cause spatially varying air circulation in the area surrounding Davis-Besse); *id.* at 62 (stating that FirstEnergy’s source term calculation and use of the Gaussian plume model, together with underestimated urban area clean-up costs, “might have masked a candidate”).

<sup>104</sup> See *Duke Energy Corp. (McGuire Nuclear Station, Units 1 & 2; Catawba Nuclear Station, Units 1 & 2)*, LBP-03-17, 58 NRC 221, 238, *aff’d on other grounds*, CLI-03-17, 58 NRC 419 (2003) (rejecting as inadmissible a subpart of a petitioner’s SAMA contention alleging that the applicant relied upon “unreasonable and unsupported” assumptions in calculating accident consequences, and that the applicant had “understate[d]” the “consequences” of accidents).

<sup>105</sup> *Indian Point*, LBP-08-13, 68 NRC at 187.

<sup>106</sup> *Pilgrim*, CLI-10-11, slip op. at 31 n.121.

materiality test: “Petitioners do not offer examples of how this cost benefit equation might have been skewed in favor of no mitigation.”<sup>107</sup> Petitioners stated only that the alleged “dramatic minimization” of costs by FirstEnergy “are such that it should be obvious that many SAMAs would be cost effective if the described defects in the analysis were addressed.”<sup>108</sup>

In the SAMA context, changes in the applicant’s cost-benefit conclusions must be genuinely plausible—not merely conceivable or conjectural. Petitioners here made no such showing. The Board erred by not requiring as much, and thereby did not correctly apply the materiality standard imposed by Section 2.309(f)(1)(iv) and Commission case law.

## **2. The Board Clearly Erred in Finding That Petitioners Furnished Adequate Factual Support for the Admission of Their Contention**

As stated above, a petitioner must provide the “reasoned evaluation” to support its SAMA contention,<sup>109</sup> and to identify a “direct connection” between the factual information on which it relies and the cost-benefit results.<sup>110</sup> As shown below for each of the three subparts of Contention 4, the Board plainly erred and/or abused its discretion, in finding that Petitioners fully complied with requirements of Section 2.309(f)(1)(v) and controlling Commission precedent.

### *a. Petitioners’ Source Term Argument (Basis 1) Lacks Adequate Support*

As admitted, this part of the contention alleges that the SAMA analysis is deficient because it uses “a source term based on radionuclide release fractions which are smaller for key radionuclides than the release fractions specified in NRC guidance.”<sup>111</sup> The core of Petitioners’ argument is that “[t]he source term used [by FirstEnergy] results in lower consequences than

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<sup>107</sup> Petition at 150.

<sup>108</sup> *Id.*

<sup>109</sup> *Pilgrim*, CLI-10-22, slip op. at 10.

<sup>110</sup> *Pilgrim*, CLI-10-11, slip op. at 31 n.121.

<sup>111</sup> LBP-11-13, slip op. at 50, 62. *See also* Petition at 108.

would be obtained from NUREG-1465 release fractions and release durations,”<sup>112</sup> and that FirstEnergy should not have used source terms obtained using the Modular Accident Analysis Program (“MAAP”) computer code in its SAMA analysis.<sup>113</sup> Noting that a Brookhaven National Laboratory study cited by Petitioners shows that source term selection can change dose results by a factor of 3 to 4,<sup>114</sup> the Board admitted this aspect of the contention, stating that “source term selection can make a large difference in dose results,” such that “a change in the SAMA candidates’ cost-benefit conclusions is genuinely plausible.”<sup>115</sup>

The Board’s ruling is clearly erroneous. As pled by Petitioners, the contention asserts that FirstEnergy should have used generic “release fractions and release durations” from *NUREG-1465* in place of the *plant-specific* values obtained using the MAAP code.<sup>116</sup> However, nowhere in their contention do Petitioners even attempt to explain why the use of data from NUREG-1465 is necessary or appropriate in this context, or, conversely, why FirstEnergy’s use of plant-specific data and the MAAP code is unreasonable for purposes of its NEPA-related SAMA analysis. Nor, for that matter, do Petitioners explain, through credible technical analysis, why use of the NUREG-1465 source terms would materially affect the results of FirstEnergy SAMA analysis by resulting in the identification of cost-beneficial SAMAs.<sup>117</sup>

As is evident from NRC-endorsed guidance (NEI 05-01) and the SAMA analysis itself, the severe accident source terms used in a SAMA analysis depend on plant design features and

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<sup>112</sup> Petition at 112 (citing NUREG-1465, *Accident Source Terms for Light-Water Nuclear Power Plants* (Feb. 1995)). “Source term” refers to a fission product release from the reactor core. *Dominion Nuclear Conn., Inc.* (Millstone Nuclear Power Station, Unit 2), CLI-03-14, 58 NRC 207, 209 (2003). It results from the amount and mix of the radionuclides from the fuel, physical and chemical properties, and release timing. *Id.*

<sup>113</sup> Petition at 114.

<sup>114</sup> See LBP-11-13, slip op. at 51, 54 (citing John R. Lehner et al., Brookhaven National Laboratory, *Benefit Cost Analysis of Enhancing Combustible Gas Control Availability at Ice Condenser and Mark III Containment Plants* at 17 (Dec. 2002) (“Brookhaven Study”), available at ADAMS Accession No. ML031700011).

<sup>115</sup> *Id.* at 54.

<sup>116</sup> Petition at 109. See also Petition at 112.

<sup>117</sup> See *Pilgrim*, CLI-10-22, slip op. at 10.

operational practices and, hence, are plant-specific.<sup>118</sup> Therefore, FirstEnergy, like many prior applicants, appropriately utilized MAAP to develop plant-specific release category information for Davis-Besse.<sup>119</sup> Petitioners did not provide any technical justification for departing from the use of plant-specific data and the MAAP code to estimate a plant-specific source term for the Davis-Besse SAMA analysis.<sup>120</sup> The Board’s general observation that “source term selection *can* make a large difference in dose results” is irrelevant as it does not remedy Petitioners’ failure to explain why FirstEnergy’s use of MAAP-derived, plant-specific source terms (instead of generic NUREG-1465 source terms) amounts to a potential violation of any NRC requirement so as to warrant a hearing. As the *Indian Point* Board concluded in rejecting a nearly-identical challenge to an applicant’s use of the MAAP code (one which was supported by a site-specific expert report, in contrast to Petitioners’ contention here), demanding or presenting “an alternative analysis is, without more, insufficient to support the admission of a contention alleging that the original analysis failed to meet applicable requirements.”<sup>121</sup>

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<sup>118</sup> See NEI 05-01 at 2, 14 (discussing use of plant-specific PRA models as input to the MACCS2 analysis and use of plant-specific core inventory values); ER, att. E at E-17, E-40 (indicating use of plant-specific PRA models and use of ORIGEN2 code to calculate the plant-specific core inventory for use as input to the MAAP code).

<sup>119</sup> See ER at 4.20-1; *id.*, att. E at E-17, E-19, E-37 to E-38.

<sup>120</sup> For the same reason, Petitioners’ references to the 2002 Brookhaven Study and a draft version of NUREG-1150 likewise do not provide the requisite factual or technical support. See Petition at 113-14 (citing Brookhaven Study and Office of Nuclear Regulatory Research, Draft for Comment, *Reactor Risk Reference Document*, NUREG-1150, Vol. 1, at 5-14 (Feb. 1987)). The portion of the Brookhaven Study cited by Petitioners relates to the Catawba and McGuire ice condenser plants, but Petitioners make no attempt to explain why the containment characteristics of those plants are relevant to a large dry containment such as that at Davis-Besse. Petition at 113 (citing Brookhaven Study at 17). The NUREG-1150 study, completed over 20 years ago, summarized an assessment of the risks from severe accidents at five U.S. commercial nuclear power plants. Davis-Besse was *not* one of those plants for which plant-specific source terms were estimated.

<sup>121</sup> *Indian Point*, LBP-08-13, 68 NRC at 187. It appears that the *Davis-Besse* Board believes that the *Indian Point* Board (as well as FirstEnergy and the Staff in this case) improperly relied on merits-based technical arguments. See LBP-11-13, slip op. at 51-52. This is not the case. As FirstEnergy noted in its Answer, the *Indian Point* Board concluded that NUREG-1465, by its plain terms, is inapplicable to the containment release scenarios postulated in a SAMA analysis. FENOC Answer at 96 (quoting *Indian Point*, LBP-08-13, 68 NRC at 187). NUREG-1465 indicates that it does not provide numerical estimates of the containment source terms *after* the effects of in-containment fission product removal mechanisms (*e.g.*, containment sprays, aerosol deposition), and directs the reader to use appropriate methodologies in crediting fission product removal or reduction within containment (as is done by the MAAP code). See NUREG-1465 at 4-5, 17-18.

b. *Petitioners' Criticisms of the MACCS2 Gaussian Plume Model and FirstEnergy's Meteorological Data (Basis 2) Lack Adequate Support*

As admitted by the Board, this portion of Contention 4 admits for litigation four interrelated issues relative to FirstEnergy's SAMA analysis: (1) the effect of spatially-varying winds for a given time period; (2) the effect of postulated Great Lakes "sea breeze" circulations which allegedly may alter air flow patterns; (3) the alleged failure to account for "hot spots" of radioactivity caused by plumes blowing offshore over Lake Erie; and (4) FirstEnergy's use of meteorological data inputs from a single site (*i.e.*, the Davis-Besse meteorological tower).<sup>122</sup>

The Board abused its discretion in admitting this part of the contention, as evidenced by its statement that "it is *self-evident* that a single immobile meteorological site would be unable to measure such spatially dependent [air] circulation."<sup>123</sup> In declaring the alleged inadequacy of a single meteorological site to be "self-evident," the Board made an impermissible technical inference on behalf of Petitioners. In challenging the meteorological "input data" used in the MACCS2 analysis (which FirstEnergy obtained from the site meteorological tower), Petitioners stated only that "such scant measurement data, from one meteorological station, will definitely not suffice to define the Great Lakes 'sea breeze' or capture variability."<sup>124</sup> This statement—and the Board's parallel inference—is conclusory and finds no support in the record. Petitioners provided no factual or expert support for their claim that annual meteorological data obtained from the site meteorological tower would not account for complex air circulation, including spatially-varying winds or sea breeze circulations. The Board may not cure Petitioners' failure

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<sup>122</sup> LBP-11-13, slip op. at 50, 54-59, 64-65.

<sup>123</sup> *Id.* at 58.

<sup>124</sup> Petition at 125.

to supply adequate supporting information through its own unwarranted technical inferences.<sup>125</sup>

Second, FirstEnergy respectfully submits that the Board committed clear error in concluding that Petitioners provided adequate support relative to the existence of certain meteorological phenomena (spatially-varying winds, sea breeze circulations, and plume-related “hot spots”) “in the area surrounding Davis-Besse.”<sup>126</sup> As noted above, SAMA analysis using MACCS2, which the Commission recently described as “the most current, established code for NRC SAMA analysis,”<sup>127</sup> is a plant-specific analysis that makes use of *site-specific* meteorological data. However, none of the references cited by the Board as support for the contention bears any clear and direct nexus to the Davis-Besse site.<sup>128</sup>

As FirstEnergy noted in its Answer, the Beyea Report discusses a different reactor (Pilgrim) in a different geographic setting (the New England coastline). Notably, the Commission itself has questioned the materiality of the particular passage in the Beyea Report cited by Petitioners, noting that “Mr. Beyea’s discussion appears more in the manner of a suggest[ion]” for further study to see *if* reduction of turbulence could lead to radiological impacts

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<sup>125</sup> See *Duke Cogema Stone & Webster* (Savannah River Mixed Oxide Fuel Fabrication Facility), LBP-01-35, 54 NRC 403, 422 (2001) (citing *Ariz. Pub. Serv. Co.* (Palo Verde Nuclear Generating Station, Units 1, 2 & 3), CLI-91-12, 34 NRC 149, 155-56 (1991)) (“A licensing board is not free to supply missing information or draw factual inferences on the petitioner’s behalf.”).

<sup>126</sup> LBP-11-13, slip op. at 58.

<sup>127</sup> *Pilgrim*, CLI-10-22, slip op. at 9.

<sup>128</sup> The Board admitted this portion of Contention 4 based on Petitioners’ references to a 2006 Pilgrim-related report authored by Dr. Jan Beyea, another study cited in Dr. Beyea’s report concerning airborne transport of airborne pollutants over water in New England cited in the Dr. Beyea’s report, and two weather-related websites. See LBP-11-13, slip op. at 56-58 (citing Jan Beyea, *Report to the Massachusetts Attorney General on the Potential Consequences of a Spent-Fuel-Pool Fire at the Pilgrim or Vermont Yankee Nuclear Plant*, at 11 (May 25, 2006) (“Beyea Report”), available at ADAMS Accession No. ML071840568; Wayne M. Angevine et al., *Modeling of the Coastal Boundary Layer and Pollutant Transport in New England* 45 J. Applied Meteorology Climatology 137 (2006) (“Angevine Study”), available at ADAMS Accession No. ML110030899; Keith C. Heidorn, *Weather Doctor*, *Weather Almanac for May 2000: Great Lake Breezes* (May 10, 2000), <http://www.islandnet.com/~see/weather/almanac/arc2000/alm00may2.htm>; National Weather Service, *JetStream - Online School for Weather*, *The Sea Breeze* (last visited May 5, 2011), <http://www.srh.weather.gov/srh/jetstream/ocean/seabreezes.htm>).

as far away as Boston or could impact any “cost-benefit computations.”<sup>129</sup> Yet the Board deemed it adequate support for an admissible challenge to the *Davis-Besse* SAMA analysis.<sup>130</sup>

Similarly, neither Petitioners nor the Board explained how the Angevine Study is relevant to site-specific meteorological conditions or a SAMA analysis at Davis-Besse. Indeed, the Board merely noted that the article is cited in the Beyea Report for the unproven proposition that postulated seaward-bound radioactive releases from the Pilgrim plant on the New England coastline—*not* the Davis-Besse plant in Lake Erie shoreline—will remain tightly concentrated due to reduced turbulence until winds blow the puffs back over land.<sup>131</sup> Again, the Board clearly erred in finding that the Angevine Study provides adequate support for Contention 4.

Finally, Petitioners argue that “[t]here is a well-established body of scholarship on the Great Lakes sea breeze that could be brought into play into this proceeding”<sup>132</sup> but Petitioners only provide references to two websites, one of which is a blog. These two websites are cited by the Board as support for admission of the contention, but they contain only generic discussion of meteorological phenomena that has no direct nexus to the Davis-Besse SAMA analysis, which was prepared by individuals with expertise in such areas as probabilistic risk assessment, severe accident phenomenology, and nuclear engineering. The “Weather Almanac” website is the personal blog of a Canadian meteorologist/artist. Whatever his credentials, Dr. Heidorn’s (a.k.a., “The Weather Doctor”) blog is not a peer-reviewed, or nationally-recognized institutional source, of reliable scientific information. The National Weather Service website cited by Petitioners, while presumably a reliable source of technical information, provides a general overview of sea breeze circulation and states only that, “[w]hile the sea breeze is generally

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<sup>129</sup> *Pilgrim*, CLI-10-11, slip op. at 25, n.97.

<sup>130</sup> LBP-11-13, slip op. at 57.

<sup>131</sup> *See id.* (quoting Beyea Report at 11).

<sup>132</sup> Tr. at 188 (Kamps).

associated with the ocean, they *can* occur along the shore of any large body of water such as the Great Lakes.”<sup>133</sup> It does not discuss possible “lake breeze” circulations near Davis-Besse or even on Lake Erie in general. Thus, neither website supports the quantum leap made by Petitioners here; *i.e.*, their speculative claim that a lake breeze “would draw contaminants across the land and inland subjecting the population to potentially higher radiation doses from a radiological release from Davis-Besse,” thereby leading FirstEnergy to underestimate severe accident consequences in its SAMA analysis.<sup>134</sup>

In summary, the Board both abused its discretion and committed clear error in admitting this portion of Contention 4 due to the clear lack of adequate supporting information.

c. *Petitioners’ Allegations Regarding Economic Consequences (Basis 3) Lack Adequate Support*

The Board’s admission of Contention 4 on the basis of Petitioners’ allegations in Basis 3 also is the result of clear and reversible error. As admitted, this portion of the contention alleges that FirstEnergy used “inputs that minimized and inaccurately reflected the economic consequences of a severe accident, specifically particle size and clean-up costs for urban areas.”<sup>135</sup> Contrary to the Board’s ruling, Petitioners provided absolutely no credible information suggesting that FirstEnergy has underestimated offsite economic consequences due to invalid assumptions regarding radionuclide “particle size” or clean-up costs for urban areas.

Instead, to support its claims regarding particle size, Petitioners cite the 1996 Sandia *Site Restoration Study* to argue that “earlier estimates (such as incorporated in WASH-1400 and up through and including MACCS2) of decontamination costs are incorrect because they examined

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<sup>133</sup> See National Weather Service, JetStream - Online School for Weather, The Sea Breeze, <http://www.srh.weather.gov/srh/jetstream/ocean/seabreezes.htm> (emphasis added).

<sup>134</sup> Petition at 120.

<sup>135</sup> LBP-11-13, slip op. at 50, 63, 65.

fallout from the explosion of nuclear weapons that produce large particle sizes and high mass loadings.”<sup>136</sup> But, as the Commission noted in CLI-10-11 when faced with a similar claim, this argument does not “demonstrate a *supported* genuine material issue—bearing on the overall SAMA cost-benefit results.”<sup>137</sup> Instead, the Commission explained, the petitioner must provide a “specific argument of error in the SAMA cost-benefit analysis calculations or conclusions.”<sup>138</sup> “Merely citing to pages in diverse reports without any additional explanation or other obvious link to the SAMA analysis is insufficient to raise a genuine material dispute for hearing.”<sup>139</sup>

Ignoring this precedent, the Board erred in finding that Petitioners discharged their burden. Petitioners did not explain how the referenced information in the *Site Restoration Study* is relevant to FirstEnergy’s SAMA analysis.<sup>140</sup> Furthermore, without explicit reference to any supporting document or expert opinion, Petitioners stated that “[d]econtamination is far less effective, or even possible [sic], for small particle sizes,” which they define as “a fraction of a micron to a couple of microns” versus “ten to hundreds of microns.”<sup>141</sup> In essence, Petitioners argued, with no factual or expert support, that dust from a nuclear power plant severe accident will be significantly more difficult and costly to clean up than dust from a plutonium dispersal

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<sup>136</sup> Petition at 140 (citing David Chanin & Walt Murfin, *Site Restoration: Estimation of Attributable Costs from Plutonium-Dispersal Accidents*, SAND96-0957, UC-502 (May 1996) (“Site Restoration Study”), available at <http://chaninconsulting.com/downloads/sand96-0957.pdf>).

<sup>137</sup> *Pilgrim*, CLI-10-11, slip op. at 31

<sup>138</sup> *Id.* n.121 (noting the petitioner’s failure identify a “direct connection” between the *Site Restoration Study* and the applicant’s SAMA cost-benefit results).

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

<sup>140</sup> Petitioners propose no method to apply the unidentified *Site Restoration Study* “framework” to a SAMA analysis, and do not explain how the cited information relates to the MACCS2 code specific inputs or assumptions to evaluate off-site consequences of a severe accident at Davis-Besse. The *Site Restoration Study* itself states: “The area contaminated in any specific hypothetical accident scenario would need to be estimated by calculations involving scenario-specific parameter values for the amount of material at risk, initial cloud size and thermal buoyancy, particle size distribution, ambient meteorology, and surrounding terrain characteristics, *all of which are outside the scope of the present study.*” *Site Restoration Study* at 2-2 (emphasis added). It further cautions that “[r]eaders are thus urged to critically evaluate the applicability of our estimates to the application at hand.” *Id.* at 6-1.

<sup>141</sup> Petition at 137.

accident, and that this alleged discrepancy in costs may result in the identification of cost-beneficial SAMAs.

Likewise, both the contention and the Board's ruling thereon lack any factual or technical justification supporting the admission of Petitioners' claim regarding urban clean-up costs. In its ruling, the Board mentions Petitioners' citation to a 2005 paper prepared by several persons at Pacific Northwest National Laboratory.<sup>142</sup> This paper, however, discusses the economic consequences of a "rad/nuc" attack involving a *nuclear weapon* or radiological dispersal device ("RDD") in "very high density urban areas" such as New York City.<sup>143</sup> Petitioners, however, fail to establish the relevance of this paper to their contention, which alleges that the WASH-1400-based economic cost model in MACCS2 is inadequate because it is based on data for "fallout from nuclear explosion of *nuclear weapons* that produce *large* particle sizes and high mass loadings."<sup>144</sup> Thus, Petitioners' reliance on this paper, which concerns clean-up costs for weapons and RDD events, is patently inconsistent with their own argument that FirstEnergy must consider *smaller* particle sizes resulting from a nuclear reactor severe accident.<sup>145</sup>

Also, the pages of the paper cited by Petitioners merely reflect the intuitive notions that cleanup of urban areas and cleanup to a higher standard can be more expensive than cleanup of rural areas or to a lower standard.<sup>146</sup> But Petitioners did not provide any information indicating that FirstEnergy's SAMA analysis inadequately accounts for urban areas. To the contrary, the SAMA analysis encompasses all areas—rural and urban—within a 50-mile radius of Davis-

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<sup>142</sup> LBP-11-13, slip op. at 60-61 (citing Barbara Reichmuth et al., *Economic Consequences of a Rad/Nuc Attack: Cleanup Standards Significantly Affect Cost* (Apr. 2005) ("Reichmuth Paper"), available at ADAMS Accession No. ML103620080).

<sup>143</sup> Reichmuth Paper at 2, 6-7.

<sup>144</sup> Petition at 140 (emphasis added).

<sup>145</sup> See *id.* at 136-37 ("Nuclear explosions result in larger-sized radionuclide particles; reactor accidents release small sized particles.").

<sup>146</sup> See *id.* at 139 (quoting Reichmuth Paper at 12).

Besse, and includes inputs for cost of “non-farm” decontamination per person (*e.g.*, for residential and commercial property) for different levels of decontamination.<sup>147</sup>

The Board clearly erred in admitting this part of Contention 4 because it lacks adequate factual foundation in contravention of 10 C.F.R. § 2.309(f)(1)(v) and, as noted above, also fails to directly controvert the ER.

## V. CONCLUSION

For the foregoing reasons, the Commission should reverse the Board’s admission of the reformulated and consolidated Contentions 1, 2, and 3 and the revised Contention 4, and the Petition should be wholly denied.

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<sup>147</sup> In this regard, and in contravention of § 2.309(f)(1)(vi), Petitioners failed to address the relevant site- and region-specific economic information included in the Davis-Besse SAMA analysis, a crucial fact overlooked by the Board. The ER describes the specific economic data and parameters used in the MACCS2 economic consequence analysis. *See* ER, att. E at E-40 to E-41, E-96. This information includes, for example, farmland and non-farmland property values; property depreciation rate; cost of farm and non-farm decontamination for various levels of decontamination; and average decontamination labor cost. *See id.* FirstEnergy also evaluated the sensitivity of its SAMA cost-benefit analyses to off-site economic costs by assuming a twenty-five percent increase in the off-site economic cost. *See id.* at E-73, E-190.

Respectfully submitted,

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