This proceeding stems from Entergy Nuclear Operations, Inc.’s license amendment request seeking agency approval of its “equivalent margins analysis” for the Palisades Nuclear Plant reactor pressure vessel. In LBP-15-20, the Atomic Safety and Licensing Board granted a petition to intervene and request for hearing filed by Beyond Nuclear, Don’t Waste Michigan, Michigan Safe Energy Future—Shoreline Chapter, and the Nuclear Energy Information Service (collectively, Petitioners) that challenged the license amendment request.\(^1\) Entergy has appealed.\(^2\) As discussed below, we reverse the Board’s decision.

**I. PROCEDURAL AND TECHNICAL BACKGROUND**

Petitioners challenge Entergy’s license amendment request on the ground that Entergy’s equivalent margins analysis “does not provide adequate assurance of margins of safety against

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\(^1\) LBP-15-20, 81 NRC 829 (2015).

fracture or rupture.”3 We provide first a short summary of the technical issue and license amendment request. A more detailed discussion of these issues is available in the Board’s decision.4

Pressure vessels in operating pressurized water reactors must meet certain requirements to demonstrate their fracture toughness (that is, their resistance to failure under certain conditions). Under normal plant conditions the materials at the “beltline” of the reactor pressure vessel must maintain “Charpy upper-shelf energy” of no less than 50 foot-pounds (ft-lb) (68 joules (J)).5 Charpy upper-shelf energy “is a measurement of the amount of energy the material can absorb at high temperatures before it fractures and fails.”6

As a reactor pressure vessel ages, it is exposed to increasing amounts of neutron radiation from the fission reaction occurring inside the reactor pressure vessel, which over time decreases the ductility (and fracture toughness) of the ferritic materials making up the vessel, thus reducing their Charpy upper-shelf energy. When a licensee determines that the Charpy upper-shelf energy of these materials will fall below 50 ft-lb, it must submit an analysis, known as an equivalent margins analysis. This analysis must demonstrate that the calculated energy will nevertheless “provide margins of safety against fracture [that are] equivalent to those required by Appendix G of Section XI of the ASME Code.”7

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3 Petition to Intervene and for a Public Adjudication Hearing of Entergy License Amendment Request for Approval of 10 CFR Part 50 Appendix G Equivalent Margins Analysis (Mar. 9, 2015), at 2 (Petition).

4 LBP-15-20, 81 NRC at 832-35.


6 LBP-15-20, 81 NRC at 833.

Fulfilling a commitment made in the license renewal application for Palisades, Entergy performed an equivalent margins analysis for the plant in early 2013. The results of that analysis demonstrated that certain materials in the Palisades reactor pressure vessel would fall below the 50 ft-lb Charpy upper-shelf energy level. Accordingly, Entergy submitted its equivalent margins analysis to the NRC in October 2013, followed by a corresponding license amendment request in November 2014. The NRC Staff published in the Federal Register a notice of the proposed amendment shortly thereafter, notifying the public of an opportunity to request a hearing. In response, Petitioners filed their hearing request. Entergy and the NRC Staff opposed the request; Petitioners replied.

In LBP-15-20, the Board granted Petitioners’ request for hearing, finding that Petitioners had demonstrated standing and proffered one admissible contention. Specifically, Petitioners’ contention (as admitted) states:

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8 Westinghouse WCAP-17651-NP, Rev. 0, Palisades Nuclear Power Plant Reactor Vessel Equivalent Margins Analysis (Feb. 2013) (ADAMS accession no. ML14316A208) (Equivalent Margins Analysis). In the Palisades license renewal application, Nuclear Management Company (the licensee at the time) committed to submit an equivalent margins analysis for materials where the Charpy upper-shelf energy would fall below 50 ft-lbs “at least three years prior to the date” this would occur. Appeal at 4-5 (citing Palisades Nuclear Plant Application for Renewed Operating License (Mar. 22, 2005), at 4-12 (ML050940446)).

9 Letter from Anthony J. Vitale, Site Vice President, Palisades Nuclear Plant, to Document Control Desk, NRC (Oct. 21, 2013) (ML13295A448); Letter from Anthony J. Vitale, Site Vice President, Palisades Nuclear Plant, to Document Control Desk, NRC (Nov. 12, 2014) (ML14316A190). The license amendment request and all attachments are available at ML14316A370.


The methods of prediction used by Entergy concerning whether steel plate and weld materials within the reactor pressure vessel ("RPV") at the Palisades Nuclear Power Plant possess Charpy upper shelf energy ("USE") values of less than 50 ft.-lbs. of ductility stress do not provide adequate assurance of margins of safety against fracture or rupture which are equivalent to those required by Appendix G of Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code.  

Petitioners focus on Entergy’s decision not to test physical samples—called coupons or capsules—as part of its equivalent margins analysis.

In evaluating the contention, a Board majority found that Petitioners had provided sufficient factual support to demonstrate a genuine dispute with the license amendment request. Judge Arnold dissented; in his view, “the information provided by Petitioners … [was] inadequate to establish a material dispute with the application.” Entergy’s appeal of the Board’s decision followed.

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12 Petition at 2; see also LBP-15-20, 81 NRC at 838.

13 See, e.g., Petition at 2; LBP-15-20, 81 NRC at 838.

14 The Board rejected several arguments proffered by Entergy and the Staff that are not challenged on appeal (e.g., whether Petitioners’ contention is barred as a challenge to 10 C.F.R. pt. 50, app G under 10 C.F.R. § 2.335). See LBP-15-20, 81 NRC at 848-49. Therefore we need not address them further.


16 Petitioners oppose the appeal. Petitioners’ Brief in Opposition to Entergy Appeal of LBP-15-20 (Aug. 7, 2015). Additionally, the Sierra Club filed a motion for leave to file a brief amicus curiae opposing the appeal. Motion by Sierra Club for Permission to File Amicus Brief (Aug. 7, 2015); Amicus Curiae Brief by Sierra Club in Support of Atomic Safety and Licensing Board Decision (Aug. 7, 2015). Entergy opposed the Sierra Club’s motion. Entergy’s Answer Opposing the Sierra Club’s Motion for Permission to File Amicus Curiae Brief (Aug. 17, 2015). The Sierra Club replied; Entergy opposed that reply. Sierra Club’s Reply to Entergy’s Answer to Motion to File Amicus Brief (Aug. 20, 2015); Entergy’s Answer Opposing the Sierra Club’s Unauthorized Reply (Aug. 20, 2015). Our rule governing amicus curiae participation does not contemplate a brief under the current circumstances. See 10 C.F.R. § 2.315(d) (providing the opportunity to file amicus briefs for matters taken up at our discretion under 10 C.F.R. § 2.341 or sua sponte). Nonetheless, we have considered the Sierra Club’s views as a matter of discretion. See, e.g., Omaha Public Power District (Fort Calhoun Station, Unit 1), CLI-15-5, 81 NRC 329, 333 n.19 (2015) (citing Southern California Edison Co. (San Onofre Nuclear Generating Station, Units 2 and 3), CLI-13-9, 78 NRC 551, 556 n.17 (2013)).
II. DISCUSSION

Entergy seeks review under 10 C.F.R. § 2.311(d), which allows for an appeal of a licensing board order granting a request for hearing on the question whether the request should have been wholly denied. Our decision today assesses whether the Board erred in granting Petitioners’ request for hearing by finding their proffered contention admissible. In ruling on Entergy’s appeal, we will defer to the Board’s rulings on contention admissibility absent an error of law or abuse of discretion. As discussed below, we find that the Board erred in admitting Petitioners’ contention.

A. Contention Admissibility Standards

Our strict-by-design contention admissibility standards focus our hearing process on “disputes that can be resolved in … adjudication.” To obtain a hearing, Petitioners must demonstrate standing and proffer an admissible contention. To satisfy our contention admissibility standards, a petitioner must:

(i) Provide a specific statement of the issue of law or fact to be raised or controverted;

(ii) Provide a brief explanation of the basis for the contention;

(iii) Demonstrate that the issue raised in the contention is within the scope of the proceeding;

(iv) Demonstrate that the issue raised in the contention is material to the findings the NRC must make to support the action that is involved in the proceeding;

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17 The Board found that Petitioners had demonstrated standing. LBP-15-20, 81 NRC at 836-37. We do not address that ruling here.

18 See, e.g., Exelon Generation Co., LLC (Limerick Generating Station, Units 1 and 2), CLI-12-19, 76 NRC 377, 379-80 (2012); AmerGen Energy Co., LLC (Oyster Creek Nuclear Generating Station), CLI-06-24, 64 NRC 111, 121 (2006).

19 Dominion Nuclear Connecticut, Inc. (Millstone Nuclear Power Station, Unit 3), CLI-08-17, 68 NRC 231, 233 (2008).

20 10 C.F.R. § 2.309(b), (d), and (f).
(v) Provide a concise statement of the alleged facts or expert opinions that support
the petitioner's position on the issue and on which the petitioner intends to rely at
hearing, together with references to the specific sources and documents on
which the petitioner intends to rely to support its position on the issue; and

(vi) Provide sufficient information to show that a genuine dispute exists with the
licensee on a material issue of law or fact.21

The proponent of a contention is responsible for formulating the contention and providing
the necessary support to satisfy the contention admissibility requirements in 10 C.F.R.
§ 2.309(f)(1). When raising a genuine material dispute with an application, we expect the
petitioner to present “well-defined issues,” not issues based on “little more than guesswork.”22
Finally, the petitioner must review the relevant documents, in this case the license amendment
request and the equivalent margins analysis, and provide sufficient discussion of these
documents and its concerns to demonstrate the existence of a genuine material dispute with the
licensee on a material issue of law or fact.23

B. Petitioners Have Not Satisfied Our Contention Admissibility Standards

On appeal, Entergy argues that the Board erred when it found (1) that the contention
raises a genuine material dispute and (2) that Petitioners provided adequate support for their


In this vein, Entergy argues that the Board erred in relying on an outdated contention-
admissibility standard that was discussed in an unreviewed licensing board decision. Appeal at
20 (citing LBP-15-20, 82 NRC at 847-48, 855 (quoting, in turn, Duke Power Co. (Catawba
Nuclear Station, Units 1 and 2), LBP-82-116, 16 NRC 1937, 1946 (1982) (“[a] contention about
a matter not covered by a specific rule need only allege that it poses a significant safety
problem”))). The contention admissibility rules in place at the time permitted less-detailed
notice pleading. See 10 C.F.R. § 2.714(b) (1982) (requiring petitioners to file “a list of the
contentions which petitioner seeks to have litigated in the matter, and the bases for each
contention set forth with reasonable specificity”). To the extent that the Board relied on
Catawba in making its contention admissibility determination, we agree that the Board erred.

22 Crow Butte Resources, Inc. (North Trend Expansion Project), CLI-09-12, 69 NRC 535, 552

23 See, e.g., Statement of Policy on Conduct of Adjudicatory Proceedings, CLI-98-12, 48 NRC
contention.24 Our contention admissibility rules require petitioners to proffer contentions that demonstrate a genuine dispute with the application.25 Here, the Board found that Petitioners’ single reference to the equivalent margins analysis, along with the general discussion in Petitioners’ supporting documents, was sufficient to provide the requisite specificity to satisfy our regulations.26 We disagree.

As Entergy notes, Petitioners provide only one specific reference to the equivalent margins analysis—an excerpt from the analysis that discusses the sulfur and nickel content in the Palisades reactor pressure vessel materials.27 Petitioners claim that this discussion shows that “the higher sulfur content of the plates means lower fracture toughness.”28 But Petitioners provide no basis for their statement regarding the sulfur content, nor does their expert address this claimed relationship between sulfur content and fracture toughness. We find, therefore, that

24 Appeal at 2-3. Entergy also argues that the Board erred when it found that Petitioners’ challenge to the equivalent margins analysis did not constitute an unauthorized challenge to the coupon removal schedule that the NRC approved under 10 C.F.R. Part 50, Appendix H. Appeal at 11-13, 13 n.74; LBP-15-20, 81 NRC at 841-45. Here, we agree with the Board—Petitioners have not challenged the coupon-removal schedule in Appendix H; rather, they have challenged Entergy’s Appendix G equivalent margins analysis—arguing that additional physical data must be obtained to support the analysis. See, e.g., Petition at 11, LBP-15-20, 81 NRC at 842. As the Board correctly stated, were Petitioners “to prevail on the merits, Entergy would need to test one or more capsules sooner than 2019 to provide adequate support” for the equivalent margins analysis. LBP-15-20, 81 NRC at 842. Thus, our regulations do not prohibit the additional testing requested by Petitioners. See 10 C.F.R. pt. 50, app. H(III)(c)(3) (specifying that “no reduction in the amount of testing” is allowed without NRC approval). But the absence of a prohibition is not sufficient justification to admit a contention—Petitioners must still satisfy our contention admissibility criteria.

25 10 C.F.R. § 2.309(f)(1)(vi); NextEra Energy Seabrook, LLC (Seabrook Station, Unit 1), CLI-12-5, 75 NRC 301, 307 (2012) (citations and quotation marks omitted).

26 LBP-15-20, 81 NRC at 861-62.

27 Appeal at 3; see also Petition at 19-20 (citing Equivalent Margins Analysis at 24-25). One of Petitioners’ supporting documents, Declaration of Arnold Gundersen (Dec. 1, 2014) (Gundersen Declaration), discussed further infra, likewise includes one general reference to the equivalent margins analysis. Gundersen Declaration ¶ 45.5.

28 Petition at 19-20.
the Board erred in finding that Petitioners provided sufficient specific references to the application to satisfy our contention admissibility criteria.\textsuperscript{29}

Petitioners attached two documents to the Petition to support their contention: a declaration by Mr. Arnold Gundersen, an engineer and Petitioners’ expert in this matter, and a report by Greenpeace on “microcracking” in reactor pressure vessels.\textsuperscript{30} The Board found that the Gundersen Declaration and Greenpeace Report provided sufficient support for Petitioners’ contention.\textsuperscript{31} We hold that the Board erred in making this determination. We address each document in turn below.

1. **Gundersen Declaration**

   In finding that the Gundersen Declaration supports Petitioners’ contention, the Board noted that Mr. Gundersen “has pointed to an alleged deficiency in the analysis (lack of recent capsule data) and he has provided a foundation for his opinion with a discussion of the characteristics of the Palisades reactor vessel that allegedly make this data significant.”\textsuperscript{32} In particular, the Board points to paragraphs 8-11 and 45-48 of the Gundersen Declaration. Paragraph 8 contains an unsupported claim that “[t]he current analysis cannot be substantiated because physical data is lacking to support any mathematical analysis.”\textsuperscript{33} Paragraphs 9-11

\textsuperscript{29} With respect to the nickel content of the Palisades reactor pressure vessel, the Board found that Petitioners did not provide adequate support for their claim that the nickel content “will weaken the materials in the Palisades reactor” and that Petitioners’ support for this assertion “does not explain how high nickel content results in ‘nickel impurities’ or otherwise leads to any undue risk to the Palisades [reactor pressure vessel].” LBP-15-20, 81 NRC at 862. We find no error in this determination.

\textsuperscript{30} See Petition at 16-19, 21-22 (referencing the Gundersen Declaration and Nuclear Reactor Pressure Vessel Crisis: Greenpeace Briefing (Feb. 15, 2015) (Greenpeace Report)).

\textsuperscript{31} LBP-15-20, 81 NRC at 851.

\textsuperscript{32} Id. at 852 (citations omitted).

\textsuperscript{33} Gundersen Declaration ¶ 8.
contain factual statements regarding reactor pressure vessels in general (e.g., that they are made of “thick steel plates”) and the Palisades reactor pressure vessel in particular (e.g., its date of construction), together with an unsupported statement that the weld materials at Palisades contain “metallic components … that are now considered unacceptable due to impurities.”34 Paragraphs 45-48 generally criticize the instant license amendment request and a separate request that is not at issue here.35 In reviewing these paragraphs, the Board found that the Declaration “offers enough factual support and explanation to dispute the adequacy of the inputs used in Entergy’s [equivalent margin analysis].”36 Further, the Board found that these paragraphs also identify an “alleged deficiency” in the equivalent margins analysis—the “lack of recent capsule data.”37

We disagree. Although Petitioners and the Gundersen Declaration challenge the adequacy of the equivalent margins analysis (i.e., stating that the analysis is inadequate without additional testing of metal coupons), the Gundersen Declaration does not cite—or otherwise discuss—the specific portions of Entergy’s analysis that Petitioners and Mr. Gundersen believe to be insufficient. Nor do Petitioners or Mr. Gundersen, as noted by Judge Arnold, “provide a description of new information that could be provided by coupon removal that is not already available” from the analysis of earlier coupons that were removed from the reactor.39 As we

34 Id. ¶¶ 9-11.

35 Id. ¶¶ 45-48. That license amendment application pertains to Entergy’s request to use alternate fracture toughness requirements at Palisades. In a separate decision issued today, we affirmed the Board’s ruling denying Petitioners’ request for a hearing in that matter. See Entergy Nuclear Operations, Inc. (Palisades Nuclear Plant), LBP-15-17, 81 NRC 753, aff’d, CLI-15-22, 82 NRC ___ (Nov. 9, 2015) (slip op.).

36 LBP-15-20, 81 NRC at 852.

37 Id.

38 See e.g., Petition at 11; LBP-15-20, 81 NRC at 851-55.

39 Id. at 864 (Arnold, J., dissenting).
have previously held, “an expert opinion that merely states a conclusion … without providing a reasoned basis or explanation for that conclusion is inadequate because it deprives the Board of the ability to make the necessary, reflective assessment of that opinion.”

Here, Mr. Gundersen provides no explanation for his claim that additional physical testing is necessary to support the equivalent margins analysis. Further, Petitioners and Mr. Gundersen neither “explain how additional testing would improve knowledge of the vessel embrittlement” at Palisades, nor “relate this concern to their contention in any way.”

To proffer an admissible contention, Petitioners must “explain the basis for the contention and read the relevant parts of the license application and show where the application is lacking”; an assertion that additional analysis is necessary, without further support (e.g., a basis to support the need for additional physical testing), is not sufficient.

Based on our review of the record and the Board’s decision, we find that the Board erred in finding that Mr. Gundersen’s Declaration provided “concrete and specific” support for Petitioners’ contention.

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41 LBP-15-20, 81 NRC at 867 (Arnold, J., dissenting).

42 Arizona Public Service Co. (Palo Verde Nuclear Generating Station, Unit Nos. 1, 2, and 3), CLI-91-12, 34 NRC 149, 156 (1991).

43 The Board further cites to Mr. Gundersen’s statements regarding the need for “physical data … to determine the actual toughness of the reactor vessel.” LBP-15-20, 81 NRC at 852 (citing Gundersen Declaration ¶ 51). But the discussion cited by the Board here appears to be a reference to a separate license amendment request not at issue here. Paragraph 51 is the only numbered paragraph in a section that discusses Entergy’s pending request to implement at Palisades the alternate fracture toughness requirements in 10 C.F.R. § 50.61a, a matter the NRC is addressing separately. Gundersen Declaration § IX (unnumbered paragraph preceding ¶ 51). See generally Palisades, CLI-15-22, 82 NRC ___ (slip op.). Even if Paragraph 51 can be read as discussing the license amendment request at issue here, it does not provide sufficient support for Petitioners’ contention.
2. Greenpeace Report

Petitioners cite the Greenpeace Report as evidence that “world-recognized nuclear engineers have advised close attention to [the microcracking] phenomenon in older reactor [pressure vessels].” Petitioners only cite the Report to call for additional examination of the microcracking phenomenon at Palisades, not to support their challenge to the equivalent margins analysis.

The Board, however, found more support in the Greenpeace Report than is reflected in the Petition and relied heavily on the Report in admitting Petitioners’ contention. In its decision, the Board provides a lengthy analysis of the Report and documents cited therein. In particular, the Board stated that “[t]hese microcracking allegations imply that the Palisades [reactor pressure vessel] materials may be of lower fracture toughness than described by Entergy, and thus that Entergy’s [equivalent margins analysis] fails to show that the Palisades reactor vessel demonstrates equivalent margins of safety under 10 C.F.R. Part 50, Appendix G.” However, it is Petitioners’ responsibility, not the Board’s, to formulate contentions and to provide “the necessary information to satisfy the basis requirement” for admission. At the contention admissibility stage, the Board should view Petitioners’ support for their contention “in a light that is favorable” to Petitioners, but the Board “cannot do so by ignoring the requirements set forth in [10 C.F.R. § 2.309(f)(1)].” We agree with Judge Arnold that the “vague speculation” in the Greenpeace Report “that this type of flaw may exist in other reactor vessels

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44 Petition at 21-22.
45 See id. at 22.
46 Compare LBP-15-20, 81 NRC at 856-61 with Petition at 21-22.
47 LBP-15-20, 81 NRC at 857.
48 Policy on Conduct of Adjudicatory Proceedings, CLI-98-12, 48 NRC at 22.
49 Palo Verde, CLI-91-12, 34 NRC at 155.
[than the two Belgian reactor vessels discussed in the Greenpeace Report] is not sufficient to establish a material challenge to the license amendment request.\textsuperscript{50}

### III. CONCLUSION

As discussed above, we find that the Board erred in finding that Petitioners had satisfied our contention admissibility criteria. Therefore, we \textit{reverse} the Board’s decision in LBP-15-20 and \textit{direct} the Licensing Board to terminate this proceeding.

IT IS SO ORDERED.

For the Commission

\begin{center}
\textbf{NRC SEAL} \hspace{2cm} /RA/
\end{center}

\begin{center}
Annette L. Vietti-Cook  
Secretary of the Commission
\end{center}

Dated at Rockville, Maryland, this 9\textsuperscript{th} day of \textbf{November}, 2015.

\textsuperscript{50} LBP-15-20, 81 NRC at 866-67 (Arnold, J., dissenting).
UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of )
) Docket No. 50-255-LA-2
ENTERGY NUCLEAR OPERATIONS, INC. )
(Entergy) )
(Palisades Nuclear Plant) )

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing COMMISSION MEMORANDUM AND ORDER (CLI-15-23) have been served upon the following persons by Electronic Information Exchange.

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[Original signed by Herald M. Speiser]
Office of the Secretary of the Commission

Dated at Rockville, Maryland
this 9th day of November, 2015