

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)
)
CALVERT CLIFFS 3 NUCLEAR PROJECT,)
LLC, and UNISTAR NUCLEAR OPERATING) Docket No. 52-016-COL
SERVICES, LLC)
)
(Calvert Cliffs Nuclear Power Plant, Unit 3))

NRC STAFF PROPOSED PARTIAL INITIAL DECISION
FINDINGS OF FACT AND CONCLUSIONS OF LAW
ON CONTENTION 10C

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April 20, 2012

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I. INTRODUCTION

1. This initial decision rules on Contention 10C in this 10 C.F.R. Part 2, Subpart L proceeding for the Calvert Cliffs Nuclear Power Plant, Unit 3 (Calvert Cliffs 3). The Applicants are seeking a combined license (COL).¹ This proceeding concerns the admitted contention filed by Nuclear Information and Resource Service, Beyond Nuclear, Public Citizen and the Southern Maryland Citizens' Alliance for Renewable Energy Solutions (collectively "Joint Intervenors") to the Final Environmental Impact Statement² prepared by the United States Nuclear Regulatory Commission ("Commission" or "NRC") staff ("Staff" or "NRC Staff").

2. Contention 10C, as admitted by the Board, states: "The FEIS discussion of a combination of alternatives is inadequate and faulty. By selecting a single alternative that under

¹ The original COL applicants were Constellation Generation Group, LLC and UniStar Nuclear Operating Services, LLC. The application was revised by letter dated August 1, 2008, which among other things changed the applicants to Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC (collectively "Applicants").

² See 76 Fed. Reg. 29,279 (May 20, 2011); NUREG-1936, Environmental Impact Statement for the Combined License for Calvert Cliffs, Nuclear Power Plant Unit 3, Final Report (May 2011) (Agencywide Documents Access and Management System "ADAMS" Accession Nos. ML11129A167 and ML11129A179) ("FEIS").

represents potential contributions of wind and solar power, the combination alternative depends excessively on the natural gas supplement, thus unnecessarily burdening this alternative with excessive environmental impacts.”³

3. After consideration of all relevant evidence in the record, the Atomic Safety and Licensing Board (“Board”) finds that NRC Staff prepared the FEIS in accordance with the requirements of the National Environmental Policy Act (NEPA)⁴ and the Commission’s regulations at 10 C.F.R. Part 51. The Board finds that, contrary to claims asserted in Contention 10C, NRC Staff and the Applicant have met their burden of demonstrating that the FEIS has examined reasonable alternatives, and combinations of alternatives, within the range dictated by the nature and scope of the Applicants’ proposal and the project’s stated purpose and need.

4. Specifically, we find that NRC Staff evaluated an array of energy alternatives, including traditional sources (such as natural gas and coal) and evolving sources (such as wind, solar, and biofuels), to meet the requirements of NEPA. Additionally, we find that NRC Staff satisfied the requirements of NEPA by evaluating a combination of energy alternatives that included reasonable contributions from wind and solar power. Finally, we find that NRC Staff’s analysis of alternatives as they exist and are likely to exist was consistent with NEPA.

5. For the reasons set forth herein, we conclude as a matter of law that the FEIS complies with the dictates of NEPA and the Commission’s regulations at 10 C.F.R. Part 51.

³ Memorandum and Order (Denying Summary Judgment of Contention 10C, Denying Amended Contention 10C, and Deferring Ruling on Contention 1) at 5 n.21 (Aug. 26, 2011) (unpublished) (August 26, 2011 Order).

⁴ 42 U.S.C. § 4321 (2006).

II. BACKGROUND

A. Procedural History

6. On July 13, 2007, Applicants submitted an application for a COL for one U.S. EPR pressurized water reactor to be located adjacent to the existing Calvert Cliffs Nuclear Power Plant, Units 1 and 2, near Lusby, Calvert County, Maryland.⁵

7. On September 26, 2008, the NRC issued a notice of hearing and opportunity to intervene. See Calvert Cliffs 3 Nuclear Project, LLC, and UniStar Nuclear Operating Services, LLC, Notice of Hearing and Opportunity To Petition for Leave To Intervene and Order Imposing Procedures for Access to Sensitive Unclassified Non-Safeguards Information and Safeguards Information for Contention Preparation on a Combined License for the Calvert Cliffs Nuclear Power Plant 3, 73 Fed. Reg. 55,876 (Sept. 26, 2008).

8. On November 19, 2008, Joint Intervenors filed a petition to intervene in the proceeding proffering seven contentions. See Petition to Intervene in Docket No. 52-016, Calvert Cliffs-3 Nuclear Power Plant Combined Construction and License Application, at 5 (Nov. 19, 2008) (Petition) (ADAMS Accession No. ML083240926).

9. On March 24, 2009, this Board admitted Joint Intervenors as parties to this proceeding and admitted Contention 1 (Foreign Ownership), Contention 2 in part, (Decommissioning Funding) and Contention 7 (Waste) as narrowed by the Board. *Calvert Cliffs 3 Nuclear Project, LLC, and UniStar Nuclear Operating Services, LLC* (Combined License Application for Calvert Cliffs Unit 3), LBP-09-04, 69 NRC 170, 231–32 (2009), *aff'd*, CLI-09-20, 70 NRC 911, 918–24 (2009).

10. After issuance of the March 24, 2009 Order, the Board convened a telephone scheduling conference, and then issued a scheduling order that, among other things, provided

⁵ UniStar Nuclear LLC; Notice of Receipt and Availability of Part of an Application for a Combined License, 72 Fed. Reg. 45,832 (Aug. 15, 2007).

for simultaneous briefing of the decommissioning funding issue. See Order (Establishing Schedule to Govern Further Proceedings) (Apr. 22, 2009) (unpublished).

11. On May 15, 2009, NRC Staff filed a motion for summary disposition of Contention 2. See NRC Staff Motion for Summary Disposition of Contention 2 (May 15, 2009) (NRC Staff's Motion).

12. Applicants filed a response to the NRC Staff's Motion, which not only agreed with the NRC Staff's Motion but also repeated its assertion that the COL application included the information necessary to satisfy the financial test for a parent company guarantee, and that as a result, Contention 2 was moot. Applicant's Response to Motion for Summary Disposition of Contention 2 (May 26, 2009), at 3.

13. On July 30, 2009, this Board granted Applicants' and the NRC Staff's Motion, thus dismissing Contention 2 from this proceeding. See Memorandum and Order (Granting Motion for Summary Disposition of Contention 2), LBP-09-15, 70 NRC 198, 205 (2009).

14. On December 1, 2009, Joint Intervenors filed two new contentions in this proceeding, designated as Contentions 8 and 9. Submission of New Contentions by Joint Intervenors (Dec. 1, 2009).

15. Applicants and NRC Staff timely filed answers opposing the admission of new Contentions 8 and 9. Applicants' Response to New Proposed Contentions (Dec. 23, 2009) (Applicants' Answer); NRC Staff Answer to Joint Intervenors' New Contentions 8 and 9 (Dec. 28, 2009).

16. On February 5, 2010, Applicants filed a motion for summary disposition of Contention 7, contending that the contention was moot, as the Environmental Report had been amended to address how the Applicant would manage Class B and C low-level radioactive waste. Applicants' Motion for Summary Disposition of Contention 7 (Feb. 5, 2010) (Applicants' Motion).

17. On March 4, 2010, Joint Intervenors filed a response opposing the Applicants' Motion. Joint Intervenors' Response to Applicants' Motion for Summary Disposition of Contention 7 (Mar. 4, 2010).

18. On April 5, 2010, this Board issued an order not admitting Contentions 8 and 9 and granting Applicants' Motion for Summary Disposition of Contention 7. See Memorandum and Order (Ruling on Joint Intervenors' Proposed New Contentions 8 and 9 and Applicants' Motion for Summary Disposition of Contention 7) (Apr. 5, 2010) (unpublished) (ADAMS Accession No. ML100950453).

19. On April 13, 2010, NRC Staff issued NUREG-1936, Environmental Impact Statement for the Combined License (COL) for Calvert Cliffs Nuclear Power Plant Unit 3, Draft Report for Comment (April 2010) ("DEIS").⁶

20. On June 25, 2010, Joint Intervenors submitted Contention 10, challenging the adequacy of the DEIS with respect to the need for power, energy alternatives, and the benefits and costs of the proposed new nuclear unit. Submission of Contention 10 by Joint Intervenors at 1 (Jun. 25, 2010) (ADAMS Accession No. ML101760532). NRC Staff and the Applicants opposed the admission of this contention. NRC Staff Answer to Joint Intervenors' New Contention 10 (July 20, 2010) (ADAMS Accession No. ML102010739); Applicants' Response to Proposed Contention 10 (July 20, 2010) (ADAMS Accession No. ML102010741).

21. On December 28, 2010, the Board reformulated and admitted one part of proposed Contention 10, concerning the combination of energy alternatives as Contention 10C, and rejected each of the Intervenors' other challenges to the DEIS for failure to meet the contention admissibility requirements in 10 CFR § 2.309(f)(1) and (f)(2). *Calvert Cliffs 3 Nuclear Project, LLC, and UniStar Nuclear Operating Services, LLC* (Combined License Application for

⁶ The DEIS is contained in two volumes. Volume 1 (ADAMS Accession No. ML101000012) includes Chapters 1 - 10. Volume 2 (ADAMS Accession No. ML101000013) includes Appendices A through M.

Calvert Cliffs Unit 3), LBP-10-24, 72 NRC __, __ (Dec. 28, 2010) (slip op. at 1, 20, 38, 44, 54, 62). Contention 10C challenged the DEIS's wind and solar power contribution estimates as inadequate. As admitted, Contention 10C read as follows:

The DEIS discussion of a combination of alternatives is inadequate and faulty. By selecting a single alternative that under represents potential contributions of wind and solar power, the combination alternative depends excessively on the natural gas supplement, thus unnecessarily burdening this alternative with excessive environmental impacts.

Id. at 54.

22. On May 20, 2011, NRC Staff issued the FEIS for Calvert Cliffs 3.

23. On June 20, 2011, the Applicants moved for summary disposition of Contention 10C on the grounds that the FEIS addressed the issues raised by Joint Intervenors in Contention 10C; the Applicants argued that no genuine issue remained as to any material fact relevant to the contention. Applicants' Motion for Summary Disposition of Contention 10C (Jun. 20, 2011) (Applicants' June 20, 2011 Motion) (ADAMS Accession No. ML111711871).

24. Also on June 20, 2011, the Joint Intervenors filed a "Submission of Amended Contention 10C" in which they, among other things, sought to update the original bases of Contention 10C to reflect additional arguments concerning the FEIS. Submission of Amended Contention 10C by Joint Intervenors (Jun. 20, 2011) (Joint Intervenors' Submission) (ADAMS Accession No. ML11711649).

25. On July 11, 2011, NRC Staff filed an answer to Applicants' June 20, 2011 Motion in which Staff did not oppose Applicants' Motion for Summary Disposition of Contention 10C. See NRC Staff's Response to Applicants' Motion for Summary Disposition (Jul. 11, 2011) (ADAMS Accession No. ML11192A286). Joint Intervenors did not file a response to the Applicants' Motion.

26. On July 15, 2011, NRC Staff filed its response to the Joint Intervenors' Submission. NRC Staff Answer to Joint Intervenors' Amended Contention 10C (Jul. 15, 2011)

(ADAMS Accession No. ML11196A218). In its response, NRC Staff did not oppose the proposed change of reference from the DEIS to the FEIS in Contention 10C, but opposed Joint Intervenors' Submission in all other respects for failure to meet the contention admissibility requirements in 10 C.F.R. § 2.309(f)(1) and (f)(2). *Id.* at 1.

27. On August 26, 2011, the Board issued a decision that denied the Applicants' Motion for Summary Disposition, denied admission of the Joint Intervenors' amended contention, and changed the reference in Contention 10C from "DEIS" to "FEIS." August 26, 2011 Order. The Board directed the parties to proceed to an evidentiary hearing according to the Board's Revised Initial Scheduling Order on Contention 10C.⁷

B. Evidentiary Filings and Hearings

28. On October 21, 2011, the Applicants, Joint Intervenors and NRC Staff, respectively, filed direct testimony and exhibits.⁸ The Applicants and NRC Staff also filed Initial Statements of Position.⁹ Joint Intervenors did not file an Initial Statement of Position.

29. On October 24, 2011, Joint Intervenors filed a motion seeking to withdraw and replace their October 21, 2011 testimony.¹⁰ The motion was unopposed. The Board granted the motion on October 25, 2011. See Order (Granting Unopposed Motion to Withdraw Written

⁷ August 26, 2011 Order at 32.

⁸ Prefiled Direct Testimony of Laura M. (Quinn) Willingham Sponsoring NUREG-1936 into the Hearing Record (Exhibit NRC000001); Prefiled Direct Testimony of Andrew J. Kugler and Katherine A. Cort Regarding Environmental Contention 10C (NRC Staff Direct Testimony) (Exhibit NRC000004); Prefiled Direct Testimony of Applicants' Witnesses Dimitri Lutchenkov, Stefano Ratti, and Septimus van Der Linden (Applicants' Direct Testimony) (Exhibit APL000001); Direct Testimony of Michael Mariotte (Joint Intervenors' Direct Testimony) (Exhibit JNT000001).

⁹ UniStar Initial Statement of Position on Contention 10C (Oct. 21, 2011) (ADAMS Accession No. ML11294A522); NRC Staff Initial Statement of Position on Contention 10C (Oct. 21, 2011) (ADAMS Accession No. ML11294A550).

¹⁰ Motion to Allow Joint Intervenors to Withdraw Written Testimony of October 21, 2011 on Contention 10C, to Submit Expert Testimony by October 28, 2011, and to Extend Other Relevant Deadlines by One Week (Oct. 24, 2011) (ADAMS Accession No. ML11294A220).

Testimony Filed October 21, Submit Expert Testimony by October 28, and Extend Other Relevant Deadlines by One Week; and Providing Additional Instructions to Intervenors Regarding the Re-Filing of Testimony and Exhibits) (Oct. 25, 2011) (unpublished). On October 28, 2011, Joint Intervenors filed the Direct Testimony of Witness Scott Sklar.¹¹

30. On November 18, 2011, NRC Staff, Applicants and Joint Intervenors filed Rebuttal Testimony.¹²

31. On December 9, 2011, NRC Staff filed a Motion in Limine to exclude portions of Joint Intervenors' direct and rebuttal testimony and several of their proposed exhibits, and, a Motion to Strike certain portions of Joint Intervenors' Rebuttal Statement of Position.¹³ The staff grouped the testimony proposed to be excluded into the following six categories: (1) energy production outside the region of interest; (2) alternatives other than wind or solar; (3) back-up power; (4) alleged violations of the Maryland Renewable Portfolio Standard; (5) project uncertainty and timeframe; and (6) evidentiary or admissibility issues. Motion in Limine at 3–9.

32. On December 19, 2011, Joint Intervenors filed a response stating that they “agree to exclude and/or strike several passages in their testimony and rebuttal position

¹¹ Testimony of Scott Sklar, President of the Stella Group, Ltd., on Contention 10 (Oct. 28, 2011) (“Joint Intervenors’ Witness Sklar”). Joint Intervenors’ Witness Sklar’s testimony did not contain page numbers or numbered answers. A revised version of Joint Intervenors’ Witness Sklar’s testimony with page numbers was filed on November 17, 2011 [(Sklar Direct Testimony (Exhibit JNTR00001)].

¹² Rebuttal Testimony of Andrew J. Kugler and Katherine A. Cort Regarding Environmental Contention 10C [(NRC Staff Rebuttal Testimony) (Exhibit NRC000043)]; Rebuttal Testimony of Applicants’ Witnesses Dimitri, Lutchenkov, Stefano Ratti, and Septimus van Der Linden [(Applicants’ Rebuttal Testimony) (Exhibit APL000055)]; Rebuttal Testimony of Scott Sklar, President of the Stella Group, Ltd., on Contention 10 [(Joint Intervenors’ Rebuttal Testimony) (Exhibit JNT000030)]. See *also* Joint Intervenors’ Statement of Position (In Rebuttal) (Nov. 18, 2011).

¹³ NRC Staff Motion in Limine to Exclude Portions of the Joint Intervenors’ Direct and Rebuttal Testimony, Exhibits, and Portions of the Joint Intervenors’ Rebuttal Statement of Position at 1–2 (Dec. 9, 2011) (ADAMS Accession No. ML11343A357) (Motion in Limine).

statement identified by the NRC as outside the scope of the hearing.”¹⁴ In all other respects Joint Intervenors opposed the Staff’s Motion in Limine.¹⁵

33. On January 17, 2012, the Board issued an order granting in part and denying in part Staff’s Motion in Limine.¹⁶ Specifically, the Board granted the Motion in Limine wherein NRC Staff and Joint Intervenors agreed, and with respect to the exclusion of one exhibit, Exhibit JNT000024. *Id.* at 1, 4. The Board rejected NRC Staff’s objections to all other exhibits. *Id.* at 2. In addition, the Board held that it would defer its ruling on disputed portions of Joint Intervenors’ Witness Sklar’s testimony, and that it need not decide NRC Staff’s request to strike portions of Joint Intervenors’ Rebuttal Statement of Position, noting that the Rebuttal Statement is not evidence and will only be considered in the merits ruling to the extent it is based on admitted evidence.¹⁷

34. On January 26, 2012 and January 27, 2012, the Board held an evidentiary hearing on Contention 10C.¹⁸

35. Prior to the admission of Joint Intervenors’ pre-filed testimony and exhibits into evidence, NRC Staff renewed its objections, as set forth in NRC Staff’s Motion in Limine. Hearing Tr. at 318. The Board announced that it would consider the arguments made in the NRC Staff’s Motion in Limine after it had heard testimony. *Id.*

¹⁴ Joint Intervenors’ Opposition to NRC Staff Motion in Limine (Dec. 19, 2011) at 1 (ADAMS Accession No. ML11353A248).

¹⁵ *Id.*

¹⁶ Order (Granting in Part and Denying in Part NRC Staff’s Motion in Limine) (Jan. 17, 2012) (unpublished) (ADAMS Accession No. ML12017A200).

¹⁷ *Id.* at 2–3, 5–6.

¹⁸ Official Transcript of Proceedings Nuclear Regulatory Commission, Calvert Cliffs III Nuclear Project Evidentiary Hearing (Jan. 26–27, 2012) (ADAMS Accession Nos. ML12033A068 and ML12034A183) (Hearing Tr.).

36. The Board, subject to the objections made in NRC Staff's Motion in Limine, admitted into evidence the pre-filed testimony and exhibits of the Joint Intervenors. *Id.* at 317–318. Thereafter, the Board admitted the pre-filed testimony and exhibits of the NRC Staff into evidence. *Id.* at 319. Finally, the Board admitted the pre-filed testimony and exhibits of the Applicants into evidence. *Id.* at 320–21.

37. On January 27, 2012, the parties presented additional testimony and closing arguments on Contention 10C. Hearing Tr. at 706–38.

38. On February 27, 2012, NRC Staff, Applicants and Joint Intervenors jointly proposed corrections to the hearing transcripts for the January 26, 2012 and January 27, 2012 evidentiary hearing.¹⁹

39. On March 6, 2012, the Board issued an Order adopting the transcript corrections in Appendix A of its Memorandum and Order and closing the evidentiary record for Contention 10C.²⁰

III. LEGAL STANDARDS

A. National Environmental Policy Act

40. Contention 10C arises under NEPA and the NRC's regulations implementing that statute. See 42 U.S.C. § 4321 (2006); 10 C.F.R. Part 51. NEPA requires that an agency prepare an Environmental Impact Statement (EIS) for any major Federal action that significantly affects the quality of the human environment. 42 U.S.C. § 4332(2)(C). The NRC has determined that the issuance of a COL is an action that requires an EIS. 10 C.F.R. § 51.20.

41. Under NEPA, the NRC is required to take a "hard look" at the environmental impacts of a proposed action, as well as reasonable alternatives to that action. See *Louisiana*

¹⁹ Joint Motion for Transcript Correction (Feb. 27, 2012) (ADAMS Accession No. ML12058A523).

²⁰ Order (Adopting Proposed Transcript Corrections, Admitting Additional Exhibit, and Closing the Evidentiary Record) (Mar. 6, 2012) (unpublished) (ADAMS Accession No. ML12066A182). Citations to the Hearing Tr. in this initial decision will be to the transcript as modified by the March 6, 2012 Order.

Energy Servs., L.P. (Claiborne Enrichment Center), CLI-98-3, 47 NRC 77, 87–88 (1998) (*Louisiana Energy Services*). This “hard look” is tempered by a “rule of reason” that requires agencies to address only impacts that are reasonably foreseeable. See, e.g., *Long Island Lighting Co.* (Shoreham Nuclear Power Station, Unit 1), ALAB-156, 6 AEC 831, 836 (1973).

42. NRC Staff’s FEIS need only discuss those alternatives that will bring about the ends of the proposed action. See *NextEra Energy Seabrook, LLC* (Seabrook Station, Unit 1) CLI-12-05, 75 NRC __, __ (Mar. 8, 2012) (slip op. at 49) (quoting *Hydro Resources, Inc.* (P.O. Box 15910, Rio Rancho, NM 87174), CLI-01-4, 53 NRC 31, 55 (2001)) (*Seabrook*); see also *Sacramento Municipal Utility District* (Rancho Seco), CLI-99-3, 37 NRC 144, 144–45 (1993) (*Rancho Seco*). NEPA does not require a detailed discussion of alternatives deemed remote and speculative or whose effects cannot be readily ascertained. *Vermont Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519, 551 (1978) (quoting *NRDC v. Morton*, 458 F.2d 827, 837–38 (1972) (*Vermont Yankee*)).

43. Whether an alternative is remote and speculative must be decided by the agency “in light of the facts then available to it”; an agency action cannot be found to be arbitrary and capricious based upon later facts. *Id.* at 555. “An agency’s consideration of alternatives is sufficient if it considers an appropriate range of alternatives, even if it does not consider every available alternative.” *Headwaters, Inc. v. Bureau of Land Management, Medford Dist.*, 914 F.2d 1174, 1181 (9th Cir. 1990). “Common sense also teaches us that the ‘detailed statement of alternatives’ cannot be found wanting simply because the agency failed to include every alternative device and thought conceivable by the mind of man.” *Id.* at 551. Further, “the concept of ‘alternatives’ is an evolving one, requiring the agency to explore more or fewer alternatives as they become better known and understood.” *Id.* at 552–53.

44. Finally, “NEPA gives agencies broad discretion to keep their inquiries within appropriate and manageable boundaries.” *Louisiana Energy Services*, CLI-98-3, 47 NRC

at 103. To this end, “NEPA does not call for certainty or precision, but an *estimate* of anticipated (not unduly speculative) impacts.” *Louisiana Energy Servs., L.P.* (National Enrichment Facility), CLI-05-20, 62 NRC 523, 536 (2005).

B. Burden of Proof

45. Generally, an applicant has the burden of proof in a licensing proceeding. 10 C.F.R. § 2.325. In cases involving NEPA contentions, however, the burden shifts to the NRC, because the NRC, not the Applicant, has the burden of complying with NEPA. *See, e.g., Duke Power Co.* (Catawba Nuclear Station, Units 1 & 2), CLI-83-19, 17 NRC 1041, 1049 (1983). According to the Commission, “NRC hearings on NEPA issues focus entirely on the adequacy of the NRC Staff’s work.” *Southern Nuclear Operating Co.* (Early Site Permit for Vogtle ESP Site), CLI-07-17, 65 NRC 392, 395 (2007); *see also Progress Energy Florida, Inc.* (Levy County Nuclear Power Plant, Units 1 and 2), CLI-10-2, 71 NRC 27, 34 (2010) (stating that “the ultimate burden with respect to NEPA lies with the NRC Staff”). Contention 10C challenges the FEIS prepared by NRC Staff and questions whether the NRC Staff has satisfied its responsibilities under NEPA. Thus, NRC Staff bears the burden of proof. *See, e.g., Levy County*, CLI-10-2, 71 NRC at 34.

46. However, because “the Staff, as a practical matter, relies heavily upon the Applicant’s ER in preparing the EIS, should the Applicant become a proponent of a particular challenged position set forth in the EIS, the Applicant, as such a proponent, also has the burden on that matter.” *Louisiana Energy Servs., L.P.* (Claiborne Enrichment Center), LBP-96-25, 44 NRC 331, 339 (1996), *rev’d on other grounds, Louisiana Energy Servs., L.P.* (Claiborne Enrichment Center) CLI-97-15, 46 NRC 294 (1997) (citing *Pub. Serv. Co. of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-471, 7 NRC 477, 489 n.8 (1978)).

47. In challenging NRC Staff’s FEIS, Joint Intervenors must identify, with some specificity, the alleged deficiencies in NRC Staff’s NEPA analysis. *See Hydro Resources, Inc.*

(Albuquerque, NM), CLI-99-22, 50 NRC 3, 13 (1999). In NRC adjudications, it is the intervenors' burden to show the significance and materiality of mistakes in the EIS. See *Exelon Generation Co.* (Early Site Permit for Clinton ESP Site), CLI-05-29, 62 NRC 801, 811 (2005) (*Clinton ESP*).

48. NRC Staff's NEPA analysis is deemed adequate unless NRC Staff "has failed to take a 'hard look' at significant environmental questions – i.e., Staff has unduly ignored or minimized pertinent environmental effects." *Duke Energy Corp.* (McGuire Nuclear Station, Units 1 & 2; Catawba Nuclear Station, Units 1 & 2), CLI-03-17, 58 NRC 419, 431 (2003). "Boards do not sit to 'flyspeck' environmental documents or to add details or nuances If the ER (or EIS) on its face comes to grips with all important considerations, nothing more need be done." *Clinton ESP*, CLI-05-29, 62 NRC at 811 (quoting *System Energy Resources, Inc.* (Early Site Permit for Grand Gulf Site), CLI-05-4, 61 NRC 10, 13 (2005)).

49. Finally, the standard of proof here is preponderance of the evidence. See *Pacific Gas and Electric Co.* (Diablo Canyon Power Plant Independent Spent Fuel Storage Installation), CLI-08-26, 68 NRC 509, 521 (2008) (applying a preponderance of the evidence standard to resolution of an environmental contention). Because NEPA does not require certainty or precision or the use of the best methodology, NRC Staff need not prove, and this Board need not find, that its results are the most accurate or were performed with the best methodology. See *Louisiana Energy Services*, CLI-05-20, 62 NRC at 536 (stating that NEPA does not require certainty or precision); *Entergy Nuclear Generating Co. and Entergy Nuclear Operations, Inc.* (Pilgrim Power Station), CLI-10-11, 71 NRC 287, 315 (2010) (*Pilgrim*) (stating that NEPA does not require use of the best methodology). Rather, Staff need only prove by a preponderance of the evidence that its alternatives analysis is reasonable, which is all that NEPA requires. See *Pilgrim*, CLI-10-11, 71 NRC at 316 (stating that an agency is free to select its own methodologies so long as they are reasonable).

C. Scope of the Contested Proceeding

50. NRC hearings are limited to the scope of the admitted contentions, and if intervenors proffer testimony or evidence outside the scope of the admitted contentions, it should not be considered. See *Southern Nuclear Operating Co.* (Early Site Permit for Vogtle ESP Site), CLI-10-5, 71 NRC 90, 100–01 (2010) (agreeing with the Staff that the licensing board properly excluded the intervenors' testimony and exhibits that were outside the scope of the admitted contention); see *also* 10 C.F.R. § 2.340(b) (providing that in an initial decision in a contested proceeding on a COL application, "the presiding officer shall make findings of fact and conclusions of law on the matters put into controversy by the parties to the proceeding," with the exception of matters designated by the Commission to be decided by the presiding officer).

51. The scope of an admitted contention is limited to the issues of law and fact pled with particularity in the intervention petition, including its stated bases, unless the contention is satisfactorily amended in accordance with NRC's rules. *Vogtle ESP*, CLI-10-5, 71 NRC at 100.

52. The Board may not consider matters not in the evidentiary record. See *Pacific Gas & Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 & 2), ALAB-580, 11 NRC 227, 230 (1980) (stating that "it is a statutory requirement that the adjudicatory decisions of this Commission stand or fall on the basis of the record on which they rest").

D. Expert Witness Qualifications

53. An expert opinion is only admissible if the witness is competent to give an expert opinion and adequately states and explains the factual basis for the expert opinion. *Duke Cogema Stone & Webster* (Savannah River Mixed Oxide Fuel Fabrication Facility), LBP-05-04, 61 NRC 71, 81 (2005). An admissible expert opinion must be "based upon sufficient facts or data to be the product of reliable principles and methods that the witness applied to the facts of the case." *Id.* at 80.

54. In addition, a party bears the burden of demonstrating that its witness is qualified

to serve as an expert. *Duke Energy Corp. (Catawba Nuclear Station, Units 1 and 2)*, CLI-04-21, 60 NRC 21, 27 (2004). “A witness may qualify as an expert by knowledge, skill, experience, training, or education to testify [i]f scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue.” *Id.* at 27–28.

55. In this proceeding the qualifications of the expert witnesses were not challenged. The Board finds that NRC Staff, Applicants and Joint Intervenors have demonstrated that each of their witnesses is qualified to serve as an expert. *Id.*

IV. FINDINGS OF FACT AND CONCLUSIONS OF LAW

A. Issues Presented

56. NRC hearings are limited to the scope of the admitted contentions. See *Southern Nuclear Operating Co. (Early Site Permit for Vogtle ESP Site)*, CLI-10-5, 71 NRC 90, 100–01 (2010). Contention 10C, as admitted by the Board, states:

The FEIS discussion of a combination of alternatives is inadequate and faulty. By selecting a single alternative that under represents potential contributions of wind and solar power, the combination alternative depends excessively on the natural gas supplement, thus unnecessarily burdening this alternative with excessive environmental impacts.

August 26, 2011 Order at 32.

57. Contention 10C, as admitted, raises the following issues: (1) whether NRC Staff evaluated reasonable energy alternatives to meet the requirements of NEPA; (2) whether NRC Staff satisfied the requirements of NEPA by evaluating a combination of energy alternatives that included reasonable contributions from wind and solar power; and (3) whether NRC Staff’s analysis of alternatives as they exist and are likely to exist is consistent with NEPA.

58. The scope of the admitted contention “is limited to the issues of law and fact pled with particularity” in the contention and its bases. See *Vogtle ESP*, CLI-10-5, 71 NRC at 100.

B. Witnesses

1. NRC Staff Witnesses

59. For Contention 10C, NRC Staff presented the “Prefiled Direct Testimony of Laura M. (Quinn) Willingham Sponsoring NUREG-1936 into the Hearing Record” (Exhibit NRC000001) to sponsor the introduction of the NRC Staff’s FEIS into the record of this proceeding as required by 10 C.F.R. § 2.337(g).²¹

60. NRC Staff also presented the prefiled direct testimony of Andrew J. Kugler, Senior Project Manager in the U.S. Nuclear Regulatory Commission’s Office of New Reactors Division of Site and Environmental Review, Environmental Projects Branch 2, and Katherine A. Cort, Staff Scientist and Economist at Pacific Northwest National Laboratory (PNNL), operated for the U.S. Department of Energy (DOE) by Battelle Memorial Institute, to present the NRC Staff’s position with regard to Contention 10C and to discuss the process used to develop and evaluate the combination of energy alternatives, present the results of the evaluation of that alternative, and demonstrate its compliance with the requirements of NEPA. See Prefiled Direct Testimony of Andrew J. Kugler and Katherine A. Cort Regarding Contention 10C (Exhibit NRC000004).

61. NRC Staff Witnesses Kugler and Cort testified that for the Calvert Cliffs 3 COL application, the purpose and need for the proposed project as defined by the NRC Staff is to provide 1600 MW of baseload power generation for the State of Maryland. *Id.* at A16 and A17.

62. NRC Staff Witnesses Kugler and Cort testified that as part of the review, NRC Staff assessed the environmental impacts of technically feasible and commercially viable energy alternatives that would be available in Maryland; be able to meet the purpose and need

²¹ Volume 1 (ML11049A000) can be found in Exhibit NRC000003A, Volume 2 (ML11129A179) can be found at Exhibit NRC000003B.

of the project in the timeframe of the proposed project; and supply part of the projected demand for electrical energy. *Id.* at A17.

63. Specifically, NRC Staff Witnesses Kugler and Cort testified that NRC Staff in the FEIS evaluated alternative energy sources, including oil, wind, solar, hydropower, geothermal, wood waste, municipal solid waste, other biomass, and fuel cells. *Id.* at A17.

64. For the combination of energy alternatives, the NRC Staff considered which of the resources to include and what amount each resource could contribute. While any number of options and variations is theoretically possible, the NRC Staff selected those alternative energy sources that are available in Maryland, and at levels of contribution that the NRC Staff reasonably expects can be achieved to meet the purpose and need of the project within the timeframe of the proposed project. *Id.* at A17–A18.

65. NRC Staff Witnesses Kugler and Cort testified that the FEIS's combination of energy alternatives analysis did not under-represent the contribution of wind and solar power to the combination of energy alternatives nor depend excessively on the natural gas component, or unnecessarily burden the alternative with excessive environmental impacts, as the approach used to develop the combination of energy alternatives included the maximum contribution from renewable sources that could be reasonably expected within the region of interest and within the timeframe of the proposed project. In doing so, the size of the contribution from natural gas generation was minimized. *Id.* at A7.

66. NRC Staff Witnesses Kugler and Cort testified that the NRC Staff did not identify any energy alternatives or combination of energy alternatives that would be environmentally preferable to the proposed action, and concluded that none of the alternatives capable of meeting the purpose and need of the project in the region of interest and in the timeframe of the proposed project were environmentally preferable to the proposed project. *Id.* at A47; FEIS at 9-31 (Exhibit NRC000003A).

67. NRC Staff witnesses also provided rebuttal testimony regarding the Applicants' and the Joint Intervenors' direct testimony with respect to Contention 10C. See NRC Staff Rebuttal Testimony (Nov. 18, 2011) (Exhibit NRC000043).

68. NRC Staff Witnesses Kugler and Cort, in responding to Joint Intervenors' assertion that the combination of energy alternatives presented in the FEIS should have been based on the potential of energy resources such as wind and solar, rather than on the reasonably foreseeable contributions from these resources, stated that the FEIS approach used reasonably foreseeable contributions of a resource, and not just a consideration of a resource's theoretical potential – the proper approach for a NEPA analysis. NRC Staff Rebuttal Testimony at A2.

69. Finally, Staff Witnesses Kugler and Cort provided direct testimony at the January 26–27, 2012, evidentiary hearing. See Hearing Tr. at 341–486.

2. Applicants' Witnesses

70. Applicants presented three witnesses: (1) Applicants' Witness Dimitri Lutchenkov, Director, Environmental Affairs and Special Projects for UniStar Nuclear Energy, LLC; (2) Applicants' Witness Stefano Ratti, founder and owner of Chaberton Consulting; and (3) Applicants' Witness Septimus van der Linden, founder, co-owner, and President of BRULIN Associates LLC. See Applicants' Direct Testimony at A3 (Lutchenkov), A7–A8 (Ratti) and A11–A14 (van der Linden) (Exhibit APL000001).

71. Applicants' Witness Lutchenkov testified that the combination of energy alternatives considered in the FEIS was reasonable for the purpose of a NEPA discussion and agreed with the NRC Staff conclusions that the combination of alternatives considered in the FEIS were not environmentally preferable to Calvert Cliffs 3. *Id.* at A21.

72. Applicants' Witness Lutchenkov also testified that any dispute over the specific mix of wind or solar used in the combination of alternatives is not one that would affect the outcome of the NEPA analysis. *Id.* at A75.

73. Applicants' Witness Ratti testified that he expected approximately 21 MW of wind power capacity to come on line in Maryland over the next few years. *Id.* at A37. Applicants' Witness Ratti testified that even under optimistic (though speculative) conditions, up to 100 MW is possible. *Id.* at A38.

74. Applicants' Witness Ratti further testified that the use of wind power to generate 400 MW in Maryland is not foreseeable in the next 10 years, much less 1600 MW. *Id.* Applicants' Witness Ratti stated that, on balance, assuming that the addition of a storage technology was technically and economically feasible, it is plausible, but unlikely, that 100 MW of wind energy could be available in Maryland as "baseload" in the next 10 years. *Id.*

75. Applicants' Witness van der Linden, testifying about CAES storage, stated that the basic objective of utility-scale storage of electricity is to store excess energy or energy with low production costs produced during off-demand periods and to use this energy at a later date to generate power during periods of higher demand. *Id.* at A52.

76. Applicants' Witness van der Linden concluded that the use of CAES in combination with wind or solar resources to generate 1600 MW of continuous base load power to the Maryland grid was not reasonably foreseeable in the next 10 years or longer. *Id.* at A66 and A67.

3. Joint Intervenors' Witnesses

77. Joint Intervenors' Witness Sklar testified that:

[t]he Environmental Impact Statement for the proposed Calvert Cliffs-3 nuclear reactor does not adequately consider the potential contribution of solar, wind, biomass and marine power to Maryland and the surrounding PJM grid which allocates power to Maryland and surrounding states as alternatives to the proposed Calvert Cliffs-3 nuclear reactor.

Sklar Direct Testimony at A4 (JNTR00001). Joint Intervenors' Witness Sklar stated that “. . . the potential contribution of wind power to Maryland and the PJM grid is significantly and substantially larger than [the wind contribution reflected in the FEIS].” *Id.* at A6. Later, Witness Sklar stated that “[w]ith these projects [Bluewater Wind projects proposed in Maryland and Delaware] alone, which only scratch the surface of potential offshore wind power in Maryland and the region, the wind power produced would exceed that considered in the Calvert Cliff-3 FEIS.” *Id.* at A7.

78. Joint Intervenors' Witness Sklar testified that the FEIS understates the potential contribution of both solar and wind. *Id.* at A6 and A8.

79. Joint Intervenors' Witness Sklar testified at the evidentiary hearing that the space that is available for solar panels [in Maryland] would add over 5,000 megawatts of capacity to the State—far, far greater than the 75 MW credit granted in the FEIS. Hearing Tr. at 569; see *also* Sklar Direct Testimony at A9. Additionally, Joint Intervenors' Witness Sklar testified that “what’s also interesting in the State of Maryland . . . is, you have some very big [solar] projects . . . Sun Edison right outside of Baltimore is the largest in the country, in fact. They’re doing a 14.6 megawatt [project].” Hearing Tr. at 577–78.

80. Joint Intervenors' Witness Sklar additionally testified that the FEIS does not adequately recognize the maximum potential contributions of wind and solar power and thus the discussion of alternatives “fails to provide a legally-defensible picture of the situation.” *Id.*

81. Joint Intervenors' Witness Sklar in his filed testimony concluded that the FEIS must be rejected as written and must be re-researched, re-written, and re-submitted. Sklar Direct Testimony at 20.

C. Board Ruling with Regard to Scope of Proceeding and Motion in Limine

82. On December 9, 2011, the NRC Staff filed a Motion in Limine to exclude portions of Joint Intervenors' direct and rebuttal testimony and several of their proposed exhibits, and to strike portions of their rebuttal statement of position. NRC Staff Motion in Limine to Exclude Portions of the Joint Intervenors' Direct and Rebuttal Testimony, Exhibits, and Portions of the Joint Intervenors' Rebuttal Statement of Position (Dec. 9, 2011) at 1 (Motion in Limine). Joint Intervenors filed a Response, stating that they agreed to exclude several passages in their testimony and rebuttal statement of position, but they disagreed with the exclusions requested in the Motion in Limine in all other respects. Joint Intervenors' Opposition to NRC Staff Motion in Limine (Dec. 19, 2011) (ADAMS Accession No. ML11353A248) at 1. In our January 17, 2012, Order (Granting in Part and Denying in Part NRC Staff's Motion in Limine) (ADAMS Accession No. ML12017A200) (unpublished) (January 17, 2012 Order), we stated that, in light of the "vigorous" dispute between the parties as to the materiality of challenged testimony, we would defer our ruling on the disputed portions of Joint Intervenors' Witness Sklar's testimony until consideration of the full evidentiary record. January 17, 2012 Order at 3.

83. As we explained in our Order, evidence is admissible if it is relevant, material, reliable, and not repetitious. See January 17, 2012 Order at 2 (citing 10 C.F.R. §§ 2.337(a), 2.711(e)). Evidence that is irrelevant or immaterial should be excluded to the extent practicable. 10 C.F.R. § 2.337(a). Furthermore, any portion of written presentations or responses to written questions may, by motion or *sua sponte*, be stricken by the Board if it "is irrelevant, immaterial, unreliable, duplicative, or cumulative." 10 C.F.R. § 2.319(d). The NRC Staff argues that portions of Joint Intervenors' testimony are outside the scope of the proceeding or the admitted

contention, and as such concern issues that are immaterial to this adjudication. Motion in Limine at 3–9. Under section 2.711(e), “[i]mmaterial or irrelevant parts of an admissible document will be segregated and excluded as far as is practicable.”²²

84. Having now considered the full evidentiary record on this contention, the Board finds that evidence received on each of the following five categories are outside the scope of the admitted contention, and therefore immaterial to our decision,²³ for the reasons explained below: (1) energy production outside the region of interest; (2) alternatives other than wind or solar; (3) back-up power; (4) alleged violations of the Maryland Renewable Portfolio Standard; and (5) project uncertainty and timeframe. Items that fell into the sixth, “evidentiary or admissibility issues,” category in NRC Staff’s Motion in Limine were resolved in our January 17, 2012 Order. See January 17, 2012 Order at 3–5.

1. Energy Production Outside the Region of Interest

85. In its Motion in Limine, the NRC Staff moved to strike certain testimony concerning energy production outside the region of interest. Motion in Limine at 4–6. We agree with NRC Staff that:

[T]he discussion of power generation outside Maryland can be relevant to consideration of the admitted contention insofar as a party believes that that information relates to generation capacity within Maryland. But information about generation outside of Maryland is not within scope of this hearing to the extent that it is used to challenge the purpose and need statement, or where no connection is made between potential capacity outside of Maryland and generation within the State.

Motion in Limine at 4–5. It is settled law that in order to evaluate the reasonableness of an

²² At the evidentiary hearing held on January 26th and 27th, 2012, this Board acknowledged that some of our questions during the examination of the parties witnesses “may have gotten into areas that are covered by [NRC Staff’s] Motion In Limine,” and that we understood “those objections as applicable to the subject matter [] raised even if it consists of testimony that was offered [at this evidentiary hearing]” Hearing Tr. at 296. Therefore, our ruling on the scope of Contention 10C and on NRC Staff’s Motion in Limine is applicable both to the Joint Intervenors’ pre-hearing filings and to the evidence received during the hearing.

²³ The NRC staff in its Motion in Limine requested that this material be stricken from the record. At this point the record is closed (see Order closing the record) so we cannot strike the matter from the record. We do, however, find it immaterial to our decision and have not further considered it.

alternative, that alternative is compared to the purpose and need of the proposed action. See, e.g., *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 109, 194 (D.C. Cir. 1990), *cert. denied*, 502 U.S. 994 (1991); *Seabrook*, CLI-12-05, ___ NRC at ___ (slip op. at 49).

86. The purpose and need of this proposed NRC action is to “provide for additional large baseload electrical generating capacity within the State of Maryland.” FEIS at 1-9; DEIS at 1-9; see also Applicant’s ER, Rev. 7, at 1-2 (“The purpose is to build and operate a baseload nuclear merchant power plant that will generate needed power for Maryland.”). For its analysis of energy alternatives, the Applicant’s ER assumed a target installed capacity of 1600 MW(e) electrical output. FEIS at 9-3. Accordingly, in order to determine which, if any, alternatives could serve as a reasonable alternative to the proposed action, the NRC Staff assessed whether each alternative could provide 1600 MW(e) of baseload power with Maryland. *Id.*

87. Joint Intervenors proffer information about power generation outside of Maryland, in part, for the purpose of challenging the FEIS’s assessment of reasonable alternatives as those that can, *inter alia*, provide 1600 MWe of baseload power within Maryland. JNTR00001 at 3–6, 20. However, Joint Intervenors had the opportunity to proffer a contention regarding the purpose and need of the proposed project, including the region of interest for the EIS alternatives analysis, when the Draft EIS became available. See NRC Staff Letter Dated April 20, 2010, informing the Licensing Board and the Parties of the Availability of the Calvert Cliffs DEIS; see also 10 C.F.R. § 2.309(f)(2).²⁴ Because they did not, Joint Intervenors cannot now seek to expand their contention beyond its language and proffered basis. *Vogtle ESP*, CLI-10-5, 71 NRC at 100.

88. Further, because Joint Intervenors rely on the stated purpose and need of generating 1600 MW(e) of baseload power in Maryland in order to challenge the adequacy of

²⁴ The purpose and need statement did not change from the draft to the final EIS. Compare FEIS at 1-9 (ADAMS Accession Nos. ML11129A167 and ML11129A179) with DEIS at 1-9 (ADAMS Accession Nos. ML101000012 and ML101000013).

Staff's analysis of alternatives to the proposed project, to permit a challenge to the purpose and need statement itself at this juncture would eliminate the basis for Joint Intervenors' claims.

Thus, we find that all evidence concerning power development outside the State of Maryland, with the exception of evidence meant to inform the possibility for energy development within Maryland, is an untimely challenge to the purpose and need statement in the FEIS and falls outside the scope of this contention. Therefore, as this evidence concerns issues that are immaterial to this adjudication, we decline to consider it in reaching our decision on the merits.

2. Alternatives Other Than Wind and Solar

89. The NRC Staff also moved in its Motion in Limine to exclude evidence concerning alternatives other than wind and solar, arguing that such evidence is outside the scope of this proceeding. Motion in Limine at 6–7. This Board has twice refused to admit claims concerning alternatives other than wind and solar, and we refuse to do so here. See *Calvert Cliffs 3*, LBP-10-24, 72 NRC __, __ (Dec. 28, 2010) (slip op.); see also August 26, 2011 Order at 24. Joint Intervenors acknowledged that such claims are outside the scope of the admitted contention when they agreed to strike their related testimony. See Motion in Limine at 6-7; Joint Intervenors Opposition to NRC Staff Motion *In Limine* (Dec. 19, 2011), at 1. In addition, Contention 10C by its own terms, applies only to the “potential contributions of wind and solar power” to the combination alternative. See *Calvert Cliffs 3*, LBP-10-24, 72 NRC at __ (slip op. at 54). Accordingly, we find that evidence regarding alternatives other than wind and solar is outside the scope of the admitted contention, and therefore immaterial to the issues before us.

3. Back-Up Power

90. The NRC Staff also moved to strike testimony concerning back-up power for the proposed nuclear plant. Motion in Limine at 7. Joint Intervenors argue that back-up power is relevant to Contention 10C because it concerns whether the proposed nuclear unit would

indeed operate as a “baseload” facility. Joint Intervenors’ Direct Testimony at 18–19. But whether or not a source of power generation is a “baseload” source concerns its design and how it is intended to be operated.

91. As defined by the Department of Energy’s Energy Information Administration (DOE/EIA), a baseload plant is “[a] plant, usually housing high-efficiency steam-electric units, which is normally operated to take all or part of the minimum load of a system, and which consequently produces electricity at an essentially constant rate and runs continuously. These units are operated to maximize system mechanical and thermal efficiency and minimize system operating costs.” Exhibit NRC000012 at 2. Because the existence of a back-up source of power does not bear upon whether the proposed Calvert Cliffs 3 meets the definition of a baseload plant, we find that Joint Intervenors’ arguments regarding the proposed unit’s lack of back-up power is outside the scope of this contention. See FEIS at 1-9. We therefore decline to consider testimony regarding back-up power as it is immaterial to the issue presented.

4. Alleged Violations of the Maryland Renewable Portfolio Standard

92. In its Motion in Limine, NRC Staff moved to strike testimony concerning alleged violations of the Maryland Renewable Portfolios Standard (MRPS). Motion in Limine at 7–9. According to NRC Staff, Joint Intervenors’ arguments that the FEIS’s combination of energy alternatives violates the MRPS are not only outside the scope of the admitted contention, but outside the NRC’s jurisdiction. NRC Staff argues that:

Longstanding Commission precedent provides that “the NRC’s adjudicatory process [is] not the proper forum for investigating alleged violations that are primarily the responsibility of other Federal, state, or local agencies.” *PPL Susquehanna, LLC*. (Susquehanna Steam Electric Station, Units 1 and 2 Power Up rate Proceeding), CLI -07-25, 66 NRC 101 at 105, *citing Hydro Resources, Inc.* (2929 Coors Road, Suite 101, Albuquerque, NM 87120), CLI-98-16, 48 NRC 119, 121–22 (1998). If a generator violates Maryland law, then that utility would face repercussions with Maryland authorities. Such claims are not properly heard in this proceeding.

Motion in Limine at 8. The Board agrees that these claims regarding alleged violations of Maryland state law are not within the scope of this proceeding. Therefore, we decline to consider testimony concerning alleged violations of the MRPS as it is immaterial to the issue presented.

93. However, in pre-filed evidence, as well as at the evidentiary hearing, the Board heard evidence from the parties concerning the requirements of the MRPS for determining what impact, if any, MRPS requirements would have on the future growth of alternative energy generation in Maryland. See, e.g., Hearing Tr. at 441 et seq; 494 et seq; 639 et seq; Exhibit NRC000043 at 7–8; Exhibit APL000005. In its Motion in Limine, NRC Staff recognized that “[t]he Joint Intervenors’ discussion of the MRPS’ requirements and renewable energy development incentives, and what impact these requirements and incentives might have on projected solar and wind development in Maryland, is within the scope of this proceeding.” Motion in Limine at 8. The Board agrees with NRC staff and finds that such information is within the scope of the admitted contention, as it relates to projected future solar and wind development in Maryland.

5. Project Uncertainty and Timeframe

94. Finally, the NRC Staff moved to strike testimony concerning the project’s uncertainty and timeframe. Motion in Limine at 9. Joint Intervenors argue that the Board should consider uncertainty in the probability and timeframe of construction of the proposed nuclear unit in comparison to uncertainty in the solar and wind contributions in the combination of energy alternatives. Joint Intervenors’ Rebuttal Statement of Position at 8-9. For the reasons set forth below, the Board finds that this position disregards the purpose of an alternatives analysis under NEPA and the proposed action under Commission consideration. See *USEC Inc. (American Centrifuge Plant)*, CLI-06-10, 63 NRC 451, 467 (2006) (holding that the

intervenor “erroneously appears to assume that the NEPA analysis of ‘alternatives’ should ignore the stated purposes of the project and the Applicants’ needs”) (*USEC*).

95. In the ER, the Applicants stated the purpose of the project is to “build and operate a baseload nuclear merchant power plant that will generate needed power for Maryland.” Calvert Cliffs 3 ER at 1-2. Based upon the application and independent analysis, NRC Staff developed the purpose and need statement for the proposed Federal action to be “to provide for additional large baseload electrical generating capacity within the State of Maryland.” Exhibit NRC000003A at 1-9; see *also* Exhibit NRC000004 at 14. In order to determine the timeframe for the proposed action, NRC Staff utilized the information in the application, which forecasts the completion of construction for Calvert Cliffs 3 at the end of 2015. See, e.g., FEIS, Chapter 8 (Need for Power) at 8-1. The timeframe for the completion of construction was subsequently changed to the end of 2017; in its direct testimony, the NRC Staff notes that this does not impact its energy alternatives analysis. See Calvert Cliffs 3 Application Section 1.1.3 at 1-14; see *also* NRC Staff Direct Testimony (Exhibit NRC000004) at 13.

96. As noted above, the admitted contention concerns the NRC Staff’s evaluation of solar and wind power in the combination of energy alternatives in the FEIS. *Calvert Cliffs 3*, LBP-10-24, 72 NRC at ___ (slip op. at 54). In order to evaluate whether or not a proposed alternative is a reasonable alternative to the proposed action, the alternative is compared to the purpose and need of the proposed action. See *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d at 194. Therefore, as with our ruling concerning the region of interest above, Joint Intervenors’ challenge disregards the purpose and need statement. To permit a challenge to the purpose and need statement itself at this juncture would eliminate the basis for Joint Intervenors’ claims.

97. Further, when the applicant revised its forecast completion of construction date, the Joint Intervenors had the opportunity to file a new or amended contention consistent with

10 C.F.R. § 2.309. They did not. The Joint Intervenors cannot now expand the scope of the admitted contention to challenge the purpose and need statement in the FEIS. Therefore, we decline to consider testimony concerning uncertainty in the completion of construction for the proposed nuclear unit because it is outside the scope of the admitted contention, which concerns only the solar and wind contributions to the combination of energy alternatives and environmental impacts thereof.²⁵

98. In conclusion, for the reasons set forth above, we find that Joint Intervenors' pre-filed testimony, and evidence received at evidentiary hearing concerning power generation outside the region of interest, generation alternatives other than wind and solar, back-up power, alleged violation of the MRPS, and uncertainty in the forecast completion of construction for the proposed nuclear unit, is outside the scope of this proceeding and the admitted contention, and is therefore immaterial and not considered in reaching our decision on the merits. See January 17, 2012 Order at 2–3 (deferring ruling on challenged portions of Joint Intervenors' testimony until after consideration of the full evidentiary record).

D. Legal and Factual Framework – Alternatives Analysis

1. Legal Principles Applicable to Alternatives Analysis

99. The NRC is required by NEPA and its own regulations to issue an FEIS addressing the environmental impacts of the proposed action and comparing them to the impacts of alternatives to the proposed action. See 10 C.F.R. § 51.53(c)(2); see also NEPA § 102(2)(C)(i)–(iii), 42 U.S.C. § 4332(2)(C)(i)–(iii). NEPA requires an FEIS to consider only “reasonable” alternatives, not every conceivable alternative. *FirstEnergy Nuclear Operating Co.*

²⁵ As with any project, the proposed nuclear plant may or may not be built, and it may or may not be built by any date forecast by the Applicants. Indeed, the Applicants have noted several obstacles to its initiation, let alone completion of construction of the proposed plant. See Hearing Tr. at 521–22. However, the principle stands that the Commission considers the application before it, and “when reviewing a license application filed by a private applicant, the agency . . . should take into account the needs and goals of the parties involved in the application.” *USEC, CLI-06-10*, 63 NRC at 467.

(Davis-Besse Nuclear Power Station, Unit 1), CLI-12-08, 75 NRC __, __ (Mar. 8, 2012) (slip op. at 5) (citing *NRDC v. Martin*, 458 F.2d 827, 834, 837 (DC Cir. 1972)).

100. To this end, the Commission has held that the NRC Staff's EIS need only discuss those alternatives that would bring about the ends of the proposed action. *Seabrook*, CLI-12-05, 75 NRC at __ (slip op. at 49); see also *Rancho Seco*, CLI-93-3, 37 NRC at 144–45. The Commission gives “substantial weight” to the preferences of the applicant in this regard. See *Seabrook*, CLI-12-05, 75 NRC at __ (slip op. at 49); *USEC*, CLI-06-10, 63 NRC at 467 (holding that the intervenor “erroneously appears to assume that the NEPA analysis of ‘alternatives’ should ignore the stated purposes of the project and the applicants’ needs.”).

101. NEPA does not require a detailed discussion of alternatives deemed remote and speculative or whose effects cannot be readily ascertained. *Vermont Yankee*, 435 U.S. at 551. Whether an alternative is remote and speculative must be decided by the agency “in light of the facts then available to it”; an agency action cannot be found to be arbitrary and capricious based upon later facts. *Id.* at 554. “An agency's consideration of alternatives is sufficient if it considers an appropriate range of alternatives, even if it does not consider every available alternative.” *Headwaters, Inc. v. Bureau of Land Management, Medford Dist.*, 914 F.2d 1174, 1181 (9th Cir. 1990). “Common sense also teaches us that the ‘detailed statement of alternatives’ cannot be found wanting simply because the agency failed to include every alternative device and thought conceivable by the mind of man.” *Vermont Yankee*, 435 U.S. 519 at 551.

102. NEPA does not require an agency to explore every extreme possibility which might be conjectured; rather, NEPA requires considering alternatives “as they exist and are likely to exist.” *Carolina Environmental Study Group v. United States*, 510 F.2d 796, 801 (D.C. Cir. 1975) (*Carolina Environmental Study Group*). As the Commission recently held, “in most cases a ‘reasonable’ energy alternative is one that is currently commercially viable, or would

become so in the relatively near term. Such an assessment generally will be sufficient to provide the requisite ‘hard look’ under NEPA.” *Seabrook*, CLI-12-05, 75 NRC at ___ (slip op. at 53).

103. The Commission acknowledged that a technology that is not commercially viable at the time of the application may be a “reasonable energy alternative,” if that technology “is under development for large-scale use and is ‘likely to’ be available during” the licensing period. *Id.* at 54 & n.245.

104. However, the Commission concluded, “[e]xcept in rare cases where there is evidence of unusual predictive reliability, it is not workable to consider, for purposes of NEPA analysis, what are essentially hypothetical or speculative alternatives as a source of future baseload power generation.” *Id.* at 53, 55 n.252.

105. Thus, “in assessing energy-alternatives contentions, practicality requires us to consider chiefly, often exclusively, alternatives that can be shown to have viability today or in the near future.” *Id.* at n.251.

106. In determining compliance with NEPA, the Board’s role is not to determine which of the parties’ calculations or methodologies is the best or most precise: “[t]here is no NEPA requirement to use the best scientific methodology, and NEPA should be construed in the light of reason if it is not to demand virtually infinite study and resources.” *Pilgrim*, CLI-10-11, 71 NRC at 315.

107. Finally, in light of the limiting principle of the NEPA rule of reason, an EIS is not intended to be a research document, reflecting the frontiers of scientific methodologies, studies, and data. *Seabrook*, CLI-12-05, 75 NRC at ___ (slip op. at 52–53).

2. Factual Background on Alternatives Analysis

108. In preparing the FEIS, NRC Staff assessed the environmental impacts of technically feasible and commercially exploitable energy alternatives that would be available in Maryland, the region of interest, and which would be able to meet the purpose and need of the proposed project within the timeframe of the proposed project. NRC Staff Direct Testimony at A10 (Exhibit NRC000004).

109. NRC Staff determined that, given that the proposed project is intended to supply 1600 MW of baseload power, a reasonable alternative to the proposed project would also need to be capable of supplying baseload power. Hearing Tr. at 343; *USEC*, CLI-06-10, 63 NRC at 467 (rejecting intervenor's assertion that the NEPA analysis of "alternatives" should ignore the stated purposes of the project).

E. Alternatives Analysis in the FEIS

1. NRC Staff Evaluated Combinations of Energy Alternatives

110. NRC Staff evaluated a wide range of possible energy alternatives in Section 9.2 of the FEIS. FEIS at 1-9 (Exhibit NRC00003A). NRC Staff concluded that coal-fired and natural gas-fired plants were feasible alternatives to the proposed project. *Id.* at 9.2.2.

111. The NRC Staff evaluated a number of other individual alternatives to the operation of an additional nuclear unit at the proposed site. NRC Staff Direct Testimony at A13 to A17 (Exhibit NRC000004); FEIS at Section 9.2.3 (Exhibit NRC00003A).

112. NRC Staff determined that none of the other energy alternatives evaluated including oil, wind, solar, hydropower, geothermal, wood waste, municipal solid waste, other biomass, and fuel cells would be capable, individually, of meeting the purpose and need of the proposed action. *Id.* at A17.

113. NRC Staff found that each of the other energy alternatives considered were insufficient individually to generate the equivalent of Calvert Cliffs 3's proposed 1600 MW

because of the small size of the resource or lack of cost-effective opportunities in Maryland. FEIS at 8-9-8-10 (Exhibit NRC000003A).

114. NRC Staff considered a combination of energy alternatives that included what it determined to be the maximum contribution from renewable sources that would be reasonably foreseeable, within the region of interest, and within the timeframe of the proposed project. NRC Staff Direct Testimony at A48 (Exhibit NRC000004); Hearing Tr. at 368-73. In doing so, NRC Staff minimized, to the extent feasible, the size of the contribution from natural gas generation. Hearing Tr. at 369.

115. For those energy sources (such as wind and solar) that NRC Staff included in the combination of energy alternatives that were not capable of meeting the purpose and need of the proposed project individually, NRC Staff developed the individual contributions to the combination based on projections and information from authoritative sources including the United States Department of Energy, Energy Information Agency, and the State of Maryland (Maryland Public Service Commission Ten Year Plan 2009-2018) (Exhibit NRC000018). See FEIS at 9-20, 9-28 (Exhibit NRC000003A); NRC Staff Direct Testimony at A18-A20 (Exhibit NRC000004); see *also* Hearing Tr. at 385-86, 419-31.

116. NRC Staff did not assume that each individual energy technology would be able to reach its theoretical maximum potential. Hearing Tr. at 343. Rather, NRC Staff struck a balance between the limited implementation successes for energy technologies such as wind and solar and the potential of the resource. *Id.* The resulting combination of energy alternatives represents what NRC Staff concluded could be reasonably achieved within the region of interest and the timeframe of the proposed project. NRC Staff Direct Testimony at A18 (Exhibit NRC000004); Hearing Tr. at 368-73. NRC Staff Witness Kugler, in discussing combinations of natural gas and wind, concluded that even in going from a 1,200 MW gas plant down to 900 MW gas plant coupled with a 1000 MW wind farm – it would not be environmentally preferable

to the proposed action. See Hearing Tr. at 370–72 (responding to Board questions of environmental impacts).

117. Applicants' Witness Lutchenkov testified that the combination of energy alternatives considered in the FEIS was reasonable for the purpose of a NEPA discussion and agreed with the NRC Staff conclusions that the combination of alternatives considered in the FEIS were not environmentally preferable to Calvert Cliffs 3. Applicants' Direct Testimony at A21 (Exhibit APL000001).

118. Joint Intervenors, as previously set forth herein, assert that the FEIS does not adequately consider the potential contribution of solar, wind, biomass and marine power to Maryland and the surrounding PJM grid as alternatives to the proposed Calvert Cliffs 3. Sklar Direct Testimony at A4 (JNTR00001).

119. This Board finds that the FEIS need only discuss those alternatives that will bring about the ends of the proposed action – a large baseload facility in the region of interest. See *Seabrook*, CLI-12-05, 75 NRC at ___ (slip op. at 49) (stating that a NEPA analysis need only discuss those alternatives that would bring about the ends of the proposed action). Given that the proposed project is intended to supply 1600 MW of baseload power in Maryland, a competitive alternative, or combination of alternatives, would also need to be capable of supplying 1600 MW of baseload power in the region of interest. See *id.* We find that Joint Intervenors failed to establish that its proposed alternatives, or combinations thereof, could provide baseload power in the region of interest. In fact, Joint Intervenors' Witness Sklar stated that Joint Intervenors' preferred alternative of a combination of wind and solar would not be a baseload source of electricity. Hearing Tr. at 605; see also *USEC*, CLI-06-10, 63 NRC at 467 (holding that the intervenor "erroneously appears to assume that the NEPA analysis of 'alternatives' should ignore the stated purposes of the project and the applicants' needs.").

Accordingly, we find that NRC Staff and the Applicant demonstrated through testimony and exhibits that the FEIS consideration of alternatives was reasonable.

2. The FEIS Presents a Well Reasoned Explanation of NRC Staff's Examination of Alternatives and Combination of Alternatives

120. The NRC Staff stated that the FEIS considered alternatives that were "reasonably foreseeable" as opposed to theoretically possible or maximally possible. See NRC Staff Rebuttal Testimony at A6 (Exhibit NRC000043); see *also* NRC Staff Direct Testimony at A19 (Exhibit NRC000004).

121. In developing the FEIS, NRC Staff did not use a value for wind energy, or any other energy source in the combination of energy alternatives, based on what was theoretically possible. NRC Staff Rebuttal Testimony at A6 (Exhibit NRC000043). Rather, NRC Staff used a value based on what it determined was reasonably foreseeable in the region of interest and in the timeframe of the proposed project. *Id.*

122. NRC Staff testified that it did not speculate in the FEIS concerning the achievement of theoretical maximums (i.e., converting "potential" into reality) for individual energy technologies. Rather, NRC Staff stated that it struck a balance between the limited implementation successes for energy technologies such as wind and solar, and the potential of those resources in Maryland. *Id.*

123. Staff testified that the maximum theoretical potential of a resource by itself is not the proper approach to determine the contributions of that resource to a combination of energy alternatives considered in a NEPA analysis in an FEIS. NRC Staff Rebuttal Testimony at A6 (Exhibit NRC000043); see *also Long Island Lighting Co.* (Shoreham Nuclear Power Station, Unit 1), ALAB-156, 6 AEC 831, 836 (1973) (the concept of a "hard look" is tempered by a "rule of reason" that requires agencies to address only impacts that are reasonably foreseeable – not remote and speculative).

124. NRC Staff concluded that if wind and solar power were utilized as the energy

alternatives, the alternatives would need to be coupled with a storage mechanism such as CAES to provide baseload power. NRC Staff Direct Testimony at A44 (Exhibit NRC000004).

125. To derive future wind contributions to the combination of energy alternatives, NRC Staff relied on electricity generation projections from U.S. DOE/EIA's Annual Energy Outlook (Exhibit NRC000022), MPSC's Ten-Year Plan (Exhibit NRC000016), and the National Renewable Energy Laboratory (NREL) 2010 report related to large-scale off-shore wind in the United States (Exhibit NRC000024). NRC Staff Direct Testimony at A34 (Exhibit NRC000004); Hearing Tr. at 345–46.

126. To derive future solar contributions to the combination of energy alternatives, NRC Staff relied on electricity generation projections from U.S. DOE/EIA's Annual Energy Outlook (Exhibit NRC000022), and MPSC's Ten-Year Plan (Exhibit NRC000016). NRC Staff Direct Testimony at A38 (Exhibit NRC000004); Hearing Tr. at 395–98.

127. For the ReliabilityFirst Corporation/East region, which includes Maryland,²⁶ DOE/EIA projects a growth of 420 MW of on-shore wind capacity and 200 MW of offshore wind capacity between 2010 and 2035. DOE/EIA 2011b (Exhibit NRC000022). NRC Staff conservatively assumed that Maryland accounts for a third of this growth, which would equate to about 210 MW of installed capacity. NRC Staff Direct Testimony at A34 (Exhibit NRC000004); Hearing Tr. at 400–01. Using 34 percent for the capacity factor of wind, Staff calculated that 210 MW of wind capacity equates to about 71 MW of baseload capacity.

128. NRC Staff determined that the largest feasible contribution from wind power would be 100 MW. For wind power, 100 MW equates to at least 250 to 300 MW of installed capacity coupled with a 100 MW CAES plant. NRC Staff Direct Testimony at A34 (Exhibit

²⁶ The ReliabilityFirst Corporation/East region is formerly the Mid-Atlantic Area Council. ReliabilityFirst Corporation is one of eight regional electric reliability councils that sets and enforces electric reliability standards. Maryland is in the ReliabilityFirst Corporation territory. RFC 2011 (Exhibit NRC000020).

NRC000004); Hearing Tr. at 362–65.

129. NRC Staff concluded that a contribution of 75 MW of solar generation in the combination of energy alternatives was reasonable. NRC Staff Direct Testimony at A48 (Exhibit NRC000004); FEIS at 9-28 (Exhibit NRC000003A).

130. DOE/EIA predicts 0 MW for utility solar capacity between 2010 and 2035 in the region that includes Maryland, and the addition of 810 MW of end-use solar capacity (all photovoltaic, or PV) in that region over the same period (DOE/EIA 2011b). NRC Staff Direct Testimony at A42 (Exhibit NRC000004). Assuming that Maryland accounts for roughly a third of the region, additions of end-use solar capacity in Maryland by 2035 would be about 270 MW. According to DOE/EIA, an average solar capacity factor ranges from 18 to 25% in the U.S. DOE/EIA 2010b (Exhibit NRC000021). Using a conservatively high 25% capacity factor, the 270 MW of capacity equates to about 68 MW of baseload capacity. NRC Staff Direct Testimony at A42 (Exhibit NRC000004). Typical solar-to-electric power plants require 5 to 10 acres (ac) for every MW of generating capacity. NRC Staff Direct Testimony at A42 (Exhibit NRC000004); FEIS at 9-23 (Exhibit NRC000003A). NRC Staff found that using a 270 MW solar contribution would impact 1350 to 2700 acres of land and associated terrestrial resources, and that a larger solar contribution would impact a correspondingly larger land area. *Id.*

131. NRC Staff concluded, based upon review of the viability of the energy production technologies within the region of interest, that a 100 MW wind and 75 MW solar baseload equivalent contributions to the combination of energy alternatives were reasonable. NRC Staff Direct Testimony at A48 (Exhibit NRC000004); Hearing Tr. at 368–73.

132. Alternative energy sources, including wind, solar, hydropower, and biomass sources, and conservation and demand-side management programs added up to a baseload equivalent of 400 MW. NRC Staff Direct Testimony at A25 (Exhibit NRC000004); Hearing Tr. at 368. NRC Staff allocated the remaining 1200 MW of baseload needed to non-renewable

energy sources – coal or natural gas. NRC Staff Direct Testimony at A25 (Exhibit NRC000004); FEIS at 9-30, Table 9-4 (Exhibit NRC000003A). Of the two, NRC Staff determined that natural gas resulted in the least environmental impacts. NRC Staff Direct Testimony at A25 (Exhibit NRC000004); Hearing Tr. at 368.

133. NRC Staff considered a scenario in which the wind contribution was quadrupled to 400 MW of baseload power, equivalent to an installed capacity of at least 1000 to 1200 MW with a 400-MW CAES plant. NRC Staff Direct Testimony at A35 (Exhibit NRC000004). NRC Staff concluded that, under this scenario, the combination alternative would require 900 MW from a natural gas-fired plant in order to meet the target generation capacity of 1600 MW. NRC Staff Direct Testimony at A35 (Exhibit NRC000004); FEIS at 9-28–9-30 (Exhibit NRC000003A); Hearing Tr. at 366–69.

134. NRC Staff noted that the MPSC considered the development potential for wind power in Maryland in a 2008 report (MPSC 2008b (Exhibit NRC000023)) and concluded the economic benefits from renewable sources remain uncertain and challenging. FEIS at 9-20 (Exhibit NRC00003A). MPSC found that onshore wind yields net economic benefits, albeit on a small scale. Additionally, MPSC found that offshore wind, as modeled in the report, does not yield economic benefits. *Id.*

135. NRC Staff Witnesses Kugler and Cort testified that increasing the contributions of wind and solar power to the combination of energy alternatives beyond values that could reasonably be expected, and decreasing the contribution from the natural gas plant, would not lead to an alternative that was environmentally preferable to the proposed action. NRC Staff Direct Testimony at A35 (Exhibit NRC000004); FEIS at 9-20, 9-31 (Exhibit NRC00003A). NRC Staff testified that the basis for this conclusion is that the expansion of the wind and solar contributions causes a continual increase in the environmental impacts associated with these sources, even as the emissions from the natural gas plant decrease. Hearing Tr. at 469–73.

136. Joint Intervenors' Witness Sklar stated that “. . . the potential contribution of wind power to Maryland and the PJM grid is significantly and substantially larger than [the wind contribution reflected in the FEIS].” Sklar Direct Testimony at A6 (JNTR00001). Witness Sklar also cited the now cancelled Bluewater Wind projects as examples of wind power potential. *Id.* at A7.

137. Joint Intervenors' Witness Sklar testified that the FEIS understates the potential contribution of both solar and wind. *Id.* at A6 and A8.

138. Applicants' Witness Ratti testified that he expects approximately 21 MW of wind power capacity to come on line in the next few years and that under optimistic (though speculative) conditions, up to 100 MW is possible. Applicants' Direct Testimony at A37 (Exhibit APL000001).

139. With respect to solar power generation, Applicants' Witness Ratti testified that 1600 MW(e) of solar power is not possible in Maryland, the region of interest, at this time. *Id.* at 51. Rather, he testified, 75 MW(e) baseload of solar power, as set forth in the FEIS analysis, was a reasonable assumption. *Id.*

140. Applicants' Witness Lutchenkov concluded that any dispute over the specific mix of wind or solar used in the combination of alternatives is not one that would affect the outcome of the NEPA analysis. *Id.* at A75.

141. The FEIS presents a well reasoned explanation for examining a combination alternative of 100 MW wind and 75 MW solar with a natural gas contribution of 1475 MW. While the Joint Intervenors testified at length about the theoretical potential of wind and solar, they failed to identify any wind or solar projects that were likely to come on line before 2017, or any projects that would supply more than the 175 MW identified in the FEIS. A reasonable alternative is one that is commercially viable, or one that will become viable in the relatively near term. *Seabrook*, CLI-12-6, 75 NRC at ___ (slip op. at 53). No evidence was presented to

establish the current commercial viability of wind or solar power at a greater scale than that considered in the FEIS (i.e., 75 MW solar and 100 MW wind). Since the NRC Staff's explanation was reasonable, and we are not persuaded that a greater wind or solar contribution is commercially viable at this time, we find the FEIS combination alternative to be reasonable.

3. NRC Staff's Inclusion of CAES Was Not Speculative

142. NRC Staff evaluated alternative energy resource combinations together with storage that included the maximum contribution from renewable sources that would be reasonably foreseeable within the region of interest and within the timeframe of the proposed project. FEIS Section 9.2.3.2 (Exhibit NRC000003A).

143. NRC Staff evaluated CAES facilities. FEIS Section 9.2.3.2 (Exhibit NRC000003A). NRC Staff found no evidence that any company has made any proposal for a CAES facility in Maryland. NRC Staff Direct Testimony at A46 (Exhibit NRC000004).

144. Applicants' Witness van der Linden, stated in his testimony that for both the wind and solar components of the combination of energy alternatives, NRC Staff's inclusion of these resources is speculative, at least to the extent that they rely on the availability of CAES. Applicants' Direct Testimony at A73–A74 (Exhibit APL000001).

145. For the reasons set forth below, the Board concludes that the use of CAES in the combination of energy alternatives was not speculative, but was a reasonable inclusion.

146. Applicants' Witness van der Linden did not rule out the possibility of CAES; rather, he stated that he does not consider its use to be likely in Maryland in the foreseeable future. *Id.* at A68.

147. NRC Staff included a smaller CAES facility in the combination of energy alternatives in order to include wind and solar resources in that alternative. NRC Staff Direct Testimony at A46 (Exhibit NRC000004).

148. NRC Staff did not consider the use of some CAES in combination with wind and solar to be speculative. NRC Staff Rebuttal Testimony at A21 (Exhibit NRC000043).

149. However, NRC Staff concluded that including a CAES facility in the region of interest large enough to significantly reduce air emissions would be speculative. *Id.* at 74.

150. Similarly, Applicants' Witness van der Linden concluded that the use of CAES in combination with wind or solar resources to generate 1600 MW of continuous base load power to the Maryland grid was not reasonably foreseeable in the next 10 years or longer. Applicants' Direct Testimony at A66 and A67 (Exhibit APL000001).

151. Joint Intervenors' Witness Sklar testified that CAES storage methods have generally been used during shorter duration reductions as when the wind drops for 20 minutes. Hearing Tr. at 619–20. However, we find that the Joint Intervenors did not provide any information to show that a large CAES facility is reasonably foreseeable and should have been considered by the NRC Staff in its NEPA analysis.

152. Based on the information described above, we conclude that NRC Staff's consideration of a smaller CAES facility in the combination of energy alternative was reasonable. See *Davis-Besse*, CLI-12-08, 75 NRC at ___ (slip op. at 5) (citing *NRDC v. Martin*, 458 F.2d 827, 834, 837 (DC Cir. 1972)) (NEPA requires an EIS to consider only reasonable alternatives). The NRC Staff and Applicants demonstrated that a CAES facility in the region of interest large enough to significantly reduce air emissions is speculative and not reasonably foreseeable. FEIS Section 9.2.3.2 (Exhibit NRC00003A); NRC Staff Direct Testimony at A46 (Exhibit NRC000004).

153. Accordingly, we conclude that the NRC Staff's evaluation of CAES in the FEIS is reasonable.

V. CONCLUSIONS OF LAW

154. The Board has considered all of the evidence presented by the parties on Contention 10C. Based upon a review of the entire record in this proceeding and the proposed findings of fact and conclusions of law submitted by the parties, and based upon the findings of fact set forth above, which are supported by reliable, probative and substantial evidence in the record, the Board has decided all matters in the controversy concerning Contention 10C and reaches the following conclusions.

155. With respect to NRC Staff's pending motion, the Board finds that the Joint Intervenors' pre-filed testimony, and evidence received at evidentiary hearing concerning power generation outside the region of interest, generation alternatives other than wind and solar, back-up power, alleged violation of the MRPS, and uncertainty in the forecast completion of construction for the proposed nuclear unit are outside the scope of this proceeding and the admitted contention, and therefore immaterial to our decision in this proceeding.

156. Turning to the FEIS, this Board finds the FEIS complies with the requirements of NEPA. Taken together, NRC Staff and Applicants presented evidence that demonstrated and established that NRC Staff, as required under NEPA, examined a reasonable combination of alternatives within the range dictated by the nature and scope of the Applicants' proposal and NRC Staff-developed purpose and need statement.

157. The FEIS properly evaluated the combination of energy alternatives that included reasonable contributions from wind and solar power, coupled with CAES. NRC Staff analyzed alternatives as they exist and are likely to exist, consistent with NEPA case law.

158. Joint Intervenors failed to establish that its proposed alternatives could achieve the purpose of the proposed action – a 1600 MW baseload plant in Maryland, the region of interest for the proposed project.

159. We hold the FEIS complies with the requirements of NEPA. Contention 10C is hereby resolved in favor of the NRC Staff and the Applicants.

Respectfully submitted,

/Signed (electronically) by/

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/Executed in accord with 10 C.F.R. 2.304(d)/

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Dated at Rockville, Maryland
This 20th day of April, 2012

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)
)
CALVERT CLIFFS 3 NUCLEAR PROJECT,)
LLC, and UNISTAR NUCLEAR OPERATING) Docket No. 52-016-COL
SERVICES, LLC)
)
(Calvert Cliffs Nuclear Power Plant, Unit 3))

CERTIFICATE OF SERVICE

I hereby certify that copies of NRC Staff Proposed Partial Initial Decision Findings of Fact and Conclusions of Law on Contention 10C have been served upon the following persons by Electronic Information Exchange this 20th day of April, 2012:

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