

November 18, 2011

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) Docket No. 52-016
OPERATING SERVICES, LLC)
)
(Calvert Cliffs Nuclear Power Plant, Unit 3))

UNISTAR REBUTTAL STATEMENT OF POSITION ON CONTENTION 10C

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Dated at Washington, District of Columbia
this 18th day of November 2011

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I. INTRODUCTION

Pursuant to 10 C.F.R. § 2.1207(a)(2), the Licensing Board’s Order (Revising Initial Schedule), dated June 24, 2011, and the Order (Providing Direction on Pre-filed Evidentiary Material), dated September 22, 2011, Calvert Cliffs 3 Nuclear Project and UniStar Nuclear Operating Services (collectively, “UniStar”) hereby submit this Rebuttal Statement of Position on Contention 10C. This Rebuttal Statement of Position is supported by rebuttal testimony from Dimitri Lutchenkov, Stefano Ratti, and Septimus van der Linden (“UniStar Rebuttal Testimony”) and the accompanying exhibits.

This Rebuttal Statement of Position responds to the legal arguments, factual assertions, and supporting materials filed by the Joint Intervenors on October 28, 2011.¹ This Rebuttal Statement of Position also addresses the NRC Staff statement of position and testimony filed on October 21, 2011.² For the reasons set forth below, the NRC Staff analysis of energy

¹ “Testimony of Scott Sklar, President of the Stella Group, Ltd., on Contention 10,” dated October 28, 2011 (“Sklar Testimony”) (Exh. JNT000001).

² “NRC Staff Initial Statement of Position,” dated October 21, 2011 (“NRC Staff Position Statement”); “Prefiled Direct Testimony of Andrew J. Kugler and Katherine A. Cort

alternatives in the Final Environmental Impact Statement for Calvert Cliffs 3 (“FEIS”)³ satisfies the requirements of the National Environmental Policy Act (“NEPA”). Contention 10C should be resolved in favor of UniStar and the NRC Staff.

II. SUMMARY OF ARGUMENT

As required by NEPA, in the FEIS the NRC Staff considered a range of energy alternatives that could satisfy the project’s purpose and need — generating 1600 MW(e) of baseload generation in Maryland. The energy alternatives considered included coal-fired generation, natural gas, and a combination of alternatives (a mix of renewables, in conjunction with energy storage, and natural gas), in addition to nuclear. These alternatives and their environmental impacts were fully discussed in the FEIS.

Based on the FEIS discussion of energy alternatives, the NRC Staff has taken the requisite hard look at the significant environmental considerations associated with energy alternatives and has “come to grips with all important considerations.”⁴ The NRC Staff considered the technical feasibility and economic viability of these alternative sources of energy and took into account the potential contribution of these sources that can reasonably be expected within the timeframe of the proposed project. In contrast, the testimony of the Intervenors’ witness takes a flawed and overly-simplistic view of the potential contribution of wind and solar generation that does not account for the economic, commercial, and technical limitations

Concerning Environmental Contention 10C,” dated October 21, 2011 (Exh. NRC000004) (“NRC Staff Testimony”).

³ Environmental Impact Statement for the Combined License (COL) for Calvert Cliffs Nuclear Power Plant Unit 3, Final Report, NUREG-1936 (May 2011) (ADAMS Accession Nos. ML11129A167, ML1129A179) (Exhs. NRC00003A and NRC00003B).

⁴ *Exelon Generation Co., LLC* (Early Site Permit for Clinton ESP Site), CLI-05-29, 62 NRC 801, 811 (2005).

associated with development of these resources. And, the Intervenor's witness wholly fails to grapple with the need for energy storage to produce baseload-equivalent power from wind and solar. Instead, the witness attempts to dismiss the concept of baseload power and would inappropriately redefine the project purpose.

Overall, the Intervenor's testimony and exhibits do not call into question the reasonableness of the NRC Staff's combination of alternatives. The hypothetical combination of energy alternatives, including wind and solar, in conjunction with energy storage, and natural gas, selected by the NRC Staff is reasonable and would satisfy the purpose and need for the proposed action. As discussed in the FEIS, and as supplemented by the testimony and exhibits introduced in this hearing, no reasonable combination of energy alternatives is environmentally preferable to the proposed action — even accounting for some uncertainty in the amount of baseload energy that could be produced using wind or solar, in conjunction with energy storage, and in combination with natural gas. The FEIS satisfies Part 51 and NEPA.

III. BACKGROUND

The procedural history of Contention 10C was discussed in detail in the “UniStar Statement of Position on Contention 10C,” dated October 21, 2011 (“UniStar Position Statement”), as well as in the “Direct Testimony of UniStar Witnesses Dimitri Lutchenkov, Stefano Ratti, and Septimus van der Linden,” dated October 21, 2011 (“UniStar Testimony”).

The legal standards applicable to Contention 10C were also addressed in the UniStar Position Statement. In short, NEPA requires that agencies take a “hard look” at the environmental impacts of a proposed action and reasonable alternatives to that action.⁵ This

⁵ See *La. Energy Servs., L.P. (Claiborne Enrichment Ctr.)*, CLI-98-3, 47 NRC 77, 87-88 (1998); see also *Balt. Gas & Elec. Co. v. NRDC*, 462 U.S. 87, 97-98 (1983) (holding that NEPA requires agencies to take a “hard look” at environmental consequences prior to taking major actions).

“hard look” is subject to a “rule of reason.”⁶ This means that an “agency’s environmental review, rather than addressing every impact that could possibly result, need only account for those that have some likelihood of occurring or are reasonably foreseeable.”⁷ When faced with uncertainty, NEPA only requires “reasonable forecasting.”⁸ NRC licensing boards do not sit to “flyspeak” the FEIS or to add minor details or nuances to the analysis.⁹

IV. UNISTAR REBUTTAL WITNESSES

UniStar’s rebuttal testimony is presented by the same three witnesses that provided initial testimony: Mr. Dimitri Lutchenkov, Mr. Stefano Ratti, and Mr. Septimus van der Linden. A description of their qualifications was provided in UniStar’s Initial Statement of Position.¹⁰ Mr. Lutchenkov is the Director, Environmental Affairs and Special Projects, for UniStar Nuclear Energy, LLC, and has responsibility for the environmental aspects of the Calvert Cliffs 3 licensing reviews. Mr. Ratti was responsible for several years for developing strategic renewable initiatives, including evaluation of potential acquisitions in the renewable energy sector and creation of renewable energy businesses in the United States. Mr. van der Linden has over 30 years experience with compressed air energy storage (“CAES”) systems.

⁶ *La. Energy Servs. (National Enrichment Facility)*, LBP-06-8, 63 NRC 241, 258-59 (2006) (citing *Long Island Lighting Co. (Shoreham Nuclear Power Station)*, ALAB-156, 6 AEC 831, 836 (1973)); see also *Dep’t of Transp. v. Pub. Citizen*, 541 U.S. 752, 767-69 (2004) (stating that the rule of reason is inherent in NEPA and its implementing regulations).

⁷ *LES*, LBP-06-8, 63 NRC at 258-59 (citing *Shoreham*, ALAB-156, 6 AEC at 836).

⁸ *Scientists’ Inst. for Pub. Info., Inc. v. AEC*, 481 F.2d 1079, 1092 (D.C. Cir. 1973).

⁹ *Hydro Resources, Inc.* (P.O. Box 15910, Rio Rancho, NM 87174), CLI-01-04, 53 NRC 31, 71 (2001).

¹⁰ The detailed statements of qualification for Mr. Lutchenkov, Mr. Ratti, and Mr. van der Linden were included in Exhs. APL000002, APL000003, and APL000004.

Mr. van der Linden was involved in the design of CAES plants in the United States and has participated in many EPRI-lead workshops on CAES.

V. DISCUSSION

A. Response to NRC Staff Statement of Position and Testimony

UniStar's expert witnesses agree with the NRC Staff Position Statement and the conclusions in the testimony of Mr. Kugler and Ms. Cort. The methodologies, assumptions, and results in the NRC Staff testimony are generally in agreement with those made by the UniStar witnesses. In particular, UniStar agrees with the following aspects of the NRC Staff testimony:

- The NRC Staff developed the combination of energy alternatives based on the maximum contribution from renewable sources that could be reasonably expected within the region of interest and within the timeframe of the proposed project.¹¹
- The FEIS energy alternatives analysis considered energy sources that are technically feasible and commercially viable in the region of interest and that would be able to meet the purpose and need of the project and supply the projected demand for electrical energy identified in the need for power analysis. The energy conversion technology should be developed, proven, and available in the relevant region.¹²

¹¹ NRC Staff Testimony at ¶7.

¹² *Id.* at ¶10.

- Because the proposed project is intended to supply baseload power, a competitive alternative would also need to be capable of supplying baseload power.¹³
- When considering future actions, the NRC Staff focused on those that are reasonably foreseeable. Reasonably foreseeable actions include (1) actions which have been approved by the proper authorities, have submitted license/permit applications, or which may not require approval of a regulating agency, but for which procurement contracts have been signed; (2) actions conditioned upon approval of the project under review.¹⁴ Actions that are not reasonably foreseeable are those that are based on mere speculation or conjecture, or those that have only been discussed on a conceptual basis.¹⁵
- The apportionment of energy sources within the combination of alternatives was based on data from a number of sources. The analysis did not speculate concerning the achievement of theoretical maximums (*i.e.*, converting “potential” into reality) for individual energy technologies.¹⁶ The NRC Staff properly struck a balance between the limited

¹³ *Id.* at ¶10.

¹⁴ *Id.* at ¶11.

¹⁵ *Id.*

¹⁶ *Id.* at ¶18.

implementation successes for energy technologies such as wind and solar, and the potential of those resources in Maryland.¹⁷

- The NRC Staff based its conclusions on the insights of the U.S. Department of Energy (“DOE”), which is the agency responsible for energy planning in the United States. DOE is a reliable source for future predictions and market analyses. To the degree that information unique to the State of Maryland was available, the NRC Staff adjusted the DOE predictions for renewable energy production where appropriate.¹⁸ Although it used a slightly different methodology, UniStar also relied on Maryland-specific data in reaching the same conclusions as the NRC Staff.¹⁹
- For wind power, the NRC Staff did not equate the “potential” of wind energy off the coast of Maryland with a technically feasible and commercially exploitable electric generation resource in the region of interest. Rather, the NRC Staff examined DOE data and assessments performed by Maryland. The NRC Staff also examined specific projects in the region, including those mentioned by the Joint Intervenors.²⁰ This is similar to the approach followed by the UniStar witnesses, which focused

¹⁷ *Id.*

¹⁸ *Id.*

¹⁹ *See, e.g.*, UniStar Testimony at ¶¶34-37 (wind), ¶¶48-49 (solar), and ¶¶57-62 (CAES).

²⁰ NRC Staff Testimony at ¶¶31-37.

on Maryland-specific data, in reaching the same conclusion as the NRC Staff.²¹

- Likewise, for solar power, the NRC Staff did not equate the “potential” of solar energy in Maryland with a technically feasible and commercially exploitable electric generation resource in the region of interest. Rather, the NRC Staff examined DOE data and assessments performed by Maryland. The NRC Staff also examined specific projects in the region, including those mentioned by the Joint Intervenors.²² This is similar to the approach followed by the UniStar witnesses, which focused on Maryland-specific data, in reaching the same conclusion as the NRC Staff.²³
- In order to produce “baseload” power, the NRC Staff concluded that energy storage (*e.g.*, CAES) would be necessary. Although there are no plans for CAES facilities in Maryland, the NRC Staff included some CAES in the combination of energy alternatives in order to include the contributions of wind and solar power in an alternative to the proposed baseload project. However, the NRC Staff concluded that a CAES facility in Maryland large enough to significantly reduce the air emissions impacts of the combination of energy alternatives is speculative, and not within the reasonable range of alternatives based on the history, current state, and

²¹ UniStar Testimony at ¶¶34-37.

²² NRC Staff Testimony at ¶¶38-43.

²³ UniStar Testimony at ¶¶48-49.

projected future potential for CAES development.²⁴ The UniStar witnesses reached a similar conclusion in their testimony.²⁵

Because the NRC Staff relied on similar data and methodologies as UniStar and reached similar conclusions regarding the reasonableness of the combination of energy alternatives used in the FEIS, the NRC Staff testimony does not change (and, in fact, supports) the conclusions in the UniStar Position Statement and UniStar Testimony. To the extent that there are any differences between the NRC Staff and UniStar testimony, those differences are not significant and do not affect the overall conclusion that the NRC Staff has taken a hard look at the combination of energy alternatives in the FEIS. In fact, the similarity of the results in the NRC Staff and UniStar analyses, which used different data and approaches, confirms the robustness of the FEIS analysis and conclusions.

B. Response to Joint Intervenors' Testimony

The Joint Intervenors' assessment of the issues in Contention 10C was presented by Scott Sklar. Mr. Sklar's testimony includes his views on the wind and solar potential in Maryland and the potential for wind and solar to produce baseload power in Maryland. The key aspects of his testimony are discussed by the UniStar witnesses, as summarized below.

1. *Baseload Power*

Any reasonable energy alternative must be able to satisfy the purpose and need articulated in the FEIS. Here, the purpose and need for the proposed NRC action (issuance of a combined license for Calvert Cliffs 3) is to provide for additional large baseload electrical

²⁴ NRC Staff Testimony at ¶¶44-46.

²⁵ UniStar Testimony at ¶¶57-62.

generating capacity within the State of Maryland.²⁶ Calvert Cliffs 3 will provide approximately 1600 MW(e) of baseload power in the region of interest. Mr. Sklar asserts that the best value that solar can achieve is to reduce the midday energy loads, which are the highest cost power. However, reducing midday loads does not satisfy the project purpose or meet the need for power described in the FEIS. Mr. Sklar also argues (at ¶10, page 17) that Calvert Cliffs 3 cannot be a baseload plant because it is a merchant plant. But, the manner in which the power from Calvert Cliffs is sold does not change the nature of the energy source.²⁷ Nuclear power plants can run continuously for hundreds of days in a row. The mere fact that the plant must periodically shut down for refueling and maintenance does not make it something other than baseload power.²⁸

In any event, the Licensing Board has already ruled, in LBP-10-24 (slip op. at 44), that challenges to the purpose and need for the project are outside the scope of the admitted contention.

2. *Energy Alternatives*

Mr. Sklar incorrectly asserts that the FEIS understates the potential contribution of wind and solar power.²⁹ To the contrary, Mr. Sklar fails to recognize that the FEIS discusses alternatives that are reasonably foreseeable, not those that are theoretically possible. For example, Mr. Sklar states that “using existing, proven technology in shallow waters (0-35 m), there is potential to install 14,625 MW of capacity, generating 4,982 MW on average” and that

²⁶ UniStar Testimony at ¶18.

²⁷ UniStar Rebuttal Testimony at ¶12.

²⁸ *Id.*

²⁹ Sklar Testimony at ¶5.

“[t]his is far greater than the potential contribution for wind power provided in the FEIS.”³⁰ Mr. Sklar also claims that “over 450 million square feet of roof space would be suitable for solar panels in the State of Maryland [and] would add over 5,000 megawatts of capacity to the State.”³¹ However, such “potential” merely indicates what is “theoretically possible.” This is not a useful metric as the mere availability of resources does not necessarily translate into deployment. The FEIS correctly focuses on “reasonably foreseeable” contributions of wind and solar power.³²

Mr. Sklar also argues that all renewable energy resources should be considered in the FEIS.³³ In fact, they were.³⁴ Regardless, based on economic considerations, the cumulative deployment of all renewable energy sources, which are all more costly to harness than conventional natural gas generation, will be driven by and bounded by the Renewable Portfolio Standard (“RPS”) requirement. For example, even in the highly unlikely case that marine power technologies become cheaper than wind technologies, the former would be deployed instead of, and not in addition to, the latter. Therefore, while it is possible that the mix of renewable resources deployed in Maryland in the upcoming years could deviate from the FEIS scenario, it is unlikely that the cumulative amount of renewable energy deployed will be materially different

³⁰ Sklar Testimony at ¶7.

³¹ *Id.* at ¶9.

³² *See Scientists’ Inst. for Pub. Info.*, 481 F.2d at 1092 (explaining that an agency cannot be expected to “foresee the unforeseeable” but nevertheless noting that “[r]easonable forecasting” is “implicit in NEPA”).

³³ Sklar Testimony at ¶5.

³⁴ FEIS at 9-20 to 9-27 (Exh. NRC000003A).

from that considered in the FEIS — the total contribution from all renewable energy resources is effectively limited by the RPS.

Mr. Sklar’s comments regarding the declining costs of solar power also do not undermine the reasonableness of the combination of energy alternatives considered in the FEIS. Natural gas is still significantly cheaper than solar PV and offshore wind, and cheaper than onshore wind.³⁵ Therefore, wind and solar cannot be expected to displace other, cheaper generation sources unless it is mandated or incentivized. Wind and solar energy are deployed because wind and solar developers can monetize Renewable Energy Credits (“RECs”) or Solar Renewable Energy Credits (“SRECs”) and use federal and state incentives, such as Investment or Production Tax Credits, to lower their effective prices.³⁶ Significantly, offshore wind is not competitive even with RECs and federal incentives. Thus, the mere fact that the cost of solar PV (or wind) is declining does not mean that more solar (or wind) will be deployed beyond the RPS.

3. Wind Power

Mr. Sklar states that there is well-documented, substantial real interest in developing Maryland’s offshore wind resources.³⁷ Mr. Sklar cites NRG Bluewater Wind’s proposal for a 600 MW wind farm off the coast of Maryland and asserts that Bluewater Wind has received approval to build a 450 MW wind farm off the coast of Delaware.³⁸ However, the interest in building offshore wind farms in Maryland is actually quite limited. NRG Bluewater Wind has taken virtually no steps towards developing an offshore wind farm off the coast of

³⁵ UniStar Rebuttal Testimony at ¶15.

³⁶ *Id.*

³⁷ Sklar Testimony at ¶7.

³⁸ *Id.*

Maryland, other than expressing publicly an interest in building one.³⁹ And, Bluewater Wind has not received final approval to build a wind farm off the Delaware coast.⁴⁰ Moreover, the Maryland Offshore Wind Energy Act failed to get out of committee in the last legislative session.⁴¹ Nothing in Mr. Sklar’s testimony undermines the reasonableness of the wind power contribution to the combination of energy alternatives in the FEIS.

4. Solar Power

With respect to solar power, Mr. Sklar asserts that the FEIS assumption of 75 MW ignores Maryland law and that the minimum amount is “likely to be greatly exceeded.”⁴² In fact, the 75 MW is driven almost entirely by the solar carve out in the Maryland RPS and, at present, solar power deployment in Maryland is tracking the solar RPS. Based on the prices for solar renewable energy credits and existing incentives, the solar RPS is likely to continue to be fulfilled up until 2018.⁴³ After that, even assuming the continued availability of incentives, the pricing structure for renewable energy credits and “penalty” payments for failing to meet the RPS changes are such that additional solar deployment is unlikely.⁴⁴ Thus, Mr. Sklar did not provide any information that would call into question the contribution from solar power used in the FEIS combination of energy alternatives.

³⁹ UniStar Rebuttal Testimony at ¶17.

⁴⁰ *Id.*

⁴¹ *Id.*

⁴² Sklar Testimony at ¶8.

⁴³ UniStar Rebuttal Testimony at ¶18.

⁴⁴ *Id.* at ¶¶18-19. Making an alternative compliance payment is one method of complying with Maryland’s RPS. *Id.* at ¶18.

5. *Energy Storage*

Although Mr. Sklar asserts that the FEIS combination of energy alternatives should include a greater contribution from renewable sources, including more wind and solar power, Mr. Sklar does not address the inability of those energy sources to provide “baseload” power. For a large solar or wind facility to be practical as a means of providing baseload power, a mechanism to store large quantities of energy is needed, such as CAES. However, development of utility-scale CAES plants in Maryland, even assuming suitable geologic structures are available, would be a lengthy process.⁴⁵ Given the length of time needed to permit CAES facilities and, based on his experience with CAES projects, CAES facilities on the scale needed to support the wind and solar generation assumed in the FEIS combination of alternatives are not reasonably foreseeable.⁴⁶ And, neither batteries nor thermal storage are viable energy storage options.⁴⁷ Thus, the Intervenors have provided no basis for including a greater contribution from wind or solar power, in conjunction with CAES, than that considered in the FEIS already.

6. *Environmental Impacts*

Mr. Sklar’s testimony focuses on the relative contribution of wind and solar to the combination of alternatives. Mr. Sklar does not testify that the impacts associated with wind or solar power production are any different from those discussed in the FEIS. Mr. Sklar therefore has not provided any information that calls into question the NRC Staff’s assessment of the environmental impacts of the combination alternative. Nor has Mr. Sklar disputed the

⁴⁵ UniStar Testimony at ¶65.

⁴⁶ *Id.* at ¶¶66-69.

⁴⁷ UniStar Rebuttal Testimony at ¶24.

conclusions of the NRC Staff’s “sensitivity analysis” for environmental impacts (quadrupled wind power assumption in the combination of energy alternatives).⁴⁸ As that sensitivity analysis indicates, even a much larger contribution from wind power (assuming availability of sufficient energy storage) would not change the conclusions in the FEIS.

VI. CONCLUSIONS

For the reasons stated above, as supported by the UniStar and NRC Staff testimony and exhibits, the FEIS shows that the NRC Staff has taken the requisite “hard look” at reasonable energy alternatives, including a combination of alternatives with significant contributions from wind or solar power, in conjunction with energy storage, and natural gas. The NRC Staff considered the potential for wind and solar power, in conjunction with energy storage, and natural gas to provide baseload power. The specific combination of energy alternatives selected by the NRC Staff is reasonable and realistic. The NRC Staff’s evaluation of the environmental impacts of a combination of energy alternatives demonstrates that no reasonable combination of alternatives is environmentally preferable to the proposed action — even accounting for some uncertainty in the amount of baseload energy that could be produced using wind or solar, in conjunction with energy storage. As a result, the FEIS satisfies Part 51 and NEPA. The Licensing Board therefore should resolve Contention 10C in favor of UniStar and the NRC Staff.

⁴⁸ *Id.* at ¶26.

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CERTIFICATE OF SERVICE

I hereby certify that copies of “UNISTAR REBUTTAL STATEMENT OF POSITION ON CONTENTION 10C” have been served upon the following persons via the Electronic Information Exchange (“EIE”) this 18th day of November 2011, which to the best of my knowledge resulted in transmittal of the foregoing to those on the EIE Service List for the captioned proceeding.

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