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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	Docket No. 52-007-ESP
Exelon Generation Company, LLC	)	ASLBP No. 04-821-01-ESP
(Early Site Permit for Clinton ESP Site)	)	May 6, 2005

EXELON'S ANSWER TO INTERVENORS' MOTION TO AMEND CONTENTION 3.1

On April 22, 2005, the Environmental Law and Policy Center, Blue Ridge Environmental Defense League, Nuclear Information and Resource Service, Nuclear Energy Information Service, and Public Citizen filed Intervenors' Motion to Amend Contention 3.1 ("Intervenors' Motion"). Intervenors allege that the NRC Staff and Exelon Generation Company ("EGC") continue to improperly reject better, lower-cost, safer and environmentally preferable clean energy alternatives to new nuclear power.[1]

EGC opposes the Intervenors' Motion. The Licensing Board should reject the amended Contention because Intervenors: (1) fail to satisfy regulatory standards pertaining to late-filed and amended contentions as described in 10 C.F.R. §§ 2.309(c) and 2.309(f)(2) and as required by the Licensing Board's March 23, 2005 Order[2]; (2) raise issues previously rejected by the Licensing Board in this proceeding; (3) raise issues that constitute unauthorized challenges to Commission rules and regulations; and (4) fail

[1] Intervenors' Motion, at 1.

[2] Memorandum and Order (Denying Filing Extension Request) (Mar. 23, 2005).

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to demonstrate that there is a genuine dispute on certain material issues of law and fact that are dispositive of the Contention. For these reasons, amended Contention 3.1 is inadmissible and Intervenors' Motion should be denied.

I. PROCEDURAL BACKGROUND

On September 25, 2003, EGC filed an application for an Early Site Permit ("ESP") seeking approval of the existing Clinton nuclear power station site in Dewitt County, Illinois, for the possible construction of one or more new nuclear reactors. On May 3, 2004, Intervenors filed proposed Contention 3.1 that alleged several shortcomings with respect to EGC's evaluation of energy alternatives to the proposed EGC ESP facility.[3]

In its Memorandum and Order of August 6, 2004, the Licensing Board admitted, in part, Contention 3.1 with respect to wind and solar power and combinations thereof. In admitting Contention 3.1, the Licensing Board rejected those portions of Intervenors' proposed Contention 3.1 that pertained to need for power and energy conservation on the ground that those matters are outside the scope of this proceeding.[4] In this regard, the Licensing Board also ruled that it is not necessary to consider "alternative generation methods that are not typically employed by independent power generators," because

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[3] Supplemental Request for Hearing and Petition to Intervene by Environmental Law and Policy Center, Blue Ridge Environmental Defense League, Nuclear Information and Resource Service, Nuclear Energy Information Service, and Public Citizen, Contention 3.1—The Clean Energy Alternatives Contention ("Intervenors' Contention 3.1"), at 1–2 (May 3, 2004).

[4] *Exelon Generation Co.* (Early Site Permit for Clinton ESP Site), LBP-04-17, 60 NRC 229, 245–46 (2004).

consideration of such methods would essentially equate to an analysis of need for power.[5] The Board has also ruled that Contention 3.1 is a "contention of omission."[6]

Based upon Contention 3.1, the NRC Staff submitted a request for additional information ("RAI") asking EGC to address Contention 3.1. In its RAI Response on September 23, 2004, EGC identified revisions to the relevant sections in Chapter 9 of the Environmental Report ("ER") for the Clinton ESP. The RAI Response provides a detailed analysis of wind and solar power, including combinations of these alternatives with coal and natural gas-fired facilities that together could generate baseload power in an amount equivalent to the proposed EGC ESP facility.

On March 3, 2005, the NRC Staff issued its Draft Environmental Impact Statement ("DEIS") for the Clinton ESP. Chapter 8 of the DEIS includes an evaluation of various alternative generating sources such as wind and solar power, including combinations of alternatives that, together, could generate baseload power in an amount equivalent to the EGC ESP facility. In sum, as stated in the DEIS, the NRC Staff reviewed the RAI Response's analysis of wind and solar power and agrees with EGC's conclusion that wind and solar generation are not reasonable alternatives to the proposed EGC ESP facility.[7] Further, the DEIS concludes that the EGC ESP facility would be either environmentally preferable or equivalent to the combination of power generation alternatives.[8]

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[5] *Id.* at 245.

[6] Order (Setting Prehearing Conference Call; Communication of NRC Staff Discovery Disclosures), at 2 (Sept. 30, 2004); Memorandum and Order, at 1 (Mar. 23, 2005); Memorandum and Order (Denying, Following Reconsideration, Filing Extension Request), at 2 (Mar, 30, 2005).

[7] *See* DEIS, at 8-16–8-18.

[8] *See* DEIS, at 8-21–8-22.

On March 17, 2005, EGC submitted a Motion for Summary Disposition of Contention 3.1. The Motion for Summary Disposition demonstrated that the RAI Response cures the alleged omission. In addition, the Motion for Summary Disposition evaluated the information that the Intervenors had provided or cited in support of Contention 3.1, and showed that the information did not raise any genuine issue of material fact. The Motion included a Statement of Material Facts on Which No Genuine Issue Exists in Support of Exelon's Motion for Summary Disposition of Contention 3.1 ("Exelon Statement of Material Facts").

On April 5, 2005, the Intervenors filed a Response to EGC's Motion for Summary Disposition of Contention 3.1 ("Intervenors' Response"). Intervenors' Response included a statement in which Intervenors disputed a few of the Exelon Statement of Material Facts. However, the Intervenors' Response did not dispute the vast majority of the Exelon Statement of Material Facts.

On April 6, 2005, the Licensing Board clarified that Intervenors had the opportunity, based upon information *first revealed* in the recently issued DEIS and information supplied by EGC *since* submitting the ER, to petition to amend Contention 3.1 or file new contentions.[9] The Licensing Board held that any such petition had to be filed on or before April 22, 2005.[10] On April 22, Intervenors submitted the Motion to Amend Contention 3.1.

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[9] Memorandum (Clarifying March 30 Memorandum and Order; Memorializing April 4 Conference Call), at 2 (Apr. 6, 2005) (emphasis added).

[10] Memorandum, at 3 (Apr. 6, 2005).

II. THE CONTENTION IS UNTIMELY UNDER 10 C.F.R. §§ 2.309(c) AND 2.309(f)(2)

A. The Amended Contention Should Be Rejected Because It Does Not Address Section 2.309(c).

As noted in the Licensing Board's March 23, 2005 Memorandum and Order, in order to file a new or amended contention, Intervenors must first address the factors in 10 C.F.R. § 2.309(c) for late-filed contentions and § 2.309(f)(2) for new or amended contentions.[11] The Licensing Board, in its April 6, 2005 Memorandum, stated that new or revised contentions based on the DEIS and RAI Response would not be deemed untimely if submitted on or before April 22, 2005.[12]

While Intervenors met the April 22, 2005 deadline, they failed to comply with the Licensing Board's March 23, 2005 Order that requires Intervenors to address the factors set forth in 10 C.F.R. § 2.309(c). As stated by the Licensing Board, Section 2.309(c) applies to all contentions filed after the period established for the filing of original contentions.[13] 10 C.F.R. § 2.309(c) identifies eight factors governing the admission of late filed contentions, including "good cause" for the late filing. Although the Board's April 6, 2005 Memorandum essentially states that Intervenors would have "good cause" if they filed by April 22, 2005, the Board's Memorandum did not relieve the Intervenors of their obligations to address the other factors in § 2.309(c). As the Commission has stated, even though a proposed contention is filed under 10 C.F.R. § 2.309(f)(2) based upon new information in the NRC Staff's environmental review document, the proposed

[11] Memorandum and Order, at 2–3 (Mar. 23, 2005).

[12] Memorandum, at 3 (Apr. 6, 2005).

[13] Memorandum and Order, at 3 (Mar. 23, 2005).

contention is also separately subject to the late-filed contentions requirements in § 2.309(c).[14]

In this regard, Petitioners have the burden to affirmatively address each of the eight factors and persuade the Licensing Board that, upon balancing the factors, they support the admission of the late-filed contention. The Commission has held that long-standing NRC practice obligates a petitioner to show that it has satisfied the requirements for late-filed contentions.[15]

Nowhere in its filing do Intervenors address the factors in § 2.309(c). The Commission has held that while the regulations governing late-filed contention impose some additional procedural steps on the litigants, "they are nevertheless the Commission's rules and [the Commission is] not authorized to dispense with them[.]"[16] The Commission itself has stated that it is appropriate to summarily dismiss late-filed contentions that fail to address the relevant factors for a late-filed petition.[17] Since Intervenors' Motion to amend Contention 3.1 does not comply with 10 C.F.R. § 2.309(c) or the Licensing Board's March 23, 2005 Memorandum and Order, it should be rejected for this reason alone.

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[14] *Sacramento Mun. Util. Dist.* (Rancho Seco Nuclear Generating Station), CLI-93-12, 37 NRC 355, 363 (1993). At the time this decision was issued, 10 C.F.R. §§ 2.309(f)(2) and 2.309(c) were §§ 2.714(b)(2)(iii) and 2.714(a)(1), respectively.

[15] *See Balt. Gas & Elec. Co.* (Calvert Cliffs Nuclear Power Plant, Units 1 and 2), CLI-98-25, 48 NRC 325, 347 (1998).

[16] *Entergy Nuclear Vt. Yankee, LLC* (Vermont Yankee Nuclear Power Station), LBP-04-28, 60 NRC 548, 578 (2004).

[17] *Balt. Gas & Elec. Co.*, 48 NRC at 347. *See also Boston Edison Co.* (Pilgrim Nuclear Power Station), ALAB-816, 22 NRC 461 (1985).

B. The Amended Contention Should Be Rejected To The Extent It Raises Issues That Are Based Upon Information In The Environmental Report

The amended Contention contains challenges to EGC's and NRC's analysis of the environmental impacts of nuclear power and gas-fired generation. For example, Intervenors argue that NRC and EGC did not adequately consider: (1) the land used to mine uranium and store nuclear waste; (2) air quality impacts of the uranium fuel cycle; (3) environmental risks posed by nuclear accidents; and (4) emissions from natural gas-fired plants.[18] However, neither the DEIS nor the RAI Response contain any new information on these issues. Instead, the information being challenged by the Intervenors was first presented in the ER.[19] Intervenors, therefore, are essentially challenging information contained in the original ER filed in September 2003.

The Commission has repeatedly stated that it does not look with favor on amended or new contentions filed after the initial filing.[20] The Commission has also stressed that its timeliness requirements "demand a level of discipline and preparedness on the part of petitioners" and that as the NRC faces an increasing adjudicatory docket, "the need for parties to adhere to [the NRC's] pleading standards and for the Board to enforce those standards are paramount."[21] As the Commission noted, "[t]here simply would be 'no end to NRC licensing proceedings if petitioners could disregard our

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[18] Intervenors' Motion, at 12–14.

[19] *See* ER §§ 5.7, 7.1, 9.2.

[20] *See Dominion Nuclear Conn., Inc.* (Millstone Nuclear Power Station, Units 2 and 3), CLI-04-36, 60 NRC 631, 636 (2004).

[21] *La. Energy Servs., L.P.* (National Enrichment Facility), CLI-04-25, 60 NRC 223, 225 (2004).

timeliness requirements' and add new bases or new issues that 'simply did not occur to [them] at the outset.'"[22]

10 C.F.R. § 2.309(f)(2) states that a petitioner may amend a contention or file a new contention if there are data or conclusions in the NRC DEIS that differ significantly from the data or conclusions in the applicant's documents. As noted by the Licensing Board in its March 23, 2005 Memorandum and Order, contentions may otherwise be amended or new contentions filed after the initial filing only with leave of the presiding officer upon a showing that:

> (i) The information upon which the amended or new contention is based was not previously available;
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> (ii) The information upon which the amended or new contention is based is materially different than information previously available; and
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> (iii) The amended or new contention has been submitted in a timely fashion based on the availability of the subsequent information.[23]

The Intervenors' challenges to the environmental impacts of nuclear power and gas-fired generation are grossly late, and the Intervenors have not attempted to show how these challenges satisfy the late filing factors in § 2.309(f)(2). Specifically, Intervenors have not even attempted to demonstrate that the information it now challenges was "not previously available" or that it is "materially different than information previously available" or that as a result of earlier unavailability, the present request on these issues has been timely submitted. In fact, as these environmental issues were addressed in the

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[22] *Id.* (quoting *Duke Energy Corp.* (McGuire Nuclear Station, Units 1 and 2, Catawba Nuclear Station, Units 1 and 2), CLI-03-17, 58 NRC 419, 428-29 (2003)).

[23] Memorandum and Order, at 3 (Mar. 23, 2005); 10 C.F.R. § 2.309(f)(2).

ER submitted in September 2003, Intervenors are inexcusably late on challenges to the environmental impacts of nuclear power and gas-fired generation. Therefore, any attempt to raise these issues as part of amended Contention 3.1 should be rejected.[24]

III. THE AMENDED CONTENTION SHOULD BE REJECTED TO THE EXTENT IT RAISES ISSUES PREVIOUSLY REJECTED BY THE LICENSING BOARD.

A. The Board Has Already Rejected Intervenors' Attempt to Raise Issues Related to Energy Efficiency and Need For Power

Intervenors claim that the NRC Staff and EGC have improperly defined the purpose of this project as the production of baseload power for sale on the wholesale market.[25] Intervenors argue that this purpose constrains the alternatives analysis in violation of the National Environmental Policy Act of 1969 ("NEPA"), 42 U.S.C. §§ 4321 *et seq.*, by improperly rejecting reasonable energy efficiency alternatives to nuclear power.[26] Intervenors also claim that such a purpose is arbitrary and capricious given that the DEIS and EGC filings do not evaluate whether there is any need for additional baseload power.[27]

These arguments are not new. Intervenors made these same arguments in their May 3, 2004 filing on proposed Contention 3.1.[28] The Licensing Board, in its Memorandum and Order of August 6, 2004, rejected those portions of Intervenors'

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[24] *See La. Energy Servs., L.P.*, 60 NRC at 225 (rejecting petitioners' untimely attempt to amend their original petition by including entirely new arguments in reply briefs without addressing the late-filing factors in 10 C.F.R. § 2.309(c) and 2.309(f)(2)).

[25] Intervenors' Motion, at 8–10.

[26] Intervenors' Motion, at 9.

[27] Intervenors' Motion, at 9.

[28] Intervenors' Contention 3.1, at 2 (May 3, 2004).

proposed Contention 3.1 that pertained to need for power and energy conservation on the ground that those matters are outside the scope of this proceeding and/or impermissible challenges to the Commission's regulations.[29] Similarly, the Board should reject those same arguments in the amended Contention.[30]

Intervenors themselves acknowledge that the Licensing Board already rejected these arguments.[31] Nevertheless, Intervenors request reconsideration of this decision in light of comments submitted by the U.S. Environmental Protection Agency ("U.S. EPA") on the DEIS for the North Anna ESP regarding the absence of a need for power analysis.[32] This request for reconsideration should be rejected. First, the U.S. EPA comments are not even applicable to this proceeding. Second, the U.S. EPA comments reflect an apparent misunderstanding of Commission rules and regulations, particularly 10 C.F.R. § 52.17(a)(2) which states that the ER for an ESP need not include an assessment of the benefits (*e.g.*, need for power) of the proposed project (instead, need for power will be considered in the combined licensing proceeding, as required by 10 C.F.R. § 52.79(a)(1)). Therefore, Intervenors are effectively challenging 10 C.F.R. § 52.17(a)(2), which is impermissible under 10 C.F.R. § 2.335.

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[29] *Exelon Generation Co.*, LBP-04-17, 60 NRC at 244–45.

[30] Under NEPA, the reasonableness of an alternative is judged by whether the alternatives will accomplish the goals or purpose of the project. The Commission has held that agencies need only discuss alternatives that are reasonable and "will bring about the ends" of the proposed action. *Hydro Res., Inc.*, CLI-01-04, 53 NRC 31, 55 (2001). Where a federal agency is not the sponsor of a project, the "consideration of alternatives may accord substantial weight to the preferences of the applicant and/or sponsor in the siting and design of the project." *City of Grapevine, Tex. v. Dep't of Transp.*, 17 F.3d 1502, 1506 (D.C. Cir. 1994), *cert. denied*, 513 U.S. 1043 (1994). The Licensing Board has already ruled that "it is appropriate for [EGC] fully to consider its own business objectives and status as an independent power provider - - as opposed to a public utility - - as it analyzes alternatives." *Exelon Generation Co.*, LBP-04-17, 60 NRC at 246.

[31] Intervenors' Motion, at 9.

[32] Intervenors' Motion, at 9.

B. The Licensing Board Has Already Rejected Issues Related to Terrorism.

Intervenors claim that the DEIS is flawed because it fails to consider a recent study from the National Academy of Sciences that, according to Intervenors, concluded that not enough has been done to protect nuclear plants from terrorist attacks.[33] However, the issue of terrorism is not cognizable in this proceeding.

In *Private Fuel Storage*,[34] the Commission detailed four principal reasons for holding that NEPA does not require a terrorism review: (1) the possibility of a terrorist attack is speculative and too far removed from the natural or expected consequences of agency action to require a study under the "rule of reason" inherent in NEPA; (2) the risk of a terrorist attack at a nuclear facility cannot be adequately determined; (3) NEPA does not require a "worst case" analysis, which creates a distorted picture of the project's impacts; and (4) NEPA is not an appropriate forum for considering sensitive security issues. Based on the Commission's decision, the Licensing Board in this proceeding rejected Intervenors' prior terrorism-based contention.[35]

Thus, Intervenors base their amended Contention, in part, upon a ground (*i.e.*, terrorism) that the Commission has already concluded need not be considered under NEPA and that the Licensing Board has previously rejected. Therefore, this basis should be rejected.

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[33] Intervenors' Motion, at 14.

[34] *Private Fuel Storage, L.L.C.* (Independent Fuel Storage Installation), CLI-02-25, 56 NRC 340, 346–57 (2002).

[35] *Exelon Generation Co.*, LBP-04-17, 60 NRC at 244–45.

IV. THE AMENDED CONTENTION SHOULD BE REJECTED TO THE EXTENT IT CONTAINS IMPERMISSIBLE CHALLENGES TO COMMISSION RULES AND REGULATIONS

The amended Contention alleges that EGC and the NRC Staff failed to fully consider the environmental impacts of (1) the uranium fuel cycle and spent fuel transportation and (2) waste storage.[36] The Licensing Board should reject each of these issues as they involve impermissible challenges to Commission rules in 10 C.F.R. §§ 51.51, 51.52, and 51.23 in violation of 10 C.F.R. § 2.335.

A. Impermissible Challenges to 10 C.F.R. §§ 51.51 and 51.52, Tables S-3 and S-4

Intervenors attack the reliance of the NRC Staff and EGC on generic environmental findings in Tables S-3 and S-4 of 10 C.F.R. Part 51. The Intervenors allege that Tables S-3 and S-4 "fail[] to consider that new information regarding fuel reprocessing, the lack of a high-level waste depository, and changes in the transport of waste" may alter the conclusions about impacts included in those Tables.[37]

Under 10 C.F.R. § 51.51(a), "every environmental report prepared for the construction permit stage of a light-water-cooled nuclear reactor . . . shall take Table S-3, *Table of Uranium Fuel Cycle Environmental Data*, as the basis for evaluating the contribution of the environmental effects of uranium mining and milling, the production of uranium hexafluoride, isotopic enrichment, fuel fabrication, reprocessing of irradiated fuel, transportation of radioactive materials and management of low level waste and high level wastes related to uranium fuel cycle activities to the environmental costs of licensing the nuclear power reactor." The environmental impacts of the uranium fuel

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[36] *See* Intervenors' Motion, at 13, 14.

[37] Intervenors' Motion, at 14.

cycle contained in ER Tables 5.7-1 through Table 5.7-3 are based on the information in Table S-3.

Table S-4, *Environmental Impact of Transportation of Fuel and Waste* (10 C.F.R. § 51.52) is an assessment of the potential impact on the environment of transporting fuel and solid radioactive waste to and from nuclear power plants. The environmental impacts contained in ER Table 3.8-3 are based on the information in Table S-4.

It is a fundamental principle of NRC adjudication that any contention challenging a Commission regulation, whether directly or indirectly, is outside the scope of a proceeding and impermissible.[38] This principle has been codified in 10 C.F.R. § 2.335(a) which prohibits attacks on the Commission's rules and regulations. Therefore, if Intervenors wish to challenge Tables S-3 and S-4, the appropriate course of action is a petition for rulemaking, not a contention in this proceeding.[39] Accordingly, this aspect of amended Contention 3.1 is inadmissible and should be rejected.

B. Impermissible Challenges to 10 C.F.R. § 51.23, Waste Confidence Rule

Intervenors claim that NRC and EGC have not adequately considered the environmental impacts of onsite storage of nuclear waste (spent nuclear fuel).[40] In

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[38] *See* 10 C.F.R. § 2.335; *Duke Energy Corp.* (Oconee Nuclear Station, Units 1, 2 and 3), CLI-99-11, 49 NRC 328, 343–45 (1999).

[39] Generic resolution of environmental findings in Part 51, such as Tables S-3 and S-4, comports with NEPA. In *Balt. Gas & Elect. v. Natural Res. Def. Council, Inc.*, 462 U.S. 87 (1983), the U.S. Supreme Court expressly upheld the NRC's adoption of Table S-3 for evaluating the environmental effects of a nuclear power plant's fuel cycle. *See also Fla. Power and Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 and 4) CLI-01-17, 54 NRC 3, 12 (2001) (noting that Petitioners with evidence that a generic environmental finding is incorrect for all plants may petition the Commission to initiate fresh rulemaking).

[40] *See* Intervenors' Motion, at 12–13.

particular, Intervenors claim both EGC and the NRC Staff have failed to consider new information regarding the lack of a high-level waste repository.[41]

This issue is an impermissible challenge to the NRC's Waste Confidence Rule ("WCR") in 10 C.F.R. § 51.23. The Licensing Board has rejected Intervenors' prior challenges to the WCR by noting that the proposed "contention and its supporting bases impermissibly challenge the Commission's regulatory requirements. . . the matters the petitioners seek to raise have been generically addressed by the Commission through the Waste Confidence Rule[.]"[42] The same is true here. Therefore, this issue should be rejected under 10 C.F.R. § 2.335 as an impermissible challenge to the Commission's WCR.

V. AMENDED CONTENTION 3.1 SHOULD BE REJECTED BECAUSE IT DOES NOT RAISE A GENUINE ISSUE OF MATERIAL FACT RELATED TO CERTAIN DISPOSITIVE ISSUES

Amended Contention 3.1 pertains to three sets of alternatives to nuclear power: (1) wind power alone; (2) solar power alone; and (3) combinations of wind/solar power and fossil-fueled plants. Amended Contention 3.1 raises several issues with respect to the analyses of these alternatives by EGC and the NRC Staff. However, as discussed below with respect to each of these alternatives, there are certain dispositive issues that the Intervenors have not challenged. As a result, the Licensing Board should reject amended Contention 3.1 based upon these undisputed issues.

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[41] Intervenors' Motion, at 13–14.

[42] *Exelon Generation Co.*, LBP-04-17, 60 NRC at 246–47.

A. It is Undisputed That Wind Power Alone Cannot Supply Baseload Power

The purpose of the EGC ESP facility is to be a merchant generator to produce baseload power for sale on the wholesale market.[43] As provided in Exelon Statement of Material Fact # II.A.1, wind power is intermittent and therefore cannot be used to generate baseload power.

The Intervenors' Response to Exelon's Motion for Summary Disposition did not dispute Fact # II.A.1. Furthermore, Intervenors' Motion to Amend Contention 3.1 does not dispute that wind power alone cannot provide baseload power equivalent to the EGC ESP facility.[44] Accordingly, wind power alone cannot serve the purpose of the EGC ESP facility.

As discussed at length on pages 8–10 of Exelon's Motion for Summary Disposition and as recognized in the Licensing Board's Memorandum and Order dated August 6, 2004, alternatives that do not serve the purpose of the project do not need to be considered under NEPA.[45] Since wind power alone cannot serve the purpose of the EGC ESP facility, wind power is not a reasonable alternative to the EGC ESP facility. Accordingly, that portion of amended Contention 3.1 that pertains to wind power alone should be rejected because it is undisputed that wind power cannot provide baseload power.

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[43] ER, at 9.2-1; RAI Response, at 14.

[44] The Intervenors' Motion attaches an Affidavit of Bruce Biewald, dated April 15, 2005 ("Intervenors' Affidavit"). Intervenors' Affidavit, at 18–20, claims that wind power and other intermittent sources have a "capacity value" but it never states that wind power can produce baseload power. Intervenors' arguments related to capacity values are addressed in Section VI.D below.

[45] *Exelon Generation Co.*, LBP-04-17, 60 NRC at 245–46.

B. Intervenors Have Not Disputed Any Material Facts Related to Solar Power

As with wind power, Intervenors' Response to the Motion for Summary Disposition did not dispute Exelon Statement of Material Fact # III.A.1, which states that solar power is intermittent and therefore cannot itself produce baseload power. Furthermore, Intervenors' Motion to Amend Contention 3.1 does not dispute that solar power alone cannot provide baseload power equivalent to the EGC ESP facility.[46] Therefore, the alternative of solar power alone should be rejected because it cannot serve the purpose of the EGC ESP facility, and it is not a reasonable alternative to the EGC ESP facility.

Additionally, Intervenors' Response to the Motion for Summary Disposition did not dispute Exelon Statement of Material Fact # III.B.1 that concentrating solar power is not commercially available, nor did it dispute Exelon Statement of Material Fact # III.C.3–4 regarding the costs of electricity from photovoltaic (PV) systems (which are substantially higher than the costs of electricity from nuclear power). Furthermore, amended Contention 3.1 does not dispute these facts. Therefore, the Licensing Board should reject the alternative of solar power alone, because it does not provide a commercially economical alternative to a new nuclear power plant.

Finally, Intervenors' Response to the Motion for Summary Disposition did not dispute Exelon Statement of Material Fact # III.D.2, which states that the land use impacts of a solar power facility equivalent in capacity to the EGC ESP facility would be large (*i.e.*, would require tens of square kilometers of land). Amended Contention 3.1

[46] Intervenors' Affidavit, at 18–20, claims that solar power and other intermittent sources have a "capacity value" but it never states that solar power can produce baseload power. Intervenors' arguments related to capacity values are addressed in Section VI.D below.

does not dispute this fact either. Therefore, the Licensing Board should reject amended Contention 3.1 on the alternative of solar power alone, because it does not raise any genuine dispute regarding the environmental impacts of solar power.

In summary, neither the Intervenors' Response nor amended Contention 3.1 dispute any of the Exelon Statement of Material Facts on solar power. Therefore, amended Contention 3.1 on solar power should be rejected.

C. Intervenors' Postulated Combination of Wind and Solar Power Should Be Rejected Because the Wind/Solar Facilities in the Combination Would Not Be Producing Baseload Power

In its Motion for Summary Disposition, EGC showed that a combination of wind/solar facilities and coal/natural gas facilities could produce baseload power, provided that the coal/natural gas facilities have an installed capacity equivalent to the EGC ESP facility such that they could provide the needed power if the wind/solar facilities were not operating when the wind is not blowing and the sun is not shining. EGC also showed that the cost of electricity from such a combination would be greater than the cost of electricity of the EGC ESP facility, because operation of the wind/solar facilities would displace the coal/natural gas facilities when the wind is blowing or the sun is shining, thereby significantly reducing their capacity factors and increasing the cost of electricity from the fossil fuel component of the combination.[47]

In amended Contention 3.1, the Intervenors do not contest EGC's analysis. Instead, the Intervenors propose a different alternative involving a combination of wind facilities and fossil fuel facilities. In their postulated alternative, the fossil fuel facilities would have an installed capacity equivalent to the capacity of the EGC ESP facility and

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[47] Exelon Statement of Material Facts # IV.C.2.b.

would operate with a capacity factor of 85 to 90%, and the wind facilities would have an installed capacity of 1500 MW and a capacity factor of 35%. Amended Contention 3.1 claims that this combination would "produce significantly more power" at a cheaper cost than the EGC ESP facility.[48]

In the combination postulated by the Intervenors, it is clear that the wind/solar facilities would contribute nothing to the production of baseload power. Instead, in the combination postulated by the Intervenors, the baseload power would be produced entirely by the fossil-fueled plant, and the wind/solar facilities would only generate supplemental power beyond that required for baseload production.[49]

In summary, in the combination postulated in amended Contention 3.1, the wind/solar facilities would be superfluous with respect to the production of baseload power. As a result, amended Contention 3.1 should be rejected to the extent that it pertains to combinations involving wind and solar power, because the wind and solar facilities would not be serving any of the purposes of the EGC ESP facility.

VI. THE FACTS RAISED BY AMENDED CONTENTION 3.1 ARE NOT MATERIALLY INCONSISTENT WITH THE FACTS PROVIDED IN THE ANALYSES OF ALTERNATIVES BY EGC AND THE NRC STAFF

The foregoing is sufficient to dispose of the amended Contention. However, the Licensing Board's Order of April 25, 2005 also directed that responses to the amended Contention "address each specific alleged factual dispute." In accordance with the Board's Order, we are providing the following analysis of the factual arguments contained in the amended Contention. Additionally, Attachment A to this Answer

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[48] Intervenors' Motion, at 17–20.

[49] *See* Intervenors' Motion at 19–20; Intervenors' Affidavit, at 20–21.

provides a table which identifies each of the Exelon Statements of Material Fact and indicates (i) whether the Intervenors' Response has disputed the fact and (ii) why such dispute is not material.

Intervenors base the amended Contention on four alleged "shortcomings" in the alternatives analyses by EGC and the NRC Staff. As shown below, none of these allegations raises a genuine dispute on a material issue of law or fact, as required by 10 C.F.R. § 2.309(f)(1).

A. Purpose of the Project

Intervenors state that the EGC and NRC Staff analyses of alternatives are flawed because the project purpose improperly excludes reasonable energy efficiency alternatives. As discussed earlier in this Answer, the Licensing Board previously rejected Intervenors' contention on this issue. The Board ruled that it is not necessary to consider "alternative generation methods that are not typically employed by independent power generators," because consideration of such methods would essentially equate to an analysis of need for power.[50] Therefore, this issue does not involve a genuine dispute on a material issue of law or fact under 10 C.F.R. § 2.309(f)(1)(vi).

B. Environmental Impacts of Alternatives and Nuclear Power

The amended Contention does not raise any genuine dispute on a material issue related to the environmental impacts of alternatives. While the Intervenors have disputed a few specific facts, the disputes are not material to any of the conclusions of NRC's or EGC's environmental analyses.

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[50] *Exelon Generation Co.*, LBP-04-17, 60 NRC at 245.

Initially, Intervenors contest the use of the SMALL, MODERATE, and LARGE categories for comparing the environmental impacts of alternatives. In categorizing and comparing the environmental impacts of alternatives, it is now standard NRC practice to assign each impact a "significance level." In particular, the NRC has established the following three significance levels for the purpose of evaluating environmental impacts:

- SMALL--For the issue, environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.
- MODERATE--For the issue, environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.
- LARGE--For the issue, environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

These significance levels are currently embodied in NRC's environmental regulations in 10 C.F.R. Part 51, Table B-1, as they pertain to license renewal of nuclear power plants. These significance levels are used in the ER and RAI Response, as well as the DEIS.[51] EGC believes that the Licensing Board should adopt this approach as a useful tool for comparing the environmental impacts of alternatives relative to the EGC ESP facility.

Intervenors contend that certain issues related to wind facilities should be classified as having "no impacts," rather than SMALL impacts.[52] Initially, we note that the NRC has not established a category called "no impacts." Therefore, the Intervenors' contention is inconsistent with established NRC practice. In any event, Intervenors' arguments do not raise any material issue. As indicated above, for an impact to be

[51] ER, at Table 9.2-6; RAI Response, at Tables 9.2-6 and 9.2-7; DEIS, at xxvi–xxvii. These significance levels are also used in the DEIS for the Grand Gulf and North Anna ESP sites. *See* NUREG-1817, DEIS for the Grand Gulf ESP Site (Apr. 2005); NUREG-1811, DEIS for the North Anna Site (Nov. 2004).

[52] *See, e.g.*, Intervenors' Motion, at 10–11, 14.

categorized as SMALL, the impacts must be "not detectable" or such that they would not "noticeably alter" any important attribute. Thus, there is no *material* difference between "no impacts" and SMALL impacts, as the Commission has defined that term. Therefore, Intervenors' amended Contention should be rejected to the extent that it argues that wind power is preferable in certain areas because it entails no impacts rather than SMALL impacts.

The following sections demonstrate that there are no material disputes on the other environmental impacts raised in Intervenors' Motion.

1. Air Pollution Impacts

Intervenors contend that wind generation produces no direct emissions of air pollutants, that NRC's and EGC's categorization of the emissions from a postulated natural gas-fired facility should be SMALL rather than MODERATE, and that the uranium fuel cycle creates greenhouse gases and emits radionuclides.[53] However, the issues discussed by the Intervenors do not raise a genuine dispute on a material issue of fact or law and therefore do not satisfy the requirements for a contention under 10 C.F.R. § 2.309(f)(1)(vi).

- EGC has clearly stated that wind generation produces no air pollution or greenhouse gases and that the impact on air quality from wind is SMALL.[54]
- EGC and the NRC Staff have stated that a natural gas-fired facility of approximately the same size as the EGC ESP Facility would generate 177 tons of SO_x/year, 568 tons

[53] Intervenors' Motion at 11, 13–14. As discussed previously in this Answer, the Licensing Board need not consider the air quality impacts of nuclear and natural gas facilities, because these impacts were addressed in the ER, and the Intervenors have not justified a late contention on this issue.

[54] Exelon Statement of Material Fact # II.C.1.

of NO_x/year, 120 tons of CO/year, and 99 tons of particulate matter/year. Intervenors do not dispute that a natural gas-fired plant would have such air quality impacts.[55]

- As discussed previously in this Answer, EGC is authorized by 10 C.F.R. § 51.51 to rely on Table S-3 in its evaluation of the environmental impacts of the uranium fuel cycle. Therefore, any claim that EGC did not consider the impact of the uranium fuel cycle on air quality is an impermissible challenge to NRC regulations.

In summary, Intervenors' claims regarding the impacts of wind, nuclear power, and natural gas on air quality do not raise any genuine dispute on a material issue and therefore do not satisfy the requirements for a contention under 10 C.F.R. § 2.309(f)(1)(vi).[56]

2. Bird Impacts

Intervenors contend that EGC overestimates the impacts to birds from wind power because on average wind turbines cause only two bird deaths per year, human activities cause many more bird deaths per year, EGC did not consider the impacts of the full uranium fuel cycle on bird habitats, and EGC provided no data regarding the number of birds killed by a nuclear power plant per year.[57] However, the issues discussed by the Intervenors do not raise a genuine dispute on a material issue of fact or law and therefore do not satisfy the requirements for a contention under 10 C.F.R. § 2.309(f)(1)(vi).

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[55] *See* Intervenors' Affidavit, at 3–4.

[56] Also, while not mentioned in Intervenors' Motion, Intervenors' Affidavit, at 4, asserts that the operation of nuclear power plants produces air emissions of radionuclides. EGC, however, has clearly stated that radiological effluents will be released from the EGC ESP Facility. Exposure from gaseous pathways or direct radiation from station operation would be within limits specified by NRC and EPA. Human health impacts from radiological effluents from the EGC ESP facility would be SMALL. Exelon Statement of Material Fact # I.E.11. Intervenors do not dispute this material fact or EGC's characterization of the environmental impacts. Therefore, this issue does not raise a genuine dispute on a material issue of fact or law.

- EGC has clearly stated that studies performed at wind sites around the U.S. measure one to two bird deaths per turbine per year.[58] This is the very number cited by Intervenors.[59] EGC also stated that bird deaths due to wind generation are a small fraction of those caused by other human activities. As a result, EGC characterized impacts from avian collisions for wind projects as SMALL.[60] There simply is no dispute regarding the impacts of wind turbines on birds.
- Intervenors state that 1500 bird deaths were reported from 1978 to 1986 at the Susquehanna plant. This amounts to approximately 167 bird deaths per year. In contrast, it is undisputed that a wind farm with the capacity of the EGC ESP facility would result in more than ten times as many bird deaths per year. For example, a wind project with 1000 two-MWe turbines (2000 MWe name-plate capacity) would result in approximately 2000 bird deaths per year, using Intervenors' mortality statistic. In other words, there is no dispute that wind facilities cause substantially more bird deaths per MWe than nuclear facilities. However, since EGC has classified the impact from wind facilities on birds as SMALL, any dispute that may exist is not material.
- EGC is authorized by 10 C.F.R. § 51.51 to rely on Table S-3 in its evaluation of the environmental impacts of the uranium fuel cycle. Therefore, any claim that EGC did not adequately consider the environmental impact of the uranium fuel cycle on birds is an impermissible challenge to NRC regulations.

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[57] Intervenors' Motion, at 13.

[58] Exelon Statement of Material Fact # II.C.4.

[59] Intervenors' Motion, at 13.

In summary, Intervenors' claims regarding the impacts of wind and nuclear power on birds do not raise any genuine dispute on a material issue and therefore do not satisfy the requirements for a contention under 10 C.F.R. § 2.309(f)(1)(vi).

3. Noise Impacts

Intervenors contend that EGC overestimates the noise impacts of wind turbines because a wind farm generates 35 to 45 dB(a) whereas a nuclear plant will generate 55 dB(a) of noise.[61] However, the issues discussed by the Intervenors do not raise a genuine dispute on a material issue of fact or law and therefore do not satisfy the requirements for a contention under 10 C.F.R. § 2.309(f)(1)(vi).

- EGC has stated that wind turbines produce some noise but that technological advances continue to lessen noise problems and the level of noise drops with increased distances.[62] EGC has stated that the noise level generated from a typical wind farm at 350 meters distance varies between 35 and 45 dB(A) and that anticipated levels from cooling tower operation are expected to be 55 dB at approximately 1000 ft.[63] These are the very numbers cited by the Intervenors.[64] Therefore, there is no dispute regarding the noise levels from wind and nuclear facilities. In any event, EGC has stated that with proper placement, the noise impacts of wind facilities would be SMALL. Therefore, any dispute with Intervenors on this issue is immaterial.

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[60] Exelon Statement of Material Fact # II.C.4.

[61] Intervenors' Motion, at 13.

[62] Exelon Statement of Material Fact # II.C.5.

[63] Joint Affidavit of William D. Maher and Curtis L. Bagnall ("Exelon Affidavit"), at 17 (Mar. 16, 2005).

[64] Intervenors' Motion, at 13.

In summary, Intervenors' claims regarding the noise impacts of wind and nuclear power do not raise any genuine dispute on a material issue and therefore do not satisfy the requirements for a contention under 10 C.F.R. § 2.309(f)(1)(vi).

4. Land Use Impacts

Intervenors contend that EGC should have used a 35% capacity factor for wind power rather than the 29% capacity factor used by EGC, which would decrease the land use for wind power to 0.35 acres per average MWe as compared to 0.23 acres per average MWe for the proposed EGC ESP facility. Intervenors also assert that EGC's environmental analysis ignores the land used to mine uranium and store spent nuclear waste and fails to account for the fact that land used to store nuclear waste is impacted more and for a longer period of time.[65] However, the issues discussed by the Intervenors do not raise a genuine dispute on a material issue of fact or law and therefore do not satisfy the requirements for a contention under 10 C.F.R. § 2.309(f)(1)(vi).

- EGC has stated that wind energy capacity factors for Class 4 areas range from 17–29%. Under the most optimistic projections, Class 4 capacity factors may increase to about 35% by 2020 due to expected improvements in wind turbine technology.[66] If the optimistic 29% capacity factor is used, the wind project would occupy 0.43 acres per average MWe. Even assuming the 35% capacity factor for wind proposed by Intervenors, the land impacts of wind would still be 50% greater than the land impacts of the proposed EGC facility on a per MWe basis. Furthermore, these figures are just for the direct land commitment for the wind turbines. Intervenors have not

[65] Intervenors' Motion, at 12–13.

[66] Exelon Affidavit, at 12.

disputed that portion of Exelon Statement of Material Fact # II.C.3, which states that the total land commitment (including the land between the turbines) would be 1,800 km^2 for an installed capacity of 9000 MW of wind facilities in Illinois, which is equivalent to about 400 km^2 for a 2000 MW wind facility with an installed capacity similar to the EGC ESP facility. Thus, it is undisputed that, on a per MW basis, wind facilities would involve a total land commitment that is substantially larger than for the EGC ESP facility.

- EGC is authorized by 10 C.F.R. § 51.51 to rely on Table S-3 in its evaluation of the environmental impacts of the uranium fuel cycle. Therefore, any claim that EGC did not consider the impact of the uranium fuel cycle on land use is an impermissible challenge to NRC regulations.
- EGC is authorized by 10 C.F.R. § 51.23 to rely on the findings of the WCR in its evaluation of the environmental impacts of storage of spent nuclear fuel. Therefore, any claim that EGC did not consider the land use impacts associated with spent fuel storage is an impermissible challenge to NRC regulations.

In summary, Intervenors' claims regarding the land impacts of wind and nuclear power do not raise any genuine dispute on a material issue and therefore do not satisfy the requirements for a contention under 10 C.F.R. § 2.309(f)(1)(vi).

5. Impacts From Nuclear Waste, Accidents, and Terrorist Attack

Intervenors contend that EGC and NRC failed to fully consider the environmental impacts of: (1) the uranium fuel cycle and spent fuel transportation; (2) waste storage,

and (3) terrorist attacks.[67] As discussed previously, all of these issues are beyond the scope of this proceeding as they involve impermissible challenges to Commission rules in 10 C.F.R. §§ 51.51, 51.52, and 51.23 in violation of 10 C.F.R. § 2.335 and prior Commission decisions on terrorism. Therefore, these issues do not raise a genuine dispute on a material issue of fact or law and therefore do not satisfy the requirements for a contention under 10 C.F.R. § 2.309(f)(1)(vi).[68]

C. Analysis of Costs of Nuclear and Wind Power

Intervenors claim that Exelon's analysis of the cost of wind power and nuclear power is erroneous. However, the issues discussed by the Intervenors do not raise a genuine dispute on a material issue of fact or law and therefore do not satisfy the requirements for a contention under 10 C.F.R. § 2.309(f)(1)(vi).

As a matter of law, issues related to cost are not material to the disposition of the Intervenors' amended Contention. An alternative is reasonable under NEPA only if (1) the alternative can serve the purpose of the proposed project, and (2) the alternative is environmentally preferable to the proposed project.[69] Unless both of these facts are first demonstrated, cost is not a material issue in the analysis of alternatives. Intervenors have

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[67] *See* Intervenors' Motion, at 13–14.

[68] Although not referenced in Intervenors' Motion, Intervenors' Affidavit, at 7, also challenges EGC's characterization of the aesthetic and water quality impacts of wind and nuclear power. However, none of the issues cited in Intervenors' Affidavit raise a genuine dispute on a material issue of fact or law. EGC has stated that wind facilities may have aesthetic impacts but if they were located in remote areas, the impacts would be SMALL. EGC has also stated that there may be aesthetic impacts from a nuclear plant due to heat dissipation into the atmosphere but, due to the industrial character of the site, the impacts would also be SMALL. Exelon Statement of Material Fact ## II.C.6, I.E.4. Intervenors do not dispute these material facts. Similarly, EGC has characterized the water quality impacts of wind power as SMALL. EGC also characterized the water use impacts of the EGC ESP Facility as SMALL. *See* Exelon Affidavit, at 17; Exelon Statement of Material Fact # I.E.5. Intervenors do not dispute these facts.

[69] *See e.g., Va. Elec. and Power Co.* (North Anna Nuclear Power Station, Units 1 and 2), ALAB-584, 11 NRC 451, 458 (1980).

not raised any material dispute regarding either of these two facts. As a result, amended Contention 3.1 can be rejected by the Licensing Board without reaching a decision on issues regarding cost.

In any event, the facts raised by the Intervenors do not raise a material dispute of fact regarding the costs of wind and nuclear power.

1. Costs of Wind Power

First, Intervenors contend that Exelon's estimate of $ 0.057 per kWh for wind power is overstated, wind power can be purchased for $ 0.035 per kWh in Minnesota, Exelon's analysis assumes a less favorable wind resource, and Exelon's analysis assumes that the Production Tax Credit (PTC) for wind will not be extended.[70] However, these assertions do not raise a material issue of fact.

- Exelon has clearly stated that the cost of wind power varies from $0.03 to $0.06 per kWh, depending upon factors such as the availability of the PTC and the wind class of the proposed site.[71] Exelon's estimated cost of $ 0.057 per kWh applies to new wind facilities to be constructed in Illinois (the location of the Clinton ESP site). This cost is based upon the undisputed fact that Illinois does not have any wind sites rated higher than Class 4.[72] Exelon has also indicated that other areas in the Upper Midwest have wind sites rated as Class 5 and 6 and can produce economical wind power. However, Intervenors have not disputed Exelon's statements that the transmission system in the Upper Midwest is currently not available to support

[70] Intervenors' Motion, at 15.

[71] Exelon Statement of Material Fact # II.B.3.

[72] Exelon Statement of Material Fact # II.B.3.

transmission of large bulk power, and that the costs of construction of new transmission would be high.[73] Therefore, Intervenors' claims regarding the cost of wind power in Minnesota do not raise any genuine issue of material fact regarding wind power as an alternative to the EGC ESP facility in Illinois.

- Intervenors have not disputed that the PTC is currently only available for wind facilities placed in service prior to 2006.[74] As a result, there is no dispute that the PTC, as it currently exists, would not be available for wind facilities that might be postulated for construction as an alternative to the EGC ESP facility.[75]

In summary, Intervenors' claims regarding the cost of electricity from wind facilities in Minnesota and the PTC do not raise any genuine dispute on a material issue of fact or law and therefore do not satisfy the requirements for a contention under 10 C.F.R. § 2.309(f)(1)(vi).

2. Costs of Nuclear Power

Second, the Intervenors criticize Exelon's cost estimates for nuclear power. Exelon has estimated the cost of electricity from the EGC ESP facility to be $ 0.031 to $0.046 per kWh, with an upper bounding cost of $ 0.055 per kWh.[76] The Intervenors contend that Exelon's costs estimates are based upon overly optimistic assumptions and that studies such as DOE's 2005 *Annual Energy Outlook* and the 2003 Massachusetts Institute of Technology (MIT) study called *The Future of Nuclear Power* indicate that the

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[73] Exelon Statement of Material Fact ## II.B.8–11.

[74] Exelon Statement of Material Fact # II.B.6.

[75] However, even if it is speculated that Congress might extend the PTC to cover later facilities, then it would also be appropriate to consider the possibility that Congress will enact financial incentives for new nuclear power plants. *See* Exelon Affidavit, at 6.

[76] Exelon Statement of Material Fact # I.D.2.

costs of electricity from nuclear power could be $ 0.067 per kWh and would not be economical.[77]

It is undisputed that there are no actual cost estimates for the EGC ESP facility, because a facility design has not yet been selected.[78] Therefore, the cost estimates of both the Intervenors and Exelon are dependent upon the assumptions used. Intervenors do not dispute Exelon's cost estimates, based upon the assumptions used by Exelon. Instead, Intervenors prefer different assumptions for their cost estimates. The most critical difference in assumptions pertains to capital costs.

The Intervenors' cost estimate of $ 0.067 per kWh is based upon a capital cost of $2000 per KWe,[79] whereas Exelon uses an estimate of $1200 to $1500 per kWe.[80] However, the study cited by the Intervenors states that the capital costs of $2000 per kWe can be reduced by 25% (*i.e.*, to $1500 per kWe) "to more closely match optimistic but plausible forecasts."[81] Using such an assumption, the study cited by the Intervenors calculates the cost of electricity from nuclear power to be $ 0.055 per kWh,[82] which is the very figure cited in Exelon's Statement of Material Facts. Furthermore, Intervenors do not dispute that reactor vendors are currently providing capital cost estimates of approximately $1200 per kWe, which would further reduce the costs of electricity to the range of $ 0.031 to $ 0.046 per kWh cited by Exelon.

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[77] Intervenors' Motion, at 15–17.

[78] Exelon Statement of Material Fact # I.D.1.

[79] MIT, *The Future of Nuclear Power*, at 43.

[80] Exelon Affidavit, at 7–8.

[81] MIT, *The Future of Nuclear Power*, at 39.

In summary, Intervenors do not dispute Exelon's costs estimates, given the assumptions used by Exelon. Furthermore, Intervenors do not dispute that Exelon's assumptions are based upon capital cost estimates actually provided by the reactor vendors for their designs. As a result, Intervenors' amended Contention 3.1 does not raise a genuine dispute regarding a *material fact*, and therefore does not satisfy the standards for admission of a contention under 10 C.F.R. § 2.309(f)(1)(vi).

D. Analysis of Combinations of Energy Alternatives

Section III.D of the Intervenors' Motion claims that Exelon has not accurately or objectively evaluated combinations of alternatives. A large portion of the Intervenors' claims are based on environmental and cost issues that are discussed in the preceding sections.[83] However, the Intervenors also criticize Exelon's assumption that the combination of alternatives would need to include a natural gas plant equivalent in capacity to the EGC ESP facility in order to produce baseload power when the wind and solar facilities are not operating.[84] As discussed below, none of the Intervenors' bases for this argument creates a genuine dispute on a material issue of fact or law under 10 C.F.R. § 2.309(f)(1)(vi).

First, Intervenors argue that wind and solar power have a "capacity value" to transmission system operators.[85] Even if this argument is assumed to be true (and not all

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[82] MIT, *The Future of Nuclear Power*, at 7.

[83] *See* Intervenors' Motion, at 17–18.

[84] Intervenors' Motion, at 18–20.

[85] Intervenors' Motion at 18–20. Intervenors do not define what they mean by "capacity value," nor do they contend that capacity value is equivalent to baseload power.

system operators assign capacity values to wind and solar power),[86] it is irrelevant because it is based upon the perspective of the transmission system operator and not the perspective of the generator or purchaser of baseload power. As stated above, the purpose of the EGC ESP facility is to provide baseload power for sale on the wholesale market; the purpose is not to provide any particular capacity value to transmission system operators. In order to supply baseload power to a purchaser of the merchant generator, the combination of alternatives will need to be able to provide firm power to the purchaser. This means that when the wind and solar facilities are not operating (*e.g.*, because the wind is not blowing and the sun is not shining), the merchant generator will need to supply baseload power through other means (*e.g.*, through natural gas plants) in order to meet its contractual obligations to the purchaser. Thus, the natural gas plants would need to have a capacity equivalent to that of the EGC ESP facility, as assumed by Exelon, in order to provide baseload power to the purchaser.[87]

Second, Intervenors contend that a large nuclear plant would pose reliability problems for transmission system operators, because they need to plan for "the sudden and unplanned loss of such a large single source of power."[88] However, even if this argument were assumed to be true, it is not material. There are already other large

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[86] As indicated in the Intervenors' Affidavit, at 20, the Midwest Independent System Operator (MISO) does not assign capacity values to wind power or other generators.

[87] As discussed above, the concept of capacity value is different than the concept of baseload power, and Intervenors do not appear to be contending that wind or solar power alone can produce any amount of baseload power. Nevertheless, we note that any such contention would be unjustifiably late under 10 CFR § 2.309(c) and (f). The ER, at 9.2-7 and 9.2-8, clearly states that wind and solar power are intermittent, that wind power by itself is unable to generate baseload power, and that solar power in conjunction with energy storage mechanisms are too expensive to generate baseload power. Therefore, any contention regarding the ability of wind and solar facilities to produce baseload power should have been made in response to the ER last year, and it is too late to raise such contentions now.

[88] Intervenors' Motion, at 19.

nuclear plants in Illinois, including the existing Clinton Power Station.[89] Therefore, transmission system operators in Illinois already plan for the loss of a single large nuclear plant.

Third, Intervenors argue that the DEIS gives "short shrift" to wind power, because it only assumes 60 MW of wind capacity as part of its combination.[90] However, it is undisputed that EGC evaluated a combination of wind power having a capacity up to 2180 MW.[91] Therefore, the record as a whole contains adequate information on combinations involving large amounts of wind capacity.

Finally, and most significantly, the Intervenors assert that Exelon has made the "absurd" assumption that a natural gas plant would reduce its operation when the wind and solar facilities are operating. In contrast, the Intervenors claim that the natural gas plant would continue to operate even when the wind and solar facilities are operating, and therefore the combination would "produce significantly more power than the Clinton 2 plant."[92]

We fully agree that production of baseload power through a combination of natural gas and wind/solar facilities would be "absurd." We are not aware of any company in the United States that produces baseload power through a combination of wind/solar facilities and natural gas or coal facilities. We have analyzed such an absurd combination only because we were required to do so by Contention 3.1.

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[89] ER § 9.3.3.3.

[90] Intervenors' Motion, at 20.

[91] Exelon Affidavit, at 24.

[92] Intervenors' Motion, at 19–20.

Wind and solar facilities are used to supplement the power produced by other facilities, not to produce baseload power. In fact, in the combination postulated by the Intervenors, it is clear that the wind/solar facilities contribute nothing to the production of baseload power. Instead, in the combination postulated by the Intervenors, the baseload power is being produced entirely by the fossil-fueled plant, and the wind/solar facilities are only producing supplemental power beyond that required for baseload production.[93]

In summary, there is no dispute that it is absurd to produce baseload power from a combination of wind/solar facilities and natural gas or coal facilities. In the Intervenors' postulated combination, the power produced by wind/solar facilities would simply supplement the baseload power produced by the natural gas and coal facilities. Therefore, amended Contention 3.1 should be rejected to the extent that it pertains to combinations of alternatives, because the proposed combination is not a reasonable alternative for generating baseload power.

VII. CONCLUSION

For the reasons discussed above, Intervenors' amended Contention (1) fails to satisfy regulatory standards pertaining to late-filed and amended contentions as described in 10 C.F.R. §§ 2.309(c) and 2.309(f)(2); (2) raises issues previously rejected by the Licensing Board in this proceeding; (3) raises issues that constitute unauthorized challenges to Commission rules and regulations; and (4) fails to demonstrate that there is a genuine dispute on certain material issues of law and fact that are dispositive of the Contention. For these reasons, amended Contention 3.1 is inadmissible and Intervenors' request should be denied.

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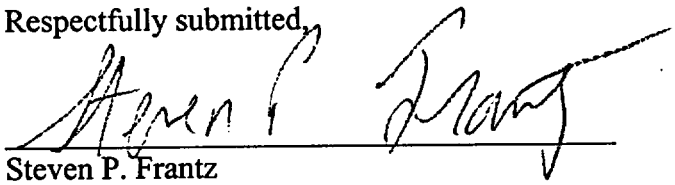
[93] *See* Intervenors' Motion, at 19–20; Intervenors' Affidavit, at 20–21.

Further, since Contention 3.1 is the only contention that has been admitted in this proceeding, a grant of summary disposition of Contention 3.1 and a rejection of the amended Contention will resolve all of the contested issues in this proceeding. Therefore, if the Licensing Board grants EGC's Motion of Summary Disposition of Contention 3.1 and rejects the amended Contention, it should also dismiss Intervenors from this proceeding.[94]

Respectfully submitted,



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[94] *See Houston Lighting and Power Co.* (Allens Creek Nuclear Generating Station, Unit 1), ALAB-629, 13 NRC 75, 77 n.2 (1981).

Attachment A
To Exelon's Answer To Intervenors' Motion to Amend Contention 3.1
Disputed & Undisputed Facts

Exelon Statement of Material Fact	Description	Undisputed	Disputed	Dispute is Not Material
I.A.1 EGC ESP Facility Location	The EGC ESP site is located within the boundary of the Clinton Power Station (CPS) property. The site is located in DeWitt County, Illinois, approximately six miles east of the City of Clinton and along the shore of Clinton Lake. The EGC ESP facility will be built about 700 feet south of the CPS. The site is zoned as industrial.	X		
I.B.1 EGC ESP Facility Purpose	The purpose of the EGC ESP facility is to operate as a baseload merchant generator--power produced will be sold on the wholesale market, without specific consideration to supplying a traditional service area or satisfying a reserve margin objective.		**pp 8–9**[1] Intervenors argue that this purpose constrains the alternative analysis in violation of NEPA by improperly rejecting reasonable energy efficiency alternatives to new nuclear power. Intervenors also claim that reliance on such a purpose is arbitrary and capricious given that the Draft EIS and EGC filings do not evaluate whether there is any need for additional baseload power.	The Licensing Board's Memorandum & Order (Aug. 6, 2004) rejected those portions of Intervenors' proposed Contention 3.1 that pertained to a need for power and energy conservation on the ground that those matters are outside the scope of this proceeding and/or impermissible challenges to the Commission's regulations. LBP-04-17, 60 NRC 229, 245–46.
I.C.1 EGC ESP Facility Capacity	The capacity of the EGC ESP facility will be approximately 2,180 MWe, it will have an average annual power output of approximately 1,962 MWe, and an average annual energy output of about 17,200,000 MWh.	X		
I.D.1 EGC ESP Facility Costs	EGC has not selected a particular design to construct and operate at the EGC ESP site. Therefore, there are no specific cost estimates for the EGC ESP facility.	X		
I.D.2 EGC ESP Facility Costs	The projected total cost of electricity associated with a new nuclear facility at the Clinton ESP site is in the range of $0.031-$0.046/kWh, with an upper bounding value of $0.055/kWh for the cost of electricity associated with a first-of-a-kind nuclear plant.		**pp. 15–17** Intervenors claim that EGC's analysis of the cost of nuclear power is erroneous, based largely on issues related to capital costs.	Intervenors do not dispute that EGC's assumptions are based upon capital cost estimates actually provided by the reactor vendors for their designs.
I.E.1 EGC ESP Facility Environmental Impacts	The EGC ESP facility would consist of approximately 461 acres (0.23 acres/MWe). Accordingly, land use impacts of the EGC ESP facility would be SMALL.		**pp. 12–13** Intervenors argue that EGC's estimate of land use for nuclear power considers only the land directly used by the nuclear plant, and ignores the amounts of land used to mine uranium and store nuclear waste.	EGC is authorized by 10 CFR § 51.51 to rely on Table S-3 in its evaluation of the environmental impacts of the uranium fuel cycle. Additionally, EGC is authorized by 10 CFR § 51.23 to rely on the findings of the WCR in its evaluation of the environmental impacts of storage of spent nuclear fuel.

[1] All references to page numbers in this column refer to Intervenors' Motion to Amend Contention 3.1

Attachment A
To Exelon's Answer To Intervenors' Motion to Amend Contention 3.1
Disputed & Undisputed Facts

Exelon Statement of Material Fact	Description	Undisputed	Disputed	Dispute is Not Material
				Therefore, any claim that EGC did not consider the land use impacts associated with spent fuel storage and the uranium fuel cycle is an impermissible challenge to NRC regulations.
I.E.2 EGC ESP Facility Environmental Impacts	During operation of the EGC ESP facility, there could be some gaseous effluents from diesel engines, gas turbines and heating facilities. Accordingly, the air quality impacts of the EGC ESP facility would be SMALL.		**pp. 13-14** Intervenors argue that EGC's categorization of air quality impacts ignores the fact that the uranium fuel cycle creates greenhouse gases, construction will result in greenhouse gas emissions, and operations will result in emissions of radionuclides.	The emission levels at the site boundary would be insignificant as defined by EPA. Additionally, EGC has stated that radiological effluents will be released from the EGC ESP facility. The resulting exposures would be within limits specified by NRC and EPA. Intervenors do not dispute these material facts. Finally, Intervenors' issues on the impacts of the uranium fuel cycle represent an impermissible challenge to the Commission's rules in 10 CFR § 51.51.
I.E.3 EGC ESP Facility Environmental Impacts	The operation of the EGC ESP facility will result in heat dissipation to the atmosphere. Other impacts could include occasional fogging, icing, and drift droplet deposition. These impacts are expected to be primarily aesthetic. Accordingly, the thermal impacts of the EGC ESP facility would be SMALL.	X		
I.E.4 EGC ESP Facility Environmental Impacts	The EGC ESP facility will have the following aesthetic impacts: a power block structure that could be up to 234 feet high, a cooling tower would have a height of about 550 feet, and noise levels from cooling tower operations would be about 55 dB at 1,000 feet. Accordingly, the aesthetic impacts of the EGC ESP facility would be SMALL.	X		
I.E.5 EGC ESP Facility Environmental Impacts	Surface water from Clinton Lake would be used to meet the operational water requirements of the EGC ESP facility. Accordingly, the water use impacts of the EGC ESP facility would be SMALL.	X		
I.E.6 EGC ESP Facility Environmental Impacts	The combined discharge flow rates and temperatures from CPS and the EGC ESP facility will remain within the existing limits specified in the National Pollution Discharge Elimination System (NPDES) permit for CPS. The chemical discharges will also be in compliance with the	X		

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	NPDES permit. Lake water temperatures may be marginally increased due to operation of the EGC ESP facility. Accordingly, the impacts on water quality from the operation of the EGC ESP facility would be SMALL.			
I.E.7 EGC ESP Facility Environmental Impacts	Groundwater will not be used as a source of water for the EGC ESP facility. Accordingly, the groundwater use impacts resulting from the operation of the EGC ESP facility would be SMALL.	X		
I.E.8 EGC ESP Facility Environmental Impacts	There are no known state- or federally-listed threatened or endangered species at the site or in the site's vicinity, although some rare birds have been sighted in the vicinity. Accordingly, the impact on threatened and endangered species from the EGC ESP facility would be SMALL.	X		
I.E.9 EGC ESP Facility Environmental Impacts	The EGC ESP site has already been developed for use by CPS. Accordingly, the impacts to cultural resources from construction and operation of the EGC ESP facility would be SMALL.	X		
I.E.10 EGC ESP Facility Environmental Impacts	The work force at the EGC ESP facility is expected to be approximately 3,150 during construction and 580 during operation. Workers would likely live within a 50-mile radius (region) of the EGC ESP facility and commute to the facility. In the region surrounding the facility, there are about 1.2 million people. The socioeconomic impacts from construction and operation of the EGC ESP facility would be SMALL.	X		
I.E.11 EGC ESP Facility Environmental Impacts	Exposure from liquid pathways, gaseous pathways, or direct radiation from station operation would be within the limits specified by NRC and EPA regulations. Accordingly, human health impacts from the radiological effluents from the EGC ESP facility would be SMALL.		**pp. 13–14** Intervenors argue that EGC's categorization of air quality impacts ignores the fact that the uranium fuel cycle creates greenhouse gases, construction will result in greenhouse gas emissions, and operations will result in emissions of radionuclides.	The emission levels at the site boundary would be insignificant as defined by EPA. Additionally, EGC has stated that radiological effluents will be released from the EGC ESP facility. The resulting exposures would be within limits specified by NRC and EPA. Intervenors do not dispute these material facts. Finally, Intervenors' issues on the impacts of the uranium fuel cycle represent an impermissible challenge to the Commission's rules in 10 CFR § 51.51.

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I.E.12 EGC ESP Facility Environmental Impacts	Nuclear accidents involving the EGC ESP facility could release substantial quantities of radiation and cause health, environmental, and socioeconomic impacts. The probability of such accidents would be low. Accordingly, the impacts of accidents from the operation of the EGC ESP facility would be SMALL.	Intervenors' Statement of Disputed Facts in Support of Intervenors' Response to Exelon's Motion for Summary Disposition of Contention 3.1 (Intervenors Statement of Disputed Facts), submitted on Apr. 6, 2005, did not dispute this fact.	p. 14 Intervenors argue that the Draft EIS understates the risks posed by serious accidents at the proposed EGC ESP facility. In particular, they state that the Draft EIS fails to consider a recent National Academy of Sciences study that concluded not enough has been done to protect plants from terrorist attacks.	Issues on terrorism are beyond the scope of this proceeding as they involve impermissible challenges to prior Commission decisions on terrorism.
I.E.13 EGC ESP Facility Environmental Impacts	Construction of EGC ESP facility's power block structure could impact up to 150 acres of terrestrial habitat, potentially displacing various species. New cooling towers would reduce impingement, entrainment, and thermal impacts to aquatic species. Accordingly, ecological impacts from the operation of the EGC ESP facility would be SMALL.	X		
I.E.14 EGC ESP Facility Environmental Impacts	The EGC ESP facility would generate, process, store, or release radioactive waste in liquid and gaseous effluents, and in the form of solid waste. Radioactive impacts would be small and non-radiological impacts would be negligible. Accordingly, waste management impacts from the operation of the EGC ESP facility would be SMALL.		p.14 Intervenors argue that the Draft EIS's and EGC filings' characterization of impacts from uranium mining and waste disposal do not consider particular impacts and new information regarding the impacts of the uranium fuel cycle.	These issues are beyond the scope of this proceeding as they involve impermissible challenges to Commission rules in 10 CFR §§ 51.51 and 51.23.
II.A.1 Wind Generation Potential	Wind power is intermittent. Therefore, wind power, by itself, cannot be used to generate baseload power.	X		
II.A.2 Wind Generation Potential	Wind resource maps identify areas by wind power class, which range from Class 1 to Class 7, at a height of 50 meters at the following average wind speeds: Class 1: < 12.5 mph; Class 2: 12.5-14.3 mph; Class 3: 14.3-15.7 mph; Class 3+: 15.5-15.7 mph; Class 4: 15.7-16.8; Class 5: 16.8-17.9; Class 6: 17.9-19.7; and Class 7: > 19.7 mph.	X		

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II.A.3 Wind Generation Potential	Areas identified as Class 4 and above are regarded as potentially economical for wind energy production with current technology. As a result of advances in technology and financial incentive support, Class 3+ areas may also be economical for wind development.	X		
II.A.4 Wind Generation Potential	Illinois has no Class 5 or higher sites. There are scattered areas in central and northern Illinois with a classification of Class 4. In Illinois, the total amount of Class 4 lands is approximately 600 square kilometers. EGC does not own or have rights to this land.	X		
II.A.5 Wind Generation Potential	There are a number of areas within Illinois that are classified as Class 3+. In Illinois, the total amount of Class 3+ land is approximately 1,200 square kilometers. EGC does not own or have rights to use this land.	X		
II.A.6 Wind Generation Potential	The total wind potential for Illinois' Class 4 (3,000 MW) and Class 3+ (6,000 MW) area is about 9,000 MW of installed capacity.	X		
II.A.7 Wind Generation Potential	At a Class 4 site, the average annual output of a wind power plant is typically about 25% of the installed capacity. The National Electric Reliability Council credits wind capacity at about 17% in Class 4 areas. More optimistic assessments place the capacity factor for a Class 4 wind facility at about 29%, rising to 35% in 2020.		**pp. 12–13** Intervenors claim that the current capacity factor for wind power is 35%.	Even if a higher capacity factor is assumed, it is undisputed that wind power is intermittent, and therefore cannot generate baseload power.
II.A.8 Wind Generation Potential	If it is assumed that Class 3+ wind areas have the same capacity factor as Class 4 areas, and all of the wind resources in Illinois' Class 3+ and Class 4 sites were developed, based upon the capacity factors of 17% and 29%, the resulting wind facilities would have an average annual output of 1,530 MWe and 2,610 MWe, respectively.		**pp.12–13** Intervenors dispute this fact only to the extent that EGC should have assumed a 35% capacity factor for wind power.	Even if a higher capacity factor is assumed, it is undisputed that wind power is intermittent, and therefore cannot generate baseload power.

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II.A.9 Wind Generation Potential	Illinois has one operating wind power project with 50 MW of installed capacity, which produces less than 0.1% (0.0001) of annual electricity sales, based upon 2002 retail electricity sales levels for Illinois. Illinois has about $1.5 billion in proposed new investment in wind power with a total of 3,119 MW of proposed wind power projects. These projects are in various stages of development and review, but none of these projects is operating.	X		
II.B.1 Wind Power Costs	Wind power generation has zero fuel costs.	X		
II.B.2 Wind Power Costs	The cost of electricity from utility-scale wind power projects was approximately $0.30/kWh in the 1980's.	X		
II.B.3 Wind Power Costs	The cost of electricity from utility-scale wind power projects ranges from $0.03-$0.06/kWh. The cost of generating electricity in Class 5 sites and above is approximately $0.047/kWh, in Class 4 sites $0.054/kWh, and $0.064/kWh in Class 3+ sites. The cost of electricity from wind facilities at sites similar to those available in Illinois is currently about $0.057/kWh.		**pp. 15–16** Intervenors contend that EGC's estimate of $0.057/kWh for wind power is overstated, wind power can be purchased for $0.035/kWh in Minnesota, EGC's analysis assumes a less favorable wind resource, and EGC's analysis assumes that the PTC will not be extended.	EGC's estimated cost of $0.057/kWh applies to new wind facilities in Illinois and Illinois does not have any wind sites rated higher than Class 4. While there are areas in the Upper Midwest that have higher class wind sites and can produce economical wind power, the transmission system is not available in these areas to support transmission of large bulk power. Finally, while the PTC is currently available for wind facilities placed in service prior to 2006, as it currently exists the PTC would not be available for wind facilities that might be postulated for construction as an alternative to the EGC ESP facility.
II.B.4 Wind Power Costs	Most wind turbines currently being installed in the U.S. have a peak capacity of approximately 1.5 to 1.6 MW. GE is currently producing 2.3-2.7 MW land-based turbines and 3.6 MW turbine designs for offshore use. These turbines are not readily available for large-scale commercial use. Clipper Wind Power has announced the groundbreaking for installation of a commercial prototype of its 2.5 MW wind turbine. This turbine is not commercially available in large numbers.	X		

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II.B.5 Wind Power Costs	By 2020, wind power generating costs are projected by some environmental groups to fall to $0.03-$0.04/kWh.	X		
II.B.6 Wind Power Costs	Direct public sector support programs have contributed to reduced costs for wind power. The PTC has been renewed through the year 2005, which provides a tax credit of $0.018/kWh for wind facilities placed in service after December 31, 1993 and before January 1, 2006. A five-year depreciation schedule is available for renewable energy systems under the Economic Recovery Tax Act of 1981.	X		
II.B.7 Wind Power Costs	Several states have implemented various policies providing incentives to wind power generation, including Illinois, which enacted legislation creating the Illinois Resource Development and Energy Security Act. Illinois has also established Public Benefit Funds to fund renewable energy.	X		
II.B.8 Wind Power Costs	There are areas in the upper Midwest with the potential to produce economic generation of wind power, including North and South Dakota, as well as parts of Iowa, which have some areas designated as Class 6 and above, and other states have Class 5 sites.	X		
II.B.9 Wind Power Costs	The transmission system infrastructure to support transmission of large bulk power from the Upper Midwest is currently not available and investment in new long-distance transmission infrastructure is not forthcoming—any new development could take at least 10 years from proposal through permitting and construction.	X		
II.B.10 Wind Power Costs	The cost of new transmission capacity would be high. The additional costs to expand the transmission system to accommodate large-scale wind farms are not reflected in the costs of wind power energy discussed earlier.	X		

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II.B.11 Wind Power Costs	There are voltage and stability issues associated with transmission of power in the Upper Midwest states. Development of large wind farms in the Upper Midwest would aggravate these voltage and stability issues.	X		
II.B.12 Wind Power Costs	Electricity generated in wind facilities in areas far removed from loads could be converted to hydrogen by electrolysis, and the hydrogen could be transmitted by pipeline to populations centers, where it could be used to produce electricity. Long-distance pipeline transmission of hydrogen is not commercially available and there are no large-scale electrolysis plants available for this purpose.	X		
II.C.1 Wind Power Environmental Impacts	Wind generation produces no air pollution, greenhouse gases, or solid or liquid waste. Wind power does not use coolant water or have thermal discharges. Therefore, the impacts on air and water quality from wind power are SMALL.		**p. 11 n.4** Intervenors contend that wind power should be considered to have no impacts on air and water quality.	There is no material difference between "no impacts" and SMALL impacts, as the Commission has defined them.
II.C.2 Wind Power Environmental Impacts	The land between wind turbines is largely available for other uses that do not impact the turbine, such as agricultural use. A 2 MW turbine requires about a quarter of an acre of dedicated land for the actual placement of the wind turbine.	X		
II.C.3 Wind Power Environmental Impacts	In Illinois, if all of the Class 3+ and Class 4 sites were developed, the sites would occupy about 1,800 square kilometers of land. Using 2 MW turbines, with each turbine occupying one-quarter acre, the wind facilities would have an installed capacity of 9,000 MW and would utilize 1,125 acres for the placement of the wind turbines alone. Assuming a capacity factor of 17%, this corresponds to approximately 0.73 acres/MWe. Using a 29% capacity factor, this project would use 0.43 acres/MWe. Land impacts for wind projects would be SMALL to LARGE depending upon the amount of wind power installed.		**pp. 12–13** Intervenors claim that the capacity factor for wind power is 35%. A 35% capacity factor would reduce the land use for wind power to 0.35 acres per MWe as compared to 0.23 acres per MWe for the EGC ESP facility.	Even assuming the 35% capacity factor for wind proposed by Intervenors, the direct land impacts of wind are still 50% greater than the land impacts of the proposed EGC facility on a per MWe basis, and the total land commitment is substantially larger.

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II.C.4 Wind Power Environmental Impacts	Wind turbines can cause deaths to birds due to collisions. Studies performed at sites around the U.S. measure one or two bird deaths per turbine per year. Bird deaths due to wind generation are a small fraction of those caused by other human activities. Accordingly, impacts from avian collisions for wind projects would be SMALL.		p. 13 Intervenors argue that EGC overstates the impact on birds that collide with wind turbines. Further, Intervenors argue that wind turbines cause an average of only 2 bird deaths per year.	EGC's estimate relating to bird deaths is consistent with Intervenors' estimate, as indicated in the description of Material Fact II.C.4. Furthermore, EGC has classified the impacts of wind facilities on birds as SMALL.
II.C.5 Wind Power Environmental Impacts	Wind turbines produce noise. Modern wind turbines are less noisy than their predecessors. The level of noise drops with increased distances. Noise impacts for wind projects could be SMALL to LARGE depending on the size and placement of the wind project. However, if the wind facilities were located in order to mitigate noise impacts, the impacts would be SMALL.		p. 13 Intervenors argue that EGC overstates the impact on noise created by wind turbines.	The actual decibel levels cited by EGC and Intervenors are the same. Further, as discussed in the description of Material Fact II.C.5; if the wind facilities are located in order to mitigate noise impacts, the impacts would be SMALL.
II.C.6 Wind Power Environmental Impacts	Nationwide, many communities have opposed the placement of nearby wind projects. Aesthetic impacts for wind projects could be SMALL to LARGE depending on the size and placement of the wind project. However, if the wind facilities were remotely located in order to mitigate the aesthetic impacts, the impacts would be SMALL.		Intervenors argue that aesthetic judgments are subjective.	EGC has stated that if wind facilities are located in remote areas, the impacts would be SMALL.
III.A.1 Solar Power Generation Potential	Solar power is intermittent as it is dependent on the availability and strength of sunlight. Solar is not available to produce power at night or on overcast days. Therefore, solar power, by itself, cannot be used to generate baseload power.	X		
III.A.2 Solar Power Generation Potential	In Illinois, solar energy varies but is approximately 4/kWh/m^2/day on average. The southwestern part of the U.S. receives about twice as much solar energy as Illinois.	X		
III.A.3 Solar Power Generation Potential	Solar technologies can be divided into two groups: concentrating solar power systems and photovoltaics (PV).	X		

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III.A.4 Solar Power Generation Potential	There are no commercial concentrating systems in Illinois. There are about 100 distributed solar electric installations in Illinois producing 2,000 MWh per year or about 228 average kw statewide. Most of these are located on buildings as distributed generation.	X		
III.B.1.a-c Concentrating Solar Power Systems	There are three kinds of concentrating solar power systems: trough system, dish/engine system, and power tower system. These systems are not commercially available yet and the technology is still in the development stage.	X		
III.B.2 Concentrating Solar Power Systems	Concentrating solar power systems cost $0.09-$0.012/kWh. This cost may decrease to $0.04-$0.05/kWh in the next few decades. These costs are for southwestern U.S. Since Illinois on average receives about half of the solar energy as the southwestern United States, the cost of electricity from such facilities, if built in Illinois, would be about twice as high.	X		
III.C.1 PV Cells	A single PV cell measures about 4 inches on each side and produces about 1 watt of power. A PV module consists of about 40 or so PV cells. Ten modules can be arranged into PV "arrays" which measure up to several meters on a side. Hundreds of arrays can be interconnected to form a single, large PV system for large electric generation.	X		
III.C.2 PV Cells	PV cell conversion efficiencies are currently about 15%. The maximum conversion efficiency in a laboratory setting is about 25%.	X		
III.C.3 PV Cells	PV's capital costs are $5-$20/watt. The total cost of generating electricity from PV is $0.20-$0.50 in the southwestern U.S. The cost of generating electricity from PV in Illinois would be approximately twice as high because it receives about 50% less solar radiation.	X		

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III.C.4 PV Cells	Improvements in production and technology could decrease the cost of centralized PV systems to $0.15-$0.20/kWh in southwestern U.S. by the year 2020. The costs in Illinois would be about twice that amount.	X		
III.D.1 Solar Environmental Impacts	During operation, PV and solar thermal generation produce no air pollution, greenhouse gases, solid waste, or noise, and require no transportable fuels. Accordingly, the impacts on air and water quality from solar power are SMALL.	X		
III.D.2 Solar Environmental Impacts	Land used for solar facilities are not available for other uses such as agriculture. To generate an amount of electricity equivalent to that produced by the EGC ESP facility, PV cells would require ten square kilometers. Land use impacts could range from SMALL to LARGE depending on the size of the solar project.	X		
III.D.3 Solar Environmental Impacts	Distributed solar PV panels are not typically employed by independent power producers. EGC does not have rights to place solar panels on tops of buildings that it does not own.	X		
III.D.4 Solar Environmental Impacts	There may be thermal discharge impacts from concentrating solar power systems. The environmental impacts from these heat discharges are expected to be SMALL.	X		
III.D.5 Solar Environmental Impacts	There are human health risks and environmental impacts associated with the manufacture, use, and disposal of solar power technologies. The impact of these potential risks is SMALL.	X		
IV.A.1 Combinations of Wind & Solar Power	Combinations of wind and solar power alone could not be relied upon as a dependable source of baseload power. The combination of the wind and solar power facilities would need to be supplemented by energy storage systems or fossil-fueled facilities to produce baseload power.	X		

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IV.B.1 Wind/Solar Power & Energy Storage	Energy storage in combination with the wind and/or solar facilities would be able to generate baseload power.	X		
IV.B.2 Wind/Solar Power & Energy Storage	The storage of one day's output at 2,180 MW is beyond any demonstration projects using batteries, compressed air, hydrogen, or other storage mechanism. The cost of such systems would be prohibitive.	X		
IV.B.3 Wind/Solar Power & Energy Storage	Solar storage systems are not available on the scale of the EGC ESP facility or are still in the demonstration stage.	X		
IV.B.4 Wind/Solar Power & Energy Storage	In the northwestern U.S., existing hydropower reservoirs are used to levelize wind generation. This approach is not available in Illinois to store large amounts of energy.	X		
IV.B.5 Wind/Solar Power & Energy Storage	Pumped storage is not available in Illinois for storage of large amounts of energy, and the costs of development of such facilities would be prohibitive.	X		
IV.C.1.a Wind/Solar Power & Coal or Natural Gas	Wind or solar power combined with a fossil-fueled facility, such as a natural gas-fired or coal facility, has the potential to produce baseload power. The fossil-fueled portion of the combination can produce the needed power during those periods when the sun is not shining or the wind is not blowing. The coal or natural gas fired generation would be displaced when the wind and/or solar resource is producing power.		**p. 19–20** Intervenors assert that EGC has made the "absurd" assumption that a natural gas plant would reduce its operation when the wind and solar facilities are operating. Intervenors claim that the natural gas plant would continue to operate even when the wind and solar facilities are operating. Therefore the combinations would produce more power than the Clinton 2 plant.	EGC agrees that it is absurd to postulate production of baseload power from a combination of wind/solar and fossil-fueled facilities. In the combination postulated by the Intervenors, the baseload power is being produced entirely by the fossil fuel plant, and the wind/solar facilities are only producing supplemental power beyond that required for baseload production.
IV.C.1.b Wind/Solar Power & Coal or Natural Gas	The coal or natural gas-fired facilities would require a peak capacity of 2,180 MW in combination with wind and/or solar facilities to produce baseload power equivalent to the EGC ESP facility. When the wind/solar generation is less than 2,180 MW, the coal or natural gas-fired generation would need to run to bring the total generation output to 2,180 MW.		**p. 19** Intervenors argue that EGC ignores the capacity values of intermittent resources such as wind power. By assuming that Clinton 2 would have to be replaced with a natural gas facility of equal size, Exelon provides no capacity value to wind power and solar energy.	The Intervenors have not contended that "capacity value" is equivalent to baseload power. The EGC ESP facility's purpose is to provide baseload power; it is not to provide any particular capacity value to transmission system operators. Therefore, when the wind and solar facilities are not operating, the merchant generator will need to supply baseload power through other means. Thus, the natural gas plants will need to have a capacity equivalent to that of the EGC ESP facility in order to produce baseload power.

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IV.C.2.a Wind/Solar Power & Coal or Natural Gas	The estimated cost of generating electricity from a natural gas-fired facility alone is currently $0.047/kWh and from a coal facility alone is currently $0.049/kWh.	X		
IV.C.2.b Wind/Solar Power & Coal or Natural Gas	The cost of electricity production from a coal or natural gas-fired facility in combination with wind and/or solar facilities would increase relative to the cost of baseload coal or natural gas-fired facilities because the capital costs and operating costs of either type of facility would be spread across fewer kWh.		p. 20 Intervenors contend that a coal or natural gas fired-facility would continue to operate even when the wind is blowing and/or sun is shining.	In the combination postulated by the Intervenors, the baseload power is being produced entirely by the fossil fuel plant, and the wind/solar facilities are only producing supplemental power beyond that required for baseload production.
IV.C.2.c Wind/Solar Power & Coal or Natural Gas	The cost of electricity from a combination of coal/natural gas facilities and wind/solar facilities would exceed the cost of electricity from a new nuclear facility.		p. 18 Intervenors contend that wind and fossil fuel alternatives individually are economically superior to new nuclear power and would also be in combination.	As discussed above, the issues discussed by Intervenors do not raise a genuine dispute on a material issue of fact or law with respect to the cost of wind power and nuclear power.
IV.D.1.a Wind/Solar Power & Coal or Natural Gas	To produce baseload power equivalent to the EGC ESP facility, a coal-fired generation facility using clean coal technologies would generate: 8,127 tons of Sulfur Oxide/year, 2,054 tons of Nitrous Oxide/year, 2,118 tons of Carbon Monoxide/year, 292 tons of Particulate Matter/year, and 67 tons of Particulate Matter^{10}/year. Although clean coal power plant technology decreases air pollution impacts associated with the burning of coal, the environmental impacts of clean coal technologies are greater than the impacts from a natural gas-fired facility. The impacts from a coal-fired plant would be MODERATE to LARGE. An equivalent sized natural gas-fired facility would generate: 177 tons of Sulfur Oxide/year; 568 tons of Nitrous Oxide/year; 120 tons of Carbon Monoxide/year; and 99 tons of Particulate Matter^{10}/year. These air quality impacts would be SMALL to MODERATE.	X		
IV.D.1.b Wind/Solar Power & Coal or Natural Gas	The water quality impact from both coal-fired and natural gas-fired generation would be SMALL.	X		

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IV.D.1.c Wind/Solar Power & Coal or Natural Gas	The impact from either a natural gas-fired or coal-fired plant on land use and ecological resources would be SMALL.	X		
IV.D.1.d Wind/Solar Power & Coal or Natural Gas	No resident threatened and endangered species are known to occur at the ESP site or along transmission corridors. Accordingly, the impact on threatened and endangered species relative to natural gas-fired and coal-fired generation at the ESP site would be SMALL.	X		
IV.D.1.e Wind/Solar Power & Coal or Natural Gas	The ESP site was previously disturbed. Accordingly, the impact of coal-fired or natural gas-fired generation on cultural resources would be SMALL.	X		
IV.D.1.f Wind/Solar Power & Coal or Natural Gas	Approximately 250 expected employees would be needed to generate electricity from a coal-fired facility and between 40-150 employees for a natural gas-fired facility. Workers would live within a 50-mile radius and commute to the facility. There are about 1.2 million people in the region surrounding the facility.	X		
IV.D.2 Wind/Solar Power & Coal or Natural Gas	The greater the output of the wind and/or solar portion of the combination alternative, the lower the environmental impacts associated with the operation of coal or natural gas-fired portion of the combination alternative.	X		
IV.D.3 Wind/Solar Power & Coal or Natural Gas	If the wind/solar facilities have a peak capacity less than the capacity of the EGC ESP facility, the construction and operational environmental impacts of the wind/solar facilities would be reduced relative to such facilities that have a capacity equivalent to the EGC ESP facility.	X		
IV.D.4 Wind/Solar Power & Coal or Natural Gas	The greater use of wind/solar facilities would reduce the fuel and fuel-burning operational impacts from a coal or natural gas-fired facility, since the wind/solar facilities would supplant the coal or natural gas-fired facility when the wind/solar facilities operate.		p. 20 Intervenors contend that a coal or natural gas fired-facility would continue to operate even when the wind is blowing and/or sun is shining.	In the combination postulated by the Intervenors, the baseload power is being produced entirely by the natural gas plant, and the wind/solar facilities are only producing supplemental power beyond that required for baseload production.

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IV.D.5 Wind/Solar Power & Coal or Natural Gas	The air quality impacts of a combination of natural gas/coal facilities and wind/solar facilities would be MODERATE. The land impacts of a combination of natural gas/coal facilities and an appreciable amount of wind/solar facilities would likely be MODERATE. Even if the impacts could be reduced to SMALL, the combination would not be environmentally preferable to a nuclear facility.	Intervenors' Statement of Disputed Facts did not dispute this fact.	p. 11 Intervenors claim that a combination of alternatives that uses a proper amount of wind and solar power would reduce the air quality impacts of natural gas to SMALL.	As pointed out in fact IV.D.5, even if the air quality impacts of a natural gas facility could be reduced to SMALL, the combination would not be environmentally preferable to the EGC ESP facility.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	Docket No. 52-007
EXELON GENERATION COMPANY, LLC	)	ASLBP No. 04-821-01-ESP
(Early Site Permit for the Clinton ESP Site)	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of Exelon's Answer to Intervenors' Motion to Amend Contention 3.1 have been served as shown below by deposit in the United States mail, first class, this 6th day of May 2005. Additional service has also been made this same day by electronic mail as shown below.

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