

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:)	
)	
Union Electric Co.)	Docket No. 50-483-LR
)	
(Callaway Plant Unit 1))	May 29, 2012

**MISSOURI COALITION FOR THE ENVIRONMENT’S REPLY TO AMEREN’S AND
NRC STAFF’S OPPOSITIONS TO HEARING REQUEST
AND PETITION TO INTERVENE IN LICENSE RENEWAL PROCEEDING
FOR CALLAWAY NUCLEAR POWER PLANT**

I. INTRODUCTION

As provided by 10 C.F.R. § 2.309(h)(2), Missouri Coalition for the Environment (“MCE”) hereby replies to the oppositions submitted by Union Electric Co. d/b/a Ameren Corp. (hereinafter “Ameren”) and the U.S. Nuclear Regulatory Commission (“NRC”) Staff. *See* Ameren’s Answer Opposing the Missouri Coalition for the Environment’s Hearing Request and Petition to Intervene (May 21, 2012) (“Ameren Answer”); NRC Staff’s Answer to Missouri Coalition for the Environment’s Hearing Request and Petition to Intervene (May 21, 2012) (“NRC Staff Answer”). Ameren and the Staff raise no objection to MCE’s standing, but contest the admissibility of all three of MCE’s contentions. As discussed below, their arguments are without merit and the contentions should be admitted.

II. DISCUSSION

Contention 1: Environmental Report Lacks Information Regarding Proposed

Modifications to Callaway Facility

Contention 1 states:

The Environmental Report fails to satisfy 10 C.F.R. § 51.53(c)(2) because it does not include information about Ameren’s plans to modify the Callaway facility in response to

post-Fukushima enforcement order EA-12-049 (March 12, 2012), Order Modifying Licenses With Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Effective Immediately) (“Order EA-12-049”) (ML12056A045). As also required by 10 C.F.R. § 51.53(c)(2), the Environmental Report must include a discussion of a reasonable array of alternative measures for modifying the facility in accordance with Order EA-12-049.

This contention seeks compliance with 10 C.F.R. § 51.53(c)(2)’s requirement that an environmental report must contain “a description of the proposed action, including the applicant’s plans to modify the facility or its administrative control procedures as described in accordance with § 54.21 of this chapter.”¹ Modifications “directly affecting the environment or affecting plant effluents that affect the environment” must be described “in detail.” *Id.* The contention also seeks compliance with 10 C.F.R. § 51.53(c)(2)’s requirement for the discussion of a reasonable range of alternatives.

Ameren asserts that the modifications required by EA-12-049 do not constitute a part of the “proposed action” in this case, *i.e.*, the license renewal application, and therefore 10 C.F.R. § 51.53(c)(2) does not apply. Ameren Answer at 12. According to Ameren, this is because EA-12-049 “pertains to all power reactor licensees and holders of construction permits” and “requires actions irrespective of license renewal. . .” Ameren Answer at 13 (emphasis in original). According to Ameren, EA-12-049 “requires actions long before the period of extended operation.” *Id.* See also NRC Staff Response at 14. But EA-12-049’s requirements have arisen while Ameren’s license renewal application is pending and the measures that Ameren proposes to satisfy EA-12-049 will affect the environmental impacts of operating Callaway during the

¹ Section 54.21(b) provides that:

Each year following submittal of the license renewal application and at least 3 months before scheduled completion of the NRC review, an amendment to the renewal application must be submitted that identifies any change to the CLB of the facility that

license renewal term. Moreover, because they are new post-Fukushima measures, it is certain that they have not previously been considered in any environmental impact statement (“EIS”) for Callaway. Thus, those measures constitute a part of the proposed action that fall within the scope of NEPA. In addition, the predicted date for the final EIS is September 2013, well before the deadline for completion of the measures required by EA-12-049. *See* <http://www.nrc.gov/reactors/operating/licensing/renewal/applications/callaway.html#licrenapp>.

Ameren also argues that 10 C.F.R. § 51.53(c)(2) applies only to plant modifications made specifically in connection with the Part 54 license renewal rule (i.e., integrated plant assessments and time-limited aging analyses). Ameren Answer at 13. *See also* NRC Staff Response at 16. But the language of § 51.53(c)(2) does not support Ameren’s narrow interpretation. The regulation requires “a description of the proposed action, *including* the applicant’s plans to modify the facility or its administrative control procedures as described in accordance with § 54.21 of this chapter.” *Id.* (emphasis added). Thus, the regulation is inclusive, not exclusive. As the Commission ruled in *Fla. Power & Light Co.* (Turkey Point Generating Plant Units 3 and 4), CLI-01-17, 54 NRC 3, 13 (2001), NEPA is not limited by the NRC’s regulations for implementation of the Atomic Energy Act.

For the same reason, Ameren lacks a legal basis for its argument that the measures to be proposed in response to EA-12-049 are not “causally related” to license renewal because they do not relate to management of aging. Ameren Answer at 14. The propose measures are, in fact, “causally related” because they will become conditions for the safe operation of Callaway during the license renewal term and have not been analyzed previously in any EIS.

materially affects the contents of the license renewal application, including the FSAR supplement.”

Ameren also argues that Contention 1 is barred by 10 C.F.R. § 51.10(d), which precludes NEPA consideration of enforcement orders. Ameren Answer at 15. But Contention 1 does not seek consideration of the environmental impacts of EA-12-049. Instead, it seeks consideration of the environmental impacts of changes to the design and operation of Callaway that will be affect the environmental impacts of operating Callaway during the license renewal term. Section 52.53(c)(2) broadly requires a description of the proposed action, including changes to the design and operation of the facility, and makes no distinction with respect to the origin of the changes.

Ameren contends that Contention 1 does not raise any genuine material dispute with the Environmental Report because it does not identify any deficiency in Ameren’s severe accident mitigation alternatives (“SAMA”) analysis. Ameren Answer at 15. *See also* NRC Staff Response at 13. But the adequacy of the SAMA analysis is not the subject of Contention 1. Contention 1 simply seeks compliance with 10 C.F.R. § 51.53(c)(2)’s requirement to describe and analyze the proposed action, including modifications to the facility that Ameren will propose in response to EA-12-049. The nature of the analysis required by EA-12-049 is also different from the SAMA analysis that Ameren has performed. While a SAMA analysis evaluates the question of *whether* SAMAs are cost-effective, EA-12-049 effectively makes a determination that certain types of SAMAs *are* cost-effective by mandating them. Given that the NRC has allowed licensees to propose alternative measures for satisfying EA-12-049, the only question is what are the relative costs and benefits among a reasonable array of alternatives for satisfying the requirement.

Ameren also argues that Contention 1 constitutes an impermissible challenge to the NRC’s determination, in the Generic Environmental Impact Statement for License Renewal, that the environmental impacts of severe accidents are small. Ameren Answer at 16. Once again,

MCE is not challenging the adequacy of Ameren's severe accident analysis, but rather the adequacy of Ameren's compliance with NRC's regulatory requirement to describe the proposed action and modifications to the facility.

Finally, Ameren argues that MCE has failed to provide expert support or documentation for the contention. Ameren Answer at 16-17. This argument is erroneous, as the documentation for the contention is in EA-12-049 and the fact that the Environmental Report does not include the information required by EA-12-049. Because the measures have not yet been proposed, there is nothing in the Environmental Report that could be analyzed.

Ameren may, as a practical matter, be arguing that the contention is premature. Once Ameren responds to EA-12-049 with the required information, it will be possible for MCE to evaluate the adequacy of the analysis to satisfy NEPA. Given that Ameren's obligation to provide the information has been established by the issuance of EA-12-049, however, MCE believes it is appropriate to submit a contention now.

Contention 2: Environmental Report Lacks Information on Status of Compliance With Federal Requirements and Approvals

Contention 2 states:

In violation of 10 C.F.R. § 51.45(d), the Environmental Report fails to describe the status of Ameren's compliance with NRC post-Fukushima orders and requests for additional information relevant to the environmental impacts of the Callaway nuclear power plant during the license renewal term. These requests for information and orders for actions originate with both the NRC and the U.S. Congress. *See* Order EA-12-049 at 4-7; Requirements of Request for Information Pursuant to Title 10 of the Code of Federal Regulations, 50.54(f) Regarding Recommendations 21.1, 2.3, and 9.3 of the Near-Term Task Force Review of Insights From the Fukushima Dai-ichi Accident at 2 (March 12, 2012) ("3/12/12 Information Request") (ML12053A340).

The Environmental Report for renewal of the Callaway operating license is inadequate to comply with NEPA and NRC implementing regulations because it lacks the

following information regarding Ameren's compliance with NRC requirements and approvals:

(a) Requirement of Order EA-12-049 to: "develop, implement and maintain guidance and strategies to restore or maintain core cooling, containment, and SFP [spent fuel pool] cooling capabilities in the event of a beyond-design-basis external event." *Id.* at 6.

(b) The following requirements of the 3/12/12 Information Request:

(i) "Requested Information" regarding Seismic Hazard Evaluation and Seismic Risk Evaluation. *Id.*, Enclosure 1 at 6-8.

(ii) "Required Response" related to item (i) above. *Id.*, Enclosure 1 at 9. Details of these requirements are provided in Attachment 1 to Enclosure 1.

(iii) "Requested Information" regarding Hazard Evaluation Report and Integrated Assessment Report. 3/12/12 Information Request, Enclosure 2 at 7-9.

(iv) "Required Response" related to item (iii) above. 3/12/12 Information Request, Enclosure 2 at 9-10. Details of these requirements are provided in Attachment 1 Enclosure 2.

(v) "Requested Actions," "Requested Information," and "Requested Response" regarding communication systems and equipment used during an emergency event, assuming that (a) the potential onsite and offsite damage is a result of a large scale natural event resulting in the loss of all alternating current (ac) power and (b) the large scale natural event causes extensive damage to normal and emergency communications systems both onsite and in the area surrounding the site. 3/12/12 Information Request, Enclosure 5 at 2-3.

Moreover, to the extent that Ameren proposes modifications to the Callaway facility in response to the 3/12/12 Request for Information, NEPA also requires the consideration of the effectiveness and relative costs of a range of alternatives for satisfying the NRC's concerns. *See* 10 C.F.R. § 51.53(c)(2) and [*Exelon Generation Co., L.L.C.* (Limerick Generating Station, Units 1 and 2), LPB-12-08, __ NRC __, 869 F.2d 719, 737 (1989)], cited above at pages 5-6.

In opposing the admission of Contention 2, Ameren and the NRC Staff make the same arguments as for Contention 1: that the contention is not related to license renewal, that its admission is precluded by 10 C.F.R. 51.10(d), that MCE has not identified the portions of the Environmental Report that are inadequate. For all the same reasons discussed above with respect to Contention 1, these arguments are incorrect and the contention should be admitted.

In addition, Ameren argues that EA-12-049 and the Information Request do not constitute “approvals” that must be obtained “in connection with the proposed action.” Ameren Answer at 18. Compliance with EA-12-049 and the Information Request do constitute an “approval,” however, because they must be complied with in order for Ameren to continue operating Callaway. The approvals have a “connection with the proposed action” because (a) any modifications that result from Ameren’s compliance with the orders will apply during Callaway’s license renewal term, (b) the requirement has arisen while Ameren’s license renewal application is pending and will be resolved before issuance of the EIS, and (c) neither Ameren nor the NRC has previously analyzed the environmental implications of the modifications that may be imposed as a result of Ameren’s compliance with the orders.

The Staff argues that the Information Request does not constitute an “approval” because it does not require Ameren to do anything other than to provide information. NRC Staff Response at 23-25. But the purpose of the information is to allow the NRC “to determine if there is a need to update the design basis and systems, structures, and components (SSCs) important to safety to protect against the updated hazards at operating reactor sites.” Information Request, Enclosure 1 at 1. Thus, compliance with the Information Request may result in significant design modifications that affect the safety of operating Callaway during the license renewal term.

Contention 3: Inadequate Discussion of Wind Energy Alternative

Contention 3 states:

The Environmental Report is inadequate to satisfy NEPA or 10 C.F.R. § 51.53(c)(2) because it dismisses and refuses to consider the relative merits of the reasonable energy alternative of wind energy operating in the Midwest Independent Transmission System Operator (“MISO”) grid. Wind energy operating in the MISO grid warrants serious consideration as an alternative because it is currently available and sufficient to entirely replace the energy to be generated by Callaway during the license

renewal term. Wind energy also has the relative benefits that it is less dangerous than renewed operation of Callaway, depends on a renewable energy source and would save millions of gallons of water now used by Callaway every day.

Ameren concedes that NRC regulations require license renewal applicants to discuss the environmental impacts of a proposed action and compare them to impacts of potential alternatives. Ameren Answer at 21 (citing 10 C.F.R. § 51.53(c)(2)). Consistent with that regulation, Contention 3 seeks consideration of an alternative that Ameren dismissed as not worthy of consideration: wind generation. Having no basis in the regulations for contesting the admissibility of the contention, Ameren resorts to mischaracterizing it. According to Ameren, the contention asks the NRC to reject Ameren's license application on the basis of the wind alternative. Ameren Answer at 22-23. The plain language of the contention, however, seeks consideration of an alternative energy source, not rejection of the license application.²

Ameren contends that there is no point in discussing alternative energy sources unless the NRC has decided that the alternative is clearly superior to re-licensing an existing reactor; otherwise, the decision of what energy source to rely on should be left to the states. *See* Ameren Answer at 21-22. But the Commission explicitly considered and rejected this argument in promulgating its NEPA implementation rules:

With respect to the industry's desire to eliminate consideration of alternative energy sources, the Commission does not agree. The Commission does not support the views of NEI and others that alternative energy sources need not be considered in the environmental review for license renewal. The Commission is not prepared to state that no nuclear power plant will fall well outside the range of other reasonably available alternative far in advance of an actual relicensing decision. Following NEI's suggestion would not lead to a meaningful set of alternatives with which to compare a proposed action. The Commission has always held the view that alternative sources of energy should be compared with license renewal and continued operation of a nuclear power plant.

² If MCE prevails on its contention and Ameren is required to discuss the wind alternative in its ER, at that point it may be appropriate for MCE to raise the issue of whether Ameren's license application should be rejected based on the information provided in the Environmental Report.

Final Rule, Environmental Review for Renewal of Nuclear Power Plant Operating Licenses, 61 Fed. Reg. 28,473 (June 5, 1996).

Moreover, Ameren's argument is based on the incorrect assumption that that the only purpose of an Environmental Impact Statement ("EIS") or an underlying Environmental Report is to allow a responsible federal agency to decide whether or not to grant a permit. In fact, an EIS also serves to inform state and local decision-makers about the impacts of a proposed action and to give them "the opportunity to plan and implement corrective measures" of their own. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989). If an adequate discussion of energy alternatives is presented in the Environmental Report, it will help state and local government decision-makers choose among the range of options available to them for providing electric power during the time frame of Callaway's license renewal term.

Ameren argues that Contention 3 is inadmissible because MCE has neither alleged nor demonstrated that wind power is capable of providing baseload power. Ameren Answer at 27 (citing *FirstEnergy Nuclear Operating Co. (Davis-Besse Nuclear Power Station, Unit 1)*, cLI-12-08, 75 NRC ___, slip op. at 5, 9 (Mar. 17, 2012)). *See also* NRC Staff Answer at 36. The purpose of baseload power, however, is to provide a constant supply of electricity. Under the "pragmatic" approach used by the Commission for consideration of energy alternatives, *see Davis-Besse*, CLI-12-08, slip op. at 5, Ameren could obtain a constant supply of energy by either building or contracting for replacement capacity, including wind generation capacity, within the MISO grid. Makhijani Declaration, Section 4. This is the effective equivalent of baseload power. *See Seabrook*, CLI-12-05, slip op. at 50 n. 223 (quoting *Envtl. Law and Policy Ctr. V. NRC*, 470 F.3d 676, 679 (7th Cir. 2006) ("Baseload power' generates 'energy intended to

continuously produce electricity at or near full capacity, with high availability.”)) As Dr. Makhijani points out, in seeking electricity sources that are the equivalent of baseload power, it is also important to bear in mind that nuclear power reactors, including Callaway, have unplanned outages; they do not have the infallible level of reliability that generally is attributed to them. The number and duration of light water reactor outages has significantly increased in recent years, notably since March 11, 2011. Currently, about 18 percent of the world’s light water reactors are in unplanned outages. *See* Makhijani Declaration, Section 3. Ameren’s appeal to an industry average capacity factor of 90 percent (Ameren Reply at 28) fails to address these new realities or their consequences, such as the environmental impacts of prolonged procurement of replacement power that may be needed for unplanned extended outages sometime in the two-decade-long license extension period. Thus, the alternatives must be compared in an appropriately accurate context. The grid already makes up for Callaway generation when other sources in the grid are not available. Similarly, the grid can make up for wind energy when it is not available. Dr. Makhijani’s declaration has shown that the capacity is available in the MISO system to accomplish this.

Further, as Dr. Makhijani states in support of the contention, “[n]o single power plant can meet continuous loads for decades” Makhijani Declaration, ¶ 3.3. Ameren itself admits that nuclear power plants, like all other power plants have unplanned outages. Ameren Answer at 27-28. Dr. Makhijani’s declaration shows that the availability of nuclear power reactors has significantly declined since March 11, 2011. Therefore even plants that are called “baseload” need other sources on the grid to supply power during planned and unplanned outages. Since the variability of wind power can be compensated by the grid, as is the case for wind capacity in MISO, there is no essential distinction between nuclear and wind operating in the context of the

grid, so long as no storage is needed. And Dr. Makhijani has shown, with references to the technical literature, that in the case of replacement of Callaway power by wind, storage is not needed. Makhijani Declaration Section 4. The assumption of a 90 percent capacity factor by Dr. Makhijani for the purpose of calculating the capacity of wind turbines needed to replace Callaway generation (Makhijani Declaration at ¶ 4.10 and fn 33) in no way contradicts or controverts the facts of the extended unplanned outages of nuclear power reactors of US conception (that is, light water reactors) in Japan, Germany and the United States, or the need to address them.³

The NRC Staff argues that Dr. Makhijani has not provided data on planned and unplanned outages of wind farms while providing that data for nuclear energy. NRC Staff Answer at 30. Dr. Makhijani's analysis is based on the inherent variability of wind (*i.e.*, that is it not available 24/7 and 365/365 for decades), this implicitly includes the occurrence of outages. No additional element is added to the analysis of wind by explicitly including outages. Under the circumstances, it is necessary only to show how reliable power will be provided in the context in which its operation is proposed. The potential for wind outages therefore does not change the nature of the comparison between wind and other energy sources such as nuclear. While both the NRC and Ameren have noted that wind is variable and that the gaps in availability need to be filled, neither of them have substantively addressed the large amount of information provided in Dr. Makhijani's Declaration (Section 3) to show that unplanned outages of nuclear power plants can and do last for months or years. The response of both the NRC staff and Ameren is therefore fundamentally deficient in that both cite the 90 percent average capacity

³ The NRC Staff argues that Dr. Makhijani fails to address the effects of the intermittency of wind power. NRC Staff Answer at 30. This is incorrect. Dr. Makhijani explains that the

factor of nuclear reactors in the past, but do not address the new developments that have led to 18 percent of the world's light water reactors being in prolonged unplanned outages for a variety of reasons. These recent facts show clearly that nuclear power is vulnerable to going from 24/7 supply of power at full capacity – that is “baseload” – to 0/365 – or what one may call “zero load” – for long periods. It is essential to address these facts for an apples-to-apples comparison because only then will the role of the grid in nuclear power and the environmental impacts become clear.

Ameren contends that the NRC's policy of giving “substantial weight” to an applicant's preference should also result in the denial of the contention because Ameren's stated goal in applying for license renewal “is to maintain Callaway as a source of baseload power.” Ameren Answer at 25 (citing *Seabrook*, CLI-12-05, CLI-12-015, slip op. at 49 and other authorities). To defer to an applicant's preference for renewal of its own license, however, would stretch that degree of deference to an absurd degree and effectively result in the elimination of consideration of any alternatives.⁴

Ameren argues that by stating that the MISO grid already has more than sufficient capacity to replace Callaway, MCE raises the “need for power” issue that has been excluded from consideration in NRC licensing cases. Ameren Answer at 35. Ameren mischaracterizes MCE's contention. MCE is not seeking to raise the need for power issue, but is instead addressing the Commission's standard for admissibility of contentions regarding energy alternatives. Under that standard, petitioners must demonstrate that an alternative “will bring

intermittency of wind power is compensated for by the availability of other sources of energy on the grid. Makhijani Declaration, ¶ 4.17 to 4.20.

⁴ The NRC makes a similarly circular argument that the availability of wind power operating in the MISO grid is irrelevant because Callaway is not part of the MISO grid. NRC Staff Answer

about the ends of the proposed action.” *Seabrook*, CLI-12-05, slip op. at 49 (quoting *Hydro Resources, Inc.* (P.O. Box 15910, Rio Rancho, NM 87174), CLI-01-04, 53 NRC 31, 55 (2001)).

In this case, the “ends,” i.e., the goal of the proposed action, is to provide a sufficient energy supply to substitute for the Callaway plant.

Ameren claims that the Environmental Report has already considered the option of purchasing power if the Callaway license is not renewed and found that environmental impacts would occur from another power plant located elsewhere in the MISO grid. Ameren Answer at 34. But the consideration was so brief as to be a dismissal of alternatives, not a discussion. Moreover, the wind option as presented in Contention 3 does not involve a net purchase of power by Ameren. The wind capacity would be sufficient to displace Callaway generation on average. Therefore Ameren would sell and purchase equal amounts of power on average when the wind power plants operate within the grid. Similarly, Ameren’s discussion of an “interconnected array of wind farms” was also a brief explanation of why the wind alternative was *not* examined. Moreover, the alternative of an array of wind farms is distinct from the alternative of wind operating in the MISO grid, whose consideration MCE seeks. For example, while the technology of energy storage may be needed at wind penetrations in excess of 20 percent, this does not apply to Ameren or the MISO grid at present or in the foreseeable future, given the renewable energy mandates in place in the MISO service area. *See* Makhijani Declaration, ¶¶ 4.13 to 4.15.

Ameren claims that Dr. Makhijani “never explains [the] statement” that neither storage nor standby capacity would be needed to reliably replace Callaway generation. Ameren Reply at 36. This is incorrect on both counts. Dr. Makhijani’s declaration quotes a National

at 34. The point of the contention is to seek consideration of the alternative of greater reliance

Renewable Energy Laboratory [NREL] study to the effect that “*integration studies of wind to about 20% on an energy basis have found that the grid can accommodate a substantial increase in VG [variable generation] without the need for energy storage, but it will require changes in operational practices, such as sharing of generation resources and loads over larger areas.*” See ¶ 4.13 (emphasis added). Similarly, Dr. Makhijani’s declaration shows that excess capacity in the MISO grid is available to meet the requirements of wind variability. *Id.*, ¶¶ 4.17 and 4.18. No standby capacity would be needed because, as Dr. Makhijani demonstrates with facts and references that are not disputed by Ameren, that excess capacity is already available.

Ameren incorrectly interprets Dr. Makhijani’s declaration on a number of other related points, including the capacity factor of wind and environmental impacts. Regarding the capacity factor of wind, Ameren incorrectly states that Dr. Makhijani assumes that 100-meter tower technology “would be a prerequisite to achieving the 40 percent capacity factor.” Ameren Answer at 32. Dr. Makhijani makes no such assumption. He uses the two parameters to provide an example of the capacity that would be needed to fully replace Ameren generation. Another example using a lower capacity factor, 37.5 percent was also provided. *See* Makhijani Declaration, ¶ 4.10. Moreover, Dr. Makhijani does not link a 40 percent capacity factor and 100-meter tower technology. In fact, the reference to wind energy potential provided in the Makhijani Declaration (NREL and AWS Truepower 2011, at http://www.windpoweringamerica.gov/docs/wind_potential.xls), shows that sites with a 40 percent capacity factor for wind are available at both 80-meter and 100-meter hub heights. Makhijani Declaration, ¶ 4.9.

Finally, Ameren states that it “is aware of few instances where development of such enormous towers is even being explored, and MCE has certainly not identified any commercially

on the MISO grid.

available deployment.” Ameren Answer at 32. While Ameren may not be aware of 100-meter hub height towers, such towers are commonly known and have been used in the industry in recent years. For instance, IEEE Spectrum, a magazine sent out to a large membership of IEEE, the professional society of electronics and electrical engineers, noted in 2009 of wind farms that were being repowered with new turbines that the “new rotors ride higher than ever, perched on towers exceeding 100 meters, whereas hub heights generally maxed out at 60 to 70 meters in the 1990s.”⁵ Wind turbines with blades that sweep more than a 100-meter diameter and are installed at hub heights of 100 meters are commercially available. Even the GE Wind Energy Wikipedia entry (and the GE brochure) shows that GE sells a 2.5 megawatt turbine that can be installed at various hub heights, including 100 meters.⁶ Indeed, wind turbines have been installed at hub heights considerably greater than 100 meters. For instance, Enercon sells wind turbines that are rated at 7.58 megawatts, with a blade diameters of 127 meters; the hub height is 135 meters.⁷ All of this information can be found quite easily. Dr. Makhijani is not obliged to provide references for facts that are commonly known in the commercial and industrial literature. The fact that Ameren appears to be unaware of these commonly known specifications of modern large wind installations that have been in operation for some time shows that it has not carefully investigated the wind energy alternative. This is all the more reason that it should be required to do so.

⁵ Peter Fairley, “Europe replaces old wind farms: More power from fewer, bigger turbines,” IEEE Spectrum, January 2009, on the web at <http://spectrum.ieee.org/green-tech/wind/europe-replaces-old-wind-farms> .

⁶ GE Wind Energy wikipedia article http://en.wikipedia.org/wiki/GE_Wind_Energy. See also the GE brochure at http://www.ge-energy.com/content/multimedia/_files/downloads/GEA17007A-Wind25Brochure.pdf

⁷ Enercon: Energy for the World, www.enercon.de/en-en/66.htm

III. CONCLUSION

For the foregoing reasons, Ameren's and the NRC Staff's oppositions to the admissibility of MCE's contentions have no merit. Therefore the contentions should be admitted.

Respectfully submitted,

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May 29, 2012

CERTIFICATE OF SERVICE

I certify that on May 29, 2012, I posted the foregoing Missouri Coalition for the Environment’s Reply to Ameren’s and NRC Staff Oppositions to Hearing Request and Petition to Intervene on the NRC’s Electronic Information Exchange (“EIE”). It is my understanding that as a result the following individuals or offices were served:

<p style="text-align: center;">U.S. Nuclear Regulatory Commission Office of the Secretary of the Commission Mail Stop O-16C1 Washington, DC 20555-0001 Hearing Docket E-mail: hearingdocket@nrc.gov</p>	<p style="text-align: center;">Office of Commission Appellate Adjudication U.S. Nuclear Regulatory Commission Washington, DC 20555-0001 E-mail: ocaamail@nrc.gov</p>
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