UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of
Luminant Generation Company, LLC **Docket Nos. 52-034 and 52-035**
Comanche Peak Nuclear Power Plant
Units 3 and 4
Combined License Adjudication

INTERVENORS' RESPONSE OPPOSING APPLICANT'S MOTION TO DISMISS CONTENTION 18 AS MOOT

Intervenors contend that Contention 18 has not been rendered moot by the Applicant's amendments to the Environmental Report attached to its December 8, 2009 letter to this Panel. Intervenors maintain that the contention remains viable because the ER amendments have not addressed certain salient aspects of the contention. Accordingly, the contention should advance as admitted.

Legal Standards

In the case of *In the Matter of Georgia Institute of Technology* (Georgia Tech Research Reactor, 42 N.R.C. 191, 194 (1995), mootness of contentions was considered. "Mootness, in our view, is not necessarily dependent upon a party's view that its claims have been satisfied but, rather, occurs when a justiciable controversy no longer exists. See, generally, *Texas Utilities Electric Co. (Comanche Peak Steam Electric Station, Unit 2)*, 37 NRC 192 (1993)." The contention that the Applicant has not considered alternative energy sources and combinations for baseload remains justiciable because the Applicant has failed to fully address the feasibility of utilizing combinations of renewable fuels with storage supplemented by natural gas.

Applicant Has Not Resolved Contention 18 With the Subject Environmental Report Amendments

As admitted, Contention 18 states as follows:

> The Comanche Peak Environmental Report is inadequate because it fails to include consideration of alternatives to the proposed Comanche Peak Units 3 and 4, consisting of combinations of renewable energy sources such as wind and solar power, with technological advances in storage methods and supplemental use of natural gas, to create baseload power.[1]

The Applicant did not consider "combinations of renewable energy sources such as wind and solar power, with technological advances in storage methods and supplemental use of natural gas, to create baseload power." The titles of Sections 9.2.2.11.4.1 and 9.2.2.11.4.2, "Renewable Energy Sources Combined with Storage and Supplemented by Natural Gas Power Generation" and "Natural Gas Power Generation Supplemented by Renewable Energy Sources Combined with Storage," give the appearance that the combinations were considered. However, a close reading of these sections actually indicates that the combinations were dismissed preemptively because, standing alone, each technology does not meet the criteria put forth by the Applicant; therefore, the combination does not meet the criteria, according to the Applicant.

The premise of Contention 18 is that the Applicant defined its goals in an overly narrow fashion that unreasonably limited the range of alternatives.[2] Accordingly, the Applicant's task was to consider whether baseload capacity could be supplied with combinations of wind and solar power coupled with advanced storage methods supplemented with natural gas.[3] The amendments to the Environmental Report purport to address the contention as stated in the Panel's Order. However, in addressing the contention the Applicant has again used assumptions and artificial constraints that, in effect, make alternatives to the proposed Comanche Peak 3 & 4 appear unworkable. As discussed in the expert reports from Ray Dean, Ph.D. and Arjun Makhijani, Ph.D. (attached) the amendments to the ER unreasonably restrict the

[1] ASLBP Memorandum and Order, August 6, 2009 at 82
[2] Id.
[3] Id.

alternative fuel sources and combinations thereof. The Applicant's methodology unreasonably understates the feasibility of renewable fuel sources and storage technologies. Dr. Dean also discusses how the Applicant's use of the evaluation criteria are geared to justifying nuclear generation rather than analyzing the functional objective of supplying baseload generation capacity.

The ER amendments considered wind with storage and solar with storage.[4] The Applicant is critical of the combination of wind and storage because wind power is generally diminished during daytime[5] and likewise disparages solar because it is limited to daylight hours.[6] The Applicant did not consider the combination of wind (relatively more productive at night) and solar (productive during the day) to produce a uniform generation profile. This is a combination explicitly anticipated in the admitted contention but arbitrarily excluded by the Applicant.[7]

The Applicant also discounts the use of compressed air energy storage (CAES) for several reasons. *Inter alia,* the Applicant marginalizes CAES because it is not available in the relevant area.[8] However, the Applicant ignores the inherent geological differences between Iowa and Texas that actually favor CAES development as an alternative to the proposed Comanche peak Units 3 & 4.[9] This is ironic given the Applicant's expressed interest in wind/CAES facilities.[10]

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[4] ER Amendments, Sections 9.2.2.11.3.1 and 9.2.2.11.3.2.
[5] ER Amendments, p. 9.2-37, section 9.2.2.11.3.1 and p. 9.2-39.
[6] ER Amendments, p. 9.2-41.
[7] As noted by Dr. Makhijani, the Applicant does not provide a substantial basis for its assertion that there is no available renewable energy alternative to Units 3 & 4. And the report from the National Renewable Energy Laboratory shows that wind combined with CAES supplemented with natural gas is a feasible baseload source. Arjun Makhijani Report, p.1.
[8] ER Amendments, p. 9.2-38
[9] Ray Dean Report, p. 3.
[10] On July 27, 2007, Luminant stated the following in their press release:
"Luminant and Shell Join Forces to Develop a Texas-Sized Wind Farm
Shell WindEnergy Inc. and Luminant, a subsidiary of TXU Corp., announced today a joint development agreement for a 3,000-megawatt wind project in the Texas Panhandle and to work together on other renewable energy developments in Texas.
Shell and Luminant will also explore the use of compressed air storage, in which excess power could be used to pump air underground for later use in generating electricity. This technology will further improve reliability and grid usage and becomes more economical with large-scale projects, such as proposed for Briscoe County.

The Applicant claims that the CAES technology is undeveloped, unproven and unavailable as a means to produce baseload generation capacity.[11] However, as discussed by Dr. Dean, renewable fuel sources of generation have been utilized in combination with other methods of generating electricity and in conditions of varying loads.[12] The real issue is whether grid managers have the ability to deal with the "dynamic electrical-grid environment."[13] Contrary to the Applicant's assertions, CAES has been utilized for several decades to absorb power from the grid during weak demand and provide power during high demand.[14]

The Applicant's ER amendments also posit that wind combined with CAES is not a viable baseload generation source.[15] However, as discussed by Dr. Dean, use of wind and natural gas or wind and CAES "is actually the easiest and most reasonable application" for baseload generation.[16] And the developed combination of wind, natural gas and storage would also meet intermediate and peaking demand whereas nuclear is only for baseload demand.[17] Further, as discussed by Dr. Makihijani, the fact

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Recent testimony by Shell before the Public Utility Commission of Texas demonstrated the Briscoe County project could deliver the lowest-cost wind energy for consumers. This low cost is driven by excellent wind resources and the comparatively lower cost to bring that energy to market from the Texas Panhandle region."
TXU website, http://www.txucorp.com/media/newsrel/detail.aspx?prid=108

[11] ER Amendments, p. 9.2-38

[12] Ray Dean Report, pp.3-4.

[13] Id. at p. 4. Additionally, experience in managing changing power loads has been gained in Texas and increasing wind production is being handled well. ERCOT states in a November 17, 2009 CEO update that an all time instantaneous wind generation record of 6223 MW was set on October 18th [2009], that at one point during the day ERCOT "served approximately 25% of our load with wind," and that a wind ramp forecaster was scheduled to go live later that month. Previously, media outlets and critics have pointed out a drop in wind power as a factor in an event on February 26, 2008, but ERCOT's response procedures were successful. Reuters reported:
"Electric Reliability Council of Texas (ERCOT) said a decline in wind energy production in west Texas occurred at the same time evening electric demand was building as colder temperatures moved into the state…System operators curtailed power to interruptible customers to shave 1,100 megawatts of demand within 10 minutes, ERCOT said. Interruptible customers are generally large industrial customers who are paid to reduce power use when emergencies occur. No other customers lost power during the emergency, ERCOT said. Interruptible customers were restored in about 90 minutes and the emergency was over in three hours." Loss of wind causes Texas power grid emergency, Houston, Reuters, Feb. 27, 2008, http://www.reuters.com/article/idUSN2749522920080228

[14] Ray Dean Report, pp.3-4.

[15] See for example, ER Amendments, p. 9.2-30

[16] Ray Dean Report, pp. 4-5.

[17] Id.

that the Huntdorf and MacIntosh CAES facilities are peaking plants does not mean that a baseload version of CAES is not possible.[18]

The Applicant's ER amendments also assert that the sheer size of Comanche Peak 3 & 4 is an advantage over wind/gas/CAES.[19] But as Dr. Dean points out, the size of the proposed plants is actually a liability because of the risks inherent in predicting demand increases (both in magnitude and over time). Nuclear capacity, because of its size, may not inherently match demand for electricity. In contrast, adding increments of wind/gas/storage may be done gradually as demand increases.[20] And while the Applicant implies that such an incremental approach is a disadvantage because it is not equivalent to the one-time addition of 3200 MW, in fact, as discussed by Dr. Dean, the incremental approach minimizes risk by maximizing flexibility in adding generating capacity.[21] Dr. Makhijani also notes that the fact that Units 3 & 4 are much larger than existing CAES facilities is "technically irrelevant". Further, he argues that smaller scale plants represent smaller risk particularly given the uncertainties regarding demand projections.[22] And to the extent that it matters that a single renewable fuel plant is comparable in generating capacity to Units 3 & 4, solar thermal with heat storage modular facilities are being constructed on a scale that could reach the 3200 MW scale.[23]

The Applicant has also overstated the environmental impacts of wind/gas/CAES facilities.[24] As discussed by Dr. Dean, the area actually used by wind farms is only about 3.5% of the area where the facility is located. The remaining 96.5% of the wind farm area is still available for other activities

[18] Arjun Makhijani report, pp. 1-2.
[19] ER Amendments, p.9.2-38.
[20] Ray Dean Report, p. 5.
[21] Id.
[22] Arjun Makhijani report, p.2. Dr. Makhijani also points out that smaller scale nuclear generation plants are being touted by nuclear power advocates. Id.
[23] Id.
[24] ER amendments, p. 9.2-40.

including economically productive enterprises such as farming and ranching.[25] This is in contrast to nuclear plant sites that are essentially irreversibly dedicated to a single function.

The Applicant also asserts that the land required for a CAES facility large enough to supply 88 hours of generating capacity is between 63,289 and 114,420 acres.[26] As discussed by Dr. Dean however, this overstates the amount of land needed because the Applicant has included the subsurface compressed air storage space (perhaps thousands of feet underground) in its calculations. Moreover, the *above-ground* area requirements for a CAES facility are actually smaller than buildings for combustion turbines generating a comparable amount of electricity.[27]

Dr. Dean notes that the land area actually dedicated to a wind facility with 4,000 turbines and a CAES facility would only occupy approximately 1000-2000 acres.[28] When compared to the Comanche Peak site requirements of 7950 acres[29] the area needed to generate a comparable amount of electricity from wind/CAES is relatively small.[30]

The Applicant further marginalizes the use of wind power by characterizing it as "intermittent and unpredictable."[31] Dr. Dean's discussion notes that wind power is actually reasonably predictable in a statistical sense and that system operators manage wind-power variations in much the same way that other

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[25] Ray Dean Report, p.6. See also Dr. Makhijani's report, p.2.
[26] ER amendments, p. 9.2-40.
[27] Ray Dean Report, p. 6
[28] Ray Dean Report, p.7.
[29] ER, Section 1.1.2, p. 1.1-2.
[30] The National Renewable Energy Laboratory (NREL) wind farm area calculator estimates the land that has to be taken out of production to provide space for turbine towers, roads, and support structures is .25 - .5 acre per turbine. NREL does not include the turbine spacing requirement in their calculation, which they note does increase the perimeter of the wind farm. They state that the "land between the turbines, minus the "footprint" area is still usable for its original purpose." National Renewable Energy Laboratory, Power Technologies Energy Data Book, Wind Farm Area Calculator, online at http://www.nrel.gov/analysis/power_databook/calc_wind.php. Moreover, Luminant purchases wind power form the Trent Mesa Project, owned by AEP. The 100 turbines (each 1.5 MW) at this West Texas site have concrete foundations that are 20 feet deep but only 14 feet in diameter. Trent Mesa Wind Project, Technical information, http://www.trentmesa.com/techdetails.htm
[31] ER Amendments, p.9.2-37

load variations are managed. Dr. Dean also points out that the use of the term "intermittent" is misleading because it implies that wind starts and stops, which it does not. Rather, wind speeds vary generally within a "moderate range of intermediate speeds."[32] This distinction is the reason that the IEEE Power Engineering Society has requested that "intermittent" be avoided and instead be replaced with a more accurate term: "variable."[33] This change in nomenclature avoids the pejorative implication that wind is unpredictable and recognizes that wind plant output variation forecasts are predictable the majority of time.[34]

Dr. Makhijani also argues that the Applicant's assertion that a CAES facility would not be available sooner than Units 3 & 4 overlooks the actual history of the duration of time needed to put wind generation into service. Nor did the Applicant make any attempt to describe the time required for the Huntdorf and MacIntosh CAES facilities' construction.[35] The Applicant makes no mention of the fact that the US-APWR is an uncertified design still in the rulemaking phase.[36] And perhaps most egregious is the Applicant's complete disregard for the history of nuclear plant construction delays and current uncertainties about financing new nuclear plants. These omissions distort the comparisons regarding temporal availability of renewable fuels/CAES facilities and new nuclear generation.[37]

Conclusion

The ER amendments at issue here have not resolved Contention 18 because while they purport to address combinations of renewable fuels and storage supplemented with natural gas, in fact, the amendments fail to consider, for example, the combination of wind and solar as a means to flatten load

[32] Ray Dean Report, p.7.
[33] Id. at pp.7-8.
[34] Id.
[35] Arjun Makhijani Report, p.2.
[36] Arguably, CPNPP Units 3 & 4 do not meet the Applicant's own Criterion 1 as the US-APWR design has not been certified NRC and has not been built anywhere in the world. See Ray Dean Report, pp. 8-10 and Arjun Makhijani Report, p. 2.
[37] Arjun Makhijani Report, p.2.

profiles and provide baseload generation.

The Applicant's methodology preordains that a combination of wind and solar (with or without CAES) will not meet its evaluation criteria. By considering whether the individual components of the combination meet each criterion, rather than considering whether an integrated system would meet the evaluation criteria, the Applicant essentially ignores the viability of the combinations of technologies. The Applicant restricts its analysis to the alleged environmental impacts of each technology standing alone and their additive and cumulative impact. The Applicant however, fails to discuss the structure and function of integrated systems, notwithstanding the expectation that this would be considered in Contention 18.

Furthermore, the Applicant's stated impacts are unsubstantiated. For example, a large land requirement for wind power projects does not necessarily mean that there is a large adverse impact on land use, as the Applicant contends.[38] It is well known, for example, that farming and ranching operations are compatible with wind power projects and can continue uninterrupted and unaffected.

The amendments also do not examine advances in CAES technology for applications in the ERCOT area. These shortcomings in the ER amendments create justiciable issues in this adjudication and Contention 18 should advance as admitted by this Panel.

Alternatively, Contention 18 should advance in a modified version that requires the Applicant to:

1) at a minimum, actually consider combinations of wind and solar with CAES supplemented with natural gas;

2) consider molten-salt storage by itself and in combination with CAES[39]; and

[38] ER Amendments 9.2-40
[39] Ray Dean Report, p.2

3) address the geological advantages presented in the ERCOT area that favor deployment of CAES in tandem with wind and solar power sources.[40]

Respectfully submitted,

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January 4, 2010

[40] Id. pp.3-4

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD PANEL

In the Matter of
Luminant Generation Company, LLC **Docket Nos. 52-034 and 52-035**
Comanche Peak Nuclear Power Plant
Units 3 and 4
Combined License Adjudication

CERTIFICATE OF SERVICE

I hereby certify that on January 4, 2010 a copy of "Intervenors' Response Opposing Applicant's Motion to Dismiss Contention 18" was served by the Electronic Information Exchange on the following recipients:

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of
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Units 3 and 4
Combined Operating License

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Make-up pumps raise level

After a lengthy decline to nearly a record low during the summer drought, the water level in the reservoir has risen significantly in just two months.

The level dropped to 36.3 feet Mean Sea Level (MSL) in early September, barely above the historic low of 36.2 feet MSL set in October 2000. The reservoir's depth had steadily decreased for more than two years, from a record of approximately 48 feet MSL in July 2007.

"If the level had fallen just a few more inches to below 36 feet MSL, we would have had to replenish the reservoir by pumping fairly brackish water under our contract Water Delivery Plan," Environmental Manager Sandy Dannhardt said.

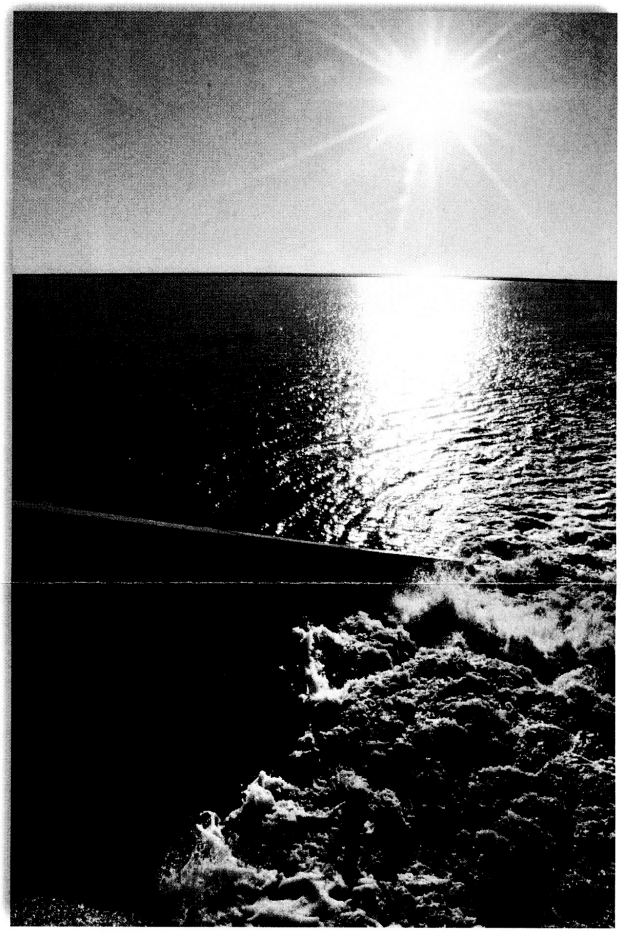
However coastal and upstream rains in September and October increased the volume and flow of the Colorado River, enabling STP to pump fresh water into the reservoir. With three of the four reservoir make-up pumps operational, capable of pumping 540 cubic feet per second (242,369 gpm), the reservoir level is rising quickly.

"How much we pump and how long we pump depends on the river's flow rate and corresponding water quality," Dannhardt said.

The flow rate was good enough in September for STP Operations personnel to run the pumps up to 24 hours a day for 12 days. They pumped nearly 5,000 acre-feet of water that month, raising the level of the 7,000-acre reservoir nearly a foot.

Heavy rains last month kept the pumps running 25 of the 31 days. The pumps operated around-the-clock on 16 of those days, drawing in 1,070 acre-feet each day and raising the reservoir level approximately a foot each week. More than 21,000 acre-feet of water was pumped into the reservoir in October, increasing the level to 40 feet MSL.

"Whenever the flow rate is sufficient, Operations will keep running the pumps," Dannhardt said. "We'd like to get the level back to 47 feet, which is considered optimal."



The reservoir make-up pumps deliver water from the Colorado River at a rate of 242,369 gallons per minute. At that rate, an average size swimming pool would fill in just six seconds. The reservoir is now at 40 feet MSL (Mean Sea Level).

Issues with head lifting device resolved

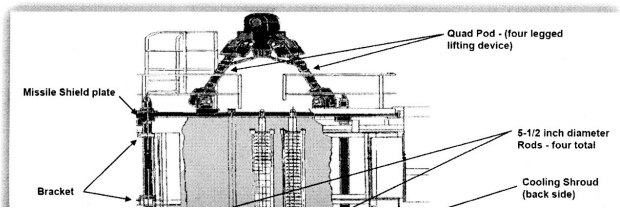
As we continue down the critical path of head installation, we are always diligent and careful to make sure the job is performed right the first time.

The head lifting device consists of three parts - the quad-pod, the missile shield plate, and the four lift rods. During this latest evolution, we had to overcome the issue of attaching the lift rods to the new head.

While attempting to re-insert two of the four lift rods into the threaded lifting 'bosses' on the replacement head, two out of the four lift rods would not fit as designed due to an obstruction with the cooling shroud.

We first noticed an issue with the lift rod when we observed threads that appeared to be split. This condition was promptly repaired by our PCI machinists.

A second issue came up after a gauging process when the gauging tool got stuck. The result again was damage to the rod threads. Our own STP mechanical teammates Terry Brewer and Al Plunkett took care of business and repaired the threads.



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