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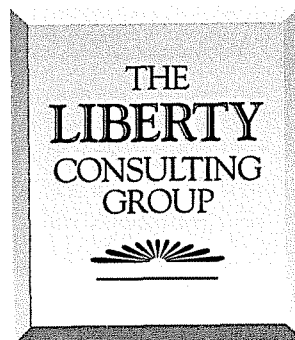
PUBLIC SERVICE
COMMISSION

**Final Report on
Review LG&E Documentation Regarding
Temporary Facilities Related to the
Mill Creek-Hardin 345 kV Transmission Line
Within Kentucky
Case No. 2009-00325**

Presented to:

The Kentucky Public Service Commission

By:



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I. Introduction

A. Background

Pursuant to KRS 278.255, the Kentucky Public Service Commission (*Commission* or *KPSC*) retained The Liberty Consulting Group (*Liberty*) to perform a focused technical review of documentation associated with Kentucky Utilities Corporation's (*KU*) application concerning the need to obtain Certificates of Public Convenience and Necessity (*CPCN* or *Certificates*) for the construction of temporary transmission facilities in Hardin County, Kentucky (Case No. 2009-00325).

Liberty is a management and technical consulting firm that specializes in the public-utility industry. Liberty has extensive experience in conducting focused reviews of this type. Liberty has served commissions in 35 different states and the District of Columbia in conducting focused reviews and management audits similar to this work related to KU's application. Liberty previously submitted a Focused Review of Documentation to the Commission for the Mill Creek – Hardin County 345 kV transmission line as part of the CPCN proceedings in 2006.¹

This report provides the results of Liberty's review of the application of KU for a waiver of the need for CPCNs for the temporary facilities or, in the alternate, the granting of these Certificates.

In 2006, the KPSC (in Case No. 2005-0472) granted KU and Louisville Gas & Electric Company (*LG&E*) Certificates to build a 42.03 mile, 345 kV transmission line from the Mill Creek substation in Jefferson County, Kentucky to the Hardin County substation, also in Kentucky. The circuit is now complete except for three sections that are involved in litigation contesting the granting of the original Certificates. These three sections are all in KU service territory; therefore, LG&E is not a party in this case.

KU intends to construct temporary by-passes around the three properties in litigation in order to permit energization of the Mill Creek – Hardin County (*MC-HC*) transmission line in time for the June 2010 commercial operation date of the Trimble County #2 (*TC2*) generating plant. The purpose and necessity of the MC-HC line is tied directly to this new generating plant. KU states in its filing that one of these temporary by-passes is less than 1 mile in length and that, under Kentucky statutes, does not require a CPCN for its construction. The other two temporary by-passes are each in excess of 1 mile. KU avers in its filing that because these are temporary facilities for an established circuit, CPCNs are not required for these by-passes, citing precedents of the Commission. In the event the Commission decides that such Certificates are required, KU requests expedited treatment for their issuing, and submitted documentation appropriate for such Certificates. On September 21, 2009 the Commission denied KU's request for a waiver of Certificate requirements for these temporary facilities.

Liberty conducted a focused review of the documentation submitted by KU, but did not conduct independent studies of the transmission circuit. Liberty reviewed the testimony, maps and other

¹ *Final Report – Focused Review of Documentation Filed by LG&E/KU For a Proposed 345 kV Transmission Within Kentucky Case Nos. 2005-00467 & 2005-00472*. February 27, 2006.

statements submitted by KU to the KPSC. The maps identify the approved path of the MC-HC line and the intended locations of the three temporary by-passes.

B. MC-HC Bypass Description

LG&E and KU are the two utility businesses of E.ON U.S. LLC, whose rates and services are regulated by the Kentucky Public Service Commission. E.ON U.S. LLC is headquartered in Louisville, Kentucky, and is part of E.ON U.S. Services, Inc., a member of the E.ON AG family of companies headquartered in Dusseldorf, Germany.

LG&E is an electricity and natural gas utility based in Louisville. It serves customers in Louisville and sixteen surrounding counties. KU is an electricity utility based in Lexington, Kentucky. It serves customers in 77 Kentucky counties and five counties in Virginia. Together these two utilities have a joint generation capacity of 7,600 MW, and serve 908,000 electricity customers and 318,000 natural gas customers over a transmission and distribution network covering some 27,000 square miles.

On May 11, 2005, KU and LG&E (together, *the Companies*) applied to the Commission for a CPCN for the construction of a 345 kV transmission line from the Mill Creek substation in Jefferson County, Kentucky, to the Hardin County substation in Hardin County, Kentucky. This transmission line is necessary to integrate the new TC2 base load generating unit into the grid. The projected commercial in-service date for this unit is June, 2010.² Test and start-up operation of this unit is scheduled to begin in January, 2010; however the MC-HC circuit is not required to be in-service until the commercial operation date.

On May 26, 2006 the Commission issued an order granting the Companies' request for Certificates for the construction of the MC-HC transmission line, at Case No. 2005-00467. This approved transmission line is 42.03 miles in length (the *Approved Line*).

The construction of the Approved Line is now complete³ with the exception of three non-contiguous segments. These segments have not been built because three property owners in Hardin County on whose land the Approved Line would cross have contested the Certificates issued by the Commission in 2006. These property owners' cases are still in litigation.⁴

In order for the MC-HC transmission line to be energized to meet the June 2010 commercial in-service date of the TC2 unit, KU is proposing to construct three temporary 345 kV bypasses on properties adjacent to the properties involved in the litigation. This transmission line with the three bypasses in place (the *Bypass Line*) would be 42.97 miles in length. KU warrants that these bypasses would be temporary. Should KU be permitted to construct the three segments on the properties under litigation per the Approved Line, these bypasses would then be removed and corridors would be restored to their current owners. KU certifies it has purchased the necessary temporary easements from the property owners on whose property these bypasses would be

² Per Mr. Lonnie E. Bellar of KU in response to Liberty Question Q-4, dated September 28, 2009

³ See KU filing of September 3, 2009, page 4, paragraph 7.

⁴ All three of these properties are solely within KU's service territory, and for this reason, LG&E is not a party to this filing.

constructed, and has paid for options for these easements. KU has the ability to retain these easements for up to 10 years.

The shortest of the three bypasses (called the Monroe Temporary Line) would be less than one mile in length. KU states that according to Kentucky statutes (KRS 278.020(1)), transmission lines less than one mile in length do not require certification for construction. KU is not requesting the Commission to waive or issue a CPCN for this segment.

The two other temporary bypasses are greater than one mile in length. They comprise the subjects of this filing:

- A 1.45 mile segment called the CDH Temporary Line,
- A 1.78 mile segment called the Jent Temporary Line.

The combined cost of these two bypasses is estimated at \$6.9 million.

KU argued in its filing that KPSC precedents on waivers for CPCN for temporary facilities do not require KU to seek Certificates for the CDH and Jent Temporary Lines. KU's filing requests that, should the KPSC rule that waivers would not be granted, then the documentation and testimony in its filing be used by the Commission to issue the Certificates. The Commission subsequently denied the request for waivers, and set a timetable for potential interventions and hearings, and a final ruling by January 1, 2010.⁵

C. Summary of Liberty's Work

Liberty performed an independent review of the filing, examining the economic and technical aspects of the documentation. Liberty reviewed KU's filing including maps illustrating the Approved Line corridor and the three temporary bypasses. Following an initial review, on September 17, 2009 Liberty submitted a series of questions to KU seeking clarification and understanding of KU's application to the Commission. KU provided responses to these questions on September 25, 2009. On October 6, 2009 Liberty, representatives from the Commission, and representatives from KU participated in a conference call to clarify KU's responses to Liberty's questions and to expand upon issues raised by those responses. See Appendix 1 for the list of the participants in that call. Based on the information initially submitted and later supplemented by responses to its questions, Liberty determined that all of the information needed was available, and there was no need for an on-site visit.

II. Conclusion Summary

Based on the information submitted by KU, Liberty concludes that:

1. The decision by KU not to perform additional technical analyses of the Bypass Line was consistent with good utility practice and technical judgment. The Bypass Line is 0.94 miles longer than the Approved Line (42.03 vs. 42.97 miles); even had technical analyses been performed, there is not a reasonable likelihood that they would have produced significantly different results.

⁵ See Order of the KPSC dated September 29, 2009.

2. The CDH and Jent bypass routes are reasonable, and appear to take the most direct paths around the properties in litigation.
3. In its siting, KU appropriately considered the needs of the property owners from whom KU acquired the easements, and chose paths that avoid built-up areas.
4. Although all of the documentation provided by KU on the acquisition of the bypass easements eventually proved adequate, Liberty observed, based on the application and responses from KU, a lack of documentation of the decision process and analyses conducted by the Company. Documentation was sparse or non-existent. Liberty would have expected that a project of this magnitude (\$6.9 million), and especially one associated with litigation, would have been supported by more extensive documentation of both qualitative and quantitative decisions.
5. Liberty does not, however, question the ultimate results of the process, which were made reasonably transparent following KU's September 25, 2009 responses to Liberty's questions, and subsequent conference call on October 6, 2009.

III. Liberty's Evaluation

A. Technical

The Commission granted a CPCN for the MC-HC 345 kV transmission line, based on the need to integrate the Trimble County #2 base load generating unit into the grid, and based on the Companies' ultimate demonstration that the technical, environmental, siting, and economic analyses for the line met Commission standards. The CPCN was granted for an approved route of 42.03 miles. The design for the circuit was self-supporting steel structures, both pole and lattice steel as appropriate.

The proposed temporary bypasses will add, in total, 0.94 miles to the total length of the circuit. The design of the temporary bypass structures incorporates guyed wood poles in various configurations, per the evidence provided by KU in its filing. The line tensions would be less on these bypasses than on the Approved Line, and the average span length 200 feet shorter than on the steel pole portions of the line.⁶

It is Liberty's experience that utilities at times may use wood pole structures for permanent transmission line design. Wood poles and related wooden structural elements that are properly treated have average lives of 30 years or more, depending on the specific type of preservation method, climate, proper inspection and maintenance practices, and exposure to physical events that would cause premature failure of the pole, such as traffic accidents. The routes of these temporary bypasses do not appear to expose the wood structures to any extraordinary risks. Therefore there is no reason to expect that the wood structures proposed by KU would not provide the required service lives of the bypasses.

KU did not perform any additional technical studies to determine if line ratings or other characteristics of the line would change. The decision was based on a comparison of electrical

⁶ See response of Edwin R. Staton to Liberty Question Q-1(b), dated September 25, 2009.

characteristics of the two lines.⁷ KU did not provide any documentation that supported this decision. While the decision is correct, in Liberty's opinion, there should be at least a detailed *qualitative* discussion of the reasons not to perform additional studies. For example:

- Whether the 0.94 mile increase in the length of the line would or would not cause changes in the circuit's electrical characteristics.
- Whether the bypasses are able to withstand ice loading that is different from the steel structures and specifications in the Approved Line.
- Whether the shorter spans in the bypasses, coupled with the lower tensions, would or would not affect the maximum and emergency line ratings of these sections, as well as the entire circuit.

It is Liberty's opinion that the decision by KU not to perform technical analyses of the electrical characteristics of the Bypass Line, and use those characteristics developed for the Approved Line, was a sound decision based on experienced engineering judgment, and within good utility practice. However, KU should have documented many of its decisions in order for the public record to be as complete as possible, to demonstrate that it took into consideration an appropriate range of technical issues in its decision, and to explain its decisions to non-experts who may become a party to this filing. In short, good regulatory practice suggests a more careful documentation process.

B. Route Selection

KU chose to site the Jent and CDH bypasses more-or-less around the perimeters of the respective properties in litigation. These routes are the shortest and most direct routes. KU was also sensitive to the needs of the property owners from whom easements were secured, and sited the bypasses away from populated areas to minimize impacts.

KU has secured options for the construction, operation, and maintenance of these bypasses for a minimum of 3 years and a maximum of 10 years. These easements were secured without litigation from the property owners. The capital budget of \$6.9 million for these two bypasses includes a line item of about \$900,000 for the restoration of the bypass corridors at such time as these easements are no longer needed.

After KU selected the bypass routes, it engaged PhotoScience, Inc. to evaluate these routes using the same model used in the evaluation and selection of the alternate routes in the original application (Cases 2005-00467 and 2005-00472). Liberty notes that this is a different approach than used in the selection of the MC-HC corridor. In that case, PhotoScience evaluated the bypass routes after, rather than before, the routes were selected. However, given the few alternatives available for the siting of bypass routes, this is an acceptable approach to demonstrate the suitability of these bypass routes on a comparable basis to the Approved Line. The PhotoScience analysis did not show any conflicts that would prevent these bypasses from being built.

⁷ See response of Edwin R. Staton to Liberty Question Q-1(c), dated September 25, 2009.

Based on the evidence provided in KU's application, as supplemented by responses to questions propounded by Liberty, it is Liberty's opinion that the selection process for these bypasses routes was sound.

C. Economic

The cost of the CDH and Jent bypasses, including easements, construction, and removal/restoration is \$6.9 million. The majority of these costs are directly related to the construction of the bypasses. Construction costs are directly related to circuit length. The shorter the bypass lengths, the lower the construction costs will be. KU considered line lengths in its planning. KU did consider minor routing changes to the centerlines of the Jent and CDH bypasses, each of which would have increased the cost of the project \$150,000 for the Jent bypass, and \$75,000 for the CDH bypass.⁸

However, KU did not present the economics of any significant alternatives to the bypasses, thus precluding a cost comparison basis. Mr. Staton, in his response to Liberty Question Q-3 dated September 25, 2009, stated that "KU did not perform any written analyses to identify alternatives to the CDH and Jent temporary lines." It is Liberty's opinion that there is essentially always at least one alternative. For example, even a cursory review of an alternative to delay the completion of the MC-HC line for 12 months to await the resolution of the litigation, with an order of magnitude estimate of cost effects on operations would have been welcome. It is Liberty's opinion that, in all likelihood, the costs of delay would have been at least multiple times higher than the bypass alternative, and such a review would have provided some documentation that would have provided additional perspectives to the Commission and other parties.

IV. Conclusion

It is Liberty's conclusion that KU has met the requirements set forth by the Commission to request Certificates of Public Convenience and Necessity for the Jent and CDH temporary bypasses. Liberty has not identified any technical, siting, or economic issues that would cause the Commission to deny such Certificates.

- From a technical perspective, the circuit is not significantly different from the Approved Line, and should not affect either the operation of the TC2 unit when it is brought into commercial operation, or the transmission grid into which the circuit will be integrated. The physical characteristics of the bypass construction reflect good utility practice.
- From a siting perspective, the paths chosen appear to be the most direct routes to bypass the properties under litigation. KU demonstrated that it followed Commonwealth regulations with regard to notifications of the appropriate property owners, and successfully acquired easements to allow construction and operation of the bypasses. The routes do not cause conflict with any feature along or within proximity to the bypasses.
- From an economic perspective, KU followed the most direct paths for siting the bypasses, resulting in a cost that is lower than had KU considered other, longer potential bypass routes. However, KU did not document any alternatives to the bypasses around the Jent, CDH and Monroe properties.

⁸ See response of Edwin Staton to Liberty question Q-3(b) dated September 25, 2009

Liberty finds the paucity of written documentation to support KU's decisions regarding the technical analyses and alternatives to the bypasses to be a matter of procedural concern. The \$6.9 million cost of the bypass is a small increment to the total cost of this project; nevertheless, on an absolute basis, most utilities would require documentation supporting the outlay of this amount. This documentation would not have necessarily included detailed economic or technical studies, but could have included qualitative descriptions of technical and management decisions, with order of magnitude cost estimates (where appropriate) to demonstrate the soundness of these decisions. Such documentation would more solidly prove KU's case for Certificates to the Commission and to other stakeholders in the process.

APPENDIX 1

Participants in the October 6, 2009 Conference Call

From Kentucky Utilities/E.ON:

- Lonnie Bellar
- Rick Lovekamp
- Ed Staton
- Allyson Sturgeon
- Robby Trimble
- John Voyles
- Bob Watt

From the Kentucky Public Service Commission:

- John Rogness

From the Liberty Consulting Group:

- Phil Weber