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VIA MESSENGER

January 10, 2006

Pamela B. Katz
Chairman
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

Re: Life-Cycle 2006 - The Connecticut Siting Council Investigation into the Life-Cycle Costs of Electric Transmission Lines

Dear Chairman Katz:

I enclose an original and twenty (20) copies of The United Illuminating Company's responses to the Connecticut Siting Council's second set of pre-hearing interrogatories. If you have any questions about this filing, please do not hesitate to contact me.

Very truly yours,

Bruce L. McDermott

cc: Service List

Enclosures

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Interrogatory CSC – 1B

The United Illuminating Company
Docket Life Cycle 2006

Witness: Richard Reed
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Q-CSC-1B: How does your company define the "life cycle cost" of a transmission line?
A. What are the major components of life cycle cost?
B. Are line termination costs included, such as protection? If so, specify which equipment items are, and are not, included.
C. Is the cost of losses an element of life cycle cost? Why or why not?

A-CSC-1B: UI defines the "life cycle costs" of a transmission line as the anticipated total cost of constructing, operating and maintaining the transmission line over the foreseeable useful life of the transmission line. In order to yield one present value of the transmission line life cycle cost, typical present value factors are applied to the construction, operation and maintenance costs of the selected project. In order to provide a common value for comparison, the same present value analysis is applied to the life cycle costs for all alternatives.

A. The major components of the life cycle cost for a transmission line are the costs of constructing, operating and maintaining the transmission line and the expected useful life of the asset being installed.

B. For purposes of estimating life cycle costs, UI recommends all relevant costs be used in comparing alternatives.

C. Yes. Different alternatives could provide different level of power losses. Therefore, UI recommends including power losses when comparing alternatives on a life cycle cost basis.

Interrogatory CSC-2B

The United Illuminating Company
Docket Life Cycle 2006

Witness: Richard Reed

Q-CSC-2B: Do you think your company's transmission line capital and construction costs are higher, lower, or about the same as those for other Northeastern utilities? If you costs are higher or lower, please specify why you believe this is so.

A-CSC-2B: In general, compared to other urban Northeastern utilities, the Company believes its transmission line capital and construction costs are similar.

Interrogatory CSC-3B

Q-CSC-3B: Do you think your company's transmission line operating and maintenance costs are higher, lower, or about the same as those for other Northeastern utilities? If you costs are higher or lower, please specify why you believe this is so.

A-CSC-3B: In general, compared to other urban Northeastern utilities, the Company believes its operating and maintenance costs are similar.

Interrogatory CSC-4B

Q-CSC-4B: List the most important factors affecting overhead transmission line capital costs and briefly discuss their relevance to your system.

A-CSC-4B: UI differs from other utilities because its territory is almost entirely urban or suburban. The following are the most important factors affecting our overhead transmission line costs.

1. **Construction**: Construction costs are the most important factor in the Company's overhead line capital costs. UI's capital costs are significantly impacted by the nature of the right-of-way (ROW) on which the line is constructed. Many of the Company's transmission lines run along railroad ROW. Construction costs along the railroad ROW will be significantly higher than costs along a private ROW due to the complexities of constructing a transmission line above an operating railroad. Other issues that can impact the cost are the type of terrain and soil/rock conditions in the ROW.

2. **Material costs:** The material costs for projects are typically higher because the urban nature of UI's overhead transmission lines require taller structures or more angle/dead end structures.

3. **Recent requirements to mitigate electric and magnetic fields**: Requirements to mitigate electric and magnetic fields will most likely result in higher construction costs for split phasing and taller structures.

Interrogatory CSC-5B

The United Illuminating Company
Docket Life Cycle 2006

Witness: Richard Reed
Page 1 of 1

Q-CSC-5B: List the most important factors affecting underground transmission line capital costs and briefly discuss their relevance to your system.

A-CSC-5B: The most important factors affecting underground line transmission line capital costs generally are:

1. Cost of cable and accessories
2. Trench excavation costs
3. Splicing chamber excavation costs
4. Cable installation
5. Cable splicing
6. Road and street composition

Depending on field conditions the following may become significant capital costs:

1. Amount of rock encountered
2. Depth of trench
3. Amount and level of soil contamination

Additional factors that can have significant impact on the cost of construction are:

1. Restrictions put on allowable work areas
2. Contiguous length of allowable work
3. Time of year restrictions on street work

UI's major underground transmission project is the Middletown-Norwalk Project. Since its inception, estimates for materials have increased approximately 45%, mainly due to the increased cost of copper and steel. Based on CL&P's experience with the underground portion of the Bethel to Norwalk Project and UI's environmental and test pit surveys along its portion of the route of the Middletown-Norwalk Project, estimates for trench excavation due to rock and soil disposal have both been increased. Preliminary discussions with CDOT regarding work restrictions, both daily and seasonally, indicate that labor costs to install the duct line and splicing chambers will both increase. A financial impact due to these restrictions has not been calculated, but a significant increase of labor costs along the route is possible.

Interrogatory CSC-6B

Q-CSC-6B: Describe your company's overall philosophy related to siting and constructing new transmission facilities.

A-CSC-6B: Maintaining a reliable and dependable electric power system is central to UI's overall philosophy related to the siting and construction of new transmission facilities. Transmission planning is done in concert with ISO-NE's Regional System Planning (RSP) effort to ensure future demands upon the electric system do not compromise its integrity. Once a system "need" is established, UI Company begins an iterative process of evaluating alternatives, balancing specific objectives outlined in the Public Utility Environmental Standards Act, various electric safety codes, the needs of many local and regional stakeholders and applicable local, state, and federal laws.

ISO-NE's RSP is a comprehensive study of all aspects of the electric system and planning necessary to ensure a reliable and efficient operation of the New England power system. The RSP identifies the desired amount of additional capacity required to assure a reliable supply, when and where the capacity will be necessary, in addition to needed transmission improvements. UI's planners are closely involved in this process.

UI's philosophy with respect to the siting of the transmission "need", as identified in the above RSP, focuses on an iterative process involving alternatives and a number of objectives such as:

- Maintaining system operability.
- Minimizing the need to acquire (by condemnation or voluntary sale) residential homes and commercial buildings to accommodate the construction of the transmission line.
- Maximizing the use of existing linear corridors (e.g., transmission line, highways, railroad, pipeline), consistent with the long-established siting guidelines of the Federal Energy Regulatory Commission.
- Minimizing the need to expand existing right-of-ways to accommodate the proposed facilities.
- Minimizing impacts to sensitive environmental resources, including inland and tidal wetlands, steep slopes, erodible soils,

parks, watercourses, and vegetation/wildlife/fisheries resources of concern.

- Minimizing impacts to significant cultural resources (archaeological and historic).
- Minimizing or avoid conflicts with local, state, and federal land use plans and resource policies.
- Minimizing aesthetic impacts on scenic resources.
- Maintaining public health and safety.
- Achieving an economic solution, consistent with good engineering practice, while balancing the consideration of the above routing factors.

Depending on the depth and breadth of the system "need", this analysis process could involve energy system alternatives such as conservation and load management, distributed generation, potential uses of new transmission technologies and transmission system alternatives, including direct current (DC).

As it pertains to the construction of an approved transmission facility, UI's philosophy is to efficiently and effectively construct in compliance with the Company's Certificate as issued by the Connecticut Siting Council and its Development and Management Plans as approved by the Connecticut Siting Council.

An overreaching philosophy pertaining to both the siting and construction effort, is UI's belief that the process should include all necessary stakeholders in a collaborative effort yielding the best overall solution for the ultimate customer.

Interrogatory CSC-7B

The United Illuminating Company
Docket Life Cycle 2006

Witness: Richard Reed

Q-CSC-7B: How are transmission and distribution system planning activities coordinated or integrated to optimize the costs of new construction and maintenance?

A-CSC-7B: UI transmission and distribution planning activities for new construction are coordinated through the following process.

By April of each year, UI's Distribution Planning provides UI's Transmission Planning a ten year peak load forecast of all UI 115 /13.8 kV substations, including substation peak loads that are coincident with the NEPOOL peak load. The substation peak load forecast coincident with the NEPOOL peak load 10 year forecast is utilized by UI's Transmission Planning each June when it provides ISO-NE with a peak load flow base case. ISO-NE utilizes this UI base case load information to develop the 10% probability extreme weather peak load case as seen in the following year's Capacity Energy Load Transmission (CELT) report.

The forecast of peak loads for each substation is made on a non-coincident basis. That is, each substation's forecasted peak load is made independently from all of the other substations as well as from the UI system peak and NEPOOL system peak forecast. The forecast is also done expecting extreme (high temperature and humidity) seasonal weather. This enables future substation thermal capacity deficiencies to be identified as early as possible. This method of peak load forecasting provides the greatest amount of lead time for UI to respond to any capacity deficiencies and alleviate the conditions.

Once a substation capacity deficiency is determined, a set of transmission and/or distribution solutions that mitigate the deficiency are developed and evaluated. These alternatives are compared and evaluated based on the specific needs and impacts of the project. Life cycle cost, i.e. the total cost to construct, operate and maintain the project over its life is an important factor in selecting the alternative for construction.

Interrogatory CSC-8B

The United Illuminating Company
Docket Life Cycle 2006

Witness: Richard Reed
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Q-CSC-8B: How and where is the cost of right-of-way acquisition included in the capital cost information your company provided in response to the Life Cycle Cost Interrogatories issued earlier under this docket?

A-CSC-8B: The Company recognizes that land costs can be a crucial factor in the differential between overhead and underground transmission line construction. However, such cost considerations are so condition-specific that they should not be estimated for a generic cost comparison. See also, the responses to interrogatory CSC-01, Q-CSC-002 and Q-CSC-04. Land rights costs because they are site and project specific and highly variable. Most often, underground lines will be built within road right-of-ways, but some parts of a line (e.g., vaults) may be forced onto private property by state DOT or local community requirements. Future significant costs may be incurred if the state requires existing underground cable systems to be relocated within or outside Connecticut DOT rights of way.

Interrogatory CSC-9B

The United Illuminating Company
Docket Life Cycle 2006

Witness: Richard Reed

Q-CSC-9B: What vegetation management practices are used on the transmission rights-of-way on your system?

A-CSC-9B: The Company uses manual cutting and mechanical mowing to control vegetation growth along its right-of-ways.

The Company also maintains transmission lines along railroad right-of-ways. On these rights-of-way, the company uses manual cutting techniques to maintain clearance between its lines and any vegetation that may approach from the side of the right-of-way. The railroad maintains the area directly beneath the lines, typically using manual cutting and herbicides.

Interrogatory CSC-10B

The United Illuminating Company
Docket Life Cycle 2006

Witness: Richard Reed

Q-CSC-10B: If herbicides or growth retardants are used, what is the cost impact of their use compared to traditional trimming and mowing?

A-CSC-10B: UI does not currently use herbicides for right-of-way maintenance. The majority of UI's transmission lines run along railroad right-of-ways. The railroad currently maintains the right of way areas under our lines, typically using herbicide. The use of herbicide on right-of ways lengthens the maintenance cycle.

Interrogatory CSC-11B

The United Illuminating Company
Docket Life Cycle 2006

Witness: Richard Reed

Q-CSC-11B: Are there additional environmental or safety costs associated with the use of herbicides or growth retardants? What are they?

A-CSC-11B: The only additional environmental or safety costs associated with the use of herbicides or growth retardants are a license from the Department of Environmental Protection. Currently, the Company uses no herbicides or growth retardants.

Interrogatory CSC-12B

Q-CSC-12B: What is the approximate cost per mile for vegetation management for various typical rights of way?

A-CSC-12B: The Company maintains approximately 100 miles of right-of-way (ROW) for overhead transmission lines. The Company conducts vegetation management of its transmission ROW on a 5 year cycle. There are two basic categories of ROW that the Company supports:

- **Railroad ROW:** The Company maintains 23 miles of transmission ROW on the Metro North Railroad. This ROW typically supports two transmission lines, one on either side of the catenary structure. Vegetation management for this type ROW costs, on average, $15,000 per mile, per side of the ROW. The vegetation management conducted by the Company on the railroad ROW consists of side trimming and removal of hazard trees that threaten the line. The floor of the ROW is maintained by the railroad using manual cutting and herbicides.

- **Conventional ROW:** The remaining 77 miles of conventional ROW costs, on average, $7,500/mile for vegetation management. These costs include side trimming of the ROW and floor maintenance through mechanical mowing or manual cutting.

Interrogatory CSC-13B

The United Illuminating Company
Docket Life Cycle 2006

Witness: Richard Reed
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Q-CSC-13B: Provide information on the difference in capital costs and construction costs for standard conductors (e.g. ACSR) and composite conductors (e.g. ACCR, ACCC).

A-CSC-13B: The Company's current research into ACCR conductors indicates that the conductor material costs are roughly ten times that of ACSR. The conductor material cost represents the most significant cost difference between these types of high temperature, low sag conductors and conventional ACSR. To a much lesser extent, the other contributing factors include the specialized line hardware required for ACCR conductors and the specialized equipment necessary to install the conductors. The Company has no current research on the cost of ACCC conductors.

Interrogatory CSC-14B

The United Illuminating Company
Docket Life Cycle 2006

Witness: Richard Reed
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Q-CSC-14B: Provide transmission maintenance cost information, as reported to FERC on the Form 1, for additional years 1999-2003.

A-CSC-14B: The Company's transmission maintenance cost information, as reported to FERC on the Form 1, for additional years 1999-2004 is given below:

TRANSMISSION EXPENSES	2004	2003	2002	2001	2000	1999
Operation						
(560) Operation Supervision and Engineering	1,513,033	963,445	800,409	1,513,355	907,766	1,552,846
(561) Load Dispatching	2,799,825	2,474,570	2,385,838	2,100,119	2,000,210	1,930,738
(562) Station Expenses	245,174	120,469	113,208	383,120	273,742	293,620
(563) Overhead Lines Expenses	4,053		220	301	4,671	10,058
(564) Underground Lines Expenses	33,330	3,629		2,904	4,869	134
(565) Transmission of Electricity by Others	21,732,852	21,881,234	22,497,788	21,790,242	18,738,299	16,205,434
(566) Miscellaneous Transmission Expenses	1,187,590	529,796	3,409,877	592,905	877,106	
(567) Rents	807,916	460,474	854,471	1,814,784	2,064,919	1,366,918
TOTAL OPERATION	28,323,773	26,433,617	30,061,811	28,197,730	24,871,582	21,359,748
Maintenance						
(568) Maintenance Supervision and Engineering	84,214	1,088	276		7,763	39,406
(569) Maintenance of Structures	31,748	106,323	81,312	76,802	88,785	37,999
(570) Maintenance of Station Equipment	1,112,275	1,292,389	1,992,739	1,287,546	1,184,682	1,493,412
(571) Maintenance of Overhead Lines	367,814	68,164	276	1,310	2,263	12,789
(572) Maintenance of Underground Lines	34,001	7,474	415	932	(13,970)	42,013
(573) Maintenance of Miscellaneous Transmission Plant						
TOTAL Maintenance	1,630,052	1,475,438	2,075,018	1,366,590	1,269,523	1,625,619
TOTAL Transmission Expenses	29,953,825	27,909,055	32,136,829	29,564,320	26,141,105	22,985,367