STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

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VIA ELECTRONIC MAIL

April 10, 2017

James R. Morrissey, Esq.
UIL Holdings Corporation
157 Church Street
New Haven, CT 06506

RE: **LIFE-CYCLE 2017** - Connecticut Siting Council Investigation into Life-Cycle Costs of Electric Transmission Lines.

Dear Attorney Morrissey:

The Connecticut Siting Council (Council) requests your responses to the enclosed questions no later than May 15, 2017. To help expedite the Council's review, please file individual responses as soon as they are available.

Please forward the original and 20 copies to this office. In accordance with the State Solid Waste Management Plan, the Council is requesting that all filings be submitted on recyclable paper, primarily regular weight white office paper. Please avoid using heavy stock paper, colored paper, and metal or plastic binders and separators. Fewer copies of bulk material may be provided as appropriate.

Any request for an extension of time to submit responses to interrogatories shall be submitted to the Council in writing pursuant to §16-50j-22a of the Regulations of Connecticut State Agencies.

Yours very truly,

Melanie A. Bachman
Executive Director

MB/RM

c: Council Members

LIFE-CYCLE 2017
United Illuminating (UI) Pre-Hearing Interrogatories, Set One

1. For new overhead transmission line installations in Connecticut, what transmission structure designs, including structure material and conductor arrangement (i.e. single-circuit vertical steel monopole), are mostly commonly used and for what reason(s)?

2. What structure designs, including structure material and conductor arrangements, are no longer used and for what reason(s)?

3. Of the overhead configurations listed in response to Question 1, what configurations would UI consider prudent for life cycle analysis? Please complete the table provided with current first cost per circuit mile and losses for each of the noted configurations.

First Costs		Losses	
Poles & Foundations		Conductor Size & Type	
Conductor & Hardware		Resistance	
Site Work		Peak Line Current	
Construction		Load Growth	
Engineering		Loss Factor	
Sales Tax		Energy Cost	
Project Management		Energy Cost Escalation	

4. Complete the table provided with current first cost per circuit mile and losses for each of the following overhead electric transmission line configurations, if not already addressed in Question 3:

   a) 115 kilovolt (kV) wood H-frame
   b) 115 kV steel delta
   c) 345 kV wood H-frame
   d) 345 kV steel delta

First Costs		Losses	
Poles & Foundations		Conductor Size & Type	
Conductor & Hardware		Resistance	
Site Work		Peak Line Current	
Construction		Load Growth	
Engineering		Loss Factor	
Sales Tax		Energy Cost	
Project Management		Energy Cost Escalation	

5. Complete the table provided with first cost per circuit mile and losses for each of the following underground electric transmission line configurations:

   a) 115 kV high pressure fluid filled (HPFF) pipe
   b) 345 kV HPFF
   c) 115 kV cross-linked polyethelene (XLPE)
   d) 345 kV XLPE

First Costs		Losses	
Ducts & Vaults		Cable Size & Type	
Cable & Hardware		Resistance	
Site Work		Peak Line Current	
Construction		Load Growth	
Engineering		Loss Factor	
Sales Tax (X %)		Energy Cost	
Project Management		Energy Cost Escalation	

6. For variables listed under Losses in Questions 3, 4 and 5, provide the origin of the value.

7. Provide the following variables for cost calculations including the origin of the value:
   a) Capital recovery factor, _____
   b) Operation and maintenance cost escalation, and _____
   c) Discount rate. _____

8. Provide the rationale of including or not including the following overhead transmission line configurations:

   a) Lattice structures
   b) Laminate structures; and
   c) Vertical conductor design.

9. Discuss the applicability of life cycle cost analysis for double circuit configurations. Is there a multiplier that can be applied to account for a second circuit to the transmission line configurations?

10. Provide costs per circuit mile of the past five years for operation and maintenance of UI's existing overhead transmission lines in accordance with Federal Energy Regulatory Commission (FERC) Accounts 560, 563, 564, 568, 571, and 572.

11. Provide costs per circuit mile of the past five years for operation and maintenance of UI's existing underground transmission lines in accordance with FERC Accounts 560, 563, 564, 568, 571, and 572.

12. Provide costs per mile of the past five years for UI's vegetation management activities for transmission line rights-of-way.

13. Is UI's vegetative management cost part of the FERC Accounts 571 and/or 572?

14. Provide an updated breakdown of UI's existing transmission facilities by length, voltage, construction type, and single/double circuit.

15. List all relevant standards applicable to transmission resources for the following categories (if standards differ between overhead and underground or 115kV and 345kV please so state):

    a. Reliability
    b. Security
    c. Vegetation Management, and
    d. Storm hardening.

16. The National Electric Safety Code and the State of Connecticut Building Code have been updated. How may these updated codes impact life cycle costs and identify those relevant code changes.

17. Where are the costs associated with applicable standards and environmental permits found in first costs?

18. Does UI agree with the list of environmental permits/certificate approvals in Table 8-2 in the Life Cycle 2012 final report dated November 12, 2012? If not, list other permitting authorities.

19. Describe the effects on life cycle costs applicable for underground/overhead transmission lines as it pertains to those entities referenced in Question 10.

20. Does UI agree that approximately 40 years is a reasonable value to assign to an overhead or underground transmission line's useful life? If not, what typical life expectancies would UI use for each of the transmission line configurations identified in Questions 1 and 2?

21. Would UI consider constructing new 69-kV transmission lines in Connecticut?

22. Are polymer insulators the preferred type of insulators? Have they largely replaced porcelain or glass insulators?

23. Describe how leak prevention and containment measures used on HPFF cable systems could impact life-cycle costs.

24. Has UI researched or evaluated the use of composite conductors for transmission lines to increase line capacity? If so, what is estimated life cycle cost impact? Please break into first cost and ongoing cost elements.

25. Does UI anticipate utilizing ACSS conductors as a common practice or would ACSR or other conductor types be used for overhead lines?

26. Has UI experienced, in the last five years, issues with construction or maintenance of transmission lines in locations that required special processes or procedures due to environmental sensitivity? If so, please describe the situations and the cost impacts.

27. ISO-New England (ISO-NE) has issued planning and operating standards for design and operation of transmission facilities. One standard prescribes transmission line ratings for normal conditions, short-term emergency and long-term emergency conditions. Does UI expect the standards to impact transmission line life-cycle costs, and if so, to what extent?

28. Has UI identified other ISO-NE policies or operating procedures that are anticipated to impact transmission line life-cycle costs? If so, what are they and what is the anticipated impact?

29. Under what conditions would UI consider using high voltage direct current (HVDC) lines for long-distance power transfers? How would the life cycle costs of HVDC lines compare to high voltage alternating current (HVAC) transmission lines?

30. Does UI believe that its transmission line capital and construction costs are higher, on par, or lower than other Northeast Power Coordinating Council region utilities? If higher or lower, by what percentage and perceived reason?

31. Does UI believe that its transmission line operation and maintenance costs are higher, on par, or lower than other Northeast Power Coordinating Council region utilities? If higher or lower, by what percentage and perceived reason?

32. Are there any updates or changes to the coordination of transmission and distribution planning activities within UI or in conjunction with the ISO New England Regional System Planning process? If so, please discuss the changes and the impacts they have on transmission line life-cycle costs.

33. Provide any comments and/or suggestions regarding how the Council's Life Cycle 2012 report could be improved.