UIL Holdings Corporation
157 Church Street
PO Box 1564
New Haven CT 06506-0901
Phone 203.499.2000

UIL

November 14, 2011

Robert Stein
Chairman
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

Re: Life-Cycle 2011 – Connecticut Siting Council Investigation into the Electric Transmission Line Life-Cycle Costs

Dear Chairman Stein:

I enclose an original and fifteen (15) copies of The United Illuminating Company's responses to the Connecticut Siting Council's second set of pre-hearing interrogatories (CSC 4, 5, 11, and 14-16) and responses to the Office of Consumer Counsel's first set of pre-hearing interrogatories (OCC 1, 4(b), 5, 7(a), 11, 12, 14, 15, and 17). If you have any questions about this filing, please do not hesitate to contact me at 203-499-2422.

Very truly yours,

Bruce L. McDermott
Managing Counsel – Operations
On Behalf of The United Illuminating Company

cc: Service List

Enclosures

Q-CSC-4: Are there any additional factors not discussed in the 2006 Council interrogatory responses that have impacted UI's transmission line operating and maintenance (O&M) costs? If so, please identify these factors and the impacts they have on transmission line life-cycle costs.

A-CSC-4: Yes, recent changes to UI's vegetation management practices are the driving factor. Please refer to A-CSC-11 for details on UI's vegetation management practices.

Q-CSC-5: This question refers to the first set of 2011 Council interrogatories. In UI's response to question 5, a table was provided that shows widely varying O&M costs for overhead and underground transmission lines. From 2006-2010, overhead O&M costs go from $5,493 to $12,425/mile (a 126% increase). Also, from 2008 to 2009, the overhead O&M costs double. Explain these increases. Also, from 2006-2007, underground O&M costs go from $1,725 to $3,452/mile. Explain this increase.

A-CSC-5: Recent changes to UI's vegetation management practices are the driving factor. Please refer to A-CSC-11 for details on UI's vegetation management practices.

The underground O&M cost increase from 2006 to 2007 was related to corrective maintenance needs of UI's 115 kV underground cable systems which were identified during a comprehensive inspection.

Q-CSC-11: Have the vegetation management practices of UI changed in any way since the 2006 Council interrogatories? If so, please describe these changes and their effect on transmission line life-cycle costs.

A-CSC-11: In 2007, the Company developed a Transmission Vegetation Management Program ("TVMP") compliant with North American Electric Reliability Council ("NERC") VM Standard FAC-003-1. The program is designed to improve the reliability of the electric transmission system by preventing growth related outages from vegetation located on transmission rights-of-way ("ROW"), minimizing outages from vegetation located adjacent to ROW (hazard trees, fall-ins, etc), maintaining specific and measurable clearances between transmission lines and vegetation on and along the transmission ROW, and reporting qualifying vegetation-related outages of the transmission system to the respective Reliability Entity and NERC.

In accordance with NERC FAC-003-1 the Company established a minimum clearance distance of 20 feet to be obtained at time of maintenance and a minimum clearance of 10 feet for 345kV and 4 feet for 115kV to be maintained at all times.

UI's TVMP identifies two components that are performed on an annual basis: cycle trimming and inspections. Cycle based trimming of all overhead transmission lines involves the trimming of the lines on a four year cycle (approximately 25% per year). The cycle based trimming is supplemented with inspection of 100% of the overhead transmission lines. The inspection process identifies off cycle "hot spot" trimming for vegetation that has encroached within the clearance requirements of the TVMP. In the past the annual inspections were performed on foot and were combined with other transmission line structure inspections. In 2010 UI implemented an improvement to the inspection process which utilized the use of LiDAR imaging and processing capabilities.

Transmission line life-cycle costs have increased as a result of meeting the compliance requirements of NERC FAC-003-1 and changes to the TVMP.

Transmission Vegetation Management Costs:

	2007	2008	2009	2010
Actual Cost	$411,000	$408,000	$693,000	$790,000

Q-CSC-14: Please provide updated costs per mile for UI's vegetation management activities for transmission line rights-of-way.

A-CSC-14: The Company does not manage or track vegetation management costs by mile.

The Company maintains 100 circuit miles of overhead transmission line ROWs on a four year cycle, approximately 25 miles per year. Additionally, other off cycle ROWs are maintained through "Hot Spot" trimming to remove tall growing trees that have encroached the clearance requirements. The costs for maintaining the ROW have been provided in A-CSC-11.

Q-CSC-15: Please provide any updated information on the differences in capital and construction costs for standard conductors (ACSR) vs. composite conductors (ACCR or ACCC)?

A-CSC-15: Conductor material costs for ACCR are roughly five times that of ACSR, with the conductor material costs representing the most significant cost difference between these types of high temperature low sag conductors and ACSR. To a lesser extent, the other contributing factors include the specialized hardware required for ACCR conductors and specialized equipment necessary to install the conductors. Other construction costs, i.e., foundations, structures, stringing, etc. do not differ significantly among the two for new construction. The Company has not actively pursued information regarding the cost of ACCC conductors.

Q-CSC-16: Please provide any information UI may have regarding the magnetic field profiles for a typical underground HPFF cable installation such as test reports or other measurements of electro-magnetic fields at various distances from the center of the right-of-way?

A-CSC-16: UI does not retain specific information regarding magnetic field profiles for typical underground HPFF cables installations. The Company is aware that pipe-type cables inherently have very low aboveground magnetic field values. A typical HPFF cable system is enclosed in a steel pipe which effectively attenuates the magnetic field produced by balanced currents (three-phase) flowing in the three cables. Magnetic field values are also low because the cables are in close proximity.

Q-OCC-1: Reference Response to CSC-001. Provide details on the work force used for operations and maintenance, including the number of workers by job title, the number of supervisors, and whether the workers are employees of the utility, or from an outside contractor.

For FERC accounts 560 and 568 (operations and maintenance supervision accounts), provide a best estimate of the costs for these supervisory functions by overhead and underground lines. The cost estimate may be in the form of a supervisory loading percentage.

A-OCC-1: The details on the workforce used for transmission related operations and maintenance is included in the table below: The company does not track the use of contractors by worker count. The cost of outside contractors included in response to CSC-001 is $1,096,765.

The charges in FERC accounts 560 and 568 include the cost of labor and expenses incurred in the general supervision and direction of the operation and maintenance of the transmission system as a whole. Approximately 25% of the charges in account 560 are for the cost of supervision of overhead and underground line operations. Approximately 50% of the charges in account 568 are for the cost of supervision of overhead and underground line maintenance.

Job Title	# Employees (1)			FTE's (2)		
	Supervisor	Worker	Total	Supervisor	Worker	Total
Admin Transm & Subst Clk	-	2.00	2.00	-	0.00	0.00
Elec Test Asst A	-	5.00	5.00	-	0.22	0.22
Elec Test Technician	-	6.00	6.00	-	0.24	0.24
Electrical Test Assistant	-	3.00	3.00	-	0.06	0.06
Electrical Test Asst B	-	6.00	6.00	-	0.27	0.27
GIS Operator	-	1.00	1.00	-	0.00	0.00
Lead Electrical Test Tech	-	1.00	1.00	-	0.00	0.00
Lead Supv, Const Opers	1.00	-	1.00	0.00	-	0.00
Line Clearance Arborist	1.00	-	1.00	0.44	-	0.44
Line Clearance Technician	-	2.00	2.00	-	0.27	0.27
Sr Technical Suppt Spec	-	1.00	1.00	-	0.41	0.41
Subst Electr Const&Maint	-	12.00	12.00	-	0.33	0.33
Subst Electrician Spec	-	4.00	4.00	-	0.06	0.06
Substation Elec 1st Class	-	2.00	2.00	-	0.04	0.04
Substation Elec 2nd Class	-	3.00	3.00	-	0.04	0.04
Supv Pwr Del/Transm&Subst	4.00	-	4.00	0.06	-	0.06
UG Cable Splicer 1st Cls	-	8.00	8.00	-	0.06	0.06
UG Cable Splicer 2nd Cls	-	4.00	4.00	-	0.03	0.03
UG Cable Splicer 3rd Cls	-	1.00	1.00	-	0.00	0.00
UG Inspector	-	2.00	2.00	-	0.11	0.11
UG Working Leader	-	2.00	2.00	-	0.01	0.01
Underground Specialist	-	6.00	6.00	-	0.04	0.04
Total	6.00	71.00	77.00	0.45	2.25	2.70

(1) The # of employees is persons who charge transmission operations and maintenance
(2) FTE's is the approximate Full Time Equivalent workers

Q-OCC-4: Ref. Response to CSC-002. Provide the following additional information for costs associated with overhead lines:

(b) Average embedded land cost per mile.

A-OCC-4: UI has not recently completed construction of an overhead transmission line.

Since UI and CL&P have collaborated on transmission line estimates as part of the Middletown to Norwalk Project, UI references CL&P's response for additional information concerning the average embedded land cost per mile.

Q-OCC-5: Ref. Response to CSC-004. For underground lines, provide the same information as requested in the previous interrogatory.

A-OCC-5: Since UI and CL&P have collaborated on transmission line estimates as part of the Middletown to Norwalk Project, UI references CL&P's response to OCC-5.

Q-OCC-7: Ref. Response to CSC-005.

(a) Provide an itemization of the costs included in the overhead and underground categories. Explain why the overhead costs per mile are so much higher than the underground costs per mile.

A-OCC-7: The table below includes the itemized costs for the overhead and underground categories. The overhead costs per mile as reported in response to CSC-005, Set 1, are much higher than the underground costs per mile due to the transmission line clearance program cost.

Category	OH	UG	Total
UI Payroll	132,609	29,422	162,032
Outside Services	38,919	-	38,919
Outside Contractors	1,072,599	24,167	1,096,765
Other	6,727	6,113	12,840
Material	5,061	-	5,061
Total	1,255,915	59,702	1,315,617

Q-OCC-11: Explain how ISO-New England allocates the cost of spare parts between the regional and the local levels.

A-OCC-11: ISO-NE utilizes its FERC Electric Tariff No. 3, Open Access Transmission Tariff's Section 12C and its Planning Procedure No. 4, entitled "Procedure for Pool-Supported PTF Cost Review" as guidelines to apply to its technical review of a transmission owner's Transmission Cost Allocation Application. The ISO-NE technical review is conducted in order to determine if a regional transmission project is deemed to have any costs which should not be included in regional transmission rates and therefore should be deemed to be "localized" and recovered from a transmission owner's local customers. As part of the ISO-NE's technical review of a transmission project, it also issues a determination regarding the appropriate rate treatment for a transmission project's spare parts.

Q-OCC-12: Explain how electric and magnetic fields are monitored at underground and overhead transmission plant sites. Specify whether all sites or only certain sites are actively monitored. Summarize monitoring results for the past three years, and include the costs of monitoring.

A-OCC-12: UI does not routinely test or monitor electric and magnetic fields of existing overhead and underground transmission lines. This is done typically only upon customer request, since many variables influence the magnetic field profiles. Circuit loading, burial depth and geometric configuration of the circuit all have a significant impact on the magnetic field profiles.

Q-OCC-14: Ref. *Life Cycle 2007 Report*, p. 31. Provide an update to Table 6-1 in the 2007 report. List percentages for all loadings on labor reflected in the costs including, but not limited to, a breakdown of each benefit, all taxes, training, vehicles, payroll and human resources costs.

A-OCC-14: Below is the update to Table 6-1. Please note that the information contained in the *2007 Report* may have contained formula errors.

TRANSMISSION LINE OPERATING AND MANTENANCE COSTS				
		UI		
Line No. **Trans Expenses Operation**	Notes	**2004**	**2005**	**2010**
1 (560) Operation Supervision and Engineering		1,513,033	1,595,059	1,626,511
2 (561) Load Dispatching	(6)	2,799,825	3,207,540	1,606,900
3 (563) Overhead Lines Expenses		4,053	6,710	57,686
4 (564) Underground Lines Expenses		33,330	27,271	23,250
5 Total Operation (UG+OH)	(1)	37,383	33,981	80,936
Maintenance				
6 (568) Maintenance Supervision and Engineering		84,214	108,205	115,829
7 (571) Maintenance of Overhead Lines		367,814	514,945	1,198,229
8 (572) Maintenance of Underground Lines		34,001	27,058	36,452
Total Maintenance (UG+OH) (incl. Acct 568 at 9 **50%)**	(2)	443,922	596,106	1,292,596
10 Ckt miles OH	(3)	99.63	100.02	101.08
11 Ckt Miles UG	(3)	16.89	16.89	28.28
OPERATION & MAINTENANCE				
In $/CKT MILE				
12 Overhead	(4)	3,732	5,216	12,425
13 Underground	(5)	3,986	3,217	2,111

Source: FERC FORM 1

(1) The total reported in the 2007 report for 2004 inadvertantly included account 561

(2) This total includes 50% of account 568, this is per the note on page 31 of the 2007 Report

(3) As reported in prior years and updated to reflect latest circuit mile data

(4) Overhead cost ((line 3 + line 7) / line 10)

(5) Underground cost ((line 4 + line 8)/line 11)

(6) Line 2, should not be included in this table, but is included to duplicate the 2007 report

The FERC accounts in the table above do not include costs associated with benefits, taxes, or human resources. These accounts only include labor, materials used and expenses incurred in the operations and maintenance of the transmission system. The table below illustrates the cost breakout for the charges that are included in the referenced FERC accounts.

		2010 Cost Breakdown					
Transmission Operation	**2010**	**Payroll**	**Outside Contractors /Services**	**Material**	**Vehicles**	**Other**	**Total**
(560) Operation Supervision and Engineering	1,626,511	48.83%	20.74%	3.11%	0.08%	27.23%	100.00%
(563) Overhead Lines Expenses	57,686	0.73%	99.17%	0.08%	0.00%	0.02%	100.00%
(564) Underground Lines Expenses	23,250	0.00%	100.00%	0.00%	0.00%	0.00%	100.00%
Total Operation (UG + OH)	80,936						
Transmission Maintenance							
(568) Maintenance Supervision and Engineering	115,829	92.21%	0.01%	6.40%	0.00%	1.38%	100.00%
(571) Maintenance of Overhead Lines	1,198,229	10.86%	87.99%	0.46%	0.15%	0.54%	100.00%
(572) Maintenance of Underground Lines	36,452	80.72%	2.52%	0.44%	15.42%	0.90%	100.00%
Total Maintenance (UG + OH)	1,234,681						

Q-OCC-15: Ref. *Life Cycle 2007 Report*, pp. 45 and 46. Provide a breakdown of dollar amounts for each of the items included in the Administrative category.

A-OCC-15: UI did not prepare the referenced information referenced and therefore cannot provide the requested breakdown.

Q-OCC-17: Explain how the cost of line losses is calculated and illustrate with an example of the calculation formula.

A-OCC-17: In general, the following is how line losses can be calculated:

Total line losses= EC (Energy cost) + DC(Demand Cost)

Where

EC = 3 x R x I2 x 8760 x LF x AIC /1000
DC = 3 x R x I2 x IDC/1000

And

EC = Energy Cost, $/yr
DC = Demand Cost, $/yr
R = Conductor Resistance (ohms/phase/mile) x Line Length (miles)
I = Peak load current on the lines (Amps)
8760 = hours/yr
LF = Loss Factor (average loss/peak loss)
AIC = Average incremental energy cost for the year ($/kWh)
IDC = Incremental demand cost ($/kW-yr)

Example:
For a one mile long 345 kV line, having 1000 Amps as its peak load and using a 1590 kcmil single conductor, these losses could be calculated as:

R= .0591 ohm / phase / mile
I= Assumed 1,000 Amps peak
LF= 0.38
AIC= 0.55 /kwhr
IDC= $500 / kw (Assumed value only to elaborate the formula – not a factual value)

EC= 3 x .0591 x 1000 x 1000 x 8760 x 0.38 x 0.55 / 1000 = $324,607 / year
Dc= 3 x .0591 x 1000 x 1000 x 500 /1000 = $88,650 / year
Total line losses per year per mile = $324,607 + $ 88,650 = $413,257 /year