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CONNECTICUT
SITING COUNCIL

May 29, 2009

Mr. S. Derek Phelps
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: Docket No. 370 - CT Greater Springfield Reliability Project

Dear Mr. Phelps:

This letter provides the response to requests for the information listed below.

Response to OCC-02 Interrogatories dated 04/24/2009

OCC-032*, 033, 040, 045, 049-SP01, 051, 052, 054, 055*, 057, 058

Very truly yours,

Robert Carberry
Project Manager
NEEWS Siting and Permitting
NUSCO
As Agent for CL&P

cc: Service List

* Bulk material provided to CSC and OCC only.

Witness: CL&P Panel
Request from: Office of Consumer Counsel

Question:

Please provide CL&P's estimates of the initial capital cost of the Bethel-Norwalk 345-kV project:

- a. at the time of CL&P's original filing with the CSC,
- b. at the time of the CSC's approval of the project design, and
- c. at the time of project completion.

Response:

CL&P used standard industry cost estimating practices for the Bethel-Norwalk 345-kV project. Initially, the project costs were estimated based upon order of magnitude costs, then as more definition became available a conceptual cost estimate was made, and ultimately a final cost estimate was determined following final siting and permit approvals, engineering design, major equipment procurement and construction bids or contracts.

The Bethel-Norwalk project experienced project delays due to a siting moratorium and a siting decision appeal, environmental permits and significant scope changes for underground transmission line construction. Higher than expected commodity costs, a corresponding rise in manufactured goods costs and currency exchange rates also impacted the final project cost. Attached please find a Brattle Group report on rising utility construction costs that is pertinent to this subject.

- (a) CL&P's capital cost estimate for the Bethel-Norwalk 345-kV project as proposed in the initial CSC application submitted in October 2001 was \$127.4 million. The cost estimate was based upon an all-overhead transmission line. The proposed in-service date was December 2003.
- (b) Following the CSC's approval of the project concept, CL&P's capital cost estimate in September 2003, was \$200 million. The proposed in-service date was May 2005.

As a result of a project delay associated with a court appeal by the City of Norwalk and the run up of costs mentioned in the Brattle Group report, CL&P revised the project cost estimate to \$350 million in 2004/2005 after receiving contracts for the work.

- (c) At the time of project completion in October 2006, CL&P's capital cost was \$334.5 million. As noted above, the final cost was impacted by scope changes (e.g., 22 miles of 115-kV and 345-kV underground transmission cable systems, and three 345-kV line transition stations), market changes leading to higher than expected equipment procurement and construction contracts, requirements of state and local construction permit requirements, and a three-year project in-service delay from that which was originally proposed.

* Bulk material provided to CSC and OCC only.

Witness: CL&P Panel
Request from: Office of Consumer Counsel

Question:

Please provide CL&P's estimates of the initial capital cost of the Middletown-Norwalk 345-kV project:

- a. at the time of CL&P's original filing with the CSC,
- b. at the time of the CSC's approval of the project design, and
- c. at the time of project completion.

Response:

CL&P used standard industry cost-estimating practices for the Middletown-Norwalk 345-kV project. Initially, the project costs were estimated based upon order of magnitude costs, then as more definition became available a conceptual cost estimate was made, and ultimately a final cost estimate was determined following final siting and permit approvals, engineering design, major equipment procurement and construction bids or contracts. Higher than expected commodity costs, a corresponding rise in manufactured goods costs and currency exchange rates, and higher than expected construction bids impacted the final project cost. (Reference the Brattle Group report attached to the response to Data Request OCC-02, Q-OCC-032 for further information on such cost increases).

a) In October, 2003, CL&P and UI jointly filed an Application with the CSC for a Certificate of Environmental Compatibility and Public Need for construction of the Middletown-Norwalk Project. The Application included a conceptual cost estimate for the project of \$604 million, and the CL&P project portion of this cost estimate was \$483 million. This estimate was based on a 2007 in-service date and 24 miles of parallel 345-kV HPFF cable systems.

b) In December, 2004 after more than a year of adjudicated hearings, but several months prior to the Council's decision date, CL&P and UI provided a planned project cost estimate using a range of \$838 million to \$993 million. The CL&P project portion of this estimate range was \$670 million to \$795 million. This estimate reflected a 2-year schedule change for an in-service date in 2009, a corresponding increase in the Allowance for Funds Used During Construction (AFUDC) and several scope changes (e.g., a change in the underground technology from HPFF to XLPE cables, equipment upgrades at the Singer and Norwalk Substations due to the change in cable technology, overhead line designs with reduced magnetic fields including split phasing and increased pole heights). The cost range reflected an allowance for project contingencies, including pending environmental permit requirements and unknown underground construction requirements.

In October 2005, six months after the Council's decision to approve the project and after engineering and major bids had been undertaken, CL&P developed a final "construction grade" cost estimate of \$1,047 million for its portion of the project. Information provided in the above-referenced Brattle Group report explains most of the difference with respect to the December 2004 planned project estimate.

c) On December 16, 2008, CL&P energized the final components of the Middletown-Norwalk Project. As of April, 2009, CL&P estimates that its share of the Middletown-Norwalk Project cost will be approximately \$950 million.

The Connecticut Light and Power Company
Docket No. 370

Data Request OCC-02
Dated: 04/24/2009
Q-OCC-040
Page 1 of 1

Witness: CL&P Panel
Request from: Office of Consumer Counsel

Question:

For each of the following Springfield-area combined-cycle plants, if the plant is off-line, what generation level can the plant's combustion turbines reach within 30 minutes?

- a. Berkshire Power
- b. MassPower
- c. The Stony Brook combined-cycle units.

Response:

Neither CL&P nor NUSCO possess this information. The OCC may be able to obtain the information from the generators or from ISO-NE. However, it is likely to be classified as Confidential Information under the ISO-NE Information Policy.

The Connecticut Light and Power Company
Docket No. 370

Data Request OCC-02
Dated: 04/24/2009
Q-OCC-045
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Witness: CL&P Panel
Request from: Office of Consumer Counsel

Question:

Please explain what factors caused the problem referenced in OCC-44 to appear at that time, such as load growth in the Springfield area, load growth in Connecticut, addition of particular generators, and so on.

Response:

The factors that created the need for the GSRP are numerous. First, load growth and power flows on the transmission system in the Springfield load pocket reached levels where, following certain contingencies, there could be an adverse impact on the bulk-power system, including the possible initiation of uncontrollable cascading outages. Secondly, the effect on the Connecticut Import interface transfer limits due to changes in the region's generation fleet and dispatch. Finally, in response to the 2003 Northeast Blackout, the federal government required a restructuring of the electric industry by which NERC was transformed into an agency with direct reporting requirements to FERC, with the power and obligation to enforce compliance by Transmission Owners with mandatory national and regional reliability standards.

CL&P, ISO-NE and other regional transmission owners assessed regional reliability, especially in load pockets that are dependent upon the availability of local generation. In the early part of this decade, CL&P, along with ISO-NE, concluded that the Springfield area transmission system, among other areas of New England, required reinforcement. ISO-NE formally recognized the Springfield area reliability problems, among others, in its 2003 Regional Transmission Expansion Plan. Thereafter, the Springfield area problems, among others, were more clearly defined by the studies undertaken in the SNETR / NEEWS planning effort, which determined that GSRP was needed to comply with mandatory national and regional reliability standards as early as 2009.

The Connecticut Light and Power Company
Docket No. 370

Data Request OCC-02
Dated: 04/24/2009
Q-OCC-049-SP01
Page 1 of 2

Witness: CL&P Panel
Request from: Office of Consumer Counsel

Question:

Please provide the generation and interface tables, comparable to those shown in redacted Attachment A.4 of CSC-018, SP0 1 Bulk for:

- a. Each N-1 dispatch from each of the "all-lines-in" base dispatch runs (D1, D2, D3, the D2 sensitivity with 100 MW on the CSC line, and each of the cases with Meridian and Towantic).
- b. Each N-1-1 dispatch from each of the base dispatch runs.

Response:

On May 21, 2009, CL&P responded to Data Request OCC-02, Q-OCC-049, as follows:

Question:

Please provide the generation and interface tables, comparable to those shown in redacted Attachment A.4 of CSC-018-SP01 Bulk for:

- a. Each N-1 dispatch from each of the "all-lines-in" base dispatch runs (D1, D2, D3, the D2 sensitivity with 100 MW on the CSC line, and each of the cases with Meridian and Towantic).
- b. Each N-1-1 dispatch from each of the base dispatch runs.

Response:

Attachment A.5 of the study report titled "*Analysis of the Technical Effectiveness of Proposed Generation at Meriden & Oxford, Ct in Resolving Springfield and North-Central Connecticut Area Transmission Reliability Problems*" was included in the CSC-01, Q-CSC-018-SP01 bulk materials, in both CEII form for qualified recipients and in redacted form for others on the Service List, and contains the requested generation and interface tables. The attachment is titled "ATTACHMENT A.5: *POWERFLOW DISPATCH SUMMARY DOCUMENT*" and contains seven power-flow summary documents arranged in the following order.

1. Power-flow summary for Dispatch D1, "all-lines-in" case used for N-1 analysis
2. Power-flow summary for Dispatch D1, "all-lines-in" case used for N-1-1 analysis
3. Power-flow summary for Dispatch D2, "all-lines-in" case used for N-1 analysis
4. Power-flow summary for Dispatch D2, "all-lines-in" case used for N-1-1 analysis
5. Power-flow summary for Dispatch D3, "all-lines-in" case used for N-1 analysis
6. Power-flow summary for Dispatch D3, "all-lines-in" case used for N-1-1 analysis
7. Power-flow summary for Dispatch D2, "all-lines-in" case with flow on CSC set to 100 MW; case used for N-1 analysis

Thereafter, the OCC contacted CL&P and further explained its request, as follows:

"It is my understanding that these cases all show *pre*-contingency dispatch. That is, Cases 1,3,5 and 7 show the dispatch before any contingency and Cases 2,4, and 6 show the dispatch after a first contingency but before the second (N-1-1) contingency. My request was for the equivalent of these pages with the *post*-contingency dispatch..."

OCC requested that CL&P reply to its clarified request by means of a supplemental response to Q-OCC-049, which follows:

CL&P did not test the system by modeling a new dispatch after each contingency, as the OCC's clarified request assumes. Rather, the performance of the system was modeled by (1) assuming a Connecticut import level (2500 MW for modeling N-1 contingencies and 1700 MW for N-1-1 contingencies); (2) selecting one of the dispatch cases (1, 3, 5, or 7 for N-1 contingencies and 2, 4, or 6 for N-1-1 contingencies); and (3) running the entire contingency "deck" with the selected import level and dispatch. This methodology is typical of that used by NU, by other New England utilities, and by ISO-NE for power-flow simulations in system planning studies. It is not typical to model a specific re-dispatch after each of hundreds of modeled contingencies.

The power-flow simulations are designed to maintain the existing power-import levels, and if that is done, the exact sequence of how and when each generating unit would be dispatched in the N-1 base case simulation and which would be dispatched following the N-1 contingency is not significant. Since it is difficult to accurately predict the potential wide range of operating conditions that may exist in the future with respect to peak demand and generation supply, stressed system conditions are used in planning studies as a common and acceptable method to evaluate the performance of the transmission system. A variety of generation dispatch scenarios are used for long-term planning studies as a critical component of assessing transmission reliability performance and ensuring the robustness of the transmission system. Stress testing of an area's transmission system encompasses the turning "off" of additional generation within that area or load pocket. These dispatch scenarios are entirely consistent with the requirements of NPCC and ISO-NE.

Accordingly, CL&P has already provided to OCC the results for all of the simulations to which Q-OCC-049 refers.

Witness: CL&P Panel
Request from: Office of Consumer Counsel

Question:

For each dispatch case, for each Connecticut or WMA unit not assumed on-line with the N-1 contingency, please specify the output level that unit could reach in the time period at which the transmission circuits are rated to operate above their LTE ratings.

Response:

Generating units which are off-line due to maintenance, a forced outage, or because of a transmission interface limitation would not be available for emergency dispatch. For those generating units not dispatched due to market conditions, CL&P does not know the 15-minute demonstrated capability of each Connecticut and western Massachusetts generating unit. This information resides with the competitive generators and ISO-NE and is considered to be Confidential Information pursuant to the ISO-NE Information policy.

The design of the New England bulk power supply system must comply with the Northeast Power Coordinating Council (NPCC) "Basic Criteria for Design and Operation Of Interconnected Power Systems," Document A-02, and the ISO-NE "Reliability Standards for the New England Area Bulk Power Supply System," Planning Procedure 3. These documents state the following:

NPCC Document A-02 (Section 2.1):

"Design studies shall assume power flow conditions utilizing transfers, load and generation conditions which stress the system."

ISO-NE PP3 (Section 3):

"With due allowance for generator maintenance and forced outages, design studies will assume power flow conditions with applicable transfers, load, and resource conditions that reasonably stress the system."

Since it is difficult to accurately predict the potential wide range of operating conditions that may exist in the future with respect to peak demand and generation supply, stressed system conditions are used in planning studies as a common and acceptable method to evaluate the performance of the transmission system. A variety of generation dispatch scenarios are used for long-term planning studies as a critical component of assessing transmission reliability performance and ensuring the robustness of the transmission system. Stress testing of an area's transmission system encompasses the turning "off" of additional generation within that area or load pocket. These dispatch scenarios are entirely consistent with the requirements of NPCC and ISO-NE.

The Connecticut Light and Power Company
Docket No. 370

Data Request OCC-02
Dated: 04/24/2009
Q-OCC-052
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Witness: CL&P Panel
Request from: Office of Consumer Counsel

Question:

If the N-1-1 dispatch cases do not include all the generation that would reduce the overloads and could be on line before the LTE ratings take effect, please explain why and provide the pre-GSRP results with the addition of that generation.

Response:

Normal and emergency transmission element ratings are always in effect. Therefore, we interpret the question as asking whether it is appropriate for long-term system planning to dispatch additional generating units to reduce power flow on transmission lines before LTE ratings are exceeded. Please see the response to Data Request OCC-02, Q-OCC-051 which explains the long-term regional planning process in performing power-flow analyses.

Witness: CL&P Panel
Request from: Office of Consumer Counsel

Question:

The "D1 With CT Import 1700 MW" differs from the D1 dispatch by the addition of generation from two plants: Wallingford and Kleen.

- a. Please explain how these plants were determined to be off-line at the peak-load hour in the D1 dispatch.
- b. Please explain how these plants were selected to reach full power in the "D1 With CT Import 1700 MW" case, including how long they would need to reach full power following the N-1 contingency.

Response:

(a) In accordance with the ISO-NE Tariff and planning procedures the development of transmission plans shall not result in a significant adverse impact to the New England bulk-power system including current regional interface transfer limits. Therefore, an important consideration in creating the generation dispatches for the GSRP Project is to maintain the existing Connecticut Import interface transfer limit levels. For the D1 dispatch, the Connecticut Import interface transfer limit level used for N-1 analyses is 2,500 MW, and 1,700 MW is used for N-1-1 analyses. The selection of specific generating units to be dispatched to develop the power-flow base case is a secondary consideration. The Wallingford and Kleen generating plants were arbitrarily selected to be off-line for the D1 dispatch.

(b) CL&P assumes that the OCC may be concerned that selected generating units that were not in operation, but available to operate if dispatched, during in the N-1 base case would be unable to achieve their full capability rating in a short period of time following the N-1 contingency. In these power-flow simulations, the specific Connecticut generating units that would be dispatched following the N-1 contingency is of secondary importance. Maintaining a Connecticut Import interface transfer limit level of 1,700 MW is the primary objective of these power-flow simulations. The exact sequence of how and when each generating unit would be dispatched in the N-1 base case simulation and which generating units would be dispatched following the N-1 contingency is irrelevant.

For both (a) and (b) above, the location and number of Connecticut generating units involved in maintaining the Connecticut Import transfer limit levels at 2,500 and 1,700 MW will have very little effect on the power-flow results in the Springfield area.

The Connecticut Light and Power Company
Docket No. 370

Data Request OCC-02
Dated: 04/24/2009
Q-OCC-055
Page 1 of 1

Witness: CL&P Panel
Request from: Office of Consumer Counsel

Question:

Please provide all available documentation and results for the power flow case performed by ICF for CEAB, as discussed at p. 30 of the CEAB Evaluation Report in this proceeding.

Response:

The attachments include CL&P's response to a LaCapra Associates Data Request on behalf of the CEAB and the documentation and results of the power-flow case performed by ICF for the CEAB. Please note that the three attachments (A, B and C) documenting the case contain CEII, and so unredacted versions of those attachments are being provided on a CD only to those names on the Service List who are qualified under the Protective Order to receive CEII. All other recipients will receive redacted versions of those attachments.

Attachments: Power-flow analysis input summary and output data for the CEAB/LaCapra Sensitivity Case.

1. CL&P's response to question Q-LACAPRA-003 of the LACAPRA-04 Data Requests dated 10/21/08 with its two attachments:
 - Attachment A: Power-flow input summary
 - Attachment B: Power-flow output summary
2. Attachment C: Complete power-flow output data; no redacted version available; non-redacted form provided only to recipients authorized to access CEII information.

* Bulk material provided to CSC and OCC only.

The Connecticut Light and Power Company
Docket No. 370

Data Request OCC-02
Dated: 04/24/2009
Q-OCC-057
Page 1 of 1

Witness: CL&P Panel
Request from: Office of Consumer Counsel

Question:

Is the same Connecticut generation in service in the analyses of Meridian and Towantic as in the corresponding dispatch (D1, D2 or D3), other than the addition of Meridian or Towantic?

a. If not, identify and explain the changes from dispatch D2.

Response:

As delineated in section 1.2, page 5 of the study report titled "Analysis of the Technical Effectiveness of Proposed Generation at Meriden & Oxford, Ct in Resolving Springfield and North-Central Connecticut Area Transmission Reliability Problems", the proposed generating plants at Meriden and Oxford (Towantic) were dispatched against other Connecticut generators, namely Montville #6 (402 MW), Bridgeport Harbor #2 (170 MW), Middletown #2 (117 MW) & Middletown #4 (400 MW). In addition to adding Meriden (530 MW) and Towantic (520 MW) to the study cases, the Devon gas unit #12 (40 MW), which was previously off-line in the starting case (the GSRP "need" analysis case), was turned on.

In summary, a total of 1,090 MW of generation (Meriden, Towantic & Devon #12) that was previously unavailable in the starting case (the GSRP "need" analysis case) was simulated on-line, and a total of 1,089 MW of previously on-line generation (Montville #6, Bridgeport Harbor #2, Middletown #2 & Middletown #4) in the starting case was simulated off-line in cases that included the dispatch of both the Meriden and Towantic plants. Dispatching the new generators against other Connecticut generators of equal capacity ensures that the system is tested to maintain the current power-import capability into Connecticut.

Witness: CL&P Panel
Request from: Office of Consumer Counsel

Question:

Please explain how NU "dispatched" Meridian or Towantic "against... Montville #6 and Bridgeport Harbor #2." (CSC-018, SPO1 Bulk, pp. 1-2).

a. Were Montville #6 and Bridgeport Harbor #2 the most expensive units operating in dispatch D2? If not, why were the new units dispatched against these particular units?

Response:

The dispatch of Montville #6 and Bridgeport Harbor #2 were not based on economics. The dispatch of these units was based on removal of equivalent generation capability to that of Meriden or Towantic. This dispatch and simulation approach resulting in the Connecticut capacity and the Connecticut Import interface transfer level remaining approximately the same.

The Meriden plant (or Towantic) was dispatched against Montville #6 (402 MW) and Bridgeport Harbor #2 (170 MW) in the "Preliminary Analysis of the Technical Effectiveness of Proposed Generation Alternatives to GSRP" study. Dispatching the Meriden plant (or Towantic) against Montville #6 and Bridgeport Harbor #2 was performed by simulating the previously on-line generators, Montville #6 and Bridgeport Harbor #2 as off-line when Meriden (or Towantic) was simulated as a new on-line generator. In other words, the Meriden plant displaces the Montville #6 and Bridgeport Harbor #2 units.

The proposed new unit at Meriden (or Towantic) was dispatched against Montville #6 and Bridgeport Harbor #2 units because the 2009 Connecticut Integrated Resource Plan (IRP) jointly submitted by The Connecticut Light and Power Company and United Illuminating found that both Bridgeport Harbor #2 and Montville #6 would find it economic to retire under the targeted emission rates for SO₂ and NOX in Connecticut. The August 2008 IRP Supplemental Report assessed the likely impacts of environmental regulations on generation plant retirements and operations in New England. The CEAB and their consultants, La Capra Associates, collaborated with the Connecticut CTDEP to develop expected SO₂ and NOX emission rate limits for 2011 and 2018 that would help Connecticut to meet National Ambient Air Quality Standards (NAAQS). The economics of each unit in 2018 under the limits in effect in that year were evaluated in this supplemental report. The supplemental report evaluated whether each non-compliant generating unit could expect to earn sufficient net revenues to recover the annualized cost of emissions control equipment to bring NOX emissions into compliance, and flue gas desulfurization to bring SO₂ into compliance. If not, the unit was assumed to retire. Both Bridgeport Harbor #2 and Montville #6 were assumed to retire under this evaluation.