middletown | norwalk

March 9, 2004

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

Re: Docket No. 272 – Middletown-Norwalk 345kV Transmission Line

Dear Ms. Katz:

Enclosed are an original and 20 copies of the pre-filed testimony of Roger Zaklukiewicz in support of the need for the Middletown to Norwalk Project

Very truly yours,

Anne Bartosewicz
Project Director
The Connecticut Light & Power Company

John Prete
Project Director
The United Illuminating Company

ABB/egh
cc: Service List

Connecticut Light & Power
The Northeast Utilities System

The United Illuminating Company

SERVICE LIST
Docket: 272

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STATE OF CONNECTICUT

SITING COUNCIL

Re:	The Connecticut Light and Power Company and The United Illuminating Company Application for a Certificate of Environmental Compatibility and Public Need for the Construction of a New 345-kV Electric Transmission Line and Associated Facilities Between Scovill Rock Switching Station in Middletown and Norwalk Substation in Norwalk, Connecticut Including the Reconstruction of Portions of Existing 115-kV and 345-kV Electric Transmission Lines, the Construction of the Beseck Switching Station in Wallingford, East Devon Substation in Milford, and Singer Substation in Bridgeport, Modifications at Scovill Rock Switching Station and Norwalk Substation and the Reconfiguration of Certain Interconnections	)	Docket 272 March 9, 2004

DIRECT TESTIMONY OF ROGER ZAKLUKIEWICZ IN

SUPPORT OF THE NEED FOR THE

MIDDLETOWN TO NORWALK PROJECT

INTRODUCTION

Q. Would you please identify yourself and the other members of the panel who will respond to cross examination?

A. I am Roger Zaklukiewicz, Vice President, Transmission Projects, employed by Northeast Utilities Service Company (“NUSCO”) on behalf of The Connecticut Light and Power Company (“CL&P”). With me on the panel is Peter Brandien, Director, NUSCO Transmission Operations, and Richard Reed, Vice President-Electric System, of The United Illuminating Company (“UI”). In addition, other CL&P and UI employees may be called upon in responding to cross-examination questions that may require knowledge of specific topics.

Q. Mr. Zaklukiewicz, could you provide the Council with the professional qualifications of the members of the panel and of the additional witnesses who may be called upon for testimony?

A. Each of us has a great deal of experience with respect to various aspects of transmission system planning, engineering, or operation. We have attached our resumes as Exhibit A, and also those of the two project directors, Anne Bartosewicz of NUSCO and John Prete of UI.

Q. Please describe the responsibilities of the panel members with respect to this project?

A. I have been responsible for overseeing the engineering of the project, and together with Ms. Bartosewicz have overseen the preparation of the application to the Siting Council, the supplemental filings, and the interrogatory responses filed on behalf of CL&P. Mr. Reed, together with Mr. Prete, has served a similar role for UI. Mr. Brandien has been involved in system planning for CL&P, including the planning for the Middletown to Norwalk Project.

SUMMARY OF THE PROJECT

Q. Please briefly describe the project for which you are seeking the Council's certification.

A. The Middletown to Norwalk Project ("Project") involves the construction of a new 345-kV electric transmission line and associated facilities from Middletown to Norwalk along a route that is approximately 69 miles long and traverses 18 municipalities. The Project includes the modification of Scovill Rock Switching Station in Middletown; the construction of the new Beseck Switching Station in Wallingford; the construction of the new East Devon Substation in Milford and the new Singer Substation in Bridgeport; the modification of Norwalk Substation in Norwalk; and the reconstruction of portions of existing 115-kV and 345-kV electric transmission lines and generator interconnections. The proposed transmission line would be overhead for approximately 45 miles from Scovill Rock Switching Station to East Devon Substation, and underground, primarily beneath public roadways, for approximately 24 miles from East Devon Substation to the proposed Singer Substation in Bridgeport and then to Norwalk Substation. The overhead portion of the new 345-kV transmission line will primarily be located within CL&P's 115-kV and 345-kV transmission rights-of-way ("ROW"). The route of the proposed line is depicted on page ES-3 of the Executive Summary in Volume 1 of the Application and in segment maps contained in Volumes 11 and 12 of the Application.

Q. Please summarize the principal reasons why the Project is needed.

A. The electrical transmission system in Southwest Connecticut ("SWCT") [1] is inadequate to serve the needs of Connecticut residents and businesses. The Federal Energy Regulatory Commission ("FERC") has designated SWCT as one of the nation's

[1] For electrical system purposes, ISO-NE has defined "Southwest Connecticut" to consist of the following municipalities: Bridgeport, Darien, Easton, Fairfield, Greenwich, New Canaan, Norwalk, Redding, Ridgefield, Stamford, Weston, Westport, Wilton, Ansonia, Branford, Beacon Falls, Bethany, Bethel, Bridgewater, Brookfield, Cheshire, Danbury, Derby, East Haven, Hamden, Meriden, Middlebury, Milford, Monroe, Naugatuck, New Fairfield, New Milford, New Haven, Newtown, North Branford, North Haven, Orange, Oxford, Prospect, Roxbury, Seymour, Shelton, Sherman, Southbury, Southington, Stratford, Trumbull, Wallingford, Waterbury, Watertown, West Haven, Wolcott, Woodbridge, and Woodbury. Because the boundaries of the SWCT electrical system are defined by electrical interfaces with other portions of the transmission system (as opposed to municipal boundaries), portions of some of these municipalities are outside of the "Southwest Connecticut" electrical system.

most severe reliability risks, while ISO New England ("ISO-NE") has indicated that the need to upgrade the SWCT transmission system is the most urgent in New England.

Growth in electricity usage in SWCT has strained the existing 115-kV transmission system and made the region susceptible to customer outages and more dependent on the availability of local generation. The Project as planned will:

- complete a "loop" in SWCT that would improve reliability in several key respects;
- enable the transmission of large amounts of electricity into the area;
- reduce power flows on the 115-kV lines, thereby reducing overloads and allowing local area load expansion;
- improve system voltage performance;
- reduce unacceptably high levels of available short-circuit current;
- improve efficiency by reducing line losses; and
- generally strengthen the entire New England transmission system by enhancing interconnections between SWCT and the rest of the New England 345-kV system.

<u>PROJECT TIMETABLE</u>

Q. When will the proposed new line be needed in service?

A. The line is needed now to prevent forecasted overloads during peak periods because the existing 115-kV transmission system in SWCT fails to meet national and regional transmission reliability standards. Although the Bethel-Norwalk 345-kV line, which is scheduled to be in service in 2005, will address some of these reliability issues and will provide enhanced capability needed to serve the forecasted loads in the

Norwalk-Stamford sub-area[2], serious reliability issues will still remain. Our target for the in-service date of the Project is December, 2007.

Q. Do you expect these reliability problems to worsen over time as a result of load growth?

A. Yes. SWCT has experienced significant growth in electrical demand over the past few decades, and the Companies expect robust load growth to continue in this region. The increase in electric energy consumption has been caused by population increases, economic development, and continuing increases in the use of air conditioners and electronic devices such as computers. SWCT accounts for approximately half of the total electrical load in Connecticut, though it represents only approximately 25% of the state in geographic terms. The projected growth of electrical demand is discussed in the Prefiled Testimony of Michael Coretto of UI filed together with this testimony.

COST AND COST RECOVERY

Q. What will the Project cost?

A. We estimate the total initial capital cost of the Project, as proposed, will be approximately $604 million in 2003 dollars. Of course, this estimate is preliminary, and it relates only to the Project as proposed. Significant modifications of the Companies' proposal would most likely have significant cost implications. Assuming an initial capital cost of $604 million, the estimated life cycle cost of the Project will be approximately $825 million.

Q. How will CL&P and UI recover the cost of the new line?

[2] The Norwalk-Stamford Sub-area, defined by electrical interfaces, includes all or part of the municipalities of Bridgeport, Darien, Easton, Fairfield, Greenwich, New Canaan, Norwalk, Redding, Ridgefield, Stamford, Trumbull, Weston, Westport, and Wilton.

A. CL&P and UI ("the Companies") will each apply for PTF (Pool Transmission Facilities) treatment under the Restated NEPOOL Agreement and for reimbursement under the NEPOOL Open Access Transmission Service Tariff for its respective share of the cost of the Project. If this treatment is granted, the cost of the Project will be recovered through the Regional Network Service ("RNS") rates that are charged to all New England electric customers.

Q. What is the basic principle underlying this rate treatment?

A. The NEPOOL Agreement and Tariff recognize that all New England customers have an interest in reliable and economic power flows throughout the region. Accordingly, transmission improvements that are required to enable reliable power flows to occur are deemed by the NEPOOL Participants and FERC to benefit all customers in the region.

Q. What is the projected date for completion of the Project?

A. The goal of the Companies is to complete construction of the transmission facilities by the end of 2007. FERC has indicated that completion of the Project by that date will assist the Companies in their efforts to obtain regional PTF cost-recovery treatment for the Project.

<u>LONG RANGE PLAN FOR EXPANSION OF THE ELECTRIC POWER GRID</u>

Q. How does the Project integrate into long-range plans for expansion of the electric power grid to insure the reliability of service to SWCT?

A. The Project is the next step in the extension of the 345-kV bulk transmission system into SWCT, which is the only part of Connecticut that is not served by 345-kV transmission lines. The Project will complete a 345-kV loop with the capability to transfer power to and within SWCT from both the north and east, so that transfers can continue even if service is interrupted on underlying 115-kV transmission lines or one “leg” of the loop is interrupted by an unplanned outage.

Q. What is the advantage of a transmission loop?

A. A loop enhances the reliability of the transmission system. The integrated 345-kV bulk power system in New England is primarily constructed in a series of “loops” so that 345-kV transmission service can be maintained to an area following an interruption of one leg of the loop. CL&P’s existing 345-kV transmission systems include several interconnected loops within Connecticut, and portions of loops that extend beyond Connecticut as interstate ties with 345-kV transmission systems in Massachusetts, New York, and Rhode Island. Virtually all of the load centers in central and eastern Connecticut are connected to one of these 345-kV loops.

Q. When was the need for the construction of a 345-kV loop first recognized?

A. In the late 1960s and early 1970s, transmission planners determined that a 345-kV loop would be needed to serve the long-term electric needs of SWCT. The implementation of this plan began in 1975 when the Connecticut Siting Council approved the construction of a 345-kV line between Long Mountain Substation in New Milford and Plumtree Substation in Bethel in Docket 5. Thereafter, the completion of the loop (and its associated costs) was deferred in favor of a program of multiple upgrades of the 115-kV supply to SWCT. The Companies have determined that the completion of the loop is still the best long-term solution and can be delayed no longer.

In 2003, the Council issued a certificate of environmental compatibility and public need in Docket 217, approving the construction of a new 345-kV transmission line that will provide bulk power transmission from Plumtree Substation in Bethel south to Norwalk Substation in Norwalk. The Middletown-Norwalk Project would complete the loop by providing 345-kV service to Norwalk from central Connecticut and from intermediate points in Milford and Bridgeport.

Q. Are further additions to the bulk power system, beyond completion of the 345-kV SWCT loop, anticipated?

A. Yes. Although completion of the loop will substantially eliminate constraints limiting bulk power transmission throughout Connecticut, it will still be necessary to relieve transmission constraints that limit imports into Connecticut. Upgrading the CL&P to Rhode Island transmission corridor will provide Connecticut access to abundant, efficient, and less expensive generation from Canada, eastern Massachusetts, Rhode Island and other new sources of generation in northern New England. Accordingly, CL&P's long-range plan for expanding the 345-kV system includes upgrading the interconnection between CL&P's Card Substation in Lebanon, Connecticut and the National Grid Millbury Substation in Massachusetts, probably through National Grid's Sherman Road Substation in Burillville, Rhode Island.

Q. Does the long range plan for SWCT contemplate any additional transmission improvements, other than the completion of the 345-kV loop?

A. Yes. Improvements to the 115-kV system will be needed to take full advantage of the 345-kV source at Norwalk Substation that will be created by the completion of the 345-kV loop, and to strengthen the transmission system west of Norwalk so that it can accept power flow from the stronger Norwalk source. Accordingly, CL&P is also proposing the addition of two 115-kV circuits between

Norwalk Substation and Glenbrook Substation in Stamford, most likely consisting of solid dielectric cables installed underground, primarily in streets, in the near future. This project is now in the municipal consultation process and should be completed and in service before the Middletown to Norwalk line proposed in this application. At a later date, pending future system developments, an additional 115-kV underground line, from Norwalk Harbor Substation to Glenbrook Substation and associated substation equipment upgrades may also be required. In addition, other upgrades to the 115-kV system will be undertaken. These are identified in the Companies' Forecasts of Loads and Resources ("FLR"). CL&P filed its FLR on March 1, 2004, and UI is expected to file its FLR on March 15, 2004.

THE PROJECT IN THE CONTEXT OF THE CONNECTICUT AND NEW ENGLAND TRANSMISSION SYSTEMS

The Existing Transmission System

Q. Please briefly describe Connecticut's existing electric transmission system.

A. The Connecticut transmission network is made up of approximately 398 miles of 345-kV lines, 6 miles of 138-kV lines, 1300 miles of 115-kV lines, and 97 miles of 69-kV lines. In combination, these systems transmit power from generation within Connecticut, from New York and within New England. The generating stations are interconnected at different voltages. Large generating stations such as Lake Road in Killingly, Middletown 4 in Middletown, and Millstone in Waterford are directly connected to the 345-kV system. Other generating units such as Montville 5 & 6 and New Haven Harbor are directly connected to the 115-kV system, but are electrically close to the 345-kV system due to local 345/115-kV transformation. All other major generation plants in Connecticut, such as Bridgeport Energy, Bridgeport Harbor, Devon, Norwalk Harbor, Middletown 2 & 3, Milford, South Meadow and Wallingford are directly connected to the 115-kV system.

Q. How is this system integrated with the rest of the New England and New York electrical networks?

A. The Connecticut 345-kV system is part of the New England bulk power transmission system. The Connecticut 345-kV transmission system allows the movement of energy from large central stations such as Lake Road, Middletown 4 and Millstone and integrates that movement with three tie-lines to neighboring utilities in Massachusetts, New York, and Rhode Island. Operating this bulk power grid at 345 kV allows for the efficient transfer of power within and outside of the New England Control Area. This enables Connecticut to transmit power efficiently and provide and share in the reliability benefits of parallel transmission paths. The electrical network also contains six transmission tie points to neighboring utilities rated between 69 kV and 138 kV.

Q. How do these tie-lines to neighboring utilities enable bulk power transfers?

A. The Connecticut electrical network, with its tie-lines to neighboring utilities, provides a path that allows power to move freely over the New England electrical network up to the capabilities of the system. This means power can flow in any direction, depending on generation dispatch and varying load demands. This electrical network enables the Companies' systems to rely on import capabilities to serve customer demands and also contribute to serving other New England load. The transmission tie-lines provide increased reliability to both the Connecticut electrical network and neighboring systems during normal operation under various generation dispatches, as well as during emergency conditions.

Q. Please describe how the 115-kV transmission system works in conjunction with the 345-kV system.

A. 345-kV lines are used to transfer bulk power from remote sources to the 115-kV system, which supplies local area load centers.

Q. How is bulk power transmitted into SWCT today?

A. Since there is no 345-kV supply into SWCT, the 115-kV system has to serve the dual purpose of transmitting power into the area and distributing it to the distribution substations that serve local load.

Q. How will the function of the 115-kV system serving SWCT change when the 345-kV SWCT loop is completed?

A. After the completion of the 345-kV loop, the 345-kV lines that make up the loop will deliver large blocks of power from remote generation into SWCT and reduce the power flows on the limiting 115-kV facilities that presently serve SWCT, thereby relieving overloads and allowing for future local load growth. The existing 115-kV system will transport the power out to all the various distribution substations that serve the area. Of course, in the event of the loss of a portion of the 345-kV system, the 115-kV system would still be able to import some power into the region.

Providing SWCT With Reliable Access to Bulk Power from Generating Stations and Regional Transmission Interconnections By Connecting the SWCT 345-kV Loop at a New Beseck Switching Station

Q. The application (page G-11 of Volume 1) states that the Companies identified “the best strong source” of power. What do you mean by best strong source?

A. “Strong” refers to the number and size of the generation stations and major interconnections that are electrically connected at a common point on the bulk power system, usually a substation or switching station, and the ability of those generating stations and interconnections to remain connected after one or more contingencies.

Q. What are the characteristics of a strong source and of a weak source?

A. A substation or switching station is a strong source if it is electrically close to multiple large central generating stations and transmission interconnections, each of which is in turn served by separate transmission lines or loops. A weak source, in contrast, is electrically farther away from significant generation resources and has fewer, restricted transmission interconnections. By way of illustration, a substation not electrically close to a major generating station and served by a single radial 345-kV line would be a weak source. If that same substation were served from two different directions by two separate 345-kV lines that did not have a common source, the substation would be a stronger source. If the substation were electrically close to several major generating stations and were in addition served by multiple looped 345-kV lines from different directions and on separate rights of way, it would be considered a very strong source.

Q. Why does it matter whether an area is served from a strong source or a weak source?

A. All transmission facilities must be designed with the capability to operate effectively under a wide range of system conditions. Small and moderate changes in system conditions will have a negligible impact on the performance of a strong source. The electric system will continue to transmit electricity reliably because it is highly integrated and close to multiple generation resources. Strong sources provide the capability for high power transfers and stabilization of potential thermal overloads and low voltages, thereby significantly reducing the risk of outages. On the other hand, small changes in system conditions can have a significant impact on performance if an area is a served by a weak source. These impacts can include thermal overloads, voltage violations, and the risk of blackouts. Strong sources have the ability to transfer large blocks of power, provide voltage control and system stability during normal conditions under various generation dispatches as well as during emergencies.

Q. What factors do the Companies consider in planning a system based upon strong sources?

A. From a transmission planning standpoint, the primary goal is to access multiple generation resources and to reliably transmit that generation to the load. To accomplish that goal:

- *Build transmission loops.* A looped system is better than a radial line because it is more reliable and can withstand system contingencies without system interruptions.

- *Diversify transmission sources.* No large load center should rely on a single source of power. Access to multiple transmission interties is important, both for maintaining system operations and for future expansion opportunities.

- *Diversify Generation Sources.* Generation sources change over time. A transmission system should not depend on a single generating station. This is particularly important in a restructured competitive generation marketplace.

- *Regional Interconnections Enhance Reliability.* Transmission connections to other Control Areas or states improve the reliability and robustness of the transmission system. Connecticut's 345-kV system interconnects with three other states (Massachusetts, Rhode Island and New York).

- *Use High Voltage Lines.* High voltage transmission lines can serve more customers more efficiently.

- *"Don't put all your eggs in the same basket."* A system should be designed so that the loss of one substation or transmission line does not result in the catastrophic loss of other substations or lines.

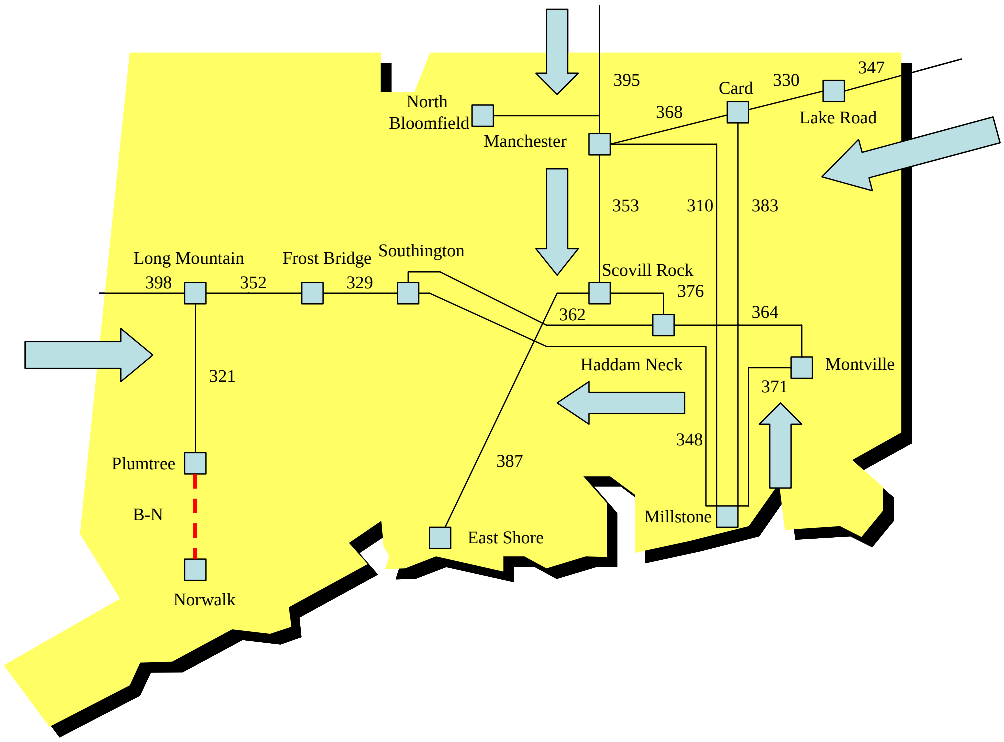
Q. What sources of power did the Companies consider in identifying the strongest source of power available for transmission into SWCT?

A. The Companies considered Frost Bridge Substation (in Watertown), Southington substation (in Southington), and the Middletown area.

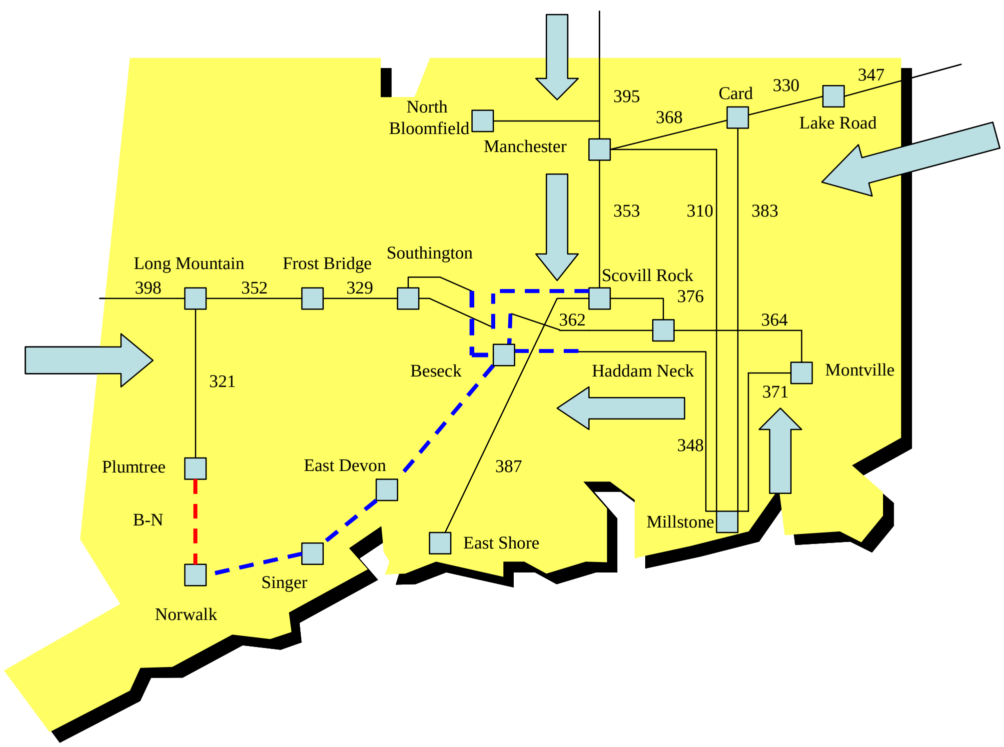
Q. In discussing the potential sources for the 345-kV loop, would a visual aid be helpful?

A. Yes. The following figures illustrate the 345-kV elements of the transmission system. The first illustrates the relevant elements of the Connecticut transmission system as it will be once the Plumtree to Norwalk line is completed; and the second shows the system as it would be with the addition of the Project.

Connecticut 345-kV Transmission System with Bethel – Norwalk



Connecticut 345-kV Transmission System with Bethel –Norwalk and Middletown – Norwalk



Q. Lets start with the Frost Bridge Substation. Is it a strong source or a weak source?

A. The Frost Bridge Substation is a relatively weak source. It is remote from large generating plants both inside and outside of Connecticut. This substation also has inadequate voltage regulation to handle the demands of meeting the SWCT load and is prone to be isolated as a radial supply from New York under contingency conditions and during maintenance. What this means is that the transmission of power into SWCT would be put into jeopardy under a number of operating conditions if Frost Bridge were used as the source for a new 345-kV transmission line into SWCT. For example, the loss of the 345-kV line (the 329 line) from Southington Substation to Frost Bridge Substation would result in both Plumtree Substation and Frost Bridge Substation being fed by a single radial line from New York through (Long Mountain Substation in New Milford). Should the transmission line between Long Mountain Substation and New York be lost during this period, both Plumtree and Frost Bridge Substations would lose their only 345-kV source from the bulk power system.

Q. Is the existing Southington Substation a stronger source than Frost Bridge Substation?

A. Yes. Southington is more integrated into the bulk power system than Frost Bridge. First of all, it is directly connected to the Millstone Generating Station by the 345-kV Millstone – Southington line (348 line) and to the two generating units at Montville Generating Station and the AES Thames Generating Station by the Montville – Haddam Neck and the Haddam Neck - Southington 345-kV transmission lines (364 and

362 lines, respectively). Upon the loss of the 348 line, Southington would continue to be connected to the Millstone Generating Station through the Millstone – Montville 371 line and the 364 / 362 lines. The 348 line is a direct connection and the 364 / 362 lines connect indirectly through the Haddam Neck Substation. Both Millstone and Haddam Neck substations also interconnect with 345-kV lines extending into Massachusetts and Rhode Island.

Q. Why was Southington not chosen as a termination point for the SWCT 345-kV loop?

A. There are several reasons. First, the transmission sources into Southington are not as robust as they will be at Beseck. The two 345-kV lines connecting Southington to Millstone and to Haddam Neck are on a common right of way. If both of these lines were affected by an outage, then the Southington Substation – and the entire SWCT loop – would be served by a single radial 345-kV line from New York. Under such conditions, Southington Substation would also have inadequate voltage regulation to handle the demands of meeting the SWCT load demands.

Second, the Project as designed would add a 345-kV transmission path across central Connecticut, and would thus increase the system's capacity to transfer power into SWCT under a greater number of contingencies and generation dispatches.

Finally, the Project as designed takes advantage of the strength of the Southington Substation, by creating a new line from Southington to Beseck. The Southington terminal of the Southington – Millstone 345-kV line will terminate at Beseck forming a new Beseck – Millstone 345-kV line. In addition, there will be other interconnections to Beseck that will make it a stronger source.

Q. Could Southington be made as strong a source as Beseck?

A. Theoretically, yes. However, that would require the construction of a new 345-kV line from Manchester Substation to Southington, independent of the Manchester to Scovill Rock ROW. There is no existing ROW that would accommodate this 345-kV construction; the existing 115-kV ROW's between Manchester and Southington substations are narrow and are closely bordered by homes and businesses.

Q. Please describe the proposed interconnections to Beseck.

A. The Beseck Switching Station will be directly connected to Millstone, Southington, and Haddam Neck Substations. In those instances when maintenance is being performed on one of the transmission lines to the east (either the Beseck – Millstone or Beseck – Haddam Neck lines) and a fault occurs on the other 345-kV line, Beseck Switching Station will continue to be served from Southington Substation, which will directly interconnect with Haddam Neck Substation and to New York, by way of the Frost Bridge and Long Mountain substations. In addition, Beseck will remain interconnected to the 345-kV bulk power system in Massachusetts and Rhode Island.

Q. Please summarize the advantages of creating the Beseck Switching Station as the source for the SWCT 345-kV loop.

A. The proposed Beseck Switching Station would be an electrical hub that would draw upon the strength of a multitude of looped 345-kV lines located on different transmission ROWs fed from large 345-kV connected generation resources. The Middletown area meets all criteria for a strong source: electrical proximity and access to Connecticut generation resources, access to other states' generation resources through a number of transmission lines, and multiple sources of power. The location at Beseck

Junction offers the opportunity to maximize power transfers and increase voltage control into southwest Connecticut. The Beseck Switching Station best meets the NERC/NPCC/NEPOOL criteria.

DETAILED DISCUSSION OF THE NEED FOR THE PROJECT

SWCT Transfer Limit

Q. What do you mean by electrical interfaces?

A. Electrical interfaces are designated by defining a set of specific transmission facilities that collectively transfer power from one area or region to another.

Q. What are transfer limits?

A. The term describes the capability of the electric system to transfer power across electrical interfaces without exceeding voltage, thermal, or stability criteria.

Q. How are transfer limits expressed?

A. Transfer limits are usually expressed in MVA or MW. It is important to recognize that transfer limits are not merely the sum of the capabilities of all the transmission lines at an interface. They vary depending upon system conditions and generation dispatch. Accordingly, transfer limits are properly expressed as a range. However, for purposes of broad comparison, single values are often used.

Q. How are transfer limits utilized in the operation of the system?

A. System operators utilize electrical interfaces - and the transfer limits over such interfaces - as a tool to monitor and evaluate transmission system performance and to set limits to reduce the risk of wide area interruptions.

Q. How does the transfer limit concept apply to SWCT?

A. The SWCT electrical interface represents transmission facilities that import power into SWCT. As noted above, the SWCT interface transfer limit is not simply the sum of the capacity of all transmission lines that bring power into SWCT. Rather, SWCT interface transfer limits are calculated using computer simulations that determine maximum power transfer levels across a set of defined transmission facilities without violating voltage, thermal or stability criteria.

Q. How will the Project affect the power transfer limits into SWCT?

A. ISO-NE has indicated that after completion of the Bethel to Norwalk Project, the SWCT interface transfer limit will increase to approximately 2,300 to 2,500 MW. Construction of the Project and associated 115-kV transmission additions and modifications will further increase those transfer limits to 3,200 to 3,400 MW.

Q. Will this increase in the SWCT transfer limits provide reliability benefits?

A. Yes. In 2002, the peak load in SWCT was approximately 3,465 MW, and the load in SWCT is expected to continue to grow over the next decade. This 2002 peak load significantly exceeded the total generation in the region of approximately 2,200 MW. As a result, businesses and residents in SWCT rely heavily on the import of power from generating stations outside SWCT. Moreover, SWCT's dependence on imported power is likely to increase. While the load in SWCT is growing, the continued availability of the existing generation and the siting of new generation in SWCT are uncertain.

Thermal Overloads

Q. You have used the term "overloads" in your testimony, and the Application refers to "thermal overloads." What do you mean by those terms?

A. Each transmission line has a rated capacity that establishes the amount of electric current that it can safely carry. The flow must be limited in magnitude and duration within certain capacity ratings to avoid overheating (i.e. thermal overload) and consequent damage to equipment. When the line is required to carry electric current in excess of its continuous current carrying capability, it is overloaded. The primary method that system operators use to restrict the flow of power on transmission lines is to selectively adjust the output of generators, remove from service the overloaded line or equipment, and in extreme emergencies, to interrupt customer load.

Q. Please explain further the capacity ratings that you use to define overloading conditions.

A. They are current ratings measured in amperes. Current is the flow of electricity in a conductor. There are two ratings that are relevant: the long-time emergency rating ("LTE") and the short-time emergency rating ("STE"). The long-time emergency rating is the maximum ampere load that can be supported during emergency conditions for up to 12 hours. The short-time emergency rating is the maximum current in amperes that can flow for no more than 15 minutes before system operators must take action to reduce the load to or below the long-time emergency rating. The short-time emergency rating is always equal to or greater than the long-time emergency rating.

Q. How does the long-time emergency rating compare to the loads the line is normally expected to carry?

A. It is much higher.

Q. Why?

A. If one or more of the circuits that serve a particular region are out of service for maintenance or trip due to equipment failure, or if a large central generating station within the area is lost, power flows on the remaining transmission lines will instantaneously increase to maintain service to the area. In other words, fewer circuits are used to import the same amount of power, or more power in the event of a generator and line outage, until the conditions that created the emergency are eliminated. To plan for these emergency conditions, the transmission system must be designed to assure that the system will be capable of carrying increased power flows for limited periods.

Q. What transmission reliability standards do CL&P and UI use for transmission planning?

A. CL&P's and UI's bulk power delivery systems are an integral piece of ISO-NE's bulk power grid. Reliability standards for facilities that are part of the interconnected bulk power system are developed by The North American Electric Reliability Council ("NERC"), The Northeast Power Coordinating Council ("NPCC"), and The New England Power Pool ("NEPOOL"). The NERC, NPCC and NEPOOL standards form the basis for utility planning standards in this region.

Q. How do electric utilities plan for design contingencies?

A. The design contingencies are simulated on computer models. The output of each generating unit is adjustable and each transmission line or transformer can be removed from service so as to represent its loss so that the planner is able to represent numerous combinations of generation dispatches and transmission system conditions. Some scenarios assume that certain generation or transmission facilities are unavailable due to scheduled maintenance or unplanned outages. Transmission capacity for an area must be designed therefore not only to transmit the power required to offset generation deficits, but also to transmit that power reliably in the event other transmission facilities are unavailable. Reliability standards require that the bulk power delivery network withstand a minimum level of transmission and generation facility contingencies and still reliably serve customer demands safely.

Q. Are these reliability standards based upon probabilistic or deterministic techniques?

A. They are deterministic criteria, based on the collective judgment of experienced planning and operating engineers throughout the country over many years. When the NPCC and the other regional planning authorities were formed following the Northeast power blackout of 1965, the Federal Power Commission mandated the use of deterministic rather than probabilistic techniques to establish planning criteria. Deterministic techniques are the foundation of the planning criteria used by all of the reliability councils today.

Q. What is the principal underlying these deterministic criteria?

A. The intent of the deterministic criteria is to insure that a widespread blackout will not occur. Although some system events such as a single line outage simultaneous with multiple generation outages have a rather low probability of occurring, such unlikely events occur with sufficient frequency that they cannot be ignored. If not planned for, such multiple facility contingencies, when they do occur, can have serious reliability effects far beyond the portion of the transmission grid where they occur, as demonstrated on August 14, 2003.

Q. Has the significance of these deterministic planning criteria in evaluating the need for new facilities been previously recognized by the Council?

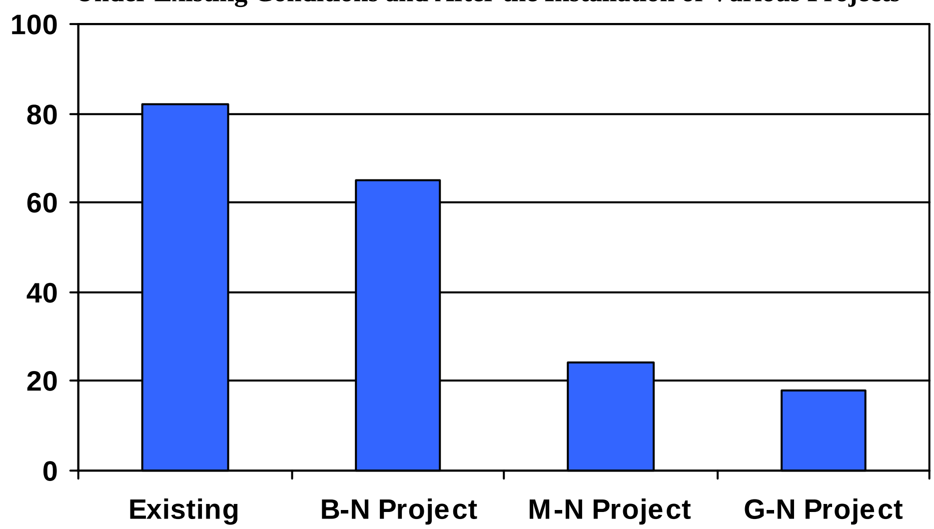
A. Yes. The Council has recognized these criteria as the basis for determining public need, most recently last year in its decision in Docket 217.

Thermal Criteria Issues in SWCT

Q. Applying these reliability criteria to SWCT, what do the design contingency models show?

A. These analyses show that the transmission system in SWCT does not meet reliability standards. The results of load flow simulations for the transmission facilities in SWCT are shown in Figure F-4 of the Application on page F-28 and reproduced below.

Figure F-4
Number of SWCT Transmission Lines Segments Affected by Contingencies Under Existing Conditions and After the Installation of Various Projects



In accordance with regional and national standards, the performance of the system was modeled using hundreds of different combinations of system conditions and varying New England generation dispatches. The bar graph in Figure F-4 depicts the number of

SWCT transmission line segments that would be thermally overloaded under different contingencies assuming a New England load of 27,700 MW. Figure F-4 shows the number of line segments overloaded for the following four configurations of the SWCT transmission system: (1) the existing 115-kV transmission system (i.e., as it currently exists); (2) the SWCT system after the Bethel to Norwalk 345-kV line is completed; (3) the SWCT system after the completion of the 345-kV loop (i.e., completion of both the Bethel to Norwalk and Middletown to Norwalk Projects); and (4) the SWCT system after completion of the 345-kV loop and the Glenbrook to Norwalk Project.[3]

The figure shows that, with the existing system, there are approximately 82 line segments that would thermally overload under various contingencies. The Bethel to Norwalk Project will reduce the number of overloaded line segments to approximately 65, while the completion of the proposed Middletown to Norwalk Project would significantly reduce the number of overloaded line segments to 24. After the completion of the Glenbrook to Norwalk Project and the 345-kV loop, there would only be 18 overloaded segments, nearly all of which can be remedied locally.

Q. Could these reliability issues have an effect on the bulk power grid?

A. Yes. The modeling results indicate that under the conditions tested, problems in SWCT could propagate outside of SWCT to the remainder of Connecticut, and could affect other Northeastern states and Canada.

Voltage Stability

Q. Will the Middletown to Norwalk Project provide benefits regarding the voltage stability of the transmission system?

[3] The Companies expect that the Glenbrook to Norwalk project will actually be in service before or essentially at the same time as this Project.

A. Yes. By resolving critical violations of thermal criteria, the Project will also protect against cascading outages from thermal overloads that could result in voltage instability and system collapse.

Short Circuit Current

Q. You stated earlier that the Project will also reduce high levels of available short-circuit current. What is short circuit current, and how does it affect the reliability of a transmission system?

A. Short circuit current, or fault current, occurs when one or more phases of a three-phase transmission system accidentally contact earth or each other. Until such a condition is isolated, high currents occur on the transmission network. These currents can pose a significant danger – both to transmission equipment and the Companies' employees -- when the magnitude of the fault current exceeds the rating of substation equipment such as circuit breakers.

One of the disadvantages of a tightly knit, interconnected transmission system of lines and substations operating at a single voltage, such as the existing 115-kV system in SWCT, is reduced impedance between the generators connected to the 115-kV system and earth. Reduced impedance causes an opposite effect on the magnitude of short circuit currents that flows on the system when a fault occurs. The short circuit currents go up. A single voltage transmission system aggravates the situation. Besides being able to shift voltages, transformers can also serve to mitigate short circuit currents on a transmission system by introducing additional impedance between the generators and earth. Short circuit currents are also increased when new generators are added to a system. Dual voltage transmission networks (e.g., a transmission network consisting of both 115-kV and 345-kV lines) are less susceptible to short circuit problems when larger generators are connected to the higher voltage (345-kV) system because there is added impedance of the transformer between the generator and the lower voltage system.

Q. Are short circuit levels a problem in SWCT?

A. Yes. Short circuit levels are high in the Bridgeport area. If this condition is not addressed, ISO-NE and the Companies will not allow additional generation to interconnect to the 115-kV transmission system or additional transmission facilities to be built to serve new customer load. At Pequonnock Substation in Bridgeport, the available fault currents can reach 63,000 amperes, which is the limit of the existing substation equipment. If short circuit currents exceed this level, the equipment could fail catastrophically, resulting in multiple transmission line outages and endangering the lives of anyone in the vicinity. In addition, these short circuit currents restrict the expansion of the 115-kV transmission system and preclude adding any large generating stations in SWCT.

Q. How will the Project reduce these short circuit currents?

A. As part of the Project, the Bridgeport Energy generating station would be taken off of the 115-kV system and connected to the 345-kV system. In addition, series reactors will be added at the 115-kV East Devon Substation, and the Milford Generating Station will be removed from the existing Devon 115-kV Substation and reterminated at the new East Devon 115-kV Substation. These system modifications will reduce the fault currents at Pequonnock and other area substations to acceptable levels.

Generation in SWCT

Q. Will the Project provide any benefits for the operation of generation resources in SWCT?

A. Yes, the Project will unlock constrained generation in SWCT and allow the siting of new generation in SWCT.

Q. Please explain.

A. The constraints on the existing 115-kV transmission system in SWCT, to which all of the existing generators in SWCT are presently connected, impose limitations on the operation of the existing generating stations in this region. Under certain operating conditions, generating units connected to the Pequonnock Substation in Bridgeport and the Devon Substation in Milford cannot operate concurrently at full capacity because segments of the existing 115-kV system would experience thermal overloads. Under other conditions, generation at Milford can operate only if Bridgeport units are operating. Completion of the 345-kV loop is necessary to eliminate this conditional dependency and to enable any new large generating station in SWCT to be connected to the system.

The proposed Middletown to Norwalk 345-kV line will interconnect new substations in Milford (East Devon) and Bridgeport (Singer), as well as the existing Norwalk Substation, and thus allow SWCT generating plants to connect directly to the 345-kV transmission system. By removing generators from the constrained 115-kV transmission system, the Project will reduce the risk of overloads on the existing 115-kV system, and thereby eliminate the restrictions on the concurrent operation of generators in SWCT. In addition, the Project will also enable the siting of new generation in SWCT.

Costs of Transmission Constraints

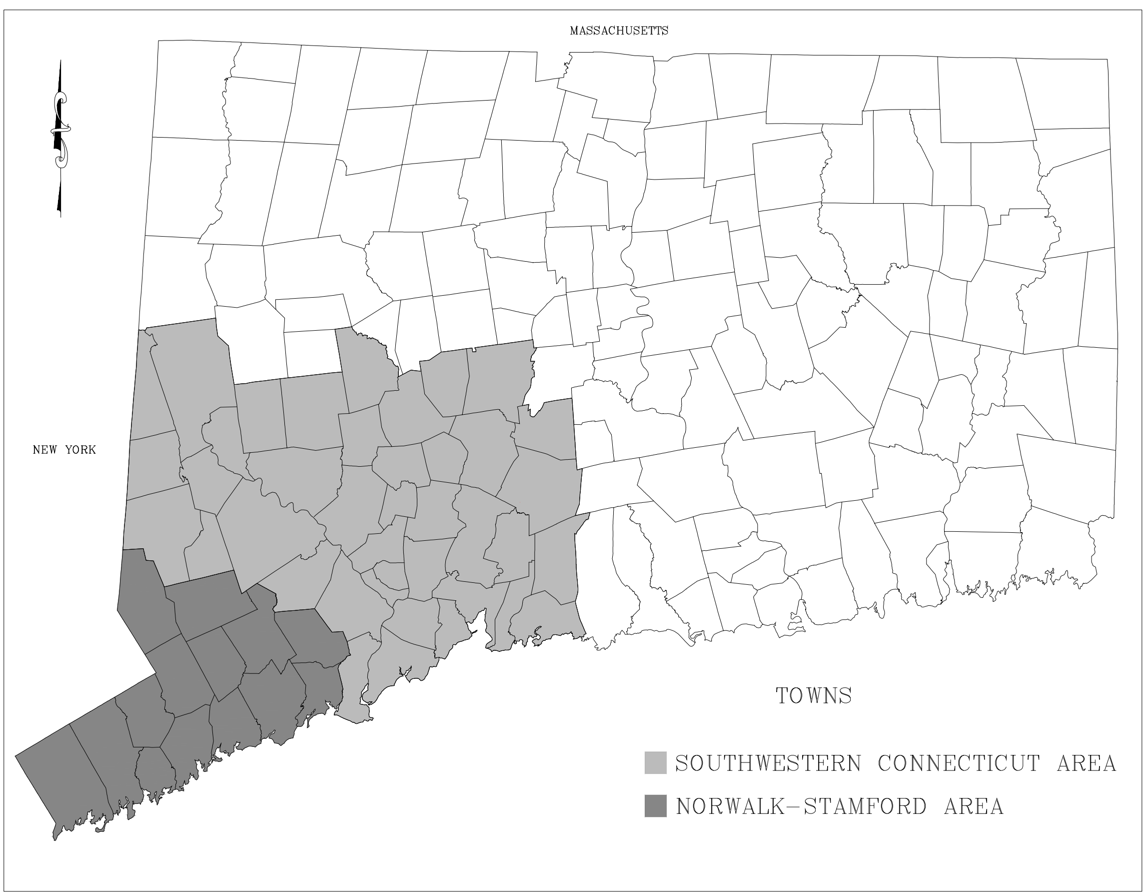
Q. You have referred to SWCT as a "load pocket." What is a "load pocket"?

A. A "load pocket" is a region that relies upon power imports to serve load, into which imports are constrained by limited transmission system capability.

Q. What "load pockets" exist in Connecticut?

A. Connecticut contains three major "nested load pockets," meaning that one load pocket is located inside another larger load pocket, which is in turn located inside another. As illustrated in the following figure, the Norwalk/Stamford load pocket is within the Southwest Connecticut load pocket, which in turn is in the Connecticut load pocket.

Load Pockets within Connecticut



There are other, smaller load pockets within Connecticut, but outside SWCT, that are currently being analyzed. These areas are identified in the CL&P's recently filed Forecasts of Loads and Resources.

Q. Do load pockets cause economic inefficiency?

A. Yes. Load pockets result from the disparity between the geographic distribution of relatively inexpensive generation and the geographic distribution of loads. When the transmission system is inadequate to reliably transport sufficient and inexpensive power to serve the demand within an area, the system must rely on more expensive local resources to serve the load and maintain the security of the electric system.

Q. Can the electric system be managed to minimize the economic inefficiencies associated with load pockets?

A. Yes. For example, prior to the restructuring of New England's electric power industry, electric utilities were compensated for both transmission and generation services based on the cost of service. NEPOOL would dispatch New England's generation on an economic basis. To the extent that more expensive "out of merit" generation was required to be dispatched in order to maintain system security, the excess costs were allocated appropriately to the utility on whose behalf the generating facility was dispatched. Vertically integrated electric public utilities could propose new generation or transmission facilities to alleviate these conditions. Today, the picture is more complex, as generation and transmission ownership have been separated, and generation is now in a competitive marketplace.

Q. How have the economic inefficiencies of load pockets been managed since electric generation has become a competitively provided service?

A. Since the New England competitive generation marketplace opened in 1999, the FERC and ISO-NE have been struggling to develop market-based solutions for the compensation of generation that is needed for reliability. The FERC and ISO-NE intend to develop an efficient market structure that will provide the appropriate market signals and incentives that will lead to the locating of efficient generation where it is needed.

Q. What approaches have been tried so far for the compensation of generation needed for reliability?

A. ISO- NE has entered into "reliability must run" (RMR) contracts to assure that certain uneconomic generators will be available when needed for reliability purposes, and it has instituted a bidding process for other generators that allows for higher prices to be recovered by these units that are located in congested areas. These generators are called "Peaking Unit Safe Harbor" (PUSH) units. ISO-NE has been ordered by FERC to replace RMR contracts and PUSH bids with a market-based solution, to be implemented by June 1, 2004. On March 1, 2004, ISO-NE proposed to FERC a "Local Installed Capacity" (LICAP) requirement to compensate generation located in areas that are deficient in transmission or generation capacity.

Q. Since restructuring, how have the costs of uneconomic generation caused by transmission constraints been allocated?

A. Between 1999 and March 1, 2003, these costs were all "socialized," which means shared proportionally, over the entire New England load. On March 1, 2003, ISO-

NE implemented a "Standard Market Design" (SMD), pursuant to which costs of supplying load, including certain uneconomic generation components, are calculated for specific locations ("nodes") and then assessed over a larger "load zone." For pricing under SMD, the entire state of Connecticut is a single "load zone." All Connecticut customers are paying for the high costs of generation as the result of transmission constraints in SWCT and Connecticut.

Q. What steps are being taken by ISO-NE to encourage new generation capacity to locate in deficient areas?

A. ISO-NE is developing a capacity market to complement the energy services market. This market is intended to provide market signals to generation, where generation and transmission capabilities are insufficient to reliably serve the customer demands.

Q. What is the anticipated impact on Connecticut customers?

A. The future impact of LICAP is unpredictable. The ISO-NE proposal includes a phase-in mechanism to mitigate the impact on Connecticut. FERC's acceptance of the ISO-NE proposal will not be known for several months. Analyses of the proposal have estimated that the costs that will be charged to the Connecticut load zone could be hundreds of millions of dollars annually, if not mitigated by a phase-in mechanism or otherwise.

Q. Will the proposed Middletown to Norwalk line affect the charges related to uneconomic generation that could be assessed to Connecticut in the future?

A As the preceding discussion suggests, it is impossible to identify now the costs that will be allocated to Connecticut, because we simply do not know how all these generation costs will be calculated and assessed, even over the next year, much less over the many years that the line will be in service. However, we can say with certainty that all of the complex regulatory and market strategies mentioned, such as RMR's, PUSH, and LICAP, are intended to send market signals to help alleviate the problems associated with transmission constraints; and that this and other contemplated bulk power transmission projects will help alleviate the three major Connecticut load pockets.

Q. Specifically, what projects and what load pockets are you referring to?

A. The Bethel to Norwalk Project approved in Docket 217, will increase the Norwalk-Stamford sub-area transfer limits to allow more efficient generation to be dispatched to serve this load. Correspondingly, the Middletown to Norwalk Project will significantly increase the SWCT, and Norwalk–Stamford sub-area transfer limits, allowing more efficient and cost-effective generation to serve both of these crucial load pockets. Further improvements, such as the tentatively planned 345-kV line from Card Substation in Lebanon into Rhode Island and Massachusetts will be necessary to reduce the transmission constraints of the Connecticut load pocket.

Promotion of a Competitive Generation Industry

Q. In addition to providing the load in SWCT with access to lower cost generation, will the Project promote competition in the generation industry?

A. Yes. A strong transmission system that can reliably deliver bulk power to all parts of Connecticut – and particularly generation-deficient areas like SWCT – is critical to the growth and success of a competitive generation marketplace. The Project will promote competition in the generation market by providing a more robust electric "highway" system in SWCT and by eliminating existing constraints that currently prevent the concurrent operation of certain generating plants in SWCT.

Improving the Efficiency of the Power System

Q. What are line losses?

A. The amount of power that leaves a generating plant is always more than the amount delivered to customers because a portion of the electrical energy is consumed by the electric system as it travels from the generating plant to the load.

Q. Will the Project have any effect on line losses?

A. As a matter of physics, line losses on a 115-kV system are nine times greater than those on a 345-kV system for the same energy transfer. By shifting the bulk power flow in SWCT from the 115-kV system to the 345-kV system, the Project will reduce line losses and thereby increase the overall efficiency of the regional power system. ISO-NE has determined that, for peak loading periods, line losses with the 345-kV system are approximately 35 MW less than with the 115-kV system, which is equivalent to the energy required to serve about 35,000 homes. This reduction in the energy dissipated through line losses produces both economic and environmental benefits because it reduces the amount of generation needed to serve customer load.

SYSTEM ALTERNATIVES

Q. What system alternatives were considered to the construction of the Project?

A. The system alternatives evaluated by the Companies were: (1) the "no action" alternative; (2) energy alternatives (i.e., generation, new transmission technologies, and distributed generation,); (3) demand side management alternatives (conservation and load management programs and demand response); and (4) transmission system alternatives. The "no action" alternative was quickly rejected. Simply put, it would be irresponsible for the Companies to ignore the existing violations of national and regional reliability criteria and other transmission-related problems discussed above. The August 2003 blackout was a wake-up call to the nation as a whole – and the SWCT region in particular – that cannot be ignored.

Distributed generation and demand side management alternatives that the Companies considered are discussed in the Prefiled Testimony of Michael Coretto of UI filed together with this testimony.

GENERATION ALTERNATIVES

Q. Why did the Companies reject generation alternatives for addressing the reliability issues in SWCT?

A. The development of new generation plants in Connecticut by merchant generators is now driven primarily by market forces. The difficulties in serving SWCT loads have been communicated to the marketplace through mechanisms such as ISO-NE's Transmission Expansion Advisory Committee, Regional Transmission Expansion plans, and various regulatory filings. However, even though ISO-NE identified SWCT as a generation deficient area in RTEP02 and RTEP03, the market has not responded to date with any proposals for large new generating stations or unit upgrades in SWCT.[4]

Moreover, even if significant new generation were proposed in SWCT, it would not provide a system alternative to the Project because any new generation would be "locked in" to SWCT absent the completion of the 345-kV loop. The existing transmission constraints in SWCT preclude the concurrent operation of all existing

[4] South Norwalk Electric Works has just proposed a 50 MW repowering of its generating station.

generation under certain system conditions. In addition, high short circuit currents are a barrier to new generation projects.

NEW TECHNOLOGY ALTERNATIVES

Q. Did the Companies consider the potential use of any new technologies to address the reliability problems in SWCT?

A. Yes, we have evaluated the use of various types of FACTS (Flexible AC Transmission System) devices to increase the capability of the existing transmission system. In fact, CL&P has installed FACTS devices such as Dynamic VAR (D-VAR) voltage regulation systems in the Bethel area and a STATCOM at the Glenbrook Substation in Stamford for local area voltage support and to increase the transfer limit into these areas. However, none of the FACTS devices we evaluated are sufficient to address SWCT's reliability problems without transmission improvements.

TRANSMISSION SYSTEM ALTERNATIVES

Q. Did the Companies consider the use of High Voltage Direct Current ("HVDC") technology for the Project, as opposed to Alternating Current?

A. Yes, but we determined that a DC solution was operationally inferior and involved significantly higher cost. The Companies first evaluated whether HVDC was a viable option for the entire Middletown to Norwalk line. This option was quickly rejected because a DC alternative could not include intermediate connections to the Pequonnock and Devon Substations without very large and expensive AC to DC converter stations at the proposed East Devon and Singer Substations, as well as at the Beseck and Norwalk terminals. Each of these AC to DC converter stations would be several stories high and require a lot at least 15 acres in size, as well as larger AC substations than those proposed for the Project, thus increasing the environmental and land use impacts of the line. Moreover, an HVDC line would not provide the full benefits of a 345-kV-AC loop, because it would not provide instantaneous backup upon the failure of a transmission line, and would not provide the same benefits as the Project in resolving short circuit fault duty problems and voltage violations. Finally, an HVDC line would not improve the ability and flexibility to interconnect new high efficiency and low cost generating plants to Connecticut's electric power system.

The Companies next considered whether HVDC could be used for the segment of the new 345-kV line between Beseck Switching Station and East Devon Substation, which represents the longest segment of the Project. Such an HVDC component would require the construction of one AC to DC converter station (described above) at both terminal locations, and would present all of the other disadvantages discussed in the preceding paragraph. The cost of the Beseck – East Devon portion of the Project, if a DC line were used, would be approximately $400 million, as opposed to $100 million for the AC line between Beseck and East Devon substations.

Determination of the Voltage Level

Q. Did the Companies consider a 115-kV solution for completion of the SWCT loop?

A. Yes.

Q. Why did you reject the 115-kV alternative?

A. SWCT's 115-kV transmission system was developed at a time when loads in this part of the state were substantially lower and when generation could be relied upon to supplement the deficiencies in transmission to deliver the desired level of power. Four primary 115-kV transmission corridors were developed to manage power flows into the area. Each transmission corridor relied upon the others to provide back-up should a contingency occur. At past load levels, the transmission capability could meet the desired level of service in accordance with reliability standards. However, the size of the 115-kV conductors on existing transmission lines and construction techniques that utilized single structures to support multiple circuits now have posed a significant reliability problem during periods of high and peak customer demands. The 115-kV reinforcement challenge would require extensive upgrades to multiple rights-of-way to achieve the same level of long-term reinforcement to the area as compared to the 345-kV option. The objective of the Middletown to Norwalk Project is to minimize the magnitude of construction, disruption, and environmental impact, while maximizing the transmission services that are required to reliably serve customer loads; and to provide a long-term improvement that will not need to be upgraded or replaced soon after it is in service.

CONCLUSION

Q. In summary, does the Middletown to Norwalk Project conform to a long range plan for the expansion of the electric power grid of the electric systems serving Connecticut and interconnected utility systems?

A. Yes.

Q. Is the Project necessary for the reliability of the transmission system in SWCT and does the Project serve the interests of electric system economy?

A. Yes.

Q. Does this conclude your testimony?

A. Yes.

EXHIBIT A

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198 Valley View Drive
Manchester, Connecticut 06040

I am the Vice President of Transmission Engineering and Operations for the Northeast Utilities System (NU). Current responsibilities include the engineering, construction, maintenance, and operation of NU's transmission facilities including all transmission substations, telecommunications engineering, Supervisory Control and Data Acquisition (SCADA) development and implementation associated with transmission equipment and facilities, and for the company's land management and real estate activities.

1960-1964 United States Air Force

Education

1966 Bachelor of science in electrical engineering from the University of Hartford.

1967 Master of science in electrical engineering from Philip Sporn Chair at Rensselaer Polytechnic Institute.

Joined CL&P in 1966 as a cadet engineer and held progressive engineering positions in Distribution Engineering, Protection Engineering, and Substation Engineering. From 1997, I have held the following management positions:

1997-1980 Supervisor of Protection Engineering for all transmission and distribution substations;

1980-1981 Supervisor of CL&P Distribution Planning Engineering. Responsible for developing the CL&P capital and expense annual and long multi-year plan, programs, and budget;

1981-1984 Manager of Substation Construction for NU. Responsible for all substation construction and major maintenance performed on all substations in the CL&P and Western Massachusetts Electric Company (WMECo) service territories.

1984-1990 Director of Transmission, Construction Test & Operations. Responsible for all transmission line and substation engineering, construction, maintenance, testing, and operations. Responsible for test activities at all NU generating facilities, including Millstone and Connecticut Yankee Nuclear Generating Stations. Responsible for all CONVEX operational and dispatching activities, the construction, maintenance, and operation of all NU process computer systems and microwave and power line carrier telecommunications facilities.

1990-2001 Vice President Transmission & Distribution. Responsibilities included engineering, construction, maintenance, test, and operations of all T&D facilities on the NU system.

2001-2002 Vice President Transmission Engineering and Operations.

2002-Present Vice President – Transmission Projets

Professional Affiliations

I have been actively involved with the following regional and national committees:

1997-1980 Institute of Electric and Electronic Engineers Protective Relaying Committee. Co-chaired the Breaker Failure Working Group which developed and published the Breaker Failure Guide. Past member of the Generator Grounding and Substation Bus Protection Working Groups. The Generator Grounding Working Group developed and published the Generator Grounding Guide.

1981-1990 Member of Edison Electric Institute Transmission Committee. Chaired the Protective Relaying Working Group, Member of Executive Committee, and Liaison to OSHA.

1989-1998 NU representative to NEPOOL Operations Committee;

1990-2004 NU member representative to Northeast Power Coordinating Council (NPCC);

1993-2004 Member of NPCC Task Force on Coordination of Operations.

1990-2004 Member of NPCC Reliability Coordinating Committee. Chaired the Committee from 1997 through 2001.

1997-2002 Member of North American Electric Reliability Council (NERC) Planning Committee (Previously designated Engineering and Adequacy Committee).

2001-2004Member of the NERC Planning Committee Resources Task Force.
Member of the NERC Planning Reliability Model Task Force.

1994- 2004 Winter Special Olympics – Co-chair since 2000

Peter T. Brandien
22 Princess Pine Path
Southington, CT 06489

I am Director, Transmission Operations for the Northeast Utilities System. Current responsibilities include transmission planning and the operations of the Northeast Utilities transmission system. These responsibilities include CONVEX, the transmission operation center for Connecticut and Western Massachusetts.

In 1987 I began my career with Northeast Utilities. First assignment was at CONVEX operating the Connecticut and Western Massachusetts transmission system. In 1990 transferred to the Northeast Utilities Transmission Engineering Operations Group progressing to Senior Engineer. From 1997 I have held the following management positions:

Present – Director, Northeast Utilities Transmission Operations. Responsibilities include transmission planning and operations including CONVEX.

2000-2002 – Director, Transmission Asset Management. Responsibilities included transmission planning, operations engineering and system performance and management of the transmission capital program.

1999-2000 – Manager, Transmission Engineering Operations. Responsibilities included Substation Engineering and Design, Transmission Line & Civil Engineering and Transmission Operations Engineering.

1997-1999 – Manager, Transmission & Distribution Operations Support. Responsibilities included the operations engineering and computer support systems.

EDUCATION
University of Hartford, Hartford, CT
1983-1987 – Bachelor of Science Electrical Engineering

U.S. Navy – USS Michigan SSBN 727
1977-1983 – Submarine Nuclear Propulsion Plant Operator /Electrician

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The United Illuminating Company New Haven, CT

Vice President – Electric System **February 1, 2001 to Present**

This position reports to the President and Chief Operating Officer.

General Manager – Electric System **November 1, 1996 to February 1, 2001**

Reported to the Group VP of Client Services. Principal responsibility is the focused leadership of the $45 million, 320 employee Electric System organization. The services rendered in this organization include planning, design, construction, operation and maintenance of the Transmission & Distribution System.

Accomplishments in this position include:

- Re-engineered and reduced the cost of this organization $20 million, from $65 to $45 million.
- Transformed the Transmission & Distribution into processed-based business.
- Established a Balance Scorecard and aligned incentives.

Process Leader – Deliver Electricity **January 1, 1996 to November 1, 1996**

This position reported to the Chairman of the Board and CEO of the corporation. Principal responsibilities included the entire re-organization of the corporation, business case and competitive gap development and objective metrics through benchmark methodology.

Accomplishments in these positions include:

- Re-engineered Electric utility into five functional business units with operational metrics
- Identified and highlighted process changes resulting in $80 million of annual savings
- Corporate "Balanced Scorecard" and aligned incentives.
- Successful company wide communication plan.

Director – Customer Service **May 1994 to June 1996**

This position reported to the VP – Customer Services. Principle responsibilities included the management of the company's Customer Service Call Center, the Commercial Field Representatives and the C & I Customer Engineers.

Accomplishments in the position include:

- Project Manager for the transformation of the Call Center from a mainframe environment to a PC based environment.
- Development and implementation of the Customer Engineering function for major C & I customers.
- Establishment of metrics in Call Center that allowed us to measure results.
- Project Manager for the replacement of an antiquated VRU with a modern IVR.

Director – T & D Projects **1985 to May 1994**

This position reported to the VP – Transmission and Distribution. Principal responsibilities include the planning, design and project management of all T & D projects. The average annual capital budget was about 30 million.

Accomplishments in this position include:

- Creation of a project management discipline for all projects with T & D.
- Completed the largest T & D project in history of the company ($26 million) on time and within budget.
- Developed Company's first true alliance with a design consultant and reduced engineering costs on major projects by 15 – 20 %.

Project Manager / Design Engineer **1970 to 1985**

This position reported to various managers with T & D. Principal responsibilities included the planning design and project management for new and rebuilt transmission lines and substations.

Accomplishments in this job include:

- Designed and project managed 5 new 115KV /13.8KV bulk substations.
- Designed and project managed a major new 345KV / 115KV substation.
- Designed and project managed numerous new 345 KV and 115 KV transmission lines.

Education

BSEE , University of Bridgeport 1970
Advanced Power System Technology Program, PTI 1977 – 1978

Continuing Education

Basic Project Management, AMA , 1978
Senior Project Management, AMA 1985
The Management Course, AMA 1993 – 1995
Priority Management 1995 - 1996
Project Management Certification Course, IIL, 2000

Professional Affiliations

Member of Board of Directors - Electric Council of New England (ECNE)
Member of Association Electric Illuminating Companies (AEIC)
Project Management Professional - Project Management Institute (PMP)

Community Activities

Member of Board of Directors - Greater Valley United Way 2004 Campaign
Member of Board of Directors - Shubert Theatre (CAPA)
Youth Baseball Coach - 25 years

Anne Bartosewicz
17 Arnoldale Road
West Hartford, CT 06119

I am Project Director, Transmission Projects for the Northeast Utilities System. I am currently responsible for the Middletown to Norwalk 345-kV Electric Transmission Line Facility and Associated Facilities between Scovill Rock Switching Station in Middletown and Norwalk Substation in Norwalk.

In 1982 I began my career with Northeast Utilities. First assignment was as a project engineer in the reactor plant systems group in Generation Mechanical Engineering for Northeast Utilities Service Company at the Millstone and Connecticut Yankee Nuclear Plants. Between 1987 and 1999 held various positions in the Budget Management & Financial Planning and Regulatory Policy and Planning departments. From 1999 I have held the following management positions:

2003-Present – Project Director, Transmission Projects. Responsible for the Middletown-Norwalk 345-kV Electric Transmission Line Facility and Associated Facilities between Scovill Rock Switching Station in Middletown and Norwalk Substation in Norwalk.

2001-2003 – Project Manager, Transmission Projects. Responsible for the Middletown-Norwalk 345-kV Electric Transmission Project.

1999-2001 – Manager, Regulatory Policy. Responsible for developing and implementing regulatory policies and strategies for the Western Massachusetts Electric Company including managing relationships with state regulatory and key public policy officials in Massachusetts and testifying at the Department of Telecommunications and Energy.

EDUCATION
University of Hartford, Hartford, CT
1986-1991 – Masters of Business Administration, concentration in Finance

University of Connecticut, Storrs, CT
1976-1980 – Bachelor of Science Chemical Engineering

John J. Prete
2 Pond View Terrace
Branford, CT 06405
203.483.0875

Career Summary:

Project Director/General Manager/Vice President with extensive experience managing diverse business functions in the Electric Utility and Specialty Contracting Industries. Strong background in Process re-design, Project Management, Acquisitions, Capital Budgeting, Integration, Supply Chain, Customer Service activities, cost effectiveness and team building. Key accomplishments include:

> **Process Design** The utilization of process mapping and business case analysis for Acquisitions, Capital Budgeting and the transformation of a Customer Service Business Unit into a customer and cost focused business operation.
>
> **Acquisition and Integration** Developed and directed the Due Diligence process and teams to acquire ten Specialty Contracting and Network Systems Integration companies.
>
> **Customer Services** Leader of a large group of management and union personnel that provides call center, meter reading, metering, payment and collection operations for 310,000 residential and business customers. In 18 months, standard performance metrics were developed and service levels were improved by 33%.
>
> **Cost Effectiveness** Rationalized an appropriate cost structure by analyzing external benchmarks and internal Total Life Cycle (TLC) reviews. In 18 months, costs were reduced on a sustainable annual basis by over $10 million (30% cost).
>
> **Project Management and Team building** Change agent and "hands on" leader that leads by example and successfully develops high performance teams.

Employment:

UIL Holdings Corporation 1980 – Present

Project Director – Middletown to Norwalk Project (October 2002 to Present).
Responsible for the schedule, scope and costs of the project for The United Illuminating Company ("UI") and in concert with Northeast Utilities.

Vice President - Xcelecom (July 2000 to October 2002) & UIL Strategic Business Director (January 2000 to December 2001).
Responsibilities included the strategic development for the Chairman of UIL Holdings and Acquisition and Integration process at Xcelecom.

- Created and lead the process to Acquire and Integrate ten Specialty Contracting and Network Systems Integration companies.
    - Post Close: Process improvements
- The negotiation and implementation of ten Vendor/Supplier contracts at Xcelecom.

General Manager-Client Fulfillment (November 1996 to December 1999).
Responsibilities included accountability and ownership for all aspects of customer service for an electric utility with annual revenue of over $650 million dollars.

- Transformed one cost center into several major services with important cost and revenue related targets through process improvement methodology.
- Established appropriate balanced scorecards and incentive programs.

Member Chairman's Select Transformation Team (January 1996 – November 1996).
One of eight staff reporting to the chairman responsible to transform the culture and cost structure of UI.

- Identified process and cultural changes necessary to reduce corporate budgets by $80 million per year.
- Developed and aligned corporate scorecards and incentive targets.
- Restructured company into five major business functions with appropriate operational metrics.

Manager - Capital Budgeting (March 1994 – January 1997).
Managed the company's $70 million a year capital budget.

- Designed and constructed a PC based budgeting and reporting system.
- Regularly worked with senior management to understand and control capital expenses.

Project Manager (1986 – 1994).
Controlled the schedule, scope and costs of over 25 projects totaling $40 million.

- Successfully managed projects from Initiation to Closeout consistent with the PMBOK methodology of project management.
- Negotiated and managed numerous contracts: performance, incentive firm target, time and material and firm fixed fee totaling over $30 million.
- Managed the company's largest electrical T&D project. This 4 year, $28 million substation/underground transmission line was completed 3 months early and under budget.
- Implemented a $6 million GIS that positioned the company to save $1 million per year.

Education:

- AS, Political Science, University of New Haven, CT – 1978
- ASEE, Greater New Haven State Technical College, New Haven, CT – 1980
- BSEE, University of Bridgeport, Bridgeport, CT – 1982
- Certified Project Manager Professional (PMP), PMI, Upper Darby, PA – 1998
- Advanced Business Course for Executives – AMA, 1995-1998

Continuing Education:

- Advanced Project Management – AMA University of Connecticut – 1987, 1988, 2001
- Team Building – AMA, University of Connecticut – 1989, 1990, 1991
- Power Technology, Two Year Course, PTI, NY – 1993
- Priority Management – 1995 – 1996
- Contract Claims and Litigation Avoidance, CA – 1989, 1996