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 Michael A. Coretto relating to load and resource forecasting, conservation and distributed generation.

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 MICHAEL A. CORETTO RELATING TO LOAD AND RESOURCE FORECASTING, CONSERVATION, DEMAND RESPONSE AND DISTRIBUTED GENERATION

INTRODUCTION

Q. Please identify yourself and the other members of the panel.

A. I am Michael A. Coretto, and I am the Director of Retail Access and Regulatory Strategy at The United Illuminating Company ("UI"). Other members of the panel are Anthony Marone III, UI's Senior Director of Client Services, Charles R. Goodwin, Director-Pricing Strategy & Administration of Northeast Utilities Service Company, John Mutchler, Director-Conservation and Load Management of Northeast Utilities Service Company, and Philip Hanser, an independent consultant who is a principal of The Brattle Group.

Q. What areas does your testimony cover?

A. This testimony addresses load and resource forecasting, the Companies' conservation and load management ("C&LM") programs, the ISO-NE Load Response program and distributed generation. Other members of the witness panel and I will be available for cross-examination with respect to these subject areas as they impact the peak load and need for infrastructure in Connecticut.

Q. Mr. Coretto, would you please provide the Council with your professional qualifications and those of the other members of the witness panel?

A. Certainly. I am responsible for UI's annual report to the Connecticut Siting Council on loads and resources, and am generally familiar with the matters discussed in this testimony. I have previously testified before the Council with respect to forecasts of load and resources, and the various factors affecting those forecasts. Anthony Marone is Senior Director of Client Services at UI. His responsibilities include oversight, planning and implementation of energy conservation and load management programs delivered to UI customers. Mr. Marone has testified before the Department of Public Utility Control regarding these programs. Charles R. Goodwin is the Director of Pricing Strategy and Administration for Northeast Utilities Service Company. His responsibilities include the management of the Economic and Load Forecasting Department that produces the electric demand forecasts for the NU distribution companies, including The Connecticut Light and Power Company ("CL&P"). John Mutchler is the Director of CL&P's Conservation and Load Management department, which is responsible for planning, implementation and evaluation of energy conservation programs. Messrs. Goodwin and Mutchler have testified on these matters before the Council. Mr. Hanser, who testified before the Council in Docket 217, provides a national as well as a regional perspective on conservation, demand response and distributed generation. Prior to joining The Brattle Group, Mr. Hanser was

the Manager of the Demand-Side Management Program at the Electric Power Research Institute. We have attached as an exhibit to this testimony the resumes and the qualifications for each panel member.

LOAD AND RESOURCE FORECASTING

Q. Do the Companies forecast loads and resources?

A. Yes. Connecticut law requires that UI and CL&P, as well as Connecticut Municipal Electric Energy Cooperative, submit to the Council each year their forecasts of loads and resources. The Council reviews and holds a hearing on these forecasts, which form the basis for the Council's own annual Review of the Connecticut Electric Utilities' Ten-Year Forecasts of Load and Resources. The Council issued its 2003 Review on December 23, 2003. The Council's annual review includes an assessment of existing and planned electric generation, substation and transmission facilities and also analyzes historical trends, the projected outlook of load, demand and the effectiveness of conservation and load management programs.

Q. Why is it important to forecast and review loads and resources?

A. The electric system's resources must be capable of meeting the load whenever it occurs, even if the peak is substantially greater than expected or the resources available are substantially fewer than expected.

Loads

Q. At the time the application for the Middletown to Norwalk Project was submitted to the Council in October 2003, the Companies had filed their 2003 forecasts of loads and resources with the Council. Have the Companies now updated their forecasts?

A. On March 1, 2004, CL&P filed its 2004 Forecast of Loads and Resources for 2004-2013. UI anticipates filing its 2004 forecast with the Siting Council later this month, and the underlying data are available now and referenced in this testimony.

Q. Have the load forecasts changed significantly from the forecasts filed in 2003?

A. No. Like the 2003 forecasts, the 2004 forecasts reflect moderate economic growth; the impact of past, present and future C&LM; growth in electric usage, particularly in the residential class due to larger homes and the increasing popularity of electronic devices; and a continued sensitivity of peak loads to weather conditions. As the Council stated in its 2003 Review of the Connecticut Electric Utilities' Ten-Year Forecasts of Loads and Resources (at p. 2):

> "Historically, the demand for electricity has been related to economic growth. That positive relationship is expected to continue, however, the precise relationship is uncertain. Connecticut's electric consumption is due to the development of larger homes, an active economy, and a high-quality lifestyle that results in increased use of expanding and new electro-technologies (i.e. electric appliances, computers, and especially air conditioning)."

Q. Do you agree with this statement?

A. Yes, both as to 2003 and 2004 and to future expected load growth.

Q. What load growth is expected in New England?

A. RTEP03, issued by ISO-NE on November 13, 2003, states that both summer and winter peak demands in New England are expected to increase at a 1.5% compound rate each year for the next ten years. The NEPOOL 2003 CELT Report, issued in April 2003, forecast a summer peak load in New England of 27,820 MW in the year 2010.

Q. What role does weather play in forecasting load?

A. Weather is the biggest factor causing peaks to vary. As the Council stated in its 2003 Review, "projections are affected by weather that can dramatically change demand." *Id.* It

is common in load forecasting to use historical average weather conditions and extreme weather conditions in developing separate forecasts. The forecast associated with extreme weather reflects the potential dramatic change in demand resulting from weather. The potential impact of extreme weather on the forecasted peak level in any given year is almost 10%.

Q. Why do weather conditions affect the demand for electricity?

A. The peak demand for electricity in New England and in Connecticut, including in particular Southwest Connecticut (SWCT), is driven by air conditioning load, which in turn is driven by hot, humid summer weather. Even summers that are not continually hot and humid may have high peak demand reflecting short, severe weather periods.

Q. Is the demand for electricity in SWCT increasing?

A. Yes. As noted in the Application (at p. F-18 of Volume 1), the SWCT summer peak was 3,437 MW in 2001 and 3,465 MW in 2002. The summer of 2001 was one of the hottest on record. The summer of 2002 was cooler than 2001, yet the peak load was higher. The summer of 2003 was, on a relative basis, cooler than 2002. However, 2003 had short, severe weather periods.

Q. What overall growth in electricity demand is reflected in the Companies' forecasts for Connecticut?

A. CL&P's growth in peak load is forecast at 2.2% per year over the 2004-2013 period. This load forecast reflects an expectation of moderate economic growth in CL&P's service territory, moderate gains from economic development and significant peak load savings from C&LM programs. For UI, the peak load is forecast to be essentially flat over the next ten years, on a weather-normal basis when calculated from the actual 2003 system peak load. (The actual peak was approximately 50 MW greater than UI's projected peak.) UI's forecast for its

service territory assumes moderate economic growth and significant C&LM savings. If extreme weather occurs in a given year, the peak will be substantially higher.

Resources

Q. Is generation supply a potential problem in SWCT?

A. Yes. The Council's 2003 Review (at p. 4) notes that "some sub-regions such as southwest Connecticut are threatened with supply deficiencies and voltage instability problems due to insufficient transmission and inadequate resources within the region."

Q. Do transmission constraints affect the need for new generation resources?

A. Yes. The Council noted in Docket 217 that transmission constraints preclude the concurrent operation of all existing generation in SWCT and can preclude the connection of new generation. See Docket 217, Findings of Fact 43, 89-91. ISO-NE has stated that "although resource adequacy studies suggest that new generation would be beneficial to Southwest Connecticut, short circuit and other network constraints make the interconnection of a sufficient supply of generating units physically unrealizable." RTEP03, Executive Summary, p. 12. RTEP03 goes on to note that "if the existing transmission constraints are not mitigated" in SWCT, then additional generation or demand response resources "will be required by 2008 to meet resource requirements." RTEP03, Executive Summary, p. 24.

Q. Have there been any significant changes in the forecast for Connecticut's generation resources since the Companies filed the application in this docket in October 2003?

A. The 560-MW Milford Power facility is now undergoing testing. However, as noted by Roger Zaklukiewicz in his testimony, there are times when all generators in the area cannot be operated at the same time because of the transmission constraints in SWCT.

Q. Are there other uncertainties associated with generation resources?

A. Yes. As discussed in greater detail in Volume 1 of the Application (pp. F-20 – F-21), emissions limitations imposed by the Connecticut General Assembly in Public Act 02-64 may restrict the operation of older generating units, and could threaten the viability of older oil-fired generation in SWCT. The economic viability of certain generating units and generation owners in SWCT is a continuing concern, even apart from environmental issues, as reflected in the increased requests for reliability must run contracts.

Q. Has ISO-NE sought generation on a temporary basis?

A. Yes. In prior years, ISO-NE contracted for temporary generation resources in SWCT. Recently, the ISO issued a request for proposal for 300 MW of resources from 2004 through 2007. ISO-NE has stated that the purpose of the RFP is "to improve system reliability within SWCT at times of peak loads through the installation of additional generating capacity and identification of load reduction resources in conjunction with the ISO-NE Load Response Program." The RFP can be met through any form of resources, including transmission, demand response, generation and conservation.

DEMAND SIDE MANAGEMENT

C&LM

Q. Do the Companies' forecasts take into account actions that can reduce the growth of demand for electricity?

A. Yes. The Companies' load forecasts take into account C&LM programs. The forecasts include actual annual peak load reductions together with projections of future reductions, adjusted for measures that have reached the end of their useful life.

C&LM programs are an integral part of a comprehensive approach to meeting the electric energy needs of Connecticut's consumers and businesses. However, C&LM alone cannot

provide a complete solution to the capacity and reliability problems that exist in SWCT. While these programs can help reduce future load growth over the long term, C&LM programs are not capable of addressing the complex issues in SWCT.

Q. Do conservation and load management programs typically have the same focus?

A. Conservation programs have a different focus than load management programs. Conservation programs are tailored to serve the needs of the Commercial & Industrial (C&I), Residential, and Low-Income customer sectors. Load management programs primarily target the C&I sector and include ISO-NE Load Response support and C&LM demand response programs.

Q. Could you quantify the impact of C&LM programs on peak load reduction?

A. The Companies estimate that their peak loads[1] in 2003 were reduced by approximately one half of one percent as a result of C&LM program efforts. This corresponds to a combined UI and CL&P summer peak load reduction of approximately 29 MW[2], based on average coincidence factors (Energy Conservation Management Board's 2003 Annual Report to the Connecticut General Assembly).

Q. Have the Companies changed their forecasts of peak load reductions from C&LM?

A. Yes. For each forecast year, the summer peak reductions from C&LM programs are lower in the 2004 forecasts than in the 2003 forecasts. In addition, the Companies' 2003 C&LM efforts were curtailed due to funding reductions resulting from legislative actions. For example, the 2004 CL&P forecast of loads and resources shows the 2006 cumulative summer peak load reduction from C&LM to be 436 MW[3] (Table III-1). In the 2003 forecast of loads and

[1] CL&P 4980 MW and UI 1274 MW.
[2] Approximately 20 MW for CL&P and 9 MW for UI.
[3] Includes demand response.

resources, CL&P's forecast 2006 cumulative summer peak load reduction is 549 MW[3] (Table III-1), a difference of 113 MW.

Q. Can you explain the anticipated lower impact of C&LM on forecast summer peak in 2004 compared to 2003?

A. Yes. This is directly attributable to the significant reductions in C&LM funding resulting from legislative actions and associated slowdowns in conservation program deployment. The combined effect of legislation enacted in the 2003 regular and special sessions (which removes funds from the C&LM program accounts and transfers them to the general funds, together with securitization that would restore funds to the accounts, less the cost of servicing the rate reduction bonds) is a 44 percent reduction in funding over the previous year's funding levels. The impact of reduced funding on peak load reductions, while not linear, is both immediate and long term. It is important to note that this reduction in summer impact is a real loss that affects the current year peak load as well as forecast peak loads going forward. This reduced level of C&LM funding and corresponding reductions in energy savings is taken into account in the Companies' forecasts.

Q. Have C&LM resources been targeted to areas in SWCT?

A. Yes. Because of bottlenecks in the transmission system that delivers electricity to SWCT, there is a potential for a shortage of electricity in SWCT for several years until remedies are implemented. This is especially true at times of peak demand for electricity, such as during summer afternoons when the use of air conditioning is high. In recent years, the Department of Public Utility Control has directed that C&LM programs be targeted at customers in SWCT. See, e.g., Decision – Phase I, Docket No. 03-11-01, DPUC Review of CL&P and UI

Conservation and Load Management Plan for Year 2004 at 2, 11 ("The Plan budget continues to emphasize the particular importance of delivering programs to SWCT.").

The Companies continue to emphasize the targeted deployment of conservation and load management activities to help address the potential for shortfalls in the supply of electricity in the area. To aid in reducing the demand for electricity during peak times, special efforts have been made to increase efficiency and put in place a program and process that would potentially shed the use of electrical equipment in SWCT. For example, there are efforts to increase the efficiency of air conditioning equipment for residential, commercial and industrial customers in the region. Further, many customers work with the Companies and agree to shut down or shed usage of equipment, if called upon to do so during a peak period.

Q. Could greater expenditures on C&LM activities in SWCT alleviate the potential for shortfalls in the supply of electricity in the area?

A. Greater expenditures should lead to some incremental benefit. But greater expenditures on C&LM will not alleviate the potential for shortfalls. First of all, a doubling of the dollars spent, for instance, would not produce double the MW peak reductions. That is because the expenditures that have been made so far have been directed at the most likely targets. Achieving a MW of peak reduction in the future will require significantly more dollars per MW than the savings achieved so far. It is also the case that the smaller the area in which you concentrate your efforts, the more expensive it may be to produce results. For these purposes, SWCT is a relatively small area.

Q. How are load reductions from conservation activities obtained?

A. The Companies actively educate, promote and encourage participation through the use of financial incentives. However, conservation is customer-driven and participation in conservation programs is at the customer's discretion.

Demand Response

Q. Have the Companies actively sought participation of customers in the ISO-NE Load Response program?

A. Yes. In 2002, the Companies collectively enrolled approximately 43 MW of Load Response (sometimes also called Demand Response) program participation, 18 MW of which were in SWCT. In 2003, the Companies enrolled approximately 50 MW, of which 32 MW were in SWCT (see Table G-1 in Volume 1 of the Application). However, enrollment does not mean that response actually was provided, or will be provided in the future. Quantification of the response obtained can only be determined retrospectively. Actual load response has historically been lower than the enrollment numbers.

Q. How are load reductions obtained from demand response activities?

A. Demand reduction programs include the ISO-NE Load Response Program and the identification of facility-specific demand reduction opportunities using load management techniques such as programmable thermostats and remote load control for curtailment of customer loads. The Companies offer higher participation incentives in SWCT. Similar to the traditional conservation programs, demand response programs are also customer-driven. It is still ultimately the customer's decision whether to take the actions necessary to achieve actual reductions by the customer when called upon to do so. Because these actions are at the customer's discretion, demand reduction savings are only potential savings.

DISTRIBUTED GENERATION

Q. Does distributed generation play a role in meeting electricity demand?

A. Yes. However, the role is limited. In the near- to mid-term, distributed generation is not expected to reduce load significantly. The RTEP03 and associated RTEP Technical Report projections indicate that distributed generation will not expand significantly for 10-15 years. RTEP03, Executive Summary, p. 25.

Q. What is distributed generation?

A. Distributed generation is modular electric generation or storage installed at a customer's point of use. In Connecticut, distributed generation resources are generally either generators installed at large commercial or industrial facilities, operated to displace some portion of the facility's electricity purchases, or emergency generators that are operated only when outside power is unavailable. These generators may be used by customers to participate in load response programs, discussed above.

Q. What are the reasons that distributed generation has grown only slowly?

A. The Council's 2003 Review (at p. 9) identifies obstacles, including "lack of technology maturation and reliability, cost associated with an economy of scale, and regulatory barriers." The 2003 Review goes on to state that "[m]arket forces, technological advances, and industry restructuring should slowly continue to remove obstacles" to the growth of distributed generation.[4]

These findings of slow growth are consistent with the results of a study undertaken by Xenergy for the Institute for Sustainable Energy, published in January 2003. This study

[4] One of the barriers, the lack of uniform standards for the interconnection of distributed generation to the electrical system, was recently overcome. UI and CL&P issued a set of uniform interconnection standards on December 22, 2003. See DPUC Docket No. 03-01-15, DPUC Investigation into the Need for Interconnection Standards for Distributed Generation.

determined that 21 MW to 186 MW of new distributed generation is expected to be installed in SWCT by 2013. See discussion in the Report of the Task Force on Long Island Sound, Pursuant to Public Act 02-95 and Executive Order No. 26, June 3, 2003, p. 121. In addition, locally sited generators are typically subject to the Department of Environmental Protection permitting process, which is still evolving.

Q. Are distributed generation resources generally dispatchable by ISO-NE?

A. No. This lack of dispatchability limits the ability to utilize distributed generation to reduce peak loads. Because the dispatch of distributed generation installations is not controlled by ISO-NE, the generation capacity that they represent cannot be marshaled to maintain reliability on the electric system as a whole.

Q. Could you summarize your testimony?

A. The resources must be available to meet the electricity demands of Connecticut's and New England's consumers and businesses, regardless of variance in the loads or the resources. The load in SWCT, Connecticut and throughout New England is growing. The Companies' load forecasts and the Council's Review of forecasts, loads and resources indicate that load will continue to grow, and is subject to substantial variance based upon the weather. Significant impacts of conservation are already taken into account in these forecasts. Demand response and distributed generation have a limited role in meeting load requirements. Transmission constraints in SWCT preclude the concurrent operation of all generators today, and preclude the interconnection of new generation in the future.

Q. Does that conclude your testimony?

A. Yes. The witness panel would be pleased to respond to questions on these subject areas.

EXHIBIT A

Michael A. Coretto currently serves as Director - Regulatory Strategy & Retail Access for The United Illuminating Company (UI).

In this position, he is responsible for coordination and management of all state regulatory affairs with the Department of Utility Control, as well as management and integration of all activities related to current and future wholesale power procurement.

Prior to this position, Mr. Coretto directed the development and implementation of the Retail Access processes for UI and was responsible for administration of power supply contracts and procurement of UI's standard offer power supply.

Mr. Coretto has been with UI for more than twenty years serving in various engineering, marketing and regulatory functions.

A resident of Prospect, CT, Mr. Coretto holds an A.S. in Electrical Engineering from Waterbury State Technical College and a B.S. in Electrical Engineering from the University of New Haven.

Mr. Coretto's office is located at UI corporate headquarters, 157 Church Street, New Haven, Connecticut. He may be reached at (203) 499-2000.

ANTHONY MARONE III

Education: B.S. Mechanical Engineering, New York Institute of Technology (1987)
M.S. Engineering Management, University of New Haven (2002)

Mr. Marone has 17 years experience in the energy field with United Illuminating an investor owned electric utility company serving customers in southern Connecticut. Mr. Marone currently holds the position of Sr. Director, Client Services for UI. In this capacity he leads UI's initiatives which deliver energy related products and customer services to UI customers. He is responsible for the design, implementation, and marketing of UI CLM programs; new product development and sales; and the overall management and service to UI's major energy customer.

Mr. Marone's additional experiences and background includes engineering and maintenance positions in fossil fueled electric generation, energy auditing of C&I customers, distributed generation evaluation and analysis, and management of marketing and sales initiatives.

Mr. Marone has held the following positions at UI: Project Engineer, Mechanical Maintenance Supervisor, Performance Engineer, Marketing Sales Engineer, Supervisor C&I Energy Services, Team Leader-Sales, Senior Sales Manager, and Sr. Director Client Services.

BIOGRAPHICAL INFORMATION
CHARLES R. GOODWIN

Charles R. Goodwin graduated from Southern Connecticut State College with a Bachelor of Science degree in Economics in 1981. He joined Northeast Utilities Service Company in 1981, and held staff positions in the areas of load research and economic and load forecasting until 1989. He joined Yankee Gas Services Company at the time of their divestiture from Northeast Utilities in July of 1989.

While at Yankee Gas, he was promoted to the position of Manager, Rates and Economic Analysis in 1992, and to Director, Regulatory and Resource Planning in 1996. In these positions, Mr. Goodwin was responsible for activities related to rate design, regulatory relations, demand forecasting, supply planning and conservation program planning.

In April of 2000, Mr. Goodwin returned to Northeast Utilities as a result of their acquisition of Yankee Gas. He holds the position of Director, Pricing Strategy and Administration, and is responsible for activities related to rate design, cost of service, load research and economic and load forecasting.

Resume of John H. Mutchler:

Summary

Mr. Mutchler is Director of CL&P's Conservation and Load Management department responsible for planning, implementation and evaluation of energy conservation programs. He has over twenty years experience in the electric power industry including generation, engineering and conservation. He is a member of the legislatively established Energy Conservation Management Board and has testified before the DPUC and the Connecticut Siting Council on energy conservation matters. Mr. Mutchler is a professional engineer and attorney practicing in Connecticut.

Experience

Northeast Utilities System, Berlin, CT (05/92-Present)
Director, CL&P Conservation and Load Management Department

Responsible for the planning, implementation and evaluation of energy efficiency initiatives including residential, commercial and industrial programs. Provides significant energy related testimony before the DPUC, the Connecticut Siting Council and Legislators. Testified before the Governor's Task Force/Working Group pursuant to Public Act 02-95 concerning Northeast Utilities Transmission line proposal. Responsible for interfacing with ISO-NE regarding implementation of load response programs. Manages a research and development group responsible for evaluating and promoting new energy efficiency technologies and fuel cells and interfacing with the U.S. DOE. Reports results and forecasts of energy efficiency savings to the Connecticut Siting Council. Past responsibilities with Northeast Utilities include various engineering and management assignments supporting the Millstone and Connecticut Yankee Nuclear Generating Stations and testifying before the Nuclear Regulatory Commission.

Other Experience

Patent attorney conducting patent prosecution before the U.S. Patent and Trademark Office. Author of various engineering and Intellectual Property publications. Inventor successful in patenting and marketing electro-mechanical technologies. Held various engineering and management positions with ABB and Combustion Engineering in the nuclear power area and with Delmarva Power in multiple fossil fueled power stations.

Education

Quinnipiac University School of Law, Juris Doctor

Rensselaer Polytechnic Institute, Masters of Science, Metallurgy

Western New England College, Masters of Science, Engineering Management

Manhattan College, Bachelor of Science Mechanical Engineering

Bar Admissions and Registrations

State of Connecticut, Attorney
U.S. Patent and Trademark Office, Patent Attorney
Professional Engineer, Registered in Connecticut and New York

PHILIP HANSER **Principal**

Philip Hanser is a Principal at *The Brattle Group* in its Cambridge office. Mr. Hanser provides consulting support in the areas of economics and business analysis, strategic planning and other business issues, with an emphasis on conceptual and quantitative analysis. His practice includes assistance on issues ranging from industry structure and market power and associated regulatory questions, to specific operational and strategic questions, such as transmission pricing, generation planning, tariff strategies, fuels procurement, environmental issues, forecasting, marketing and demand-side management, and other management issues. He has also provided support to utilities in insurance recovery of environmental liabilities arising from former manufactured gas plant sites, assessed liability risk from a mass tort suit and designed statistical database auditing procedures.

He has appeared as an expert witness before the Federal Energy Regulatory Commission, the California Energy Commission, the New Mexico Public Service Commission, the Public Service Commission of Wisconsin, the Public Service Commission of Vermont, and the Public Utilities Commission of Nevada and in Federal and state courts. He has also presented before the National Association of Regulatory Utility Commission and the New York State Energy Research and Development Authority and served on the America Statistical Association's Advisory Committee to the Energy Information Administration. Prior to joining *The Brattle Group*, his past employment experience included a number of different academic positions and serving as the Manager of the Demand-Side Management Program at the Electric Power Research Institute. He has been published widely in leading industry and economic journals and testified frequently before regulatory agencies. Mr. Hanser has taught at the University of the Pacific, University of California at Davis, and Columbia University, and guest lectured at the Massachusetts Institute of Technology and Stanford University.

REPRESENTATIVE RECENT EXPERIENCE

- For a U.S. electric utility, he assisted in the development of a legislative and regulatory strategy with regard to restructuring. This assignment included generation asset valuation in a competitive market, development of stand-alone transmission and distribution rates under cost-of-service and performance-based regulation, and estimation of strandable costs.

- For Connecticut Light and Power, Mr. Hanser provided testimony in support of a application for a Certificate of Environmental Compatibility and Public Need for the construction of a 345-kV electric transmission line and reconstruction of an existing 115-kV electric transmission line between Connecticut Light and Power Company's Plumtree Substation in Bethel, through the Towns of Redding, Weston, and Wilton, and to Norwalk Substation in Norwalk, Connecticut.

- For Otter Tail Power Company, Mr. Hanser provided an affidavit to the Federal Energy Regulatory Commission assessing how the Midwest ISO's proposed Transmission and Energy Market Tariff will affect Otter Tail Power both operationally and financially.

- Provided expert testimony on the damages incurred by a power plant developer as a result of alleged contractual violations by a supplier.

- For a power marketer and developer of independent power projects in Great Britain, he assisted in the preparation of comments on proposals by the U.K. pool regarding the pricing of transmission losses and the role of demand-side bidding.

- For a European transmission company, he provided an analysis of the likely development of the European electricity market. He also assessed the market implications for the transmission company of modifications to the transmission grid.

- Assisted a U.S. electric utility in the preparation of a bid proposal to an industrial firm for the leasing of a portion of a new power plant. The assignment included risk analysis of the proposal, assessment of financial and rate impacts, and market assessment of competitors' potential offerings.

- For a U.S. electric utility, he assisted in the valuation of generation assets for use in its testimony on stranded costs. This included developing a financial model to determine the generation assets' market value, development of a convolution algorithm to convert market scenarios into a probability distribution of asset values, and statistical analysis of the relationship of the utility's generation assets' operating costs in comparison to its competitors. The assignment also included testimony preparation, interrogatories, and rebuttals.

- For a Midwest utility, he examined the implications of differing configurations of the independent system operator on potential market power concerns.

- For NSTAR, he provided expert testimony before the FERC with regard to the necessity of imposing bid caps on the New England electricity market.

- For NSTAR, he provided expert testimony at the FERC in their intervention of the granting of market-based rate authority to a New England generator.

- For NSTAR, he provided expert testimony on the appropriate rates for generators during transmission upgrades or enhancements requiring substantial and sustained reduction in transfer capability.

- For Nevada Power Company, he provided expert testimony before the FERC for its market-based rate authority application.

- For Southern California Edison, he submitted testimony before the FERC describing the implications for the electricity market of the manipulation of gas market prices.

- For Edison Mission Energy's subsidiary Midwest Gen, provided expert testimony to the FERC for its market-based rate authority application.

- For the California Parties, Mr. Hanser provided litigation support and testimony regarding manipulation of electric power and natural gas prices in the western U.S. during 200-01. The proceeding, before the Federal Energy Regulatory Commission involved Enron, Dynegy, Mirant, Reliant, Williams, Powerex and many other suppliers in the U.S. and Canada.

- For Sierra Pacific Resources Company, he provided expert testimony before the Public Utilities Commission of Nevada and the FERC, regarding the market power implication of generation asset divestiture required for the merger of Sierra Pacific Power and Nevada Power Company.

- For the Public Service Company of New Mexico, he provided expert testimony before the Public Utilities Commission of New Mexico regarding the forecasted growth of the El Paso and Juarez, Mexico markets and their electricity requirements.

- For Vermont Public Service, he provided expert testimony on the impact of its demand-side management programs before the Public Service Commission of Vermont.

- For the investor-owned utilities of Wisconsin, he provided testimony before the Public Service Commission of Wisconsin on the cost of capital.

- For the Pennsylvania—New Jersey—Maryland Interconnection, LLC (PJM) he co-authored the first annual report on the state of its markets. The report included an assessment of the Market's competitiveness and potential structural deficiencies, and identified potential instances of market abuse.

- For PJM, he developed an ensemble of metrics for assessing market power in its markets. The metrics included an early warning system to permit PJM interventions into market abuse at the earliest possible stage.

- For PJM, he developed software for unilateral market power assessment and assisted PJM in its preliminary implementation. Its use was demonstrated with an incident involving potential market power abuse by PJM members.

- He co-authored a report assessing the reliability implications of the New York Independent System Operator's (NYISO) modification of its rules regarding installed capacity.

- Before staff members of the FERC, he assisted in the development of a review of the implications of the restructuring in transmission assets' cost of capital.

- For a Midwest utility, provided expert testimony in Federal Court on the regulatory and rate base implications of the Clean Air Act Amendments, in support of the calculation of noncompliance economic damages.

- Assessed the liability risk of an insurance company that provided coverage relevant to a mass tort suit.

- Designed a statistically valid database sampling procedure for assessing the validity of insurance claims arising from mass tort actions.

REPRESENTATIVE PAST EXPERIENCE

- For a gas utility, he assisted in the development of potential manufactured gas liabilities for use in insurance recovery. For this assignment, he assisted in estimating potential recovery under a variety of insurance allocation theories and estimated the risk distribution of the estimates.

- He assisted a gas utility in the development of an assessment of the announcement effect of environmental liabilities on its cost of capital. This assignment included estimation of changes in betas for pre- and post- environmental liability announcement.

- For an international development bank, he assisted in a generation resource needs assessment for an Eastern European country as well as a determination of alternative means to meet those generation needs. This assignment included an evaluation of the impact of privatization on the country's economy, its import and export sectors and future development of Russian electricity and gas resources.

- For a California utility, he supervised short- and long-term forecasts of sales and peak demand for use in resource and corporate planning. He supervised and helped prepare forecast documentation for public hearings before the California Energy Commission and represented the utility to the Commission on the forecast. He supervised the design and implementation of long-term strategic planning and financial models for the utility, and prepared both marginal and embedded cost of service studies for the utility and assisted in their use for the design of customer rates. He evaluated the impact of energy conservation programs and legislation on long-term system resource requirements. Designed and implemented the residential survey of appliance holdings and commercial customer equipment survey. He also designed and implemented the load research survey for use in PURPA 133 submittals and cost of service studies.

- For the Electric Power Research Institute (EPRI), he was responsible for developing and directing a research program to provide electric utilities the following capabilities: marketing, marketing research, pricing and rate design, integrated resource planning,

capital budgeting, environmental impacts of electric utilities and end-use technologies, load research, forecasting, and demand-side management through software tools, database development and technology development. He served as the final project manager of the Edison Electric Institute (EEI), Natural Rural Electric Cooperatives Association (NRECA), American Public Power Association (APPA), and National Association of Regulatory Utility Commissioners (NARUC) jointly sponsored Electric Utility Rate Design Study (EURDS). Represented the Institute before various regulatory commissions, Federal agencies, and utility executives. He served on the Environmental Protection Agency's advisory committee for the Clean Air Act Amendments. He also served as the operating agent for Annex IV, Improved Methods for Integrating Demand-Side Options into Utility Resource Planning, of the International Energy Agency Agreement on Demand-Side Management.

ACADEMIC HISTORY

Guest Lecturer, Energy Laboratory Short Courses, Massachusetts Institute of Technology, Cambridge, MA	1997-1998
Visiting Lecturer, Department of Economics, University of California, Davis; Davis, CA	1981-1982
Assistant Professor, Department of Economics and Mathematics, University of the Pacific, Stockton, CA	1975-1980
Ph.D. Candidacy Requirements Completed, Columbia University, NY	1975
Phil.M. (Economics and Mathematical Statistics) Columbia University	1975
A.B. (Economics and Mathematics) The Florida State University, FL	1971
Time Series and Econometric Forecasting, University of California at Berkeley Engineering Extension Course	September 1979
Data Analysis and Regression, American Statistical Association Short Course, San Diego, CA	August 1978

PROFESSIONAL MEMBERSHIPS

American Statistical Association, Member of Committee on Energy Statistics, 1993-1999
Institute of Electrical and Electronics Engineers
Association of Energy Service Professionals, Board Member, 1991-1995, *Journal of ADSMP*, Editor, 1995 American Economic Association

HONORS

Who's Who in the West	1984
Teaching Incentive Award, University of the Pacific	1979
Outstanding Young Men of America, Junior Chamber of Commerce	1980
Teaching Assistantship in Econometrics, Columbia University	1974
National Science Foundation Research Traineeship	1972-1974
Undergraduate and Graduate Research Assistantships, Florida State University	1968-1972
Omicron Delta Epsilon, Economics Honor Society	1971

PUBLICATIONS AND PRESENTED PAPERS

"Does SMD Need a New Generation of Market Models? Or How I Learned to Stop Worrying and Enjoy Carrying a Pocket Protector," SMD Conference, Washington D.C, December 5, 2002.

"Standard Market Design in the Electric Market: Some Cautionary Thoughts," SMD Conference, May 10, 2002, Chicago, Illinois.

"The Design of Tests for Horizontal Market Power in Market-Based Rate Proceedings" (with James Bohn and Metin Celebi), *The Electricity Journal*, May 2002.

"The State of Performance-Based Regulation in the U.S. Electric Industry" (with D.E.M. Sappington, J.P. Pfeifenberger, and G.N. Basheda), *The Electricity Journal*, October 2001.

"Deregulation and Monitoring of Electric Power Markets" (with R.L.Earle and J.D. Reitzes), *The Electricity Journal*, October 2000.

"Lessons from the First Year of Competition in the California Electricity Market" (with R.L.Earle, W.C. Johnson, and J.D. Reitzes), *The Electricity Journal*, October 1999.

"In What Shape is Your ISO?" (with J.P. Pfeiffenberger, G.M. Basheda and P.S. Fox-Penner),
The Electricity Journal, Vol. 11, No. 6, July 1998.

"What's in the Cards for Distributed Resources?" (with J. P. Pfeifenberger and P.R. Ammann), in Special Issue of *The Energy Journal, Distributed Resources: Towards a New Paradigm of the Electricity Business*, January 1998.

"One-Part Markets for Electric Power: Ensuring the Benefits of Competition" (with F.C. Graves, E.G. Read, and R.L. Earle), in *Power Systems Restructuring: Engineering and*

Economics, ed.
M. Ilic, F. Galiana, and L. Fink, (Boston, MA: Kluwer Academic Publishers, 1998)

"Power Market Price Forecasting: Pitfalls and Unresolved Issues" (with R.L. Earle and F.C. Graves), forthcoming in *The Energy Journal.*

Five EPRI reports and approximately 20 articles in EPRI Reports and Conference Proceedings.

"Insurance Recovery for Manufactured Gas Plant Liabilities" (with G.S. Koch and K.T. Wise), *Public Utilities Fortnightly*, April 1997.

"Real-Time Pricing-Restructuring's Big Bank?" (with J.B. Wharton and P. Fox-Penner), *Public Utilities Fortnightly*, March 1997.

"Load Impact of Interruptible and Curtailable Rate Programs" (with D.W. Caves, J.A Herriges, and R.J. Windle), *IEEE Transactions on Power Systems*, Vol. 3, No. 4, November 1988.

"Estimating Hourly Electric Load with Generalized Least Squares Procedures" (With N. Toyama and C.K. Woo.), *The Energy Journal*, April 1986.

"Transfer Function Estimation Using TARIMA," *SAS User's Group International, 1982 Proceedings*. Cary, North Carolina: SAS Institute. Inc., 1982.

"Invited Editorial Response to Behavioral Community Psychology: Integrations and Commitments," by Richard Winett, *The Behavior Therapist* 4(5), Convention, 1981.

Statistics Through Laboratory Experiences (with D. Christianson and D. Hughes), Stockton, CA: University of the Pacific 1976-1977.

"Unsolved Advanced Problem," *American Mathematical Monthly*, May 1975.

"Multiattribute Utility Theory and Earthquake Mitigation Policy" (with T. Munroe), Western Economic Association Conference, June 1978.

"Introduction to Multivariate Data Analysis Techniques," Bureau of Applied Social Research, Columbia University, New York, NY, 1973.