

**STATE OF VERMONT
PUBLIC SERVICE BOARD**

Docket No. 7081

**Investigation into Least-Cost Integrated Resource)
Planning for Vermont Electric Power Company, Inc.'s)
Transmission System)**

DIRECT TESTIMONY

OF

PAUL R. PETERSON

ON BEHALF OF

CONSERVATION LAW FOUNDATION

October 26, 2006

Q. Mr. Peterson, please state your name and business address.

A. My name is Paul R. Peterson. I am a Senior Associate at Synapse Energy Economics, Inc., 22 Pearl Street, Cambridge, MA 02139.

Q. On whose behalf are you testifying in this case?

A. I am testifying on behalf of the Conservation Law Foundation.

Q. Mr. Peterson, please summarize your educational background and recent work experience.

A. I have twenty-six years of experience with electrical energy policy issues through work with the University of Vermont Extension Service, the Vermont Public Service Board, ISO New England, the operator of the regional electric grid for New England, and, since March 2001, with Synapse Energy Economics. Over the last 9 years, I have worked on electric restructuring issues directly related to the six New England states, regional wholesale power markets, and Federal Energy Regulatory Commission (“FERC”) initiated proceedings. I currently represent clients in the New England Power Pool (“NEPOOL”) Committee meetings and I am the voting representative at NEPOOL governance meetings. I have recently testified in proceedings before state regulatory commissions in Nevada, Arizona, Arkansas, Rhode Island, and Texas in regard to issues related to regional transmission organizations and wholesale electricity markets. I have also testified before the Connecticut Siting Council in 2002 on Northeast Utilities’ proposed 345kV transmission line between Bethel and Norwalk, Connecticut. In 2003, I participated in a review of a proposed transmission line upgrade in York

County Maine. My most recent testimony was before this Board in regard to the Northwest Reliability Project on behalf of the Town of Charlotte in Docket No. 6860.

I have a BA from Williams College and a Juris Doctor degree from Western New England College School of Law.

A copy of my current resume is attached as Exhibit PRP-1.

Q. What is the purpose of your testimony?

A. I was retained by the Conservation Law Foundation to evaluate and provide recommendations regarding a new transmission planning process for Vermont that would address the discrepancies identified by the Vermont Public Service Board in its Order approving the VELCO Northwest Reliability Project (NRP) and its Order opening this docket.

Q. Please summarize your testimony.

A. My testimony identifies the process that needs to be in place to evaluate non-transmission alternatives (NTAs) on a comparable basis with transmission facilities to ensure that Vermont's electricity is reliably transmitted at least cost. My testimony also explains why the system put forth in the proposed Memorandum of Understanding submitted by the other parties in this proceeding (7081 MOU) is flawed and will not achieve the objectives set out by the Board for this proceeding.

Q. Please describe the components of a transmission planning process that effectively incorporates evaluation and implementation of NTAs.

A. An effective transmission planning process that allowed for the fair evaluation and implementation of NTAs would include the following:

- I. Multiple base case scenarios over a 20 year planning horizon for the existing system that evaluate the criteria below and utilize various planning tools:
 - a. Load growth estimates for various regions of VT
 - b. Generation additions/retirements and power contracts in VT
 - c. Planned transmission enhancements in VT and New England
 - d. Imports and exports within New England and outside New England
 - e. Identify reliability and economic congestion thresholds using both deterministic and probabilistic planning tools as done by ISO-NE in its Regional System Plan process.
 - f. Utilize scenario planning sensitivity analyses and market efficiency planning tools.
 - g. Identify problems by geographic scope (sub-region v. statewide)

- II. Transmission enhancements warranted from base case scenarios
 - a. Identify base case transmission upgrades
 - b. Determine cost of base case transmission upgrades within a +/- 20% accuracy as done for NEPOOL facilities studies.
 - c. For each transmission upgrade, specify megawatt equivalent of alternative solutions in terms of total dollar cost.

- d. Provide opportunity for public review of base case analyses.
- III. Identify alternative system enhancements (non-transmission alternatives) over the base case planning horizons similar to the Optimal study done that was done for VELCO as part of the Northwest Reliability Project. The analysis of alternatives should be both regional and local as determined by the base case scenarios, and should, at a minimum, include:
- a. Energy efficiency load reductions
 - b. Small-scale distributed generation
 - c. Demand response as a “generator”
 - d. Merchant transmission projects
 - e. Combinations of alternatives
- IV. Provide a market test that allows a wide range of solutions to come forward and be considered. It should:
- a. Specify the criteria for evaluating alternative proposals and transmission upgrades.
 - b. Use the Societal Test for comparing alternatives as required by Vermont law and Board precedent.
 - c. Identify cost bandwidths for alternatives (+50%) to capture uncertainty of transmission upgrade costs and to capture the reduced impacts of most non-transmission solutions

- d. Establish a public review process that effectively incorporates public input for evaluating options.
- V. Identify funding options that treat NTAs equivalent to transmission alternatives. These may include:
- a. Inclusion in transmission tariffs
 - b. Utility funding by one or more distribution utilities
- VI. Over-arching issues
- a. Encourage a decoupling or similar provision for VT distribution utilities to reduce the disincentive for DSM and DG solutions that exists when increased energy sales results in increasing revenues and profit
 - b. Provide for an independent entity to be responsible for ensuring a fair evaluation of NTAs. Possibilities include:
 - i. Independent agent of the Board specifically assigned to this task.
 - ii. Expanded Efficiency Vermont role
 - iii. A small three member panel of utility, government and public members.
 - c. Provide specific and consistent standards for the “ability to serve” information that is provided to Act 250 commissions. Possibilities include:
 - i. Specifying “zero” net electrical impact for new development
 - ii. Specifying “zero” net peak load impact for new development

iii. Establishing a sliding scale of development payments for improved energy efficiency and self-generation

d. Develop effective means and opportunities for the public to provide meaningful and informed input into the evaluation and decision making process and require the incorporation of the public input into decision making at all levels.

Q. Does the 7081 MOU provide for such a process?

A. No it does not. While some of these measures are included, overall the 7081 MOU establishes a flawed process that perpetuates many of the existing failures in transmission planning.

Q. Please summarize those failures.

A. The 7081 MOU fails to establish a process, as required by Vermont law, to select a least cost solution for the reliable transmission of electricity. The 7081 failures can be summarized as follows:

a) the Vermont System Planning Committee (VSPC) proposed in the 7081 MOU will create a cumbersome and ineffective bureaucracy without authority or independence to effectively ensure NTAs are fairly identified and evaluated;

b) the opportunity for public input is limited and unlikely to affect any decisions;

c) the responsibility for evaluating and implementing NTAs is left to individual distribution companies and perpetuates the development of solutions in a piecemeal, ineffective and inefficient manner;

d) the standard for reviewing NTAs is deficient because it fails to rely on the societal test that has been incorporated into Vermont law and Board Orders for over fifteen years; and

e) the funding for NTA solutions is so radically different than the funding for transmission facilities that it ensures the continued bias towards traditional transmission solutions, even when they are not the least cost solution.

f) no projects should be exempt from the new process.

Each of these reasons is described in greater detail in my testimony.

Q. Please describe the structure of the VSPC and your concerns with that structure.

A. As described in the 7081 MOU, the VSPC will have representatives from all of Vermont's distribution utilities (DUs) and three public members appointed by the Board for five year terms. VELCO will provide administrative support for the VSPC. The DPS and any "efficiency utility" delivering statewide programs that is not a DU will be non-voting members. This structure will ensure that traditional utility viewpoints and perspectives will always dominate the evaluation and decision process for addressing system needs. As a practical matter, to the extent non traditional alternatives are considered, they will have to be advocated for by the three public members against both the financial interests of the DUs and the existing biases embedded in years of distribution utility planning and operations. The recent experience of the NRP shows that it was only non-utility entities – a municipality and CLF – that advocated for fair consideration of NTAs.

Furthermore, the size of the VSPC and the very bureaucratic process it operates under fails to provide for an efficient process. Also, the VSPC has very limited authority and is little more than a dispute resolution procedure. It is a cumbersome process that adds little value in terms of effectively evaluating NTAs.

Q. What would be a better structure for the VSPC?

A. A VSPC that is separate and independent would be the best structure. It could be a three member board with its own staff for reviewing and analyzing both VELCOs Transmission Plan and ensuring a fair analysis of NTAs is undertaken. It would be responsible for the public review processes and for recommending solutions for identified problems. It would be responsible for recommending a least cost solution and would provide that recommendation to VELCO and /or the DUs for implementation. There could be an appeal process to the Board to resolve disputes. Such a process would be more likely to produce “least cost” solutions for transmission problems within the meaning of Vermont law because it would create an entity that is specifically responsible for and focused on the many alternatives for resolving transmission related problems. It would not be just another, and likely lower priority, focus for the many utility members. As one entity it would have a broader perspective and could better consider the inter-relationships of projects instead of being focused only on individual utility interests.

Q. Please describe your concerns regarding the opportunity for public input.

A. The MOU proposes three steps where public input would be sought: step 5, after VELCO has produced its draft Transmission Plan; step 8, during the development of detailed NTAs; and step 9, the selection process and cost allocation for solutions. However, the MOU provides no mechanisms for the public to actively engage in the development of the Plan, NTAs, or solutions. The public input is reactive, not active. The public will be provided opportunities to comment on the proposals produced by a utility dominated process, both the initial proposals and the VSPC review of those proposals. The public will not have an opportunity to participate in the development of the initial Plan, review of the Plan, or the development of solutions.

Q. What opportunities for public involvement would you propose?

A. First, the public involvement process should do more than just consider public input. There should be mechanisms for the public's input to change or alter a decision and not simply allow the public input to be ignored. In reference to the "IP2 Public Participation Spectrum" that is included as Exhibit D to the 7081 MOU, the public process should include provisions that "Empower" participation as well as the other levels identified. Second, there should be mechanisms to provide for better informed public participation including some means to provide access to independent experts and information.

It is also difficult to separate the public involvement issue from the VSPC structure issue. Having a VSPC that is truly independent from utility dominance

is a critical precondition for effective public involvement. Lacking that independence, the VSPC could develop any number of charades to pretend that there is meaningful public involvement in its analysis of the Plan, problems, and solutions. If we assume that the VSPC proposed in the MOU has been restructured along the lines I discuss above, then effective public involvement becomes easier to incorporate. First, the public could interact with the VSPC staff through informal or formal processes. Second, the VSPC could have the authority to provide matching grant money to entities that want to focus on specific alternatives or options. This would be an enhancement to the VSPC staff's own analyses and review. Third, the VSPC could require VELCO and the DUs to respond to public suggestions, questions, or analyses in order to fully develop options and alternatives before the VSPC makes decisions. There are probably additional steps that the VSPC could implement over time to further enhance effective public involvement.

Q. What are your concerns with letting DUs evaluate alternatives to traditional transmission solutions?

A. Over twenty years ago, VELCO was created to provide integrated, comprehensive solutions to transmission-related problems. Distribution utilities were viewed as less likely to develop such solutions on their own. Similarly the Energy Efficiency Utility (EEU) was created to replace a fractured system for efficiency and allow an independent entity to have comprehensive responsibility for acquiring energy efficiency resources. That same logic applies to NTAs. Allowing twenty-one different entities to individually consider non-transmission

options and making them responsible for implementing those NTAs where they are a better solution to specific problems will lead to an inefficient and likely ineffective patchwork quilt instead of a consistent, coherent, and seamless approach. The individual ability of Vermont DUs to address NTA options varies widely. Each DU will have a different experience with NTAs and a different learning curve for understanding and evaluating options. The goal should be to develop solutions to local problems that can be integrated with other local solutions as well as statewide and regional enhancements to the New England bulk power system. Such a goal is not served by relying on twenty-one different decision makers who focus primarily on their specific, local issues.

Q. What would be a better approach for evaluating proposed solutions?

A. There needs to be an independent entity with a statewide perspective and a broad responsibility to identify and evaluate solutions to transmission related problems, whether those problems are regional, statewide, or local. For regional issues, ISO New England often takes the lead role, in consultation with VELCO and DUs as appropriate, in regard to transmission solutions. VELCO performs a similar function for statewide and local transmission problems; it is the lead entity in consultation with affected DUs. The statewide perspective on NTAs could be provided by VELCO in coordination with Efficiency Vermont and the independent VSPC discussed above. It is also possible that VELCO or Efficiency Vermont could be specifically designated as the entity to develop coordinated and consistent approaches for the evaluation of NTA solutions. These options would most closely approximate the creation of a “board agent” or similar type structure.

Within the context of the MOU proposed in this docket, the VSPC could be modified to make it more independent of utility control and with the authority (and funding) to support its own staff's efforts to identify and evaluate alternatives.

The requirement should be to ensure that there is an honest and fair evaluation of all alternatives, that the alternatives are vetted through an open public process, and, ultimately, that there is a recommendation for a least cost solution. The recommendation is then presented to VELCO or the DUs for implementation. It would then become the obligation of the entity charged with implementation to go forward with the implementation or defend its decision not to go forward (as well as any alternative approach that it proposed) before the Board.

Q. Please describe your concerns with the evaluation standards that will be used to screen NTAs.

A. This is one of the most serious flaws of the 7081 MOU. Instead of a simple declaration that the societal test will be the final arbiter of alternative solutions, the 7081 MOU identifies several specific cost effectiveness analyses that will be considered, as well as any yet unknown analyses that might be appropriate. For the last fifteen years, the Board has consistently applied the societal test as the appropriate means of screening resource options. Title 30 of Vermont Statutes specifies that least cost planning includes an evaluation of "lowest present value life cycle cost, including environmental and economic costs" as part of a strategy that combines investments and expenditures on traditional and non-traditional options. The development and implementation of utility least cost plans, pursuant

to Title 30 and the Board's Order in Docket 5270, has included the use of the societal test as the principal means of screening alternatives. The 7081 MOU is a significant departure from this long line of historical precedents. Two more examples specifically relate to the subject matter of this 7081 MOU. In Docket No. 6290, regarding guidelines for distributed utility planning, an MOU filed with the Board in January 2003 specified that a DU would select the "optimal investment strategy, determined under the societal test as defined in Docket No. 5270". In Docket No, 5980, regarding the DPS' proposed Energy Efficiency Plan, the societal test is mentioned several times in connection with the screening of energy efficiency measures, for distributed utility planning (DUP), and when considering the cost-effectiveness of *alternatives to a new transmission and distribution investment*. There is even a statement that state law requires the Board to ensure that the public's need for energy services is met at the lowest total societal cost. The 7081 MOU under review in this docket proposes to reverse Vermont's established criteria for evaluating alternatives, leading to less likelihood that least cost alternatives will be utilized.

Q. What is your recommendation to the Board?

A. The Board should not accept this MOU without requiring a modification to its terms that requires the continued use of the societal test as the decisional screening tool.

Q. What are your concerns regarding the proposed funding of NTAs that are selected as preferred solutions over traditional transmission projects?

A. Historically, transmission projects that provide regional system benefits are funded on a regional basis and paid for by all New England ratepayers. Vermont Act 61 made it an affirmative obligation of VELCO and the DUs to advocate for comparable treatment for NTAs. This is particularly significant for Vermont because Vermont pays only its pro-rata share of peak load for reliability upgrades. Currently, Vermont's pro rata share is approximately 4% (1200 MW peak load divided by a 28,000 MW New England peak). That means that for every \$100 of a traditional reliability upgrade, Vermont pays \$4.

Vermont Act 61 made it an affirmative obligation of VELCO and the DUs to advocate for comparable treatment for NTAs. However, the 7081 MOU ignores this requirement of Act 61 when it proposes that the cost of NTAs will be fully charged to Vermont ratepayers alone. This will make it extremely difficult, if not impossible, for an NTA solution that has a lower overall cost to be selected over a traditional transmission solution for a regional reliability issue. This is precisely one dilemma that the Board wrestled with in its review of VELCO's NRP transmission proposal and led to the investigation in this docket.

Q. What is your recommendation on how to address this disparity in the treatment of alternative solutions?

A. Transmission and NTAs should be treated the same. The MOU proposes that for solutions that address Vermont reliability needs (as distinct from regional reliability needs) that generation and energy efficiency alternatives will be funded in the same manner as traditional transmission solutions. That is, if the costs of the traditional transmission solution would have been shared among the Vermont

DUs, then the costs of the NTA alternatives would have the same cost sharing formula. This is the approach that can and should be adopted for solutions to regional reliability problems, too.

Q. What is your recommendation?

A. Vermont's transmission planning process should support the obligation of the DPS and the Vermont DUs under Act 61 to seek shared funding for NTAs and allow them to be funded regionally on the same basis as transmission solutions.

Q. Do you have any additional concerns about the treatment of NTAs in regard to cost allocation?

A. Yes. The 7081 MOU introduces an alternative approach that would assign the costs of an energy efficiency NTA as a "territory-specific adder" to the current energy efficiency charge (EEC). My concern is that this creates an additional burden on an energy efficiency alternative compared to a transmission solution. Transmission solutions are incorporated into the relevant portions of the VELCO and DU transmission tariffs and charged to all ratepayers. The 7081 MOU proposal to create a "territory-specific adder" for an energy efficiency alternative means that a much smaller group of ratepayers will be assigned the costs of the solution. This will likely diminish customer support for an energy efficiency solution and may result in an overall more costly option being selected. Such a result is not consistent with the requirements of "least cost planning" as specified in Vermont statutes and in Board Orders.

Q. What are your concerns regarding the 7081 MOU exemption for projects?

A. The 7081 MOU attachment F exempts an extensive number of projects from the new process. The standard should be that all projects should be evaluated under the new process. Limited exemptions should be allowed by the Board only upon specific request with appropriate justification. The extensive exemptions provided for in Attachment F merely perpetuate the existing inadequate process longer.

Q. Is it your recommendation that the Board should reject this 7081 MOU?

A. There is a lot of hard work that went into the creation of this 7081 MOU. The Board could adopt large portions of this 7081 MOU with very few changes. However, if the Board does not modify the 7081 MOU consistent with the recommendations I have made to change the VSPC, provide more meaningful public input, improve the process for identifying and evaluating NTAs, ensure comparable funding options for NTAs, and limit the exemptions, then the Board should reject the 7081 MOU. Without these essential changes, the 7081 MOU will not resolve the concerns regarding the transmission planning process that the Board identified in Docket No. 6860, that the legislature sought to address in Act 61, and for which this investigation was initiated.

Q. Does this conclude your testimony?

A. Yes.

EXHIBIT PRP-1

Paul R. Peterson

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EMPLOYMENT

Synapse Energy Economics Inc., Cambridge, MA. Senior Associate, March 2001 - present. Provide consulting services on a variety of energy and electricity related studies. Represent New England consumer advocate and environmental concerns in NEPOOL and ISO New England working groups. Monitor reliability and markets issues in PJM Interconnection on behalf of consumer advocate clients in DC, IL, OH, and PA. Participate in FERC proceedings on market design issues.

ISO New England Inc., Holyoke, MA.

Coordinator of Regulatory Affairs, 2000 – 2001.

Coordinate regulatory activities with individual state public utility commissions, the New England Conference of Public Utilities Commissioners (NECPUC), and the Federal Energy Regulatory Commission (FERC). Assist the General Counsel on a variety of specific tasks and documents; draft letters and reports for the Chief Executive Officer.

Public Information and Government Affairs, 1998 – 1999.

Worked with all ISO-NE constituencies including NEPOOL Participants, regulatory agencies, and stakeholder groups in large-group and small-group formats. Developed and presented materials that described ISO-NE's functions, special projects (including Year 2000 rollover issues), and future evolution.

Vermont Public Service Board, Montpelier, VT.

Policy Analyst, 1997 - 1998.

Monitored House and Senate legislation on electric restructuring; helped coordinate the passage of Senate Bill S.62 in 1997. Coordinated the New England Conference of Public Utilities Commissioners (NECPUC) activities regarding NEPOOL restructuring; assisted in drafting documents to create an Independent System Operator (ISO) for New England. Worked on New England task forces to develop a model rule for electric disclosure projects for consumer information and regulatory compliance.

Utilities Analyst, 1990 - 1997.

Reviewed regulated utility filings for changes in rates; judicial Hearing Officer for contested cases on a wide range of topics; wrote all decisions regarding annual utility applications for Weatherization Tax Credits. Focused on integrated resource planning and electric industry restructuring; initial Hearing Officer for the Energy Efficiency Utility docket. Chaired the Staff Energy Committee of NECPUC.

Energy Analysis, Burlington, VT. Consultant, 1990.

Energy-efficiency program design and evaluation.

UVM Extension Service, Burlington, VT.

Area Energy Agent, 1985 - 1990.

Performed tasks pursuant to an annual contract with Vermont Department of Public Service to conduct energy research, design energy efficiency programs and provide public education (see attached list of publications).

Home Energy Audit Team (H.E.A.T.), 1978 - 1985.

Home energy audits; energy surveys for commercial, municipal, and non-profit buildings; energy education and information.

The Close-Up Foundation, Washington, D.C. Program Administrator, 1975 - 1978.

Directed weekly government studies program for 200 high school students and teachers; supervised a staff of fifteen; coordinated curriculum and logistical aspects of program.

EDUCATION

Admitted to Vermont Bar, February 1992

Western New England College School Of Law, Springfield, MA.

Juris Doctor degree, cum laude, May 1990

American Jurisprudence Award: Remedies, 1989

Merit Scholarship recipient

Student Bar Association Representative

Williams College, Williamstown, MA

Bachelor of Arts degree, cum laude, June 1974

Political Science and Environmental Studies

Tyng Scholarship recipient

National Judicial College, Reno, NV

Administrative Hearings, Sept., 1994

Civil Mediation, March, 1996

Civil Mediation, July, 1997 (faculty assistant)

American Inns of Court, Northern Vermont Chapter

1995-1996, member

1996-1997, member

Continuing Legal Education, Vermont Bar Association

Americans with Disabilities Act, April 1992

Ethical Issues/Governmental Agencies, October 1992

Advance Medical Directives, May 1993

Family Law Workshop, September 1993

Negotiating Settlements, May 1994

Physician Assisted Suicide Symposium, October 1996

Electric Industry Restructuring, March 1999

Advance Medical Directives, May 1999

International Law Update, June 2000

UVM Continuing Education, Brattleboro, VT
Small Computer Course, Spring 1983
Communications Workshops, Spring 1983 & Spring 1984

PUBLICATIONS & PROJECTS

SYNAPSE ENERGY ECONOMICS

An RPM Case Study: Higher Costs for Consumers, Windfall Profits for Exelon: A study of the impacts of PJM's Reliability Pricing Model for the Illinois Citizens Utility Board, by Ezra Hausman, Paul Peterson, David White, and Bruce Biewald, October 18, 2005.

Capacity Revenues for Existing, Base Load Generation in the PJM Interconnection: A Pennsylvania Case Study: A report on the impacts of PJM's Reliability Pricing Model for the Pennsylvania Office of Consumer Advocate by Paul Peterson, David White, and Bruce Biewald, June 10, 2005.

Capacity for the Future: Kinky Curves and Other Reliability Options: A report on various approaches to pricing capacity resources for Northeast Consumer Advocate Offices, by Paul Peterson, David White, Amy Roschelle, and Bruce Biewald, December 20, 2004.

FERC's Transmission Pricing Policy: New England Cost Impacts: A report on the cost impacts of FERC's proposal to provide incentives to transmission owners through PL03-01-000 for New England Consumer Advocate Offices, by Paul Peterson, David White, Nick Doolittle, and Amy Roschelle, September 29, 2003.

The New England Experiment: An Evaluation of the Wholesale Electricity Markets: A report on the evolution of the New England electricity markets prepared for New England Consumer Advocate Offices by Paul Peterson, David White, Bruce Biewald, and Cliff Chen, June, 2003.

Financial Insecurity: The Increasing Use of Limited Liability Companies and Multi-Tiered Holding Companies to Own Nuclear Power Plants: A Synapse Energy Economics, Inc. report prepared for the STAR Foundation and Riverkeeper, Inc., by David Schlissel, Paul Peterson, and Bruce Biewald, August 7, 2002.

Best Practices in Market Monitoring: A Survey of Current ISO Activities and Recommendations for Effective Market Monitoring and Mitigation in Wholesale Electricity Markets, prepared for the Maryland OPC, the Pennsylvania OCA, the Delaware DPA, the New Jersey DRA and the OPC of DC, November 2001.

The Other Side of Competitive Markets: Developing Effective Load Response in New England's Electricity Market, prepared for The Maine Department of Attorney General and the Maine Office of the Public Advocate, June 2001.

Clean Air and Reliable Power: Connecticut HB 6365 Will Not Jeopardize Electric System Reliability, prepared for The Clean Air Task Force on behalf of The Connecticut Coalition for Clean Air, May 2001.

UNIVERSITY OF VERMONT EXTENSION SERVICE

Residential Construction Survey, Survey of Vermont new home construction for construction techniques, energy-efficient design, appliance loads, etc. 1986, 1989.

Vermont Vacation Home Energy Study, Survey of vacation home energy consumption and impact on Vermont statewide electrical demand. 1989.

Dairy Farm Energy Use, A detailed examination of electrical energy consumption on forty Vermont dairy farms to identify opportunities for improving energy-efficiency. 1987.

Mobile Home Booklet, A fresh look at energy saving opportunities for mobile homeowners. Specific problems of cold climates are addressed. 1987.

Dairy Farm Energy Project, Implemented \$400,000 grant from Vermont Department of Agriculture for installation of milk-cooling equipment that also produced hot water. 1989.

Vocational Building Trades Instructors, Annual workshops on energy-efficient construction practices for the teachers of Vermont building trades students. Classroom presentations on selected topics. 1986 - 1989.

Brattleboro Community Energy Education Project, Coordinated a Central Vermont Public Service Company funded project to promote energy-efficiency awareness through community programs. 1985.

TESTIMONY

Arkansas Public Utilities Commission (2006): Resource Planning Guidelines for Electric Utilities and Consideration of Sec. 111(d)(12) of the Energy Policy Act of 2005 (Docket No. 06-028-R)

Texas Public Utilities Commission (2004): Petition of Entergy Gulf States for Certification of an Independent Organization for the Entergy Settlement area in Texas (Docket No. 28818)

Rhode Island Energy Facilities Siting Board (2004): Narragansett Electric Company E-183 115kV Transmission Line Relocation Project (Docket No. SB-2003-1)

CT Siting Council (2003): CL&P Application for a Transmission Facility (Docket No. 217)

Arizona Corporations Commission (2002): APS Generic Proceeding on Electric Restructuring (Docket No. E-00000A-02-00051)

Nevada Public Utilities Commission (2002): NPC Wholesale Markets Cost Recovery (Docket No. 01-11029)

PROFESSIONAL CONFERENCES

Federal Energy Regulatory Commission Conference, Philadelphia, PA. March 2001.

National Association Of Regulatory Utility Commissioners, Washington, DC. 1998 - 2000

Advanced Integrated Resource Planning Seminar, Berkeley, CA 1995

ACEEE Summer Study, Pacific Grove, CA 1992 & 1994

1991 DOE Low-Level Radioactive Waste Conference, Atlanta, GA

Resume dated September 2006.