

*Proposal to Provide a*

# **Comprehensive Management Audit of Iberdrola S.A., Iberdrola USA, New York State Electric & Gas, and Rochester Gas & Electric**

**Case 10-M-0551**

*Submitted to*

**New York State Public Service Commission**

*January 24, 2011*



**Shaw**® Shaw Consultants International, Inc.

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January 24, 2011

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**Proposal to Provide a Comprehensive Management Audit of  
Iberdrola, S.A., Iberdrola USA, New York State Electric & Gas, and Rochester Gas & Electric  
Case 10-M-0551**

To Whom It May Concern,

Shaw Consultants International, Inc., in association with KBL, LLC (collectively the “Shaw Team”), is pleased to provide this proposal to the Department of Public Service and to the Secretary of the Commission, to provide a comprehensive management audit of Iberdrola USA’s New York State operating utilities (New York State Electric & Gas and Rochester Gas & Electric) as well as certain aspects of Iberdrola S.A, and Iberdrola USA.

Shaw Consultants International (Shaw Consultants) is an international consulting firm in the broad utility sector with offices throughout the U.S., Canada, the U.K., and Dubai. We provide strategic, economic, business, and technical services that offer value, insight, and expertise to our clients, worldwide. Shaw Consultants has expertise in both management and technical audits including organizational reviews. Through these audits or technical reviews we provide utility management and regulatory commissions an independent assessment of the effectiveness and efficiency of management, strategy, controls, and operations, by reviewing and evaluating the appropriateness of planning and implementation, and by identifying areas in which changes or new approaches could enhance efficiency. In the last five years, we have advised Energie New Brunswick, Barbados Light and Power, Southwest Louisiana Electric Membership Corporation, Hoosier Energy Rural Electric Cooperative, Nova Scotia Power, Public Service of New Hampshire, New Hampshire Electric Cooperative, Vermont Department of Public Service, and the Vermont Electric Cooperative by providing assessments that addressed their overall organizational structure, board effectiveness, system planning and their project management and implementation, business process reviews, and specific management, operating, and technical issues that were key to corporate success. Descriptions of these are highlighted throughout our proposal, and are provided collectively in Section 7. We continue to work with many of these clients to provide periodic

“check-ups” to assess their progress with implementation of our recommendations or to provide further advice relative to implementation.

Our Shaw Team has the added experience of KBL, LLC, an internationally recognized accounting firm that will contribute its expertise to financial and risk management evaluation, as well as provide Spanish language interpretation, should the need arise in discussions with Iberdrola’s Spain-based Board. KBL is located in New York, NY, and is a certified Minority Business Entity (Certificate No. NY1451). Additional information regarding KBL’s expertise is provided in Section 7.

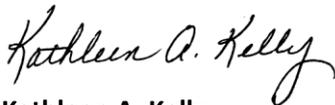
The Shaw Team is committed to meeting the needs of the NYDPS and we have the capability to perform all aspects of the work envisioned in the RFP and contained in our proposal. This review will be performed in accordance with the standards as defined in the RFP and set forth in the National Association of Regulatory Utility Commissioners’ “Consultant Standards and Ethics for Performance of Management Analysis”.

We believe the Shaw Team offers the right combination of practical knowledge and expertise to provide the Commission with a well-balanced, insightful management audit that draws upon our diversity of expertise and understanding. We enjoy meeting with potential clients so that they may become more familiar with our skills and capabilities as part of the RFP process – we find that this in-person dialogue is the best means of expressing our interest in and understanding of client objectives. These informal meetings and discussions provide our team with an opportunity to fine-tune our understanding of client concerns – in the past, we have found that this better enables our team to meet client objectives, which are more difficult to fully appreciate based on one document. It further allows our potential clients to gain a better appreciation for our team’s expertise and capabilities.

If you have any questions or require clarification, please contact me at 617.589.5215, or by email at [kathy.kelly@shawgrp.com](mailto:kathy.kelly@shawgrp.com). We would be happy to meet with you personally or by teleconference to further discuss our qualifications or approach. This is a firm offer for 180 days from the date of this letter.

Sincerely,

**Shaw Consultants International, Inc.**



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# 1 Introduction

Our approach to management and technical audits has been continually refined over the last decade but essentially includes immersion into the client's (or in this case, the utilities') management and operations through the use of document reviews, group meetings, and individual interviews to assess the current state of activities in each area. Due to the size, diversity of systems, and geographical reach of the Company, these interviews will require significant but efficiently managed on-site time to complete. Because the employees are the best source of knowledge when it comes to making their work life easier, we rely on the interviews, coupled with and corroborated by confirmation from reports, documentation, system information, and business process information, to provide significant evidence of underlying inefficiencies and areas for improvement.

Following the collection of utility information, our team also compares and contrasts information on specific activities to other industry information, assessing how well the target utility compares. An important indicator of performance is self-trending, which allows the utility to monitor its own progress according to a target over a number of quarters or years in order to assess performance. This technique is also useful in comparing work management across several geographic service areas. Our team will put together graphical and tabular comparative information that will support our findings and demonstrate the improvement potential from changes we may recommend. Finally, our team meets to discuss and debate among ourselves the observations, analysis and information catalogued as part of this process to enable our team to demonstrate our observations and to provide clear direction to the utility and to the Commission.

During the entire process, we expect the Commission staff to participate in any of the steps through observation of the interviews, participation in our discussions and project meetings, and particularly through our periodic discussion of findings. We utilize these discussions to ensure that our findings are well founded and that there are no surprises when the report is developed. Our report will be developed throughout the project as we will utilize topical summaries that serve as project notes. These summaries will be pieced together to form the report basis and then provided to the Commission staff to review.

Our team is most productive when we work closely with our clients in this process and we welcome a combined team approach – that is participation by the Commission staff, and utility and holding company staff as we move through our project approach.

Our proposal is organized according to the format and content described in the “Guide for Consultants Submitting Proposals for Management and Operations Audits,” last revised by the Office of Accounting and Finance on November 5, 2010. We appreciate the opportunity to provide our approach to the Commission, for consideration; should you have any questions, or require any clarification, please contact our Vice President and Practice Leader, Ms. Kathleen Kelly, at 617.589.5215, or by email at [kathy.kelly@shawgrp.com](mailto:kathy.kelly@shawgrp.com).

## 2 Scope and Objectives

The following section works to demonstrate the Shaw Team’s understanding of the scope, objectives, and deliverables presented in the Commission’s Request for Proposals, and is organized as follows:

- Our understanding of the elements and objectives of an audit – including the three general elements summarized in the Management Audit Manual, prepared by the National Association of Regulatory Utility Commissioners (NARUC) in 1988; and
- Our understanding of the seven-step management audit process, detailed in the same publication referenced above, including descriptions of our own expertise and insights gained from management audits and reviews for past clients.

### 2.1 Our Understanding of the Objectives of an Audit

The Shaw Team presents our understanding of this engagement within the context of the three general elements of an audit:

- **Interest for a certain purpose** – Our team recognizes the Commission’s interest in regularly auditing utility providers within the State of New York and believes that this regulatory practice can be used to highlight effectiveness and best practices within the industry, enhance the Commission’s understanding of utility operations beyond the context of rate proceedings, and provide prospective recommendations to help improve upon utility operations and potential inefficiencies.
- **Search for evidence** – Within Section 3, we present our approach to the management audit of S.A. Iberdrola, New York State Electric and Gas, and Rochester Gas and Electric, which includes our proven approach to collecting, analyzing, and interpreting evidence, in support of a management review. Evidence takes many forms including information collected during interviews, evaluation of operating and management reports, observation of processes and meetings, and comparisons between pieces of evidence and with other industry metrics. Our team has aligned our approach to this audit with both the Commission’s Request for Proposals, as well as with the Management Audit Process presented in Chapter 5 of the “Management Audit Manual, Volume I, Fundamentals of Management Audits”, prepared for the National Association of Regulatory Utility Commissions (NARUC) in November of 1988.
- **Opinion (resulting from an analysis or interpretation of evidence)** – We understand that the paramount objective of this audit is to develop an opinion and associated recommendations relative to nine focus areas, as provided in the Commission’s RFP. Our team also recognizes the importance of reviewing these elements from the perspective of the impact they have on New York State ratepayers within the context of an interstate and international parent company. Through comprehensive interviews with key representatives within the utilities, their parent, and the Board of Directors, compounded with document review and testing of processes and internal controls, our team will develop well-defined, well-supported, global recommendations for consideration and discussion with the Commission Staff and utility representatives.

We understand the macro themes of this work and have completed successful management reviews with past clients that lead to real organizational and process changes, including improved planning processes, enhanced operations, improved communications and reporting, cultural changes, better alignment of responsibilities and

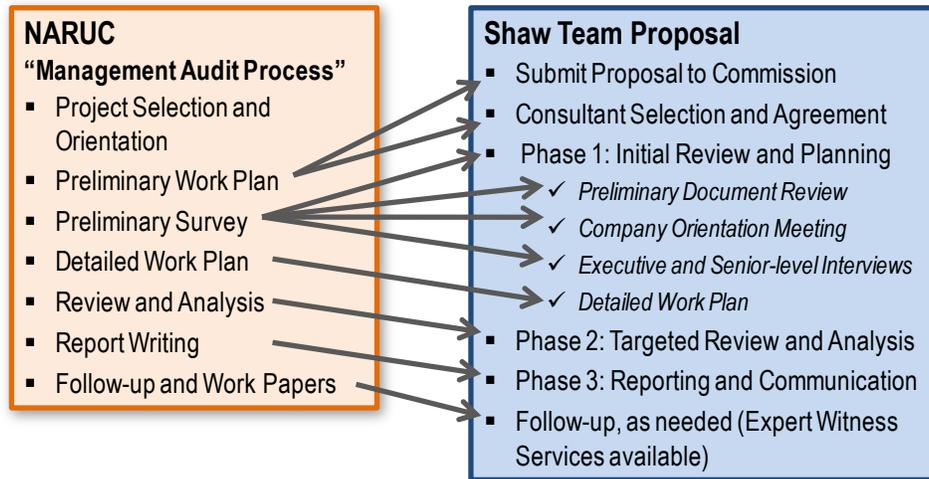
accountability, more focused metrics, and more defined/supported compensation and succession planning. We will work, through this audit, to provide specific opportunities to:

- Improve Processes and Resource – including business and operational planning, strategic decision-making, management of staffing and professional development, and performance measurement, evaluation, and communication;
- Improve Performance – within structured processes, practices, and policies, how to improve performance by increasing efficiency, effectiveness, customer services and focus, employee performance and development goals, and technical indicators like reliability and safety; and
- Develop Recommendations – our team will provide both the identification of areas for improvement, as well as recommendations for how to implement the improvement; these recommendations will be quantified, where appropriate, by potential costs and benefits, as well as the guidelines needed for implementation.

This team has facilitated organizational change and process improvement for many of our clients, including: Nova Scotia Power, Inc., an investor-owned utility and Emera Company in the Canadian province of Nova Scotia; the Southwest Louisiana Electric Membership Corporation (SLEMCO), a private membership corporation providing integrated utility services located in Louisiana; Hoosier Energy R.E.C., a cooperative generation and transmission utility in south-central Indiana; and Vermont Electric Cooperative, a cooperative delivery utility in northern Vermont. Each of these efforts and the insights gained from each are highlighted throughout our proposal, and are provided, together, in Section 7.

## **2.2 The Seven-Step Management Audit Process**

The seven-step process described in the NARUC Management Audit Manual is very similar in style, approach, and scope, to the process our team has used in previous efforts with both utility and non-utility clients. The main tenants that move the auditor through the process include an initial immersion in the subject of the audit, followed by a more detailed, targeted scope of work that is used to lead a more in-depth evidence collection and analysis process – all of which is documented throughout, and culminates in a formal written report, with appropriate review and input from interested stakeholders. The following exhibit compares NARUC’s seven-step management audit process to our proposed approach to providing the Commission with a forward-looking, management and business process review of Iberdrola USA’s operating utilities in New York State. Our approach is more fully defined and described in Section 3 of this proposal.



The remainder of this section highlights the NARUC process, demonstrating our understanding and examples of each of the seven elements. Section 3 of this proposal goes on to describe, in more detail, our proposed approach to executing and managing this audit in a way that meet the Commissions objectives within the timeline required. Section 4 better demonstrates our understanding of and experience developing recommendations for improvement within the nine key audit areas.

### Project Selection & Orientation

We believe that this initial step is completed through New York State’s implementation of Public Service Law, Section 66 (19), which outlines the Commissions power to provide management and operational audits of both electric and gas corporation at least once every five years.

### Preliminary Workplan

This second step in the process is partially completed with the Commission’s issuance of the RFP, which includes a preliminary list of major focus areas that should be targeted in the audit. The Shaw Team provides our understanding of, supporting methodology for, and examination approach to this comprehensive audit in Sections 2, 3, and 4, respectively.

### Preliminary Survey

Upon selection, our team will begin a preliminary document and data review in order to better equip ourselves for discussions with the Commission Staff and utility personnel, and for formulating a more detailed workplan. We see this preliminary survey step as an opportunity in the process to implement a high-level review of utility management, operation, communication, and achievements that will assist our team in targeting the comprehensive audit on those areas that present the most substantial opportunity for improvement. This initial review will be interpreted in the context of developing a more detailed workplan for submission to and discussions with Staff.

### Detailed Workplan

Our Shaw Team will consider and incorporate, as appropriate, comments from the Commission Staff and proposed modification from within our project team based on discussion of the preliminary workplan and preliminary data review. Our team proposes to make a presentation to the Staff for purposes of presenting our

preliminary observations and facilitating discussions. Our preliminary observations and initial recommendation for further investigation and testing will be discussed and agreed upon with the Staff, leading to the development of a detailed workplan and initial report outline.

### **Review & Analysis**

Following the Staff-approved workplan, our team will begin the review and analysis phase, with the objective of developing findings and recommendations based on systematic evidence collection and substantiation. Similar to our efforts with other clients, our team proposes to utilize a structured interview process that is accompanied by and substantiated with a review of pertinent documents, such as management reports, business process maps, procedures, audit reports, meeting minutes, and whitepapers, for example, and an analysis of key performance metrics and indicators such as financial indices, reliability metrics, or customer satisfaction metrics.

Our team understands and will utilize the analytical format below as a means of developing our findings and developing appropriate elements of the final audit report:

- Finding
- Condition
- Criteria/Standard
- Effect
- Root Cause
- Recommendation

Our specific approach to this audit, from beginning to end, including all deliverables, is discussed in Section 3 of this proposal. Additional detail relative to the audit areas and issues that will be systematically analyzed in this step of the audit is included in Section 4.

### **Report Writing**

Report writing ensures the consistent communication of the auditing process and results, such that stakeholders can effectively utilize the report to encourage improvement. An efficient work process would initiate the report writing step as soon in the overall process as possible. In completing this step, our team would continually document our findings, evidence, and recommendations, such that in developing the formal report, key elements are maintained. Our review will include observations and assumptions supported by evidence and testing – incorporating findings and potential recommendations to facilitate the drafting of a formal report.

### **Follow-up & Work Papers**

This final step in the auditing process is key to the implementation of recommendations, as well as key to the development and continual enhancement of our team's standard auditing approach. In many past engagements, our team has provided clients with "check-ups" on the progress and appropriateness of the implementation of our recommendations. This type of feedback both adds to the value of our initial review for clients, but also provides our team with valuable insights into what recommendations have made the most change for the better, what recommendations are most difficult to implement and why, and what recommendations are commonly misunderstood. Our team will utilize the insights that we've developed through experience with other utilities, providing NYSEG, RG&E, and the Commission with an audit report that adds real value and actionable recommendations for improvement. Our key work papers will be provided to the Commission and utilities for reference. A follow-up plan will be recommended in the draft report.

## 3 Approach, Methods, and Project Management

The previous section outlined our understanding of management audits, in general, as well as our understanding of and alignment with the management audit process identified by the National Association of Regulatory Utility Commissioners. This next section more fully defines our proven approach to management and organizational reviews, as well as our proposed execution and project management plan for the comprehensive management audit of NYSEG and RG&E.

### 3.1 Overview of Our Approach

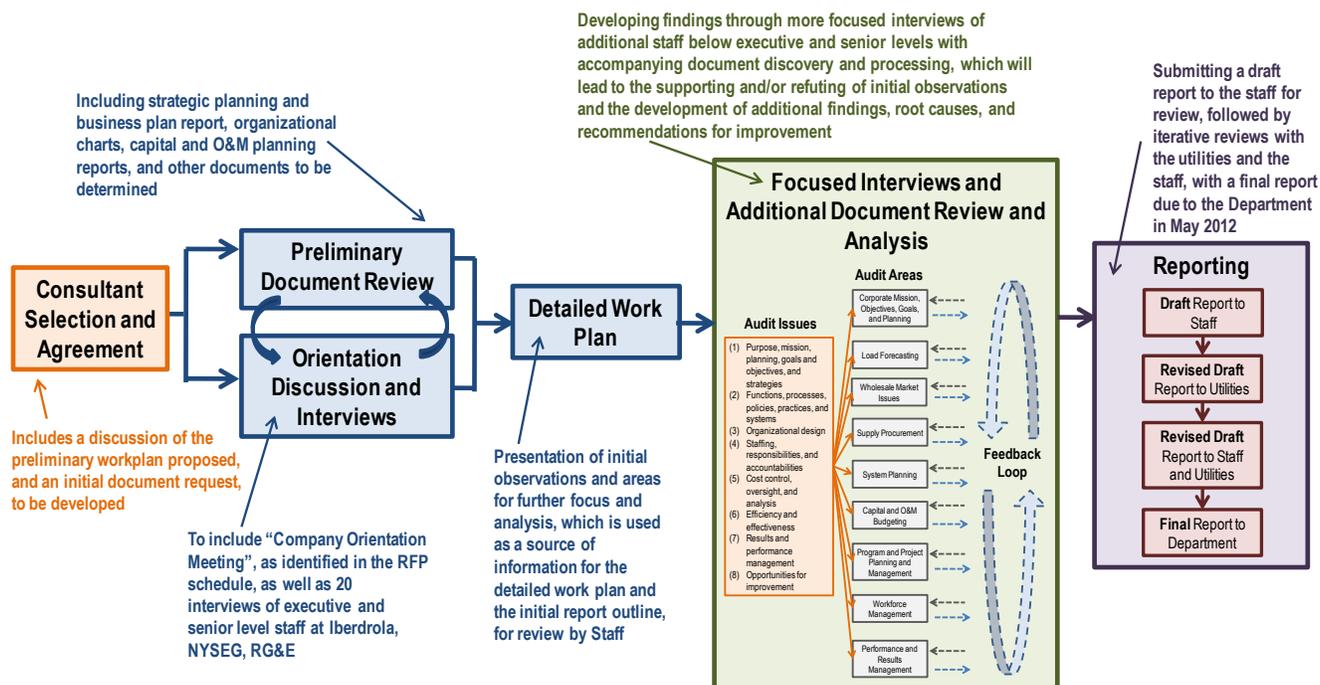
We proposed to complete this effort in three primary phases, as was described earlier in Section 2.

**Phase 1: Initial Review and Planning** – this phase aligns with the NARUC process steps of “Preliminary Survey” and “Detailed Work Plan”, and include our team’s initial review of executive-level documents and overviews, our team’s involvement in the Company Orientation Meetings, described in the RFP schedule, and preliminary interviews (20) with the executive and senior-level leadership at Iberdrola USA, NYSEG, and RG&E. This phase results in the development of a presentation to the Commission that summarizes our initial observations and recommends a focused and detailed work plan moving forward.

**Phase 2: Targeted Review and Analysis** – this phase aligns with the NARUC process step “Review and Analysis”, and includes the majority of the audit effort. Our team proposes to conduct an additional 180 interviews, beyond the 20 performed in Phase 1, and process the necessary documents that will be accumulated to prepare for or are associated with those interviews. Based on the results and recommendations developed in Phase 1, we will conduct either individual or group interviews, as identified in the approved work plan, in two teams of two. Utilizing two independent teams allows for our ability to complete interviews more quickly and efficiently; operating in teams of two, allows for a more balanced perspective on the evidence and business processes presented by the interviewee. Each of our team members listens and interprets with a different “accent” and thus will take away differing key points for discussion within our comprehensive audit team. This approach to interviewing has proven to, both, provide a balanced perspective of the key issues and facilitate an open, creative discussion of potential recommendations or improvement. Interviewing practices will be compounded with document review and data processing to identify outlying perspectives and to support or refute initial findings.

**Phase 3: Reporting and Communication** – this final phase is where all of the insights, findings, recommendations, and implementation guidelines will be organized and documented in an effort to clearly communicate to both the Commission and the interested utilities, the results of the audit. We understand that the objective of these audits, from the perspective of the NYS Commission, is to provide the utilities with guidance and recommendations for improvement, as well as to provide the Commission with an indication of areas that have the most impact on NYS ratepayers, and with a better understanding of utility operations. We will craft our final report with those objectives in mind in order to provide a useful, actionable record of our review. Samples of such reports, which this team developed for (1) Public Service of New Hampshire, and (2) Vermont Electric Cooperative, are referenced in Appendix C. The executive summaries of each are included in the same appendix.

A flowchart of the three key phases is provided in the exhibit below. More detailed information relative to (1) the specific deliverables, (2) our process steps, and (3) the plan for managing this process is included in the next two sections.



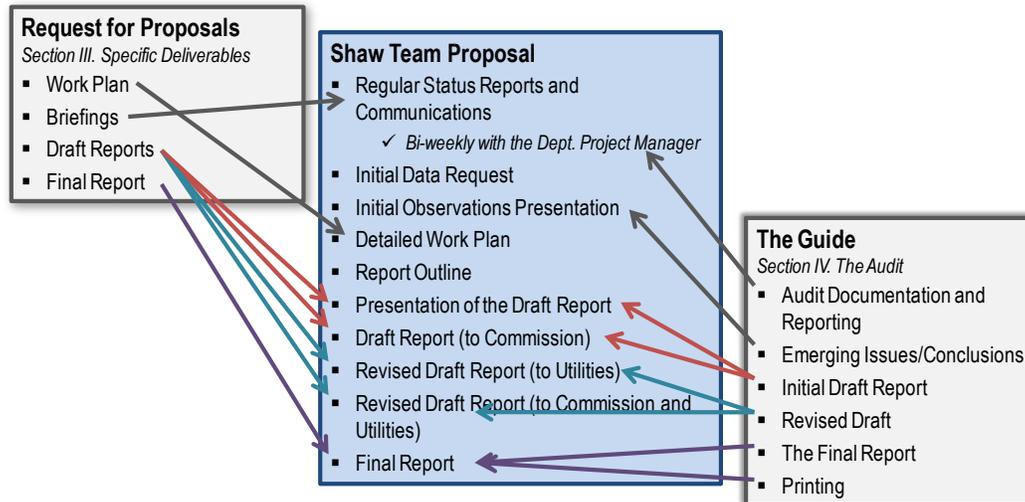
**Phase 1:**  
*"Initial Review and Planning"*  
 March to May 2011

**Phase 2:**  
*"Targeted Review and Analysis"*  
 June 2011 to January 2012

**Phase 3:**  
*"Reporting and Communication"*  
 February to May 2012

## 3.2 Deliverables

The deliverables our team will provide are provided in summary below. This exhibit depicts the interrelationship and schedule of deliverables, as they comply with the RFP, the Guide, and our approach.



The following sections detail the objectives and timelines for our proposed deliverables.

### 3.2.1 Regular Status Reports

Our team proposes to submit bi-weekly status summaries to the Commission, highlighting key progress, emerging insights, and potential challenges going forward. We have found that bi-weekly reports and weekly or bi-weekly discussions are a great way to balance involvement and updates to the Commission, without overburdening the process.

### 3.2.2 Initial Data Request

Our team will provide the Commission, Iberdrola, NYSEG, and RG&E with an initial request for data and documentation within a week of authorization to begin work. This request is likely to include documents such as:

- Board minutes and key reports
- Corporate, business, and strategic planning
- Organizational charts
- Capital investment planning and budgeting plans and budget variance reports
- Business process maps or equivalent documentation
- Procedures and authority matrices
- Project justification examples, including approvals
- Financial statements

- Key performance metrics, including, but not limited to
  - Reliability (SAIDI, SAIFI, CAIDI)
  - Safety (DART Rates, Incident Rates)
- Key regulatory filings

The purpose of this initial request is to get a high-level view and introduction to the company management including key planning, operational and performance areas and an initial assessment of areas that may need more information and discussion during the orientation meeting and interviews.

### 3.2.3 Initial Observations Presentation

Upon completion of our initial document review, preliminary interviews, of which we expect to complete 20, and our company orientation meeting, our team will convene and “download” our observations from one another. This step is where the value of a teaming approach to interviews is best seen – our Shaw Team members will go back and forth discussing what they heard, their interpretations of the evidence presented and demonstrated with documentation that either supports or refutes those observations. Key among our focuses during this stage of the effort is identifying how to measure the implications that our observations may be having on interested stakeholders, as well as the potential benefits that recommended improvements could have on each of the utilities and on their NYS customers.

Our team will prepare a summary presentation of our findings, which we will present to the Commission and to the utilities as a means of facilitating discussion and follow-up reactions to our observations. This presentation and discussion will aid our team in developing the next deliverable, the Detailed Work Plan.

### 3.2.4 Detailed Work Plan and Report Outline

Shortly after our presentation and discussion with the Commission, NYSEG and RG&E, our team will take our initial observations as well as the feedback gained in the discussion and develop a detailed work plan that will guide the remainder of the work effort. This detailed work plan will be informed by our initial observations, identifying areas that we believe will lead to the most influential recommendations for improvement. This detailed work plan will allow the stakeholder to this process to help guide the remainder of the effort. This work plan may shift some of the anticipated work effort between the nine topical areas of interest as a result of our initial survey. We expect to work with the Commission as we fine tune our initial work scope in this step. With this detailed work plan our team will also develop a preliminary report outline for review and approval by the Commission. The report outline works hand in hand with the detailed work plan, outline key areas for further focus, as well as the project management plan moving forward with the effort.

During the analysis our team will draft topical whitepapers on each area in order to streamline report development and to keep the Commission staff informed as to our findings and associated analysis. These whitepapers will serve to organize our analysis and research, supporting and documenting the thought process used to develop the recommendations for improvement that address our key findings.

### 3.2.5 Presentation and Submission of the Draft Report (to Commission)

At the end of Phase 2, as our team is completing our targeted review and analysis of the evidence presented and discovered throughout the audit, we will begin to finalize our documentation, crafting a draft report for review

and discussion with the Commission. It is customary for our team to develop a summary-level presentation of our report that will assist in facilitating discussion of the key elements. We propose to have a meeting with the Commission to present and submit our draft report in February of 2012. We then understand that the Commission will need time to review and comment on the draft – our team will work to incorporate Commission comments and discussions in our revised draft that is submitted to the two utilities, for factual accuracy.

### 3.2.6 Revised Draft Report (to Utilities)

Upon our receipt of comments and edits from the Commission on the draft report, our team will work to incorporate all comments, as appropriate, documenting the changes and the rationale for addressing/omitting comments. Many times the same area of a report, if written or organized unclearly, will have multiple suggestions for modifications, and our team will work to address the intent of all comments in a way that makes sense. Our team will then submit the revised report to the two utilities for review of factual accuracy, as well as submit documentation of our changes to the Commission.

### 3.2.7 Revised Draft Report (to Commission and Utilities)

After the utilities are allowed time to review the revised draft report, our team will again address and where appropriate incorporate comments, documenting how each is addressed. We will provide both the utilities as well as the Commission with a second revised draft, as well as our summary of changes.

### 3.2.8 Final Report and Printing

Once the Commission and the two electric and gas utilities have reviewed the revised draft report, our team will begin to incorporate any outstanding changes, and finalize the report for printing. We will provide the Commission with ten hardcopies of our final report, in accordance with the Request for Proposals.

## 3.3 Execution of Our Approach and Project Management Plan

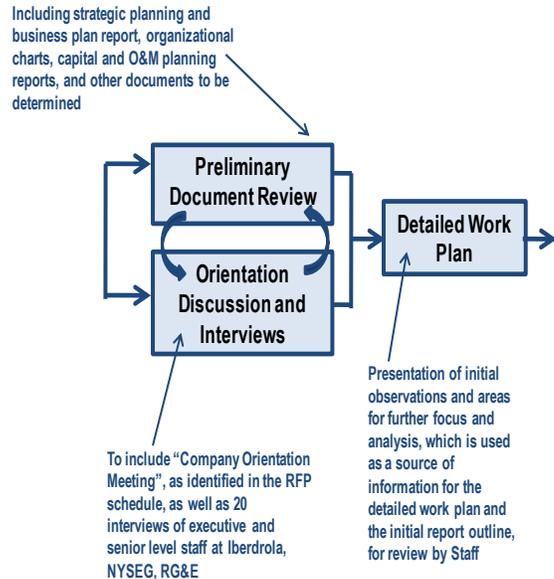
The following section discusses our team’s proposed approach to and management of the audit, from beginning to end. We aim, in this discussion, to describe the key methodology and workflow of this engagement – detailed discussion of the key focus areas within this utility management audit are addressed in Section 4.

### 3.3.1 Selection and Agreement

Our team looks forward to meeting and working with the Commission on this engagement and would be happy to meet with key decision makers as they evaluate our and others’ proposals. Upon notification of selection, the Shaw Team will work with the Commission Staff and Iberdrola USA representatives to finalize the contract covering this engagement. Our minor and selective suggestions for language modifications to the sample agreement are provided in Section 6. Our team will work with the Commission to establish a scheduled start date and to begin to establish a more refined schedule for interviews.

### 3.3.2 Phase 1: Initial Review and Planning

Once the Commission authorizes work to begin on this effort, our team will quickly assemble an initial data request that will provide the necessary background to fully immerse us in the high-level management, operations, interrelationships, and planning functions of the two utilities. Our review of these documents will make for a more productive Company Orientation Meeting, which we've assumed will be scheduled and facilitated by either the Commission or the utilities' project manager. In order to maximize our efficiency, and provided it is acceptable to the Commission and to the schedules of key utility personnel, we propose to initiate executive and senior level interviews, while on-site for the Company Orientation Meeting. This will serve to manage travel costs, as well as continue to immerse our team in the happenings at the utility. Completing the initial document review, company orientation meeting, and preliminary interviews within a limited timeframe allows our team to better compare and contrast "what is written", "what is practiced", and "what could be better", in order to focus the fine tuning of the detailed work plan.



**Phase 1:**  
*"Initial Review and Planning"*  
 March to May 2011

Once our team has completed this initial evidence collection and review, we will develop a summary presentation of our observations for discussion with both the Commission and the utilities to ensure that we have not reached inappropriate initial conclusions. This presentation and collaborative discussion will be used to develop our detailed work plan for the remainder of the audit review and analysis. We anticipate that this detailed work plan will be provided to the Commission in May of 2011.

### 3.3.3 Phase 2: Targeted Review and Analysis

Subsequent to review, discussion, and approval of our work plan, as necessary, our team will initiate the second phase of our audit, which includes the detailed interviews, process reviews, and comparative analyses with industry standards and our own expertise. A critical element of this effort is the identification, collection, development, and systematic assessment of data to support a well-informed and rigorous analysis; requests for required information will be developed in advance of and alongside the interview process. We will provide a list of reports, analyses, and documents that cover all of the areas of this audit including full descriptions of the methodologies, processes, information and databases that support management that will be updated periodically as we complete our interviews. We find that the interview process regularly uncovers additional documentation and databases that contribute to this effort. This documentation effort will continue throughout the audit as we identify additional necessary information or additional sources resulting from our interviews and meetings.

Our team will identify the existing planning, business process, and the integration issues that are barriers to effectiveness and efficiency in the system planning and construction process. Once these issues are identified

we will develop streamlined processes, as appropriate, including action plans for implementation. Next, our team will compare and contrast both utilities' "what is" to industry practices based on our research and expertise and assess how well these practices are working and will continue to work moving forward. This "gap analysis" will signal those areas that require significant, moderate, and slight improvement to reach the levels of best practice exhibited by other utilities. In addition, this analysis will provide information with which we can prioritize and plan the steps for improvement. Key areas for auditing focus are discussed more fully in Section 4 of this proposal. Our combined team has both the breadth and depth of understanding of the nine audit areas to identify key findings and develop value-added recommendations. Our team will be able to quickly identify key areas for improvement, and the recommendations that will achieve that improvement – key audit issues, areas, and feedback analysis of processes will be of primary focus in this phase.

Shaw Consultants expects that Department and Company personnel will be participating with us on a regular basis throughout the process and that our findings will not present any surprises. Our initial findings, developed in Phase 1, will provide an organized presentation of the information collected and developed, and our subsequent findings in Phase 2 will be communicated to the Commission as they are developed.

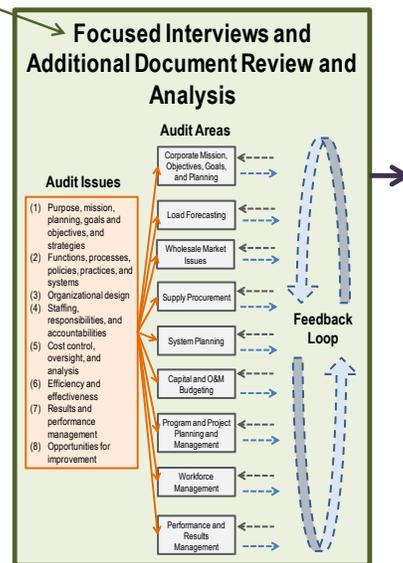
### 3.3.4 Phase 3: Reporting and Communication

As presented in the discussion of our deliverables, the Shaw Team will provide the Commission and the utilities with draft reports and with revised reports that include accompanying changes from previous versions to highlight modifications. We expect to have several meetings to review and summarize the information, in PowerPoint, with the Commission, discussing the findings and to incorporate additional information should the Commission or the utilities believe we have reached an inappropriate conclusion. We anticipate extensive discussions at this point so that the draft and final report will be easier to complete. We also anticipate that there will not be any surprises in our conclusions as we will have had several update meetings during which key findings will be discussed.

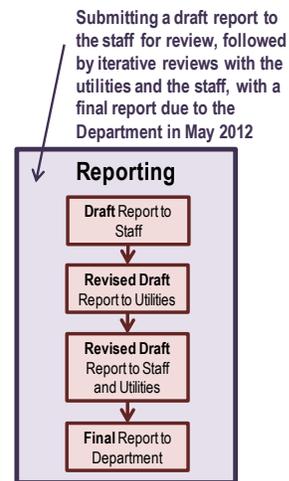
### 3.3.5 Project Management

As indicated above, we will initiate the project with an initial data request, company orientation meeting, and preliminary interviews with utility staff. We assume that the Department of Public Service Staff management and/or the utilities will facilitate the Company Orientation Meeting, and that our Shaw Team will attend and

Developing findings through more focused interviews of additional staff below executive and senior levels with accompanying document discovery and processing, which will lead to the supporting and/or refuting of initial observations and the development of additional findings, root causes, and recommendations for improvement



**Phase 2:**  
*"Targeted Review and Analysis"*  
 June 2011 to January 2012



**Phase 3:**  
*"Reporting and Communication"*  
 February to May 2012

participate in a collaborative meeting, during which we expect to learn more about expectations, issues, and needed reviews, and adjust our interviewing objectives and work plan accordingly.

A result of the orientation will be that project managers or liaisons from the Commission and utility will be identified for the consultant project manager to contact for scheduling interviews, meetings, office space, and other needs. In addition, we welcome and expect frequent communication with both parties as we move through our investigation. We achieve this through regularly scheduled conference calls, structured meetings during site visits, casual discussions on key issues as they are identified, and through documented reports as required. We expect to discuss the issues and suggestions with both parties openly in order to gain your insights and to jump start improvement as we move through the project. We anticipate and encourage the Commission staff to participate in the interview process but expect that such participation will not delay our proposed schedule. Finally, we are open to your additional suggestions on how we can incorporate both teams in this effort.

### **Responsibilities and Roles within Our Team**

Typically, our consultants fulfill various project roles on such assignments, including:

- Responsible Officer
- Project Manager, and
- Functional Area Specialist(s)

Each of these positions is briefly described below, along with an indication of the suggested and alternative candidates we might assign.

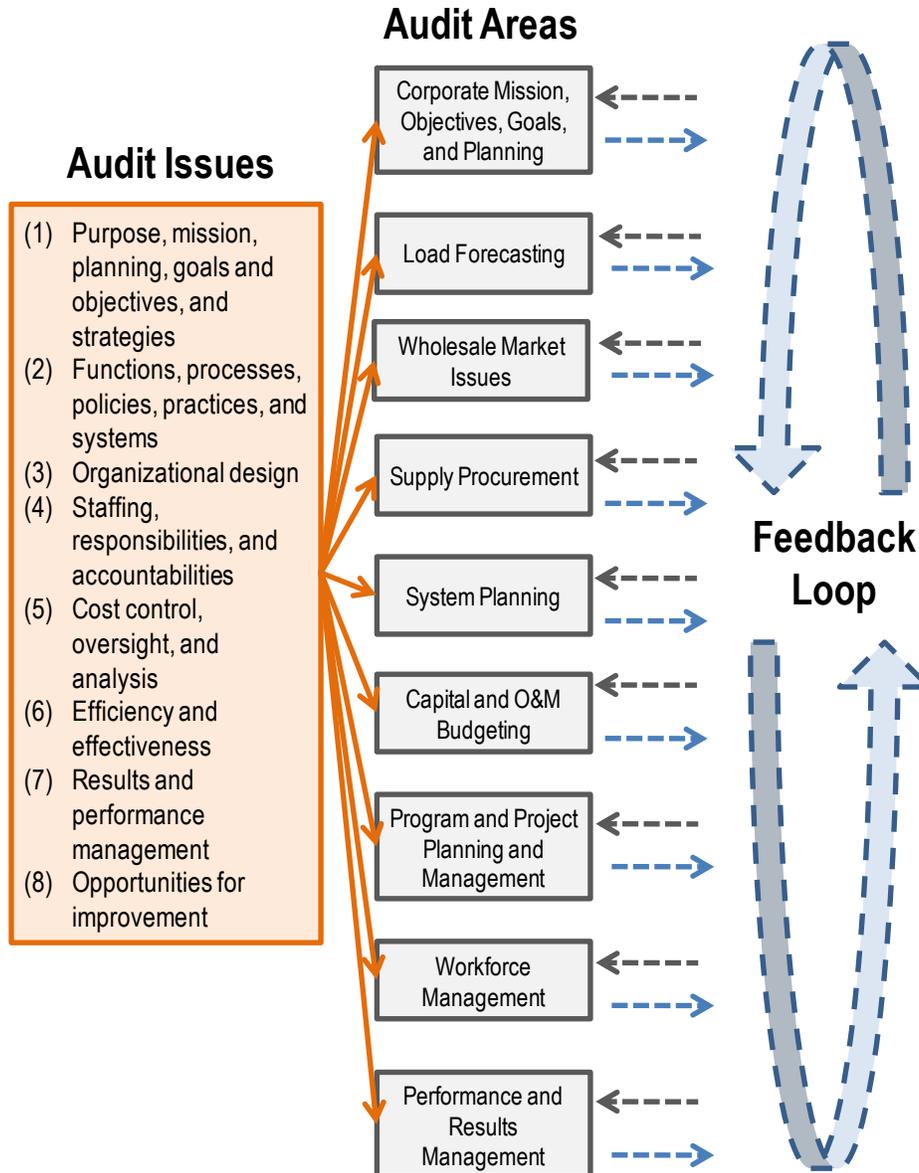
**Responsible Officer** - Typically, the individual(s) we assign as our Responsible Officer(s) are authorized to act on behalf of Shaw Consultants International and are empowered to make decisions regarding both contractual and project matters. He or she is typically directly responsible for inter-company communications, accountable for ensuring the successful conclusion of the work on a timely and cost-effective basis, and assures satisfaction regarding the scope of work and overall product quality. This includes a professional quality report in full compliance with generally accepted standards and the Commission's requirements or guidelines. To do so, they are directly involved in all client presentations, executive interviews, and production of any draft and final reports. They are also heavily involved in leading specific activity areas including, but not limited to project planning, requirements definition, developing and conducting various sessions, reviewing and analyzing records, leading the preparation of draft and final recommendations and reports, and preparing and making any presentations.

**Project Manager** - Individuals assigned to this responsible position are more directly involved in the detailed planning of work. This includes overall project planning and task development as well as staff assignments to appropriate tasks. This role is also typically the lead in coordinating interviews, data requests, progress status briefings and reports. Ultimately the Project Manager is responsible for closing functions such as draft and final reports and final presentation preparation and delivery.

**Lead and Functional Area Specialists** - These consultants bring planning, engineering, construction, maintenance and operational experience to the team. They possess significant experience with similar assignments or related assessment work in specific functional areas. Regardless of consulting category, each of these individuals has strong analytical skills.

## 4 Audit Areas and Issues

Our proposed approach incorporates a targeted review and analysis of the nine key areas, and according to the eight audit issues, as highlighted in the Commission’s RFP. A detailed illustration of our understanding of the interrelationships of these two major elements is provided below.



Our team sees the interrelationship of these issues and areas as an implementation matrix – the application and investigation of each of the eight issues, within each of the nine areas is what will guide the data requirements, interviews, evaluation, and testing activities, to ensure a comprehensive audit is developed.

## 4.1 Our Understanding of the Audit Issues

### 4.1.1 Purpose, Mission, Planning, Goals, Objectives, Strategies

Establishing a common mission that all employees must support is key to organizational success in the market, its effectiveness in carrying out the underlying plans, and in ensuring that the organization continues to improve and move forward. Each organization's ability to succeed in this key differs.

In several of our comprehensive management audits our team has identified setting a course of action as a key component to success of a short or long term plan – many boards of directors and senior management teams have not effectively communicated the role of their direct reports in the ability to achieve that plan. We have found these plans are discussed – but how employees can help the organization achieve the goals is not clearly defined.

Effective communication of the mission, goals, and objectives, including how each department contributes to their success and how each employee in turn contributes makes the objective achievable. Our findings have included recommendations to post key goals and objectives with regular reports posted on achievements during the year so that employees can monitor success. We have worked with boards to clarify their executive's performance parameters to make it clear to incent the desired behavior. For other utilities we have modified the planning process to focus the goals and objectives into manageable activities, while for others we have expanded their focus. Many organizations plan well but do not execute the plan or know how well they have executed due to the lack of performance criteria and reporting on those criteria.

Our role will be to assess the planning process of Iberdrola USA and its utilities in New York to understand where the process takes place in the organization, how well the plan is understood, the metric associated with the plan, the results, and how all is fed back into the next planning cycle.

### 4.1.2 Functions, Processes, Policies, Practices, Systems

Most organizations are established based on key functional roles, such as customer service, engineering, operations, financial and accounting, planning, and corporate support areas. Business processes and all of the supporting systems should be owned in a function and supported without regard to functional breakdowns.

We have found that silo's exist in most organizations so that communication is constrained, teams are not functional, and duplication of efforts and data systems is common. Our review strives to identify inefficiencies that occur due to a buildup of silo actions or culture by identifying the changes that can reduce handoffs in a process, eliminate the need for duplicate reports or system intervention, and provide incentives at all levels for keeping an eye towards such efficiencies.

### 4.1.3 Organizational Design

An organization is designed to align functions or responsibilities to provide the greatest efficiency and communication. As indicated in the functional discussion, the organizational alignment can follow customer oriented focus, engineering focus, and the like. However, the effectiveness of the design is assessed by

recognizing whether the alignment enhances and fosters the achievement of the organization's mission. In many cases, we have sought to re-align an organization minimally to enhance its performance – reduced due to the creation of organizational divisions that are too vast to manage or that lack sufficient managerial talent to orchestrate success. In other cases, change has been the requirement to streamline the CEO's focus so that strategy becomes a more frequent topic by pushing down in to the organization more day to day decision making.

Our review will investigate the current structural alignment and use the interviews and business process discussions to evaluate the barriers to effective management and leadership if they exist. Typically, minor tweaks are needed to enhance performance.

#### 4.1.4 Staffing Responsibilities, Accountabilities

Ensuring that responsibilities are clearly established such that accountability is also clear is a means for ensuring job satisfaction and successful achievement of corporate objectives. Many employees feel responsible for what they are contributing to the organization but in many management audits that we have performed, the accountability is less apparent. Accountability requires setting expectations and sometimes consequences of your actions. For example, a CEO is clearly responsible for the ability of the organization to meet expectations for stock prices and performance according to wall street standards and a CEO is also accountable for it and typically understands the implications of not meeting goals, such as termination or a reduction in roles and responsibilities. Likewise, all employees are responsible for their contribution to the success of the organization and should understand they are accountable for their actions. Performance planning and feedback should be key to communicating the responsibilities and expectations and when employees fail, such feedback should be provided. Failure does not mean termination or penalty, but it should result in additional support and activities to shore up the employees ability to succeed. In this way the organization is pulling to one overall corporate goal – ensuring the organization succeeds.

In our reviews, we have found that while expectations exist, they are not consistently communicated. Likewise accountability is in residence but the consequences are not always fairly meted out to employees. This lack of consistency reduces the employee's satisfaction and can impact morale over longer periods of time.

Our investigation will yield an assessment of the alignment of responsibilities, including whether some areas are too heavily overloaded with work and expectations while others are underutilized, a review of the performance planning and feedback loop, and an assessment of the approach taken with regard to accountability for performance.

#### 4.1.5 Cost Control, Cost Oversight, Cost Analysis

Every organization establishes an annual budget and multi-year budgets and monitors their performance relative to the plan. However, we have found in a number of situations that O&M budgets are tied to capital in a way that can game the system of providing funding. Other findings have included tradeoffs or buddy system approaches to multi-year budgets. For example, if the overall operations budget is capped at \$800 million, divisions within the operations area have worked together to submit multi-year budgets that slip certain projects to a later date to gain funding for a favored project sooner. A well executed asset management plan should be the basis for investment and funding of projects over time and our investigation will document the current asset management approach, justification for funding, and overall budgeting and cost control functions of the utilities.

Analyzing the costs and monitoring costs is another area that may be a concern. We found at one utility that going over the budget was never a problem – so divisions under estimated to get the project in the plan and then just spent whatever was needed without regard to total expenditure or budget variances. Our investigation will monitor the use of the budget as a management tool and identify improvements as needed. Ensuring that all managers participate on a level playing field in this process is key to ongoing management success.

We have found in the past that constraints imposed by senior management have significantly impacted the organization's ability to invest in system improvement and have found that regulatory changes can make investment more consistent.

#### 4.1.6 Efficiency, Effectiveness

Time is of the essence in most situations in corporate America due to the lean staffing and reduction in earnings of the last few years as a result of economic downturns. Employees are trying to get the job done during a normal work day – but competing demands for work products can reduce our efficiency and effectiveness in many ways. We will investigate the work load, approach to business processes, and current expectations for the organization to evaluate the current effectiveness.

We have found business processes that take 13 months to complete to bring a new customer online to an electric system and to issue a first bill – clearly not an effective approach. In some utilities, it is always easier to redo a project than to get it correct the first time – the result of not enough information when assigned or too little time to complete during initial assignment. In a number of cases, we have found that management does not take the time to plan the work load and effectively makes implementation of work management system inefficient.

Anticipated improvements typically identified include better communication, use of standardized practices, ensuring compliance with policies and procedures, maintaining a focus on quality control (which sometimes is left to the last minute or eliminated due to lack of time), and introducing new approaches to root cause analysis in the area of outages.

#### 4.1.7 Results, Performance Measurement

Metrics are important to ensure adherence to short and long term plans and to act as an early warning system if success is not going to be achieved so that an organization can institute an alternative approach. We will strive to understand how the metrics are selected, established, monitored, communicated, and used for reporting in order to assess how well they support achieving the corporate goals.

Our team has found that metrics can be too numerous and too few, or measuring the wrong parameter to achieve the goal. Sometimes management knows the metrics and the general employee population is in the dark. Knowing what you are trying to achieve and balancing those achievements is key to success of the organization

During a prior management review, we discovered that feedback loops were not well devised and that communication took place in the hallway rather than through better and more documented formal channels. We recommended the development of a complete report that was simple and straightforward to communicate the goals, metrics and progress towards those metrics for every 2008 performance objective. This report would

be posted to the website and on various internal boards and would be used at regular weekly and monthly meetings to discuss project changes needed to meet the criteria for solid performance.

#### 4.1.8 Opportunities for Improvement

Our team focuses on solutions – we regularly provide interim improvements during our audit that can help streamline or improve efficiency while we continue our investigation. We appreciate that the Commission is interested in working with the utilities throughout the effort so that such enhancements can be instituted sooner. Many suggestions come from employees who have not found an outlet for such suggestions before the audit process.

We have found simple changes such as eliminating duplicate data storage systems by providing a pc to a field surveyor which had been resulting in two different reports of new customer completions in one instance. Our team has identified the adoption of a business process improvement team at one utility for key business processes that resulted in the elimination of four new positions due to reduction in duplication and handoffs.

We believe there is always room for improvement in any process, the key is to provide the participants with an opportunity to identify these and the recognition of their achievement once adopted.

## 4.2 Our Understanding of Audit Areas

Each of the nine elements of electric and gas transmission and distribution areas that this audit targets are discussed in the following sections, with an aim toward demonstrating our understanding of each, and specific experience in addressing each in prior client commitments. Our understanding of the key issues presented in the Commission's Request for Proposals is summarized in the orange boxes within each section, organized according to key themes we believe are important to consider. We believe this approach to discussion of the nine audit areas is the best way to demonstrate to the Commission (1) our understanding of the key focus areas, and (2) our specific capabilities and insights to each, based on the history of our firm and personnel.

Our audit approach is such that we will be addressing multiple areas during each interview/meeting, such that no area is addressed in isolation – this approach results in a good definition of areas in which necessary interaction, integration and document control are not occurring, typically resulting in disjointed planning or planning and execution that does not sufficiently address common goals. Following this macro-review, we will use more focused interviews to first, gather information that corroborates our initial findings, and second, identify where conflicting approaches are found. We have addressed all of these topics in recent audits or management reviews.

### 4.2.1 Corporate Mission, Objectives, Goals, and Planning

Understanding and analyzing the high-level management practices, coordination, relationships, and decision-making criteria is a key piece of any comprehensive audit, and can be a key indicator of the areas and issues within the organization that would benefit most from focused review and analysis. Our experience in reviewing organizational structures and management activities, including at both utility and non-utility companies, leads us to expect that this area will be the predominant element of the initial reviews phase, where our team will process preliminary document requests, and meet with executive and senior level management.

A key piece of the investigation in this area, from the Shaw Team’s perspective, is a review and understanding of the decision-making processes at the executive levels of both NYS utilities, as well as the holding company. This understanding will inform our review of many other elements identified in the Commission’s Request for Proposals, including:

- Potential implications for New York State electric and gas customers;
- Perspectives that may drive planning practices, including attitudes toward aligning state and corporate policies, developing and maintaining infrastructure, addressing customer concerns, and managing environmental stewardship; and,
- Initiatives addressing newer technologies and customer services, including for example, smart grid, electric vehicles, demand response, renewable energy, and climate change mitigation.

We anticipated that after the initial analysis of this area, more focused review will be required to address the more detailed elements of this audit area. The Shaw Team includes professionals from Shaw Consultants International, Inc., and KBL, LLC – we believe this team will offer the Commission a well-balanced review of these more detailed elements of corporate objectives and planning.

Shaw Consultants International has a more than 100-year history of working with and for utilities, commissions, and financial houses in the areas of management efficiency, technical analysis, rate design, regulatory policy, strategic planning, load and resource planning and forecasting, power plant due diligence, and independent engineering. This element of the team will bring with it a “utility-perspective” of corporate operations and policies, comparing the views and objectives of NYSEG and RG&E with other utilities we’ve worked with, with emerging industry issues, and with regulatory policies and objectives. KBL, the second component of our team will contribute a “non-utility perspective”, serving to strengthen the breadth of our review, and the creativity and insight we can provide through our recommendations for improvement. KBL has proven expertise in the review and development of internal controls and risk management practices that spans multiple industries.

Shaw Consultants will examine the extent to which NYSEG and RG&E are providing any undue subsidies to Iberdrola or unregulated affiliates. In terms of apportionment of costs from Iberdrola to NYSEG and RG&E, Shaw Consultants will examine the nature and magnitude of any such costs that are being asked to be borne by New York State ratepayers and whether they are apportioned among Iberdrola’s various entities in a cost-related manner. Shaw Consultants will also examine whether either of Iberdrola’s New York regulated utilities are

**Governance**

- Organizational structure and corporate relationships (IBE, IUUSE, RG&E, NYSEG&G)
- Role, influence, and direction of Boards, Board members, and management
- Audit and controls over business plans

**Decision-Making and Management**

- Between and through corporate organizations and functions
- Implications for NYS customers
- Criteria used to justify and analyze purchase and sales opportunities
- Succession planning, compensation planning, and employee development

**Planning**

- Budgeting allocations and capital investment priorities
- Alignment and compliance with legislative and regulatory initiatives

**Controls**

- Development of, decision-making for, and approval of budgets and affiliate transactions
- Performance management according to key performance indicators, goals, metrics, and standards
- Commercial implications of affiliate relationship, and the potential impacts on NYS customers
- Cash management and comparison of commercial terms against open-market indicators
- Compliance with internal controls, audits functions, and Sarbanes Oxley Act

providing subsidies to affiliates of the utilities or of Iberdrola. This effort will include review of the utility's cost of service studies with a focus on allocation administrative and general expenses; general plant and specific transactions that may be provided to the regulated utilities by an affiliate.

Shaw Consultants recognizes that filing of rate cases is a costly and time-consuming endeavor and that there are operating efficiencies and cost reductions that can be realized in having same rate structures for both utilities. In performing this work, Shaw Consultants will address the myriad of issues needed to make a reasonable determination. These include, but are not limited to considerations described below.

- Should same rate structure also infer same rate level?
- Are there salient intrinsic differences in customer load profiles between same or similar customer classes in each utility?
- What are the relative per unit cost costs for each function in each utility, e.g., power supply; transmission, distribution and customer-related costs?
- Does same rate structure for each utility require that both utilities file a common rate case? If each utility files separate rate cases, how are the individual revenue requirements reflected in the new common rate for each service classification?
- Can same structure for both utilities be defended against possible charges of undue cost/rate discrimination?
- What special circumstances exist in either utility that would be inappropriate for the other utility to carry?

Shaw Consultants is versed in all aspects of cost of service, rate design and revenue requirements and is able to provide an in-depth analysis of these issues and identify where cost savings can be achieved. In carrying out this effort, we will carefully review the fully-allocated cost of service studies and existing rates of each utility, prior rate case filings, financial and operating reports and conduct interviews at each utility.

#### 4.2.2 Load Forecasting

Our review of NYSEG and RG&E's load forecasting process, methodologies, and results will mainly target understanding the level of alignment with industry standards and with corporate objectives. We find in many instances that the load forecasting process can in some ways act in isolation, failing at times to adequately incorporate corporate initiatives, incent policy directives, and provide clear understanding of future energy and load projections, all of which are necessary inputs to other business segments, planning functions, and decision-making criteria.

Many of the individuals proposed for this team have been associated with load forecasting activities and results throughout their careers. Ms. Kathleen Kelly led the load and revenue forecasting team a

#### **Methodology**

- Alignment with industry standards
- Alignment with corporate objectives and initiatives
- Role of stakeholders
- Means by which DSM, electric vehicles, smart grid, and other initiatives are included
- Incorporation of NYISO resources and requirements
- Incorporation of enhancements

#### **Execution of Forecasting Function**

- Clarity of results and ability to use results in other business areas
- Appropriateness of processes, resources, practices
- Reporting and metrics
- Frequency of update

major electric utility in Massachusetts. Mr. Philip DiDomenico has extensive expertise working with load forecasting results in his experience with resource planning, risk management, and reliability support throughout his career. Mr. Joseph Pino has extensive expertise planning and evaluating demand-side management programs, including energy efficiency and demand response initiatives. Each of these individuals brings with them a different perspective on the use of, dependence on, and process for load forecasting – as such, each will provide valuable insights to the review of this process, leading to well-balanced recommendations for consideration by the Commission.

### 4.2.3 Wholesale Market Issues

Through this audit area, our team will be able to review the alignment, both between the two utilities as well as with outside groups such as FERC and NYISO. Key developments in transmission cost allocation methodologies, regulatory objectives, independent system operating rules, and market operations present opportunities for utilities to better manage costs, invest in infrastructure, communicate with stakeholders, and support their corporate and customer interests. These entities provide interconnection services to generators and our team will assess the business process and decision-making that serves this market supportive function. This area is key to the customers cost control and reliability. Our review in this area will also include assessing the extent to which the utilities are utilizing and/or planning for these new opportunities. Mr. Robert Howland formerly directed wholesale trading operations and has extensive experience with northeastern U.S. ISO markets including the NYISO administered market. Mr. Joseph Pino has extensively advised the Rhode Island League of Cities and Towns regarding wholesale power purchases.

#### Emerging Issues

- Planning for and capitalizing on emerging opportunities for industry change
- Interacting with and providing practices that protect customers but support market effectiveness
- Development and application of corporate vision for participation in NYISO and FERC processes

#### Relationship Management

- Alignment of policies and processes with industry groups, regulators, and customer preferences

### 4.2.4 Supply Procurement

Our consulting services often incorporate discussions of market elements and issues, including the implications of various market drivers, generation options, greenhouse gas reduction initiatives, supply/demand balances, fuel use and fuel supply issues and pricing, wholesale energy market pricing, capacity pricing, and renewable energy pricing and credits. Insights that we provide in these areas are often used by clients to develop strategies for short versus long-term planning, contracting, and leadership.

We expect to focus on the quality and completeness of preparations supporting power supply management processes and procedures, as well as diligence and documentation of their implementation. We expect to find both short- and long-term energy plans including assessment of both the current power supply situation and forecasts

#### Planning and Policies

- Analysis of options, and decision-making criteria driving resource choices
- Implications for NYS customers
- Alignment of choices with corporate vision and regulatory direction
- Tradeoffs of short vs. long term options

#### Controls

- Monitoring and evaluation of contracts
- Justification and competitiveness of bidding and contracting practices and procedures

of future needs, along with an evaluation of proposed resources to meet future needs. The planning process should incorporate, among other items, the potential for price volatility and availability issues in fuel markets, potential transmission constraints, and supply resource expansion planning.

Our Shaw Consultants team was a key advisor in working with an aggregated group of Rhode Island cities and towns to procure electricity needs over the medium term. Our team assisted in formulating the organization, as well as in facilitating bidding and selection processes that allowed the aggregate to secure affordable electricity rates. Our team has been involved in three instances of this bidding practice, each time reevaluating the appropriateness of alternative contract and pricing options, and facilitating discussions between our client and resource suppliers. Mr. Robert Howland has formerly directed power supply procurement, wholesale power trading and contract administration for an investor owned utility. He has recently advised several public power utilities on energy planning and supply procurement matters. Finally our team has worked with the Long Island Power Authority throughout its long-term power planning process to develop and document its supply plan.

#### 4.2.5 System Planning

The Shaw Team’s review of NYSEG and RG&E’s system planning functions will assess the quality and adequacy of the organization, and its people and practices in relation to producing high quality and functional plans that help focus the respective Companies on critical infrastructure and operational matters. We typically find that this is a critical feature for utility success and examine planning standards applied, the length of term of studies/plans that are produced, and the frequency of publication and updates of these plans. Our team will consider and evaluate the extent and quality of baseline standards and data used to monitor and invest in system reliability. This part of the investigation will address whether the utilities have established adequate reliability and planning standards and, equally important, whether they adhere to these guidelines while producing short-term and long-term plans. Our audit will offer insights into the extent that integration of emerging technologies and issues such as, for example, AMI, Smart Grid and electric vehicles, receive formal and adequate consideration in the planning process. Likewise, we seek evidence of utility understanding of the impact and extent of evaluation of factors such as demand response, energy efficiency, and loss reduction measures and their impacts on peak load and energy requirement growth, as incorporated into the planning process. Adequate and robust system plans include the consideration of the impacts renewable generation may have, and our approach assesses the extent to which this is factored in to the planning process. In addition to the robustness of system infrastructure planning, our team will assess its fit within the operations and management decision-making structure. Our goal will be to ensure that this area receives sufficient support and is allowed input into investment criteria.

<p><b>Justification</b></p> <ul style="list-style-type: none"><li>▪ Development of forecasts</li><li>▪ Engineering and planning input</li><li>▪ Analysis and consideration of alternatives</li><li>▪ Decision making</li><li>▪ Alignment with policies and objectives</li></ul> <p><b>Planning</b></p> <ul style="list-style-type: none"><li>▪ Processes for planning, including consideration from various perspectives (technical, regional, business development)</li><li>▪ Integrated resource planning</li><li>▪ Identification of customer and reliability benefits and periodic measurement and verification of those benefits</li></ul>
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## 4.2.6 Capital and O&M Budgeting

Shaw Consultants believes a key component for capital and O&M budgeting includes appropriate systems and processes in place including linking to long-term utility planning processes like wholesale market and resource procurement, T & D system planning, engineering, operations, and information technology. In particular, we will assess how key capital budgets are incorporated and treated in the Companies’ decision making processes. Typically successful processes include both bottom-up planning and project identification process with iterative top-down response and feedback. We will assess the extent and methods to which key contributors within the organization are educated and communicated with relative to business issues, opportunities, and constraints in order to ensure that all are working with the same information in their budgeting process. We will investigate whether this is an “in-house activity” and if so, how it is implemented (e.g., organizational meetings, short-term job rotations, cross-training opportunities, etc).

Our team will evaluate the reporting and internal controls in place relative to finances and financial requirements, including accountability, processes, procedures, policies, and management training to assure appropriate methods exist and are adhered to. Our work will include review to identify and evaluate the extent to which assignment of projects to capital budget comply with accounting conventions and investigate appropriateness of the split between O & M and capital budgeting, and decision processes (including documentation) determining this split. Finally we will review the auditing of the budget and reporting process. The Shaw Team will evaluate the connection between planning and capital budgeting, for instance, how they’re connected, communicated within the organization, included in feedback loops, and overseen and reviewed by management. Our investigation will consider the strength and formalization of the connection between corporate goals, strategic planning, and the budgeting decision process. The extent to which major projects are evaluated internally, prioritized and communicated throughout the organization is key.

Another key review area in the audit includes method and type of approach for long term economic assessment to compare competing initiatives for scarce capital and prioritize and justify capital projects. The modeling tools and software as well as skill levels and training of analysts and management are critical to success of such scrutiny of contending investment options.

## 4.2.7 Program and Project Planning and Management

The Shaw team will identify and assess the process used to develop plans for and implementation of project planning and management including project cost estimating, project justification requirements, the approval process, it’s documentation and how well known and communicated the plans are throughout the organization including feedback loops and procedures for management oversight and

### Relationship within Iberdrola

- Roles and decision making or Boards and senior management
- Details available at varying levels of corporate authority
- Authorization and appropriation of funds

### Budgeting

- Alignment with corporate planning
- Guidelines and practices, and implementation of those standards
- Prioritizing practices and controls
- Consideration of safety and reliability metrics
- Reporting on projects and progress

### Impacts on Customers

- Rates, financing options, allowed revenues
- Regional planning activities to mitigate duplication and costs

### Accountability, Goals, and Objectives

- Administrative and risk management processes
- Methodology for tracking and reporting on costs
- Planning and management of resources, materials, schedules

review. Our review will seek to confirm the existence of and adherence to guidelines and consistency with their implementation.

Prioritization of projects is an important area that is typically reduced to assigning a reliability requirement or a safety requirement to all projects of interest in order to see them implemented. We will assess the system for defining the priority, identify the parties to that decision process, and assess the independence of the prioritization. There is no single system of prioritization that works well for all utilities – we will identify any areas that could use enhancement after comparing and contrasting the current approach with others.

Consistency of approach across affected involved organizations within the utility (i.e. among regions, and between different managers). This review will include evaluation of a sample of capital budget work plans to assess the planning and consideration of alternatives, monitoring of construction management policies, quality assurance policies and the like through field visits to construction activities, monitoring of project reporting, and interviews with field staff.

The planning process as well as program management processes will be reviewed and the roles and responsibilities will be identified, including identifying and documenting the existing relationship, roles and responsibilities of Senior Management, the Board of Directors, and key responsibility areas within the Company relative to the process. Our team will identify the preferred approach to reporting and controls, level and quality of documentation, quality assurance, and decision processes for this area and compare these to any documented approach by the utilities in order to develop our findings and recommendations.

#### 4.2.8 Workforce Management

This area requires site visits, review of current procedures and policies and development of an assessment of how well workforce execution follows the policy. The management of the planning, implementation, quality trends, and reporting of day to day work in the field should be a resource for the planners so that the budgets can be more fine tuned and to assess the extent of investment needed in upcoming years. Conversely, we also evaluate the quality and timeliness of job estimating and work plans, processes employed to define work and assign it to the field and their impact on scheduling of field work. This assessment includes evaluation of measures of performance and productivity trends targets to determine if they are appropriately aggressive and if pay-for-performance is adequately applied to encourage high productivity.

##### **Resource Management**

- Execution of project management in day-to-day functions and accountability
- Feedback of work management systems
- Roles, responsibilities, and effectiveness of project management according to key metrics for success

Our review of Workforce Management covers much of the utility service area and will involve discussion with a number of employees. We do not expect to interview a large percentage of employees but do expect to visit each geographic region and meet with a small set of employees and management at each. Group sessions with the regional managers will help identify improvements in this area through structured discussion and development of high level process flow diagrams.

We expect that the process followed could be different in each geographic service center and as such will contrast and compare the various approaches with appropriate recommendations for how to streamline our effort. The work management systems and the extents to which these systems are utilized in planning, analyzing, and reporting on completed work will be assessed. These systems are of significant importance when used well and can serve the planning function if the tool is sufficiently and accurately populated. We will assess

feedback loops and the differences in the amount of feedback by evaluating the content of the databases and the interaction between doers and planners. Our interviews will assess safety incorporation in the planning and work management processes.

Part of this review will include assessment of the extent to which RG&E and NYSEG apply performance reviews consistently across the Company and ties employee performance to the Company strategy. The extent to which employee skills/talents or gaps are mapped against company needs will be noted. As part of this effort we will evaluate the effectiveness of each utility's performance review process in:

- Translating organizational goals to the individual employee
- Consistency in application across the organization
- Providing compensation commensurate with performance

#### 4.2.9 Performance and Results Measurement

In order to assess performance monitoring, we will evaluate the regular reports provided to us by the company and gather information from the interviews about the emphasis placed on performance to evaluate the value of the feedback and information provided to employees. The Shaw team seeks communication of performance against plan, budget performance, reliability planning and reporting of these items. Also performance planning and feedback will be reviewed largely obtained by reviewing the processes but also by observing the management communication approaches – both documented and while our team is on site.

##### **Measurement and Improvement**

- Feedback and identification of areas and methods for improvement
- Accountability
- Benchmarking and comparison of key performance metrics to industry standards

We will assess performance from the Board through the lowest levels of the organization. We will evaluate the Board and management interaction through the use of interviews, review of the board reports, and the use of KPIs in the discussion of strategy and plans. This is a key area in which many companies can improve especially if it is implemented as a regular conversation between managers (including the Board) and their direct reports. We will follow the process of developing performance metrics to ensure that the metrics for all areas of the Company combine to address the corporate goals. This will require a review of all department reports to assess whether the lower levels of the company understand the drivers. We will also assess whether and how individual employee performance is tied to the KPIs, particularly if long-term incentive program for management and directors is generally structured like that of other similar utilities. Some weaknesses that can show up include lack of performance reviews for senior management, criteria of bonus plans that over- or under-emphasize key items, and insufficient measures for managers to both accomplish pre-determined tasks and as well as meet budgets.

A key area of success for a utility involves high quality information conveyed in an effective way to its Board of Directors. The Shaw team reviews both the quality of information and method by which it is of communicated and in addition the Board's skill set and experience to understand the information provided and managements activity implementing it. Our team seeks to determine if communication at the BOD level includes the Board in planning, budgeting and on-going high level monitoring of such plans and budgets.

Broad communication of performance is an area that many utilities do not address. We will review the communication plans and actual implementation historically to assess the Company's performance in this area. We seek to find a long term business plan that clearly provides an integrated vision for the Utility. Communication of this plan should be done in such a way that it effectively communicates and provides back up for capital projects and other critical Company investments.

Important issues of interest includes review of the utilities KPIs (Key Performance Indicators) to determine if they are defined and measured in a manner appropriate for high-level operational KPIs for the utility business. This review will determine if they are aligned with the corporate business plan and are appropriate for measuring utility performance in a comprehensive, corporate-wide integrated system with sufficient emphasis on longer term performance. This includes assessment of adequacy of corporate level objectives and alignment of performance & compensation to supporting these objectives.

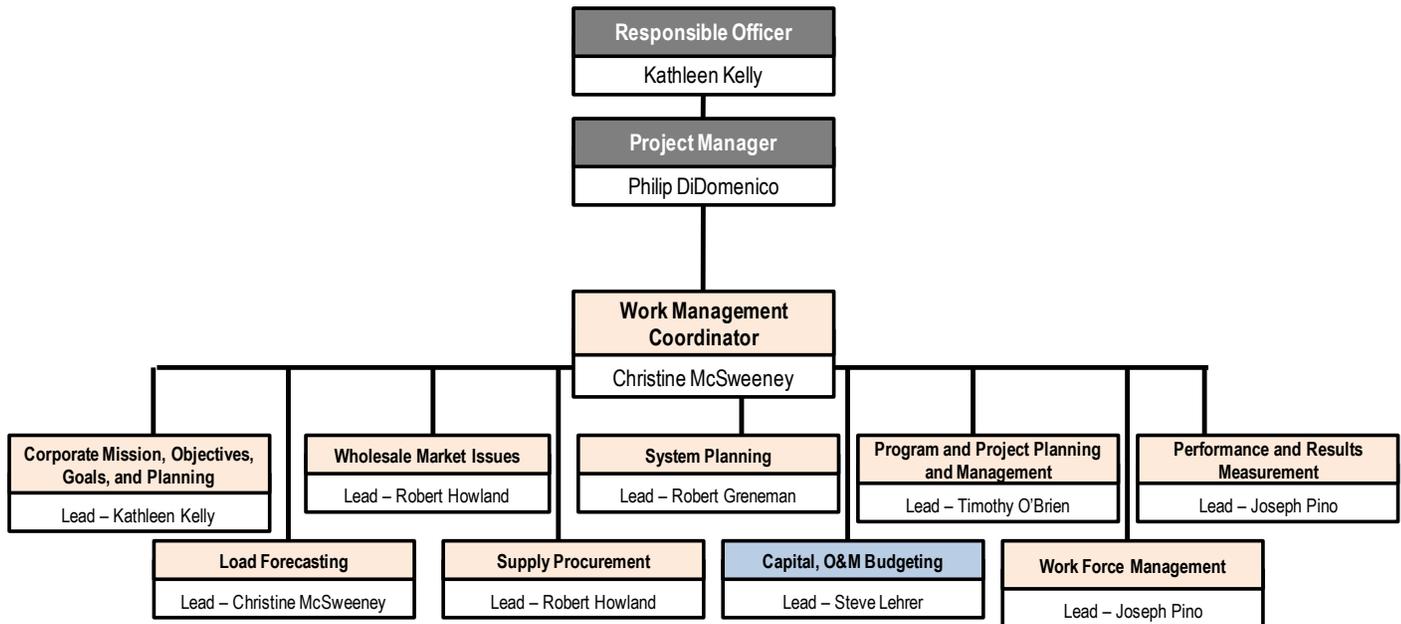
Finally the tie to performance planning will be investigated to assess whether the organization has internalized the achievement of goals in critical areas such as planning, O & M, and finance. We seek to determine if and how long term planning is linked to corporate success, and the manner and extent institutional, regulatory or cultural barriers hinder successful achievement of goals. Key items includes identifying if planning can be influenced by management discretion being exercised at high levels. We will look for evidence of regular feedback in our interviews and monitor the communication during our visits as well as how the Company ties employee performance to the success of Company strategy. As with the "Work Management" function, above, the extent to which employee skills/talents or gaps are mapped against company needs will be noted as well as the effectiveness of the utility performance review process.

## 5 Project Team and Responsibilities

Our project team is made up of Shaw Consultants and KBL personnel according to the organizational design below. Our Responsible Officer, Kathleen Kelly, will act as the authorized representative of our team in all contractual negotiations and authorizations. Philip DiDomenico, our proposed Project Manager, will be the main point of contact for the Commission, as well as the two utilities and Iberdrola. He will be supported by Christine McSweeney, who will assist in managing the day to day scheduling and coordination of area leads and participating consultants.



Within this organization of our firm and our leaders, our team is made up of highly experienced and trained professionals with a range of expertise in utility and non-utility-specific processes, operations, and performance metrics. Our matrix of personnel will be organized as is depicted below.



A discussion of how each lead is qualified to contribute to and coordinate this effort is included in the remainder of this section.

***Work Management Coordinator – Christine McSweeney***

Ms. McSweeney has been involved in and has helped manage the logistics of three organizational and management reviews in just over two years with Shaw Consultants. Ms. McSweeney brings organization, document management discipline, and report drafting expertise to her role and will assist the project manager in coordinating the work efforts of functional area leads.

***Corporate Mission, Objectives, Goals, and Planning – Kathleen Kelly***

Ms. Kelly has worked with and for the utility sector for over 30 years. It is this extensive expertise that will support Ms. Kelly’s ability to manage and address the executive-level interface between senior managers, Board members, and executives, as well as the strategic business and management planning within this level of the organization. Ms. Kelly is a management consultant with extensive strategic utility experience including management and operations, organizational design, process improvements, and change management. Her experience incorporates corporate and strategic planning, management and operational audits, analysis of industry issues, business analysis, market strategy, functional unbundling, market analysis, stranded costs, pricing, and business infrastructure implementation planning and education.

***Load Forecasting – Christine McSweeney***

Ms. McSweeney will manage and coordinate the review of load forecasting methodologies, practices, and processes within both the New York State Electric and Gas, and the Rochester Gas & Electric utilities. Ms. McSweeney has worked within our market modeling services to develop reasonable projections for load and peak demand growth within the context of customer types, regional areas, and utility initiatives. She has worked with a utility in the State of New York to interpret and communicate their load forecasting

methodologies and practices, in support of a comprehensive energy policy publication. She produced a projection of demand for products and services within the North American utility industry for use by a major investment firm.

***Wholesale Market Issues and Supply Procurement – Robert Howland***

Mr. Howland is our expert in competitive wholesale market rules and operations, and will lead the analysis in this audit relative to wholesale market issues and supply procurement processes. Mr. Howland is frequently called upon within our consulting team to follow and report on market rules, trends, and operations across the North American energy markets. He has worked in the energy and electric power industry for 30 years including in such areas as power planning, marketing, renewable power development and ISO market developments. His experience also includes resource assessment, origination and trading, Independent System Operator (ISO) and Power Pool relations, markets development, renewable power project development, electric power planning and power supply contract negotiation and administration. He has a power supply planning and marketing executive background and is skilled in energy planning, regulatory compliance, renewable energy resources, project management, and related areas.

***System Planning – Robert Greneman***

Mr. Greneman is a Licensed Professional Engineer who will lead the analysis and development of recommendations in the area of system planning. Mr. Greneman has extensive regulatory experience testifying in association with rate design and cost of service issues – it is this expertise that will support his analysis of key areas such as planning, identifying, and justification capital projects and the impact those projects have on utility customers according to accepted regulatory practices and decision making. He has relied on engineering and system planners in his cost of services planning to evaluate and recommend appropriate allocators. Mr. Greneman will support a key component in the review, which we anticipate to be the analysis and appropriateness of organizational and budgeting overlap, verifying that each of the components, affiliates, and subsidiaries of Iberdrola are not unduly subsidizing another component, specifically with reference to how these operations and processes could impact New York customers.

***Capital, O&M Budgeting – Steve Lehrer***

Mr. Lehrer is a Principal in the Risk Management and Advisory services Group at KBL and has provided financial and operational solutions to midsized companies as well as fortune 100 companies. He has worked with companies that were both domestic and international, publicly traded and privately held. Mr. Lehrer's experience includes a broad range of industries such as insurance, retail, biotechnology, financial services, entertainment, technology, manufacturing and distribution, and healthcare. He is a licensed Certified Public Accountant in New York and a proactive thought leader and lecturer, and considered a subject expert on topics such as Sarbanes-Oxley, Internal Controls and Corporate Governance.

***Program and Project Planning and Management – Timothy O'Brien***

Mr. O'Brien has provided projections of market prices and analyses of power purchase agreements to support project development and project due diligence efforts. Mr. O'Brien frequently works with our capital cost estimating team and is experienced in project evaluation efforts to support construction, operation, and financing alternatives.

*Workforce Management and Performance and Results Measurement – Joseph Pino*

Mr. Pino has directed several efforts in reviewing business processes improvements requiring strong interviewing and data analysis skills. He has participated in and directed organization assessments focusing on IT, work order, and customer interactions, with a strong focus on monitoring key performance indicators in these areas. He has worked with clients to establish information systems requirements for energy information, reporting, data management, and data issues investigation.

## 6 Schedule and Budget

The following section details the schedules, pricing, and other commercial components of our proposal. We believe this proposal best meet the Commission’s objectives based on our understanding of the effort to be completed.

### 6.1 Proposed Schedule

Our team believes that the project schedule, as presented in the RFP, can be met, provided that there are no unreasonable delays in contract negotiations, document availability, interview scheduling, or coordination with the Commission project manager. Our deliverables are discussed earlier in this proposal (Section 3), and we provide the timing of those deliverables, as currently anticipated, below.

Deliverable / Proposal Component	Anticipated Schedule
<b>Consultant Selection</b>	<i>March 2011</i>
<b>Project Management</b>	<i>Bi-weekly status report, weekly conference calls with Commission PM, and additional correspondence, as needed</i>
<b>Phase 1: Initial Review and Planning</b>	<b>March – May 2011</b>
Submission of Initial Data Request	March 2011
Company Orientation Meetings	April 2011
Initial Interviews (20)	April 2011
Discussion of Preliminary Observations with Staff	May 2011
Draft Work Plan Submitted to Staff	May 2011
<b>Phase 2: Targeted Review and Analysis</b>	<b>June 2011 – January 2012</b>
Workplan approved by Staff	June 2011
Targeted Interviews (180)	July – September 2011
Focused Analysis and Additional Data Review	July – December 2011
Preparation of Draft Report	August 2011 – January 2012
<b>Phase 3: Reporting and Communication</b>	<b>February – May 2012</b>
Presentation of Draft Report to Staff (PowerPoint format)	February 2012
Draft Report Submitted to Staff	February 2012
Revised Draft Report to Iberdrola (Factual Accuracy)	March 2012
Revised Draft Report to Staff and Iberdrola	April 2012
Final Report to Department	May 2012

## 6.2 Proposed Commercial Terms

Our team’s commercial proposal associated with the approach and deliverables in Section 3, and the schedule highlighted above, is summarized on the following page according to the example included in The Guide.

	Orientation	Discovery	Analysis	Report Writing	Total
Focus Areas	(Phase 1)	(Phase 2)	(Phase 2)	(Phase 2 & 3)	
Corporate Mission, Objectives, Goals and Planning	134	153	306	158	<b>751</b>
Load Forecasting	54	61	122	63	<b>300</b>
Wholesale Market Issues	54	61	122	63	<b>300</b>
Supply Procurement	67	76	153	79	<b>375</b>
System Planning	67	76	153	79	<b>375</b>
Capital and O&M Budgeting	67	76	153	79	<b>375</b>
Program and Project Planning and Management	54	61	122	63	<b>300</b>
Workforce Management	67	76	153	79	<b>375</b>
Performance and Results Measurement	67	76	153	79	<b>375</b>
<b>Sub-total</b>	<b>630</b>	<b>718</b>	<b>1,436</b>	<b>743</b>	<b>3,528</b>
Project Management and Report Writing	84	96	192	100	<b>472</b>
<b>Total Hours</b>	<b>714</b>	<b>814</b>	<b>1,629</b>	<b>843</b>	<b>4,000</b>
<i>Blended, Weighted Billing Rate (\$/hr)</i>	<i>\$212.15</i>	<i>\$212.15</i>	<i>\$212.15</i>	<i>\$212.15</i>	
<b>Total Fees</b>	<b>\$151,513</b>	<b>\$172,776</b>	<b>\$345,551</b>	<b>\$178,760</b>	<b>\$848,605</b>

Audit Areas	Shaw Consultants International					
	K. Kelly.	P. DiDomenico	J. Pino	R. Greneman	R. Howland	J. Mesko
	<i>VP</i>	<i>Sn. EE</i>	<i>EC</i>	<i>EC</i>	<i>EC</i>	<i>EC</i>
Corporate Mission, Objectives, Goals and Planning	90	78	160			
Load Forecasting			60	60		
Wholesale Market Issues			90	20	58	
Supply Procurement			80	20	60	
System Planning		30		209	40	60
Capital and O&M Budgeting		10		71		105
Program and Project Planning and Management				30		150
Workforce Management			120	60		
Performance and Results Measurement			120			
<b>Project Management / Misc.</b>	<b>68</b>	<b>40</b>				
<b>Total Hours</b>	<b>158</b>	<b>158</b>	<b>630</b>	<b>470</b>	<b>158</b>	<b>315</b>
<i>NYPSC Billing Rate</i>	<i>\$350</i>	<i>\$290</i>	<i>\$200</i>	<i>\$200</i>	<i>\$200</i>	<i>\$240</i>
<b>Total Fees</b>	<b>\$55,300</b>	<b>\$45,820</b>	<b>\$126,000</b>	<b>\$94,000</b>	<b>\$31,600</b>	<b>\$75,600</b>

Audit Areas	Shaw Consultants International			KBL
	T. O'Brien	C. McSweeney	J. Milton	
	<i>Cn. C</i>	<i>C</i>	<i>C</i>	
Corporate Mission, Objectives, Goals and Planning		160		263
Load Forecasting		120	60	0
Wholesale Market Issues	18	29	85	0
Supply Procurement	20	29	91	75
System Planning			36	0
Capital and O&M Budgeting			20	169
Program and Project Planning and Management	60			60
Workforce Management		75	120	0
Performance and Results Measurement	60	40	61	94
<b>Project Management / Misc.</b>		177		188
<b>Total Hours</b>	<b>158</b>	<b>630</b>	<b>473</b>	<b>848</b>
<b><i>NYPSC Billing Rate</i></b>	<b><i>\$185</i></b>	<b><i>\$170</i></b>	<b><i>\$170</i></b>	<b><i>\$240</i></b>
<b>Total Fees</b>	<b>\$29,230</b>	<b>\$107,100</b>	<b>\$80,410</b>	<b>\$203,545</b>
<i>Subtotal, Professional Fees</i>				\$848,605
<i>Subtotal, Travel and Administrative Expenses</i>				\$45,000
				<i>(Optional Travel to Spain estimated at an additional \$8,000)</i>
<b>Not-to-Exceed Price</b>				<b>\$893,605</b>

### 6.3 Contract Sample

Shaw Consultants received and reviewed the sample contract provided, which we understand will require updating to reflect Iberdrola USA's requirements and, we respectfully request, to address consultant needs as well, prior to execution. We are respectfully suggesting language additions or modifications to reduce our risk, without significantly increasing those of the other parties. We have successfully executed contracts with the State of New York and expect a successful negotiation can result in this instance. Our suggested modifications include:

- **Article 1. B. 4.**

The Consultant, ~~its affiliated companies~~ and any Audit subcontractor agree not to perform any work for the Utility or any affiliated organization as defined in Public Service Law Section 110 without the written permission of the Commission, **which will not be unreasonably withheld**, during the terms of this Agreement and not until at least two (2) years after the Department certifies the Consultant's completion of this Audit as defined in Article V, Section C of this Agreement.

- **ARTICLE XII – DISPUTES**

Any disputes between the Utility and the Consultant in the performance of this Agreement shall be submitted to the Department for resolution. In the event the Utility or the Consultant desires to dispute the Department's resolution, or a Department determination made pursuant to Article VI B of this

Agreement, it may appeal the decision to the Commission. Pending the outcome of any such appeal, the Utility agrees to perform all of its other, uncontested obligations hereunder pending the resolution of the dispute. ~~The Consultant agrees to continue its work under this Agreement notwithstanding the existence of a dispute or the fact that a dispute is resolved in a manner not satisfactory to the Consultant.~~ In the event of a dispute, the Consultant, the Utility, and the Commission shall retain all legal rights, remedies and authorities otherwise available under law.

Our suggested additions include:

- **LIMITATION OF LIABILITY** – NOTWITHSTANDING ANY OTHER PROVISION TO THE CONTRARY IN THIS AGREEMENT, CONSULTANT’S TOTAL AGGREGATE LIABILITY FOR DAMAGES UNDER THIS AGREEMENT SHALL BE LIMITED TO ONE HUNDRED PERCENT (100%) OF THE AMOUNT OF FEES RECEIVED FOR SERVICES BY CONSULTANT UNDER THIS AGREEMENT.
- **CONSEQUENTIAL DAMAGES** – IN NO EVENT SHALL CONSULTANT, ITS PARENT CORPORATION, OR THEIR AFFILIATES, AGENTS, OR EMPLOYEES BE LIABLE FOR ANY INDIRECT, INCIDENTAL, CONSEQUENTIAL, SPECIAL, EXEMPLARY OR PUNITIVE LOSS OR DAMAGE, INCLUDING, BUT NOT LIMITED TO, LOST PROFITS, BUSINESS INTERRUPTION LOSSES, OR CUSTOMER CLAIMS, WHETHER ARISING UNDER CONTRACT, WARRANTY, EXPRESS OR IMPLIED, TORT, INCLUDING NEGLIGENCE, OR STRICT LIABILITY, ARISING AT ANY TIME FROM ANY CAUSE WHATSOEVER IN CONNECTION WITH THIS AGREEMENT OR PERFORMANCE HEREUNDER, EVEN IF CAUSED BY THE SOLE OR CONCURRENT OR ACTIVE OR PASSIVE NEGLIGENCE, STRICT LIABILITY OR OTHER LEGAL FAULT OF CONSULTANT.
- **INDEMNIFICATION** – EXCEPT FOR THE LIABILITIES ASSUMED HEREIN, COMPANY DOES RELEASE, INDEMNIFY, AND HOLD HARMLESS CONSULTANT, ITS PARENT CORPORATION AND THEIR AFFILIATES, AGENTS, AND EMPLOYEES FROM AND AGAINST ANY AND ALL LIABILITIES, CLAIMS, LOSSES, DAMAGES, COSTS, FEES AND EXPENSES, AS WELL AS COSTS OF DEFENSE, SETTLEMENT, AND REASONABLE ATTORNEY’S FEES, ARISING AT ANY TIME IN CONNECTION WITH i) CLAIMS BY COMPANY THAT EXCEED THE LIMITATION OF LIABILITY SET OUT IN SECTION 9 ABOVE, AND ii) ANY CLAIMS BY THIRD PARTIES ARISING IN CONNECTION WITH ANY WORK PRODUCT OR SERVICES PROVIDED HEREUNDER, EVEN IF CAUSED BY THE SOLE OR CONCURRENT OR ACTIVE OR PASSIVE NEGLIGENCE, STRICT LIABILITY OR OTHER LEGAL FAULT OF CONSULTANT. THIS PARAGRAPH SHALL SURVIVE EXPIRATION OR TERMINATION OF THIS AGREEMENT.

We appreciate the Commission and the State’s consideration of our suggestions.

## 7 Experience and Qualifications of the Individuals and Firm

The Shaw Team, comprised of Shaw Consultants International, Inc., and KBL, LLC, has extensive experience in providing our clients with management reviews, operational improvement recommendations, auditing services, and evaluations of risk management and internal control processes. We hope you'll find that the following section clearly articulates the experience of each of our proposed team members, as well as each of our two firms – demonstrating our ability to provide the NY utilities and the Commission with a clear, value-added assessment of areas for organizational and process improvement.

References for a selected number of the clients and efforts described in the following sections are presented in the table below.

Client	Contact	Project Description
<b>Energie New Brunswick</b>	Tony O'Hara Distribution Manager 506.458.4444	T&D reliability and planning assessment
<b>Hoosier Energy, REC</b> Bloomington, Indiana	Donna Snyder CFO 812.876.0372	Corporate management review and technical condition assessment of power generating assets
<b>Hoosier Energy, REC</b> Bloomington, Indiana	Robert Richhart VP, Management Services 812.876.0236	Corporate management review and technical condition assessment of power generating assets
<b>Public Service of New Hampshire</b>	Karen Mackey 603.634.2519	Planning Criteria and Reliability Review
<b>Southwestern Louisiana Electric Membership Corp</b> Louisiana	J.U. Gajan, CEO 337-896-2527;	Organization Review
<b>Vermont Electric Cooperative</b> Johnson, Vermont	David Hallquist CEO 42 Wescom Road Johnson, VT 05656 802.730.1138	Management and business process review; Organizational design review and restructuring; Recommendations designed to improve capital investment and cooperative direction

## 7.1 Qualifications of Our Professionals

Our team is comprised of 9 members of Shaw Consultants, as well as 6 members of KBL. A matrix of the management auditing experience of each of these 15 individuals is included below, organized by firm.

	Hoosier Energy	Confidential Client	Vermont Electric Cooperative	SLEMCO	Public Service of New Hampshire	Energie New Brunswick	
Audit Type	Organizational Review	Review of Sales and Proposals Business Process	Comprehensive Management Audit	Operational Review	Review of T&D System Planning	T&D Audit	Expertise Highlight
Consultant							
Kathleen Kelly	Responsible Officer	Responsible Officer	Responsible Officer	Responsible Officer	Responsible Officer	Responsible Officer	Planning, Regulatory, Market Issues
Philip DiDomenico	Project Manager	Project Manager	Project Manager	Project Manager	Project Manager	Project Manager	Planning, Organizational Alignment, Operations
Joseph Pino	Lead in Work Management	Consultant - Analysis, Report Development		Consultant – Work Management	Consultant	Consultant	Demand and Resource Planning, Business Processes, IT
Robert Greneman				Consultant – System Planning, Budgeting, Rates			Regulatory Insight, Rate Design, Business Processes
Robert Howland	Supporting Analysis		Supporting Analysis				Supply Planning, Market Issues
John Mesko							Gas Utility Expertise, Management
Timothy O'Brien		Consultant – Documentation Management					Market Issues, Data Analysis and Interpretation
Christine McSweeney	Consultant (Interviews, Analysis, Report Development)	Consultant - Analysis, Report Development					Organizational Alignment, Business Processes, Data Analysis, Reporting
John Milton							Internal Auditing

Proposal to Provide a  
**Comprehensive Management Audit of**  
**Iberdrola S.A., Iberdrola USA, New York State Electric & Gas, and Rochester Gas & Electric**  
*Case 10-M-0551*

	University	Retirement Plan	Government Entity	Waste Disposal	Service	Wireless Company	Medical Company	
<b>Audit Type</b>	Financial Audit for GAO and GAS Compliance	Financial Audit for Statements	Financial Audit for GAO and GAS Compliance	Financial Audit for GAO and GAS Compliance	Financial Audit for GAO and GAS Compliance	Review of Internal Controls	Controls and BOD Audit Oversight and Governance	<b>Expertise Highlight</b>
<b>Consultant</b>								
<b>Frank Sanchez-Ruiz</b>	Concurring Partner	Concurring Partner	Concurring Partner	Concurring Partner	Concurring Partner			Process Review, Control Design, Financial Statements
<b>Nelly</b>	Partner-in-Charge	Partner-in-Charge	Partner-in-Charge	Partner-in-Charge	Partner-in-Charge			Process Review, Control Design, Financial Statements
<b>Abraham</b>	Manager		Supervisor					Audit Management, Compliance Tests and Analysis
<b>Eliseo</b>		Supervisor		Supervisor				Audit Management, Compliance Tests and Analysis
<b>Uday Gulvadi</b>					Managing Consultant	Managing Consultant	Managing Consultant	Audit Management, Compliance Tests and Analysis
<b>Steve Lehrer</b>						Director	Director	Audit Management, Compliance Tests and Analysis

Summary biographies of each of these professionals are included below, organized by firm. Resumes for each are included in Appendix A.

### 7.1.1 Shaw Consultants International, Inc.

**Ms. Kathleen Kelly**, *Vice President and Responsible Officer of Shaw Consultants International*, is a skilled manager with 30 years of leadership, policy development, business planning, technical management, and project management experience working with and for utilities, regulatory commissions, market aggregators, end-use customers, suppliers and project developers. Ms. Kelly has extensive utility strategic planning experience, including analysis of retail industry restructuring issues, developing a competitive industry market framework, business analysis, market strategy, functional unbundling, market analysis, stranded costs, re-regulation, pricing, business infrastructure implementation planning and education. She has provided strategy facilitation services and advised senior managers on strategic issues, strategy development, and implementation. Ms. Kelly is experienced in corporate planning, resource assessment and acquisition, forecasting, evaluation, market research, rate design and cost unbundling, utility operations and management, and Demand-Side Management planning, implementation and evaluation. Ms. Kelly has testified in several rate and regulatory proceedings. Ms. Kelly has directed, and participated in, all of the management and technical audits referred to in this proposal.

During her career at Shaw Consultants International, Ms. Kelly has directed numerous strategy engagements that involved competitive positioning plans, rate structure and strategy, restructuring of the industry, DSM planning and recovery, forecasting, financial unbundling, senior management discussions, business plans, and modeling efforts. She has directed cost of service, rate design and pricing projects for municipals and IOUs throughout the U.S. and Canada. Ms. Kelly has facilitated senior level and key managers as they develop strategic and tactical business/product/member plans. She has been active in regulatory policy, legislative development and implementation of market rules and policies.

Prior to joining Shaw Consultants International, formally Stone & Webster Management Consultants, she was with Boston Edison Company for 20 years in management positions, where she was responsible for overall corporate restructuring, competitive positioning, marketing, rates, sales and revenue forecasting, and energy efficiency. Ms. Kelly has a BS in Mathematics and Economics and an MBA in Finance. Ms. Kelly has written articles and presented at several conferences related to Regulatory Issues, Rate Design, Cost of Service and Utility Restructuring.

**Mr. Phil DiDomenico**, *Senior Executive Consultant* is an accomplished manager, management consultant, and electrical engineer with extensive and diversified experience in electric utility management and operations. His areas of expertise range from strategic capital planning to resource planning, electric system planning and operations, and fossil power plant engineering and operations. He has facilitated and advised senior managers on strategic issues including; reshaping business management strategies, financial planning, asset transactions, asset optimization, asset valuations, operations, and maintenance practices in both Electric Delivery and Fossil Generating organizations. Mr. DiDomenico planned and directed comprehensive strategic assessments of electric delivery and fossil generating assets, which served as the cornerstone for infrastructure development. He is experienced as an expert witness in regulatory proceedings addressing such matters as managing risk in resource planning and operations and maintenance practices. Mr. DiDomenico has managed the audits completed for VEC, PSNH, EKPC, Kauai, Hoosier Energy – and contributed to Energie New Brunswick and SLEMCO.

Mr. DiDomenico leads the Long Island Power Authority efforts relative to resource planning including considering the contribution from renewables and energy efficiency. He directed the Consumers Power Resource Planning effort and contributed to the consideration of climate change impacts and incorporation of risk into the planning processes of both projects.

**Mr. Joe Pino**, *Executive Consultant*, is a management consultant with diverse experience in the electric utility industry including implementation planning for deregulation; demand-side planning, implementation and evaluation; rates; business process mapping; and customer information systems including billing and settlement. He joined Shaw Consultants International with over 20 years experience working for a major Northeast utility. He directed several efforts in reviewing business processes improvements requiring strong interviewing and data analysis skills. He has participated in and directed organization assessments focusing on IT, work order, and customer interactions. He has worked with clients to establish information systems requirements for: energy information, reporting, data management and data issues investigation. He directed a team of professionals in developing software upgrades, standard reports, and new system interfaces to meet client needs. He led an investigation of customer information system capabilities and weaknesses during the merger of two utilities. He created and negotiated pricing for several special contracts in competitive customer situations; set policy and pricing on non-regulated products, services and special contracts; and prepared unbundled rates after introduction of industry restructuring. Mr. Pino has contributed his management and information collection expertise to Hoosier Energy Cooperative, Energie New Brunswick and Public Service of New Hampshire projects. Mr. Pino was the project manager for the New Hampshire Electric Cooperative business process review and mapping. Mr. Pino worked in DSM program evaluation for five years at NSTAR and was the manager of the NIPSCO Energy Efficiency Program Design effort. Mr. Pino managed the Energy New Brunswick and Lower Valley, Wyoming audits – he contributed to VEC, Hoosier Energy, and the sales and proposals process review for a confidential client.

**Mr. Robert Greneman P.E.**, *Associate Director* is a licensed professional engineer with a broad range of industry experience in rate and regulatory matters spanning more than thirty years. He has prepared nearly 100 cost of service and rate design studies, including expert testimony for domestic and international energy companies, combination electric and gas vertically integrated North American investor owned utilities, electric cooperatives, municipal public power companies with multiple services including gas, electric, steam, water and wastewater, electric cooperatives – both distribution and generation and transmission owners, as well as Canadian crown corporations. These clients have each required attention to a diverse variety of cost of service and rate design issues including equitable treatment for multi-state jurisdictions, allocation of shared services for companies that offer multiple services to differing customer bases, aligning costs for isolated island generation and distribution systems, developing costs and rate design for underdeveloped countries, and the development of rate structures that balance the concerns across the diversity of stakeholders, from low income residential consumers to rates that promote energy conservation and competitive rates for industrial customers. He developed a proprietary Excel-based SCOST model, which Shaw Consultants International utilizes and licenses to its clients for cost of service analysis. He has also developed DSM screening models and has evaluated electric and gas program measures for large Midwest utilities. Mr. Greneman has a BEE in Electrical Engineering with follow-up graduate work and has written articles and presented at several conferences related to rate design, cost of service and industry restructuring. Mr. Greneman has advised the audit team on key planning issues, metrics, and system planning issues with regard to VEC, PSNH, SLEMCO, and Energy New Brunswick.

**Mr. Robert Howland**, *Executive Consultant*, is a skilled utility and management consultant as well as a utility planning executive with extensive experience in wind and other renewable power resources, regulatory compliance, electric power marketing and related transmission issues, as well as project management. Mr. Howland is also skilled in Power Pool relations, resource planning, developing customer relationships, strategic planning and contract administration. He directed the energy trading desk, and devised operation protocols for wholesale trading, risk management, power accounting, and managed budgets and RFPs. Mr. Howland has been active in the field of renewable development and has represented utilities interests on market rule development at the ISO-New England. Since joining Shaw Consultants International in the summer of 2007 he has provided clients with advisory services in the market pricing, resource planning, and implementation of power supply management processes and procedures. Mr. Howland has worked with the team at Shaw Consultants International on system planning and procurement efforts, as well as development services for renewable energy in Vermont, and consideration of carbon policies in resource planning and for individual clients that are addressing their carbon footprint.

**Mr. John Mesko, P.E.**, *Executive Consultant*, is an Engineering/Business Consultant specializing in the upstream and midstream oil & gas industry. Formal education includes Chemical Engineering, Petroleum Engineering and MBA/finance with 26 years diversified experience in the energy industry, domestic and international. Career work has included a diverse spectrum of specialty areas such as reservoir engineering, economics/capital investment, strategic planning, fuel supply operations, privatization, project due diligence, asset appraisal, and facilities operations. Within these broad areas of activity, work has been related to hydrocarbon reserves, development of gas storage (salt cavern, reservoir, LNG, propane-air) and other midstream assets, LDC and merchant plant fueling, financial analysis, planning and forecasting, pipeline design/optimization, contract analysis and project management. Mr. Mesko participated in a number of audits during his career with Shaw Consultants International.

**Mr. Timothy O'Brien**, *Senior Consultant*, is a management consultant who specializes in energy price forecasting, utilizing Prosym, the energy market simulation software licensed by Shaw Consultants International, formally Stone & Webster Management Consultants. He has completed more than twenty separate analyses in support of resource planning efforts, appraisal efforts, operational review efforts, investor reporting, and acquisition support. He also has a significant amount of experience in the areas of project controls, earned while working on the EPC side of Stone & Webster, including cost tracking, monitoring earned value, change orders, reporting, and budget forecasts, with a special focus on running ShawTrac, The Shaw Group's proprietary earned progress software. Before joining Shaw Consultants International, Mr. O'Brien worked in the financial services industry, where he focused on sales and new business development. Mr. O'Brien is a valuable member of the team providing modeling services for review of existing modeling results to provide enhancements and critical analysis of the information. Mr. O'Brien has contributed to many auditing efforts by supporting our team's document management functions and analysis, and monitoring of performance metrics.

**Ms. Christine McSweeney**, *Consultant*, is a management consultant with experience in organizational improvement and operational efficiency enhancement efforts, market research, resource planning and forecasting documentation, and stakeholder facilitation services for electric utilities and interested parties. She has experience in the auditing of complex models and tools, including cost of service and demand side management planning models. Her work has included market research and forecasting, including developing presentations summarizing power markets in the U.S. by region, forecasting and tracking changes in regulatory and legislative initiatives and their potential impacts on the energy industry, and developing demand projections

and associated research of power and process-industry-dependent products and services. Ms. McSweeney's organizational skills as well as her document review and document management approaches have contributed to efforts that involved multiple participants, contributors, and stakeholders. Ms. McSweeney has experience in electricity procurement, power supply contracting, and resource cost-evaluation for various clients, including utilities and aggregated municipal electric customers. Ms. McSweeney has contributed substantially to the resource plan development and documentation for a large electric utility in the northeastern U.S. Ms. McSweeney holds a BS in Mechanical Engineering from Villanova University. Ms. McSweeney has contributed to the document management, interview execution, research and supporting analysis, and draft and final report development for efforts with Hoosier Energy, Nova Scotia Power, and the sales and proposals business process review.

**Mr. John Milton, CIA, CISA, MSM**, is an internal auditor who has held positions at First Wind, Robert Half Management Resources, Titus, and NSTAR in the areas of internal auditing and Sarbanes-Oxley activities. Mr. Milton joins our team as a subcontracting staff member – he has had experience working with and for Shaw Consultants and its professional, and will be a valuable asset to our project team.

### 7.1.2 KBL, LLC

**Richard Levychin, CPA** is the CEO of KBL, LLP and the Managing Partner of KBL's New York office. Richard is also the Managing Partner of KBL's affiliate, KBL Eisner, LLP. KBL is a CPA and Advisory firm with offices located on Wall Street in New York, and in New Jersey. KBL's primary focus is on both privately and publicly held emerging businesses. KBL Eisner has a primary focus on Fortune 500 companies. KBL has 7 partners and the resources of over 50 professionals. Combined with its affiliate KBL Eisner, KBL has the resources of 90 partners and over 600 professionals. Richard has over 25 years of accounting, auditing, business advisory services, and tax experience working with both privately owned and public entities in various industries including financial services, media, entertainment, sports, real estate, oil and gas, not-for-profit, technology, and professional services. His experience also includes expertise with SEC filings, initial public offerings, and compliance with regulatory bodies.

**Mr. Steve Lehrer, CPA** is a Principal in the Risk Management and Advisory Services (RiMs) Group at KBL. He brings 20 years of experience gained from the Big 4, national and regional accounting firms. Steve has extensive experience in audit, accounting, reporting, internal audit, regulatory compliance, process re-engineering, enterprise risk management, Risk Intelligence, and Sarbanes-Oxley compliance. His specialty is identifying high risk areas and providing financial, operational and best practice solutions.

**Mr. Uday Gulvadi, CPA, CIA, CISA, CA** is a Principal in the Risk Management and Advisory Services (RiMs) Group at KBL. He formerly held leadership positions as a Partner and a Director in premier regional accounting firms in their Internal Audit and Risk Management practice groups. Uday is a recognized expert and thought leader in the areas of corporate governance, enterprise risk assessments, internal audit, Sarbanes-Oxley optimization, business process improvements, information technology governance and social media risks.

**Maria Stan, CPA** is a Senior Manager with KBL, LLP. KBL is a CPA and Advisory firm with offices located in New York and New Jersey. KBL's primary focus is on both privately and publicly held emerging businesses. Maria has more than 10 years of financial audit and consulting services experience. A majority of that time has been spent on large engagements within the Media and Communications industries. She has been engaged with companies navigating through acquisitions and divestitures, integrations, internal control structuring and restructuring, and corporate reorganizations. In this capacity, Maria manages and coordinates domestic and international

engagement teams through the planning, execution, and completion of multifaceted audit and consulting engagements. This includes the formulation and coordination of strategy and execution.

**Frank Sánchez Ruiz**, CPA, CMA, CIA, CGFM, is the Co- Chairman of KBL’s Government Services Practice Group. KBL’s Government Services Practice Group combines the resources of KBL and the CPA firm Torres-Llompарт, Sánchez-Ruiz LLP (TLRS). TLRS is one of the larger CPA firms in Puerto Rico. Frank has over 30 years of public accounting experience working in a variety of fields including, manufacturing, hotel (leisure time), retail and wholesale, insurance, pension and welfare funds, construction, low rental housing, and government, including audits of federal financial assistance programs, federal grant aid audits, HUD audits, and general government accounting. Frank is licensed to practice as a Certified Public Accountant in New York, New Jersey, and Puerto Rico. He is also licensed as a Certified Management Accountant, Certified Internal Auditor, and a Certified Government Financial Manager.

**Nelly Vázquez**, CPA is a Partner in KBL’s Government Services Practice Group. KBL’s Government Services Practice Group combines the resources of KBL and the CPA firm Torres-Llompарт, Sánchez-Ruiz LLP (TLRS). TLRS is one of the larger CPA firms in Puerto Rico. Nelly has over 20 years of public accounting experience working in a variety of fields, including, manufacturing, hotel, retail and wholesale, insurance, education, employees’ retirement plans, pension funds, construction, waste disposal, telecommunications, and government.

## 7.2 Qualifications of Our Firms

The expertise of our collective team is included below. We have organized descriptions of our expertise according to themes and expertise that are most relevant and similar to a comprehensive management audit, as requested by the Commission.

### 7.2.1 Management Review – Comprehensive Review and Auditing

#### Vermont Electric Cooperative

Our staff worked with the CEO and Board of Directors of the Cooperative in concert with the Vermont Department of Public Service to perform a Business Process Review and Audit of the Transmission and Distribution Cooperative as part of a settlement agreement between the parties. This effort involved a review of the entire organization including Board activities to assess whether improvements could be made to the organization’s structure, effectiveness and execution. Our recommendations for improvement were extensive impacting capital investment and cooperative direction for the near term.

*“...Although the process could have been disruptive, Shaw Consultants provided frequent internal communication about the approach [to the organizational review] so that VEC staff embraced the process and the results of the review. More than 80 recommendations were provided and nearly all have been adopted and implemented. VEC now enjoys improved operations and an improved regulatory relationship, and for the first time in its history, has submitted a rate increase request*”

### 7.2.2 Management Review – Organizational and Management Effectiveness

The following examples of our firm’s experience work to highlight our expertise in reviewing and providing recommendations for improvement relative to an organization as a whole, much like this comprehensive audit for the NYS Commission.

## E.ON US

Our team worked with a number of separate generating facilities to assess the management and operations practices in place in order to advise E.ON executives (both in engineering operations and planning as well as financial management of the organization) with respect to areas of best practice along with identification of areas needing improvement. The effort involved high level facility inspections and extensive staff interviews to assess operations and planning functions such as maintenance planning, capital budgeting, operations management and communications. Our effort confirmed the independence of the facilities in terms of management and operations standards and identified several approaches to streamlining the operations, introducing standards and centralized planning. Our recommendations were designed to reduce operating costs, improve the effectiveness of operations and reporting, and to align the organization for succession planning purposes.

### East Kentucky Power Cooperative Performance Review

In support of this effort an organizational assessment was performed which analyzed and assessed the effectiveness of the existing organizational structure, alignment, performance in achieving results in meeting the utility's core mission. A functional and core process review was performed in order to analyze the as-is processes, policies, and procedures and how these subsequently hinder, impact, or strengthen desired levels of efficiency and effectiveness. This analysis involved reviewing the process activities, looking for improvement opportunities including: areas of inconsistency, disconnects in service, duplication of efforts, sources of rework or errors, bottlenecks that hinder response time, and overall communication barriers.

As part the on-site analysis, interviews, and field observations, the top issues, concerns and opportunities were identified. Key conclusions were summarized along with the potential impacts to the organization. Specific recommendations were developed, including recommendations for improving performance, and recommended changes to organizational structure, functional activities, core processes and proposed staffing levels.

### Hoosier Energy Cooperative

Shaw Consultants International, Inc. conducted a management evaluation including both business process reviews and a condition assessment of the largest generation asset owned by Hoosier energy. This process involved a series of interviews with senior executives, senior manager and staff throughout the company, relevant document and information reviews, report reviews, several process review teams composed of Company staff and our team members, and an extensive analysis of trends to provide recommendations for changes and improvements to the organization, staffing, planning, business processes, and system applications.

*"...all of our collective hard work five years ago is paying off in a big way...cultural change is the hardest, in my opinion, but we have turned the corner...no doubt about it. ...Don't ever change your philosophy/approach, which is to tell the client what they need to hear v. what they want to hear. That is what distinguishes Shaw from other*

### Southwestern Louisiana Electric Membership Cooperative

Shaw Consultants International, Inc. conducted a review of the organization through interviews with the CEO followed by interviews of key managers and a review of appropriate documentation. We assessed the effectiveness and efficiency of management and business operations through our discussions and document reviews as well as observations of business processes. We evaluated the risks associated with anticipated succession issues over the next decade. Our recommendations included a realignment of responsibilities,

acquiring new personnel for several positions, a shift in organizational focus, revised reporting, and new resource training and mentoring plans.

#### **Barbados Light & Power Company, Ltd**

Shaw Consultants International, Inc. conducted an organization review brought about by the planned retirement of the Managing Director. We met with key staff at all levels of the organization to understand the underlying business processes and decision making approaches. We also interviewed potential candidates for executive training opportunities to outline needed skills training and mentoring requirements to prepare these staff for C-level positions within five and ten year time frames. We worked with the Managing Director and key members of the senior management team to assess several alternative business structures and advised them in the strengths and weaknesses of each. We designed the final organizational structure and prepared succession plan alternatives for the incoming Managing Director.

### **7.2.3 Management Review – Targeted Operational Improvement**

Examples provided in this area highlight our firm's experience in addressing targeted business process. Our team has reviewed many different types of business processes for both utility and non-utility clients, and in each engagement we collect evidence through interviews and document review, analyze and compare evidence against our industry insights and published benchmarks, and provide actionable recommendations for change. References for a selection of these clients are included at the beginning of this section.

#### **Nova Scotia Power Company**

Shaw Consultants worked with Senior Management of Nova Scotia Power Company to provide advice and counsel relative to their ability to achieve productivity gains and efficiencies in the management and operations of their generation facilities. This effort was undertaken in the Fall of 2009 and addressed only three of their generating facilities. Our review included management talent, standardization of processes, use of procedures, common planning and reporting, and approaches to work management and planning. Our recommendations include a greater focus on asset management and an implementation plan that will move the company forward with regard to centralized asset decisions and implications of emission control strategies on operations and asset life.

#### **Hoosier Energy Cooperative – Process Improvement and Competitive Solicitation**

Pursuant to a comprehensive business process review with Hoosier Energy, Shaw Consultants assisted the Midwestern cooperative in selecting a computerized maintenance management system (CMMS) to complement pending improvements in the cooperative's work management processes. Upgrading the CMMS system was identified as a high priority action item during the process review – to support the selection of such an integral system, Shaw Consultants facilitated discussions with Hoosier management to outline the deficiencies in the then current system, as well as outline the necessary elements and functions of a proposed new system. Our team was responsible for researching available options for the CMMS, as well as involved in coordinating vendor presentations and developing evaluation criteria to systematically assess alternative options. Our team facilitated evaluation discussions with a diverse management team, representing many departments and functions within the Hoosier organization, in order to drive consensus in identifying the best available candidate. Finally, Shaw Consultants facilitated contract negotiations between Hoosier Energy and the successful vendor.

### **Public Service of New Hampshire**

Shaw Consultants International, Inc. conducted a review of the distribution planning processes, system reliability, and a general system condition assessment for this northeastern utility. Our approach to this effort included a reliance on extensive staff and commission interviews, reviews of documentation and reports, investigation into particular issues, sample system condition site visits and reviews, and analysis of the related documentation and information provided. We provided numerous areas that reflected industry standard approaches and offered several recommended changes in processes, information systems, management reporting, and documentation that will serve to improve the reliability of information and system planning at the Company. Our report was presented to the commission staff and provided to the commission as part of a regulatory filing process.

### **Energie New Brunswick**

Our staff evaluated the transmission and distribution business lines of the corporation to assess its effectiveness and efficiency. We conducted a sample based condition review of the assets to assess the infrastructure's vulnerability. We collected information on maintenance practices, budgets, business plans, distribution system planning policies and procedures, system planning standards, staffing, and conducted interviews of key staff involved in the T&D areas. Our report documented the state of the infrastructure and functional support of the system with key findings and recommendations for changes to existing approaches.

Energie New Brunswick engaged our firm to investigate their progress at implementing the many recommendations of the 1999 report during 2005. The company had recently undergone significant structural changes and we interviewed staff to independently assess the company's response to our original report. These interviews sought to understand the plan adopted for each identified change, the progress to date achieving change, and the results of those changes so that we could present findings and further recommendations if necessary. Our report documented the activities taken by the Company to improve its effectiveness and provided additional opportunities for efficiency.

## **7.2.4 Other Audit Expertise**

### **Lower Valley (WY) Energy Cooperative**

Shaw Consultants International, Inc. provided business process mapping of several key areas of Lower Valley Energy Coop in Wyoming. We facilitated sessions to discuss billing, materials control, GIS, and work order processes. Process maps with identification of the advantages and disadvantages of each work flow were also provided.

### **Kauai Electric Cooperative**

Shaw Consultants International, Inc. staff worked with a team of consultants to review the organization, management, operations, and business processes of this island cooperative and provided a roadmap to guide future investment and improvements in each area.

**Attachment A**  
**Professional Resumes**

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Ms. Kelly is an experienced manager with more than thirty years of leadership, supervisory, project management, and diverse utility experience. She is a management consultant with extensive strategic utility experience including management and operations, organizational design, process improvements, and change management. In addition her experience incorporates retail industry restructuring issues, developing a competitive industry framework, business analysis, market strategy, functional unbundling, market analysis, stranded costs, re-regulation, pricing, and business infrastructure implementation planning and education. Ms. Kelly facilitates discussion by and advises senior managers on strategic issues and strategy development and implementation. She is experienced in corporate planning, forecasting, management, valuation, market research, rate design and cost unbundling, utility management, and Demand-Side Management (DSM) planning, implementation and evaluation. Ms. Kelly is an expert witness and has provided expert testimony on retail restructuring, rate design, resource planning, forecasting and DSM.

**PROFESSIONAL EXPERIENCE****1997 - Present****Shaw Consultants International Inc.**

Vice President and Practice Leader

Ms. Kelly is responsible for marketing, revenues, profitability, client relationship management, commercial issues, and management of the Management and Strategy Practice. Ms. Kelly markets for the entire organization as well as for the Practice. She directs cross-functional teams in the marketing and technical execution of client engagements and management.

**1977 - 1997****Boston Edison Company**

Director of Industry Restructuring

Manager of Marketing and Rates

Manager of DSM Evaluation

Division Manager of Energy Efficiency Planning

Division Manager of Rate Design

Division Manager of Demand and Revenue Forecasting

**CONSULTING EXPERIENCE*****Strategy, Business and Energy Planning***

Ms. Kelly has directed the creation of an independent long term energy plan for several major utilities and customers including Long Island Power Authority, a Major Upper Midwest Investor Owned Utility, Massachusetts Institute of Technology, and Massachusetts Health and Education's Facilities Authority's PowerOptions aggregated buying group. These plans incorporate new generation technology, demand response programs, energy efficiency and load reduction programs, new construction, repowering, and renewable resources. The methodology utilized traditional planning methods coupled with the incorporation of probabilistic risk on major drivers to more fully understand the impact of resource decisions and the risk of resource shortages. These approaches included an assessment of the implications for economic development and growth.

Ms. Kelly directed the development of a portfolio of electric energy efficiency and demand response strategies for Northern Indiana Public Service Company for inclusion in its 2007 Integrated Resource Plan (IRP) filed with the Indiana Utility Regulatory Commission (IURC) and sponsored and provided testimony in support of the plan. Ms. Kelly also provided a report and support to regulators and stakeholders of NIPSCO's gas efficiency programs during 2006.

For the Edison Electric Institute, Ms. Kelly directed the design of a survey of major electric utilities in the US relative to the implementation of Sarbanes Oxley Regulations in their organizations. She interviewed 15 CEO's and more than 75 C-Level officers to obtain their estimate of the costs, staffing impacts, concerns, and policy changes resulting from passage of the law. She prepared a report for CEO's and for the C-level staff and EEI to provide to its membership and presented the results to EEI.

Ms. Kelly facilitated strategy development for a major East Coast developer interested in expanding its renewable energy resource base. For an Association of Iowa Electric Cooperatives, Ms. Kelly provided technical facilitation and policy development services to a cross section of 20 representatives of the more than forty members – resulting in the creation of positions with respect to climate change requirements. The positions and strategies included development of a wide range of approaches to legislative and regulatory policy development on global warming solutions including, in particular, energy efficiency levels and standards, demand response, renewable portfolio standards, and net metering for community resources.

She directed the development of a ten-year forecast of North American copper demand resulting from electric industry expansion in generation, transmission and distribution segments for the Copper Development Association which is a business trade association.

Ms. Kelly directed and completed a three-phase project working with the *Iowa Association of Electric Cooperatives*. Phase one involved the facilitation of a restructuring task force comprised of member cooperatives working together to strategize and formulate their joint restructuring position. Phase two required both facilitation and technical knowledge and focused on negotiation strategy and implementation of that strategy, resulting in the cooperative association taking a leadership role in state restructuring legislation development. Phase three developed and implemented an education series for cooperative managers, directors and employees to prepare for industry restructuring.

She worked with *several municipal utilities and joint action power agencies* in separate projects to assess the impact of competition on their operations, develop strategies for the businesses to grow, and facilitate the development of implementation plans for successful growth. Ms. Kelly facilitated *strategic planning sessions* for several cooperative and municipal utilities boards to establish strategies for a competitive market framework. .

### ***Organizational Design, Effectiveness, and Strategy***

Ms. Kelly directed an assessment of the process and organizational effectiveness for a major Midwestern cooperative including corporate services and plant management and operations for a 1000 MW coal fired facility. This engagement resulted in recommendations for immediate and longer term process and organizational improvements, culture change requirements, and implementation and monitoring plans to achieve success. Ms. Kelly has provided these assessments for numerous private utilities, cooperatives and municipal utilities. Ms. Kelly directed a mapping of the new service business processes for New Hampshire Electric Cooperative and identified a wealth of process improvements.

Ms. Kelly directed a team of professionals to review and evaluate the efficiency and effectiveness of the management and business processes of the third largest utility in Vermont working with the utility Board of Directors, senior management, and regulators. Our team prepared a report providing a detailed discussion of our methodology, findings, conclusions and recommendations to improve efficiency, management, operations, communication, regulatory relationships, culture, and member relations.

She recently completed a review of the distribution planning and reliability of a major Northeastern IOU which evaluated the processes, procedures, and results on reliability. These efforts also assessed the philosophy of distribution planning and reliability as well as evaluating the procedures, processes, systems, and results for reporting to the regulators. Ms. Kelly directed audits of three major eastern utilities' distribution outage situations to determine the root cause of the failure and recommended technical, planning, and operational improvements. Ms. Kelly completed an evaluation of the

implementation progress relative to a prior Shaw Consultants International Inc. Management Consultants report on T&D improvements needed in the planning, construction, reporting, and IT areas of a Canadian Crown Corporation. Ms. Kelly directed the review and comparison to market of the salary structure of an East Coast Water Utility. She worked with a major west coast water utility to identify cost reduction opportunities and provided regulatory strategy on cost of service issues.

#### ***Acquisition Transactions and Contract Negotiations***

Ms. Kelly worked with a client to assess alternative resource procurement strategies for an aggregated group of customers with more than 500MW of electricity consumption. Ms. Kelly evaluated the ability to offer green power solutions to its customer group as well as the opportunity to participate in equity ownership of green facilities.

Ms. Kelly completed efforts with several confidential clients to *value potential acquisition* of utility assets including auctions of assets.

- She provided decision tools including forecasts of pro forma income statements including assessment of potential risks. She directed the efforts of a team of experts reviewing data room materials to assess the forecast of revenue and cost impacts of the available information. She prepared forecasted market assessments for generation opportunities in various markets. Assets analyzed include electric generation, electric and gas transmission and distribution systems, steam systems, and competitive businesses such as product and service businesses or retail energy companies.
- Ms. Kelly advised clients in the assessment of opportunities, risks and financial alternatives in the consideration of an acquisition.
- Ms. Kelly completed a successful energy procurement process for the *Rhode Island League of Cities and Towns*.

#### ***Rate and Regulatory Strategy and Filings***

Ms. Kelly directed and participated in efforts with Newfoundland Labrador Hydro to develop a revised cost of service and redesigned its retail and wholesale rates for its 2003 rate case. Ms. Kelly evaluated the potential for supporting regulatory capitalization of startup costs for a Canadian utility.

Ms. Kelly participated in the application of the FERC Seven Factor Test to distribution and transmission assets for a major Midwestern utility and advised the client on strategic issues relative to application.

She directed rate case analysis and preparation for numerous utilities including NIPSCO, Terasen (formerly Centra Gas British Columbia) a division of Kinder Morgan, Newfoundland Labrador Hydro, Boston Edison, Centra Gas Manitoba, SLEMCO, Fayetteville Public Works, and others.

#### ***Competitive Analysis and Positioning***

Ms. Kelly directed the competitive positioning analysis of more than fifty generation units or portfolios using dispatch models to develop market prices for regions and for locational marginal pricing. For example, Ms. Kelly directed the development of a portfolio market analysis for a major investor that included more than 12 plants in eight different US markets that established competitive position of each unit, based on the forecasted market or PPA revenues, operating costs and market risks for ArcLight Capital Partners.

#### **1977 - 1997                      Boston Edison Company**

Ms. Kelly held various responsible positions within the corporation managing groups of professionals in marketing, forecasting, analysis, rate design, regulatory issues, business strategy, and DSM planning and evaluation. A summary of key activities is provided below by topic area. Ms. Kelly's ability to design and develop new areas was tapped several times during her tenure at Boston Edison – in particular she

developed the first ever energy and load forecasting group, the first demand-side management planning and later evaluation areas, and she merged several areas to create the first marketing department for the company that including forecasting, energy management evaluation, cost of service, rate design, and marketing planning. In many ways, Ms. Kelly's role was that of an internal consultant to senior management.

### ***Industry Restructuring Manager***

Ms. Kelly was a primary author and developer of Boston Edison's electric industry restructuring plan, evaluating strategic financial, operational and customer impacts of the proposed plan and building consensus both within and outside the corporation. She participated in the team that negotiated solutions with regulators and third parties resulting in settlement of major issues. She identified the structure and resources necessary to meet the demands of the new competitive energy market. Ms. Kelly developed strategies for business infrastructure implementation and coordinated regulatory strategy and witness preparation. She was an expert witness on rate design, implementation issues and customer education requirements. Ms. Kelly was the company representative on industry working groups investigating and negotiating statewide restructuring issues and the public spokesperson with area trade associations, businesses and customers on industry restructuring.

### ***Pricing and Marketing Manager***

She directed the development of cost allocation methods, retail and wholesale tariffs and filing requirements for rate cases. Ms. Kelly successfully implemented the use of creative utility pricing tactics. She positioned the utility as the first in the region capable of regional real time pricing through negotiated model development and successful customer pilot of hourly day ahead pricing. She educated and trained corporate personnel on pricing strategy, positioning and tactics. Ms. Kelly developed and implemented successful responses to competitive retention challenges with several major customers.

### ***Market & Competitive Analysis***

Ms. Kelly developed a competitive marketing plan utilizing market research results in preparation for a transition to a competitive environment. She initiated competitive positioning analysis at a northeast utility by working with senior management to define strategic information and analysis requirements. She completed a first time assessment of competitive customer value of electricity and the utility's competitive position, while completing a competitive positioning analysis of bundled and unbundled electric pricing. She directed the development of in-depth competitor assessments covering market share, pricing strategy, and restructuring positioning and new market strategies.

### ***Utility Regulation***

Ms. Kelly has extensive regulation and regulatory interaction experience. She developed resource plan filings, DSM budgets, DSM evaluation and reconciliation for cost recovery purposes, forecasting filings, rate filings and restructuring filings. She has testified before regulatory commissions supporting energy sales and load forecasting and resource planning, DSM planning, rate structures and restructuring proposals.

## **EDUCATION**

**MBA**, Finance, Northeastern University

**BS**, Mathematics and Economics, University of Massachusetts

## **AFFILIATIONS**

Member of the Board of Directors (1996-2000) and current member, Association of Energy Services Professionals

Associate Member, National Association of Rural Electric Cooperatives

Associate Member, American Public Power Association

### **SPEECHES & PUBLICATIONS**

Energy Efficiency – Providing Equivalent Incentives to Utilities, Presented to the RKS Research & Consulting Energy Efficiency Seminar, Dallas TX, March 2008

Organizational Improvement – Strategies and Tactics, Presented to the CEO Conference, National Rural Electric Cooperative Association, Phoenix, AZ, January, 2006

Cooperative Restructuring Issues, Paper presented at the 10<sup>Th</sup> National Energy Services Conference, Tucson, AZ, December, 1999

Several *Industry Restructuring* speaking engagements.

*Issues and Trends in Pricing*, Professional Pricing Society, Annual Conference, Chicago, IL, October 1995.

*Selling Evaluation*, Sixth International Energy Program Evaluation Conference, August 1993. Published.

*A Brief History of a Measurement and Evaluation Department: Boston Edison Company*, Edison Times, IRP Quarterly, April 1993.

*Competition in the Energy Markets and its Impact on IRP*, National Association of Regulatory Utility Commissioners (NARUC), May 1993.

*Managing Evaluations*, ACEEE Summer Study Program 1992. Published.

Several *DSM* speaking invitations, 1985 - 1994.

Several *Forecasting* speaking invitations, 1980 - 1984.

Numerous publications on such subjects as *Demand Planning Process, Conservation and Load Management, DSM Monitoring, Evaluation, Forecasting, and Business Planning*.

## Philip DiDomenico

## Senior Executive Consultant

An accomplished manager, management consultant and electrical engineer with extensive and diversified experience in electric utility management, planning, and operations. Areas of expertise range from strategic and capital planning, to resource planning, electric system planning and operations as well as fossil power plant engineering and operations. Facilitates and advises senior managers on strategic issues including; reshaping business management strategies, financial planning, asset transactions, asset valuations and operations and maintenance practices in both Electric Delivery and Fossil Generating organizations. Planned and directed comprehensive strategic assessments of electric delivery and fossil generating assets, which served as the cornerstone for infrastructure development. Experienced as an expert witness in regulatory proceedings addressing such matters as managing risk in resource planning and fossil generating operation and maintenance practices.

### PROFESSIONAL EXPERIENCE

#### *Representative Consulting Assignments*

**MIT Utility Master Plan** - The objective of this project was to establish a long-term plan for MIT's utility infrastructure to support the continued operation and expansion of the Cambridge campus facilities. The plan benchmarked the existing utilities and provided a firm plan for the improvements needed over the next five years with a projection of the improvements that may be needed in years six through ten. Additionally, the plan provides a framework for annual updating so as to continue with an ongoing five year planning horizon. While the plan is based on future development scenarios for the complete build out of the campus, it also provides guidance for incorporating changes in development priorities in the decision making process. A dynamic model was created capable of providing feedback on the impacts that individual building projects would have on the campus system so that utility supply decisions can be made within a broad context.

**Long Island Power Authority Energy Plan Development** – Working in conjunction with the Authority's staff, led the development of a multi-faceted, dynamic Energy Plan to meet the energy needs of Long Island. The plan provides a comprehensive and flexible approach to providing a safe, reliable, environmentally friendly and cost efficient supply of electricity to customers well into the future. This is accomplished by investing in customer programs, energy efficiency, conservation, new technologies, encouraging development of merchant transmission and generation, adding off-island transmission interconnection capability, enhancing existing power supply resources and evaluating the need to build additional ones. The Energy Plan includes programs for energy efficiency and renewable technologies. One of the programs is the LIPA Solar Pioneer program for the installation of photovoltaic systems for residential customers.

**Long Island Power Authority Resource Planning Process** – Developed a unique approach to managing the risk inherent in resource planning. The probabilistic Decision Analysis based approach allows decision makers the ability to clearly understand the uncertainties in the planning process and the implications of planning to meet varying levels of uncertainty.

**Long Island Power Authority Generation Acquisition** - Led a team that evaluated the strategic value of acquiring 4000 megawatts of generating assets on Long Island. Issues evaluated included; economics under varying purchase prices, potential for operations and maintenance related savings, opportunities for reduced staffing, economics of alternative financing proposals as well as market power related concerns and the likely implications for stimulating a competitive market on Long Island.

**Western Resources T&D Asset Valuation** - Led a study to determine the value of the T&D system in preparation for a potential municipalization action. The RCN (replacement cost new) value was determined based on a combination of cost trending, construction costs and field observations.

**Long Island Power Authority T&D Facilities Condition Assessment in Support of Bond Financing -** Led a T&D facilities condition assessment in support of a \$200 million bond offering. Onsite inspections were performed on a representative of sample of T&D facilities. Maintenance records were also reviewed for selected major pieces of equipment.

**Long Island Power Authority Review of Electrical Utility Undergrounding Policies and Practices -** Led a study that evaluated the pros and cons of underground versus overhead construction. Several utilities, communities, and governmental agencies were contacted or researched in order to gain a broad understanding of the issues involved. Key insights were identified. The focus of the evaluations centered on a combination of factors including; system reliability, public safety, aesthetics and economics.

**Long Island Power Authority Review of T&D Construction Practices and Their Impact on Public Safety -** Led a study that reviewed trends in electrical contact cases on Long Island and identified and discussed the public safety implications of alternative T&D construction practices. These practices included; total undergrounding of transmission and/or distribution facilities, undergrounding of transmission and/or distribution facilities near schools, replacement of transmission and/or distribution conductor with covered wire, replacement of transmission and/or distribution conductor with aerial cable, fencing transmission rights-of-way and enclosing substations. These alternative construction practices were compared and contrasted in categories that included; construction cost, environmental impact, reliability impact, and their likely effectiveness in reducing injuries from accidental contact.

**Conectiv Generation Divestiture -** Based on field observations, identified areas in need of improvement aimed at increasing the curb appeal of the generation assets in preparation for divestiture.

**Long Island Power Authority (LIPA) Acquisition of Long Island Lighting Company T&D Assets -** Successfully led the effort by LIPA to negotiate and implement a management services agreement with KeySpan Energy to operate and maintain LIPA's transmission and distribution facilities. The agreement is a key component of a comprehensive restructuring plan under which LIPA acquired the former Long Island Lighting Company's transmission and distribution assets as a means of lowering electric rates on Long Island. As LIPA's representative, identified assets to be transferred to LIPA, evaluated the overall condition of T&D facilities, negotiated capital and O&M budgets, established capital project justification guidelines and the criteria for LIPA's review of major capital projects and scheduled maintenance deferral, determined criteria for defining "major storm" events, and reviewed corporate procurement practices. Also contributed to the development of the consultant's report to support the bond refinancing of the acquired assets.

#### ***Utility Management Assignments***

**Electric Delivery Process Redesign -** As a utility manager, played a key role in transitioning Boston Edison Company's Electric Delivery Organization from a traditional engineering and operations based organization to one focused along process lines. Led the creation of the Asset Management Process predicated on the philosophical separation between decision and action in a business. This separation better matches work and workforce, lowering overall cost, improving service quality and reducing compromises by matching the workforce to the work required as opposed to matching the work to the available workforce. The Asset Management model encompasses those processes, sub-processes and applications (tools) necessary to make consistent, effective and efficient decisions relating to company assets. These decisions deal with optimizing the operation, maintenance, upgrade and design of new portions of the asset, retirement of assets, and the evaluation of investment/ business opportunities. Also supported the development of processes in support of Customer Electric Services, Customer Service Connection, Construction & Services and Community Lighting Services.

**Management of Electric Delivery System -** As a utility manager, played key role in restructuring and realigning Boston Edison Company's electric distribution operations to reduce costs, improve customer service, and position the company for competition. Directed all facets of the business group's \$80-million

capital budget, supervised staff of 28 engineers, and developed and implemented competitive business and operational strategies. Facilitated the transition from a traditional engineering based operation to one structured along process lines. Planned and directed a comprehensive, strategic assessment of the present and future needs of the electric delivery system as a guide for addressing infrastructure planning and development. Implemented a reliability-centered maintenance initiative, leading the way to a 40 percent cost reduction and an increase in the effectiveness of the distribution system's maintenance program. Also, developed criteria for performance-based ratemaking.

**Management of Engineering Services** - As a utility manager, developed and implemented business and operational strategies to support the successful operation of Boston Edison Company's fossil generating units. Directed all facets of the business unit's \$30-million capital budget. Achieved a \$6-million inventory reduction, far exceeding company goals, by devising highly effective planning and control procedures. Facilitated development of the Production Engineering Planning System, an innovative Oracle and Powerbuilder-based IT application that significantly improved budget accountability and control. Also developed performance criteria for the advancement of fuel cell technology.

**Power Supply Planning and Management** - As an executive assistant to the utility's Senior Vice President, Power Supply, prepared analyses of alternative operating strategies and emerging generation technologies for strategic evaluation. Planned and mobilized the Power Supply Group's initial business and strategic operating plan, which focused the organization's direction and ensured consistency with overall corporate objectives. Managed the group's \$60-million capital budget establishing processes that directly led to excellence in budget performance and the optimal use of resources.

**Fossil Power Plant Performance Improvement** - As a principal engineer for the utility, developed innovative approaches for improving the operating efficiency of and capital planning criteria for the fossil generating units operated by Boston Edison Company. Developed a new program for monitoring and evaluating the condition of turbine lube oil. Created, analyzed and monitored fossil unit performance goals as a means of predicting operating problems in advance of outages. Extended the time between major turbine overhauls. As the primary witness before the Massachusetts Department of Public Utilities, prepared and offered testimony regarding fossil unit performance. Through effective and through presentation of events and their underlying causes, saved over \$1-million in replacement power penalties and incurred zero penalties for replacement power costs for an unprecedented three consecutive years.

**Energy Supply Planning and Management** - As a senior engineer for the utility, performed and directed production cost and financial analyses to evaluate capital investments and to identify power purchase and sales opportunities for Boston Edison Company. Created a unique approach using decision analysis techniques to manage the risks inherent in energy supply planning and capital investment decisions associated with fossil power plants. The Integrated Decision Analysis System (IDEAS) was subsequently presented at the 15<sup>th</sup> Inter-RAM Conference for the Electric Power Industry in Portland, Oregon, in October 1988. Authored the company's standard "Guidelines for Capital Investment Analysis - Fossil Stations", outlining the financial method to be used in evaluating capital investments. Created the first, comprehensive cost analysis model to integrate the value of generation with financial analysis at the engineer level, thus increasing ownership and substantially improving productivity. Represented the company as an expert witness in energy supply planning before the MDPU.

**Underground Distribution Engineering and Construction** - As an engineer for the utility, developed construction standards, prepared specifications, and evaluated materials and equipment for Baltimore Gas & Electric Company's underground distribution system. Also responsible for correcting unusual outage and engineering problems related to duplicate 34.5-kV supply to industrial customers and 13-kV supply to large residential subdivisions.

## **EDUCATION**

MBA, Management, Loyola College

BS, Electrical Engineering, Power Systems, Northeastern University

**PROFESSIONAL MEMBERSHIPS**

Institute of Electrical and Electronic Engineers, Member

Association of Edison Illuminating Companies

Electric Power Apparatus Committee, 1996-97

Power Generation Committee, Distributed Resources Subcommittee, 1994-95

New England Power Pool

Unit Availability Task Force, 1989-92

Generation Task Force, 1986-88

**PUBLICATIONS**

“An Apples to Apples Survey of Utility Measurement”, American Public Power Association, Engineering & Operations Workshop Proceedings.

“Plant Performance Optimization Using Cost-Benefit Decision Analysis Techniques”, Inter-RAM Conference Proceedings.

“Guidelines for Capital Investment Analysis - Fossil Stations”, prepared for Boston Edison Company.

**EXPERT TESTIMONY**

Massachusetts Department of Public Utilities

Generating Unit Performance Program

Massachusetts Electric Facilities Siting Council

Resource Planning Process

**CONTACT INFORMATION**

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# Joseph F. Pino

# Executive Consultant

Management consultant with diverse experience in the electric utility industry centering on business process reviews and improvement, approaches to deregulation, unbundling of cost, rate design, customer aggregation, state and federal regulatory proceedings, and customer information systems including billing, and settlement. Joined Shaw Consultants International Inc. with over 25 years experience that includes rates, cost-of-service, demand-side management, performance-based rates, pricing, billing and information systems.

## PROFESSIONAL EXPERIENCE

<b>2002 - Present</b>	<b>Shaw Consultants International Inc.</b> <i>Executive Consultant</i>
<b>1981 - 2002</b>	<b>NSTAR (formerly Boston Edison Company)</b> <i>Manager - Customer Information System</i>

## CONSULTING EXPERIENCE

### *Utility Restructuring*

Involved in the implementation of new unbundled tariffs for deregulation. Mr. Pino has developed methods of unbundling cost by rate class. He has also participated in the redesign of a customer billing system for deregulation, assisted in development of Performance Based Rates (PBR) metrics associated with service quality, and separated street lighting revenue and cost to prepare for municipalization.

### *Pricing*

Participated on the team that implemented real-time pricing pilot. Recommended and implemented several rate design improvements including economic development rates by class and manufacturer retention rates. Assisted in development of sample performance base rates (PBR) for PUC. Created and negotiated pricing for several special contracts in competitive customer situations. Set policy and pricing on non-regulated products, services and special contracts.

### *Demand-Side Management (DSM)*

Assisted in several process and impact evaluations that included data analysis, field investigation, program design, program implementation and management. Developed company's first data warehouse to retrieve billing and customer participation information for DSM related projects. Managed several internal consultants in creating DSM information system. Managed external consultants in program evaluations of several DSM programs.

### *Business Process Reviews and Management Audits*

Mr. Pino led review of all work and service orders for an electric utility that included detailed mapping of each process and assisted in a process and management review of electric utility's work practices and procedures. He has also led assessments of previous management audit on review of implementation of recommendations, as well as led several teams in developing detailed business process review, analysis and enhancements.

### *Northern Indiana Public Service Company (NIPSCO)*

Researched and recommended energy efficient end uses for Integrated Resource Plan. Assisted in analyzing modeling savings, cost and benefits for several energy efficiency programs including demand response and load management programs. Researched the application of the FERC seven factor test across the US to form the basis for an application at NIPSCO. The research included developing a matrix showing the diversity and homogeneous classifications undertaken and approved.

### ***Consumers Energy***

Developed and recommended energy efficient end uses for Integrated Resource Plan including air conditioning cycling program. Assisted in analyzing modeling savings, cost and benefits for several energy efficiency programs including demand response and load management programs. Program development included investigating implementation and management of programs in the most efficient and costly manner.

### ***Yucca Mountain, DOE***

Completed an energy audit of two buildings for the Yucca Mountain Facility in Las Vegas. On site for a detailed walk through of both facilities, gather building demographic information and produced a detailed report of energy efficiency results with recommendations.

Developed a conservation plan for the Yucca Mountain facility that identified all the activities that need to take place to comply with DOE requirements in the environmental, energy efficiency, load management and compliance areas. The document required a field visit to the facilities, a review of the current and anticipated facility uses, a series of teleconferences, and a study of the end-uses to complete.

### ***Massachusetts Institute of Technology (MIT)***

Acted as Project Manager of the MIT team responsible for creating a modeling tool to support the campus utility master plan. This model was customized to handle multiple energy sources including steam, electric, hot and chilled water with the flexibility to handle one of all at the same time. Coordinated the data gathering necessary to develop the model, translated and scrubbed the data and provided alternatives to support future requirements of the campus.

### ***Vermont Electric Cooperative***

Assisted in detailed business process review and audit of the Cooperative. Interviewed several employees, board members and commission personnel. Reviewed and analyzed company and commission documents related to the project scope. Developed process charts for several business processes. Assisted in the presentation and delivery of results of the review and audit.

### ***Hoosier Energy Cooperative***

Assisted Hoosier staff in selection of vendor to provide CMMS software. Liaison between vendors and company. Set up vendor demonstrations, assisted in developing requirements document, facilitated selection team, assisted in vendor selection and negotiated pricing of software. Assisted in the development of an implementation plan.

### ***E.ON U.S. Services***

Directed an assessment of the utility's coal generation in Kentucky for a benchmarking study and report. The study included reviewing all reliability reports, staffing, capital costs, O&M costs, age, size, schedule maintenance and unscheduled outages. Compared information to similar plants in U.S. and provided a detail report of the results. Assessment included interviews with key personnel at all six plants.

### ***Energie New Brunswick***

Directed an assessment of the Company's implementation of recommendations resulting from an earlier assessment of Energie New Brunswick's planning for and operation of its transmission and distribution systems. The update included reviewing all recommendations from the previous assessment, updating the status of recommendations, developing findings and conclusions relative to the company's progress in implementation each recommendation. Directed an update of the benchmarking from the previous report. The benchmarking included analysis of similar size companies from the northeast US and Canada with benchmarks associated with reliability, sales, revenue, employees, peak demand, capital costs, O&M costs, customers, and miles of line.

### ***Hoosier Energy Cooperative***

Assisted Hoosier staff by managing several business process teams as they reviewed the current processes in order to develop the preferred future process including coordinating information, diagramming processes, facilitating business process meetings and advising during the development of the new business process design. Provided assistance on several different process teams including asset management, work order process, communication and information technology.

### ***Long Island Power Authority***

Coordinated the review of community meeting comments on the needs of Long Island for the energy plan. Organized the comments by topic, developed a means for tracking the originator, comparing information, and developed draft responses to the questions. These questions included policy level concerns such as divestiture of utility assets, management decisions, and compensation issues; technical concerns such as the adoption of renewable resources and energy efficiency technology, operational issues, and customer issues. Fielded the review of the responses and developed a document for stakeholder input.

### ***Rhode League of Cities and Towns (RILCT)***

Acted as liaison between the RILCT and suppliers in the aggregation of electric power supply for its members. Provided researched of supply options available to the RILCT and created a short list to negotiate with based upon the RILCT requirements. Coordinated the review of the RILCT billing information with suppliers and assisted in providing timely and accurate information to them based upon the requirements of RILCT. Negotiated pricing options for the RILCT with multiple suppliers that lead to the selection of a provider for future service to the RILCT. Provided various other information upon request and review supplier contracts.

### ***New Hampshire Electric Cooperative***

Currently working with all levels of management and staff to develop a process map that includes full documentation for eight related work processes that directly touch the customer. Process involves extensive number of interviews with staff responsible for each step in the processes. Map provides decision information, areas where overlap occurs, competing and conflicting data management systems, a method for estimated time commitments and elapsed process time, and reporting inconsistencies. Project will result in significant efficiencies and cost reductions for the client.

### ***Customer Information Systems***

Responsible liaison between information system business area and business partners for whom the software and databases are maintained. Worked with clients to establish information requirements, reporting efforts, data management requirements, and data issues for investigation by information system personnel. Directed team of professionals in developing software upgrades, standard reports, and new system interfaces to meet client needs.

Led NSTAR investigation of customer information system capabilities and weaknesses during merger of acquired utility. Required working with a team to establish the new business entity's requirements:

### ***Information System Manager***

Provided support and resources leading up to merger process. Managed implementation of supplier billing using EBT/EDI. Managed successful Y2K team effort for the Customer Information System. Led team responsible for the daily operation and maintenance of the billing system. Implemented several tariff changes to billing system. Assisted in the creation of new financial and usage reports

## **EDUCATION**

BS, Mathematics, University of Massachusetts, Boston

Specializing in utility rate and regulatory matters, Mr. Greneman has prepared numerous cost of service and rate design studies for clients that range from international energy companies, combination gas and electric vertically integrated North American investor owned utilities, municipal public power companies with multiple services including gas, electric, steam, water and wastewater, electric cooperatives – both distribution and generation and transmission owners, and Canadian crown corporations. These clients have each required attention to a diverse variety of cost of service and rate design issues including equitable treatment for multi-state jurisdictions, allocating shared services for a company that offers multiple services to differing customer bases, aligning costs for isolated island generation and distribution systems, developing costs and rate design for underdeveloped countries, and competitive considerations.

**PROFESSIONAL EXPERIENCE**

<b>1986 - Present</b>	Shaw Consultants International, Inc.
<b>1978 - 1982</b>	Associate Director
<b>1983 - 1986</b>	The Brooklyn Union Gas Company Senior Rate Engineer
<b>1973 - 1978</b>	Alan J. Schultz, Consulting Engineer Associate Engineer
<b>1971 - 1973</b>	Ebner-Schmidt Associates, Consulting Engineers Electrical Design Engineer

**CONSULTING ASSIGNMENTS***Cost of Service and Rate Design*

Alpena Power Company	<i>Cost of Service, Rate Design</i>
Artesian Water Company	<i>Cost of Service</i>
Barbados Light & Power Company, Ltd.	<i>Embedded &amp; Marginal Cost, Rate Design</i>
Blackstone Valley Electric Company	<i>Marginal Cost</i>
Brockton Edison Company	<i>Marginal Cost</i>
Brooklyn Union Gas Company	<i>Cost of Service, Marginal Cost, Rate Design</i>
Centra Gas British Columbia	<i>Rate Design</i>
Central Illinois Light Company	<i>Cost of Service, Marginal Cost, Rate Design</i>
Chesapeake Utilities (Maryland Division)	<i>Gas Cost of Service</i>
China Light & Power Co., Ltd. (Hong Kong)	<i>Review of Cost of Service &amp; Tariff Structure</i>
Citizens Utilities Company (VT, AZ)	<i>Electric Cost of Service, Rate Design</i>
Citizens Utilities - Illinois Water	<i>Water &amp; Wastewater Cost of Service, Rate Design</i>
Colorado Electric (West Plains Energy)	<i>Marginal Cost</i>
Commonwealth Edison Company	<i>Electric Cost of Service</i>
Consolidated Edison Company of NY	<i>Fully-Unbundled Electric, Gas &amp; Steam Models</i>
Consumers Energy Corp.	<i>DSM Screening</i>
Dayton Power & Light Company	<i>Gas Cost of Service</i>
Delmarva Power & Light Company	<i>Electric Cost of Service</i>
Delta Natural Gas Company	<i>Cost of Service, Rate Design</i>
Edison Sault Electric Company	<i>Cost of Service, Rate Design</i>
El Paso Electric Company	<i>Marginal Cost</i>

Energy North, Inc.	<i>Rate Design</i>
Equitable Gas Company (Pittsburgh PA)	<i>Cost of Service</i>
Fall River Electric Light Company	<i>Marginal Cost</i>
Federal Energy Administration	<i>Marginal Cost Pricing</i>
Florida Public Utilities Corporation	<i>Cost of Service (Electric, Gas)</i>
Gas Del Estado (Argentina)	<i>Cost of Service for Privatization Study</i>
Gaz Metropolitan, Inc. (Montreal)	<i>Cost of Service</i>
Green Mountain Power Company	<i>Cost of Service</i>
Guyana Electricity Corporation	<i>Marginal Cost, Rate Design</i>
Halifax Regional Municipality	<i>Nova Scotia Power Rate Case Intervention</i>
Holyoke MA (Department of Gas & Electric)	<i>Cost of Service</i>
Jamaica Water Supply Company	<i>Cost of Service</i>
Lake Superior District Power Company	<i>Cost of Service</i>
Louisville Gas and Electric Company	<i>Electric Cost of Service</i>
Midland Electric Power Cooperative (IA)	<i>Support for Cogeneration Standby Rate</i>
Montana-Dakota Utilities Company	<i>Marginal Cost</i>
New Jersey Board of Public Utilities	<i>Rate Initiatives to Lower Summer Peak Demand</i>
Newfoundland & Labrador Hydro	<i>Cost of Service &amp; Rate Design Assistance</i>
Newport Electric Corporation	<i>Cost of Service</i>
Newtown Artisian Water Company	<i>Development of Continuing Property Records</i>
Northern Indiana Public Service Company	<i>Fully-Unbundled Electric Cost of Service; DSM</i>
Oklahoma Natural Gas Company	<i>Review of Main Extension Policy</i>
Philadelphia Gas Works	<i>Allocation of Costs to Marketing Initiative</i>
Riverbay Corporation (Co-op City)	<i>Rate Case Intervention</i>
Roseville Electric (Roseville CA)	<i>Fully-unbundled &amp; Marginal Cost of Service</i>
South Jersey Gas Company	<i>Cost of Service</i>
Southern Indiana Gas & Electric Co.	<i>Electric/Gas Cost of Service, Rate Design</i>
Southwest Louisiana Electric Membership Corp.	<i>Fully-unbundled Cost of Service</i>
Suffolk County Water Authority	<i>Cost of Service, Rate Design</i>
Tampa Electric Company	<i>Cost of Service</i>
U.S. Dept. of Energy/PSE&G	<i>District Heating Rates</i>
Valley Gas Company	<i>Cost of Service, Rate Design</i>
Vermont Public Service Board	<i>Cost of Service &amp; Rate Advisory</i>
Washington Natural Gas Company	<i>Cost of Service</i>
Westfield, MA (City of)	<i>Cost of Service, Rate Design</i>
Winnipeg Hydro	<i>Cost of Service Review</i>

**Expert Testimony**

Delaware Public Service Commission	Docket No. 829 (Cost of Service)
Federal Energy Regulatory Commission	Docket No. ER-81-557-000 (Cost of Service)
Indiana Utility Regulatory Commission	Cause No. 35780-S4 (PURPA Compliance)
Indiana Utility Regulatory Commission	Cause No. 39593 (Gas Cost of Service)
Indiana Utility Regulatory Commission	Cause No. 39671 (Electric Cost of Service)
Indiana Utility Regulatory Commission	Cause No. 40283 (Gas Cost of Service)
Indiana Utility Regulatory Commission	Cause No. 41746 (Electric Cost of Service)
Indiana Utility Regulatory Commission	Cause No. 42150 (Environmental Tracker Support)
Indiana Utility Regulatory Commission	Cause Nos. 42151 & 42658 (Purchased Power & Transmission Tracker)

Indiana Utility Regulatory Commission	Cause No. 43526 (Cost of Service, Rate Design, FERC Seven Factor Test)
Iowa Utilities Board	Docket No. FCU-99-3 (C-99-76) (Standby Rates)
Kentucky Public Service Commission	Case No. 90-342 (Cost of Service)
Louisiana Public Service Commission	Docket No. U-17735 (Rate Design, Cost of Service)
Michigan Public Service Commission	Case Nos. U-6354 & U-6434 (Cost of Service)
Montana Department of Public Utilities	Docket No. 95.6.____ (Marginal Cost)
Newfoundland & Labrador Public Utilities Board	Newfoundland & Labrador Hydro 2003 & 2006 GRA (Rates & Cost of Service)
Nova Scotia Utility and Review Board	NSUARB-P-882, P-884 and P-886 (Cost of Service, Rate Design and DSM cost recovery on behalf of Halifax Regional Municipality)

***Plant Inspections for Bond Indenture Requirement***

- Orange & Rockland Utilities
- Jamaica Water Supply Company (NY)

***Annual/Consultants Reports***

- Energy Services of Pensacola
- Philadelphia Gas Works

**RELATED BACKGROUND**

***Costing, Pricing and Ratemaking***

Actively involved in electric industry restructuring assignments including, preparation of fully unbundled cost of service study models, unbundled rate alternatives, rates designs consistent with Integrated Resource Plans and myriad other issues associated with electric deregulation.

Cogeneration rates, load retention rates and strategies. In conjunction with a comprehensive review of the tariff system for China Light & Power Company, focused on ways of structuring rates to retain industrial load that was closing operations, moving out of the service territory or installing self-generation. Developed unbundled cost of service study for the Barbados Light & Power Company and advised client as to recommendations for changes to rate structure with an objective of retaining industrial customers that are considering self-generation. Prepared unbundled electric and gas cost of service studies for Southern Indiana Gas and Electric Corporation that were heavily relied on in developing new projects and successfully attracting new business to the service territory, including an automobile assembly plant.

Adjustment Clauses: Developed a power adjustment clause for Southwest Louisiana Electric Membership Corporation and adopted as a model for use by cooperatives within the state of Louisiana. Developed an operation and maintenance adjustment clause mechanism for Alpena Power Company, and automatic adjustment clauses for the Guyana Electricity Corporation to adjust rates for changes in foreign exchange, fuel, labor, and inflation. Provided support Northern Indiana Public Service Company for purchased power and environmental trackers. Compiled an industry survey of characteristics of gas adjustment clause mechanisms of responding utilities in the U.S. and Canada to be presented to the American Gas Association.

Prepared a Glossary of Rate and Regulatory Terms; investigated the costs associated with implementation of time-of-day metering; compared the effects of master metering and individual metering on utility load and revenues; and analyzed the impacts of automatic fuel adjustment clauses on revenues in conjunction with the Public Utility Ratemaking Guidelines Project for the U.S. Department of Energy.

Conducted research for a report on The Evolution of Cost Allocation Methodologies Employed by the FPC and FERC (gas pipelines) in conjunction with providing rate case support for Pan-Alberta Gas, Ltd.

Conducted water system costing and pricing studies including work for a large New York water authority with over 300,000 customers.

Participated in a comprehensive review of the main extension policy for Oklahoma Natural Gas Company including cost of extensions and recommendations for change on policy and practices to encourage new load.

### ***Demand Side Management***

Investigated the cost effectiveness of potential energy efficiency programs for NIPSCO for both electric and gas companies in Indiana. Effort included developing an evaluation tool, researching the measures and programs in the US to assess those better suited for the Indiana service territory, evaluating the service territory and its ability to conserve, developing a series of measures that passed the standard tests, and documenting the results for use in regulatory filings and the Integrated Resource Plan.

Developed a set of measures for use in Consumers Energy Company's IRP including a cost-effectiveness modeling plan.

Investigated gas conservation programs for Brooklyn Union Gas Co.; Developed DSM screening models and program parameters for Consumers Energy Corp. and Northern Indiana Public Service Co., including statistical analysis relating to projection of program participants and impact on system load and sales.

### ***Energy Audits and Electrical Load Surveys***

Conducted a study for Riverbay Corporation to determine the quantity of heat generated by its steam plant and transferred for sale via a high-temperature, hot-water system to six nearby public schools. Compared cost with current price of this service to the New York City Board of Education.

Conducted electrical load surveys and cost analyses to determine reasonable charges to be paid for electricity by a customer in billing disputes involving the utility, or the landlord in the case of submetered properties. Clients included Radio New York Worldwide (WRFM), Wometco WWHT, Inc., Key Food Supermarkets, Morningside Heights Housing Corporation, Pavlo Engineering Company, A7A Graphic Arts Studio, Inc. and Fisher Brothers Management Company.

### ***Valuation***

Prepared pro forma income and rate base statements for clients in valuation efforts in connection with the potential acquisition of utility and other business assets.

### ***Organizational Studies***

Conducted an investigation of the organization, structure and operation of the rate department of a major Northeast combination utility. Focused on the gas ratemaking function as part of a study to determine if gas should operate as separate business unit from electric.

### ***Power Contract Analysis***

Conducted an analysis of a proposed negotiating plan by Westvaco Corporation to modify an electric service agreement with the Potomac Edison Company for purchase and sale of power from Westvaco's Luke Mill Plant.

### ***Energy Procurement***

Participated in a study concerning the Niagara Power Project in which Vermont, Pennsylvania and Ohio were competing for a 30-MW block of low-cost hydro power from the Power Authority of the State of New York. Performed load forecasting and research, including coal reserve data for report to show why Vermont could derive the greatest economic benefit.

### ***Load Forecasting***

Performed a load forecast for a proposed 650-MW, combined-cycle plant in Georgia, Vermont. Analysis of Vermont's present installed capacity, joint ownership in out-of-state units, and future purchased power agreements versus peak-load forecasts for the state.

### ***Feasibility Studies***

Participated in a study to determine the economic feasibility of constructing a 40-MW electric generating plant in Vermont, using wood chips obtained from the state's rough and rotten trees as fuel.

### ***Marketing Studies***

Performed an analysis of local market conditions for the disposal of flue gas desulfurization by-products for a major northeastern utility. Conducted research and interviews to determine current and forecasted supply/demand characteristics for five potential by-products. Recommended which product had the most favorable market for absorption of continuing supplies.

### ***Electrical Systems Design***

Responsible for design and engineering of electrical systems including power distribution, lighting, and signal systems for various commercial and educational facilities.

## **EDUCATION**

The City College of New York, Bachelor of Engineering - Electrical, 1970

## **REGISTRATION**

Professional Engineer - State of New York  
Professional Engineer - State of New Jersey

## **AFFILIATIONS (past and present)**

American Water Works Association  
Institute of Electrical & Electronic Engineers  
New York Academy of Sciences  
Mensa

## **ARTICLES & PRESENTATIONS**

"A Determination of Fire Hydrant Rental Fees," presentation at the 16th Annual Legislative Dinner of the Long Island Water Conference.

"Utility Rate Design and Structure," *Skylines*, August 1983 (Building Owners & Managers Association).

"Preparing for a Rate Case" and "Electric Utility Cost of Service", Presentation at a General Electric Company Seminar. Schenectady, N.Y., June 1992

"Gas Cost of Service and Rate Design in a Deregulated Environment", Presentation at a joint conference of the American Gas Association (AGA) and the Mexican Natural Gas Association (AMGN) in Mexico City, March 28, 1996.

Speaker on "Electric and Gas Fully-Allocated and Marginal Cost of Service " at Stone & Webster's Utility Management and Development Program.

"Setting Up Your Cost Models", Presentation at the INFOCAST Functional Unbundling Program. Chicago, IL, November 2000.

Mr. Howland has worked in the energy and electric power industry with 30 years of experience including power planning, marketing, renewable power development and ISO markets development. His experience also includes resource assessment, origination and trading, Independent System Operator (ISO) and Power Pool relations, markets development, renewable power project development, electric power planning and power supply contract negotiation and administration. He has a power supply planning and marketing executive background and is skilled in energy planning, regulatory compliance, renewable energy resources, project management and related areas. His experience also includes resource planning, strategic planning and alliances, writing and documentation, developing customer relationships, contract administration, and purchasing. He has performed as a Development Representative for a major wind power developer, handling Community and landowner relations as part of a team effort to investigate development potential for a large wind park in Vermont.

Mr. Howland has served in management roles for electric utilities directing power supply operations including administration of power supply contracts, wholesale purchase and sale transactions, budgeting, and government regulations. As Director of Power Supply for Central Vermont Public Service Corp. he was a principal architect of a bilateral wholesale power trading alliance with Virginia Power and directed trading and origination activities in Northeastern U.S., as well as overseeing scheduling, reporting, checkout, and Accounts Receivable/Accounts Payable. His responsibilities included risk management, staffing, cross discipline integration through the partnered companies, evaluation and acquisition of specialized Information Technology (IT) tools and software for accounting, deal analysis, and ISO/regulatory reporting. His work also included negotiating enabling agreements under the Federal Energy Regulatory Commission tariff.

Mr. Howland has also performed as a power supply manager the Vermont Public Power Supply Authority, a municipal electric utility Joint Action Agency, and as an energy resource analyst for the Vermont Public Service Board where he managed renewable energy research programs, plus other duties.

### **BACKGROUND AND CONSULTING ASSIGNMENTS**

#### ***Market Management and Trading***

While employed at **Central Vermont Public Service** as **Director of Power Supply**, Mr. Howland had management responsibility for the company's power supply, including administration of \$160 Million in a combination of power supply contracts, wholesale purchase and sale transactions, budgeting, and government regulations. Mr. Howland designed and implemented a wholesale power trading alliance with **Virginia Power**, resulting in a wholesale trading book with \$100,000,000 per year in revenues. He directed trading and origination, mid-marketing activities, as well as related back office tasks. Mr. Howland handled power purchase and sale transactions including administration of power contracts and supervised government relations and state and federal regulatory matters, as well as contracting for non-utility generation, transmission contracting, and marketing.

**Long Island Power Authority** – Provides consulting and advisory services on implementation of new operations process for power supply management, including review of operational procedures, risk management protocol and procedures for handling back office tasks for counterparty transactions.

**Confidential Investment Client** – Provided market price and revenue forecasting and associated risks and market analysis services in support of an active bid for a generation asset in the U.S. upper Midwest (MISO Control Area).

**Northeastern ISO, NEPOOL and Related Activities** - Provided consulting and information services on SMD, RTO formation and ISO operation to clients, including representing interests at various NEPOOL Committees.

**Hydroelectric Relicensing** - Provided socioeconomic planning and scoping services for major FERC license renewal. Duties include identification and drafting of issues and preparing Scope of Services as well as RFP (Request for Proposals) documents, and management of hired consultants.

**Confidential Investment Client** – Provided market price and revenue forecasting and associated risks in support of successful acquisition of portfolio of Canadian generation assets in multiple provinces

**Confidential Investment Client** – Developed a long term projection of market revenues with alternative scenarios for a portfolio of generation assets that included major regions of the US.

**Hydroelectric Relicensing & NYISO matters** - Authored relicensing report that provided detailed information regarding structure and operations of NYISO (New York ISO) and business interaction of major hydro facility with the NYISO market.

### *Energy Planning*

**Long Island Power Authority** – Assisted with development of long term Energy Master Plan. The plan provides a comprehensive and flexible approach to providing a safe, reliable, environmentally friendly and cost efficient supply of electricity to customers well into the future.

### *General Consulting Services*

Provided consulting and information services to clients, including wind power developers, State utility regulator, as well as representing business clients interests at key NEPOOL and ISO-NE / RTO-New England Committees.

### *Project Development*

**Development Representative for Windpark developer:** Responsible for landowner easements, government official and community outreach and education of potential and benefits of proposed Windpark in southwestern Vermont. Assistance included providing detailed educational outreach discussions with public officials and Legislators regarding the technical and economic viability and benefits to local communities of wind power development.

**Wind Electric Development:** Assisted developer of clean energy electric generation facility (wind resource) with successful application in response to an RFP from the Connecticut Clean Energy Fund “Project 100” program. Also provided services in power and REC marketing and market research efforts.

## **EXPERIENCE**

### **Executive Consultant – Shaw Stone & Webster Management Consultants, Inc.**

Since joining Stone & Webster Consultants in the summer of 2007, Mr. Howland has provided advisory services in power plant market entry assessment, power supply management operations, resource evaluation and planning, regional power market design, pricing and evaluation, rate design and cost of service.

**Principal Consultant, Robert E. Howland, Pittsford, Vermont**

Provided consulting services to utility regulators, as well as representing business client interests at key NEPOOL and ISO-NE / RTO-New England Committees. Mr. Howland utilized his experience in market rule development and inter-regional market seams issues to advise clients.

**Central Vermont Public Service Corporation, Power Supply, Rutland, Vermont**

As Director of Power Supply, Mr. Howland had management responsibility for the company's power supply, including administration of \$160,000,000 worth of power supply contracts, wholesale purchase and sale transactions, budgeting, and government regulations. He directed the trading desk, contract origination, and mid-marketing and RFP development and response activities as well as all middle office and many back-office functions. In this role he devised strategic direction and operation protocols for wholesale trading as well as risk management techniques.

**Power Planning Manager, Vermont Public Power Supply Authority, Power Planning, Williston, Vermont**

Mr. Howland supervised the department that managed the power supply resources to meet the needs of ten municipal electric utilities. He handled long- and short-term power supply planning, FERC licensing, and regulatory compliance.

**Operations Manager, Advanced Energy and Technology Associates, Operations and Engineering, Dover, New Hampshire**

Responsibilities included scheduling, planning, and supervision of consulting and contracting projects. Duties included marketing and responses to RFPs. Consulting assignments included collaborative United States Agency for International Development in-field wind energy site survey and evaluation in Portugal.

**Energy Resource Analyst, Vermont Public Service Board, Engineering, Montpelier, Vermont**

Managed renewable energy research programs including hydroelectric and wind energy, plus other duties relating to utility regulation, facilities licensing, and utility legislation.

**EDUCATION**

Bachelor of Science, Agricultural and Resource Economics, University of Vermont, Burlington, Vermont

***Additional Training/Continuing Education***

New York Independent System Operator Market Operations Course, Saratoga, New York

Energy Planning and the Environment, University of Oslo, Norway

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**JOHN J. MESKO, P.E.**

2316 Addison Rd.  
Houston, TX 77030  
970 389 7817

An Engineering/Business Consultant specializing in the upstream and midstream oil & gas industry. Formal education includes Chemical Engineering, Petroleum Engineering and MBA/finance with 26 years diversified experience in the energy industry, domestic and international. Career work has included a diverse spectrum of specialty areas such as reservoir engineering, economics/capital investment, strategic planning, fuel supply operations, privatization, project due diligence, asset appraisal, and facilities operations. Within these broad areas of activity, work has been related to hydrocarbon reserves, development of gas storage (salt cavern, reservoir, LNG, propane-air) and other midstream assets, LDC and merchant plant fueling, financial analysis, planning and forecasting, pipeline design/optimization, contract analysis and project management.

**EXPERIENCE**

**2006 to Current Shaw Consultants International, Inc.  
Executive Consultant**

Project Manager of the Lodi Gas Storage technical advisory study for Buckey Partners, L.P. in their purchase of an existing water drive **gas storage** facility and the development of Kirby Hills II storage in California. Providing ongoing advisory services for downhole and topside development of Kirby Hills II.

Project Manager of the Energy Master Plan for Pequiven, the Venezuelan National Petrochemicals company, in the development of their petrochemical complex (CPP) in Paraguana, Venezuela. Project includes Class V/IV estimate of infrastructure OSBL facilities with estimated EPC cost of US\$ 2.2 billion.

Project Manager for the technical review of the Rivara underground natural **gas storage** facility for ERG Power & Gas in Italy. Assessed water drive reservoir for integrity, capacity and deliverability.

Project Manager for a 3-phase study assessing and prioritizing the replacement of bare steel and cast iron distribution pipe components for Vectren Energy in its three operating districts of Indiana and Ohio.

Project Manager on behalf of International Finance Corp. for the Independent Engineer review of a gas-to-energy project and oil field development in Peru by BPZ at the Corvina and Albacora offshore fields involving all aspects of field development including platform, drilling, reserves, FPSO, project execution, HAZOP, SIMOP, etc.

Project Manager for the assessment of natural gas transportation, compression and CO<sub>2</sub> treatment assets of CMS in Michigan for ABN AMRO in their funding for third party purchase.

**2003 to 2006  
Independent Consultant**

For industry consulting company developed dynamic segmentation model in C-Plus to facilitate **Pipeline Integrity Management**. Model identified pipeline operation threats and performance measures for pipeline risk management.

Provided Expert Witness testimony in litigated case related to the Stagecoach underground natural **gas storage** facility for plaintiff (eCorp) in defense of a forced take-over by project lender (AIG Highstar and West Landesbank).

Assessed the performance capabilities of eCorp's Stagecoach **gas storage** field on behalf of Buckeye Pipeline Company in consideration of asset purchase. Study involved reservoir characteristics/capability assessment to provide injection, storage and withdrawal integrity, the application of horizontal wells and review of historical operations.

**2002 to 2003    Jacobs Consultancy  
Group Manager**

Provided consulting services to the oil & gas industry.

Assessment of the Exploration and Production assets of Petrom, the Romanian National Oil Company in their privatization proceedings.

Provided pipeline simulation assistance in the "Multi-Region Assessment of the Adequacy of the Northeast Natural Gas Infrastructure to Serve the Electric Power Generating Sector" for the IMO Ontario, ISO PJM, ISO NY and ISO NE.

Managed the Port Campbell Underground Natural **Gas Storage** Feasibility Study for Freehills in support of The State of Victoria's legal case against Esso (Longford Plant).

**1999 – 2002    Acres Management Consulting  
Houston Division Manager; Executive Consultant**

Managed consulting/engineering practice providing technical due diligence to the energy industry for lenders, equity participants and owners.

Partnership with other consulting firm assessing the reliability and adequacy of the natural gas pipeline systems of New England. This work was carried out for the Independent System Operator of New England's electric grid to identify the factors affecting the reliability of the regional electric power generation.

Project Manager for the Barbados Natural Gas Sector Study on behalf of the Barbados Public Utilities Board. Study included the assessment of the natural gas infrastructure, the natural gas transportation and distribution operations, the natural gas market and the regulatory regime.

Project Manager in the study involving the technical review of 31 landfillgas sites in the US for potential purchase by AIG. Services included inspection of site facilities comprised of the landfillgas gathering equipment and electric generating equipment. Additionally, counseled on the availability of landfillgas supply through simulation of the landfillgas generation from selected sites under various operating assumptions.

**1987–1999    Stone & Webster Management Consultants, Inc.  
Executive Consultant, Senior Consultant and Consultant**

Reviewed the technical aspects of the natural gas and liquid fueling arrangements for the Cuiaba power project in Brazil as part of an overall technical review of the project for the Overseas Private Investment Corporation.

Analyzed the proposed pipeline system in the study to produce and transport to market the natural gas reserves of the Camisea Field for the Special Committee to the Peruvian Government.

Project Manager for the independent technical review of the Gas Atacama project in Argentina and Chile, a combined pipeline and power plant project for Chase Securities, Inc.

Project Manager for the independent technical review of the Cardinal Pipeline extension project, a pipeline lateral on the Transco system in North Carolina for Credit Lyonnais.

Project Manager on the independent technical review for the development of a 40 Bcf underground natural **gas storage** field by Michigan Consolidated Natural for Newcourt Capital.

Project Manager on the independent technical review for the expansion of American Crystal Sugar Company's sugar beet plant in North Dakota for Newcourt Capital (CIT).

Key project participant for the Ministry of National Infrastructure in Israel to study \$500 million natural gas transmission and distribution alternatives related to country-wide optimization of power generation and gas trans-mission/distribution. Work involved design of pipeline system alternatives.

Project Manager for the study to reduce the cost of gas supply to the Arkansas distribution areas for ARKLA (Reliant Energy).

Provided independent technical review of Hunt Oil Company's oil and gas reserves in Yemen for OPIC.

Provided independent review of design and contracts for Electrogas pipeline from Santiago to Quillota in Chile for Bank Santander.

Performed due diligence review of the design of the Alliance pipeline system for National Westminster Bank.

Managed the study to appraise the value of three LNG facilities for company acquisition negotiations for Bay State Gas.

Convened with client management to assess the strategic planning of proposed peaking alternatives and managed the review of a proposed LNG facility for Berkshire Gas Company.

Managed the study of LNG peakshaving facilities in North America for the INGAA Foundation.

Performed natural gas pipeline design studies for various transmission alternatives for AMISRAGAS in Israel in their pursuit of importing gas from Egypt.

Convened with client management from the Colombian Energy Planning Department (UPME), the Colombian Ministry of Mines and Energy, ECOPETROL, AMOCO, TEXPETROL and British Petroleum for purposes of reviewing the natural gas reserves base of Colombia and assessing the natural gas supply over the term of financing period for the Transmetano pipeline project for Inter-American Development Bank.

Convened with numerous departments of British Gas to assess the asset value of various components of their natural gas transmission system in the UK and to determine the extent of overdesign; assisted in various levels of study for support in their ongoing cases before the Office of Gas Supply (Federal Energy Regulatory Commission equivalent). Work included assessment BG's **natural gas storage** facilities at Hornsea salt cavern and Rough offshore North Sea depleted reservoir.

Involved in various ongoing levels of support for the management of Mobile Gas Services, optimized the gas supply portfolio through the use of a linear programming model, developed the economics for investment in and operation of an underground (salt dome) natural **gas storage** facility.

Provided counsel and strategy to management of ENDESA on contractual issues related to gas supply and transportation for the largest electric generating company in Chile.

Provided independent technical review of the design of the proposed Mariquita to Cali pipeline in Colombia; reviewed the estimated proven natural gas reserves of the Guajira gas field (offshore Colombia) for purposes of project funding for Salomon Brothers, Inc.

Managed the yearly study to serve as independent engineer in the assessment of onshore and coal seam gas reserves dedicated to the Big Spring cogeneration facility; provided counsel and advice to bank project management on risks associated with hydrocarbon recovery for Credit Suisse, Kansallis-Osake-Pankki.

Provided independent engineering review of offshore gas supply, offshore production facilities and natural gas pipeline to fuel to the Centro Energia power plant in Comunanza, Italy, for Banque Paribas.

Participated in high level safety review of a major US natural gas transportation company. Responsibilities included compressor stations, metering and regulating stations, and specific O&M procedures; study involved extensive interviews with related company departments (confidential client).

Modeled natural gas transportation system within Peru and from Argentina to Chile for ENDESA.

Provided analyses to company management on the cost differences between natural gas and electric compressor drives for use in natural gas transmission as a means of increasing power sales for Mississippi Power Company.

Proposed pipeline configuration improvements for the long-term optimized gas purchasing plan and short-term dispatch operations for DPG-DPS Argentina.

Provided assistance to ABEGAS (Brazil) in contracting for natural gas from proposed Petrogas pipeline in their long-term plan.

Assessed the fuel supply strategy for proposed power facility on Hainan Island, People's Republic of China, to secure financing arrangement for Enron/Lehman Brothers.

Managed the economic and technical review of proposed participation in the Ouachita River **gas storage** project for Dayton Power & Light.

Performed independent engineering review of the viability of gas supply from a landfill in Azusa, California, for purposes of securing financing for Sentry Financial Corporation.

Studied landfill gas availability for power generating plant in Keele Valley, Canada for purposes of securing financing for Eastern Power Developers.

Assisted in the preparation of expert witness testimony on behalf of Washington Natural Gas, Cascade Natural Gas, Intermountain Gas and Washington Water Power in their intervention on Northwest Pipeline's rate case.

Instrumental in developing expert witness testimony for Southern California Gas Company through the modeling of PG&E's gas transmission trunk lines, and the simulation of various operating scenarios to contest certain aspects of PG&E's rate application with the California Public Utilities Commission in conjunction with PG&E's pipeline expansion.

Managed a **gas storage** performance study to relate the lost and unaccounted for gas to storage-specific phenomenon for Southern Indiana Gas & Electric Company.

Performed risk assessment of fuel resource and transportation arrangement for the proposed Las Vegas cogeneration project for the Bank of Nova Scotia.

Performed a peaking supply optimization study involving the analysis of various supply options including propane-air, LNG, and underground natural **gas storage** for the City of Colorado Springs.

Assessed the utility and value of an underground natural **gas storage** facility for potential purchase by the City of Winfield, Kansas.

Assessed gas supply alternatives/proposals to fuel various power generating projects for Midwest Power Systems, Inc.

Assessed the gas supply and transportation alternatives to fuel the Wray and Burlington power generating sites for the Tri-State Generation Association, Inc.

Provided independent review of gas supply arrangement for proposed power generating facility in Hartwell, Georgia for Union Bank of Switzerland.

Managed a study to determine the expected deliverability performance of a proposed underground natural **gas storage** site considered for purchase by the Delta Natural Gas Company.

Assisted in the identification of non-monopolistic business sectors in the privatization of the gas processing, transmission, and distribution sector of Argentina leading to greater than expected success of bid awards for Gas del Estado, Argentina.

Audited the safety standards and procedures in the operations of underground **gas storage** as part of a larger audit of SONAT's natural gas transmission system for Southern Natural Gas Company.

Managed an extensive **gas storage** development study involving the simulation of storage reservoir performance; performed a system-wide peak demand/deliverability study and determined the optimal storage development strategy; provided written expert testimony for same in state rate case for Arkansas Western Gas Company.

Assisted in the planning of fuel supply strategy for Alabama Electric Cooperative.

Performed a study of the availability of potential underground formations (aquifers) suitable for the **storage** of natural gas; study included assessment of costs, operating characteristics, safety, environment, development and flexibility for Wisconsin Gas.

Performed management/performance duties involving the natural **gas storage** operations of East Ohio Gas Company and National Gas & Oil for Public Utilities Commission of Ohio.

Appraised the value of several existing underground natural **gas storage** facilities on the basis of new construction for United Cities Gas Company of Kansas.

Appraised the value of an LNG storage facility in terms of its use as a peaking facility for Distrigas of Boston.

Assessed the viability of landfill gas supply at Brock West, Canada, for purposes of fueling proposed power generating facilities to be financed for Security Pacific Merchant Bank.

Managed a strategic gas supply study for Cody Gas Company, Wyoming.

Performed a technical review of the gas supply arrangement for the Hartford cogeneration facilities; independent technical review of the development and feasibility of EOR project and assessment of natural gas supply arrangements of the Chalk Cliff cogeneration project; independent technical review of gas supply arrangements for steam use (Libby-Owens-Ford glass plant) for the San Joaquin cogeneration project for Sumitomo Bank.

Managed reserves evaluation and categorization studies in the reserves acquisition program for Falcon Seaboard Oil Company.

Designed computer model simulating the exploration, development, deliverability and economics of Oman's gas reserves for use in an energy optimization model for the Ministry of Petroleum & Minerals in Oman.

Performed a technical review of the enhanced oil recovery operations involving steam cycling and steam flooding of the Placerita Field in Los Angeles County for AES cogeneration project financing for the Swiss Bank Corporation.

Appraised the competitive and earning capabilities of a southwest refinery (EPRC) for the El Paso Electric Company's interest in prospective acquisition.

### **1979 – 1987 ANR Pipeline Company / Coastal Corporation Engineer/Staff Reservoir Engineer**

Reserves estimation of onshore and offshore leases of the Gulf Coast, and leases of the Anadarko Basin; deliverability analyses; company representation at the Federal Energy Regulatory Commission and negotiations with producer; recommended well reclassification, drilling, workover, and abandonment; sizing and recommendation of compression facilities; provided technical support to legal staff in take-or-pay proceedings; train new engineers; review studies performed by associates.

For Coastal Corporation, performed managerial assessment relating to the acquisition of a \$50 million oil refinery in Hamburg, Germany.

### **TECHNICAL PUBLICATIONS**

- *The Use of Liquefied Natural Gas for Peaking Services*  
The INGAA Foundation, 1996.

### **EDUCATION**

University of Houston, Houston, Texas

- M.B.A. Finance, 1988
- M.S. Petroleum Reservoir Engineering, Geology 1984

University of Arizona, Tucson, Arizona

- B.S. Chemical Engineering, 1979

### **PROFESSIONAL ASSOCIATIONS**

- Registered Professional Engineer, State of Texas
- American Society of Petroleum Engineers

### **LANGUAGES**

- Fluent German
- Practicing Spanish

## Timothy J. O'Brien

## Senior Consultant

Mr. O'Brien is a management consultant who specializes in energy market assessments and energy planning including electric price forecasting, utilizing Prosym, the energy market simulation software. He has experience in energy efficiency program design and evaluation. He also has a significant amount of experience in the areas of project controls, earned while working on the EPC side of Shaw Consultants International Inc., including cost tracking, monitoring earned value, change orders, reporting and budget forecasts, with a special focus on running ShawTrac, The Shaw Group's proprietary earned progress software. Before joining Shaw Consultants International Inc., Mr. O'Brien worked in the financial services industry, where he focused on sales and new business development. He earned a BA in Economics from the University of Massachusetts and a MS in Economic Policy and Planning from Northeastern University, with a focus on economic development.

### PROFESSIONAL EXPERIENCE

<b>2006- Present</b>	<b>Shaw International Consultants, Inc.</b> Consultant
<b>2001 – 2006</b>	<b>Stone &amp; Webster Engineering &amp; Construction, Inc.,</b> Cost Analyst
<b>1998 - 2001</b>	<b>WearGuard Corporation</b> Business Account Manager
<b>1995 – 1998</b>	<b>PaineWebber Inc.</b> Sales Assistant
<b>1994 – 1995</b>	<b>Wells Fargo Bank</b> Sales Representative
<b>1989 – 1993</b>	<b>Scudder, Stevens and Clark</b> Registered Representative

### CONSULTING EXPERIENCE

#### *Market Assessments*

Modeled multiple markets to assess and forecast the market price of power and the competitive positioning of units or portfolios in each market, including New England, the Midwest, the Dakotas, Texas, Nevada, California, and the Northwest. In Canada, studies have included the Alberta and Ontario markets. Resources modeled have included both fossil fuels as well as renewables, including the addition of wind in California and financing support for wind farms in the Northwest.

Prepared a nationwide study of existing aggregation programs and marketed our services to states that allow aggregation but do not currently have a program in place.

Compiled a database of coal fired plant costs and statistics, utilizing FERC 1 forms, to provide a benchmark for future plant modeling. Included plants of 27 companies across 6 years of history.

Researched NIPSCO electric DSM – and developed 6 additional programs with high kW savings

Researched NIPSCO gas DSM and energy efficiency opportunities for use in filed DSM investment plan

#### *Acquisition Support Projects*

Prepared regional market studies for A. G. Edwards energy sector research team as part of their client energy sector report development.

Provided forecasting and market studies for a portfolio of Canadian generation assets to support the development of a bid strategy. This effort included analysis of gas and coal fired technologies as well as the regulatory and provincial government activities that might impact the future value of these assets. Our team participated in numerous strategic discussions to develop the right market approach for the assets of interest in a very uncertain long term competitive wholesale electricity market.

Provided a projection of market prices as well as an assessment of PPA dispatch for a portfolio of assets that were spread across the US. This assessment included an analysis of carbon tax implications on costs and revenues for RGGI regions and non-carbon tax regions. Contributed to discussions of revenue implications and provided input to the proforma analysis.

***Competitive Market Price Forecasting and Advisor Services***

Provided support to Consumers Energy IRP....Price forecasting and research of Michigan market in support of a long term energy resource plan filed with Michigan Regulators.

Competitive long term market price forecasting for Great River Energy, Midland Cogeneration, Selkirk, Keystone-Conemaugh

**EDUCATION**

M.S., Economic Policy and Planning, Northeastern University, 2000

B.S., Economics, University of Massachusetts, 1985

**EXPERIENCE**

Member, Cohasset Economic Development Committee

Member, Board of Trustees, Cohasset Sailing Club

Member, Board of Managers, Cohasset Swim Center

Chairman, Cohasset Village Revitalization Committee, 1998-2002

Ms. McSweeney is a management consultant with an engineering and business background. She is a new addition to our team and a recent graduate of Villanova University. She has a mechanical engineering degree with a business minor.

## PROFESSIONAL EXPERIENCE

**Shaw Consultants International, Inc.**  
Consultant

June 2008 - Present

**Wyeth BioTech, Andover MA**  
Intern II

Summer 2006

## CONSULTING EXPERIENCE

### *Long Island Power Authority (LIPA)*

Ms. McSweeney has been involved in analyzing, presenting, and documenting information relative to the LIPA Electric Resource Plan, 2009-2018. She has experience incorporating and combining multiple information streams from various sources into a publically available set of documentation. Her duties related to this project include technical writing, policy review, and data management and analysis.

### *Northern Indiana Public Service Company (NIPSCO)*

Ms. McSweeney has experience auditing extensive and complicated excel based models including cost of service allocation tools and rate revenue proofs. She has contributed to extensive research into regulatory precedent involving topics necessary to support allocation approaches and Rate Design for use in testimony filed on behalf of NIPSCO. Her experience also includes presentation design and development. She has completed numerous tasks to organize information and sort information as needed for input to other analyses.

### *Market Modeling*

Ms. McSweeney is trained in energy market modeling as well as power plant valuation based on projected revenue streams. She has developed presentations for revenue models for use in combination with market forecasting.

### *Rhode Island League of Cities and Towns*

Ms. McSweeney has experience in the procurement of the energy needs of the Rhode Island League of Cities and Towns for 2009 and the years to follow. Her experience includes research into electricity suppliers as well as possible roles the RILCT could take to procure affordable electricity rates in the future.

## OTHER EXPERIENCE

### *Senior Design Project*

2007-2008

Designing and constructing an original thermal management system for use in electronics cooling (XBOX360). Utilizing techniques and themes studied in Honors level Heat Transfer course (Spring 2007) and Thermal-Fluid System Design course (Fall 2007). Completed two written proposals/reports and one oral presentation of the project. Final written and oral reports completed in April 2008. Developed and enhanced my project management skills over a three-semester-long project. Learning the importance and practice of project task delegation, and teamwork

**Management Project**

Fall 2007

Project that required the organization of twelve business students to complete a thorough investment pitch to a panel of Vanguard and Johnson & Johnson executives. Participated in the product development, marketing strategy and financial analysis phases.

**Other Projects**

Dec. 2005

Manufactured and programmed a small robot to self-navigate a pre-specified maze. Cultivated individual and group ideas and concepts through effective teamwork. Applied Skills, including experience with Vernier software and measurement devices, AutoCAD, MathCAD, MatLAB, Solidworks, Microsoft Word, Excel, and PowerPoint.

**EDUCATION**

Villanova University, Villanova PA

May 2008

Bachelor of Science in Mechanical Engineering (3.30 GPA)

Minor in General Business, Villanova School of Business (VSB)

**International Education**

Università Urbino; Istituto Lorenzo de' Medici

Aug. 2007

(Villanova University Study Abroad Program – Urbino & Florence Italy)

**Professional Certificates**

Engineer In Training (EIT) – passed the Fundamentals of Engineering Exam

April 2007

**JOHN J. MILTON, CIA, CISA\*, MSM**  
16 Parish Pathe  
Marshfield, MA 02050  
781 718-1197 [jmilton216@verizon.net](mailto:jmilton216@verizon.net)

**First Wind**

Jan. 2010 - Dec. 2010

Sr. Internal Auditor

Assisted Audit Director in development of 2010 and 2011 audit plans. Lead auditor on travel and expense, construction, Green-E and NERC compliance audits. Co-lead in preparing the Company for Sarbanes Oxley compliance related to future IPO. Solely responsible for the identification and selection of an Internal Audit GRC software tool.

- Identified several areas needing improvements related to NERC standards and their related requirements. Made recommendations that were implemented
- Managed the GRC tool implementation project; bringing the project on time and significantly under budget
- Internal Audit liaison to the Information Technology Steering Committee
- Participated in several IT implementation projects with an emphasis on controls

**Robert Half Management Resources**

2008 - Sept. 2009

Sr. Consultant – Internal Audit / Sarbanes Oxley

2005 - 2006

Led team for an international utility in a FERC compliance audit. Team lead for client's Sarbanes Oxley initiative. Worked on all aspects from narratives through certification.

Coordinated year end Audit effort between client and external auditors. Acted as liaison between parties, organized client's accounting team, prepared audit documentation, managed budget and reported progress / results. Prepared client for a potential Sarbanes Oxley implementation.

**Titus**

2006 – 2008

Sr. Consultant – Internal Audit / Sarbanes Oxley

Managed an audit of a client's key supplier that resulted in a \$265,000 refund to the client and a rewrite of several major contract terms that provided additional future savings.

Managed / participated in Sarbanes Oxley projects across a variety of industries. The work included, composing narratives, walkthroughs, testing controls, and remediation as required. Provided solid and reasonably implementable business improvement recommendations for clients.

**NSTAR Services Company**

1991 - 2005

**Manager Energy Supplier Services**

2000 - 2005

Served as NSTAR's principle contact with competitive suppliers, aggregators, State Regulators, industry groups, major customers and other NSTAR departments regarding the supply of electricity and/or gas to NSTAR customers. In addition, oversaw day-to-day activities related to NSTAR and retail energy suppliers' business transactions. Managed a staff of twelve. Also, managed Oracle and Special Ledger billing functions. Lead business project manager on several key IT initiatives.

- Project manager responsible for recovering \$10,000,000 in overpayments to suppliers and a successful rewrite of the CIRS supplier module. Recovery made through audit of process.
- Billing / Meter Reading Department lead for Sarbanes Oxley. Coordinated resource allocation, test requirements and remediation efforts. Reported results directly to Senior Management.
- Nominated for, and completed Management Development Initiative Program
- Co-Chair State of Massachusetts Electronic Business Transactions Collaborative 2003 – 2004.
- Lead effort to move gas suppliers from manual processing to Electronic Data Interchange. First utility in Massachusetts to do so. Saved two FTEs.

**Audit Manager - Internal Audit Group** 1995 - 2000  
 Assisted Audit Director in development and implementation of annual audit plan. Managed audits of financial, operational, and information system functions. Prepared recommendations and courses of action based audit findings, developed follow up application. Software experience included: Microsoft Office and ACL.

- Managed Company's 1998 and 1999 year end audits in conjunction with the external auditors.
- Developed an ACL program used to recalculate and analyze customer bills; tested 30,000 bills on a daily basis. This resulted in a significant reduction of resources required for year end, billing, and receivables audits.
  - Managed audit of medical insurance plans that resulted in a \$125,000 refund.
  - First NSTAR auditor to attain CIA and CISA status.
  - Received Employee Incentive Award for Excel application developed for the Audit Group.

**Senior Budget & Control Analyst - NSTAR Pilgrim Station** 1991 – 1995  
 Liaison for Budget & Control and other Nuclear Organization departments with respect to budget and financial matters. Prepared, maintained and reported on labor / overtime budgets and related charges. Reviewed costs and commitments for accuracy. Other functions included development of new and update of existing systems and reports. Extensive use of Dbase, Excel and Access.

- Created weekly capital project reporting system in Access.
- Identified and recovered significant cost savings through a contractor audit.

**Abbott Equipment Co., Inc., Boston, MA** 1990 – 1991  
**Controller:** Prepared and analyzed financial statements and budgets. Developed financial forecast model. Other duties included cash management and supervision of the accounting department.

- Assisted in negotiation of new financing arrangement with major lender.
- Developed strategies for expansion of cash flow opportunities.

**Shawmut Design & Construction, Inc., Boston, MA** 1989 – 1990  
**Accounting Manager:** Prepared and reviewed monthly financial statements, analyzed General Ledger accounts. Responsible for cash management. Automated job cost reporting system. Managed staff of three.

**Condyne, Inc., Norwell, MA** 1985 - 1989  
**Assistant Controller/Cost Manager:** Initial duty was to redesign Job Cost System, completed successfully. Developed and analyzed monthly job forecast reports and presented to Senior Management. Managed A / R departments of Condyne, CD Property Managers and CD Realty Trust. Prepared cash flow projections and WIP Schedule. Integrated cash flow systems of all companies.

**Broadway Electrical Company, Inc., Boston, MA** 1982 - 1985  
 Cost Accountant / Billing Manager

**G. B. H. Macomber Co., Inc., Boston, MA** 1979 - 1982  
 Construction Cost Accountant

EDUCATION:	PROFESSIONAL CERTIFICATIONS & ASSOCIATIONS:
Lesley University, Cambridge, MA Master of Science - Management	Certified Internal Auditor (C.I.A.)
Northeastern University, Boston, MA Accounting Certificate	* Certified Information System Auditor (C.I.S.A.) non - practicing
Boston College, Chestnut Hill, MA BA – Economics	Member of The IIA and ISACA



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## Richard Levychin, CPA



**Richard Levychin, CPA** is the CEO of KBL, LLP and the Managing Partner of KBL's New York office. Richard is also the Managing Partner of KBL's affiliate, KBL Eisner, LLP. KBL is a CPA and Advisory firm with offices located on Wall Street in New York, and in New Jersey. KBL's primary focus is on both privately and publicly held emerging businesses. KBL Eisner has a primary focus on Fortune 500 companies. KBL has 7 partners and the resources of over 50 professionals. Combined with its affiliate KBL Eisner, KBL has the resources of 90 partners and over 600 professionals.

Richard has over 25 years of accounting, auditing, business advisory services, and tax experience working with both privately owned and public entities in various industries including financial services, media, entertainment, sports, real estate, oil and gas, not-for-profit, technology, and professional services. His experience also includes expertise with SEC filings, initial public offerings, and compliance with regulatory bodies.

Within the financial services industry Richard has worked with such companies as AIG, Citigroup, Genworth Financial, Goldman Sachs, JP Morgan Chase, Merrill Lynch, and UBS.

He has written articles on a wide range of topics, which have been featured in several periodicals including Dollars and Sense, National Black MBA Magazine, Black Enterprise Magazine, and The Network Journal. He has also conducted seminars on a wide range of business topics including SEC matters and taxation, for several organizations including the Black Enterprise Entrepreneurs Conference, and the Learning Annex.

Richard is a member of several organizations including the American Institute of Certified Public Accountants, the New York State Society of Certified Public Accountants, the National Association of Tax Professionals, the National Association of Black Accountants, the Association of Latin Professionals in Finance and Accounting, One Hundred Black Men of New York, 100 Black Men of New Jersey, and the United States Hispanic Advocacy Association. Richard is a past Treasurer and Board Member for the New York chapter of One Hundred Black Men, Inc. Richard serves as co-chair of the Economic Development Committee of 100 Black Men of New Jersey. Richard is a

Board Member with the New York Chapter of Entrepreneurs Organization a dynamic, global network of more than 7,300 business owners in 42 countries. Richard is a past winner of The Network Journal's prestigious "40 Under 40" award. In 2009 Richard was admitted to the United States Hispanic Advocacy Association's 2009 National Business Council (NBC) Fellows.

Richard is a graduate of Baruch College, and started his career with a Big Four CPA firm.

### **Specialties**

- Financial Services
- Fortune 500 Companies
- Publicly Held Companies
- Media and Entertainment
- Oil and Gas
- Business Taxation



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## Steve Lehrer, CPA



**Steve Lehrer, CPA** is a Principal in the Risk Management and Advisory Services (RiMs) Group at KBL. He brings 20 years of experience gained from the Big 4, national and regional accounting firms. Steve has extensive experience in audit, accounting, reporting, internal audit, regulatory compliance, process re-engineering, enterprise risk management, Risk Intelligence, and Sarbanes-Oxley compliance. His specialty is identifying high risk areas and providing financial, operational and best practice solutions.

Steve has provided financial and operational solutions to mid-sized companies as well as fortune 100 companies. He has worked with companies that were both domestic and international, publicly traded and privately held. Steve experience includes a broad range of industries such as insurance, retail, biotechnology, financial services, entertainment, technology, manufacturing and distribution, healthcare, and racing / wagering.

Steve has a Bachelor of Science degree in Accounting and is a licensed Certified Public Accountant in New York. He is a proactive thought leader and lecturer, and considered a subject expert on topics such as Sarbanes-Oxley, Internal Controls and Corporate Governance.



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## Uday Gulvadi, CPA, CIA, CISA, CA



**Uday Gulvadi, CPA, CIA, CISA, CA** is a Principal in the Risk Management and Advisory Services (RiMs) Group at KBL. He formerly held leadership positions as a Partner and a Director in premier regional accounting firms in their Internal Audit and Risk Management practice groups. Uday is a recognized expert and thought leader in the areas of corporate governance, enterprise risk assessments, internal audit, Sarbanes-Oxley optimization, business process improvements, information technology governance and social media risks.

During his career spanning 20 years, he has established a reputation as a trusted advisor to Audit Committees and senior management of emerging businesses and Fortune 500 companies in implementing risk based internal control frameworks. His experience spans the banking and financial services industry including banks, hedge funds, family offices, private equity funds, broker-dealers and also the manufacturing and distribution sector including healthcare, retail, technology, media and entertainment.

Uday is a Certified Public Accountant, Certified Internal Auditor, Certified Information Systems Auditor and a qualified Chartered Accountant (equivalent to CPA) from the Institute of Chartered Accountants of India. In addition, Uday has a Bachelor's degree with a major in Accounting from the University of Mumbai (Bombay), India. He has been a speaker at various national and international conferences, seminars and webinars and writes a blog on leadership, governance and risk management called "[RiskAdvisor](#)".



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## **Maria Stan, CPA**



**Maria Stan, CPA** is a Senior Manager with KBL, LLP. KBL is a CPA and Advisory firm with offices located in New York and New Jersey. KBL's primary focus is on both privately and publicly held emerging businesses.

Maria has more than 10 years of financial audit and consulting services experience. A majority of that time has been spent on large engagements within the Media and Communications industries. She has been engaged with companies navigating through acquisitions and divestitures, integrations, internal control structuring and restructuring, and corporate reorganizations. In this capacity, Maria manages and coordinates domestic and international engagement teams through the planning, execution, and completion of multifaceted audit and consulting engagements. This includes the formulation and coordination of strategy and execution.

Throughout her career, Maria has developed a practical financial and operational understanding of her client's businesses in order to identify and control financial, business, and industry risks and opportunities. This analytical approach is the catalyst to effective and efficient audits and value added services.

Maria instructs classes on audit methodology and project and engagement team management. She also serves as an advisor to University accounting majors on various technical topics and accounting courses. Maria has also served as a reviewer in Big Four accounting firm monitoring programs where she reviewed audits of other Big Four accounting offices within the United States and abroad for compliance with professional auditing standards.

Maria is a member of several organizations including the New York State Society of Certified Public Accountants, the American Institute of Certified Public Accountants and the Association of Latino Professionals in Finance and Accounting.

Maria is a graduate of Brooklyn College and has worked previously with both KPMG and Ernst and Young.



## **Frank Sanchez Ruiz, CPA, CMA, CIA, CGFM**



Frank Sánchez Ruiz, CPA, CMA, CIA, CGFM, is the Co-Chairman of KBL's Government Services Practice Group. KBL's Government Services Practice Group combines the resources of KBL and the CPA firm Torres-Llompart, Sánchez-Ruiz LLP (TLRS). TLRS is one of the larger CPA firms in Puerto Rico.

Frank has over 30 years of public accounting experience working in a variety of fields including, manufacturing, hotel (leisure time), retail and wholesale, insurance, pension and welfare funds, construction, low rental housing, and government, including audits of federal financial assistance programs, federal grant aid audits, HUD audits, and general government accounting.

Frank is licensed to practice as a Certified Public Accountant in New York, New Jersey, and Puerto Rico. He is also licensed as a Certified Management Accountant, Certified Internal Auditor, and a Certified Government Financial Manager. Frank is a member of the American Institute of Certified Public Accountants, the Institute of Management Accountants, the Institute of Internal Auditors, the Association of Government Accountants, the New York State Society of Certified Public Accountants, and the Puerto Rico Society of Certified Public Accountants.

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## **Nelly Vázquez, CPA**



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Nelly has over 20 years of public accounting experience working in a variety of fields, including, manufacturing, hotel, retail and wholesale, insurance, education, employees' retirement plans, pension funds, construction, waste disposal, telecommunications, and government.

Nelly is licensed to practice as a Certified Public Accountant in Puerto Rico. She is a member of the American Institute of Certified Public Accountants and is a member of the Board of Directors of the Puerto Rico State Society of Certified Public Accountants. She has served for several years in the Committee of Technical Matters on Accounting and Auditing and has been appointed Chairperson for 2010-2011. Nelly is President of the Alumni Business School of the University of Puerto Rico and is the Treasurer of the Interamerican Association of Entrepreneurs.

Nelly has served as an instructor with the PR Society of CPA's focusing on a variety of disciplines including risk assessment standards, international accounting standards, disclosure and reporting of non-public entities, agreed-upon procedures, internal controls, cash flows, and capital leases, among others. She has been awarded recognition by the PR Society for her contribution to its Continuing Education Program.

Nelly has extensive experience in developing and implementing audit plans, evaluating the effectiveness of internal control systems, as well as designing and implementing new control systems and best practices. She has extensive experience in overseeing performance management initiatives and reengineering efforts, and has been acknowledged as the key player in the turnaround of various organizations. Nelly has been involved in designing and refining systems to manage complex processes and to optimize performance.

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Appendix B  
KBL – Minority Business Entity Certification

**THE COUNCIL**  
NY and NJ Minority Supplier Development Council

THIS CERTIFIES THAT  
**KBL, LLP**

Has met the requirements for certification as a bona fide Minority Business Enterprise as defined by the National Minority Supplier Development Council, Inc.® (NMSDC®) and as adopted by the NY and NJ Minority Supplier Development Council

\*\*NAICS Code(s): 524210 ; 541211

\*\*Description of their product/services as defined by the North American Industry Classification System (NAICS)

<u>04/13/2010</u>	<u>NY1451</u>
<i>Issued Date</i>	<i>Certificate Number</i>
<u>05/22/2011</u>	<u><i>Lynda Ireland</i></u>
<i>Expiration Date</i>	<i>Lynda Ireland, President, NYNJMSDC</i>

By using your assigned (through NMSDC only) password, NMSDC Corporate Members may view the original certificate by logging in at: <http://www.nmsdc.org>.



An affiliate of the National Minority Supplier Development Council, Inc.® (NMSDC®)

## Appendix C

### Shaw Consultants International – Previous Work Products

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The following references link to publically available samples of our work, demonstrating the various types of and uses for the deliverables that the Shaw Consultants team is capable of creating. We would like to note that there is a wealth of additional reports that we cannot provide for reasons of confidentiality.

#### **Public Service Company of New Hampshire – Independent Assessment of Distribution Reliability and System Planning**

Shaw Consultants International provided an independent assessment of its distribution reliability and system planning criteria to assure the New Hampshire Public Utilities Commission (NHPUC) that the Public Service Company of New Hampshire (PSNH) was reasonably meeting its public utility obligations and to comply with and address its rate case settlement agreement commitment with the NHPUC.

#### **Vermont Electric Cooperative – Comprehensive Business Process Review and Audit**

Shaw Consultants completed a business process review of the Vermont Electric Cooperative, under the direction of the Vermont Department of Public Service, that identified opportunities for operational and reliability improvements. Our final report summarized the approach, findings, recommendations and implementation plan developed throughout the comprehensive review and audit, and was filed with the Department in December of 2007.

<http://www.vermontelectric.coop/pdf/reports/BPRA.pdf>

## **Executive Summary**

Public Service of New Hampshire (PSNH), a subsidiary of Northeast Utilities, commissioned Stone & Webster Management Consultants, Inc. (Stone & Webster Consultants) to perform an independent assessment of its distribution reliability and system planning criteria to assure the New Hampshire Public Utilities Commission (NHPUC) that PSNH reasonably meets its public utility obligations and to comply with and address its rate case settlement agreement commitment with the NHPUC. This document, together with the complete report provided with appendices in Power Point format, comprise the final report of the assessment undertaken by Stone & Webster Consultants during the first half of 2005.

The key areas of review for this assessment included:

- PSNH's philosophy relative to system planning, maintenance, operation, and reliability expectations,
- Reliability performance and its impacts on planning, investment, and maintenance,
- Capability and limitations of the existing outage management system,
- Broad benchmarking of reliability performance measures with comparable utilities, and,
- General distribution system condition assessment.

This document summarizes the methodologies utilized to complete the review and presents our findings and recommendations.

### ***Approach and Methodology***

Stone & Webster Consultants' efforts were initiated in early January of 2005 and the initial draft report was documented during May and June of 2005. The team's approach was to utilize meetings, documentation reviews, site visits, interviews, observation, and analytical tools to complete our assessment in the five areas of focus.

Senior management of PSNH met with the key Stone & Webster Consultants team members early in the process to understand our approach and to commit their support of this effort, as evidenced by their offer of additional time with them to ensure candid discussion. It was evident to the investigating team that all of the PSNH participants were open to the review and interested in suggestions for improvement.

### **Information Collection**

Stone & Webster Consultants reviewed initial documents provided by PSNH that would enable us to get up to speed on the appropriate issues including rate case testimony and information requests related to the rate case, planning documents, and organization charts. The organization charts and the document review were necessary in order to formulate a list of personnel to interview. In all, 50 interviews were conducted accounting for nearly 80 hours of discussion regarding PSNH's distribution reliability and system planning. These interviews resulted in nearly 100 specific information requests for existing reports, procedures, and databases that were used to establish PSNH's philosophy and approach to system planning. Stone & Webster Consultants utilized the gathered information and our industry expertise to draw the conclusions presented in this report.

A critical element of the study is the identification, collection, development where necessary, and critical assessment of data to support a well-informed and rigorous analysis.

The key steps in the data collection efforts included:

*Data/document identification* – PSNH provided extensive information which was reviewed and evaluated during our assessment (reliability performance, planning criteria, load forecasting techniques). We received and reviewed more than 100 documents.

*Data collection* – After necessary and/or desired reports and data were initially identified, Stone & Webster Consultants also requested additional working documents and databases as needed during the interview process. To the extent necessary, Stone & Webster Consultants sought other sources of information, including public sources - such as IEEE information, as well as the team's expertise - as resources during the data collection phase.

*Critical assessment of available/collected data* – The Stone & Webster Consultants team reviewed the data for completeness/responsiveness, apparent accuracy, comparisons between sources for consistency, and relevance to our effort. Our review then identified areas of compliance with industry norms and areas where improvement would be recommended.

In order to gain a complete understanding of the existing distribution system, the following major steps were performed:

*Understanding the Service Area* – Documents were reviewed and key PSNH staff interviewed to allow the Stone & Webster Consultants team members to gain a detailed understanding of the area served by the existing distribution system.

*Review of Standards and Procedures* – Documents (including construction standards, design guides etc.) were reviewed and key PSNH staff interviewed to determine the adequacy of the overall distribution system design.

*Review of the System's Management and Operation* – Existing operation and maintenance practices were reviewed to determine the appropriateness and adequacy of resources available to meet customers' energy requirements reliably. Outage statistics were reviewed and compared to regional averages to gauge relative performance.

*System Condition Assessment* – In order to determine the general condition of the existing systems, Stone & Webster Consultants completed visual examinations of facilities to gauge the general condition of the facilities. In addition to field observations, our team reviewed historical operation and maintenance records for the system to gauge past performance levels and examined written maintenance procedures to assess the reasonableness of existing maintenance practices. Our team reviewed the capital and operating budgets for the electric system to gauge the

reasonableness of budgeted expenditures to maintain historical electric system reliability levels.

*Peak Demand Requirements* – Forecasted demand requirements were reviewed to determine the adequacy of the forecasting process, and the forecasting approach’s ability to incorporate location specific growth parameters.

*Planned and Proposed System Improvements* – Planned and proposed system improvements are an integral part of determining the ongoing viability of the distribution system. This review included both an analysis of the extent to which system needs are being met, as well as an assessment of the planning and investment criteria and processes supporting these efforts.

In addition to reviewing system planning and reliability, part of our mission in this effort included an assessment of PSNH’s distribution system’s condition. Our team spent 180 hours in the field with the assistance of PSNH guides to visit and inspect a sample of the system. At the outset of this project, it was not the intent of the condition assessment to inspect a statistically valid representative sample of the PSNH system. Rather, our goal was to see a mix of voltages, circuit age and construction, substations, and urban and rural construction in order to develop general conclusions, when coupled with the remainder of our assessment, relative to PSNH’s system. Our tour included 199 distribution circuit miles and 7 substations which represented approximately 5% of the PSNH distribution system.

### ***Observations, Findings, and Recommendations***

PSNH staff, at all levels, were very open with the assessment team throughout the intensive interviews, information requests, clarifying discussions, and site visits and displayed in-depth knowledge of their system, procedures, goals, and the status of the industry locally and in general. We found the staff to be dedicated and interested in discussions with our team – genuinely open to suggestions and probing or challenging discussion. The remainder of the executive summary provides information for each key area of the assessment and summarizes the key recommendations with the following priority assessments for further investigation and possible subsequent implementation:

- High Priority – implementation of the recommendation could result in significant cost savings, major service improvements, or substantial improvements in management practices and performance.
- Medium Priority – implementation of the recommendation could result in important cost savings, service improvements, or meaningful improvements in management practices and performance.
- Low Priority – implementation of the recommendation could potentially enhance cost controls, service improvements, or management practices and performance.

It is important to recognize that most of our recommendations anticipate the need for additional investigation by appropriate PSNH personnel prior to making a decision to go forward. This investigation would more specifically identify costs, benefits, and impacts on PSNH operations and its customers.

## **Summary Finding**

Based on the evidence amassed during this assessment, Stone & Webster Consultants finds that PSNH is committed to providing reliable service to its customers and has developed effective processes, systems, and approaches to planning for a reliable system. As with all processes and approaches, enhancements can be introduced to improve the efficiency of the systems and to improve the “information” required to analyze issues that require solutions. This effort has identified a number of enhancements – some are significant and will take time to implement while others are more easily implemented. It is worth noting that PSNH has already taken action on some of the recommendations outlined in this report. The balance of the recommendations should be further analyzed and prioritized by PSNH as they consider whether or not and how to proceed with implementation.

## **System Planning**

Stone & Webster Consultants met with managers and numerous personnel directly responsible for system planning efforts during our review process. We found that all personnel have a very good understanding of system needs and planning needs. PSNH’s distribution planning design criteria is documented in a procedure that incorporates specific planning policies. The planning criteria are clearly driving investment and projects are prioritized first by base case overload, then design criteria, then reliability improvements, then discretionary. Short term (lower cost) solutions are often utilized instead of preferred long term solutions due to budget constraints.

Circuit design philosophies are handed down from person to person and are generally not well documented, however the Circuit Design Guide II process has resulted in a very good description of a circuit design philosophy, which, once adopted, will be a good reference. We recommend quick action on these criteria. In general, staff has limited time to document philosophies and standards and staff experience has been impacted due to high reported turnover rates. Some areas that are affected by a lack of fully defined design criteria include 1) the philosophy for distribution automation (DA) which is currently reliability driven and used as a location specific solution, 2) the philosophy on maximum circuit lengths and subsequent levels of outage exposure, and 3) the design criteria for animal guards where they are only installed on new installations or are reliability driven on a location specific basis. In the construction standard area the QA/QC function is limited and should be revisited.

During our analysis PSNH invited us to interview Unil and the New Hampshire Electric Cooperative to evaluate their issues and concerns relative to joint planning for their facilities that are interconnected with or rely upon PSNH for service. These interviews were very open and positive; each participant was prepared with suggestions for improvements. Some of the critical issues identified involved the treatment of outages by PSNH (one customer mindset versus impacting numerous customers), preferred construction standards, and inclusion of each utility in long term planning discussions. PSNH has been working with both parties and during our project instituted more frequent meetings to enhance the planning relationship. Stone & Webster Consultants suggests that PSNH continue to work with these utilities to improve the planning for New Hampshire’s reliability.

In the area of load forecasting, PSNH’s circuit forecasting methodology relies on the expertise of one individual who utilizes analysis supported by information collected from “local experts” combined with graphical reviews of historical load growth to project forecasted growth trends. The methodology is a useful one as there are limited approaches to small area forecasting that are

cost-effective; however, there are some improvements that are suggested here. The resulting forecasts are “point” projections that do not evaluate the risks of load growth uncertainty on the conclusions that may be drawn from these projections. For example, if a certain circuit has been experiencing 4% growth on average for the past five years and the projection has noted a declining trend in the area and projects a shift to 2.5% growth, the risk of 4% growth returning is not considered in the criteria to reinforce the capacity. The methodology and rationale for the growth projections are not sufficiently documented for a critical review of the analysis and the criteria for “need” in the circuit areas is also not well documented.

PSNH’s planning can be improved by more clearly defining, utilizing, and documenting the criteria for projecting load and by specifying in a document the adjustments used in the forecast. Further, all inputs considered (especially those provided by local experts) should be fully documented.

Specific system planning related recommendations are outlined in the following table.

AREA OF REVIEW	RECOMMENDATIONS	PRIORITY
<b>System Planning</b>	1. Consider the degree to which discretionary language in planning criteria drives the use of short term (lower cost) solutions instead of preferred long term solutions and investigate the degree to which these short term solutions may be compromising long term system reliability.	Medium
	2. Circuit design philosophy is not well documented. A draft report “Circuit Design Guide II” is a significant effort aimed at addressing this issue. Recommendations in this report need to be acted upon as soon as practical.	High
	3. Consider the implementation of a QA/QC function similar to that used for outside contractors for work completed by PSNH construction resources to ensure consistent adherence to construction standards.	Medium
<b>Inter-Utility Planning Coordination</b>	1. Recent efforts to improve planning and coordination with NHEC and Unitil should continue. PSNH should consider a more formal, recurring means of communication where issues can be raised, discussions documented, action items developed, accountability assigned, and follow-up completed.	Medium
	2. NHEC and Unitil need to be more directly involved in PSNH’s system planning process. Consider modifying the planning process to explicitly incorporate NHEC and Unitil feedback as part of the development process rather than as an after the fact review.	Medium
<b>Load Forecasting</b>	1. Plans are developed for each area using only the base load forecast rather than a range of possibilities. Investigate adoption of a bounded approach for planning – forecast bounds are developed but not used in planning.	High
	2. Highest peak (based on a hot summer) is the base that is preferred. This is a conservative approach to planning for load growth – potentially resulting in investment that may be higher or earlier than	High

AREA OF REVIEW	RECOMMENDATIONS	PRIORITY
	<p>necessary. Consider weather adjusting load and the implications of planning to a specific and defined level of certainty.</p> <p>3. Document forecast methodology including its assumptions and information relied upon to complete the load forecast for each region. Consider expanding the sources of information to include the local planning agencies in New Hampshire.</p>	High
<b>Reliability Committees</b>	<p>1. In general, consider enhancing existing meeting format for all the reliability committees to include better documentation of discussion, action items developed, and accountability assignments. This would promote better follow-up and measurement of results.</p> <p>2. A number of substandard equipment conditions have been identified as part of the System Equipment Review Committee “SERC” efforts. The “Equipment Replacement Program” details an extensive list of equipment targeted for replacement based on factors including reliability, maintainability, operability, and cost. Efforts to-date have largely been dominated by budgetary issues which have led to numerous implementation deferrals. Consider establishing a firm budget for this program based on clearly identified criteria consistent with overall asset management goals.</p> <p>3. Capital Budget Review Committee “CBRC” reviews both distribution and generation related capital projects in a common format. Consider formally separating the distribution from the generation projects review in order to avoid the appearance of cross-subsidization between the two organizations.</p>	<p>Medium</p> <p>High</p> <p>Low</p>

### Reliability and Circuit Design

The Stone & Webster Consultants team spent 180 hours in the field with PSNH guides in order to gain an understanding of the overall condition of the distribution system. The goal was to view a mix of voltages, circuit age, construction, and substations in both urban and rural settings. The condition assessment included approximately 199 distribution circuit miles and 7 distribution substations, which roughly represents about 5% of the PSNH distribution system. Coupling information gathered from the visual inspections with maintenance records and reliability reports allows Stone & Webster Consultants to draw general conclusions regarding the general overall condition of the system. As part of the review numerous photographs were taken in order to outline illustrative examples of the system’s condition.

Reliability measures at PSNH encompass many indices (e.g. SAIDI, SAIFI, and CAIDI) of which SAIDI is a major driver of performance assessments. Reliability measurement and tracking systems are in place and PSNH focuses communication on these indices. The Annual Hit List Report (a SAIDI driven report defining the worst performing circuits) and the Quarterly Three or More Outage Report (defining outage frequency) drive reliability investments. However, some circuits are always on the Hit List due to their design characteristics. The total circuit length, which includes the circuit backbone and associated lateral side taps, varies from as little as several miles to well over 100 miles on the PSNH system. Exposure of over a hundred miles can significantly impact circuit reliability. Typically, demand exceeds the funding available for Distribution Reliability Projects (\$1 Million/year). PSNH’s capital budget defines new customer

service and vegetation management (ETT only) as non-discretionary, an area that has been growing substantially, a trend that is expected to continue. Since the PSNH capital budget has a limit, the budget available for discretionary or reliability driven projects is declining. This issue is of concern to Stone & Webster Consultants as it was difficult to gather reliable evidence to support a clear conclusion.

Area Work Centers (AWC) play a critical role in outage restoration. The time it takes an AWC to restore service once an outage has been communicated to them (i.e. restoration time) is tracked and compared to the performance of other AWCs only. Currently, no goal exists that defines targeted or optimal performance. Year to year trending of restoration times is also not currently monitored making it difficult to determine trends relative to optimal or targeted performance.

PSNH follows a good systematic approach for investigating outages. During interviews the process was described as incorporating:

- Reviewing outages along with the associated cause codes
- Plotting the outages on a map
- Patrolling area to determine cause
- Patrolling area to identify problems that could result in a future outage

However, no written documentation was made available to independently verify that these steps are in fact being taken on a regular basis.

PSNH makes good use of Distribution Automation (DA) in urban areas resulting in reduced outage duration and increased reliability. DA primary disconnect switches are used at open points between circuit ties in some urban areas with higher population densities. The result is the ability to reconfigure the circuit/feeder boundaries in real time, thereby reducing the duration of an outage.

Voltage sensing disconnect switches are used in conjunction with reclosers to reconfigure circuit/feeder boundaries in urban areas with higher population densities. The voltage sensing disconnect switches are typically located near the circuit halfway points and/or based upon load and customer count on the circuit, while the reclosers are located at circuit tie points. When voltage is not present, a voltage sensing switch opens and the upstream recloser closes picking up a portion of the load from the affected circuit thereby minimizing the number of customers impacted by the outage.

Temporary isolation switches are routinely added to the system in order to minimize system disturbances and facilitate new construction and rebuilds. These switches are often left in place after the construction activities have been completed because there is not a compelling reason to remove them. The locations of these temporary isolation switches are not consistently reported to the Electric System Control Center (ESCC) given their “temporary” designation; however, if the ESCC were made better aware of their locations it may enhance ESCC’s ability to minimize the duration and extent of outages.

During the Condition Assessment some laterals were found unfused in violation of PSNH’s construction standards. Unfused laterals increase the likelihood of 1) a greater number of

customers experiencing an outage, 2) longer outages due to increased exposure of line section, and 3) the potential for additional equipment and conductor damage.

There is inconsistent use of animal guards and covered primary jumpers on existing construction. There is no proactive, systematic approach for retrofitting existing locations to reduce the likelihood of an outage caused by an animal. If an existing device experiences 3 outages in a year, then animal guards and covered primary jumpers are installed. Animal guards are standard practice on all new construction.

Newer style polymer arrestors, that are not susceptible to failure, are being utilized on new installations. Older style arrestors (brown porcelain and gapped), that are particularly susceptible to failure caused by moisture intrusion and in turn outages, were observed on older installations. On a consistent basis, lightning arrestors are not installed on three-phase dead ends and both sides of three-phase primary disconnect switches that are normally closed. In discussions with PSNH personnel, PSNH has experienced moisture intrusion problems with the older porcelain style lightning arrestors tripping out the circuit. In order to minimize these moisture related outages the arrestors were removed as the lesser of two evils.

The majority of backbone circuits observed were accessible to vehicles and located along roadways. This is a good practice that aids in reducing outage restoration time. Some utilities have a portion of their older backbone circuits located along rear lot lines which are inaccessible to vehicles, thereby increasing outage restoration time. Standard framing for the circuit is crossarm construction with the neutral below the crossarm. This is similar to what is observed at other utilities. Based on visual inspection, the overall condition of the poles appeared to be adequate. Temporarily braced poles were not found, nor were any requiring immediate attention.

Based upon visual inspection, the overall condition of the primary insulators appears to be satisfactory. Insulators with corroded steel pins, cracked or damaged insulators, or any requiring immediate attention were not discovered. However, based upon discussions, 4.25" discs have been a recurring cause of outages and are currently being replaced as part of an ongoing Equipment Replacement Program.

Historically, PSNH has experienced problems with failure of older porcelain material caused by repeated freezing and thawing. As part of the Backbone Rehabilitation Program, the older porcelain material (switches, insulators, lightning arrestors and cutouts) is being replaced with newer polymer material.

Based on visual inspection, the overall condition of crossarms appears to be adequate - crossarms requiring immediate attention were not observed. The majority of the conductor associated with the circuit backbone was of newer vintage (477 and #1/0) with minimal to no splices - this is similar to what is observed at other utilities. Aerial spacer cable and covered conductor are utilized where tree conditions and space limitations dictate. A few instances were observed where aerial spacer cable was utilized where lower cost bare conductor could have been used.

Two locations were discovered with a broken tie wire (floating conductor) - both locations were reported to the Area Work Center for resolution. One location was observed with a broken tie wire with the conductor resting against the bottom on the insulator and at another location the conductor was observed to be frayed. Unless addressed, these situations could result in the

likelihood of an outage, possibly a pole fire, and/or the wire burning down. Circuits and associated laterals need to be patrolled on a regular and consistent basis to proactively identify and address these types of problems.

Based upon a visual inspection, the overall condition of the line transformers appears to be satisfactory. Some transformers greater than 25-30 years old were found, however, transformers with excessive rust or any that were leaking were not discovered. The transformers were similar in shape and condition to what is found at other utilities.

PSNH standard is a CSP (Completely Self Protected) transformer. If the internal fuse blows or breaker is damaged on a CSP transformer, the whole transformer must be replaced, resulting in increased outage times. It is potentially easier and quicker to replace the external fuse on a conventional transformer than to replace an entire CSP transformer. Many utilities use conventional transformers because they are more readily available and cost less than a CSP transformer – also CSP’s can be more difficult to use in banking applications.

Recommendations for improvement in this area are outlined in the following table.

AREA OF REVIEW	RECOMMENDATIONS	PRIORITY
<b>Reliability and Circuit Design</b>	1. Demand exceeds funding available for Distribution Reliability Projects (\$1 Million/year) on a routine basis. Consider developing more formalized criteria that would allow funding to be allocated across competing projects based on a common set of asset management driven criteria rather than a fixed budget.	High
	2. Since the PSNH capital budget has a limit, the budget available for discretionary or reliability driven projects is declining. This issue is of concern to Stone & Webster Consultants as it was difficult to gather reliable evidence to support a conclusion.	High
	3. The total circuit length of the circuit backbone and associated lateral side taps vary from several miles to well over 100 miles. As the total circuit length increases so does the overall exposure which greatly impacts reliability. Focus should be on limiting exposure by reducing total circuit length - where possible, extension of existing circuit backbone and lateral side taps should be limited along with shifting existing load to adjacent circuits. A standard circuit length should be developed. Exceptions should be allowed only with the approval of Asset Management. PSNH initiative - Design Criteria II addresses this issue, however acceptance and implementation has been slow.	High
	4. Distribution circuits were generally observed to be in a condition consistent with facilities of a similar age, design and function. However minor variations from good practice were observed. <ul style="list-style-type: none"> <li>a) Consider a systematic review of all the distribution circuits to identify lateral taps that are not fused as required by PSNH standards. Unfused laterals increase the likelihood of a greater number of customers experiencing an outage, longer outages due to increased exposure, and additional equipment and conductor damage.</li> <li>b) There is inconsistent use of animal guards and covered primary jumpers. Animal guards are standard practice on all <u>new</u></li> </ul>	Medium

AREA OF REVIEW	RECOMMENDATIONS	PRIORITY
	<p>construction. Also, if an existing device experiences 3 outages in a year, then animal guards and covered primary jumpers would be installed. Consider instituting a proactive, systematic approach for <u>retrofitting</u> existing locations to reduce the likelihood of an outage caused by an animal.</p>	Low
<p><b>System and Customer Operations</b></p>	<ol style="list-style-type: none"> <li>1. The location of temporary isolation switches are not consistently reported to the Electric System Control Center (ESCC). These switches could facilitate restoration activities if their locations were better documented with the ESCC.</li> <li>2. Average restoration time is tracked relative to other Area Work Centers only – an optimal or targeted goal needs to be established and multi-annual trending put in place in order to better determine performance gains or losses.</li> </ol>	<p>Medium</p> <p>Low</p>

### Substation Design and Maintenance

The substation portion of the condition assessment of the 34.5 kV System was conducted through visual inspections of selected substations to ascertain the general physical condition of the equipment. These substations were selected for review by PSNH because they represent the different classifications of their distribution system. As part of the review numerous photographs were taken in order to outline illustrative examples of the system's condition.

Pine Hill Substation is an example of PSNH's standard layout for new 115 kV-34.5 kV distribution substations. It consists of a normally closed 115 kV bus tie circuit breaker installed between the two transformers. The 115 kV bus tie breaker is used to provide high-side bus isolation if there is a fault on the 115 kV line or on the 115 kV bus inside the substation. If a fault occurs on the 115 kV bus or on the 115 kV line, the 115 kV bus tie will open to isolate that part of the substation. There are two 3-phase transformers. High-side transformer protection is provided by candlestick style circuit switcher. Each transformer has a 34.5 kV low-side SF6 gas circuit breaker.

The 34.5 kV low-side is arranged as a single bus, with two bus sections. Each bus section has two distribution circuits. There is also a low side 34.5 kV bus tie breaker installed between the two bus sections. The 34.5 kV bus tie breaker is used to perform an automatic swap-over scheme when the 115 kV source or transformer is lost. This breaker is normally open but when one of the transformers is lost the 34.5 kV bus-tie breaker will automatically close allowing the other transformer to pick up the other circuits. Station surge arrestors are installed on transformer High-side and low-side Station surge arrestors are installed on the 115 kV line termination structure and on the distribution circuit exit structure inside the substation. This substation arrangement and circuit breaker protection scheme provides for outage protection and system operation consistent with good utility practice.

The distribution side is protected by microprocessor based protective relays consisting of Schweitzer 351 relays, 352 relays, and 2030 devices. The Schweitzer 351 and 352 relays are

microprocessor-based relays which provide over current protection, breaker control, auto-reclose, high accuracy metering, and fault recording in a simple package and contains both standard and IEC over current curves. It is also a self checking relay, and provides an alarm in the event of relay failure. The Schweitzer 2030 microprocessor-based communication processor provides remote control and access through the microprocessor relays. The 2030 also has real time monitoring, remote fault recording capabilities, and provides sequential event recording.

Inspection of the relay panels showed the relay panels to be in excellent condition, and the wiring behind the panels was in good shape. Individual conductors were identified by wire markers. Cables were identified and neatly tie-wrapped. The relay panels appeared to be properly grounded. Inspection of the DC panel board showed no spare breakers available for future modifications, but the AC panel board did have sufficient spare breakers. There were no alarms indicated on the control house enunciator. Visual inspection of the batteries and battery charger showed no indication of leaking batteries or corrosion on the battery racks.

Up to date documentation is on-site including Schweitzer relay manuals for qualified field personnel to use. An up to date copy of the ESCC generated station orders is also on-site for field personnel use.

Station drawing redlines/green lines are transferred from station drawings back to engineering annually unless a modification to the station is to be performed. In this case, those station red/green marks are transferred back to engineering before the modification is designed.

The two individual 34.5 kV buses are monitored by individual Dranetz-BMI disturbance monitors to provide power quality data. The disturbance monitors can communicate with the engineering department via modems to provide power quality data from each 34.5 kV bus.

There are three control modes available for operating this substation; local manual control, remote SCADA control via programmable logic controllers, and local GUI (Graphical User Interface) control.

Amherst 345-34.5 kV Substation is built on top of the city of Amherst groundwater system. This substation was built with an underground transformer apron to prevent soil and groundwater contamination. The apron is also installed underneath the oil circuit breakers to prevent soil and groundwater contamination. The oil circuit breakers also have a shield installed around them to prevent oil from spraying out and away therefore confining the oil leakage to the breaker area.

At Pine Hill Substation, portable transformer provisions were provided on the high side and on the low-side. The high-side provisions consist of stirrup type connection on the line coming into the substation. The low-side provisions consist of tapping the single bus with a disconnect switch. However this switch is installed between the transformers and only on one bus section. In order to utilize this switching location, power cables would need to be run along the ground and then up to the disconnect switch. PSNH should consider installing the disconnect switch on the end of the single bus at both ends to facilitate quicker portable transformer hookup.

The Rimmon Substation consists of a single 115 kV/34.5 kV transformer feeding 8 circuit breakers. The circuit breakers and control house were installed in approximately 1970 and the transformer was installed in 1987. The overall condition of the control room was good; the

Relay/Control Panels appeared in good condition, wiring behind the panels looked good, and no flags or lockouts were visible. The batteries and battery racks were clean and corrosion free. The GE and Basler electromechanical relaying provide adequate relay protection, providing directional phase distance, directional phase over current, and directional ground over current. While this protection is adequate, it does not offer some of the advantages available with modern microprocessor-based relays, such as fault recording, reduced wiring and installation costs, more accurate settings, and no interposing relays. Microprocessor-based relaying offers more accurate relay settings that will not drift over time and performs self-checking functions. This enables the routine relay test interval to be significantly lengthened without sacrificing system reliability.

The existing SCADA cabinet is scheduled to be replaced as part of an ongoing program to standardize to a Harris D-20 remote terminal unit (RTU). No timeframe has been set for replacing the SCADA cabinet. Up to date documentation is on-site for qualified field personnel to use. An up to date copy of the ESCC generated station orders is also on-site for field personnel use. No existing retrofit program exists for upgrading existing control rooms from electromechanical relays to solid state relays.

The Amherst Substation is a ring bus configuration, with (2) 345 kV/34.5 kV transformers feeding 5 circuit breakers. One transformer feeds 2 circuit breakers on bus #1 and the other transformer feeds 3 circuit breakers on bus #2. The overall condition of the control room was good; the Relay/Control Panels appeared in good condition, wiring behind the panels looked good, and no flags or lockouts were visible. The batteries and battery racks were clean and corrosion free.

The GE and Basler electromechanical relaying provide adequate relay protection, providing directional phase distance, directional phase over current, and directional ground over current. While this protection is adequate, it does not offer some of the advantages available with modern microprocessor-based relays, such as fault recording, reduced wiring and installation costs, more accurate settings, and no interposing relays. Microprocessor-based relaying also offers more accurate relay settings that will not drift over time, and perform self-checking functions. This enables the routine relay test interval to be significantly lengthened without sacrificing system reliability. Up to date documentation is on-site for qualified field personnel to use. An up to date copy of the ESCC generated station orders is also on-site for the field personnel use. No existing retrofit program exists for upgrading existing control rooms from electromechanical relays to solid state relays.

Substation grounding practices generally follow industry standards (IEEE Standard 80-2000).

- Pigtails were attached on every structure column leg,
- bolted ground lugs are used for below grade connections,
- major equipment has two ground leads connecting to the ground grid,
- ground leads for fence grounding are attached to the fence fabric,
- a ground grid loop is installed 3' outside of fence around the perimeter of the substations,
- the substation fence is also attached to the perimeter loop by use of a ground lead,
- there is a ground grid loop installed outside of the swing of all gates, and
- barbwire installed at the top of the fence is bonded together and connected to the fence fabric.

Rimmon Substation did not appear to have adequate gravel in substation yard. Adequate gravel stone should be in place for protection of personnel walking around the substation. We recommend gravel be installed between 3” to 6” deep to protect personnel from step potentials.

At the Blaine Street Substation the neighboring business installed a metal chain link fence perpendicular to the substation fence. This represents a potential transfer of ground potential rise away from the substation. We recommend installation of a non-metallic fence section within the Blaine Street Substation to isolate the customer fence or replacing the customer metal fence with non-metallic fence material (i.e., wood or fiberglass post and fabric). Currently, PSNH does not test the ground grid for resistance to check for significant changes, however, PSNH does plan to start this process as soon as they can acquire the required meters.

Animal protection is generally not a major issue for 34.5 kV and higher voltages inside substations. The length of substation insulators helps to provide protection from animal short circuits. Animal guard protection is more of a concern in the 34.5-12.5 kV and 34.5-4 kV substation on the low voltage side. Animal guard protection was used at Brown Avenue Substation, but not used at other unit substations that were visited. Animal guard protection is recommended at voltages below 34.5 kV.

The substation maintenance organization is organized in four groups: Construction, Maintenance Support, Communication, and Equipment Maintenance. Currently the PSNH approach to maintenance is based on time or periodic maintenance with plans to move to a more condition based program in the near future.

Monthly inspections are performed on all the substation equipment. These are generally visual inspections. Data is entered into a database using an electronic data tablet in the field. Data tablets have alerts built in to notify the user to call the problem in or they can download later into the system. This data is downloaded into CASCADE. PSNH is using the CASCADE software program to help them better manage their maintenance activities. CASCADE has built in triggers to identify when maintenance is required. CASCADE has been populated with historical maintenance records back to the year 2000. Paper records older than the year 2000 have not been entered into CASCADE. Trending analysis is not done in CASCADE. Staff prefers to use MS Access database to create trending reports.

The protective relay maintenance schedule and log is being developed in CASCADE. It is presently not in the system for Rimmon Substation. The protective relays log is 90% complete in CASCADE, and is scheduled to be complete by the end of 2005. Labor constraints make it difficult to schedule all of the required maintenance work orders generated. There is currently a 10% workforce shortage from approved complement in the Distribution Maintenance Department due to retirements and transfers. Some critical maintenance was not completed last year due to outages and the lack of experienced personnel.

PSNH is currently using time based or preventive maintenance approach to substation maintenance, although they are moving toward a condition based maintenance program. This shift may help free up labor to do maintenance on critical equipment. In general maintenance procedures appear to be adequate; time based frequencies are within industry norms. New substations, substation transformer additions, and substation circuit breaker additions are now

being awarded to outside contractors on an EPC (engineering, procurement, construction) basis to help supplement PSNH resources.

At Pine Hill Substation inspection of the equipment within the energized substation yard revealed that on one of the transformer winding temperature gauges there was condensation on the inside of the gauge glass. This can lead to inaccurate reading due to corrosion and friction; the gasket on the gauge needs to be replaced.

Condensation was visible inside the glass on several of the electromechanical relay cases. A broken glass cover was also noticed on another relay case. The presence of condensation inside an electromechanical relay can cause corrosion of contact surfaces and friction in the jeweled bearings in the relay which can adversely affect the operation and reset time of the relay. The additional moisture from condensation can also be absorbed by the internal relay wiring and coil insulation. This reduces the voltage withstand capability of the insulation and increases the potential for relay failure.

Inspection of the equipment within the energized substation yard did not show any visual problems. Wiring inside the circuit breaker cabinets looked good for its age. PSNH personnel believe that because they only schedule test tripping the breakers once every 6 years and due to environmental conditions, they have experienced “slow breaker” conditions. PSNH personnel are working with an outside supplier to determine the best lubricant to use to help mitigate the problem and also withstand the environmental conditions.

At Rimmon Substation, corrosion was found on the exterior of a few equipment cabinets, arrester supports, and on oil circuit breakers. Rusting fans were found on a transformer. This is a minor problem but PSNH should perform minor repairs before corrosion becomes a major factor resulting in major repairs.

PSNH has experienced problems with older brown Lapp hollow core insulators as water intrusion causes them to crack and break. PSNH is currently proactively replacing these insulators inside the substation when operating conditions allow (e.g. during periods of outage or equipment failures).

Chipped transformer bushings were observed at Rimmon Substation. This presents a reliability concern. Chipped bushings need to be sealed to prevent failure and should be replaced as soon as system conditions allow.

Most of the older substations have a mix of the old and the new insulators. Notre Dame Substation had all of the old insulators replaced with new insulators. Continued proactive replacement of these problem insulators will enhance reliability.

Recommendations for improvement in this area are outlined in the following table.

AREA OF REVIEW	RECOMMENDATIONS	PRIORITY
<b>Substation Design and Maintenance</b>	1. Maintenance triggers and philosophy are not well documented. Consider a detailed review of all existing maintenance practices with a focus on documenting the triggers and philosophy.	High
	2. New maintenance management system (CASCADE) is in the process of being implemented. Emphasis needs to be placed on completing the implementation process as soon as practical. As part of implementation reporting needs to be enhanced to better support asset management requirements.	High
	3. There is significant shortage of experienced substation maintenance staff. Limited succession planning is in place or technical training focus other than “on-the-job”. Consider filling existing vacancies and increasing the emphasis on technical training as soon as practical.	High
	4. Overall, only 92% of substation critical maintenance was completed in 2004 (substation major critical maintenance – 35% in 2004, mobile substation major critical maintenance – 46% in 2004) which results in a growing backlog. As part of the documentation process re-consider the appropriateness of the “critical” designation. Once the appropriate “critical” maintenance has been identified develop a detailed action plan to ensure 100% of all “critical” work is competed annually.	High
	5. Substation grounding practices generally follow industry standards however minor variations from standards were observed. Consider a complete review of all substations to ensure consistent adherence to grounding practices.	Low
	6. Seven mobile transformers are available in the event system conditions require their use. Consider a formal statistical review of PSNH outage performance in relation to transformer availability in order to assess the adequacy of the existing mobile transformers.	Medium
	7. Substations were generally observed to be in a condition consistent with facilities of a similar age, design, and function. However minor variations from good practice were observed. <ul style="list-style-type: none"> <li data-bbox="483 1339 1230 1465">a. Consider a complete review of all substations to ensure cracked glass and leaking gauge gaskets are replaced on a systematic basis to minimize contaminant intrusion which could lead to faulty operation.</li> <li data-bbox="483 1465 1230 1564">b. Consider a complete review of all substations to identify, prioritize, and address corrosion related issues on exterior cabinets, arrestor supports, and circuit breakers.</li> <li data-bbox="483 1564 1230 1690">c. Consider accelerating the existing “brown glass” replacement program. These brown hollow core insulators have been susceptible to failure from cracking and breakage due to water intrusion followed by freezing and thawing.</li> <li data-bbox="483 1690 1230 1764">d. Chipped transformer bushings need to be sealed initially and ultimately replaced as soon as practical to prevent failure.</li> </ul>	Low  Medium  Medium  Low

## Vegetation Management

The vegetation management portion of the condition assessment focused on sampling a representative cross-section of PSNH's system in order to ascertain the general adequacy of the vegetation management program. The Stone & Webster Consultants team spent 16 hours in the field with PSNH guides in order to review a sample of the distribution system. Our goal was to see a mix of both urban and rural construction in order to develop general conclusions relative to PSNH's system. As part of the review photographs were taken in order to outline illustrative examples of the system's condition.

At PSNH vegetation management is process based and managed by four arborists, with each arborist assigned to one of the four following processes: Planned Maintenance Trimming (Cycle), New Business and Enhanced Tree Trimming (ETT), Corrective Maintenance (Follow-up), and QA (Inspection). The plan for long term trimming, approved by the NHPUC, combines both time based and condition based trimming - Planned Maintenance Trimming is done on a per mile and cycle basis involving the backbone and associated side taps. The Average Planned Maintenance Trimming cycle is based upon the circuit voltage: 34.5 kV – 4 years, 12 kV – 5 to 6 years and, 4 kV – up to 8 years. Overall the trimming cycle across the entire system is maintained at approximately 5 years. Corrective Maintenance Trimming is performed between cycles when a tree problem is identified by a circuit owner. In a typical year, 2200 to 2400 circuit miles of Planned Maintenance Trimming are performed. In 2004, approximately \$8,000,000 was spent on Planned Maintenance Trimming.

PSNH's Tree Trimming standard is 8 feet to each side of the conductor, 15 feet above, and 10 feet below, consistent with typical utility practice. However, PSNH's Tree Trimming standard is not always obtained. New Hampshire State law requires permission from the owner prior to trimming where distribution easements specifically allowing for tree trimming were not obtained. Several locations were observed during the condition assessment where the customer refused to allow trimming. In 2004, PSNH spent approximately \$500,000 attempting to obtain trimming authorization from customers. PSNH's refusal rate for both Planned and ETT program efforts in 2003 and 2004 are reflected below.

### Customer Tree Trimming Refusals

	Planned Maintenance	ETT
2003	12%	6%
2004	13%	17%

In normal practice, the service drop to a house is not trimmed unless there is a hazardous condition (e.g. conductor rubbing tree). This is consistent with typical utility practice. PSNH, like other utilities, uses mailers or door hangers to notify customers of upcoming tree trimming.

Currently, PSNH does not use herbicides in its Rights-of-Way. Herbicides are used by some U.S. utilities as an effective means of ROW vegetation management as part of their overall Integrated Vegetation Management (IVM) Plan. IVM incorporates a variety of vegetation control methods including: mechanical (the physical removal or trimming of problem trees), chemical (the use of herbicides to control problem trees) and biological (the use of naturally occurring vegetation to reduce problem tree population near power lines).

Each of these control methods can be implemented in a variety of different ways:

- *Mechanical* - selective cutting, rotary mower clearing,
- *Chemical* - herbicides, tree growth regulators (TGRs)
- *Biological* - planting low-growing shrubs, introducing herbivorous species (insect or mammal) that feed on problem trees.

Overall, tree trimming was sufficient in the inspected areas (Manchester, Goffstown, Pembroke, Allenstown, Deerfield, East of Onway Lake, Durham, and Newmarket). Occasionally, substandard conditions requiring attention were found. A few trees required immediate attention, while others could wait until the next planned trimming cycle. During the assessment, two locations of a tree contacting a line hose (eel) placed on an overhead conductor were observed. At both locations, the line hose was placed on the line to prevent direct contact between the tree and the overhead conductor. Remedial action (e.g. relocating or out rigging the line) needs to be taken immediately to prevent damage to the conductor, to reduce the likelihood of an outage, and to prevent and/or minimize hazards to the public associated with the tree catching on fire or the wire burning down. A line hose should not be considered a permanent solution and is not intended to be exposed to the weather for extended periods. The line hose could get displaced, deteriorate, or the conductor could rub through to come in direct contact with the tree. PSNH uses line hoses as a last resort when customers refuse to allow tree trimming.

ETT removes all trees in close proximity to the circuit to the ground level which results in a much lower probability of a tree related outage. During the assessment, a tree related outage occurred when a dead overhanging tree limb fell across all three phases of a circuit - ETT had previously been performed on a large portion of the circuit, however, ETT had not been performed on the section where the outage occurred. Care must be taken to address and identify all portions of a circuit which qualify as a candidate for ETT. Due to the additional cost of ETT, its use is limited to circuits experiencing a high percentage of tree related outages. ETT is significantly more expensive (up to \$20,000 per mile) than traditional cycle (up to \$4,000 per mile) maintenance trimming. ETT is an excellent practice that should be expanded and considered on future circuits when conditions warrant and customer permission is obtainable.

Overall, PSNH's VM program has been effective at maintaining to slightly reducing the percentage of tree related customer outages to overall distribution system outages.

Recommendations for improvement in this area are outlined in the following table.

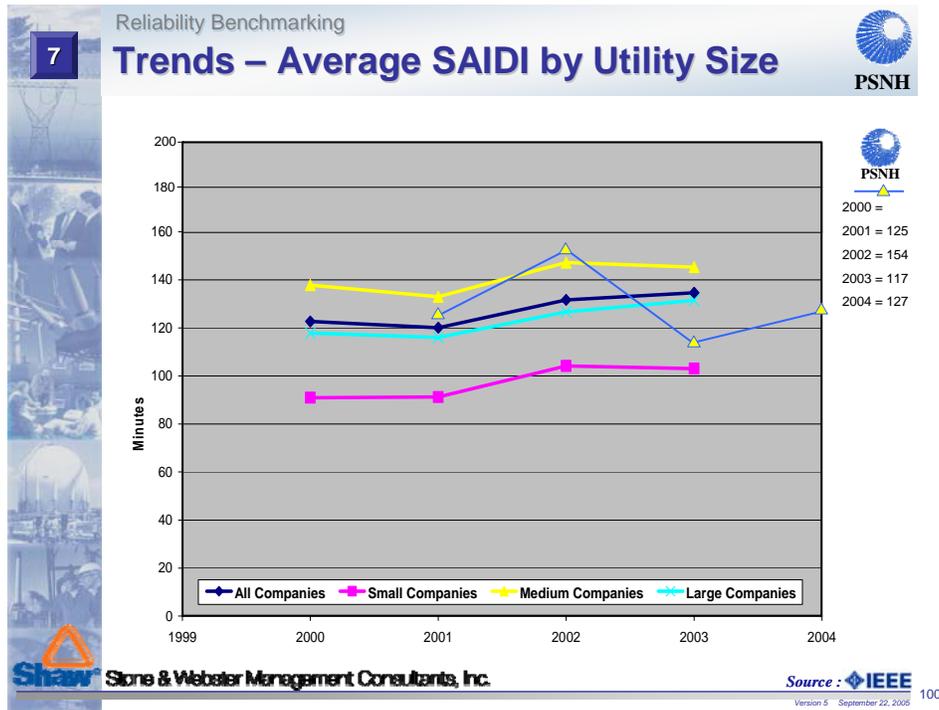
AREA OF REVIEW	RECOMMENDATIONS	PRIORITY
Vegetation Management	1. Overall, the tree trimming was sufficient in the inspected areas. Occasionally, substandard conditions requiring attention were found. A few trees required immediate attention, while others could wait until the next planned trimming cycle. Enhanced inspections would minimize the occurrence of substandard conditions.	Medium
	2. Consider expanding the existing primarily mechanical methods employed for ROW maintenance to include both chemical and biological techniques.	Medium
	3. Due to the high cost of ETT, its use is limited to circuits experiencing	Low

AREA OF REVIEW	RECOMMENDATIONS	PRIORITY
	<p>a high percentage of tree related outages. ETT is an effective practice that should be expanded and considered on future circuits when conditions warrant and customer permission is obtainable.</p> <p>4. A line hose should not be considered a permanent solution and is not intended to be exposed to the weather for extended periods. Remedial action in the form of line relocation or out rigging should be considered.</p>	Low

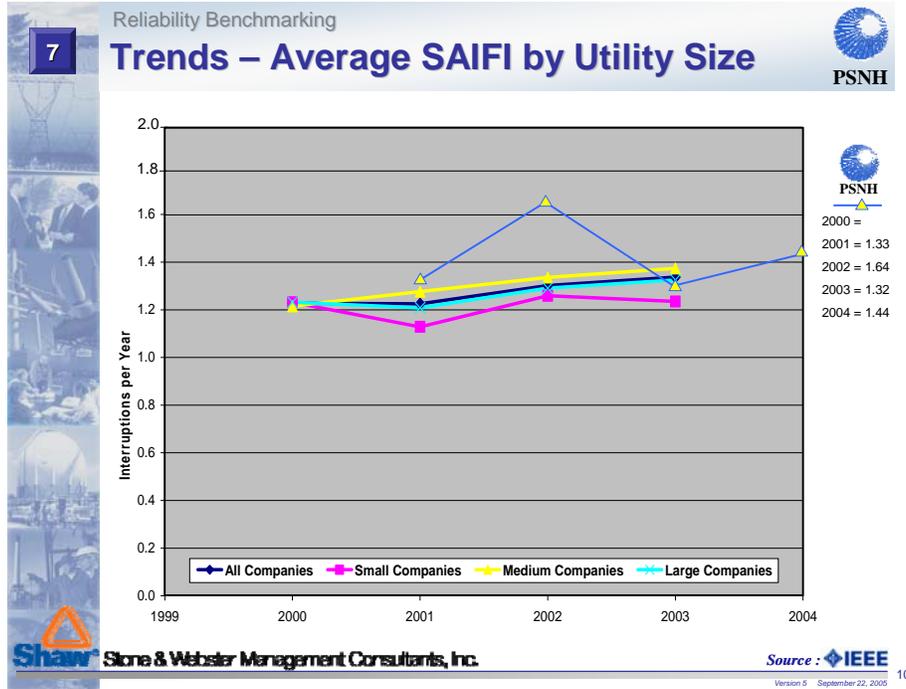
### Reliability Benchmarking

Consistent with NHPUC requirements, PSNH does not use the recently developed IEEE 1366 criteria for reliability statistics. As a result the value of comparisons to utilities outside of New Hampshire is questionable. The NHPUC should consider adopting IEEE 1366 criteria as a broader means of measuring reliability performance.

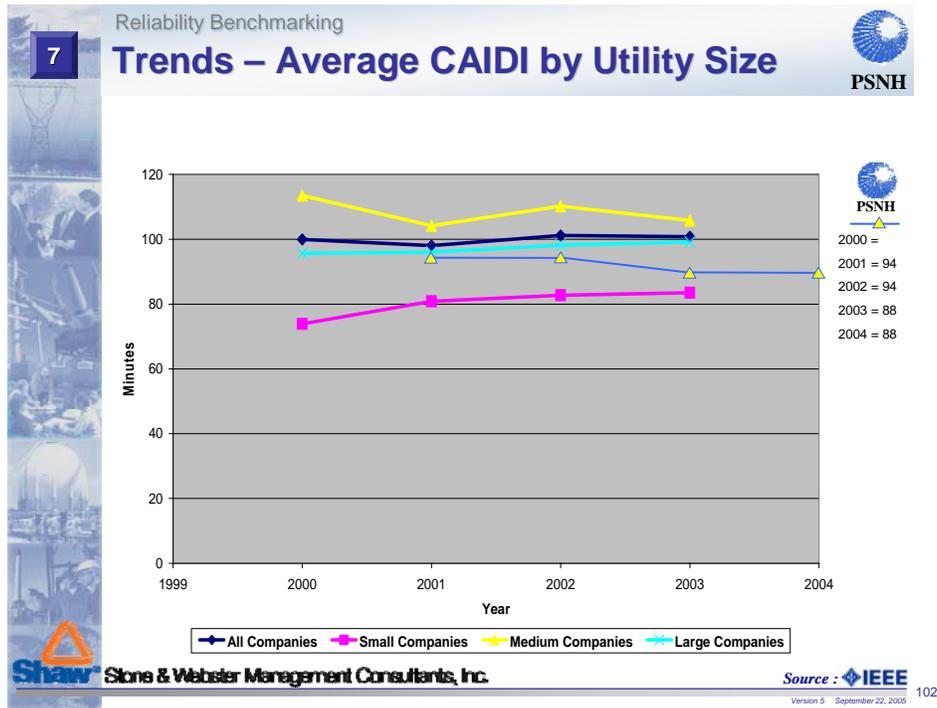
Using the study completed by IEEE (reference the following graphs) in its recent efforts (2004) to develop reliability metrics, PSNH's performance was compared to industry norms for similar sized utilities. SAIDI performance (excluding NHPUC defined major storms) ranked in the 2nd quartile of comparably sized utilities in 2003. The trend over the 2001-2004 timeframe has been generally better than the average medium sized utility and constant to slightly negative (increasing) overall.



SAIFI performance (excluding NHPUC defined major storms) ranked in the 3rd quartile of comparably sized utilities in 2003. The trend over the 2001-2004 timeframe has been generally the same as the average medium sized utility and slightly negative (increasing) overall.



CAIDI performance (excluding NHPUC defined major storms) ranked in the 2nd quartile of comparably sized utilities in 2003. The trend over the 2001-2004 timeframe has been generally better than the average medium sized utility and the trend over the 2001-2004 timeframe has been positive (decreasing).



Recommendations for improvement in this area are outlined in the following table.

AREA OF REVIEW	RECOMMENDATIONS	PRIORITY
Reliability Benchmarking	Consistent with NHPUC requirements, PSNH does not use the recently developed IEEE standards for reliability statistics. As a result the value of comparisons to utilities outside of New Hampshire is questionable. The NHPUC should consider adopting IEEE standards (1366) for reliability.	Medium

### IT Support

As part of the assessment of the distribution system reliability and system planning, Stone & Webster Consultants reviewed several Information Technology systems. The key systems reviewed were:

- TRUPER – Trouble Reporting and Unsatisfactory Performance of Equipment
- CASCADE – Substation maintenance management system
- CRS – Customer Request System
- TRS – Trouble Reporting System
- TAS – Trouble Analysis System
- DMS – Distribution Management System

Each system performs a unique function within the distribution system reliability and system planning areas. Similar to other utilities, PSNH has a combination of newer and older information technologies in place. As part of our review of each system, Stone & Webster Consultants was provided documentation and a hands-on demonstration of each system.

In general, we found that the IT systems supporting the PSNH operations are functional and meet their requirements, but we recommend some improvements. There are few electronic interfaces between the applications resulting in duplicate efforts and information, numerous inefficient paper transactions between systems, and contributes to inefficient use of staff resources. Some of these interfaces will be added during the upgrade to the new CIS system in 2007.

IT support is provided by a centralized group within NU corporate offices. Major system enhancements are addressed by a committee comprised of representatives from all the subsidiary companies in order to determine which changes will be made to common NU applications. PSNH still utilizes several applications that are not in use at the other companies or by the parent. As is commonly the case, it can be difficult to use a one-size-fits-all approach and we recommend additional attention needs to be used when reviewing adoption of new applications and the implementation costs required to make these applications effective for PSNH.

Implementation of GIS at PSNH could improve the efficiency of many business processes including map creation, improve customer service by identifying problems and notifying crews as to exactly where the problem is located, improve decision making with easy access to information about the system, and reduce operational expenses in the longer term by having more efficient business processes. GIS and the impending new CIS system would streamline many processes throughout the company including outage management, work orders, and customer service by providing information to customers in a timely manner. However, it should be recognized that extensive resources are required to adopt and more importantly, maintain a GIS system. PSNH must balance any decision in this area with its associated benefits and costs. The implementation of a field order service system (electronic communications with field crews) should be included in future plans along with a new outage management system. All these systems would streamline business processes, reduce overall cost to provide service and, in the longer term increase reliability by identifying problem areas, and provide better customer service due to information and reliability improvements.

The current and future applications at PSNH should have electronic interfaces wherever possible. Automatically programmed interfaces eliminate duplication of effort and assure that the information on multiple systems is always the same. A summary of our recommendations is provided in the table below.

<b>AREA OF REVIEW</b>	<b>RECOMMENDATIONS</b>	<b>PRIORITY</b>
<b>IT Support</b>	<ol style="list-style-type: none"> <li>1. Outage Management could be improved with system-wide implementation of GIS. A properly maintained GIS application may improve efficiency, require fewer resources overall, reduce overall costs, provide better customer service, and improve the decision making process.</li> <li>2. Mobile technology should be considered to integrate work management. Field crews can be given job changes, maps, and new work electronically.</li> <li>3. Interfaces between existing systems should be addressed. Duplication of work would be eliminated, better use of resources, and better customer service would be some of the benefits.</li> </ol>	<p>Medium</p> <p>Medium</p> <p>High</p>



## **Summary Findings**

Based on the evidence amassed during this assessment, Stone & Webster Consultants finds that PSNH is operating its distribution system in a reasonable, utility-like manner, and provides reliable service to its customers. PSNH is committed to providing reliable service to its customers and has developed effective processes, systems, and approaches to planning for a reliable system. Enhancements can be introduced to improve the efficiency of the systems and to improve the “information” required to analyze issues that require solutions. This effort has identified a number of enhancements – some are significant and will take time to implement while others are more easily implemented. Stone and Webster Management Consultants has provided PSNH with a number of improvements for consideration – these do not imply that PSNH is not performing in a manner consistent with good utility practice but that there are opportunities for doing the job better and more effectively that should be considered.

It is worth noting that PSNH has already taken action on a number of the recommendations outlined in this report. The balance of the recommendations should be further analyzed and prioritized by PSNH as they consider whether or not and how to proceed with implementation.

## 1 Executive Summary

Vermont Electric Cooperative (VEC) along with the Vermont Department of Public Service (VT DPS) commissioned Shaw Stone & Webster Management Consultants, Inc. (Stone & Webster Consultants) to perform a Comprehensive Business Process and Audit as a result of the Memorandum of Understanding entered into by both parties as a negotiated settlement of the 2006 VEC rate case. This document, together with the presentations provided as appendices, comprise the final report of the assessment undertaken by Stone & Webster Consultants during the second quarter of 2007.

The key areas of review for this assessment included:

- Board of Directors Representation
- Power Planning, Forecasting and Acquisition
- Budgeting Processes
- Existing Organization
- Decision Making Processes
- Strategic and Tactical Planning

This document summarizes the methodologies utilized to complete the review and presents our findings and recommendations. Throughout this document we utilize terms such as will, should consider, and shall, for example, with respect to our recommendations to both VEC and the DPS. We believe each and every recommendation should be evaluated and implemented after consideration of approach, cost-effectiveness and the inclusion of new information in the decision.

### 1.1 Approach and Methodology

Stone & Webster Consultants' efforts were initiated in late March of 2007 with a presentation of our work plan to the Board of Director, our findings and recommendations were proved to VEC, VT DPS and the Board during late May and June, and the initial draft report was documented during July and August of 2007. Our approach utilized meetings, documentation reviews, site visits, interviews, observation, and analytical tools to complete our assessment.

The VEC Board and the Commissioner of the VT DPS met with the key Stone & Webster Consultants team members early in the process to understand our approach and to commit their support of this effort, as evidenced by their offer of additional time with them to ensure candid discussion. It was evident to the investigating team that all of the participants were open to the review and interested in our suggestions for improvement.

#### 1.1.1 Information Collection

Stone & Webster Consultants reviewed initial documents provided by VEC and the VT DPS that would enable us to get up to speed on the issues including rate case testimony and orders, planning documents, internal reports, consultant reports, board meeting minutes, management reports to the board, and organization charts. The organization charts and the document review were necessary in order to formulate a list of personnel to interview. In all, approximately 80 interviews were conducted accounting for approximately 180 hours of discussion regarding VEC's operations and management today. These interviews resulted in the exchange of nearly 300 specific information requests for existing reports, procedures, and databases that were used to establish evidence of VEC's existing management processes, operations, decision processes and planning. Stone & Webster Consultants utilized the gathered information and our industry expertise to draw the conclusions presented in this report.

The key steps in the data collection efforts included:

*Data/document identification* – VEC provided extensive information which was reviewed and evaluated during our assessment (reliability performance, planning criteria, load forecasting techniques). We received and reviewed more than 300 documents.

*Data collection* – After necessary and/or desired reports and data were initially identified, Stone & Webster Consultants also requested additional working documents and databases as discovered during the interview process. To the extent necessary, Stone & Webster Consultants sought other sources of information, including public sources - such as IEEE information, VT DPS and Vermont Public Service Board (PSB) PSB information, as well as the team's expertise - as resources during the data collection phase.

*Critical assessment of collected data* – The Stone & Webster Consultants team reviewed the data for completeness/responsiveness, apparent accuracy, comparisons between sources for consistency, and relevance to our effort. Our review then identified areas of compliance with good industry or business practice and areas where improvement would be recommended.

In order to gain a complete understanding of VEC's existing utility system, the following major activities were performed:

*Understanding the Service Area* – Documents were reviewed and key staff interviewed to allow the Stone & Webster Consultants team members to gain a detailed understanding of the area (including its characteristics and implications for operations) served by the existing distribution system.

*Review of Organizational Efficiency* – Our team reviewed the number of business processes within the organization, discussed efficiency of the processes with the interviewees, observed meetings of key staff and the Board, and evaluated whether alternative structures might improve the effectiveness of operations.

*Evaluate Board Operations* – Written procedures, meeting minutes and other board documents were reviewed to understand the current operations of the board and one meeting was attended to observe the Board interaction and focus.

*Evaluate Planning and Strategy* – We reviewed existing documented plans and discussed the strategy with senior managers and lower level staff to assess whether an organizational understanding of the strategic direction was evident.

*Financial Planning and Budgeting* – Rate case testimony and orders were evaluated along with evidence of planning and budgeting processes as provided by VEC. In addition, Board directives were discussed to assess the appropriateness of financial planning and direction.

*Marketing and Member Relations* – Regulatory reports, internal documents, and interviews were utilized to assess the current state of marketing and relationships with members.

*Employee Relations* – Our interviews and document reviews were utilized to assess the state of internal communications, trust and the morale of the staff of VEC.

*Regulatory Effectiveness* – We discussed the relationship between VEC and the VT DPS with representatives throughout each organization as well as the appropriate role and communications required to forge a respectful relationship.

*Review of Standards and Procedures* – Documents (including budget guidelines, construction standards, design guides etc.) were reviewed and key staff interviewed to determine the efficiency and effectiveness of VEC management.

*Review of the System's Management and Operation* – Existing operation and maintenance practices were reviewed to determine the appropriateness and adequacy of resources available to meet customers' energy requirements reliably. Our team reviewed the capital and operating budgets for the electric system to gauge the reasonableness of budgeted expenditures to maintain electric system reliability levels.

*Planned and Proposed System Improvements* – Planned and proposed system improvements are an integral part of determining the ongoing viability of the system. This review included both an analysis of the extent to which system needs are being met, as well as an assessment of the planning and investment criteria and processes supporting these efforts.

*Energy Planning Requirements* – The current process for power supply was reviewed and the process by which power purchases are entered into was reviewed to assess the adequacy of power planning.

## 1.2 Observations, Findings, and Recommendations

VEC staff, at all levels, were very open with the assessment team throughout the intensive interviews, information requests, clarifying discussions, and site visits and displayed in-depth knowledge of their business, system, procedures, goals, and the status of the industry locally and in general. We found the staff to be dedicated to improving VEC and interested in discussions with our team – genuinely open to suggestions and to probing or challenging discussion. In addition, the members of the Board of Directors that were interviewed participated in frank discussion of the perceived and observed strengths and weaknesses of the organization and of the Board itself. Our interviews with the VT DPS provided thought provoking issues for investigation and observation relative to management and decision making processes and to the organization's effectiveness as a whole.

VEC has made progress toward improving the financial stability of the organization, recovering from a bankruptcy during the 1990s and the acquisition of Citizens Energy in 2004. The Board of Directors strategy has been to focus on financial matters to improve the ability of the organization to invest at reasonable rates and to support continued operation of the cooperative. A serious incident occurred in September of 2006 during which an employee was injured – an event that has impacted employee morale and raised concerns over the cooperative's safety and training programs.

Member satisfaction surveys result in high ratings for the cooperative however complaints to the VT DPS are higher than for any of the other large utilities within VT. The Board of Directors, as part of its plan for financial improvement, directed the member services are to tighten its collection policy; implementation of that directive has likely had an impact on the number of complaints. Our investigation has included all of these areas and our findings and recommendations for improvement are detailed in this document.

It is important to recognize that most of our recommendations anticipate the need for additional investigation by appropriate VEC personnel prior to making a decision to go forward as well as a prioritization of the initiatives since they are numerous and should not all be adopted in parallel. This additional investigation would more specifically identify costs, benefits, and impacts on VEC operations and its members as well as developing a well thought out implementation plan.

Based on the evidence amassed during this assessment, Stone & Webster Consultants finds that VEC is committed to improving its overall service, business processes and planning and has made changes early during our process review as opportunities were identified by the BPRA team. As with all processes, enhancements can be introduced to improve operational efficiency and the associated support systems and to improve the "information" required to analyze issues that require solutions. This effort has identified a number of enhancements – some are significant and will take time to implement while others are more

easily implemented. It is worth noting that VEC has already taken action on some of the recommendations outlined in this report. For example, we suggested monthly meetings between the VEC CEO and his contact at VT DPS to begin improving communications – Mr. Hallquist initiated such a meeting with Mr. Commons immediately after our verbal discussion of its potential benefits. The balance of the recommendations should be further analyzed and prioritized by VEC as they consider how to proceed with implementation.

VEC is struggling as it continues to use the old processes and systems developed for a much smaller cooperative utility (its former self) to manage and operate what is now the third largest utility system in Vermont. These management techniques, business processes and systems are ill prepared to be “right sized” to manage the larger entity. In addition, the acquisition is not yet complete as evidenced by the prevailing recognition that one part of the company does things the Citizens way and the other the VEC way and by the inconsistency of business process application and adherence. VEC must begin to accept the changes required by its new size and complexities and address the need for improvement. Key to future success will be the requirement for all personnel to work toward common goals and to support a unified VEC.

The BPRA identified quickly four priorities for improvement at VEC: first moving the board towards a focus on policy and strategy to support shifting the cooperative to common goals; organizational improvements directed at the functional alignment of the organization and the underlying business processes by which the organization accomplishes its day to day responsibilities; strategic direction through which the cooperative addresses its future by establishing long term objectives and tactics for achieving those objectives; and operational improvements by which the cooperative enhances its ability to achieve member satisfaction.

It should be clearly noted that this BPRA was commissioned to provide both VEC and the VT DPS with information that would be used to improve the existing operations of VEC. Our team as noted above found evidence that the organization is getting the job done and these will be described throughout the document, but an audit - by its very nature - appears to focus on the negatives, and as such this document is heavily focused on identifying and offering suggested approaches in those areas that need to improve.

The remainder of this executive summary provides information for each key area of the assessment and summarizes the key recommendations with the following priority assessments for further investigation and possible subsequent implementation:

- High Priority – implementation of the recommendation could result in significant cost savings, major service improvements, or substantial improvements in management practices and performance.
- Medium Priority – implementation of the recommendation could result in important cost savings, service improvements, or meaningful improvements in management practices and performance.
- Low Priority – implementation of the recommendation could potentially enhance cost controls, service improvements, or management practices and performance.

It should be noted here that not all recommendations are summarized in the executive summary – more detail is provided in the detailed sections of this report.

### 1.2.1 Organization

VEC’s organization, like most organizations, reflects common approaches to management structure within the electric industry, and it has been adjusted for the capabilities of the personnel in their positions. As will be discussed in the organization section of this report, business organizations cycle through stages of organization design moving from a structure in which a manager supervises many direct reports (typically when the next layer down requires training and smaller spans of control) to fewer direct reports (more common as staff matures and can handle additional responsibilities or to provide common

management of certain problem areas). These cycles occur due to a number of factors including industry issues, staff capabilities, business issues, and strategic focus, to name a few. VEC has been undergoing extensive growth and change: recovering from a bankruptcy in the decade of the nineties, acquiring and merging with a utility, and changing CEOs at a time of great uncertainty in the process of acquisition and merger. With the number of direct reports at 7 senior staffers, and with many of these managers relatively new to the industry and/or their positions, the CEO is enmeshed in solving day to day crises and issues that divert his attention from matters of importance to moving the business forward. As a result the organization has no strategic plan for its future – and as such is unable to focus on moving towards that future. Early in this BPRA process the COO was separated from service and the search for a replacement initiated.

VEC’s staffing level targets are important to the CEO and to the Board of Directors – a magic number of 96 has been established, although our team has heard members of the Board comment that the staff level is still too heavy. We have observed that many staff are overloaded while others appear to be able to contribute more – but some staff are in positions that they may not be best trained to accomplish. Due to the findings reached in other areas of this assessment, we find that staff levels may need to be higher for the short term to 1) train new linepersons to ensure appropriate succession planning in that key area, 2) provide additional trained and experienced engineers in the planning and standards area to establish and ensure adoption and compliance in the field as well as to allow long term planning to be completed, and 3) to implement the recommended improvements in this BPRA while allowing day to day business to be completed.

AREA OF REVIEW	RECOMMENDATIONS	PRIORITY
<b>Organization Design</b>	1. Realign the organizational structure to reflect the functional responsibilities identified by the BPRA, reducing the number of direct reports to the CEO, and allowing the CEO to focus on key initiatives, Board management, and strategic direction for the organization.	High
	2. Increase the span of control of the Senior Managers to better align functions and business processes to improve the effectiveness of operations and management.	High
<b>Staffing</b>	1. Increase degreed engineering staff to provide improved technical resources and to implement recommendations relative to system planning and improvement.	High
	2. Implement a temporary increase in total staffing designed to provide resources to implement the recommendations of this BPRA as well as to address succession planning throughout the organization but specifically in field forces.	High

### 1.2.2 Board of Directors

The Board of Directors is made up of VEC members who are elected to represent their fellow members on the Board. Since the acquisition of Citizens Energy, the Board has adopted improved systems such as better documentation of and adherence to procedures, but in our opinion, board meetings have become unwieldy due to size and focus on day to day issues rather than strategy. All members of the board are

interested in improving their contribution to VEC and exhibit the desire to work with the Stone & Webster Consultants team’s recommendations to improve the effectiveness of the Board.

Generally, Board meetings include a significant amount of time for reporting by VEC management on financials, key initiatives, and in many cases recommended actions that should be handled within the management of VEC rather than by the Board. Due to their focus on these types of issues, little time remains during Board meetings to address long term business strategy and direction. While some disagreement was observed, the Board needs to spend time learning how to deal with “conflict” effectively as it is necessary at that corporate level to discuss hard issues unemotionally and with the best interests of VEC in the forefront of the discussions.

During our BPR process, the Board was reviewing its geographic representation, had recently completed a review of the by-laws, and undertook a review of the Board policies and procedures. We strongly recommend that the Board complete its review of geographic representation as it is a key strategic issue, and consider the use of “at large” representation to discourage parochialism in decision making and to help the Board grow into its strategic framework.

AREA OF REVIEW	RECOMMENDATIONS	PRIORITY
<b>Board Focus</b>	1. Realign the Board focus to strategic direction and corporate vision issues by reducing the “reporting” at Board meetings and providing strategic discussion topics and time to pursue those during half of each board meeting	High
	2. The Board needs to be provided very focused reports on initiatives, financial updates and other corporate activities so it can efficiently choose those items that require board attention.	High
	3. The VEC Board should consider facilitated meetings as it moves towards a strategic focus in order to improve their comfort and capacity to work through these issues.	
<b>Board Effectiveness</b>	1. Continue to follow procedures and update these periodically to reflect changes in focus.	High
	2. The Board should complete a self evaluation of its effectiveness semi-annually initially and then annually after improvements have been internalized.	High
	3. The Board should complete its review of geographic representation and consider the use of “at large” directors to focus on broader Cooperative and industry issues.	Medium

### 1.2.3 Leadership

VEC has new leadership in place with the appointment of a new CEO in October of 2005 and the organization is currently seeking new field and engineering senior managers. The CEO has been making incremental changes since his appointment that are beneficial but is unable to focus appropriately on strategy and longer term business decisions due to the need to participate in day to day operational decisions. The biggest drain on the CEO has been the Engineering and Operations functions of the cooperative – changes in management in this area began at the very start of the BPR and since that time the CEO has been seeking to replace the leadership in this area. It should be noted that the CEO has hired

a new substation manager with extensive expertise who we expect will contribute significantly to technical and system improvements if supported by investment.

The existing senior management team requires consistent direction from VEC leadership: the Board and the CEO. It became apparent during the BPRA that the direction of VEC was unknown to employees and that even at the senior management level one could detect a difference of opinion as to the future direction of the organization. For example, the Board has directed the financial organization to focus on obtaining growth from its investments, rather than a focus on regulatory requirements combined with returning to financial strength. In the operations area, the Board has adopted the position that the system condition is sufficient to support the expectations of cooperative members, yet the regulatory paradigm for system reliability is not being met. Finally, in the member services area, the Board has directed the organization to reduce collections and as such the organization has been tough on members to collect its revenues resulting in poor complaint statistics at the DPS. These directives have clearly resulted in ongoing negative performance with regulators and are part of the reason for the BPRA itself.

While we have addressed the Board in another section, it is clear that the direction of the senior management team requires clarity and consistency in order to employees to understand where to focus their efforts on a day to day basis. Our interviews consistently resulted in employees describing confusion as to where the organization was heading and in fact concern that there was no direction or that the direction was changed frequently. The Board, CEO and senior managers must establish a firm but flexible plan with a common set of goals and performance metrics that is consistently communicated and adhered to with respect to regular reports, performance reviews, and external discussions. In addition to common goals and consistent messages, the goals, while flexible, should not change on a weekly basis nor should they be set aside to address an interest of any single member of the senior team. We found evidence that decisions are made without full investigation of the impact on existing initiatives at VEC in many cases to the detriment of necessary system repair and improvements.

Tightly aligned with establishing clear goals is the use of and demonstration of transparent decision making processes. It became clear in the BPRA that employees do not understand the process of getting a decision nor do they understand why a decision has been reached. Most indicated that all decisions come either from the Board or the CEO raising concerns that day to day management is taking place at far too high a level in the organization and that employees are either untrained to make decisions or have a fear of making decisions due to potential for reprisal. VEC must establish a clear process for decisions, align those decisions at the lowest level of the organization to facilitate day to day operations, and ensure that common business plans and goals are clearly understood so that decisions can be made without fear of failure.

Finally, the senior management team must work together to direct and support employees in achieving the goals established by the Board. Our team found that the senior management team was highly independent from each other – creating and supporting a silo based organization that is not desirable or effective with a small organization such as VEC.

AREA OF REVIEW	RECOMMENDATIONS	PRIORITY
<b>Leadership</b>	1. Establish a business plan and align responsibility for decisions at the lowest realistic level to improve and facilitate day to day operations.	High
	2. Realign the Board focus to strategic direction and corporate vision issues by establishing the appropriate decision making levels for day to day operations and making employees responsible and accountable for their decisions without fear of reprisal.	High
	3. The CEO and senior managers must set a level of expectation for their direct reports including the expectation to make decisions that are in line with the cooperative's business plan and to address any issues within performance plans and reviews.	High
	4. Establish and maintain consistency in approach and management at all levels of the organization.	High

#### 1.2.4 Corporate Planning and Strategy

VEC as an organization has no documented plan for its business strategy and as such there is no common understanding of the long term cooperative plan and no common approach for the staff to follow as part of their day to day management of the utility. This situation results in decisions that may be counter to the strategy of another area of the organization, confusion on the part of staff, and an organization that rarely moves forward effectively. To his credit, the CEO recognizes the lack of a plan and initiated a strategic planning initiative during early 2007, but it had not moved forward during the BPR review period. The Board has not conducted its own strategic plan nor has it contributed to a well thought out strategic plan beyond the directive to be a least cost utility. While the Board may have evaluated the implications of its approach – no documentation exists to support its rationale or decision making process; similarly, no document exists directing the staff to implement such a plan.

We recommend that a strategic planning process be developed and implemented during the remainder of 2007 as a basis for final investment decisions in 2008 and beyond. This process must include the Board as well as the senior management team and a clear communication to all employees of the strategic vision must occur delineating each employee's role in carrying out the strategy.

AREA OF REVIEW	RECOMMENDATIONS	PRIORITY
<b>Planning</b>	1. Establish a strategic plan for the cooperative at the Board and Senior Management Team levels.	High
	2. Align budget decisions and new initiatives with the strategic plan.	High
	3. Communicate the strategic plan to all staff. .	High

### 1.2.5 Financial Planning and Budgeting

Financial planning under the current Chief Financial Officer has significantly improved VEC’s financial situation over the last few years. The organization’s ability to borrow has improved, the level of TIER (times interest earned ratio) has increased with the approval of regulators, and the process of capital budgeting has improved. However, the financial organization demonstrates little understanding of the regulatory processes it must comply with in order to obtain regulatory approval for member rates and returns allowed for VEC. The last rate order was direct relative to the limitations of the previously filed rate cases and strongly suggested additional training for the CFO in particular in this area. As indicated earlier, the Board of Directors bears a certain amount of responsibility in this area since the Board directed the CFO to improve financial issues without concern for regulatory responsibility. The CFO has since become more knowledgeable in this area but we recommend continued diligence in this area through industry conferences, industry relationships, meetings with regulatory personnel, and the use of knowledgeable consultant services when preparing a regulatory filing.

In addition to the CFO, VEC should provide additional training to its entire financial and accounting staff to ensure that they all understand the differences between traditional accounting and regulatory accounting. All staff in this area should read and understand the regulatory decisions in the state of Vermont that affect these areas as well as FERC decisions to ensure that they stay abreast of industry developments.

Budgeting processes at VEC have been improved in the past two years by utilizing a defined process through which the budget is developed for both the expense and capital budgets. While the BPR review found these to be an improvement, much more attention is needed to bring these to the industry standard. In particular, the expense budget must be more widely understood by staff so that they understand what will be expended in each year and why. The capital budget process is a more significant concern since the condition of the system appears to be below industry standards and spending in this area has been limited in order to improve the financial stability of the cooperative. All budget processes should clearly identify the responsible area and person for development, reporting of actual and variances, and for regular performance reviews.

The capital budgeting process improvements instituted in the last year or two are good enhancements. We recommend that the process become more transparent by requiring standardized project justifications, the use of better criteria for prioritizing the projects proposed, and the introduction of a capital budgeting committee to review the proposals, prioritize them and to monitor progress towards completion. A simple payback prioritization approach, as has been utilized until very recently, results in few long term system improvements being chosen but instead focuses on those projects with short term returns – a result that is counterproductive for a utility.

AREA OF REVIEW	RECOMMENDATIONS	PRIORITY
<b>Financial Planning</b>	1. Continue to enhance CFO knowledge of regulatory accounting and regulatory precedent and practices by attending appropriate industry conferences, developing and strengthening industry relationships, regular meeting with regulators and use of knowledgeable consultants during regulatory cases.	Medium
	2. Staff training related to regulation and regulatory accounting should be performed regularly.	High
	3. Enhance the expense and capital budgeting processes through full	High

AREA OF REVIEW	RECOMMENDATIONS	PRIORITY
	<p style="text-align: center;">documentation of the plan and resulting budget.</p> <p>4. Improve the transparency of the capital budget by establishing a standardized project justification, using better and more appropriate criteria for prioritization of the proposed investments and creating a committee to review and monitor project planning and implementation. .</p>	High

### 1.2.6 Engineering and Construction Operations

At the outset of this process two key members of the leadership team in the Operations area (the Chief Operations Officer and the technical substation expert) left the cooperative such that this part of the organization had little direction or oversight and requiring a search for appropriate new personnel to move the operations area forward. This area of the company requires the most attention with regard to staffing and enhancing capabilities, including standardization of work processes, consistent business plans, standardization of planning and field construction practices, and education and training. Cultural change in this area is imperative and such a change must be demonstrated and supported by the Senior Management team and other managers in the organization. On the engineering side of this organization staff additions are necessary to ensure adequate planning and quality control are implemented.

The Operations area is functionally responsible for all technical system planning, construction, quality control, emergency planning, regulatory relations, record keeping and day to day operations. This organization has the largest number of employees and significant system management responsibilities. As was indicated in the Organization discussion, we recommend realigning this part of the organization to allow one senior manager to focus on system planning, standards and reliability issues with another senior manager focused on implementing the plans established by the other functional area. The next few sections provide more recommendations for several key areas of this important area of the cooperative.

#### 1.2.6.1 System Planning & Construction

Stone & Webster Consultants met with senior managers and other personnel directly responsible for or who participate in system planning efforts during our review process. We found that all personnel have a good understanding of system needs and planning needs. VEC utilizes an external consultant to develop and file with regulators a long term system plan every three years.

Since the last regulatory filing, VEC has introduced a capital planning process that relies upon a project description and budget information that is intended to lead to the ability to prioritize the projects in the pipeline based on specific criteria – to date the criteria that we observed has primarily been payback. Establishing this capital planning process is an improvement; however we propose that the criteria need to be revised and that the information provided to justify the project require more development to be fully relied upon for investment decisions. Under the current criteria, short term (lower cost) solutions are often utilized instead of preferred long term solutions due to budget constraints.

VEC’s construction standards are based on the National RUS Cooperative standards; however, it became clear during the BPRA that not all construction complies with these standards and there neither sufficient quality control nor management control to ensure that all of the operations areas follow these standards in

practice. Documentation relative to design criteria were not in place nor well communicated. Without clearly documented design criteria and construction standards coupled with a quality control program to ensure construction to those standards – it is largely in the hands of each operations person to build the system resulting in individual approaches to modification and repair. Clear records of the system are not available for the facilities that were purchased from Citizens Energy and as such results in inefficiency when preparing for field operations, in the field solutions, and a general lack of knowledge of system condition.

AREA OF REVIEW	RECOMMENDATIONS	PRIORITY
<b>System Planning</b>	1. Consider the development of written formalized planning criteria to ensure consistency in design and capital investment without compromising long term system reliability.	High
	2. Circuit design philosophy is not well documented. Consider the development of a formalized “Circuit Design Guide”	High
	3. Consider the implementation of a QA/QC function similar to that used for outside contractors for work completed by VEC construction resources to ensure consistent adherence to construction standards and design criteria.	Medium
<b>Inter-Utility Planning Coordination</b>	1. Recent efforts to improve planning and coordination with VELCO should continue. VEC should consider a more formal, recurring means of communication where issues can be raised, discussions documented, action items developed, accountability assigned, and follow-up completed.	Medium
<b>Load Forecasting</b>	1. Forecast methodology is not well documented. Efforts in this area are limited to those associated with the IRP filing to meet regulatory requirements. Consider developing and documenting an annual forecast methodology including its assumptions and information relied upon to complete the load forecast for each region. Consider expanding the sources of information to include the local planning agencies in Vermont.	Medium
<b>Reliability Committees</b>	1. Formalized reliability focused discussion is limited to individual initiative. Formalized committees are not currently in place. Consider establishing a reliability focused committee with documentation of discussion, action items developed, and accountability assignments in order to promote better follow-up and measurement of results.	High
	2. Consider the establishment of an “Equipment Replacement Program” that identifies equipment targeted for replacement based on factors including reliability, maintainability, operability, and cost. Efforts to-date have largely been dominated by budgetary issues which have led to numerous implementation deferrals. Consider establishing a firm budget for this program based on clearly identified criteria consistent with overall company goals.	High
	3. Consider the creation of “Capital Budget Review Committee” with direct responsibility for ensuring proper levels of capital investment and monitoring of expenditures as they occur during the year	High

### 1.2.6.2 Reliability and Circuit Design

SAIFI and CAIDI are the primary reliability measures tracked by VEC (consistent with State regulatory requirements). Reliability measurement and tracking systems are in place however the manner in which system performance is tied to capital investment and maintenance is unclear. Communication of these indices is limited to those directly responsible for the preparation of regulatory reports. There is limited communication of these indices internally at VEC. The creation of an “Annual Hit List” Report (a CAIDI driven report defining the worst performing circuits) and something akin to a Quarterly “Three or More Outage” Report (defining outage frequency) would help focus reliability investments where they are most needed.

Some circuits will always be poor performers due to their design characteristics. The total circuit length, which includes the circuit backbone and associated lateral side taps, varies from as little as several miles to circuits that are longer than average on the VEC system. Exposure such as this can significantly impact circuit reliability. Typically, demand exceeds the funding available for Distribution Reliability Projects. VEC’s capital budget defines new customer service and vegetation management as non-discretionary, an area that has been growing substantially, a trend that is expected to continue. Since the VEC capital budget has a limit, the budget available for discretionary or reliability driven projects is declining. This issue is of concern to Stone & Webster Consultants as it was difficult to gather reliable evidence to support a clear conclusion.

Area Work Centers (AWC) play a critical role in outage restoration. The time it takes an AWC to restore service once an outage has been communicated to them (i.e. restoration time) is tracked. However no goal exists that defines targeted or optimal performance. Year to year trending of restoration times is also not currently monitored making it difficult to determine trends relative to optimal or targeted performance.

VEC follows a good systematic approach for investigating outages. During interviews the process was described as incorporating:

- Reviewing outages along with the associated cause codes
- Plotting the outages on a map
- Patrolling area to determine cause
- Patrolling area to identify problems that could result in a future outage

However, no written documentation was made available to independently verify that these steps are in fact being taken on a regular basis.

VEC does not make extensive use Distribution Automation (DA) in their limited urban areas. DA has the potential to reduced outage duration and increased system reliability. DA primary disconnect switches can be used at open points between circuit ties in some urban areas with higher population densities. The result is the ability to reconfigure the circuit/feeder boundaries in real time, thereby reducing the duration of an outage.

Also, voltage sensing disconnect switches could be used in conjunction with reclosers to reconfigure circuit/feeder boundaries in urban areas with higher population densities. The voltage sensing disconnect switches are typically located near the circuit halfway points and/or based upon load and customer count on the circuit, while the reclosers are located at circuit tie points. When voltage is not present, a voltage



sensing switch opens and the upstream recloser closes picking up a portion of the load from the affected circuit thereby minimizing the number of customers impacted by the outage.

Temporary isolation switches could be routinely added to the system in order to minimize system disturbances and facilitate new construction and rebuilds. These switches could be left in place after the construction activities have been completed because there is not a compelling reason to remove them. The locations of these temporary isolation switches would then be reported to the Electric System Control Center (ESCC) which would enhance ESCC’s ability to minimize the duration and extent of outages.

While a formal “Condition Assessment” was not performed as part of the consultant’s effort on this project several laterals were noted during our system travel in passing as unfused. Unfused laterals increase the likelihood of 1) a greater number of customers experiencing an outage, 2) longer outages due to increased exposure of line section, and 3) the potential for additional equipment and conductor damage.

Also noted in passing and reported during interviews was the inconsistent use of animal guards and covered primary jumpers on existing construction. There is no proactive, systematic approach for retrofitting existing locations to reduce the likelihood of an outage caused by an animal. Animal guards and covered primary jumpers are installed on all new construction.

In discussions with VEC personnel, historically, VEC has experienced problems with failure of older porcelain material caused by repeated freezing and thawing. Newer style polymer arrestors, that are not susceptible to failure, are being utilized on new installations. Older style arrestors (brown porcelain and gapped), that are particularly susceptible to failure caused by moisture intrusion and in turn outages, were observed and reported on older installations.

On a consistent basis, lighting arrestors are not installed on three-phase dead ends and both sides of three-phase primary disconnect switches that are normally closed.

The majority of backbone circuits observed were accessible to vehicles and located along roadways. This is a good practice that aids in reducing outage restoration time. However, there are significant areas where circuits are located well off the road with very limited vehicular access, thereby increasing outage restoration time. There is no formalized pole inspection and replacement program.

Recommendations for improvement in this area are outlined in the following table.

AREA OF REVIEW	RECOMMENDATIONS	PRIORITY
<b>Reliability and Circuit Design</b>	1. Demand exceeds funding available for “Distribution Reliability Projects” on a routine basis. Consider developing more formalized criteria that would allow funding to be allocated across competing projects based on a common set of criteria rather than a fixed budget.	High
	2. Given the fixed nature of VEC’s capital budget and the escalating costs associated with power supply, the budget available for discretionary or reliability driven projects is declining. Consideration should be given to requesting rate relief from regulators in order to specifically address reliability and infrastructure concerns.	High
	3. The total circuit length of the circuit backbone and associated lateral side taps are higher than average. As the total circuit length increases so does the overall exposure which greatly impacts reliability. Focus should be on limiting exposure by reducing total circuit length - where	Medium

AREA OF REVIEW	RECOMMENDATIONS	PRIORITY
	<p>possible, extension of existing circuit backbone and lateral side taps should be limited along with shifting existing load to adjacent circuits. A more standard circuit length should be developed. Exceptions should be kept to a minimum..</p> <p>4. Consider a systematic review of all the distribution circuits to identify lateral taps that are not fused. Unfused laterals increase the likelihood of a greater number of customers experiencing an outage, longer outages due to increased exposure, and additional equipment and conductor damage.</p> <p>There is inconsistent use of animal guards and covered primary jumpers. There use is standard practice on all new construction. Consider instituting a proactive, systematic approach for retrofitting existing locations to reduce the likelihood of an outage caused by an animal.</p>	<p>Medium</p> <p>Low</p>
<b>System Operations</b>	<p>1. System Operations needs to become more formalized in VEC's day-to-operation.</p> <ul style="list-style-type: none"> <li>A. Procedures need to be better documented and communicated.</li> <li>B. Competence based training and testing should be considered</li> <li>C. Operator errors should be tracked</li> <li>D. Field reporting and direction should be the exclusive responsibility of System Operations</li> </ul> <p>2. Average restoration time is tracked relative to other Area Work Centers only – an optimal or targeted goal needs to be established and multi-annual trending put in place in order to better determine performance gains or losses.</p>	<p>High</p> <p>Low</p>

### 1.2.6.3 Substation Design and Maintenance

Substation drawings were not available at the time of interviews. As part of the AMR project, VEC has hired a consultant to create/update all their substation drawings. Accurate drawings are critical to the safe and reliable operation of a substation. Procedures need to be put in place to ensure their continued accuracy beyond this initial update. Engineering and Operations needs to be kept informed of any and all configuration changes. Station drawing red lines should be transferred from station drawings back to engineering annually unless a modification to the station is to be performed. In this case, those station red marks are transferred back to engineering before the modification is designed.

Electromechanical relaying does provide adequate relay protection, providing directional phase distance, directional phase over-current, and directional ground over-current. While this protection is adequate, it does not offer some of the advantages available with modern microprocessor-based relays, such as fault recording, reduced wiring and installation costs, more accurate settings, and no interposing relays. Microprocessor-based relaying also offers more accurate relay settings that will not drift over time, and perform self-checking functions. This enables the routine relay test interval to be significantly lengthened without sacrificing system reliability. No retrofit program exists for upgrading existing control rooms from electromechanical relays to solid state relays.



Substation grounding practices were not well documented at the time of our interviews, however, extensive training was underway to raise overall awareness and technical knowledge of grounding practices. Substation grounding practices should generally follow industry standards (IEEE Standard 80-2000).

Animal protection is generally not a major issue for 34.5 kV and higher voltages inside substations. The length of substation insulators helps to provide protection from animal short circuits. Animal guard protection is more of a concern in the 34.5-12.5 kV and 34.5-4 kV substation on the low voltage side. Based on interviews with field personnel, animal guard protection is not consistently used at substations across the system. Animal guard protection is recommended at voltages below 34.5 kV.

At the time of this report the substation maintenance organization was in a state of transition. A substation manager had recently been hired and was in the process of inspecting all the substations on the VEC System. The effort was focused on determining the overall condition of the substations and identifying areas (design, obsolescence, maintenance) needing attention.

The VEC approach to substation maintenance had fallen well short of good utility practice. While procedures were in place for monthly and annual maintenance the work was not being done according to these standards. No computerized maintenance management system (CMMS) was in place. Limited paper records were available for review making conclusions as to the adequacy of the maintenance being performed difficult to determine.

Interviews indicated that monthly inspections are performed at the substations by linemen. However, the value of these inspections is somewhat suspect. The value of the information reported varied substantially depending on the skill level and experience of the linemen doing the reporting. The paper trail that was developed was very difficult to follow. It is unclear what if anything is done with the information gathered from these visual inspections.

As an alternative, CMMS technology today allows data to be entered into a database using an electronic data tablet in the field. Data tablets have alerts built in to notify the user to call the problem in or they can download later into the system. This data is downloaded into CMMS software. Many utilities are using CMMS software to help them better manage their maintenance activities. CMMS has built in triggers to identify when maintenance is required. CMMS programs are also typically populated with historical maintenance records.

Recommendations for improvement in this area are outlined in the following table.

AREA OF REVIEW	RECOMMENDATIONS	PRIORITY
Substation Design and Maintenance	1. Maintenance triggers and philosophy are not well documented. Consider a detailed review of all existing maintenance practices with a focus on documenting the triggers and philosophy.	High
	2. Consider implementing a CMMS program to better manage maintenance activities.	High
	3. There is significant shortage of experienced substation maintenance staff. Limited succession planning is in place or technical training focus other than “on-the-job”. Continue filling existing vacancies and increasing the emphasis on technical training as soon as practical.	High

AREA OF REVIEW	RECOMMENDATIONS	PRIORITY
	4. Overall, limited substation maintenance was being performed which results in a growing backlog. As part of the documentation process going forward consider identifying “critical” maintenance activities not subject to budgetary considerations. Once the appropriate “critical” maintenance has been identified develop a detailed action plan to ensure 100% of all “critical” work is competed annually.	High
	5. Ensure substation grounding practices follow industry standards. Consider a complete review of all substations to ensure consistent adherence to grounding practices.	High
	6. Institute formal substation drawing control procedures to ensure the ongoing accuracy of station drawings.	High
	7. Mobile transformers are available in the event system conditions require their use. Consider a formal statistical review of VEC outage performance in relation to transformer availability in order to assess the adequacy of the existing number of mobile transformers.	Low
	8. Substations should be inspected on a proactive basis to ensure their condition and reliability.	
	a. Consider a complete review of all substations to ensure cracked glass and leaking gauge gaskets are replaced on a systematic basis to minimize contaminant intrusion which could lead to faulty operation.	Low
	b. Consider a complete review of all substations to identify, prioritize, and address corrosion related issues on exterior cabinets, arrestor supports, and circuit breakers.	Medium
	c. Consider replacing brown hollow core insulators which have been susceptible to failure from cracking and breakage due to water intrusion followed by freezing and thawing.	Medium
	d. Chipped transformer bushings need to be sealed initially and ultimately replaced as soon as practical to prevent failure.	Low

**1.2.6.4 Vegetation Management**

The vegetation management area is a major focus for VEC. At VEC vegetation management is managed by an arborist whose responsibilities included Planned Maintenance Trimming (cycle), Corrective Maintenance (follow-up), and QA (inspection). The plan for long term trimming, approved by the DPS, combines both time based and condition based trimming - Planned Maintenance Trimming is done on a per mile and cycle basis involving the backbone and associated side taps. Corrective Maintenance Trimming is performed between cycles when a tree problem is identified by the linemen.

In normal practice, the service drop to a house is not trimmed unless there is a hazardous condition (e.g. conductor rubbing tree). This is consistent with typical utility practice. VEC, like other utilities, uses mailers or door hangers to notify customers of upcoming tree trimming.

Currently, VEC is planning to use herbicides in its Rights-of-Way. Herbicides have been demonstrated to be an effective means of ROW vegetation management as part of an overall Integrated Vegetation Management (IVM) Plan. IVM incorporates a variety of vegetation control methods including: mechanical (the physical removal or trimming of problem trees), chemical (the use of herbicides to control problem trees) and biological (the use of naturally occurring vegetation to reduce problem tree population near power lines).

Each of these control methods can be implemented in a variety of different ways:

- Mechanical - selective cutting, rotary mower clearing,
- Chemical - herbicides, tree growth regulators (TGRs)
- Biological - planting low-growing shrubs, introducing herbivorous species (insect or mammal) that feed on problem trees.

Overall, VEC’s VM program is in the early stages of implementation. Strict adherence to planned trimming cycles should be an effective means of maintaining (in the near term) to reducing (longer term) the percentage of tree related customer outages to overall distribution system outages.

Recommendations for improvement in this area are outlined in the following table.

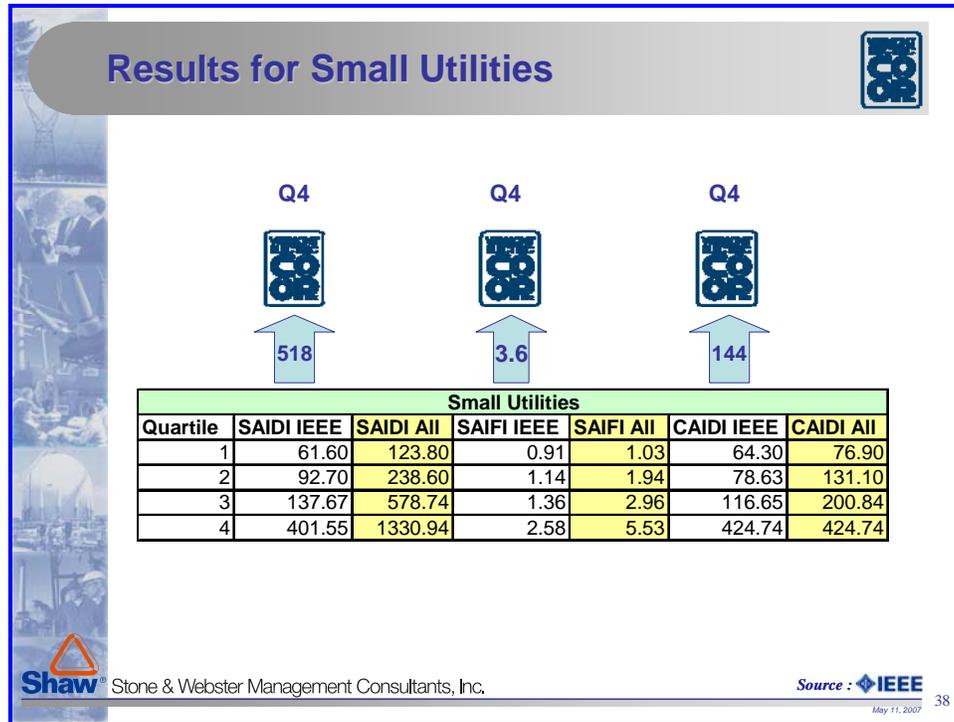
AREA OF REVIEW	RECOMMENDATIONS	PRIORITY
<b>Vegetation Management</b>	1. Consider formally allocating a portion of the trimming budget to address poor performing circuits driven by tree related outages. Should be routinely addressed as part of the Reliability Committee discussions.	High
	2. Consider accelerating the use of herbicides for ROW maintenance.	Medium
	3. Consider improving the tracking of actual versus planned circuits for trimming. Focus today is primarily on the dollars spent not whether or not the planned work was accomplished.	Medium

### 1.2.7 Reliability Benchmarking

Consistent with regulatory requirements, VEC does not use the recently developed IEEE 1366 criteria for reliability statistics. As a result the value of comparisons to utilities outside of Vermont is questionable. The Department should consider adopting IEEE 1366 criteria as a broader means of measuring reliability performance.

Using the study completed by IEEE in its recent efforts (2004) to develop reliability metrics, VEC’s performance was compared to industry norms for similar sized utilities. SAIDI, SAIFI and CAIDI performance (excluding defined major storms) all ranked in the 4th quartile of comparably sized utilities.

While the lack of a common set of assumptions and definitions makes the value of comparisons with non-Vermont utilities somewhat questionable the consistently poor (4th Quartile) performance is cause for concern.



Recommendations for improvement in this area are outlined in the following table.

AREA OF REVIEW	RECOMMENDATIONS	PRIORITY
<b>Reliability Benchmarking</b>	Consistent with regulatory requirements, VEC does not use the recently developed IEEE standards for reliability statistics. As a result the value of comparisons to utilities outside of Vermont is questionable. The Department should consider adopting IEEE standards (1366) for reliability.	Medium

### 1.2.8 Regulatory Effectiveness

VEC is a regulated utility in the state of Vermont but the organization has not effectively managed its relationship with the Vermont DPS. The VEC Board has historically believed that its management of the organization has been sufficient and that the DPS and PSB oversight was not necessary – however during the BPRA our discussions with Board members resulted in an acceptance that regulation is a VEC reality. The Board direction for the cooperative in recent years, based on our interviews and observations of Board meetings, appears to have been one that did not support good regulatory relations overall. This strategic direction has been reflected in rate orders and decisions that are less than ideal for continued financial viability of the organization, and as such, support the changes recommended in this report.

On the other hand, the engineering area of the company was required to make filings for changes at facilities because approval was needed prior to making the investment and has developed a better working relationship with staff at the VT DPS.



We recommend that each area of the organization adopt an approach that builds the relationships with regulatory staff of the VT DPS by having regular meetings, in person or by phone, to discuss key issues or activities that may be of interest. The CEO has already adopted a meeting a month routine with his contact at the DPS during this effort at our suggestion to improve communication and to develop a relationship. Regulation is a requirement for this utility and all employees should recognize the presence of and contribution of regulators to the success of VEC.

AREA OF REVIEW	RECOMMENDATIONS	PRIORITY
Regulatory Effectiveness	1. Align the senior managers' performance appraisals with an assessment of their regulatory effectiveness and require regular reports at senior meetings outlining activities with VT DPS.	High
	2. Require all appropriate personnel to meet with regulators on a regular basis to discuss appropriate information and to develop long term relationships.	High

### 1.2.9 Member Relations

The Member Relations area is very closely managed with clear policies and procedures known by the staff. The staff does a very good job of managing customer calls efficiently and handles calls on a timely basis. Our review of the collection function indicates that the rules in place set by both the DPS and VEC are being followed by the customer service staff. Several members of the department were interviewed including the manager. There is a business process in place that the customer services group follows and they seldom vary from that process.

During the review several documents from both the DPS and VEC were analyzed including the SQRP. The process does work in controlling VEC's bad debt, but does create above average complaints to the DPS. Some of the complaints to the DPS were generated by what could be considered unreasonable treatment of members and less leniency in the payment requests by VEC staff during the process than would be allowed by the DPS. IN these cases we also observed that VEC extended the payment terms at the request of the DPS – avoiding that step would likely mean that VEC could be more in compliance on the complaint statistics. We also observed VEC staff talking to members at the front desk area discussing payments and agreements in a public area. We think this is an unprofessional and impersonal method of handling members.

One of our recommendations for this process is to be more understanding of the member circumstances and treat customers with more respect. Another is to have an area available to talk to customers in private to discuss financial and other member concerns.



AREA OF REVIEW	RECOMMENDATIONS	PRIORITY
<b>Staff Capabilities</b>	<ol style="list-style-type: none"><li>1. Enable the collection staff to provide more flexibility in payment plans particularly if it is evident that the member will next contact the VT DPS to negotiate an extension that VEC will comply with. This approach reduces the need to impact VT DPS staff time and will reduce the complaint statistics for VEC.</li><li>2. Offer a more private location to discuss collection issues with members rather than the very public front desk at VEC.</li></ol>	High  High

### 1.2.10 Staff Capabilities

The intent of the BPR broadly included an assessment of the qualifications of the existing staff at VEC. Generally, we find the VEC staff to be well trained and qualified to provide value to VEC; however some staffers are in positions that are not a good match for their skills. The DPS for example has been critical of the preparation for a recent rate case, citing ill prepared managers and lack of attention to regulatory requirements. The Board has directed the financial staff of the organization to focus on bringing the utility out of bankruptcy and earning a good return on their investments. There has not been a directive to work with the Regulators or to comply with regulation – in fact the Board has generally exhibited an attitude that the cooperative does not need to be regulated and therefore can ignore the regulators’ directives. This approach by the Board has been communicated and acted on by the Financial Organization and the Member Services Organization and is reflected in the DPS’ assessment of VEC in these areas. Stone & Webster Consultants finds that these two functional areas of VEC have been following the directives of the Board of Directors and the Board needs to change its long term vision relative to regulatory policy and regulation in general in order to effect change in the approaches utilized within these functional areas.

Within the Engineering function of VEC there is only one fully qualified engineer to provide design standards, planning, and to work with regulators on necessary filings. We recommend that additional degreed engineers are necessary in this area to support the existing functional requirements and to expand the focus in this area to support the development of quality control, long term capital planning and system upgrades.

Many of the staff at VEC with whom we spoke appears reluctant to attend training courses and industry events that would expose them to issues at other, similar utilities. We recommend that a full training plan be developed for staff based on annual evaluations of their strengths and areas for improvement. Continued investment in VEC personnel will provide value to management of the organization.

AREA OF REVIEW	RECOMMENDATIONS	PRIORITY
<b>Staff Capabilities</b>	1. Identify appropriate ongoing training for all members of VEC staff and establish a prioritized training plan to improve investment in staff and to maintain industry knowledge.	High

### 1.2.11 IT Support

A review of VEC’s current IT systems meets the needs and requirements of VEC. During the review process all three full time IT professionals were interviewed by Stone & Webster Management Consultants, Inc. VEC is a Microsoft shop and is up to date with current versions and updates. VEC currently uses NISC for most of its IT application requirements including billing and financials. There are plans to update NISC to its newer product iVUE sometime this year. VEC has a service contract for maintenance with NISC to supplement its IT staff.

A staking tool was just added to NISC this spring. The plans are to update the Outage Management System (OMS) later this year. Automated Meter Reading (AMR) system is in place and is currently being slowly implemented. AMR is currently behind schedule for a variety of reasons that include safety and resources.

For the size of VEC its current IT systems are very good and are above average for a company its size. The IT staff of three with a part time network resource is dedicated and responsive to their customers. Lack of resources sometimes delays implementation of projects and responsiveness to internal customer requirements. An additional resource or two would greatly assist IT department in implementing projects and responding to its customers in a timely manner. These resources do not have to be full time and could be temp resources used until the IT department catches up with VECs aggressive project schedule for implementing systems.

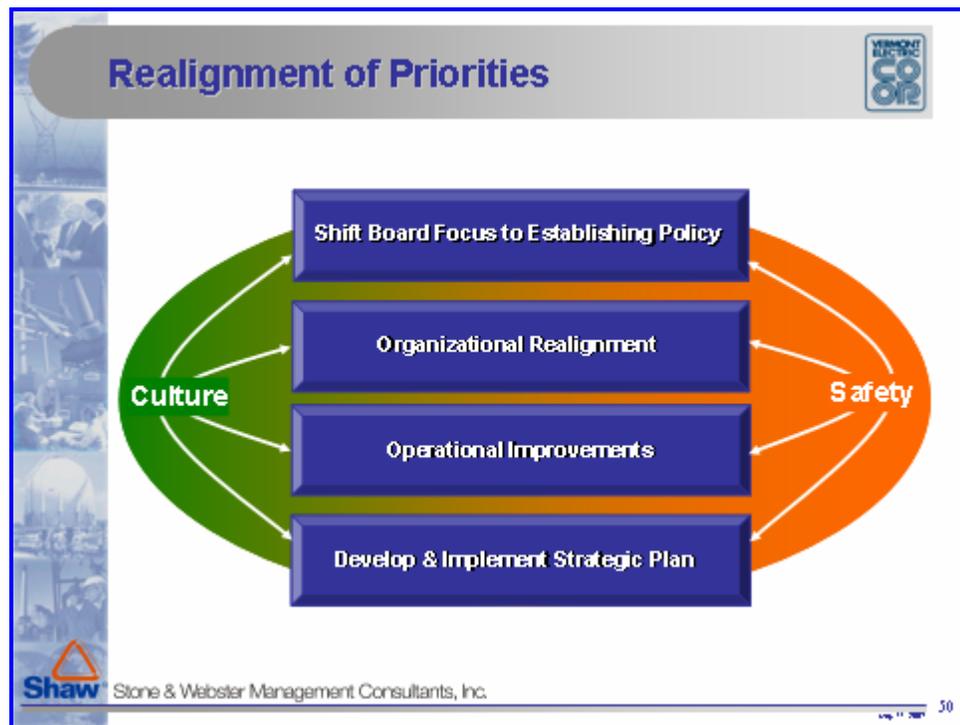
### 1.3 Summary of Findings

Based on the evidence amassed during this assessment, Stone & Webster Consultants finds that VEC’s intention is to operate its distribution system in a reasonable, utility-like manner, and provide reliable service to its customers. At this time, the organization is struggling to meet member needs and regulatory expectations while the merger is not yet complete. This assessment has identified many improvements and enhancements that in many cases must be introduced to continue to provide industry standard service or to move towards these standards. This effort has identified a number of enhancements – some are significant and will take time to implement while others are more easily implemented.

Shaw Stone and Webster Management Consultants has provided VEC and the DPS with a number of improvements for consideration – these do not imply that VEC is not performing in a manner consistent with utility practice but that there are numerous improvements needed to meet that level and opportunities for doing the job better and more effectively that should be considered.

It is worth noting that VEC has already taken action on a number of the recommendations outlined in this report. For example, the CEO has initiated more frequent discussions with the DPS to improve communication and relationships. The balance of the recommendations in this document that have not already been adopted should be further analyzed and prioritized by VEC as they consider whether to and how to proceed with implementation. It is imperative that an orderly plan for implementation of the recommendations is necessary – this organization cannot and should not attempt to adopt all of the recommendations at once as it will serve to distract the employees from their day to day activities and result in confusion and perverse member impacts.

Our initial prioritization for change is depicted in the following exhibit and we recommend that all changes in this report be assessed with respect to their contribution to the changes highlighted in the four key areas.



## 1.4 Implementation Plan

VEC should immediately review all of the recommendations and develop a report to the DPS establishing a timeframe for more detailed review of and VEC’s recommended approach and time frame relative to each recommendation. This report establishes an immediate set of milestones with which the DPS can review VEC’s implementation progress and interact to discuss issues surrounding the implementation planning. This report should take no longer than 6 weeks to complete as it sets forth a plan for more detailed actions. Since VEC has already implemented several of the recommendations, this report should also provide a summary of those actions already taken.

VEC should then update the DPS periodically as the more detailed assessments are underway. Our recommendation is for a quarterly written update on each item and a regular meeting to discuss progress verbally.

Our expectation is that several of the recommendations require extensive efforts to complete (reorganization, system condition assessments, Board training). A three year period of implementation has been discussed – and on average we agree with the exception of the reorganization (complete within one year), Board Training and refocusing (complete within 6 months) and a review of key business processes underlying the reorganization (one year). Condition assessments should be completed in 2008 and their recommendations are likely to take up to ten years to complete depending on the extent of system improvement necessary. A strategic plan should be completed in the first half of 2008. Operational improvements should be initiated immediately with a long term plan aligned with our recommendations that may take up to three years to implement.

Cultural change is imperative and must take place now – starting with senior management and working throughout the organization on a permanent basis. This is not a simple undertaking and is one that easily falls to the wayside.

Implementation costs are expected to be \$1 to \$2.5 Million in 2008 and 2009 excluding implementation of system improvements and addressing the maintenance backlog, the costs of which we are unable to predict. Staffing should be immediately increased to allow current VEC employees to direct and participate in the improvement. Without focus this effort will not succeed. We suggest that 1) a change manager be anointed with the majority of their responsibility the implementation of this report's recommendations; 2) continued participation by the consultant for clarification, monitoring and support as we have developed a deep and valuable knowledge base that is of value to the senior VEC and DPS teams; and 3) a report manager be established to update all information to both VEC and DPS management regarding implementation successes and delays.

#### 1.4.1 Prioritization of Recommendations

As indicated in the report the four key areas are shown in the chart below. Within each of these VEC needs to prioritize however, the keys are 1) introducing a new organization structure, reviewing the underlying business processes and making improvements, updating staffing, and ensuring expectations and consequences are communicated; 2) refocusing the Board of Directors on strategic issues and providing them the support to make the change; 3) develop and implement a strategic corporate plan, and 4) adopt operational improvements such as commissioning a condition assessment, reviewing the recommendations resulting from the merger analyses and seeking employee suggestions for improvement.

#### 1.4.2 Monitoring Plan

The monitoring plan should include:

1. Quarterly written reports to the DPS, VEC management, Board and employees outlining successes and delays with recommended corrections
2. Quarterly meetings between VEC and the DPS to discuss progress and issues;
3. Quarterly reviews by the consultant to assess progress;
4. Monthly updates by VEC management to the Board of Directors on progress and issues.
5. Monthly budget updates to VEC management and the Board as needed to assess costs.

The remainder of this document includes an introduction outlining our approach and then our findings and recommendations for the organization organized by the four key areas outlined above.