Building Retro-commissioning, Texas Style

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ABSTRACT

CenterPoint Energy is the first investor-owned utility in the state of Texas to sponsor a retro-commissioning program for commercial and industrial markets in its service territory. CenterPoint Energy is a Houston, Texas, based company engaged in the transmission and distribution of electric power to 1.8 million customers in a 5,000 square-mile area that includes Houston, the fourth largest city in the nation. Deregulation occurred in Texas in 2001, and significantly changed how investor-owned utilities offered energy efficiency programs within their service territories. As part of deregulation, the State Legislature required that 10 percent of all new demand growth be met through utility-sponsored energy efficiency programs. In the large commercial and industrial markets, CenterPoint Energy implemented a commercial and industrial standard offer program to help meet this 10 percent demand reduction goal. After two years of implementation and a downturn in the economy, it became apparent that another program was needed to extract demand reduction from commercial and industrial markets. Through discussion with national experts and review of other building commissioning programs, CenterPoint Energy concluded that retro-commissioning would be a good candidate to supply additional demand reduction along with identifying opportunities for its commercial and industrial standard offer program. In conjunction with other Texas investor-owned utilities, a retro-commissioning program template was submitted to and approved by the Public Utility Commission of Texas in early 2003. This program has been structured to be a market transformation offering, and will continue until retro-commissioning becomes an everyday practice in the CenterPoint Energy service territory. This article will detail the development of CenterPoint Energy's retro-commissioning program, characterize the market for retro-commissioning

in the CenterPoint Energy service territory, review program goals over the next three years, and discuss results to date and lessons learned.

INTRODUCTION

The Commercial & Industrial Retro-Commissioning Market Transformation Program sponsored by CenterPoint Energy started when the Public Utility Commission of Texas (PUCT) approved the program template in the summer of 2003. The template was designed around acquiring cost-effective peak demand reduction and energy savings in existing commercial and industrial facilities using commissioning as the tool. Savings resulting from the program are required to persist for a ten-year period. While the program's main goal is to achieve demand reduction, its secondary goal is to increase the demand for commissioning services and the number of local providers to supply that service. Once both these goals have been achieved, the program will be considered a success.

BACKGROUND

Texas Senate Bill 7 (SB7), sponsored by Texas State Senator David Sibley, was passed in March, 1999, by the Texas Senate and revised by the Texas House of Representatives (sponsored by Texas Senate Representative Steve Wolens) and signed into law by then-Governor George W. Bush in June 1999. SB7 restructured the electric utility industry in Texas to provide retail competition and customer choice beginning January 2002. In addition to restructuring, SB7 has five key provisions dealing with stranded cost, market power, authority of the Public Utility Commission of Texas (PUCT), consumer safeguards and low-income protection and environment and renewables.

PUCT Substantive Rule §25.181, Energy Efficiency Rule, is the implementation tool for achieving the energy efficiency goal under SB7. With the restructuring of the electric market, SB7 mandated a reduction in each utility's peak demand growth by at least ten percent each year. The goal can be achieved through market-based standard offer programs and limited market transformation programs, and must result in the reduction in consumption and energy costs for all electric customer classes.

In 2001, CenterPoint Energy chose to meet the requirements of SB7 and PUCT Substantive Rule §25.181 for the commercial and industrial marketplace with a standard offer program (SOP). The first year was a pilot program and had a goal of a two megawatts reduction in peak demand. Following is a graph (Figure 1) that shows the demand reduction achieved by the SOP program during the first three years, and the goal for the next three years.

The SOP is open to all non-residential customers that have a demand greater than 100 kW within the CenterPoint Energy service territory. The program is on a first come/first served basis and applies to both retrofit and new construction. The incentive for this program is $198/kW for on-peak demand and $0.068/kWh for energy. Lighting-only projects are paid 65 percent of this value. Projects have to be permanently installed, have a ten-year life expectancy, exceed minimum efficiency standards, and a minimum twenty kW on-peak demand reduction. The SOP will only pay for verified savings, and there are three methods used for verifying these savings. Deemed savings is the simplest of the three methods and will allow full payment of the incentive at the completion of the project. Simplified savings and full metering and verification (M&V) are the other methods used in the program, and may require a longer payout period. Currently, CenterPoint Energy has invested $7.5 million in incentives for this program, and estimates an

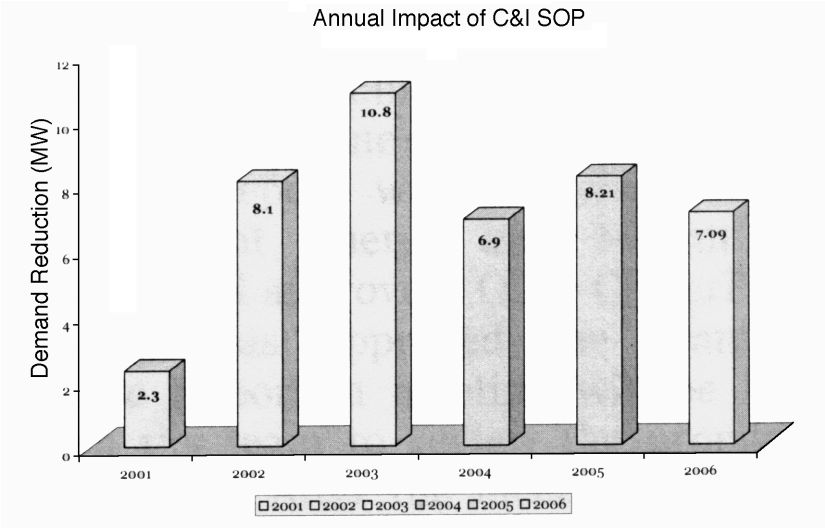

Figure 1

additional $12 million for the next three years. A graph indicating the yearly breakdown is shown in Figure 2.

COMMERCIAL & INDUSTRIAL RETRO-COMMISSIONING PROGRAM

The commercial & industrial (C&I) retro-commissioning program was designed to be implemented in four phases to be completed within a calendar year. The phases are completed by three parties: Nexant, the market transformation facilitator, is responsible for the overall program operation; the RCx agent will provide the commissioning services; and the customer is responsible for project implementation. During the pilot year, we selected five firms (RCx agent) to provide commissioning services to the participating six buildings in the program. The selection of RCx agents will be a yearly project and the number selected will be based on the number of facilities needed for the coming year. CenterPoint Energy and Nexant will select the RCx agent each year and assign their project.

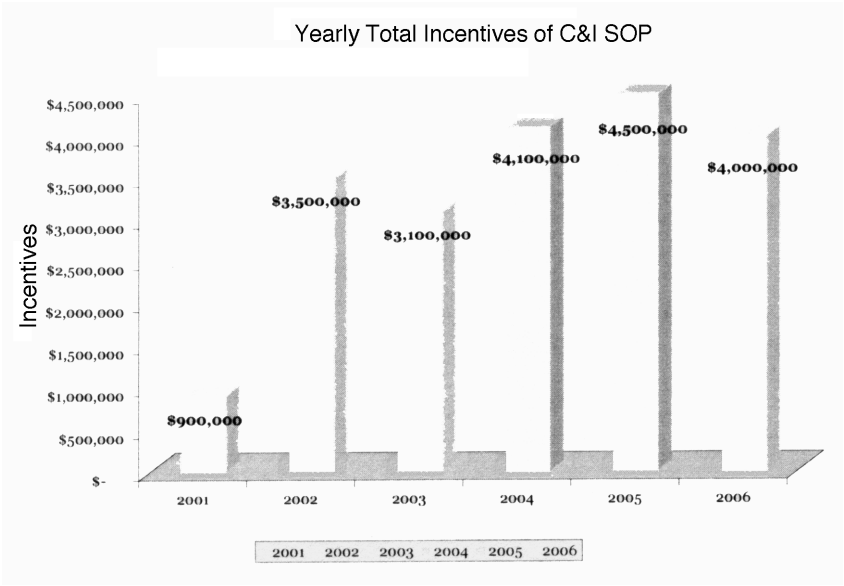

Figure 2

The outreach for the program will be done through half-day workshops twice a year. RCx agents and individual customers will be the focus of the workshops.

The retro-commissioning program is started once a customer downloads an application from the web site or requests one be sent to them. All applications will be returned to CenterPoint Energy and Nexant for review and approval. Upon approval, the application will be assigned to an RCx agent (unless an agent has been requested) and a letter will be sent to the customer notifying them of their assigned RCx agent and a thirty-day deadline to begin the retro-commissioning project.

The planning phase is the beginning of the agent's work and will determine the amount of demand reduction a customer can achieve. The planning phase is broken into one field day and four days of analyses. The field day begins with an in-depth interview with the facility operator and review of as-built drawings, owner's manual, and operating schedule. Once the interview is completed, the agent will walk the facility to determine if there are any further opportunities. The analytical work will determine demand reduction, energy savings, and estimated measure cost. The planning phase should take approximately one week to complete. A draft report will be forwarded to CenterPoint Energy and Nexant for review and approval. Once CenterPoint Energy has approved the planning phase report, a meeting will be held with the team to review the proposed measures. After the meeting, the RCx agent is free to start the second phase of the commissioning program.

The investigation phase is a detailed audit of the customer site that requires data collection. This phase will take about three weeks to complete and will conclude in a final report that details measures for implementation and the engineering calculations used to estimate the demand reduction. This phase is also broken into two parts consisting of field days and analytical work. The field days will be used to measure the usage of current systems and to evaluate the measures agreed upon in the planning phase. These measured values will be used in the calculation of demand and energy savings. The analytical work typically consists of modeling the building energy consumption and calculating the measure cost, demand reduction, and energy savings. With these values, a simple payback will be calculated and the measures will be ranked for inclusion in the investigation phase report. Once completed, these reports are then sent to CenterPoint Energy for review and ap-

proval. After the review is completed and the report is approved, the RCx agent will develop the final measure list and deliver this list to the customer along with the completed report. At this point, the program will shift over to the customer focus and the implementation phase.

The implementation phase is where the customer takes the measure list and completes as many measures as required to meet the demand reduction stated in the investigation phase report. The customer has a commitment to invest a minimum of $10,000. The customer is free to use any contractor or in-house staff to complete these measures within a ten-week period. Once the implementation phase is completed, the customer will contact the RCx agent for the completion of the retro-commissioning project.

The verification phase is the final stage of the program and requires the RCx agent to review and approve all measures implemented by the customer. This phase will be done only at the customer facility and will not require any analytical work. During this phase, the RCx agent will supply the customer with written documents on all the measures implemented and will complete any training required for the operating staff, so that these measures will have a ten-year life. One to two days will be the typical length for the verification phase. During this phase, the RCx agent's fee will be trued-up for actual demand reduction and, as a result, the final payment to the RCx agent may be reduced.

The retro-commissioning program database is a Microsoft Access file. This database will provide customer information, demand and energy impacts, project status, and total measure cost. CenterPoint Energy and Nexant will update the database on a weekly or as-needed basis. The database will have password protection for safety of customer information. With this database, CenterPoint Energy will be able to calculate a cost effectiveness ratio for the program and also determine when the program has transformed the market.

COMMERCIAL & INDUSTRIAL RETRO-COMMISSIONING BASELINE STUDY

CenterPoint Energy commissioned Opinion Dynamics Corporation (ODC) to assess the current market for retro-commissioning activities and service providers (RCx agents). In May of this year, ODC completed its study with the following conclusions:

- Based on interviews, the target market (400,000^{2}ft & minimum peak demand of 1,000 kW) for the program indicated approximately 69 percent may be in need of retro-commissioning services.

- According to respondents, one-quarter of the target market has been previously retro-commissioned.

- 37 percent of the customers interviewed stated their facilities were commissioned when new.

- Four-fifths of facilities potentially in need of retro-commissioning are occupied by the owner.

- Educating customers about the benefits of retro-commissioning may be the most important tool to achieve large-scale energy savings.

The study concluded that the Houston market was ripe for a retro-commissioning program. ODC interviewed eighteen RCx agents, with eleven completing projects which would represent approximately sixty projects per year in the market. The RCx agents stated that almost all or all of the facilities they retro-commissioned have some kind of control systems, while only one-half of the customers interviewed indicated they had controls. Finally, the study determined that as CenterPoint Energy begins to penetrate this market and look for candidates to participate in its full-scale program, they may also want to consider targeting facilities that are part of a multiple-building campus or complex.

CONCLUSION

At the time of this article, the retro-commissioning program has been in operation for only four months and has secured the facilities needed to meet its pilot year goals. Approximately sixteen customers and over six million square feet of facilities have completed applications and will be retro-commissioned either this year or the next. After the pilot year is completed, elements of the program will be evaluated, including marketing strategy, RCx payment schedule, and overall target market. CenterPoint Energy believes the retro-commissioning program will be a valuable addition to its commercial and industrial program.

Reference

1. Mitchell-Jackson J.; Opinion Dynamics Corporation: Baseline Study Report, May 2004

ABOUT THE AUTHOR

After completing college, **Mr. Snyder's** first position was a plant engineer for a start-up baby food manufacturer in Middlebury, Vermont. He was responsible for construction coordination in the building of the facility, and once the facility was completed, his attention changed to managing the day-to-day operation of the utility and manufacturing equipment. After a year, Mr. Snyder moved to Houston, Texas, beginning a design career with Brown & Root in the civil engineering section. With Brown & Root, Mr. Snyder was responsible for life cycle costing and building modeling for government projects, along with designing HVAC systems for numerous types of facilities. In 1993, Mr. Snyder commenced working for CenterPoint Energy (HL&P, Reliant Energy) as a senior engineer in commercial industrial services, focusing on the commercial cool storage program. Throughout his career with CenterPoint, Mr. Snyder has been the supervisor of the energy efficiency programs and energy audits, and is currently the program manager for the retro-commissioning program. Mr. Snyder has a Bachelor of Science degree from the University of Missouri in mechanical engineering, is a member of ASHRAE, a member of AEE, and is a Certified Energy Manager and Energy Procurement Professional.

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