SESSION 3A

LESSONS LEARNED DURING THE LAST DECADE OF DEMAND RESPONSE PROGRAMS

Moderator: Michael Messenger, California Energy Commission

PAPERS:

Want to Avoid Building a Large Power Plant? Top Ten Keys to Building a Successful Demand Response Programs
Lark Lee and Carol Sabo, PA Consulting
Ann Lieser and Heather Hemphill, Xcel Energy
Beat the Heat with a Better Baseline
Stephen Carlson, RLW Analytics, Middletown, CT
Chad Telarico, RLW Analytics, Middletown, CT
Communication Reliability Improvements through Measurement and Verification of Demand Response Programs
Robert Bress, Comverge, Inc., East Hanover, NJ

SESSION SUMMARY:

This session will focus on the lessons learned from a set of evaluations of demand response programs conducted in Minnesota, New Jersey and the Mid West. At the highest level the key lessons are how you calculate the baseline for peak reduction payments really matters, targeting and taking care of customers is crucial to the effectiveness of demand response programs and the reliability of the channels you use to communicate with customers are likely to become increasingly important over the next decade.

The first paper, "Want to Avoid building a Large Power Plant? Top Ten Keys to Building a Successful Demand Response Programs", is based on a comprehensive evaluation of XCEL ENERGY's demand response program and a high level review of a number of different process and impact evaluations conducted on demand response programs from the North East and Mid West . The authors review the effectiveness of the XCEL energy program design and identify customer segments who consistently provide high levels of peak savings. . The evaluation also suggests changes in reward or payment structure for customers to ensure they are receiving fair value for the load reduction delivered. The authors then deduce several recommendations to build and operate better demand response programs. Highlights included:

- Clearly establish goals and objectives for the program- not just reduce peak demand
- Target, and limit, program recruitment to those customers who are solid performers
- Identify specific opportunities to cross-sell demand response programs with energy efficiency programs,
- Introduce customers to the concept of demand response programs through voluntary programs – 'good fits' can then graduate to higher reward, higher commitment programs,
- Assist customers to help identify ways to respond to control events that fit their operations.
- Make sure participants' compensation is in-line with the value they provide to the company.

- Performance is greatly increased if more than one site employee is trained on how to pick up and respond to notification signals.

The second paper, "Beat the Heat with a Better Baseline", chronicles the use of different techniques to estimate baseline conditions before curtailment requests are made in the New York ISO area and their impact on the estimated peak savings and payments to customers. The peak savings estimates derived using simple averaging processes to construct an average baseline for a given building are contrasted with other techniques used to "true up" or adjust the customer baseline load shape (up or down) based on conditions at the site three to four hours before a curtailment call. The impact of using different analysis techniques to construct a customer baseline and subsequent estimates of peak savings is shown for actual building load shapes during curtailment events in the summer 2006 in New York. Results from the paper document the potential problems with the adoption of a rigid or fixed methodology to define the customer baseline in the absence of other contextual information during system emergencies. The study finds that scalar adjustments (up or down) to average or baseline load shapes based on the weather or actual operating conditions in the building on the day of the call sound good in theory but can yield unreliable estimates of peak savings during emergencies. This is particularly true if customers begin making voluntary reductions starting early in the morning rather than waiting for the call in the afternoon. The author concludes that program administrators and or the curtailment service providers should be given the flexibility to use an alternative true up method rather than the adopted or default protocol or method to estimate peak savings if there is visual evidence that customers have used pre cooling or other significant changes in cooling strategies during extreme conditions. The key is to make sure everyone understands the criteria that will be used to define an emergency condition and the resulting flexibility in determining a new customer baseline.

The third paper, "Communication Reliability Improvements through Measurement and Verification of Demand Response Programs", reviews several methods to assess the effectiveness of communication channels used to notify or directly control loads as part of a load management program. The analyses include advanced mapping and topographical software packages to understand geographic effects on communication reliability. These analyses involve testing message reception by time of day, using different paging transmitters, and conducting quality control checks of hardware equipment. Results from an analysis of the effectiveness of direct load control show how one utility was able to increase the effectiveness of its programs by focusing on the weak links in the communication channels. Results from paging simulations and power to site analyses are also used to identify areas where signal reception is weak and identify alternative pathways to reach customers with poor receptivity. The results highlight the importance of measuring the effectiveness of communication channels used in load management programs to accurately estimate the peak savings achieved and cost effectiveness of the program.