ELECTRIC GRID RESEARCH PROGRAM

Project Summary

California Transmission Congestion Assessment

Context

In 2004, California Independent System Operator (CAISO) gross congestion and Reliability Must Run Generation (RMR) costs were estimated to be in the neighborhood of $1 billion annually, with congestion accounting for approximately half of the total. This figure did not include congestion that may be experienced on the California transmission facilities operated separate from CAISO. The problems of congestion also have an adverse impact on reliability, environment, and efficiency.

Congestion costs and RMR costs for 2003 were $628 million and just under $400 million in 2002. While congestion costs are large, there had been no good baseline information on historical patterns of congestion, how much was considered a reasonable amount, and whether congestion patterns are constant or ever changing with market conditions. Understanding the scope and magnitude of the congestion problems and the challenges in forecasting and identifying solutions would better help educate stakeholders who are considering making investments, and regulators who must address transmission and rate-related policies. Perhaps more pertinent to the PIER Transmission Research Program, this baseline information was needed to develop and conduct a planned research initiative in congestion management planning.

Goals and Objectives

The purpose of this project was to perform a scoping study to document in explicit detail the scope and magnitude of the congestion problems facing the State of California and to report the challenges in forecasting. This scoping study report would provide an essential building block for developing a congestion planning methodology in future research.

The specific objective was to develop a primer document on congestion on the California grid that would:

- Explain the problem of congestion
- Identify the key metrics and thresholds for establishing critical levels of congestion.
- Present historical congestion patterns
- Discuss the challenges of forecasting congestion
- Describe the current transmission system sources of information regarding congestion and identify sources of inconsistencies.

Description

The project consisted of 2 primary approaches to gathering information – data collection and interviews.

The data collection process was to obtain historical data on congestion from a number of California transmission control area operators as well as the California Energy Commission.

Interviews were then conducted with several California transmission control area operators to obtain their inputs and assessments.

Key Results/Conclusions

- CAISO congestion cost data understates the amount of congestion that exists. It captures information related only to schedules attempted, as compared to the full economic potential for transactions.
- Inter-zonal congestion causes higher prices for all energy within the zone. This price impact is not captured in current congestion cost assessments.
- Reliability Must Run is the largest single component of congestion costs.
- Without the construction of new local generation, RMR costs can only be reduced by expanding the transmission capabilities into constrained local areas.
- Congestion can only be avoided by planning and constructing sufficient transmission in advance to manage any remaining congestion costs to acceptable levels.
- Metrics are needed to identify and classify congestion costs as actionable, manageable, or monitor.

Why It Matters

Congestion costs in California can be very high and mitigating these costs generally involves long term planning and expensive upgrades to the grid in the form of new transmission lines or expansion of existing ones. Improved understanding of the nature of California's congestion issues is a necessary precursor to effectively managing the problem.

{More details}

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California Transmission Congestion Assessment (Pg 2)

Participating Organizations

Principal Investigator:

Electric Power Group, LLC.

Research Advisors/Consultants:

CalEnergy Generation
California Independent System Operator
Imperial Irrigation District
Los Angeles Department of Water and Power
Pacific Gas & Electric Co.
Powerex
Sacramento Municipal Utility District
San Diego Gas & Electric Co.
Sempra Generation
Southern California Edison

Project Start Date: March 1, 2006

Project End Date: December 31, 2006

CIEE Contract No.: C-06-09

CEC Contract No.: 500-99-013

CEC Work Authorization No.: BOA-142

Reports

Final Report: *Multi-area Real-time Transmission Line Rating Study*

Funding

Funds for this project came from a $200,000 award by the CIEE under a research contract 500-99-013 awarded to CIEE by the California Energy Commission (CEC) through the Public Interest Energy Research (PIER) program

For More Information, Contact

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