Transmission congestion deemed a potential risk to competitive markets in Illinois

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By Steve Muller

With a view toward the completion of the transition to a competitive electricity market at the beginning of 2007, the Illinois Commerce Commission funded a study to assess whether the transmission system in the state and surrounding region would be able to support a competitive electric market in Illinois.

The study specifically examined whether the transmission system could accommodate competition by allowing the cheapest power to be brought to where it was needed to meet loads or whether, conversely, generators would be able to exercise market power.

The report, "Evaluating the Potential Impact of Transmission Constraints on the Operation of a Competitive Electricity Market in Illinois," was prepared by the University of Illinois at Urbana-Champaign and Argonne National Laboratory. The university did load flow analysis and Argonne modeled market behavior.

"There is a concentration in the generation market and evidence of transmission congestion, at least during high load periods," the report concluded. "This will give rise to the ability of some companies to unilaterally raise prices and increase their profits. Consumer costs will increase, in some cases substantially. However, the situations under which this can be done are limited to a number of conditions, especially high load periods."

The study was initiated in July 2002 and used available information to project expected system conditions in 2007. The report was substantially completed by September 2004, but for various reasons was not considered by commissioners until June.

The authors emphasize that the report must be read with an understanding of the assumptions used. The analysis began before Exelon Corp. subsidiary Commonwealth Edison Co., which serves Chicago and northern Illinois, joined the PJM Interconnection LLC and before the start of the Midwest ISO market in most of the remainder of Illinois in mid-2005, so it did not model the impact of ISO market oversight.

It further assumed market conditions in the absence of any regulatory oversight and without restrictions on generator bidding practices.

"The intent was to see if competition alone would be able to control prices," said co-author Richard Cirillo of Argonne National Laboratory.

Congestion and bidding behavior

The report found evidence of transmission congestion in areas of Illinois including the city of Chicago, areas north and west of Chicago to the Iowa border, "a broad area stretching southwest of Chicago to Peoria and Springfield," and isolated areas in the southern part of the state.

In addition, "Some transmission equipment was operated at its capacity limits for a significant number of hours in a year," the report said.

"The effects of transmission congestion were more prevalent during peak load periods," the report said. "Price variations across the state due to transmission congestion were as much as 24% during these peak load periods."

Transmission congestion provides opportunities for generators to manipulate the market and increase profits.

"Physically withholding multiple units that are strategically located in the transmission network, particularly during peak load conditions, can increase profitability," the report concluded. "This type of strategic physical withholding could even create conditions where some load cannot be met and could result in very steep price increases."

The report determined that three generators would have generation market power if they used this strategy: Exelon, which operates 10 nuclear reactors at five sites in northern Illinois; Midwest Generation LLC, a subsidiary of Edison International's competitive power business, Edison Mission Energy, which owns 5,900 MW of generating capacity in Illinois; and Ameren Corp., which has three utility subsidiaries in Illinois and about 4,600 MW of unregulated generating capacity, mostly in Illinois. Dynegy Inc., which has about 4,300 MW of generating capacity in Illinois, and Dominion Energy, a competitive power subsidiary of Dominion Resources Inc. that owns about 1,850 MW of generating capacity in Illinois, would not, the report noted.

Illinois market participants have criticized the report on two main points: the data used is outdated; and the impact of Midwest ISO and PJM market monitoring is not included.

Co-author Thomas Overbye, an engineering professor at the University of Illinois, pointed out that even though the data set used for modeling was several years old, it accurately predicted the physical state of the state's generation and transmission systems.

In response to criticisms that the analysis should have included a wider footprint beyond Illinois, he said he believed that modeling a larger market "would not have significantly changed the potential for market power caused by localized transmission system congestion."

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"The intent of the study was to see if competition alone would be able to control prices," Cirillo emphasized. "The results demonstrate the importance of an ISO … to maintain rigorous oversight of the market's operation."

He pointed to recent PJM data showing generators bidding their capacity well above production costs and bidding their last increment of capacity at a very high price ("hockey stick" bidding).

In addition, he said that the differences in locational marginal prices across the PJM market and instances of very high LMPs reflect both transmission congestion and generator bidding strategy.

"[This] illustrates that even in a tightly monitored market … there are participants that will bid strategically," he noted. "Neither competitive forces nor market oversight and monitoring deterred this type of market activity."

The report, an appendix, comments and responses to the comments by the authors can be found at

http://www.icc.illinois.gov/en/eclibrary.aspx?key=ecTrans. *i*

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