MEMO

Date: September 12, 2006
To: ERCOT Board of Directors
From: Read Comstock, TAC Chair
Subject: Nodal Co-Optimization Recommendation

Issue for the ERCOT Board of Directors

ERCOT Board of Director Meeting Date: September 19, 2006
Agenda Item No.: 09(d)

Issue:
In its Final Order in Docket No. 31540, *Proceeding to Consider Protocols to Implement a Nodal Market in the Electric Reliability Council of Texas Pursuant to Subst. R. §25.501*, the Public Utility Commission of Texas (PUCT) required ERCOT and stakeholders to determine the feasibility of adding real-time co-optimization to the Nodal Protocols.

TAC found that while it would be feasible to implement either of the forms of co-optimization, the impact on the cost, schedule and risk associated with implementing the option outweighs the potential benefit of doing so in the initial implementation of Texas Nodal. For this reason, the TAC recommends that the initial implementation of the Texas Nodal Market not include either Sequential or Real Time Co-Optimization.

Key Factors Influencing Issue:

Background/History:
In its Final Order in Docket No. 31540, dated April 5, 2006, the PUCT required that ERCOT and its stakeholders provide a determination on the feasibility of adding real-time co-optimization to the Nodal Protocols. Ordering Paragraph 3 of the Final Order provided:

> ERCOT and the electric-market stakeholders shall determine whether co-optimization is feasible and beneficial to implement in the wholesale market as approved by this Order. Any modifications to the protocols required to implement co-optimization shall be brought to the Commission for final approval.

TAC assigned this issue to WMS. WMS formed a task force on the feasibility of co-optimization in the nodal market.

The task force examined two forms of co-optimization which became known as Sequential

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Co-Optimization (hour ahead) and Real Time Co-Optimization. The task force concluded that Real Time Co-Optimization should not be pursued for the initial implementation of the Texas Nodal Market. The task force reasoned that it would have too great an impact on the nodal implementation schedule, due to the number of decisions that would have to be made by stakeholders and the large number of interactions with the real-time control systems that may potentially impact reliability of the system. The task force concluded that Sequential Co-Optimization could be accomplished with less risk and schedule impact and a Nodal Protocol Revision Request (NPRR) was drafted to provide implementation.

The WMS endorsed the findings of the Co-Optimization Task Force but asked ERCOT to request information from vendors regarding the cost and schedule impact of either Sequential or Real Time Co-Optimization.

ERCOT asked its Market Management System (MMS) vendor to determine cost and schedule impacts of implementing each of the two co-optimization options, neither of which have defined requirements.

- **Sequential Co-Optimization (Hour Ahead)**
  - MMS System Cost & Schedule Impact:
    - Minimum $950,000 + $250,000 risk**
    - Minimum two months MMS project delay
    - Potential two month impact on Texas Nodal, cost not quantified
  - Must also consider:
    - Settlement Impact Certain (cost not quantified, analysis in progress)
    - Operational Staffing Impact
    - Market Rules Changes

**Risk uncertainty due to new software development and the addition of a sequence

- **RT Co-Optimization (Every SCED run)**
  - MMS System Cost & Schedule Impact
    - Minimum $950,000
    - Minimum two months MMS project delay
    - Potential two month impact on Texas Nodal, cost not quantified
  - Must also consider:
    - Settlement Impact Certain (cost not quantified, must have additional information such as NPRR)
    - EMS Impact Certain (cost not quantified, must have additional information such as NPRR)

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- Operational mechanics between QSE and ERCOT
- Overlap of Ancillary Service Deployment and Re-Allocation
- Market Rules Changes

At its August 2006 meeting, the WMS heard and discussed the findings of ERCOT staff regarding the inclusion of either Real Time or Sequential Co-Optimization in the initial implementation of the nodal market. In addition, PUCT staff strongly encouraged the stakeholders not to proceed with the hour-ahead Sequential Co-Optimization proposal that may be in effect for only a few years and instead to consider an eventual implementation of the Real-Time Co-optimization in the future. WMS members did not discuss the potential benefit to consumers or the market associated with co-optimization again and based its decision primarily on the cost, schedule and risk impact on initial nodal implementation.

WMS noted in its findings that other ISOs in the United States have either implemented or are in the process of implementing real-time co-optimization for their markets. Given that a number of markets see the benefits of implementing real-time co-optimization, and given the importance of scarcity pricing in meeting ERCOT's resource adequacy needs in the long run as noted by a number of stakeholder comments in the Commission's Resource Adequacy rulemaking, WMS intends to reconsider the subject of real-time co-optimization in the future.

Finally, WMS determined that the cost and the delay of the nodal market did not, at this time, justify the benefits and noted that the architecture planned would have the fundamental systems for performing the co-optimization should it be implemented at a later time. WMS, therefore, concluded that there is little savings which could be achieved by developing the co-optimization engine now versus later.

Voting Record:
On 08/25/06, the WMS passed the following resolution via email vote with 19 in favor and two abstentions from the Investor Owned Utility and Consumer Market Segments.

> The WMS has found that while it would be feasible to implement either of the forms of Co-Optimization, the impact on the cost, schedule and risk associated with implementing the option outweighs the potential benefit of doing so in the initial implementation. For this reason, the WMS recommends that the initial implementation of the Texas Nodal Market not include either Sequential or Real Time Co-Optimization.

On 09/07/06, the TAC voted to accept the WMS recommendation to TAC on co-

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optimization. There was one abstention from the Consumer segment.
Alternatives: (1) Approve the TAC and WMS resolution regarding co-optimization; (2) reject the TAC resolution; or (3) remand to TAC with instructions.
Conclusion/Recommendation: As more specifically described above, TAC recommends that the Board approve the resolution providing that neither Sequential nor Real Time Co-Optimization will be included in the initial implementation of the Texas Nodal Market.