BEFORE THE
PUBLIC UTILITY COMMISSION OF TEXAS

LONGHORN ENERGY LP AND
WEST OAKS ENERGY LLC

vs.

ELECTRIC RELIABILITY COUNCIL
OF TEXAS ("ERCOT"), ET AL.

Docket No. 3943

LONGHORN ENERGY LP AND WEST OAKS ENERGY LLC'S
APPEAL, COMPLAINT, AND MOTION FOR SUSPENSION
OF ERCOT DECISION TO CONDUCT MARKET RESETTLEMENT

Pursuant to P.U.C. PROC. R. 22.251, Longhorn Energy LP and West Oaks Energy LLC (jointly "Financial Marketers") hereby file this Appeal, Complaint, and Motion for Suspension ("Appeal and Complaint") against the Electric Reliability Council of Texas ("ERCOT"). Absent action by the Public Utility Commission of Texas ("Commission"), ERCOT intends to make unlawful retroactive adjustments to final settlement prices for Operating Days December 1, 2010 through February 1, 2011. These adjustments, which ERCOT inaccurately characterizes as "corrections," would completely alter market results, arbitrarily taking millions of dollars away from certain market participants and unlawfully giving them to others. There is no lawful basis for ERCOT to take this action.

In addition to being unlawful, the planned resettlement would establish the worst possible precedent and policy, harming and disrupting the entire ERCOT market. As the ERCOT rules provide, changing settled market prices can only be done under very limited circumstances, where a clear market error has occurred. Yet no "error" occurred here, the prices in question
were properly established under the then existing Protocols. As a result, retroactively changing settled market prices for over 60 days of trading would seriously undermine the credibility of ERCOT. Just as damaging, making this resettlement decision four months after all prices were settled and final tells all market participants that ERCOT markets are unreliable and that rules and final prices can be ignored at will.

As a matter of law, the settled prices for Prices for Operating Days December 1, 2010 through February 1, 2011 were properly determined in accordance with ERCOT Protocols. There was no software or data error. While ERCOT may believe that its Protocols did not yield the most economically efficient outcomes on those days, the solution is not to retroactively resettle the market, but to modify the Protocols and pricing model so that different outcomes can be achieved in the future. Financial Marketers fully support efforts to reconsider Protocols that may need to be refined or modified. However, applying such changes on a retroactive basis is not a reasonable or lawful option.

For the reasons discussed more fully herein, Financial Marketers respectfully request that the planned resettlement be suspended and found unlawful. In support hereof, Financial Marketers aver the following:

I.

AUTHORIZED REPRESENTATIVES

Financial Marketers request that all communications and correspondence in regard to this matter be sent to Financial Marketers' authorized representatives and counsel of record, as set forth below:
II.

STATEMENT OF THE CASE

A. Underlying or Related Proceedings

In accordance with Rule 22.251(d), Financial Marketers state that, to their knowledge, there is no underlying proceeding or any prior or pending proceedings related to the issues raised by this Appeal and Complaint.

B. Identification of Affected Entities

Longhorn Energy LP ("Longhorn") and West Oaks Energy LLC ("West Oaks") are electric power marketers that conduct, or have conducted, financial transactions in ERCOT's Day-Ahead Market ("DAM") and Real-Time Market ("RTM"). Both Longhorn and West Oaks engaged in financial transactions in these markets during the period December 1, 2010 through February 1, 2011. Therefore, both Longhorn and West Oaks will be directly affected by the Commission's decision on this Appeal and Complaint.

All other entities that conducted DAM and/or RTM transactions in ERCOT during the period December 1, 2010 through February 1, 2011 may be directly affected by the Commission's decision on this Appeal and Complaint.
C. The Conduct from Which Relief Is Sought

Financial Marketers seek relief from a market resettlement ERCOT intends to conduct to implement what it refers to as "price corrections" in connection with certain De-Energized Buses.¹

D. Statement Regarding ERCOT Procedures, Protocols, By-Laws, Articles of Incorporation or Law Related to Resolution of Dispute

Under Sections 4.5.3 and 6.3 of the ERCOT Protocols, locational marginal prices ("LMPs") and Settlement Point Prices ("SPPs") cannot be altered retroactively unless they are shown to have been "significantly affected by a software or data error."²

Protocols 4.5.1 and 6.6.1 require ERCOT to determine the LMP and SPP for de-energized Electrical Buses by using heuristic rules applied in the following order:

(a) Use average LMP for Electrical Buses within the same station having the same voltage level as the de-energized Electrical Bus, if any exist.

(b) Use average LMP for all Electrical Buses within the same station, if any exist.

(c) Use system lambda.

Under Section 2 of the ERCOT Nodal Protocols, the term "Electric Bus" is defined as:

A physical transmission element defined in the Network Operations Model that connects, using breakers and switches, one or more: (a) Loads; (b) Lines; (c) Transformers; (d) Generators; (e) Capacitors; (f) Reactors; (g) Phase shifters; or (h) Other reactive control devices to the ERCOT Transmission Grid where there is negligible impedance between the connected Transmission Elements.³

¹ The ERCOT Board Report approving the market resettlement that is challenged here is included as Exhibit A.
² Statement by Mr. John Dumas, Director of Wholesale Market Operations for ERCOT; Dumas Memorandum is Exhibit B, at 1-2.
³ Emphasis added.
In accordance with Rule 22.251(c), Financial Marketers request a good cause waiver from the requirement to use the Alternative Dispute Resolution ("ADR") Procedures under Section 20 of the ERCOT Protocols, to the extent such requirement may be applicable here. Counsel for ERCOT has informed Financial Marketers that ERCOT waives its right to ADR on the subject of this Appeal and Complaint.

E. Statement on Whether Suspension Is Sought.

Financial Marketers request suspension of the planned market resettlement pending final resolution of this case.

F. Jurisdiction


III. STATEMENT OF ISSUES

(1) Whether the planned resettlement violates Sections 4.5.3 and 6.3 of the ERCOT Protocols.

(2) Whether the LMPs and SPPs for the Operating Days at issue were "significantly affected by a software or data error."

(3) Whether the heuristic rules under ERCOT Protocols were properly applied.

(4) Whether there were Electrical Buses within the same station as the de-energized Electrical Buses during the period December 1, 2010 through February 1, 2011.

(5) Whether ERCOT has legal authority to retroactively adjust the LMPs and SPPs by reference to the LMPs of Electrical Buses in the "next connected stations."

IV.
STATEMENT OF QUESTIONS OF FACT REQUIRING EVIDENTIARY HEARING

(1) Whether the LMPs and SPPs for the Operating Days at issue were "significantly affected by a software or data error."

(2) Whether there were Electrical Buses within the same station as the de-energized Electrical Bus during the period December 1, 2010 through February 1, 2011.

V.

STATEMENT OF THE FACTS

During the two-month resettlement period at issue, the ERCOT network model determined the LMP and SPP for de-energized Electrical Buses by using heuristic rules applied in the following order:

(a) Use average LMP for Electrical Buses within the same station having the same voltage level as the de-energized Electrical Bus, if any exist.

(b) Use average LMP for all Electrical Buses within the same station, if any exist.

(c) Use system lambda.

Thus, consistent with ERCOT rules, in instances in which there were no "Electrical Buses" within the same station, the LMP and SPP were determined using the system lambda.

On April 12, 2011, Mr. John Dumas, Director of Wholesale Market Operations for ERCOT, submitted a memorandum (the "Dumas Memorandum") to the ERCOT Board of Directors ("Board") recommending that the Board approve what Mr. Dumas referred to as "price corrections" of extensive DAM LMPs and SPPs for Operating Days December 1, 2010 through February 1, 2011, and RTM LMPs and SPPs for Operating Days December 1, 2010 though January 31, 2011.4

4 The Dumas Memorandum is attached hereto as Exhibit B.
The Dumas Memorandum proposed to make these so-called "price corrections" with respect to certain de-energized Settlement Points which were assigned LMPs of system lambda due to what the Dumas Memorandum calls "data error."

Financial Marketers submitted written comments to the ERCOT Board of Directors urging rejection of the proposed resettlement because the LMPs and SPPs were not, in fact, affected by "a software or data error." Financial Marketers also sent several requests to ERCOT Staff seeking clarification on the specific transactions proposed to be resettled and seeking information on the new prices to be imposed but no timely information was provided in response.

At the ERCOT Board's subsequent April 19, 2011 meeting, the Board summarily approved the proposed resettlement without addressing the comments submitted by Financial Marketers or the issues raised thereby.

Financial Marketers seek Commission suspension and a determination that the planned resettlement of the market violates ERCOT Protocols and is therefore unlawful.

VI.

ARGUMENT

A. The LMPs and SPPs on the Operating Days at Issue Were Correctly Determined in Accordance with ERCOT Protocols.

The ERCOT decision challenged here is unlawful because on the Operating Days at issue, ERCOT properly determined LMPs and SPPs in accordance with its Protocols applicable to de-energized Electrical Buses. Protocols 4.5.1 and 6.6.1 govern with specificity how LMPs and SPPs are to be determined with respect to a de-energized Electrical Bus. They require ERCOT to determine the LMP and SPP for de-energized Electrical Buses by using heuristic rules applied in the following order:
(a) Use average LMP for Electrical Buses within the same station having the same voltage level as the de-energized Electrical Bus, if any exist.

(b) Use average LMP for all Electrical Buses within the same station, if any exist.

(c) Use system lambda.

Accordingly, when there is a de-energized Electrical Bus, ERCOT is required to determine the LMP and SPP by reference to the prices of Electrical Buses within the same station. Whenever there are no "Electrical Buses" within the same station, ERCOT is required to determine the LMP and SPP using the system lambda. With respect to the de-energized Electrical Buses at issue here, ERCOT properly determined the LMPs and SPPs using the system lambda because there were, in fact, no other Electric Buses within the same station.

It is critical to note that the term "Electrical Buses" is a defined term under the ERCOT Protocols. Section 2 of the ERCOT Nodal Protocols defines an "Electrical Bus" as:

A physical transmission element defined in the Network Operations Model that connects, using breakers and switches, one or more: (a) Loads; (b) Lines; (c) Transformers; (d) Generators; (e) Capacitors; (f) Reactors; (g) Phase shifters; or (h) Other reactive control devices to the ERCOT Transmission Grid where there is negligible impedance between the connected Transmission Elements.\(^5\)

Thus, physical characteristics are not enough for a transmission element to be considered an Electrical Bus. To qualify as an Electrical Bus, a transmission element must also be specifically defined as such in the Network Operations Model.

During the Operating Days at issue, there were no other physical transmission elements "defined in the Network Operations Manual" as Electrical Buses that were located within the same station as the de-energized Electrical Buses. The Dumas Memorandum expressly acknowledges, "there were no other Electrical Buses in the station with which to calculate an

\(^5\) Emphasis added.
LMP." As Mr. Dumas further explained on page 20 of a March 22, 2011 presentation to the Board (attached hereto as Exhibit C), "The only 'Electrical Bus' in the model was dead; hence the system picked up 'System Lambda' as the Price." This is precisely how ERCOT's heuristic rules are designed to work.

The issue of whether there were other "physical transmission elements" in the same station that ERCOT could have defined as Electric Buses is inconsequential as a matter of law under ERCOT's Protocols. Only those transmission elements that were defined in the Network Operations Model qualified as Electric Buses under the heuristic rules. While ERCOT may now believe that its Network Operations Model would have worked more efficiently on the Operating Days at issue if it had defined more Electric Buses, that does not change the fact that the LMPs and SPPs were properly calculated under the market rules, and that under those rules there were no other "Electrical Buses" in the same station. Whether or not ERCOT liked the results under its Protocols and rules, there is no doubt that they were lawfully in effect and properly applied. Thus no "error" occurred.

There is no lawful basis for ERCOT's decision to effectively change its rules and Protocols on a retroactive basis. All market participants have a right to rely on ERCOT's market rules unless and until they are properly changed. ERCOT arbitrarily ignored over 60 days of settled market results and prices in order to implement a pricing result that is completely inconsistent with established rules and Protocols.

B. **The Proposed Resettlement Is Unlawful Because There Was No Software or Data Error.**

The decision challenged here is also unlawful because under Sections 4.5.3 and 6.3 of the ERCOT Protocols, ERCOT has no authority to retroactively adjust final LMPs and SPPs unless

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6 Dumas Memorandum at 1.
they are shown to have been "significantly affected by a software or data error." As described below, there is no evidence of any software or data error here. Thus, there is no basis on which the LMPs and SPPs could be lawfully modified retroactively.

The LMPs and SPPs at issue were correctly and properly determined in accordance with ERCOT Protocols. The mere fact that ERCOT may now wish to have defined certain "physical transmission elements" as Electrical Buses in its Network Operations Model does not convert its failure to have done so previously into a "software or data error." Importantly, ERCOT has not shown or even claimed that its software failed to properly apply the heuristic rules set forth in the Protocols. Nor has ERCOT shown or claimed that Electrical Buses within the same station were missed, or that the system lambda used was incorrect. In addition, the buses at issue were not treated as de-energized due to any software or data error. The buses were, in fact, de-energized as a physical matter due to a variety of factors, including generation and transmission outages.

There is simply no legitimate basis on which one could claim that not having defined more Electrical Buses in the Network Operations Manual was a software or data error. Testing of the CIM network model began in August 2009, more than a year before the nodal market went online in December 2010. In addition, Transmission Service Providers ("TSPs") review and update the ERCOT model on a daily basis. If anyone thought it beneficial to define additional Electrical Buses in the Network Operations Manual, there was ample time to do so before the Operating Days at issue. Yet, no one did. Thus, ERCOT cannot legitimately claim that the LMPs and SPPs were affected by a software or data error.

C. **ERCOT Has No Authority to Recalculate Prices the Way It Plans.**

While it may be appropriate for ERCOT to refine its Network Operations Model to yield arguably more economically efficient market outcomes in the future, such changes in thinking

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7 Dumas Memorandum at 1-2.
and policy cannot be used to effect settled market prices and results. There is simply no basis under the ERCOT Protocols for ERCOT to retroactively adjust the LMPs and SPPs by reference to the Electrical Buses in the "next connected stations," as ERCOT plans to do here.\(^8\) ERCOT's heuristic rules do not allow for the calculation of LMPs and SPPs in this manner. In fact, there is no reference in the Protocols whatsoever to using the LMPs from the "next connected stations."

Where, as here, there were no transmission elements within the same station that met the definition of Electrical Bus, the LMP is required to be determined using the system lambda. That is what ERCOT properly did, and now tries to change retroactively.

ERCOT does not even purport to have authority to price LMPs and SPPs by reference to the LMPs of Electrical Buses in the "next connected stations." The ERCOT Board's April 19, 2011 approval of NPRR 339, which is attached hereto as Exhibit A, clearly shows that ERCOT realizes it does not now have the authority to do that which it plans to do through this resettlement. In that NPRR, ERCOT proposes to revise the heuristic rules it uses to assign an LMP to de-energized Electrical Buses for use in the calculation of DAM SPPs and RTM SPPs. Specifically, ERCOT proposes to add a new first step, such that before applying the currently effective heuristic rules, ERCOT can "use an appropriate LMP predetermined by ERCOT as applicable to a specific Electric Bus." (Exhibit C at 7-8). The addition of this new step is an acknowledgement by ERCOT that it currently has no authority to price LMPs the way it intends as part of the announced market resettlement.

D. **If ERCOT Did Not Believe Its Model Produced the Most Economically Efficient Prices, the Lawful Solution Was to Refine the Model, Not Retroactively Change Settled Market Results.**

Financial Marketers fully support the desire of ERCOT to make the market work in an economically efficient manner. Indeed, financial transactions contribute greatly to this cause.

\(^8\) *See Dumas Memorandum at 2.*
However, Financial Marketers cannot support retroactive changes to final prices. Such changes are unpermitted under ERCOT Protocols and would be extremely disruptive and harmful to the market.

If the ERCOT market is going to foster vibrant participant and function efficiently, it is critical that retroactive changes to final prices be few and far between. Only in instances of real software or data error should retroactive changes be even considered. It is only in those instances that retroactive changes can be permitted.

Market participants are lawfully entitled to rely on ERCOT’s nodal Protocols. Those Protocols were properly applied on the Operating Days at issue, without any software or data error. Thus, those market participants that conducted transactions on those days have a lawful right to retain any revenues they received.

Undoubtedly, market rules can always be fine-tuned and improved in ways that may produce more desirable market outcomes. But that does not mean ERCOT should be permitted to adjust the rules retroactively to reflect what the system operator now believes the rules should have been, particularly where, as here, there is no protocol authorizing the very action ordered. The fact that pricing at system lambda in accordance with established Protocols may have yielded market outcomes that were less economically efficient than desirable might justify modifications to ERCOT’s Network Operations Model in the future, but it is no basis for changing prices retroactively.

ERCOT has, in fact, taken action to address its concerns with the Protocols in effect during the period at issue here on a prospective basis. On January 31, 2011, ERCOT changed the network model by adding 609 new Electrical Buses.9 All of these newly added buses have been added for the sole purpose of reducing the frequency in which the ERCOT De-Energized

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9 Dumas Memorandum at 1.
Bus heuristics rules result in pricing at system lambda. Thus, the claimed economic inefficiency that ERCOT is concerned about has been addressed prospectively with a refinement to ERCOT's model. No retroactive resettlement is warranted or lawful.

E. The Proposed Resettlement Would Greatly Harm the Market and be Contrary to the Public Interest.

Promoting vibrant participation by financial marketers and other participants in ERCOT's nodal market is essential to the success of that market. It is critical that the Commission not lose sight of the fact that all market participants must be able to rely on established Protocols and prices. If the Nodal Market is to achieve sufficient trading volumes to promote efficient market operations, ERCOT must be focused on ways to attract participation, not on unwarranted measures that will increase uncertainty and thereby discourage market entry and trading.

Allowing ERCOT to conduct its planned two-month resettlement would be extremely detrimental to the public interest, establishing the worst possible precedent. Changing over 60 days of market results is likely to result in a decline in virtual trading and liquidity that would allow generators to regain market power, undercutting one of the major reasons for instituting virtual trading to begin with. The planned ERCOT action also would create market mitigation issues for the market monitor and send poor pricing and investment signals to the market. Furthermore, it would provide an opportunity for market manipulation issues resulting from the lack of competition faced by generators. Generators would have the ability to raise their offer prices, and load-serving entities would be forced to pay a higher price for energy. This would adversely affect the overall market and be contrary to the public interest.

It is difficult to overstate how the day-ahead market would be affected by a large exodus of financial traders and a sharp reduction in virtual trading. Just as important, it would send a signal to the many companies watching this new market to see how it performs that they should
avoid entering the ERCOT market because it is unreliable, a place where market results can be changed months after participants reasonably concluded their prices were final. This loss of trading by existing and potential financial participants would be extremely harmful to consumers in Texas, removing a key competitive element. As Mr. Andrew Ott, PJM's Senior Vice President of Markets, was quoted as saying in *Platts Megawatt Daily*, "[I]f we did not have financial participation, we might as well shut [the PJM day-ahead market] down. Essentially, the market could not function without financial participation, period."\(^{10}\) In the same article, PJM's market monitor, Joe Bowring, was quoted as saying that "it would be difficult to imagine" day-ahead markets operating effectively without participation by financial players.\(^{11}\) The same most certainly holds true for ERCOT's day-ahead market, allowing the proposed resettlement of over 60 days of trading results simply because ERCOT does not like the result produced by its Protocols is both unlawful and contrary to the public interest..

**VII.**

**MOTION FOR SUSPENSION**

P.U.C. Proc. R. 22.251(i) provides that the Commission may, upon demonstration of good cause, issue an order "on such terms as may be reasonable to preserve the rights and protect the interests of the parties during the processing of the complaint." Good cause exists to grant Financial Marketers request for suspension of the planned market resettlement.

Counsel for ERCOT has informed Financial Marketers that ERCOT will not oppose this request to suspend the resettlement pending final resolution of the case.

Without a suspension, ERCOT may very quickly conduct the planned market resettlement, which will result in substantial debits to the accounts of Financial Marketers and

\(^{10}\) *Platts Megawatt Daily* at 7 (Nov. 14, 2008).

\(^{11}\) *Id.*
many other market participants, and credits to the accounts of others. Such a resettlement would be very detrimental and disruptive to the market and would deprive Financial Marketers and others of significant amounts of collateral, limiting the volume of trades they will be able to conduct. If the resettlement is later found to have been unlawful and in violation of ERCOT Protocols, a second resettlement would be required further disrupting the market. Financial Marketers and the other market participants who were deprived of collateral would have no way of recouping the lost profits from the period between resettlements. Further, the harm to the ERCOT markets themselves would be irreparable because there is no way to correct for the many trades that did not occur due to market uncertainty and the loss of trading capital by Financial Marketers and others.

For the reasons set forth above, Financial Marketers request that the Commission expeditiously consider and grant this motion and suspend implementation of the planned market resettlement.
VIII.

CONCLUSION

WHEREFORE, for the foregoing reasons, Financial Marketers respectfully request suspension of the planned market resettlement and a determination that the resettlement would be unlawful and in violation of ERCOT Protocols.

Respectfully submitted,

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Attorneys for
Longhorn Energy LP
West Oaks Energy LLC

DATED: May 23, 2011
CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing document and attached exhibits was served on ERCOT's General Counsel and the Office of Public Utility Counsel by overnight delivery on this 23rd day of May, 2011. In addition, a copy was furnished electronically to ERCOT's General Counsel, Mr. Bill Magness, via e-mail.

Carol A. Smoots
Exhibit A
# Board Report

<table>
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<tr>
<th>NPRR Number</th>
<th>NPRR Title</th>
<th>Modifications to Heuristic Rules to Determine LMP at De-energized Electrical Bus and Treatment of CRR Offers at De-energized Settlement Points</th>
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<th>Priority and Rank Assigned</th>
<th>Nodal Protocol Sections Requiring Revision</th>
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<td>April 19, 2011</td>
<td>Upon system implementation.</td>
<td>Priority – Critical; Rank – 9.3</td>
<td>4.4.5, CRR Offers</td>
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<td>4.5.1, DAM Clearing Process</td>
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<td>6.6.1, Real-Time Settlement Point Prices</td>
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<th>Revision Description</th>
<th>Reason for Revision</th>
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<td>This Nodal Protocol Revision Request (NPRR): (a) Extends the heuristic rules to determine the Locational Marginal Price (LMP) at de-energized Electrical Buses; and (b) Changes the treatment of Congestion Revenue Right (CRR) offers when either the source or sink Settlement Point is de-energized in the Day-Ahead Market (DAM).</td>
<td>(a) The current Protocol language for determining the LMP at de-energized Electrical Buses using heuristic rules prevents ERCOT from correcting the LMP when the heuristic rules fail under certain scenarios. This NPRR will allow ERCOT the ability to quickly respond to correct deficiencies found in the heuristic rules to determine LMPs at de-energized Electrical Buses. (b) Currently, CRR offers submitted at de-energized Settlement Points are not awarded in the DAM, no matter what the clearing prices are, and the CRRs settle at Real-Time prices. This NPRR provides that CRR offers submitted at de-energized Settlement Points will always settle at Day-Ahead prices. This is consistent with the treatment of Point-to-Point (PTP) Obligation bids in the DAM, which are not awarded in this scenario, such that no Qualified Scheduling Entity (QSE) can purchase a Real-Time congestion hedge when either the source or sink Settlement Point is de-energized in the DAM.</td>
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<tr>
<th>Overall Market Benefit</th>
<th>Overall Market Impact</th>
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<tr>
<td>(a) Reduces Real-Time Revenue Neutrality Allocation to QSEs with Load due to excessive payout of PTP Obligation awards in Real-Time that are not related to congestion but due to flaws in the heuristic rules to determine LMPs at de-energized Electrical Buses. (b) Reduces Real-Time Revenue Neutrality Allocation to QSEs with Load.</td>
<td>(a) Reduces Real-Time Revenue Neutrality Allocation to QSEs with Load. (b) Non-Opt-In Entities (NOIEs) cannot settle a CRR at Real-Time</td>
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Board Report

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<th>Consumer Impact</th>
<th>None.</th>
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<tr>
<td>Credit Impacts</td>
<td>ERCOT Credit Staff and the Credit Work Group (Credit WG) have reviewed NPRR339 and do not believe that it requires changes to credit monitoring activity or the calculation of liability.</td>
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| Procedural History | ➢ On 3/18/11, NPRR339 and a preliminary Impact Analysis were posted.  
➢ On 3/23/11, the motion to grant NPRR339 Urgent status failed via PRS e-mail vote.  
➢ On 3/24/11, PRS considered NPRR339.  
➢ On 4/4/11 PRS comments were posted.  
➢ On 4/4/11, a Cost Benefit Analysis was posted.  
➢ On 4/7/11, TAC considered NPRR339.  
➢ On 4/19/11, the ERCOT Board considered NPRR339. |
| PRS Decision | On 3/24/11, PRS voted to grant NPRR339 Urgent status. There was one abstention from the Independent Power Marketer (IPM) Market Segment. PRS then unanimously voted to recommend approval of NPRR339 as submitted, to recommend a priority of Critical and a rank of 9.3, and to forward NPRR339 to TAC. All Market Segments were present for the vote. |
| Summary of PRS Discussion | On 3/24/11, there was no discussion. |
| TAC Decision | On 4/7/11, TAC unanimously voted to recommend approval of NPRR339 as recommended by PRS in the 3/24/11 PRS Report. All Market Segments were present for the vote. |
| Summary of TAC Discussion | On 4/7/11, there was no discussion. |
| Board Decision | On 4/19/11, the ERCOT Board approved NPRR339 as recommended by TAC in the 4/7/11 TAC Report. |

### Quantitative Impacts and Benefits

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<th>Assumptions</th>
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<td>NOIEs cannot settle a CRR at Real-Time prices if the source or sink is de-energized.</td>
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Board Report

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<th>Reduces Real-time Revenue Neutrality Allocation to QSEs with Load.</th>
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Sponsor

<table>
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<tr>
<th>Name</th>
<th>Sai Moorthy</th>
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Market Rules Staff Contact

<table>
<thead>
<tr>
<th>Name</th>
<th>Jonathan Levine</th>
</tr>
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<tbody>
<tr>
<td>E-Mail Address</td>
<td><a href="mailto:jlevine@ercot.com">jlevine@ercot.com</a></td>
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CommentsReceived

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<td>PRS 040411</td>
<td>Endorsed the draft Cost Benefit Analysis as presented to PRS on 4/1/11.</td>
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Comments

Please note that the following NPRRs also propose revisions to Section 4.5.1:

NPRR316, Negative Self-Arranged Ancillary Services Quantity
NPRR322, Real-Time PTP Option Modeling
4.4.5  **CRR Offers**

1. A Congestion Revenue Right (CRR) offer is the information for an offer by a CRR Account Holder to sell CRRs that it owns in the Day-Ahead Market (DAM).

2. All CRRs held by CRR Account Holders are settled based on applicable DAM Settlement prices, except for Point-to-Point (PTP) Options and PTP Options with Refund that have been declared by a Non-Opt-In Entity (NOIE) before DAM execution to be settled in Real-Time and are still held by that NOIE in Real-Time.

3. PTP Options and PTP Options with Refund that are declared by NOIEs for Real-Time Settlement may specify an offer price (Minimum Reservation Price) in the DAM. If no Minimum Reservation Price is specified, ERCOT shall assign a default value of $2,000 per MW per hour, as an offer in the DAM. If such an offer clears in the DAM, it is settled as part of the DAM and is not carried to Real-Time.

4. If either the source or the sink Settlement Point identified in the CRR offer is de-energized in the base case for a given hour in the DAM, then the PTP Option or PTP Option with Refund declared in the CRR offer is settled in the DAM and is not carried to Real-Time.

4.5.1  **DAM Clearing Process**

1. At 1000 in the Day-Ahead, ERCOT shall start the Day-Ahead Market (DAM) clearing process.

2. Prior to execution of the DAM, ERCOT shall complete a Day-Ahead Simultaneous Feasibility Test. This test uses the Day-Ahead Updated Network Model topology and evaluates all Congestion Revenue Rights (CRRs) for feasibility to determine hourly oversold quantities.

3. The purpose of the DAM is to economically and simultaneously clear offers and bids described in Section 4.4, Inputs into DAM and Other Trades.

4. The DAM uses a multi-hour mixed integer programming algorithm to maximize bid-based revenues minus the offer-based costs over the Operating Day, subject to security and other constraints, and ERCOT Ancillary Service procurement requirements.

   a. The bid-based revenues include revenues from DAM Energy Bids and Point-to-Point (PTP) Obligation Bids.

   b. The offer-based costs include costs from the Startup Offer, Minimum Energy Offer, and Energy Offer Curve of any Resource that submitted a Three-Part
Board Report

Supply Offer, DAM Energy-Only Offers, CRR Offers, and Ancillary Service Offers.

(c) Security constraints specified to prevent DAM solutions that would overload the elements of the ERCOT Transmission Grid include the following:

(i) Transmission constraints – transfer limits on energy flows through the ERCOT Transmission Grid, e.g., thermal or stability limits. These limits must be satisfied by the intact network and for certain specified contingencies.

These constraints may represent:

(A) Thermal constraints – protect Transmission Facilities against thermal overload.

(B) Generic constraints – protect the ERCOT Transmission Grid against transient instability, dynamic stability or voltage collapse.

(C) Power flow constraints – the energy balance at required Electrical Buses in the ERCOT Transmission Grid must be maintained.

(ii) Resource constraints – the physical and security limits on Resources that submit Three-Part Supply Offers:

(A) Resource output constraints – the Low Sustained Limit (LSL) and High Sustained Limit (HSL) of each Resource; and

(B) Resource operational constraints – includes minimum run time, minimum down time, and configuration constraints.

(iii) Other constraints –

(A) Linked offers – the DAM may not select any one part of that Resource capacity to provide more than one Ancillary Service or to provide both energy and an Ancillary Service in the same Operating Hour. The DAM may, however, select part of that Resource capacity to provide one Ancillary Service and another part of that capacity to provide a different Ancillary Service or energy in the same Operating Hour, provided that a Generation Resource may not offer, and the DAM may not select, linked Energy and Off-Line Non-Spinning Reserve (Non-Spin) Ancillary Service offers in the same Operating Hour.

(B) The sum of the awarded Ancillary Service capacities for each Resource must be within the Resource limits specified in the Current Operating Plan (COP) and Section 3.18, Resource Limits.
Board Report

in Providing Ancillary Service, and the Resource parameters as described in Section 3.7, Resource Parameters.

(C) Block Ancillary Service Offers for a Load Resource – blocks will not be cleared unless the entire quantity block can be awarded.

(D) Block CRR Offers and PTP Obligation Bids – blocks will not be cleared unless the entire time block can be awarded.

(E) Combined Cycle Generation Resources – The DAM may commit a Combined Cycle Generation Resource in a time period that includes the last hour of the Operating Day only if that Combined Cycle Generation Resource can transition to a shutdown condition in the DAM Operating Day.

(d) Ancillary Service needs for each Ancillary Service include the needs specified in the Ancillary Service Plan that are not part of the Self-Arranged Ancillary Service Quantity and that must be met from available DAM Ancillary Service Offers while co-optimizing with DAM Energy Offers. ERCOT may not buy more of one Ancillary Service in place of the quantity of a different service. See Section 4.5.2, Ancillary Service Insufficiency, for what happens if insufficient Ancillary Service Offers are received in the DAM.

\[NPR131: Replace paragraph (4)(d) above with the following upon system implementation.\]

(d) Ancillary Service needs for each Ancillary Service include the needs specified in the Ancillary Service Plan that are not part of the Self-Arranged Ancillary Service Quantity plus the quantity of Ancillary Service Trades with ERCOT, and that must be met from available DAM Ancillary Service Offers while co-optimizing with DAM Energy Offers. ERCOT may not buy more of one Ancillary Service in place of the quantity of a different service. See Section 4.5.2, Ancillary Service Insufficiency, for what happens if insufficient Ancillary Service Offers are received in the DAM.

(5) ERCOT shall determine the appropriate Load distributions to allocate offers, bids, and source and sink of CRRs at a Load Zone across the Electrical Buses that are modeled with Load in that Load Zone. The default distribution is the State Estimator hourly distribution for the seven days before the Operating Day. If ERCOT decides, in its sole discretion, to change this distribution for reasons such as anticipated weather events or holidays, ERCOT shall select a State Estimator distribution from a proxy day reasonably reflecting the anticipated distribution in the Operating Day. ERCOT may also modify this distribution to account for predicted differences in network topology between the proxy day and Operating Day. ERCOT shall develop a methodology, subject to Technical Advisory Committee (TAC) approval, to describe the modification of the proxy day bus-load distribution for this purpose.
Board Report

(6) ERCOT shall allocate offers, bids, and source and sink of CRRs at a Hub using the distribution factors specified in the definition of that Hub in Section 3.5.2, Hub Definitions.

(7) A Resource that has a Three-Part Supply Offer cleared in the DAM may be eligible for Make-Whole Payment of the Startup Offer and Minimum Energy Offer submitted by the Qualified Scheduling Entity (QSE) representing the Resource under Section 4.6, DAM Settlement.

(8) The directional network element flows for PTP Options declared for Settlement in Real-Time must be properly accounted for in determining available transmission network capacity in the DAM. In the event the available transmission capability in the DAM cannot accommodate all PTP Options declared for Settlement in Real-Time, any PTP Option declared for Settlement in Real-Time that impacts overloaded directional network elements must be appropriately derated for DAM modeling purposes only, in proportion to that impact. The derated MW of PTP Options declared for Settlement in Real-Time will be settled in the DAM if their Minimum Reservation Prices are less than or equal to the DAM prices for corresponding PTP Options. Otherwise, the derated MW will be settled in Real-Time.

(9) The DAM Settlement is based on hourly MW awards and on Day-Ahead hourly Settlement Point Prices. All PTP Options settled in the DAM are settled based on the Day-Ahead Settlement Point Prices. ERCOT shall assign a Locational Marginal Price (LMP) to de-energized Electrical Buses for use in the calculation of the Day-Ahead Settlement Point Prices by using heuristic rules applied in the following order:

(a) Use an appropriate LMP predetermined by ERCOT as applicable to a specific Electrical Bus; or if not so specified

(b) Use the following rules in order:

(ij) Use average LMP for Electrical Buses within the same station having the same voltage level as the de-energized Electrical Bus; if any exist.

(ii) Use average LMP for all Electrical Buses within the same station, if any exist.

(iii) Use system lambda.

(10) The Day-Ahead Market Clearing Price for Capacity (MCPC) for each hour for each Ancillary Service is the Shadow Price for that Ancillary Service for the hour as determined by the DAM algorithm.

(11) If the Day-Ahead MCPC cannot be calculated by ERCOT, the Day-Ahead MCPC for the particular Ancillary Service is equal to the Day-Ahead MCPC for that Ancillary Service in the same Settlement Interval of the preceding Operating Day.
Board Report

(12) If the Day-Ahead Settlement Point Prices cannot be calculated by ERCOT, all CRRs shall be settled based on Real-Time Prices. Settlements for all CRRs shall be reflected on the Real-Time Settlement Statement.

6.6.1 Real-Time Settlement Point Prices

Real-Time energy Settlements use Real-Time Settlement Point Prices that are calculated for Resource Nodes, Load Zones, and Hubs. ERCOT shall assign a Locational Marginal Price (LMP) to de-energized Electrical Buses for use in the calculation of the Real-Time Settlement Point Prices by using heuristic rules applied in the following order:

(a) Use an appropriate LMP predetermined by ERCOT as applicable to a specific Electrical Bus; or if not so specified

(b) Use the following rules in order:

(i) Use average LMP for Electrical Buses within the same station having the same voltage level as the de-energized Electrical Bus, if any exist.

(ii) Use average LMP for all Electrical Buses within the same station, if any exist.

(iii) Use system lambda.
Exhibit B
Date: April 12, 2011
To: Board of Directors
From: John Dumas, Director of Wholesale Markets Operations, ERCOT
Subject: Price Corrections for De-energized Settlement Points in Day-Ahead Market (DAM) and RTM Market (RTM) affected by Data Error

**Issue for the ERCOT Board of Directors**

**ERCOT Board of Director Meeting Date:** April 19, 2011  
**Agenda Item No.:** 16a

**Issue:**  
Pursuant to paragraph 5 of Protocol Section 4.5.3, Communicating DAM Results, and paragraph 4 of Nodal Protocol Section 6.3, Adjustment Period and RTM Operations Timeline, whether the ERCOT Board of Directors (Board) should approve price corrections for DAM Locational Marginal Prices (LMPs) and Settlement Point Prices for Operating Days December 1, 2010 through February 1, 2011, and RTM LMPs and Settlement Point Prices for Operating Days December 1, 2010 through January 31, 2011, for de-energized Settlement Points (including Resource Nodes and DC Tie Load Zones) which were assigned LMPs equal to system lambda due to data error.

**Background/History:**  
The network models used by the DAM for Operating Days December 1, 2010 to February 1, 2011, and by the RTM for Operating Days December 1, 2010 to January 31, 2011, did not contain a sufficient number of Electrical Buses to properly implement the pricing heuristics described in paragraph 9 of Protocol Section 4.5.1, DAM Clearing Process, and paragraph 9 of Protocol Section 6.6.1, RTM Settlement Point Prices. In many stations where Settlement Points became de-energized, there were no other Electrical Buses in the station with which to calculate an LMP. In those cases, the heuristic rules required the Settlement Point to be assigned an LMP of system lambda. This data error resulted in inappropriate DAM LMPs and Settlement Point Prices and inappropriate RTM LMPs and Settlement Point Prices for many Settlement Intervals during the affected Operating Days. On January 31, 2011, ERCOT corrected this data error for all future Operating Days by adding 609 new Electrical Buses to the model.

The December 1, 2010 version of Paragraph 5 of Protocol Section 4.5.3 states the following:

All DAM LMPs, Market Clearing Prices for Capacity (MCPCs), and Settlement Point Prices are final at 1000 of the next Business Day after the Operating Day. After DAM LMPs, MCPCs, and Settlement Point Prices are final, if ERCOT determines that prices are in need of correction, it shall notify Market Participants and describe the need for such correction. DAM LMPs, MCPCs, and Settlement Point Prices cannot be changed unless the ERCOT Board finds that the DAM LMPs, MCPCs, or Settlement Point Prices are significantly affected by a software or data error.

The December 1, 2010 version of Paragraph 4 of Protocol Section 6.3 states the following:
All RTM LMPs, Supplementary Ancillary Service Market (SASM) MCPCs, and RTM Settlement Point Prices are final at 1600 of the next Business Day after the Operating Day. After RTM LMPs, SASM MCPCs, and RTM Settlement Point Prices are final, if ERCOT determines that prices are in need of correction, it shall notify Market Participants and describe the need for such correction. RTM LMPs, SASM MCPCs, and RTM Settlement Point Prices cannot be changed unless the ERCOT Board finds that the RTM LMPs, SASM MCPCs, or RTM Settlement Point Prices are significantly affected by a software or data error.

ERCOT discovered this data error in January and added the new Electrical Buses on January 31, 2011. By the time the new buses were added, DAM LMPs and Settlement Point Prices and RTM LMPs and Settlement Point Prices had already become final under the ERCOT Protocols. Thus, on March 31, 2011, ERCOT issued a Market Notice announcing ERCOT’s intention to remedy these data errors by requesting a price correction at the next regularly scheduled Board meeting. Pursuant to paragraph 5 of Protocol Section 4.5.3 and paragraph 4 of Protocol Section 6.3, ERCOT staff recommends that the Board authorize ERCOT to correct DAM LMPs and Settlement Point Prices for Operating Days December 1, 2010 through February 1, 2011, and RTM LMPs and Settlement Point Prices for Operating Days December 1, 2010 through January 31, 2011, for de-energized Settlement Points which were assigned LMPs equal to system lambda, because such prices were significantly affected by a data error.

Since these new Electrical Buses and their respective LMPs were not implemented before February 1, 2011, ERCOT recommends assigning an appropriate LMP and recalculating the Settlement Point Price based on the new LMP for each Security Constrained Economic Dispatch (SCED) interval in which Settlement Points were de-energized. ERCOT recommends that the appropriate LMP be determined by using the average of the LMPs of Electrical Buses that were energized in that interval in the next connected stations.

To allow for any appeal of the Board’s decision, ERCOT staff would begin resettlement of the impacted Operating Days no earlier than 36 days after the Board issues a Resolution authorizing these price corrections.

ERCOT staff’s recommended price corrections for DAM LMPs and Settlement Point Prices for Operating Days December 1, 2010 through February 1, 2011 are being sent to Board members via email communication. ERCOT staff is finalizing the calculation of the RTM LMPs and Settlement Point Prices for Operating Days December 1, 2010 through January 31, 2011, and will email those data to the Board as soon as they are available. All data will be posted to the Board’s webpage on the ERCOT website.

**Key Factors Influencing Issue:**
Due to a data error, some of the de-energized Settlement Points were inaccurately assigned LMPs equal to system lambda during Operating Days December 1, 2010 through February 1, 2011, which resulted in inappropriate DAM LMPs and Settlement Point Prices for Operating Days December 1, 2010 through February 1, 2011, and inappropriate RTM LMPs and Settlement Point Prices for Operating Days December 1, 2010 through January 31, 2011. Since these prices are considered final under the ERCOT Protocols, ERCOT staff recommends that
the Board approve price corrections for the affected DAM and RTM Settlement Intervals.

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<td>1. Approve the ERCOT staff recommendation on the price corrections as described above or as modified by the Board;</td>
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<td>2. Reject the ERCOT staff recommendation on the price corrections;</td>
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<td>3. Defer decision on the price corrections; or</td>
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<td>4. Instruct ERCOT staff to consider further information on the price corrections.</td>
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<th>Conclusion/Recommendation:</th>
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<td>As more specifically described above, ERCOT staff recommends that the Board approve the price corrections of DAM LMPs and Settlement Point Prices for Operating Days December 1, 2010 through February 1, 2011, and RTM LMPs and Settlement Point Prices for Operating Days December 1, 2010 through January 31, 2011, for de-energized Settlement Points which were assigned LMPs of system lambda due to data error.</td>
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WHEREAS, paragraph 5 of the December 1, 2010 version of Nodal Protocol Section 4.5.3, Communicating Day-Ahead Market (DAM) Results, authorizes the ERCOT Board of Directors (Board) to approve price corrections only upon a finding that DAM Locational Marginal Prices (LMPs), Market Clearing Price for Capacity (MCPCs), and Settlement Point Prices have been significantly affected by a software or data error;

WHEREAS, paragraph 4 of the December 1, 2010 version of Nodal Protocol Section 6.3, Adjustment Period and Real-Time Market (RTM) Operations Timeline, authorizes the ERCOT Board of Directors (Board) to approve price corrections only upon a finding that RTM LMPs, Supplemental Ancillary Services Market (SASM) MCPCs, and Settlement Point Prices have been significantly affected by a software or data error;

WHEREAS, the Board deems it desirable and in the market’s best interest to correct DAM LMPs and Settlement Point Prices for Operating Days December 1, 2010 through February 1, 2011 and RTM LMPs and Settlement Point Prices for Operating Days December 1, 2010 through January 31, 2011 for de-energized Settlement Points which were assigned LMPs equal to system lambda due to data error;

THEREFORE BE IT RESOLVED that the Board hereby authorizes ERCOT staff to implement the appropriate price corrections no earlier than 36 days after the date this Resolution is adopted.

CORPORATE SECRETARY’S CERTIFICATE

I, Bill Magness, Corporate Secretary of ERCOT, do hereby certify that, at its April 19, 2011 meeting, the ERCOT Board passed a motion approving the above Resolution by __________.

IN WITNESS WHEREOF, I have hereunto set my hand this ___ day of April, 2011.

Bill Magness
Corporate Secretary
Exhibit C
Wholesale Market Operations Update

John Dumas
Director Wholesale Market Operations

ERCOT Board of Directors
March 22, 2011
Day-Ahead Schedule

Average DAM Schedule During February 2011

- Hedged Energy exceeded the day ahead load forecast on average for all 24 hours
- Indicating a conservative approach

Acronym: TPO - Three Part Offer; EOO – Energy Only Offer;
Hedged Energy = Energy purchased /sold in Day-Ahead Market plus Point –to-Point Obligations and Options carried forward to real-time.
Day-Ahead Electricity And Ancillary Service Hourly Average Prices

February 2011

- Compared to Dec 2010 and Jan 2011, Energy Prices and Ancillary Service Prices for Feb 2010 were much higher on average due to a few days of extreme weather condition during that month.
Day-Ahead Vs Real-Time Load Zone SPP (Hourly Average)

Load Zone West Prices February 2011

Price ($/MWh)

$0 $50 $100 $150 $200

Hour 1 3 5 7 9 11 13 15 17 19 21 23

Load Zone North Prices

Price ($/MWh)

$0 $50 $100 $150 $200

Hour 1 3 5 7 9 11 13 15 17 19 21 23

Load Zone South Prices

Price ($/MWh)

$0 $50 $100 $150 $200 $250 $300

Hour 1 3 5 7 9 11 13 15 17 19 21 23

Load Zone Houston Prices

Price ($/MWh)

$0 $50 $100 $150 $200

Hour 1 3 5 7 9 11 13 15 17 19 21 23

- Average of DASPP
- Average of RTSPP

- Day Ahead prices and Real-Time prices were closely correlated and follow the load profile.
- Real-Time prices were slightly higher on peak hours due to ramp rate and transmission constraints.
- Compared to Dec 2010 and Jan 2011, Load Zone SPPs of Feb 2010 were much higher on average during peak hours due to a few days of extreme weather condition in that month.
Day-Ahead vs Real-Time HUB SPP (Hourly Average)

February 2011

**Hub West Prices**

![Graph showing Hub West Prices]

**Hub North Prices**

![Graph showing Hub North Prices]

**Hub South Prices**

![Graph showing Hub South Prices]

**Hub Houston Prices**

![Graph showing Hub Houston Prices]

- Day Ahead prices and Real-Time prices were closely correlated and follow the load profile.
- Real-Time prices were slightly higher on peak hours due to transmission and ramp rate constraints.
- Compared to Dec 2010 and Jan 2011, Load Zone SPPs of Feb 2010 were much higher on average during peak hours due to a few days of extreme weather condition in that month.
Day-Ahead Vs Real-Time Hub Average SPP (Hourly Average)

February 2011

- The average real-time and day-ahead prices for the four Hubs
- Day Ahead prices follow the hourly load profile more closely than real-time prices
- Real-Time prices are dependent on real-time ramp rate capability
- Compared to Dec 2010 and Jan 2011, average Hub SPPs of Feb 2010 were much higher at peak hours due to a few days of extreme weather condition during that month.

ERcot March 22, 2011
Day-Ahead Vs Real-Time Cumulative Average

Simple Average Prices During Dec 2010 and Jan & Feb 2011

- Day Ahead prices and Real-Time prices converged nicely after the first few days of the market open.
- Due to extreme weather condition happened in early February,
  - The simple average prices of February were much higher than the other two months.
  - The average RT prices were higher than the average DAM prices.

ERCOT
March 22, 2011
Day-Ahead Vs Real-Time Cumulative Average SPP

Simple Average Prices During February 2011

- The under generation in Real Time due to extreme weather caused most of the price divergence during first week of February.
The table shows the RT load weighted average prices for Load Zones for February. Due to extreme weather condition that happened in early February, the load weighted average RT SPPs were higher than the load weighted average DAM SPPs.
Load Weighted Average SPP

Jan and Feb 2011

- Due to extreme weather condition that happened in early February, the load weighted average DAM and RT SPPs of February were much higher than January.
Load Weighted Average SPP

Dec 2010 and Jan & Feb 2011

- Due to extreme weather condition that happened in early February, the load weighted average DAM and RT SPPs of February were much higher than the last two months.
DRUC

- 27 executions (4 published after 1600; 0 published after 1800)
- DRUC ran on 02/04 for OD 02/05 missed due to DAM solution delay
- 21 min average execution time
- Resource commit/decommit
  - 113676 MWh committed (37 resources for 536 hours)
  - no DRUC de-commitment

---

**Net committed capacity in DRUC (Feb 2011)**

---

**DRUC Average QSE scheduled capacity/load forecast (Feb 2011)**

---

**LD_FCST_MW**  **SCHED_HSL_MW**  **SCHED_HASL_MW**
HRUC

- 664 executions (8 missed)
- 15 min average execution time
- Resource commit/de-commit
  - no HRUC de-commitment

Net committed capacity in HRUC (Feb 2011)
Supplemental Ancillary Service Market (SASM)

- 9 SASMs were run in February, 2011
  - 2 for undeliverable AS
  - 7 for AS failure to provide

Count of SASMs for Undeliverability by Hour in Feb 2011

Count of SASMs for Failure to Provide by Hour in Feb 2011
CRR Auction for Operating Month February 2011

- 158,560 Bids
- 23,660 Auction Awards
  - 781,075.6 MW
    - 262,344.2 Peak WD
    - 258,940.8 Peak WE
    - 259,790.6 Off-peak
- Total Auction/Allocation Revenue = $15,110,237.27
## CRR Price Convergence

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<td>Convergence (Value/Cost)</td>
<td>534%</td>
<td>109%</td>
<td>99%</td>
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Nodal Market Challenges after Three Months of Operations

- **Weighted Average LMP different at electrically close locations when congestion doesn’t exist**
  - Addressing through NPRR 326

- **Pricing of De-energized Resource Nodes**
  1. Inconsistent pricing between DAM and Real-Time due to de-energized resource nodes getting assigned System Lambda in real-time
     - Addressed by Adding 609 Electrical Buses to 140 stations
  2. Inconsistent pricing between DAM and Real-Time due to split bus station and de-energized resource nodes getting assigned average LMP at same kV in station
     - Addressing through short term and long term approach. Short term – submit urgent NPRR to modify de-energized bus pricing logic.
Pricing Rules for De-energized Resource Nodes

(a) Use average LMP for Electrical Buses within the same station having the same voltage level as the de-energized Electrical Bus, if any exist.
(b) Use average LMP for all Electrical Buses within the same station, if any exist.
(c) Use system lambda.
Previously (eg. Permian Basin) Level (c) Caused Problems

(c) Use system lambda.
Example – Permian Basin Unit 5 in DAM

Electrical engineers think of these dots as buses, but they weren’t specially designated “Electrical Buses” in the model

Lines to other station

Open Breaker

Open Breaker

Pricing Location at Dead Electrical Bus

The only “Electrical Bus” in the model was dead; hence the system picked up “System Lambda” as the Price-Addressed by Adding 609 Electrical Buses at 140 Stations
Now Level (a) is Causing Issues

(a) Use average LMP for Electrical Buses within the same station having the same voltage level as the de-energized Electrical Bus, if any exist.
B1, B2, B3 Closed, B4 open
All Resource Nodes Energized, taking appropriate prices
PTP Obligations from R1 to R2 are $0.
Occasional Situation in Real Time Market

Line out

Electric Bus L2

B4

Resource Node L

L

B1, B2 Closed, B3, B4 open
L and R1 Resource Nodes Energized, taking appropriate prices
R2 taking average Price of {Resource Node L, Resource Node R1, Electric Bus L2, Electric Bus R3}

PTP Obligations from R1 to R2 have non-zero value, even though there is no congestion.
ERCOT estimates indicate ~$3M payout on this issue.
Short Term Solution

Introduce ERCOT definable level in Pricing Heuristic
In this case, if R2 is de-energized, take price of R3