



**Date:** July 31, 2018  
**To:** Board of Directors  
**From:** Kenan Ögelman, Vice President of Commercial Operations  
**Subject:** Real-Time Market Price Correction for Certain Intervals on Operating Day July 18, 2018

**Issue for the ERCOT Board of Directors**

**ERCOT Board of Directors Meeting Date:** August 7, 2018

**Item No.:** 9

**Issue:**

Pursuant to paragraph 6 of Protocol Section 6.3, Adjustment Period and Real-Time Operations Timeline, whether the ERCOT Board of Directors (Board) should approve price corrections for Real-Time Locational Marginal Prices (RTLMPs), Real-Time Settlement Point Prices (RTSPPs), EPS Meter Prices (RTRMPRs), and other prices for certain intervals on Operating Day July 18, 2018 that were affected by a Data Input error.

**Background/History:**

ERCOT staff has identified the need to correct prices in the Real-Time Market (RTM) for certain Security-Constrained Economic Dispatch (SCED) intervals and Settlement Intervals (i.e., intervals ending 16:30 – 18:30) on Operating Day July 18, 2018. The impacted prices include:

- RTLMPs;
- RTSPPs;
- RTRMPRs;
- Real-Time Settlement Point Price Energy-Weighted (RTSPPEW);
- Real-Time Price for Energy Metered as Wholesale Storage Load (RTRMPRWSL);
- Real-Time On-Line Reserve Price Adder (RTORPA);
- Real-Time Off-Line Reserve Price Adder (RTOFFPA);
- Real-Time Reserve Price for On-Line Reserves (RTRSVPOR); and
- Real-Time Reserve Price for Off-Line Reserves (RTRSVPOFF).

The ERCOT Protocols require ERCOT to correct prices when invalid prices are identified in an otherwise valid market solution (Protocol Section 6.3(4)). If ERCOT determines that prices are erroneous, ERCOT must correct the prices before they are final (Protocol Section 6.3(5)). Prices are final at 1600 on the second Business Day following the Operating Day (Protocol Section 6.3(6)). However, if ERCOT determines that prices are erroneous and need correction after they are final, then ERCOT can seek Board review of such prices if, within 30 days of the Operating Day, ERCOT notifies Market Participants of the need for correction and that ERCOT intends to seek Board approval of the correction (Protocol Section 6.3(6)(a)). The Protocols provide that the Board can review and change prices if the Board finds that such prices are



“significantly affected by an error” and ERCOT gave timely notice to Market Participants (Protocol Section 6.3(6)(b)). In review of erroneous prices, the Protocols state that the Board can rely on the reasons set forth in Protocol Section 6.4(a)-(d) to find that the prices are significantly affected by an error (Protocol Section 6.3(6)(c)). Protocol Section 6.3(4)(a)-(d) provides that the following reasons may cause invalid prices to be identified in an otherwise valid solution: (a) Data Input error; (b) Data Output error; (c) Hardware/Software error; and/or (d) Inconsistency with the Protocols or Public Utility Commission of Texas (PUCT) Substantive Rules.

On Thursday, July 19, 2018, a Market Participant notified ERCOT that there appeared to be incorrect Transmission Elements included as a part of two double circuit contingency definitions. ERCOT staff investigated the issue, determined that the definitions were incorrect for contingencies DCNSLHS8 and DLHSCNR8, and disabled them in ERCOT’s Energy and Market Management Systems (EMS and MMS). ERCOT found that the source of the error occurred in post-processing, which is performed for each Network Operations Model database load prior to sending contingency definitions to the EMS and MMS. Following its investigation, and confirming the source of erroneous data and the correct data, ERCOT staff updated its systems with the correct contingency definitions on July 20, 2018. ERCOT also posted a Market Notice informing all Market Participants that ERCOT would be seeking Board approval of a price correction for the Operating Day July 18, 2018 intervals at issue.

Based upon ERCOT’s analysis, this Data Input error resulted in incorrect Real-Time prices for Settlement Intervals ending 1630 – 1830 on Operating Day July 18, 2018. Although ERCOT identified the issue and potential need for a price correction before the prices became final at 1600 on July 20, 2018, ERCOT was unable to ascertain the correct prices for publication prior to the deadline. ERCOT asserts that RTLMPs, RTSPPs, RTRMPRs, and other prices for Settlement Intervals ending 1630 – 1830 on July 18, 2018 were significantly affected by a Data Input error, and are in need of correction. ERCOT timely provided Market Participants with a Market Notice on July 20, 2018, pursuant to ERCOT Protocol Section 6.3(6)(a). Accordingly, ERCOT requests that the Board: (a) review such prices; (b) make a determination RTLMPs, RTSPPs, RTRMPRs, and other prices for Settlement Intervals ending 1630 – 1830 on July 18, 2018 were significantly affected by a Data Input error; and (c) authorize ERCOT to correct such prices. Attached hereto are documents containing the corrected prices for the RTLMPs, RTSPPs, RTRMPRs, and other prices for Settlement Intervals ending 16:30 – 18:30 on July 18, 2018, as follows:

- Attachment A - Price Correction RTM ORDC by 15-min Settlement Interval;
- Attachment B - Price Correction RTM ORDC by SCED Interval;
- Attachment C - Price Correction SCED EBLMP;
- Attachment D - Price Correction SCED SP LMP;
- Attachment E - Price Correction SCED SPP; and
- Attachment F – Price Correction SCED RTRMPR.

It is important to note that the same error also resulted in incorrect Day-Ahead Market (DAM) prices for certain intervals on Operating Day July 20, 2018. However, before the prices became final at 1000 on July 24, 2018, ERCOT was able to determine the correct prices, and post the corrected prices (i.e., ERCOT posted the corrected prices on July 23, 2018). No action is being requested by ERCOT with respect to DAM prices.

**Relevant Protocol Sections:**

**6.3 Adjustment Period and Real-Time Operations Timeline**

...

- (4) ERCOT shall correct prices when: (i) a market solution is determined to be invalid, (ii) invalid prices are identified in an otherwise valid market solution, (iii) the Base Points received by Market Participants are inconsistent with the Base Points of a valid market solution, unless accurate prices cannot be determined, or (iv) the Security-Constrained Economic Dispatch (SCED) process experiences a failure as described in Section 6.5.9.2, Failure of the SCED Process. The following are some reasons that may cause these conditions.
- (a) Data Input error: Missing, incomplete, stale, or incorrect versions of one or more data elements input to the market applications may result in an invalid market solution and/or prices.
  - (b) Data Output error: These include: (i) incorrect or incomplete data transfer, (ii) price recalculation error in post-processing, and (iii) Base Points inconsistent with prices due to the Emergency Base Point flag remaining activated even when the SCED solution is valid.
  - (c) Hardware/Software error: These include unpredicted hardware or software failures, planned market system or database outages, planned application or database upgrades, software implementation errors, and failure of the market run to complete.
  - (d) Inconsistency with the Protocols or Public Utility Commission of Texas (PUCT) Substantive Rules: Pricing errors may occur when specific circumstances result in prices that are in conflict with such Protocol language or the PUCT Substantive Rules.
- (5) If it is determined that any Real-Time Settlement Point Prices, Settlement Point LMPs, Electrical Bus LMPs, Real-Time prices for energy metered, Real-Time On-Line Reliability Deployment Price Adders, Real-Time On-Line Reliability Deployment Prices, Real-Time On-Line Reserve Price Adders, Real-Time Off-Line Reserve Price Adders, Real-Time Reserve Prices for On-Line Reserves, Real-Time Reserve Prices for Off-Line Reserves, and/or constraint Shadow

Prices are erroneous, ERCOT shall correct the prices before the prices are considered final in paragraph (6) below. Specifically:

- (a) If it is determined that correcting the Real-Time Settlement Point Prices will not affect the Base Points that were received by Qualified Scheduling Entities (QSEs), then ERCOT shall correct the prices before the prices are considered final in paragraph (6) below.
  - (b) If it is determined that correcting the Real-Time Settlement Point Prices will affect the Base Points that were received by QSEs, then ERCOT shall correct the prices before the prices are considered final and settle the SCED executions as failed in accordance with Section 6.5.9.2.
  - (c) If the Base Points received by QSEs are inconsistent with the Real-Time Settlement Point Prices reduced by the sum of the Real-Time On-Line Reliability Deployment Prices and the Real-Time Reserve Prices for On-Line Reserves averaged over the 15-minute Settlement Interval, then ERCOT shall consider those Base Points as due to manual override from the ERCOT Operator and settle the relevant Settlement Interval(s) in accordance with Section 6.6.9, Emergency Operations Settlement.
- (6) All Real-Time LMPs, Real-Time Settlement Point Prices, Real-Time prices for energy metered, Real-Time On-Line Reliability Deployment Price Adders, Real-Time On-Line Reliability Deployment Prices, Real-Time Reserve Prices for On-Line Reserves, Real-Time Reserve Prices for Off-Line Reserves, Real-Time On-Line Reserve Price Adders, Real-Time Off-Line Reserve Price Adders and SASM MCPCs are final at 1600 of the second Business Day after the Operating Day.
- (a) However, after Real-Time LMPs, Real Time Settlement Point Prices, Real-Time prices for energy metered, Real-Time On-Line Reliability Deployment Price Adders, Real-Time On-Line Reliability Deployment Prices, Real-Time Reserve Prices for On-Line Reserves, Real-Time Reserve Prices for Off-Line Reserves, Real-Time On-Line Reserve Price Adders, Real-Time Off-Line Reserve Price Adders and SASM MCPCs are final, if ERCOT determines that prices are in need of correction and seeks ERCOT Board review of such prices, it shall notify Market Participants and describe the need for such correction as soon as practicable but no later than 30 days after the Operating Day. Failure to notify Market Participants within this timeline precludes the ERCOT Board from reviewing such prices. However, nothing in this section shall be understood to limit or otherwise inhibit any of the following:
    - (i) ERCOT's duty to inform the PUCT of potential or actual violations of the ERCOT Protocols or PUCT Rules and its right to request

that the PUCT authorize correction of any prices that may have been affected by such potential or actual violations;

- (ii) The PUCT's authority to order price corrections when permitted to do so under other law; or
  - (iii) ERCOT's authority to grant relief to a Market Participant pursuant to the timelines specified in Section 20, Alternative Dispute Resolution Procedure.
- (b) The ERCOT Board may review and change Real-Time LMPs, Real-Time Settlement Point Prices, Real-Time prices for energy metered, Real-Time On-Line Reliability Deployment Price Adders, Real-Time On-Line Reliability Deployment Prices, Real-Time Reserve Prices for On-Line Reserves, Real-Time Reserve Prices for Off-Line Reserves, Real-Time On-Line Reserve Price Adders, Real-Time Off-Line Reserve Price Adders and SASM MCPCs if ERCOT gave timely notice to Market Participants and the ERCOT Board finds that such prices are significantly affected by an error.
- (c) In review of Real-Time LMPs, Real Time Settlement Point Prices, Real-Time prices for energy metered, Real-Time On-Line Reliability Deployment Price Adders, Real-Time On-Line Reliability Deployment Prices, Real-Time Reserve Prices for On-Line Reserves, Real-Time Reserve Prices for Off-Line Reserves, Real-Time On-Line Reserve Price Adders, Real-Time Off-Line Reserve Price Adders and SASM MCPCs, the ERCOT Board may rely on the same reasons identified in paragraph (4) above to find that the prices are significantly affected by an error.

**Key Factors Influencing Issue:**

Due to a Data Input error, Real-Time Locational Marginal Prices (RTLMPs), Real-Time Settlement Point Prices (RTSPPs), EPS Meter Prices (RTRMPRs), and other prices for certain intervals on Operating Day July 18, 2018 were incorrect. Since these prices are considered final under the ERCOT Protocols, ERCOT staff recommends that the Board make a determination that these prices were significantly affected by a Data Input error, and authorize ERCOT to implement the appropriate price corrections.

**Conclusion/Recommendation:**

As more specifically described above, ERCOT asserts that RTLMPs, RTSPPs, RTRMPRs, and other prices for Settlement Intervals ending 1630 – 1830 on Operating Day July 18, 2018 were significantly affected by a Data Input error, and require price correction. ERCOT recommends that the Board make a determination that RTLMPs, RTSPPs, RTRMPRs, and other prices for Settlement Intervals ending 1630 – 1830 on July 18, 2018 were significantly affected by a Data Input error, and authorize ERCOT



to implement the appropriate price corrections. If so authorized, ERCOT shall issue a Resettlement Statement no later than August 22, 2018.



**ELECTRIC RELIABILITY COUNCIL OF TEXAS, INC.**  
**BOARD OF DIRECTORS RESOLUTION**

WHEREAS, paragraph (6) of Protocol Section 6.3 (June 1, 2018 Version), Adjustment Period and Real-Time Operations Timeline, authorizes the ERCOT Board of Directors (Board) to approve price corrections only upon a finding that Real-Time Locational Marginal Prices (LMPs), Real-Time Settlement Point Prices, Real-Time prices for energy metered, Real-Time On-Line Reliability Deployment Price Adders, Real-Time On-Line Reliability Deployment Prices, Real-Time Reserve Prices for On-Line Reserves, Real-Time Reserve Prices for Off-Line Reserves, Real-Time On-Line Reserve Price Adders, Real-Time Off-Line Reserve Price Adders and Supplemental Ancillary Services Market (SASM) Market Clearing Prices for Capacity (MCPCs) have been significantly affected by an error;

WHEREAS, pursuant to paragraph (6)(a) of Protocol Section 6.3, ERCOT gave timely notice to Market Participants that prices for Operating Day July 18, 2018 were in need of correction, and ERCOT would be seeking Board review of such prices; and

WHEREAS, the Board deems it desirable and in the market's best interest to correct the Real-Time Locational Marginal Prices (RTLMPs), Real-Time Settlement Point Prices (RTSPPs), EPS Meter Prices (RTRMPRs), and other prices affected by a Data Input error for Settlement Intervals ending 1630 through 1830 of Operating Day July 18, 2018, as such prices were significantly affected by the Data Input error;

THEREFORE BE IT RESOLVED that the Board hereby (1) determines that the RTLMPs, RTSPPs, RTRMPRs, and other prices affected by a Data Input error for Settlement Intervals ending 1630 through 1830 of Operating Day July 18, 2018 were significantly affected by such Data Input error, and (2) authorizes ERCOT staff to implement the appropriate price corrections pursuant to paragraph (6) of Protocol Section 6.3.

**CORPORATE SECRETARY'S CERTIFICATE**

I, Vickie G. Leady, Assistant Corporate Secretary of ERCOT, do hereby certify that, at its August 7, 2018 meeting, the ERCOT Board passed a motion approving the above Resolution by \_\_\_\_\_.

IN WITNESS WHEREOF, I have hereunto set my hand this \_\_\_\_ day of August 2018.

\_\_\_\_\_  
Vickie G. Leady  
Assistant Corporate Secretary