



**The Reliability and Markets (R&M) Committee
is expected to consider
R&M Committee Agenda Item 6.2:**

***Recommendation regarding Market Price
Corrections – Incorrect Constraint Data for
GTCs impacting Real-Time Market***

at its meeting on April 22, 2024.

**The Board of Directors is expected to hear
the R&M Committee’s recommendation on
this matter as part of the
R&M Committee Report
at the Board meeting
on April 23, 2024.**

**Attached are the Board and Committee
materials in relation to these agenda items.**



Item 6.2: Recommendation regarding Market Price Corrections – Incorrect Constraint Data for GTCs impacting the Real-Time Market

Kenan Ögelman

Vice President, Commercial Operations

Reliability and Markets Committee Meeting

ERCOT Public

April 22, 2024

Reliability and Markets Committee Request

Why this is being presented today:

ERCOT staff requests that the Reliability and Markets (R&M) Committee recommend that the ERCOT Board of Directors (Board) approve the proposed correction of Real-Time Market prices for Operating Day February 28, 2024 (Board Decision Template Attachments A through D).

Background

- On February 28, 2024, during routine maintenance, the process that exports constraint data from the Energy Management System (EMS) to the Market Management System (MMS) experienced an issue that resulted in incorrect constraint data for Generic Transmission Constraints (GTCs) being sent to the Security-Constrained Economic Dispatch (SCED) process. Affected SCED intervals were between 15:50 and 16:25.
- On March 1, 2024 at 2:40 PM, ERCOT issued an Operations Notice, notifying the market of the issue and that ERCOT would be performing further analysis to determine if the impact to the market met the criteria for significance needed to seek Board approval for price correction as specified by ERCOT Protocol Section 4.5.3(6)(b).
- Market Notice [M-B031824-01](#) was issued on March 18, 2024, notifying the market of the price impact results and ERCOT's intent to seek Board review.

Settlement Impact Analysis

- ERCOT Protocol Section 6.3(7)(b) requires that the absolute value impact to any single Counter-Party (CP) meet one of the following two criteria before seeking approval from the Board.
 - i. 2% and also greater than \$20,000; or
 - ii. 20% and also greater than \$2,000.

Counter-Parties meeting criteria for significance

Operating Day	Counter-Parties meeting criteria in Protocol Section 6.3(7)(b)(i)	Counter-Parties meeting criteria in Protocol Section 6.3(7)(b)(ii)
2/28/2024	7	9

Settlement Impact Analysis

Maximum estimated absolute value impact to Counter-Parties

Operating Day	Maximum Amount (\$Thousands)	Maximum Percentage for Criteria (i)*	Maximum Percentage for Criteria (ii)**
2/28/2024	\$455.32	2137.76%	2137.76%

* The maximum of percentage change to any single Counter-Party with impact more than \$20,000 (set as NA when no single Counter-Party has impact more than \$20,000)

** The maximum of percentage change to any single Counter-Party with impact more than \$2,000 (set as NA when no single Counter-Party has impact more than \$2,000)

Estimated change in charges due to ERCOT*

Operating Day	Change in Statement Charges Due to ERCOT (\$ thousands)
2/28/2024	\$277.93 1.87%

* Negative amounts are increased payments to Market Participants; positive amounts are increased charges. The percent amount is the absolute value of the percent impact to the previously settlement net amount due to/from ERCOT.



Date: April 16, 2024
To: Board of Directors
From: Bob Flexon, Reliability and Markets (R&M) Committee Chair
Subject: Market Price Correction – Incorrect Constraint Data for GTCs impacting the Real-Time Market

Issue for the ERCOT Board of Directors

ERCOT Board of Directors Meeting Date: April 23, 2024

Item No.: 10.3

Issue:

Pursuant to paragraph (7) of Protocol Section 6.3, Adjustment Period and Real-Time Operations Timeline, whether the Board of Directors (Board) of Electric Reliability Council of Texas, Inc. (ERCOT) should approve price corrections for Real-Time Locational Marginal Prices (RTLMPs), Real-Time Settlement Point Prices (RTSPPs), Real-Time Price for Energy Metered for Resources (RTRMPRs), and Real-Time Price for Energy Metered for Settlement Only Generators (RTESOGPRs) for certain Settlement Intervals on Operating Day (OD) February 28, 2024, that were affected by the use of incorrect Generic Transmission Constraint (GTC) Shift Factors.

Background/History:

ERCOT staff has identified the need to correct prices in the Real-Time Market (RTM) for certain Settlement Intervals on OD February 28, 2024. The impacted prices include:

- RTLMPs;
- RTSPPs;
- RTRMPRs; and
- RTESOGPRs.

The ERCOT Protocols require ERCOT to correct prices when invalid prices are identified in an otherwise valid market solution. If ERCOT determines that prices are erroneous, ERCOT must correct the prices before they are final. Prices are final at 1600 on the second Business Day following the OD. However, if ERCOT determines that prices are erroneous and need correction after they are final, then ERCOT shall seek Board review of such prices provided that, within 30 days of the OD, ERCOT notifies Market Participants of the need for correction and that ERCOT intends to seek Board approval of the correction.

In considering a correction of prices, the Board may rely on the following reasons to find that prices should be corrected:

- 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.
- Data Output Error: These include incorrect or incomplete data transfer, price recalculation error in post-processing, and Base Points inconsistent with prices due to the Emergency Base Point flag remaining activated even when the Security-Constrained Economic Dispatch (SCED) solution is valid.
- 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.
- 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.

See ERCOT Protocol Section 6.3(4) – (7).

On February 28, 2024, during routine maintenance, the process that exports constraint data from the Energy Management System (EMS) to the Market Management System (MMS) experienced an issue that resulted in incorrect constraint data for GTCs being sent to the SCED process. Affected SCED intervals were between 15:50 and 16:25.

On March 1, 2024 at 2:40 PM, ERCOT issued an Operations Notice, notifying the market of the issue and that ERCOT would be performing further analysis to determine if the impact to the market met the criteria for significance needed to seek Board approval for price correction as specified by ERCOT Protocol Section 4.5.3(6)(b).

On March 18, 2024, ERCOT notified the market of the price impact results and ERCOT's intent to seek Board review. See Market Notice M-B031824-01.

Accordingly, ERCOT requests that the Board:

- (a) Review RTLMPs, RTSPPs, RTRMPRs, and RTESOGPRs for OD February 28, 2024;
- (b) Make a determination as to whether such prices were significantly affected by the error; and
- (c) Direct ERCOT to correct the impacted RTLMPs, RTSPPs, RTRMPRs, and RTESOGPRs for OD February 28, 2024.

Attached hereto are documents containing corrected RTSPPs, RTRMPRs, and RTESOGPRs for OD February 28, 2024, as follows:

- **Attachment A** - Corrected RTLMPs
- **Attachment B** - Corrected RTSPPs
- **Attachment C** - Corrected RTRMPRs
- **Attachment D** - Corrected RTESOGPRs

Relevant Protocol Sections:

6.3 Adjustment Period and Real-Time Operations Timeline

- (4) ERCOT shall correct prices for an Operating Day when accurate prices can be determined, the impact of the price correction is determined to be significant, and one of the following conditions has been met: a market solution is determined to be invalid, invalid prices are identified in an otherwise valid market solution, the Base Points received by Market Participants are inconsistent with the Base Points of a valid market solution, or 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 incorrect or incomplete data transfer, price recalculation error in post-processing, and 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 (PUC) Substantive Rules: Pricing errors may occur when specific circumstances result in prices that are in conflict with such Protocol language or the PUC Substantive Rules.
- (7) 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 qualify for a price correction pursuant to paragraph (4) above and that ERCOT will seek 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) Before seeking ERCOT Board review of prices, ERCOT will determine if the impact of the price correction is significant, as that term is used in paragraph (4) above, by calculating the potential changes to the Real-Time Market (RTM) Settlement Statement(s) of any Counter-Party on a given Operating Day. ERCOT shall seek ERCOT Board review of prices if the change in RTM Settlement Statement(s) would result in the absolute value impact to any single Counter-Party, based on the sum of all original RTM Settlement Statement amounts of Market Participants assigned to the Counter-Party, to be greater than:
 - (i) 2% and also greater than \$20,000; or
 - (ii) 20% and also greater than \$2,000.

- (c) 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 should be corrected for an Operating Day.
- (d) 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 should be corrected for an Operating Day.

Key Factors Influencing Issue:

- Due to the use of incorrect GTC Shift Factors, RTLMPs, RTSPPs, RTRMPRs, and RTESOGPRs for a portion of OD February 28, 2024 were incorrect and cannot be corrected by ERCOT without authorization from the Board.
- Analysis of the impacts of the pricing error for OD February 28, 2024 has shown that the largest dollar impact to any individual Counter-Party for the OD is approximately \$455,000. For Counter-Parties meeting the dollar impact criteria, the largest percentage impact to a Counter-Party for a single OD is 2137.76%
- Notably, Nodal Protocol Revision Request (NPRR) 1024, Determination of Significance with Respect to Price Corrections, was approved by the Board in February 2021 and became effective on April 1, 2021. NPRR1024 requires ERCOT to seek Board review of prices if the change in Settlement Statement(s) would result in the absolute value impact to any single Counter-Party, based on the sum of all original Settlement Statement amounts of Market Participants assigned to the Counter-Party, to be greater than 2% and also greater than \$20,000, or 20% and also greater than \$2,000.

Conclusion/Recommendation:

ERCOT recommends, and the R&M Committee is expected to recommend, that the Board make a determination that RTLMPs, RTSPPs, RTRMPRs, and RTESOGPRs for OD February 28, 2024, were significantly affected by SCEDs use of incorrect GTC Shift Factors, and direct ERCOT to correct the impacted prices for the OD at issue.





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

WHEREAS, paragraph (7) of Protocol Section 6.3, Adjustment Period and Real-Time Operations Timeline, authorizes the Board of Directors (Board) of Electric Reliability Council of Texas, Inc. (ERCOT) to approve a price correction for certain prices if ERCOT has determined that such prices have been significantly affected by an error;

WHEREAS, in accordance with paragraph (7) of Protocol Section 6.3, ERCOT staff gave timely notice to Market Participants that Real-Time Market Locational Marginal Prices (RTLMPs), Real-Time Market Settlement Point Prices (RTSPPs), Real-Time Price for Energy Metered for Resources (RTRMPRs), and Real-Time Price for Energy Metered for Settlement Only Generators (RTESOGPRs) for Operating Day (OD) February 28, 2024 were incorrect; that a price correction for the OD met the criteria for “significance” in Protocol Section 6.3(7)(b); and ERCOT staff would be seeking Board review of such prices; and

WHEREAS, after due consideration of the alternatives, the Board deems it desirable and in the best interest of ERCOT to correct RTLMPs, RTSPPs, RTRMPRs, and RTESOGPRs for OD February 28, 2024, that were significantly affected by incorrect Generic Transmission Constraint (GTC) Shift Factors;

THEREFORE, BE IT RESOLVED, that the Board hereby (1) determines that RTLMPs, RTSPPs, RTRMPRs, and RTESOGPRs for OD February 28, 2024, were significantly affected by incorrect GTC Shift Factors; and (2) directs ERCOT staff to implement the appropriate price corrections pursuant to Protocol Section 6.3.

CORPORATE SECRETARY’S CERTIFICATE

I, Jonathan M. Levine, Assistant Corporate Secretary of ERCOT, do hereby certify that, at its April 23, 2024 meeting, the Board passed a motion approving the above Resolution by _____.

IN WITNESS WHEREOF, I have hereunto set my hand this ____ day of April, 2024.

Jonathan M. Levine
Assistant Corporate Secretary