

**ERCOT BUSINESS PRACTICES**

**NODAL PRICE VALIDATION AND CORRECTIONS**

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**PROTOCOL DISCLAIMER**

This Business Practice describes ERCOT tools and processes related to price validation and price correction in the ERCOT Nodal Market, which is not intended to be a substitute for the ERCOT Nodal Protocols (available at <http://www.ercot.com/mktrules/nprotocols/> ), as amended from time to time. If any conflict exists between this document and the ERCOT Nodal Protocols, the ERCOT Nodal Protocols shall control in all respects.

# Price Validation Tools and Support

With the implementation of the nodal market, ERCOT has developed a formal set of tools and team of analysts to evaluate market prices and resulting dispatch instructions from the markets executed in nodal, specifically the Real-Time Market (RTM), the Supplemental Ancillary Services Market (SASM) and the Day-Ahead Market (DAM). ERCOT’s Price Validation Tool (PVT) is the software that provides evaluation tools for market solutions, and flags any potential errors in a market solution. The PVT does not recreate market solutions, but statistically analyzes results of market solutions based on inputs from ERCOT’s market management system (MMS) to identify potential errors.

Although the PVT identifies possible pricing issues, it does not alter or re-post prices.

The PVT is managed and supported by ERCOT’s Market Validation team. This document sets forth: (a) the processes for how the PVT is used to evaluate market solutions (as initial analyses); (b) the means by which the PVT is used by the Market Validation team to evaluate the need for price changes to market solutions; (c) requisite timelines; and (d) the parties responsible for changing prices and communicating those changes to the market.

# Real-Time Price Validation and Corrections

The RTM is executed from ERCOT’s control room at least every five minutes. The RTM runs on an automatic timer and publishes and/or instructs Resources to dispatch energy to meet the required system load every five minutes. PVT execution is automatically triggered for each completed 15-minute Settlement Interval.

ERCOT Operators will monitor and evaluate the RTM and/or Security-Constrained Economic Dispatch (SCED) solution in Real-Time. Where immediate action is needed, ERCOT Operator may take the following actions to ensure the system reliability: Each QSE shall immediately verbally report to ERCOT and the TSP any inability of the QSE’s Generation Resources required to meet its reactive capability requirements as specified in the Nodal Protocols.

* If the RTM and/or SCED solution is recognized by the ERCOT Operator to be failed, then the ERCOT Operator will take necessary action to correct the issue and declare a SCED failure pursuant to ERCOT Protocols. If SCED is deemed as failed, then the ERCOT Operator may declare an emergency and issue emergency Base Points (BPs). The prices from that point forward will be automatically based on the last SCED run. The intervals will be automatically settled with emergency BPs according to the emergency BP Settlement using the Settlement Point Price (SPP), which will be calculated based on the Locational Marginal Prices (LMPs) from the last SCED run. However, the Market Validation team will analyze the intervals with error flags before the SCED was aborted and determine whether price correction is necessary.
* If the RTM and/or SCED solution fails, then ERCOT will follow Protocol Section 6.5.9.2, Failure of the SCED Process to operate the system, set LMPs, and settle the market.

By 1600 of the second Business Day after the Operating Day, the Market Validation team will have evaluated the RTM PVT results and identified any pricing issues:

* If no pricing issues are identified and escalated by the Market Validation team, a notification will not be posted.
* If pricing issues are identified and accurate prices can be re-calculated by 1600 of the second Business Day after the Operating Day, the Market Validation team shall evaluate the impact of price correction pursuant to ERCOT Protocol Section 6.3 (5). If the impact of the price correction is determined to be significant, the Market Validation team will notify and present the results to ERCOT’s Director of Market Design and Analytics. Upon review approval by ERCOT’s Director of Market Design and Analytics, the Market Validation team will post a Public Notice indicating the RTM price correction/s. The changed prices, times, and new values to be used for Settlement purposes will be posted on the MIS. Such price corrections will not require ERCOT’s Board of Directors (Board) approval.
* If pricing issues are identified, but due to an ongoing investigation cannot be re-calculated and posted by 1600 of the second Business Day after the Operating Day, the Market Validation team will notify ERCOT’s Director of Market Design and Analytics and continue the investigation. If the accurate prices can be re-calculated and the impact of the price correction is determined to be significant pursuant to ERCOT Protocol Section 6.3(7)(b), the Market Validation team will present the results to ERCOT’s Director of Market Design and Analytics. Upon review and approval by ERCOT’s Director of Market Design and Analytics, the Market Validation team will post a Market Notice and describe the need for such correction, as soon as practicable but no later than 30 days after the Operating Day pursuant to ERCOT Protocol Section 6.3 7(a). Failure to notify Market Participants within this timeline precludes the ERCOT Board from reviewing such prices. Any subsequent re-calculated prices will be presented to ERCOT’s Board for approval prior to changing Settlement prices.

# DAM Price Validation and Corrections

The Day-Ahead process is executed daily following the completion of DAM.

After each DAM execution, ERCOT DAM Operator evaluates the DAM solution for DAM awards and Ancillary Service (AS) capacity awards. Part of the evaluation process involves running the DAM PVT to identify potential pricing and/or dispatch issues. ERCOT DAM Operator will notify the Market Validation team of any identified issues.

ERCOT DAM Operator will review the DAM solution and DAM PVT results, and take one of the following actions:

* If (a) the DAM solution is successful, (b) the PVT is executed successfully, and (c) there are no error or warning flags generated, i.e., incorrect or suspicious prices detected, then no action is required and the DAM team may approve the DAM solution.
* If the DAM solution is successful, but the PVT identifies potential issues with the solution, the ERCOT DAM Operator will assess the situation and determine whether the issues are “false alarms,” inconsequential, or significant. If the issues are determined to be “false alarms,” ERCOT DAM Operator will publish the DAM results. If the issues are determined to be inconsequential, the DAM team will correct any erroneous data and re-execute the Day-Ahead process if necessary. If the issues are determined to be significant, ERCOT DAM Operator will determine if aborting the Day-Ahead process pursuant to ERCOT Protocols Section 4.1.2 is necessary.
* If the DAM solution fails, then ERCOT will follow Protocol Section 4.1.2, Day-Ahead Process and Timing Deviations, to operate the system, set LMPs, and settle the market where applicable. If ERCOT cannot execute the Day-Ahead process, it may abort all or part of the Day-Ahead process and notify Market Participants pursuant ERCOT Protocol Section 4.1.2. In such an event, the PVT will not be executed, nor will price correction be considered.

By 1000 of the second Business Day after the Operating Day, the Market Validation team will have evaluated the DAM PVT results and identified any pricing issues.

* If no pricing issues are identified and escalated by the Market Validation team, no action will be taken and a notification will not be posted.
* If pricing issues are identified and the accurate prices can be re-calculated by 1000 of the second Business Day after the Operating Day, the Market Validation team shall evaluate the impact of price correction pursuant to ERCOT Protocol Section 4.5.3 (5). If the impact of the price correction is determined to be significant, the Market Validation team will notify and present the results to the DAM Team and ERCOT’s Director of Market Design and Analytics. Upon review approval by ERCOT’s Director of Market Design and Analytics, the Market Validation team will post a Public Notice indicating the DAM price correction/s. The changed prices, times, and new values to be used for Settlement purposes will be posted on the MIS. Such changes do not require Board approval.
* If pricing issues are identified, but due to an ongoing investigation cannot be re-calculated and posted by 1000 of the second Business Day after the Operating Day, the Market Validation team will notify ERCOT’s Director of Market Design and Analytics and continue the investigation. If the accurate prices can be re-calculated and the impact of the price correction is determined to be significant pursuant to ERCOT Protocol Section 4.5.3 (6)(b), the Market Validation team will notify the DAM team and ERCOT’s Director of Market Design and Analytics with the results from impact analysis. Upon review and approval by ERCOT’s Director of Market Design and Analytics, the Market Validation team will release a Market Notice and describe the need for such correction, as soon as practicable but no later than 30 days after the Operating Day pursuant to ERCOT Protocol Section 4.5.3 (6)(a). Failure to notify Market Participants within this timeline precludes the ERCOT Board from reviewing such prices. Any subsequent re-calculated prices will be presented to the Board for approval prior to changing Settlement prices.

# SASM Price Validation and Corrections

ERCOT Operator may procure additional Ancillary Services through a Supplemental Ancillary Services Market (SASM). A SASM PVT execution is automatically triggered upon the completion of SASM run. Following each SASM, the Market Validation team will use the SASM PVT results to identify potential data and/or system issues.

By 1600 of the second Business Day after the Operating Day, the Market Validation team will have evaluated the SASM PVT results and identified any pricing issues.

* If no pricing issues are identified and escalated by the Market Validation team, a notification will not be posted.
* If pricing issues are identified and the accurate prices can be re-calculated by 1600 of the second Business Day after the Operating Day, the Market Validation team shall evaluate the impact of price correction pursuant to ERCOT Protocol Section 6.3 (5). If the impact of the price correction is determined to be significant, the Market Validation team will notify and present the results to ERCOT’s Director of Market Design and Analytics. Upon review approval by ERCOT’s Director of Market Design and Analytics, the Market Validation team will post a Public Notice indicating the SASM price correction/s. The changed prices, times, and new values to be used for Settlement purposes will be posted on the MIS. Such price corrections will not require ERCOT’s Board of Directors (Board) approval.
* If pricing issues are identified, but due to an ongoing investigation cannot be re-calculated and posted by 1600 of the second Business Day after the Operating Day, the Market Validation team will notify ERCOT’s Director of Market Design and Analytics and continue the investigation. If the accurate prices can be re-calculated and the impact of the price correction is determined to be significant pursuant to ERCOT Protocol Section 6.3 (7)(b), the Market Validation team will present the results to ERCOT’s Director of Market Design and Analytics. Upon review and approval by ERCOT’s Director of Market Design and Analytics, the Market Validation team will post a Market Notice and describe the need for such correction, as soon as practicable but no later than 30 days after the Operating Day pursuant to ERCOT Protocol Section 6.3 7(a). Failure to notify Market Participants within this timeline precludes the ERCOT Board from reviewing such prices. Any subsequent re-calculated prices will be presented to ERCOT’s Board for approval prior to changing Settlement prices.