



Transmission Constraint Penalty Factors

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What Are Transmission Constraint Penalty Factors?

- Transmission constraint penalty factors are parameters used by the Market Clearing Engine (MCE) to determine the maximum cost willing to be incurred to control a transmission constraint.
- The transmission constraint penalty factor does not directly impact the shadow price of a constraint as long as the constraint can be solved by resources whose effective costs are lower than the value of the penalty factor.

- PJM does not allow the transmission constraint penalty factor to set the shadow price of a constraint.
 - The longstanding business practice is to have the price set by a resource that is providing constraint control in the dispatch solution.
- In the market clearing software, constraints which cannot adequately controlled must be relaxed to prevent the penalty factor from setting the clearing price (referred to as Constraint Relaxation).
- Resulting clearing prices are inefficient and do not accurately reflect market conditions.

- Current PJM practice is to use constraint relaxation whereby transmission constraint penalty factors do not directly set the constraint shadow price for a transmission constraint which cannot be adequately controlled.
- Transmission constraint penalty factors and the process used by PJM in applying transmission constraint penalty factors are not included in the PJM Tariff or Manuals.
- PJM Stakeholders approved an Issue Charge on August 9, 2017 to:
 - Review and potentially revise the current practices related to the use of transmission constraint penalty factors.
 - Develop clear rules that define PJM actions related to the application of transmission constraint penalty factors and how they affect locational marginal prices.

- PJM and Monitoring Analytics jointly proposed a single package.
- No other options or packages were submitted.
- Remove transmission constraint relaxation and allow the transmission constraint penalty factor to set the shadow price of a transmission constraint in the market clearing software when the constraint cannot be adequately controlled in the market clearing software.
 - No change proposed to the default penalty factors.
 - MISO M2M exception to allow constraint relaxation logic on an individual constraint basis
- Provide transparency into changes in the penalty factor.
 - Document process for changing the transmission constraint penalty factor.
 - Post changes to the transmission constraint penalty factor publicly.

- MRC/MC Vote – October 25, 2018
- November 09, 2018 FERC Filing
 - Will be filed as a Section 205 Filing
 - FERC Order 844 Compliance
 - November 9th filing intended to also satisfy FERC Order 844
- February 01, 2019 Implementation
 - Change for MISO M2M constraints may be delayed until spring 2019.

- Manual Language has been developed.
 - New section 2.17 added to M11
 - Documents the default transmission constraint penalty factors and the process when the penalty factor may be adjusted.
 - M33 Section 3 Market Data Posting
 - Updated to include the posting of the transmission constraint penalty factor.
- Tariff Language has been developed.
 - Memorializes the default transmission constraint penalty factors and the process when the penalty factor may be adjusted, and how adjustments to the penalty factor are determined.

Component	Modification	Reasoning
Magnitude of transmission penalty factors	Status Quo	Operational experience indicates most constraints can be effectively controlled at a cost below \$2,000/MWh
Ability for transmission penalty factors to set transmission constraint shadow prices.	Allow penalty factors to set price. Remove constraint relaxation process*.	Produce congestion prices that accurately reflect the severity of the localized transmission shortage

*M2M Constraints may be delayed to accommodate coordination of reciprocal updates to MISO/NYISO systems

Component	Modification	Reasoning
Exception Process	<p>Retain ability to increase/decrease penalty factors when the \$2000 penalty factor is no longer sufficient to capture all controlling actions.</p> <p>Memorialize and publish guidelines to identify when the default penalty factor should be modified.</p>	<p>Maintain ability to reflect system operational needs and the cost of the resources available to effectively relieve congestion on the constraint.</p>
Transparency when dispatch needs to adjust Penalty Factor	<p>Update Real-Time Marginal Value Limit posting on Data Miner 2 to include transmission penalty factor</p>	<p>Provide transparency</p>