

# Transmission Constraint Penalty Factors

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- 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).

- Problem Statement:
  - Current PJM practice is 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
  - Resulting clearing prices are inefficient and do not accurately reflect market conditions.
  - 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.

- To Date:
  - PJM & MA jointly presented education on use of Transmission Constraint Penalty Factors and analysis of potential impact of removing constraint relaxation process
  - PJM & MA jointly propose 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.
- Provide transparency into changes in the penalty factor

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>

	1 <sup>st</sup> Read	Endorsement
MIC	August 8	September 12
MRC/MC	September 27	October 25*

- 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
    - Manual Language endorsed at September 12<sup>th</sup> MIC (0 objections and 4 abstentions)
  - Tariff language has been developed
    - Memorializes the default Transmission Constraint Penalty Factors and the process when the Penalty Factor may be adjusted
    - Will comply with Order 844 requirements for transparency into Transmission Constraint Penalty Factors
- \*Requesting MRC and MC vote on the same day to meet Order 844 compliance filing deadline (November 9<sup>th</sup> 2018)