

Transmission Constraint Penalty Factors: Proposal First Read

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- Problem Statement:
 - Current PJM practice is use constraint relaxation whereby transmission constraint penalty factors do not directly set the constraint shadow price for a violated transmission constraint
 - 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 presented education on use of Transmission Constraint Penalty Factors and analysis of potential impact of removing constraint relaxation process
 - PJM/MA propose a single package
 - No other options or packages were submitted

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 Penalty Factor (Real-Time Marginal Value Limit) posting on Data Miner 2 to include transmission penalty factor</p>	<p>Provide transparency</p>

Example 1 - Constraint Is Violated and Constraint Relaxation Logic Is Applied

- Inputs:

- Penalty Factor = \$2,000/MWh
- Constraint Limit = 150 MW
- Limit Control = 95%
- Target limit = 142.5 MW

– Target Limit = ~~142.5~~ 145
MW

Initial Constraint Solve Results

Calculated Flow = 145 MW

Violation Degree = 2.5 MW

Shadow Price = \$2,000/MWh

Constraint Violated → Apply Constraint Relaxation!

Constraint Relaxation Solve Results

Calculated Flow = 145 MW

Violation Degree = 0 MW

Shadow Price = \$1,200/MWh

The Shadow Price resulting from Constraint Relaxation masks the presence of the transmission shortage.

Transmission Constraint Control: Proposed Method: Constraint Relaxation Example

Example 2 - Constraint Is Violated and Constraint Relaxation Logic Is **Not** Applied

- Inputs:

- Penalty Factor = \$2,000/MWh
- Constraint Limit = 150 MW
- Limit Control = 95%
- Target limit = 142.5 MW

Constraint Solve Result

Calculated Flow = 145 MW

Violation Degree = 2.5 MW

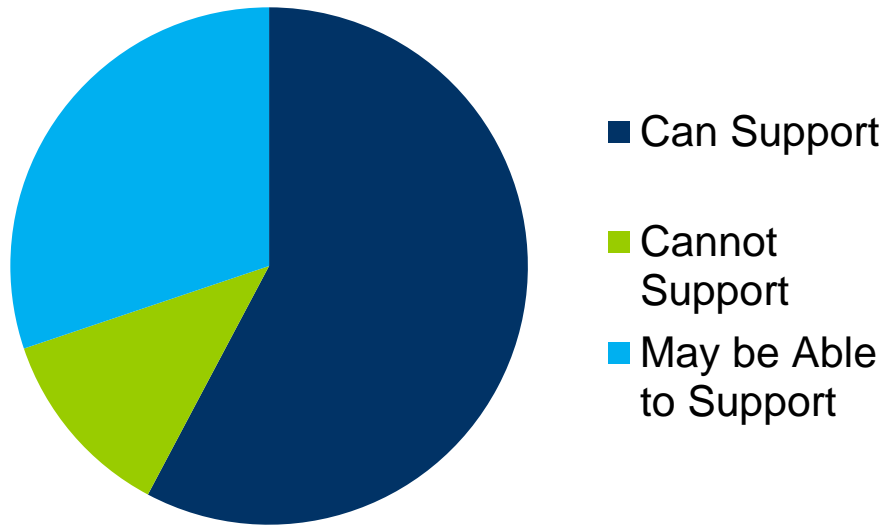
Shadow Price = \$2,000/MWh

Constraint Violated → Use Penalty Factor to set shadow price!

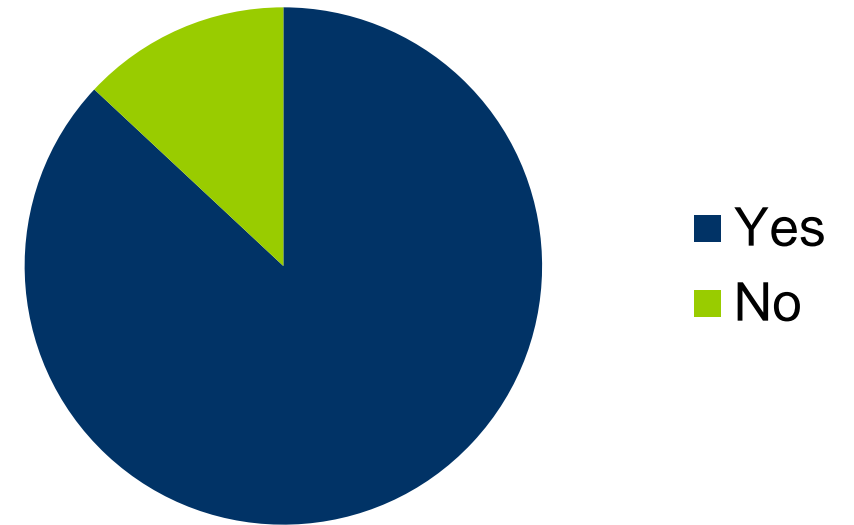
The Shadow Price now reflects the presence of the transmission shortage.

Total Unique Responders	15
Total Organizations Represented	116

1. Please provide your level of support for Package A (PJM/MA Joint Proposal).	#	%
Can Support	67	57.76%
Cannot Support	14	12.07%
May be Able to Support	35	30.17%



2. Would you like to change the current process of how Transmission Constraint Penalty Factors are used?	#	%
Yes	100	86.21%
No	15	12.93%



	1st Read	Endorsement
MIC	August 8	September 12
MRC	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

Next Steps – Tariff Language Endorsement Path

	1 st Read	Endorsement
MRC/MC	September 27	October 25

- Order 844 directive to include existing transmission constraint penalty factor rules in Tariff
 - Sought Request for Extension for this portion of 844
 - Plan to file Tariff language reflecting outcome of this stakeholder process in November 2018
- Tariff language will be developed and presented at the MRC/MC
 - Memorialize the default Transmission Constraint Penalty Factors and the process when the Penalty Factor may be adjusted