



Marginal Value Limit Adjustments

Special MIC: Transmission Constraint Penalty Factor

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PJM adjusts an internal¹ constraint's Marginal Value Limit (MVL) in order to reflect system operational needs and the cost of controlling actions with an effective resource to relieve congestion. When real-time personnel identify that the cost of controlling actions are not being properly reflected in pricing, the MVL will be increased or decreased as explained in examples detailed below. Once it has been identified that an adjustment is required, PJM dispatchers and real-time markets support engineers make real-time evaluations of the appropriate MVL adjustments based on an effective resource's cost to control a constraint (expressed in \$/MW as defined below):

$$\frac{\$}{MW} = \frac{(\text{Resource Offer Price} - \text{System Energy Price})}{dfax}$$

When not enough relief can be provided by resources at a cost below the default MVL, PJM retains the ability to increase the MVL (or willingness to pay for control) for a constraint when congestion flow is over or approaching the controlled limit and additional available resources have a \$/MW cost above the default MVL. Conditions requiring increasing the MVL for a constraint include, but are not limited to:

- a) An effective resource with a raise-help $dfax$ is required, but the system energy price has decreased such that the resource's \$/MW cost exceeds the default MVL.
- b) An effective resource with a lower-help $dfax$ is required, but the system energy price has increased such that the resource's \$/MW cost exceeds the default MVL.
- c) Additional relief for a constraint is required from a resource with a \$/MW cost above the default MVL based on the resource's Offer Price and/or $dfax$.

When the congestion flow is within the controlled limit, PJM also retains the ability to lower the MVL for a constraint in order to prevent a high cost resource that cannot provide material relief on the constraint from inappropriately setting price.

Conditions requiring lowering the shadow price limit for a constraint include, but are not limited to:

- a) A thermal surrogate is used to set price for a resource called for voltage control and the resource's \$/MW is lower than the default MVL.
- b) A constraint with many low $dfax$, high cost resources where the available control is sufficient and over controlling the constraint by allowing ineffective resources to artificially raise the price would result in ACE deviations and/or other system controlling issues.

PJM incorporates a buffer typically of 25% above the effective resource's \$/MW cost when setting the adjusted marginal value limit. This buffer accounts for any fluctuation in the system energy price that would increase a resource's \$/MW cost.

¹ Market to Market constraints will only be adjusted in coordination with neighboring partners