

IMM Response to Transmission Constraint Penalty Factors

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Shadow Price

- **In linear constrained optimization problems, shadow price (or marginal value) of a transmission constraint is the change in the production cost due to incremental (one unit) change in the transmission line capacity.**

Shadow Price

- **In the linear constraint optimization, only one of the following three possibilities can occur**
 - **nonbinding (shadow price = 0)**
 - **binding (shadow price < marginal value limit)**
 - **violated (shadow price = marginal value limit)**
- **If the transmission constraint is binding, the shadow price is a linear function of marginal units' offer prices**

Pricing Outcomes

- **If the pricing outcome is such that the shadow price equals the marginal value limit, then the marginal value limit is setting the market price**
- **PJM stated that these pricing outcomes are possible (slide 14)**

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