

Economist's Supplemental Comments to the DiCaprio/PJM Inadvertent Interchange
Pricing Proposal
Inadvertent Interchange Payback Taskforce, Business Practices Subcommittee
North American Energy Standards Board

There are several problems with the DiCaprio/PJM Inadvertent pricing proposal, endemic to using a "single" price (energy only) instead of a "two-part" price (energy plus frequency-contribution).

(i) FREQUENCY-CONTROL CONTRIBUTION CONFUSED WITH TRANSMISSION-CONGESTION OR WITH CONGESTED ENERGY

(i.1) Frequency-contribution confused with transmission-congestion or reverses congestion pricing. When there is no congestion, contribution to underfrequency is not priced! When the Inadvertent taker is the low priced party, he is not paid for congestion relief. When the Inadvertent taker is the high priced party, the congestion charge is also the charge for contribution to underfrequency.

(i.2) Frequency-contribution confused with congested energy or reverses congested energy pricing. Keeps the price of contribution to overfrequency the reverse of the total fixed congested energy price when the Inadvertent supplier is the low priced party, and well in excess of the normal payment for decongestion when the Inadvertent supplier is the high-priced party.

(ii) UNFAIRNESS/INEFFICIENCY/DISCONTINUITY. Makes inadvertent interchange prices economically too big or too small.

(ii.1) Tiny random frequency errors make energy in the wrong direction suddenly hugely costly and energy in the right direction suddenly hugely rewarding.

(ii.2) Inadvertent interchange is kept from being priced high enough when underfrequency error is big, or from being positively priced when overfrequency error is big.

(iii) DEADBAND WORSENS THE UNFAIRNESS. A frequency deadband within which Inadvertent Interchange would not be priced would prevent the over-compensating/charging for good/bad inadvertent when frequency error is low from offsetting on average the under-compensating/charging for good/bad inadvertent when frequency error is big. This worsens the unfairness.

(iv) INSTABILITY. Price mis-signaling destabilizes frequency control.

(iv.1) Under-compensating/charging for good/bad inadvertent when frequency error is small risks oscillations destabilizing control into the direction opposite the anticipated errors. It thereby also penalizes people who otherwise have good control by suddenly throwing them into having bad control.

(iv.2) Under-compensating/charging for good/bad inadvertent when frequency error is big discourages good inadvertent, and encourages bad inadvertent, at the very worst time for reliability (when frequency error is big).

(v) COMPLEXITY OF COMPUTING HIGHEST PRICE. The higher energy price across a single Intertie cannot be charged because we have voted that Inadvertent is between the Balancing Authority and the rest of the Interconnection, not between an individual pair of Balancing Authorities. Moreover, there is no simple/easy way of calculating a different "average price" for the rest of the interconnection for each Balancing Authority every hour.

(vi) VIOLATION OF LOCATIONAL (CONGESTION) PRICING. Using the highest energy price enables avoiding congestion charges and violates the fundamental principle of electricity markets. It makes inadvertent-pricing (frequency-control) and congestion-pricing (transmission-loading) interfere with one another and contradict one another rather than complement one another.

(vi.1) When frequency is high, congested-off Balancing Authorities will have a disproportionately big incentive to take energy across congested interties because they are sure to be exempted any congestion charge regardless of how small the over-frequency. This uneconomic frequency control, that is non-marginal with respect to frequency error, also winds up underpricing congestion, thereby overpenalizing the generator for congestion and underpenalizing the consumer for congestion.

(vi.2) When frequency is low, congested-off Balancing Authorities will have a disproportionately big incentive to send energy to decongest congested interties because they are sure not to have to pay the full congestion revenue to the energy taker. Uneconomic frequency control, that is non-marginal with respect to frequency error, also winds up overcompensating the generator for congestion relief and overpenalizing the consumer for congestion relief.

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