



Interface Pricing Flaw in MISO and PJM

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Introduction

- MISO and PJM's interface prices currently contain a substantial flaw when a market-to-market constraint is binding.
 - ✓ Transactions are over-paid/over-charged when they settle with both RTOs because both RTO's are pricing its full effect on the constraint.
 - ✓ In other words, *every dollar paid by the non-monitoring RTO for the same relief is redundant with the payment made by the monitoring RTO.*
- We have been working with the RTOs to understand the flaw and develop alternative solutions that can be implemented quickly.
 - ✓ We believe there is now consensus between the RTOs and market monitors on the existence and nature of the flaw.
- This presentation provides an update on this issue and the potential alternatives for addressing the flaw.



Does the Interface Pricing Flaw Raise Substantial Concerns?

- **Yes.** Our primary concern with this error is that it provides inefficient scheduling incentives and, therefore, will cause:
 - ✓ Efficient transactions to not be scheduled; and
 - ✓ Inefficient transactions to be scheduled.
 - ✓ These inefficient transaction patterns lead to higher production costs and, ultimately, to higher costs to the RTO's consumers.
 - ✓ Although these effects would be very difficult to quantify, we believe the costs are large.
- It also raises substantial equity concerns because the redundant payments by the non-monitoring RTO results in:
 - ✓ Balancing Congestion (called negative ECF in MISO);
 - ✓ FTR underfunding.



Solutions for the Interface Pricing Flaw

Objective for any solution:

Pay or charge the transaction for 100 percent of the congestion value of constraints affected by the transaction.

Two alternatives for achieving this objective:

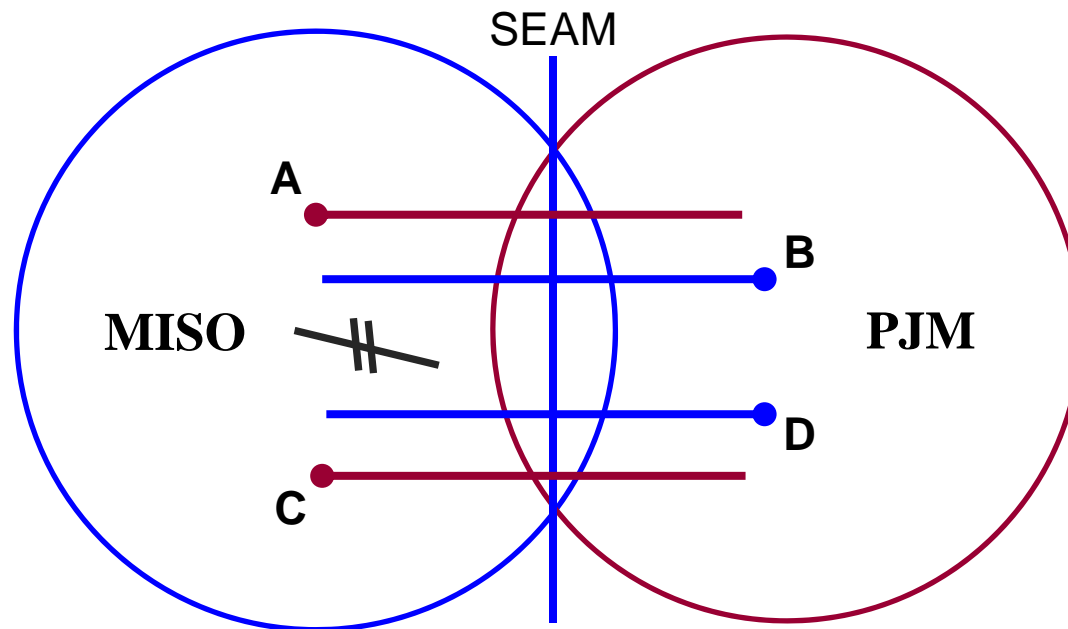
1. The monitoring RTO settles 100 percent of the affected congestion with the transaction.
2. Both RTOs settle part of the affected congestion with the transaction, summing to 100 percent.

Factors to Consider

- The first alternative ensures that the settlement reflects the monitoring RTO's valuation (shadow cost) of the constraint.
- Any alternatives where the non-monitoring makes or receives a payment would require some reimbursement mechanism.
 - ✓ E.g., direct reimbursement or market flow adjustment.



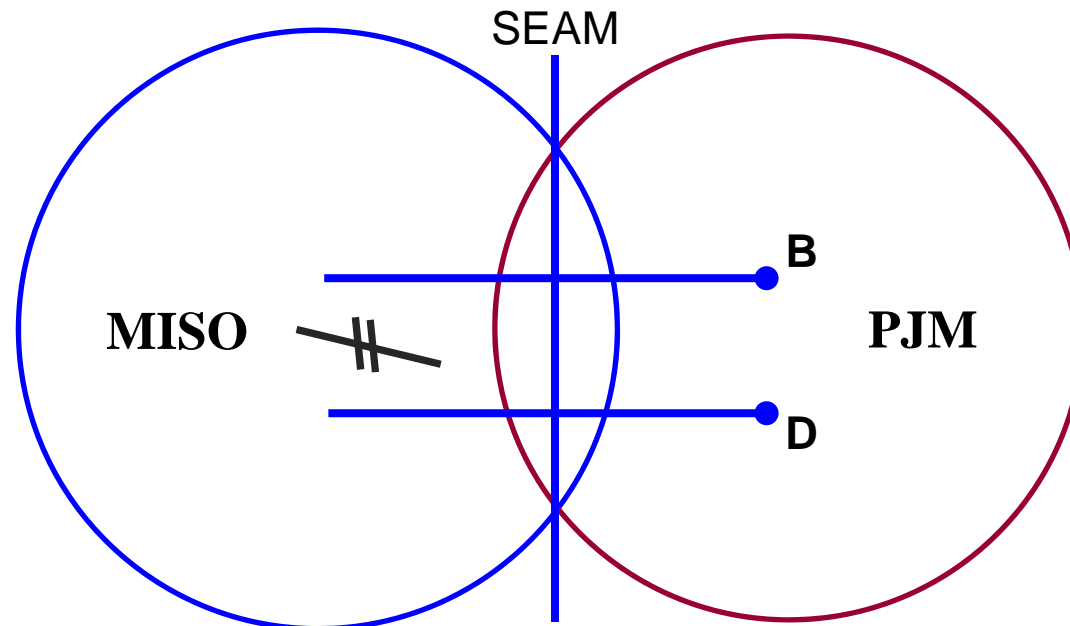
Interface Pricing Flaw: Current Situation



- Under the current market, the full effect of the transaction on the MISO M2M constraint is modeled by both RTOs.



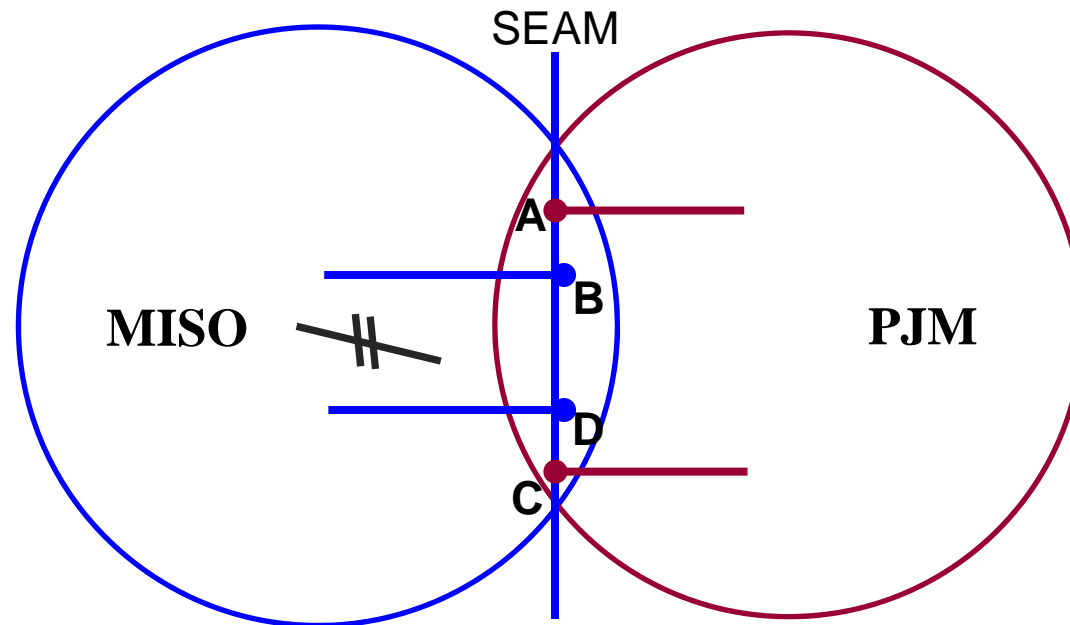
Interface Pricing Flaw Solutions: Alternative #1



- Double payment is eliminated because only the monitoring RTO settles with the transaction.
- Settlement is based entirely on the monitoring RTO's shadow price.
- Settlement will be efficient whether the MISO constraint is a M2M constraint or an internal constraint (because no PJM settlement is necessary to achieve objective).



Interface Pricing Flaw Solutions: Alternative #2



- The two legs of the transaction are separately modeled by the RTOs.
- If both RTOs have the same shadow price for the constraint, the payment to the transaction will be roughly consistent with Alternative #1.
 - ✓ Unfortunately, this is often not the case.
- Non-M2M constraints will not be efficiently settled because the effects of the transaction from the seam into PJM will be missing.



Interface Pricing Flaw Solutions: Examples

- The following examples show how both Alternatives can produce an efficient settlement with the transaction.
 - ✓ Examples assume a 1 MW export from MISO to PJM that relieves a binding MISO M2M constraint.

Example 1- Alternative #1

	MISO	PJM	Adjustment
Shadow Cost	\$500	0	
Shift Factor	-10%	0	
Congestion Payment	\$50	0	No Inter-RTO settlement Necessary
Total Payment	\$50		Payment is efficient

Example 2- Alternative #2 in the Ideal Case

	MISO	PJM	Adjustment
Shadow Cost	500	500	
Shift Factor	-5%	-5%	
Congestion Payment	\$25	\$25	MISO pays PJM \$25
Total Payment	\$50		Payment is efficient



Interface Pricing Flaw Solutions: Examples

- The following examples shows that if the shadow prices do not converge, the total settlement with the transaction under Alternative #2 will not be efficient.

Example 3- Non-Convergent Shadow Price, Positive GSFs

	MISO	PJM	Adjustment
Shadow Cost	500	100	
Shift Factor	-5%	-5%	
Congestion Payment	\$25	\$5	MISO pays PJM \$5
Total Payment	\$30		Transaction underpaid

Example 4- Non-Convergent Shadow Price, Opposing GSFs

	MISO	PJM	Adjustment
Shadow Cost	500	100	
Shift Factor	-20%	10%	
Congestion Payment	\$100	(\$10)	PJM pays MISO \$10? MISO will incur \$40 of Balancing Congestion (neg. ECF)
Total Payment	\$90		Transaction overpaid



Interface Pricing Flaw Solution: Other Interfaces

- The examples above address the PJM-MISO interface.
- It is efficient for the non-monitoring RTO to continue to settle the congestion on the monitoring RTO's M2M constraints for transactions that do not settle with the monitoring RTO.
 - ✓ For example, a transaction from MISO to TVA may affect a PJM M2M constraint.
 - ✓ MISO and PJM should continue to make such payments, but a settlement or market flow adjustment should be developed.
- A problem exists when transactions cross interfaces that sometimes settle with both RTOs.
 - ✓ E.g., MISO's TVA or IMO interfaces are sometimes involved in wheels to PJM.
 - ✓ The problem is solved if PJM and MISO prices these transactions at the MISO/PJM interface price when the power is wheeled through the non-monitoring RTO.



Recommendations

- Both RTOs should implement Alternative #1 as quickly as possible.
- The WPPI concerns can be addressed in the future if the non-monitoring RTO *adopts the assumed injection/withdrawal of the monitoring RTO for the monitoring RTO's M2M constraints.*
 - ✓ These common assumed points do not have to be located at the seam.
- Non-monitoring RTO's should retain the congestion component for M2M constraints at interfaces where the transaction would only settle with the non-monitoring RTO.
 - ✓ RTO's should develop a market flow adjustment or settlement adjustment to account for this payment/receipt.
 - ✓ Development of this adjustment should not slow the implementation of Alternative #1.
- Wheels through the non-monitoring RTO's area should be settled at the interface price for the non-monitoring RTO.
- All other external constraints (e.g., TLR constraints) should be eliminated from all interface prices.