



FTR Forfeiture FERC Order MIC Update



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- On June 10, 2013 PJM filed revisions to its Tariff to define UTC transactions and clarify rules including FTR forfeitures
 - PJM explained the need to apply different rules for UTCs
- In August, 2014 FERC initiated an FPA 206 investigation to determine the need to apply different FTR forfeiture rules for UTCs vs INC/DECs
 - In January, 2015 FERC held a technical conference
- On January 19, 2017 FERC issued a final order
 - FERC found existing rules are unjust and unreasonable

- Adopt a portfolio-based virtual transaction forfeiture calculation
- Adopt a load-weighted reference bus when evaluating impacts
- Include Zones, Interfaces, and Hubs
- Remove the 75% virtual threshold test and trigger forfeitures when
 - The net portfolio forfeiture flow increase the value of an FTR; and
 - The net flow exceed a certain % of the constraint physical limit
- Include FTR counter flow transactions
- Revise the definition of affiliates to include affiliates under common ownership

| Item | Prevailing Flow FTR | Counter Flow FTR |
|---------------------------|--|---|
| Virtual Impact | Participant Portfolio Hourly Net Impact on DA Constraints | Participant Portfolio Hourly Net Impact on DA Constraints |
| Constraint Threshold Test | Net impact more than positive threshold % | Net impact less than negative threshold % |
| FTR Impact On Constraints | Participant FTR Path constraint spread is at least \$ 0.01 | Participant FTR Path constraints spread is at least \$ 0.01 |
| Convergence Test | DA Value > RT Value | DA Value > RT Value |
| Forfeit | Sum [participant hourly profits per FTR] | Sum [participant hourly profits per FTR] |

- A constraint can impact the value of a FTR based on
 - FTR shift factor & constraint Shadow Price

- If the FTR congestion LMP spread for a constraint that is significantly impacted by a member's virtual portfolio is greater than a \$0.01, then the FTR shall forfeit profits
 - This is because:
 - Member significantly influenced constraint flows from its virtual portfolio
 - Member did not help converge DA and RT markets
 - Member is manipulating market outcomes to increase its profits
 - Profits are paid by other members for no gain

- 3 Scenarios where forfeitures can apply:
 - DA Target Allocation $>$ \$0, FTR Cost $>$ \$0 and Virtual Impact $>$ 0 MW
 - DA Target Allocation $<$ \$0, FTR Cost $<$ \$0 and Virtual Impact $<$ 0 MW
 - DA Target Allocation $>$ \$0, FTR Cost $<$ \$0
- Forfeiture = FTR DA Value – FTR Cost

- PJM will file Tariff Changes by April 19, 2017
- PJM will present Tariff and Manual language changes at future MICs
- PJM's goal is to develop a tool to calculate forfeitures based on new rules by 3rd quarter, 2017
 - Until then, forfeitures are not billed
 - Once the tool is built, forfeitures would be calculated effective Jan, 19
- PJM will work towards incorporating forfeiture calculations in its daily production settlement environment

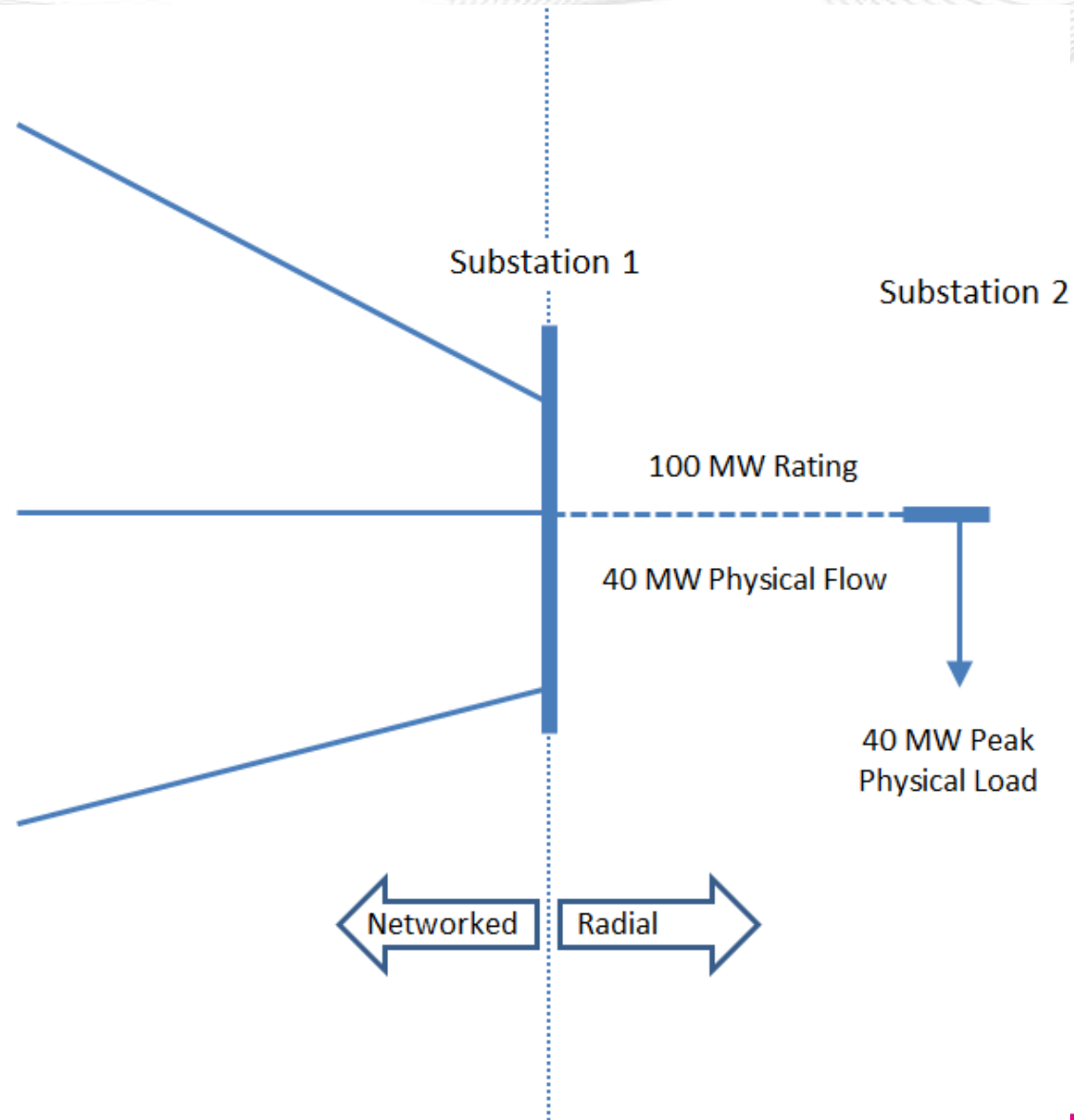
APPENDIX

| Item | FTR 1 | FTR 2 | FTR 3 | FTR 4 | FTR 5 | FTR 6 |
|---------------------------|-------|---------|---------|-------|--------|-------|
| FTR Cost | \$100 | (\$100) | (\$100) | \$100 | \$100 | \$100 |
| FTR DA Value | \$150 | (\$50) | \$50 | \$125 | (\$50) | \$150 |
| FTR RT Value | \$100 | (\$100) | (\$100) | \$130 | \$100 | \$100 |
| Virtual Constraint Impact | 20% | 10% | 15% | 25% | 10% | 5% |
| FTR Constraint Spread | \$5 | \$0.01 | \$10 | \$5 | \$10 | \$10 |
| Forfeiture | \$50 | \$50 | \$150 | NONE | NONE | NONE |

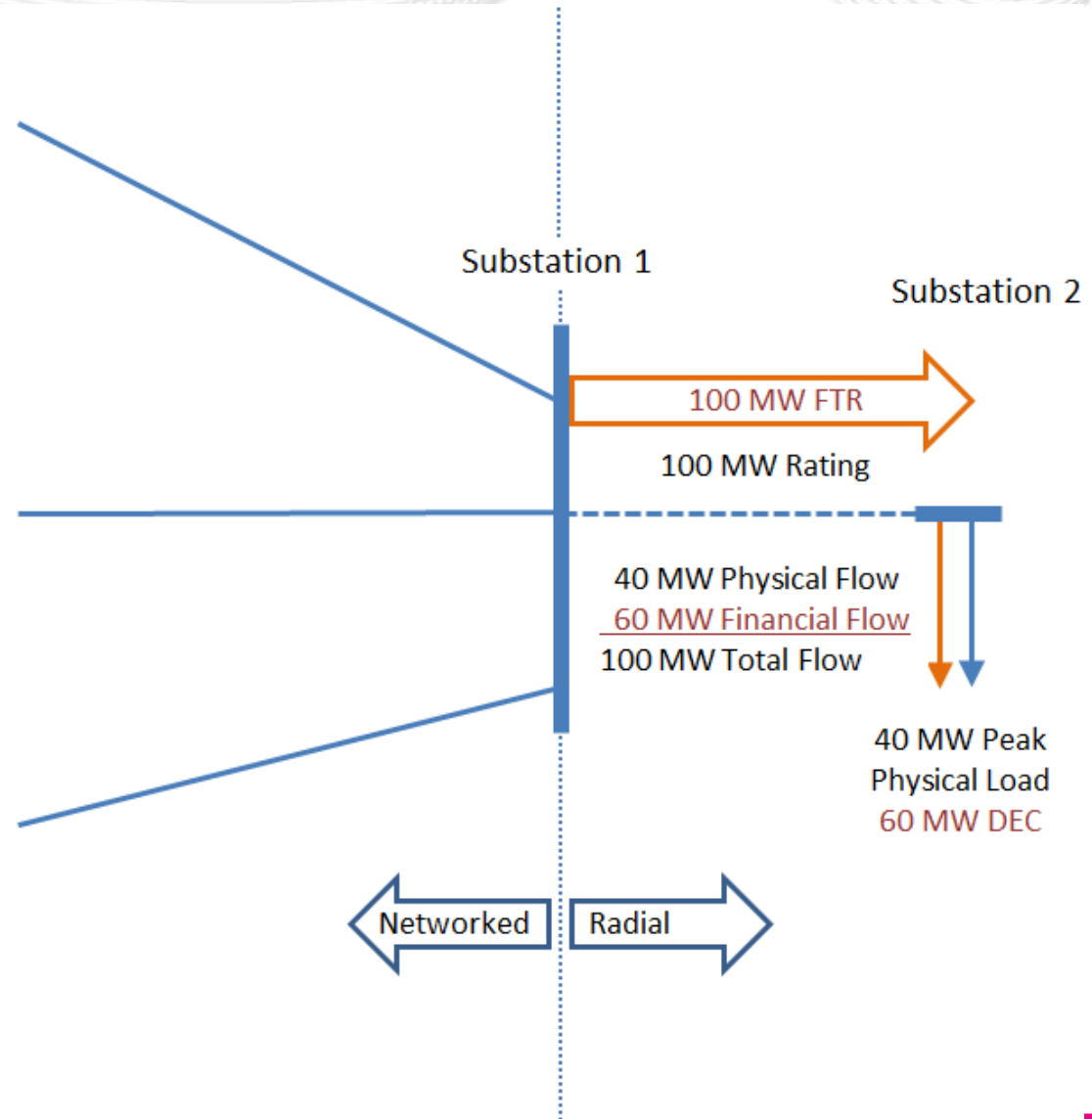
- In 2000, PJM observed certain market participants obtaining FTRs on radial paths that were never congested
- Participants then used virtual products in DA market to create congestion that is inconsistent with RT market congestion in order to develop inappropriate profits
- As a result participants were able to control FTR profits without adding market liquidity or market efficiency
- This behavior was mitigated by applying FTR forfeiture rules

- In response to market participant behavior, on December 22, 2000 PJM filed with the FERC amendments to its Tariff as Section 5.2.1(b).
- The particular behavior consisted of:
 - Obtaining FTRs on never-congested radial paths
 - Then using INCs and DECcS to cause congestion on the path in the day-ahead market
 - Path never congested in real-time
 - Participant had the ability to control its profits
 - Behavior did not enhance market efficiency

- Radial path built to serve load years into the future
- Flow \ll Capability so never congested



- Radial path built to serve load years into the future
- Flow \ll Capability so never congested
- Path price consistently nil so 100 MW FTRs obtained for little or no cost
- 60 MW DEC bid caused path congestion
- For every FTR MW above cleared DEC MW, participant nets path-price difference as profit



- Radial path
- No RT congestion

| Case 1: Pure Physical | | | | | | |
|-----------------------|--------------|--------------|---------------------|------------|--|------------|
| | Prices | | | Quantities | | Settlement |
| | Substation 1 | Substation 2 | Path ₁₋₂ | Load 2 | | Load 2 |
| DA | \$30 | \$30 | \$0 | | | |
| RT/BAL | \$30 | \$30 | \$0 | 40 | | -\$1,200 |
| TOTAL | | | | | | -\$1,200 |

| Case 2: Observed Behavior; \$1/MWH Price-movement | | | | | | | | | |
|---|--------------|--------------|---------------------|-------------------------|-----|--------------------|------------|---------|--------------------|
| | Prices | | | Quantities | | | Settlement | | |
| | Substation 1 | Substation 2 | Path ₁₋₂ | Load 2 | DEC | FTR ₁₋₂ | Load 2 | DEC | FTR ₁₋₂ |
| DA | \$30 | \$31 | \$1 | 60 | 100 | | -\$1,860 | | \$100 |
| RT/BAL | \$30 | \$30 | \$0 | 40 | -60 | | -\$1,200 | \$1,800 | |
| TOTAL | | | | | | | -\$1,200 | -\$60 | \$100 |
| | | | | Physical Load: -\$1,200 | | | | | |
| | | | | Net Financials: | | | \$40 | | |

| Case 3: Observed Behavior; \$100/MWH Price-movement | | | | | | | | | |
|---|--------------|--------------|---------------------|-------------------------|-----|--------------------|------------|----------|--------------------|
| | Prices | | | Quantities | | | Settlement | | |
| | Substation 1 | Substation 2 | Path ₁₋₂ | Load 2 | DEC | FTR ₁₋₂ | Load 2 | DEC | FTR ₁₋₂ |
| DA | \$30 | \$130 | \$100 | 60 | 100 | | -\$7,800 | | \$10,000 |
| RT/BAL | \$30 | \$30 | \$0 | 40 | -60 | | -\$1,200 | \$1,800 | |
| TOTAL | | | | | | | -\$1,200 | -\$6,000 | \$10,000 |
| | | | | Physical Load: -\$1,200 | | | | | |
| | | | | Net Financials: | | | \$4,000 | | |

- The observed behavior did not:
 - Enhance market efficiency/provide convergence
 - Moved day-ahead away from real-time, yet was rewarded
 - No liquidity at isolated points on the system, so no competition to mitigate impacts
 - Provide incentive to bid efficiently
 - The higher the DEC bid, the more net profit!
- Behavior first observed early/mid-December 2000 and Tariff changes filed December 22