

Day-Ahead Firm Flow Entitlement Exchange and Settlement

FERC Technical Conference

September 22, 2014

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Day-Ahead Firm Flow Entitlement (FFE) Market-to-Market Coordination

DA FFE Coordination

- **SPP understands that MISO and PJM do not practice DA FFE exchange and settlement**
 - **SPP's current methodology for recognizing FFE in DA processes is via Parallel Flow Forecasting**
- **SPP and MISO agree to coordinate DA FFE values for quality assurance in respective DA Markets**
- **Utilizing DA FFE without modification will commit resources based on a DA market methodology and not a real-time market methodology**

SPP DA FFE Coordination (cont.)

- **SPP plans to assess the benefits of adding DA FFE exchange and settlements after implementing real-time Market-to-Market Congestion Management**
 - **If results of that analysis indicate benefits are worth pursuing, SPP will work with MISO and SPP stakeholders to prioritize and implement**
- **Benefits of real-time Market-to-Market coordination should not be delayed**
 - **It may be possible to realize increment value from DA exchange and settlement of FFE**
 - **DA FFE exchange and settlements are not required for benefits of real-time Market-to-Market Congestion Management to be realized**



Helping our members work together
to keep the lights on... today
and in the future

APPENDIX

Firm Flow Entitlement (FFE)

- **Firm Flow Entitlements (FFE)**
 - **The firm limit of net market flow above which the market entity agrees to pay for congestion relief on a Reciprocally Coordinated Flowgate (RCF)**
 - **In the Interregional Coordination Process that extra usage is subject to financial settlement**

Firm Flow Limit Calculation

- For RCFs, $FFL = DA\ GTL + (2DA\ Allocation - DA\ GTL - Schedule\ Impacts)$

if $(2DA\ Allocation - DA\ GTL - Schedule\ Impacts) > 0$

$FFL = \text{minimum}(2DA\ Allocation, DA\ GTL)$

if $(2DA\ Allocation - DA\ GTL - Schedule\ Impacts) < 0$

where,

- 2DA Allocation is 2 Day-Ahead Allocation of flowgate capacity to an entity based on flowgate capacity and historical flowgate usage. It is a single daily number that applies to every hour of the day
- DA GTL is Day-Ahead Generation-to-Load impacts of generation serving load on a flowgate based on the Day-Ahead load forecast
- Schedule Impacts is Real-Time Actual Usage of Point-to-Point impacts on a flowgate caused by scheduled energy flows

Firm Flow Entitlement Calculation

- It is a maximum value of a Market Entity's Market Flows that can be considered as Firm for purposes of congestion management on a net basis on a particular flowgate
- Hourly values
- FFE is calculated for Net Market Flows down to 0% and used in Market-to-Market Settlement Calculations
- $FFE = \text{Forward FFL} - \text{Reverse FFL}$

Where,

Reverse FFL = minimum (2DA Allocation, DA GTL) in reverse direction

FFE IN FORWARD PROCESSES

- Both Credits and Charges impact Revenue Neutrality Uplift (RNU)
- Both the Transmission Congestion Rights (TCR) and Day-Ahead (DA) Markets use entitlement based limits
 - Market limits based upon FFE estimate in DA and TCR
- DA uses an estimate of the FFEs that are ultimately settled based upon RT dispatch/binding
 - This Day Ahead estimate should not be prescribed by JOA or neighboring RTO. Estimate based on real-time flows in real-time, plus Day-Ahead FFE estimate consideration.

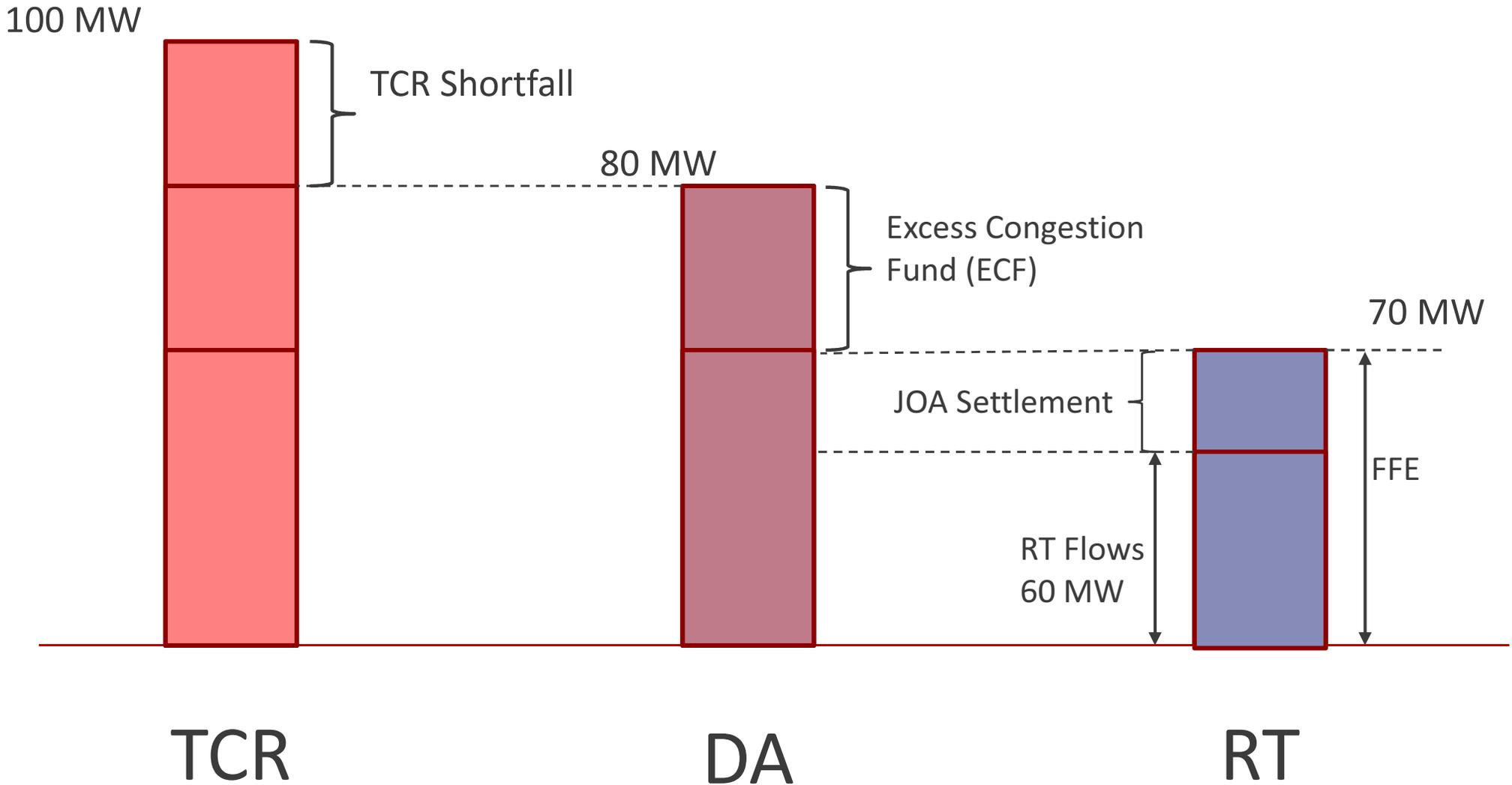
FORWARD MARKET LIMITS FOR M2M FLOWGATES

- **External M2M constraints limits**
 - Estimate of Real-time RCF flow based upon measured parallel flow
 - $FFE_{\text{Non-Monitoring RTO (NMRTO)}}$
- **Internal M2M constraints limits**
 - $FG \text{ Limit } \textit{minus} FFE_{\text{NMRTO}} \textit{minus} \text{LoopFlow}_{\text{Non-JOA-parties}}$

TCR, DA AND RT REVENUE ADEQUACY

- **RT Excess Congestion Fund (ECF)**
 - Results from the differences between DA and RT net flows when RT is binding
- **TCR Funding shortfall**
 - Results from the difference between TCR and DA net flows when DA is binding
- **Flow differences between markets are due to:**
 - Topology Differences (planned vs. actual outages)
 - Constraint modeling (Limits, monitored elements, FFEs)
 - Loop flow modeling/assumption differences

FUNDING PARADIGM



DA FFE Payment

- **SPP is Non-Monitoring RTO and is above FFE on M2M constraint**
 - SPP pays MISO
- **SPP is Monitoring RTO and is below FFE on M2M constraint**
 - SPP receives payment from MISO

FFE formula

- Example of major SPP-MISO RCF Day-Ahead schedule impact FFE component error only:

Flowgate	VALIANTLYDIA	
Rating	1076	
	Operating Day-2	
	Average MW Diff (absolute)	Percentage error
March	128.04	11.90%
April	116.78	10.85%
May	96.45	8.96%
June	64.02	5.95%
July	102.62	9.54%
August	74.92	6.96%
6mo	96.99	9.01%
6mo (5%-95%)	93.18	8.66%