Emergency Load Response and Emergency Energy Billing Settlement Education

Market Settlements Subcommittee

June 25, 2014

- PJM may purchase energy from outside PJM as needed to alleviate or end an Emergency, and may sell energy to another Control Area as requested during Emergency conditions in that Control Area.

- Emergencies may be reserve deficiencies or Minimum Generation (low load) Emergencies.

- There are four possible Emergency Energy transactions:
  - Emergency Energy Purchases by PJM
  - Emergency Energy Sales by PJM
  - Minimum Generation Emergency Purchases by PJM
  - Minimum Generation Emergency Sales by PJM

- The total hourly costs in excess of RT LMP of Emergency energy purchased by PJM are allocated to real-time deviations from day-ahead net interchange that create a shorter real-time position

  – Increase in participant's spot market purchase or decrease in spot market sales

- A billing adjustment is calculated, as applicable, to exempt any MWh of generator reductions requested by PJM for reliability during any hours of Emergency energy purchase

- The total hourly revenues in excess of RT LMP of Emergency energy sold by PJM are allocated to:
  - Real-time deviations from day-ahead net interchange that create a shorter real-time position
    - Increase in participant's spot market purchase or decrease in spot market sales
  - Any energy sales from within PJM to entities outside of PJM that have been curtailed by PJM during the Emergency

- The total hourly costs in excess of RT LMP of Minimum Generation Emergency energy purchased by PJM are allocated to real-time deviations from day-ahead net interchange that create a longer real-time position
  - Decrease in participant's spot market purchase or increase in spot market sales

- The total hourly revenues in excess of RT LMP of Minimum Generation Emergency energy sold by PJM are allocated to Real-time deviations from day-ahead net interchange that create a longer real-time position
  - Decrease in participant's spot market purchase or increase in spot market sales
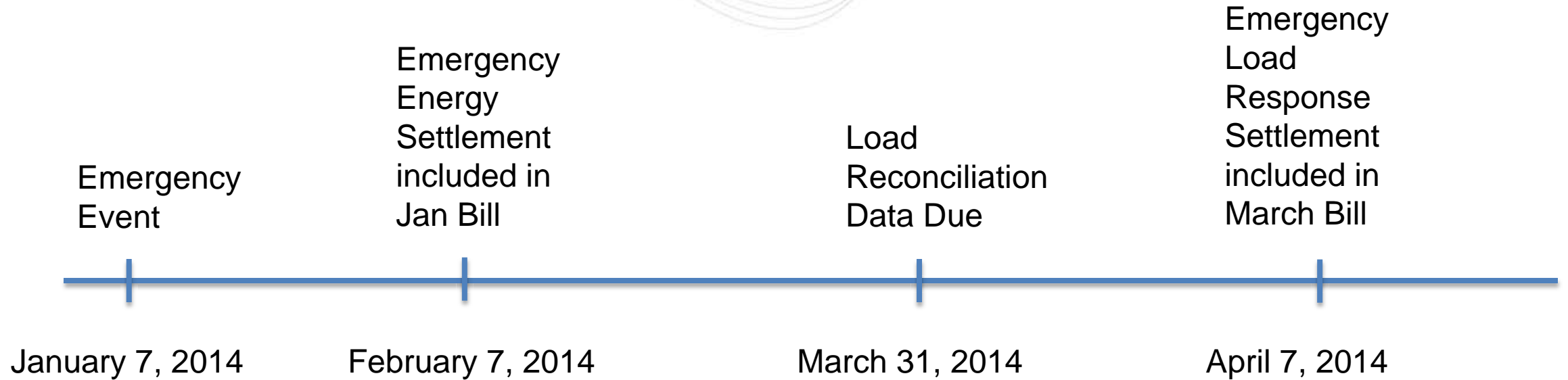
- Similar to Emergency Energy allocations, all energy charges under the Full Emergency, Full Pre-Emergency, and Emergency Energy Only Load Response Program are allocated pro-rata to PJM Market Participants

- Participants' share is determined by calculating the real-time deviation from their net interchange in the day-ahead market, whenever that deviation increases their spot market purchases or decreases their spot market sales

- Emergency Energy charges and/or credits and Emergency Load Response Charges are allocated pro-rata based on participant's share of Real-time deviations from day-ahead net interchange versus the total deviations across PJM.

- Day-ahead net interchange equals the sum of a participant's:

  - Cleared DA demand and/or DEC bids

    minus Cleared DA Generation and/or Increment offers

    adjusted for all DA energy transactions in which the customer is involved

- Real-time net interchange equals:
  - Participant's hourly metered flows

    <u>minus</u> any ownership of metered generation

    <u>adjusted</u> for all real-time energy transactions*

  *(including any load obligations [de-rated for transmission losses] or generation modeled by InSchedule transactions, and including any InSchedule transactions that were priced day-ahead) in which the customer account is involved.

- Real-time net interchange is calculated using submitted initial Load values, which may be updated as part of the existing reconciliation process.

Emergency Event

Emergency Energy Settlement included in Jan Bill

Load Reconciliation Data Due

Emergency Load Response Settlement included in March Bill

January 7, 2014

February 7, 2014

March 31, 2014

April 7, 2014

Assume:

- Total PJM Emergency Load Response Energy Credits to be allocated = $500,000
- Total PJM Bal Positive Interchange = 10,000 MW

Participant Specific Parameters:

Day-Ahead:
Cleared DA Demand Bid: 200 MW
Cleared Decrement Bid: 10 MW
Cleared DA Gen Offer: 100 MW
Cleared Increment Offer: 10 MW
Total DA Net Interchange: 100 MW

Real-Time:
RT Load: 600 MW
Gen Actual Generation: 100 MW
Real Time Net Interchange: 500 MW

Participant's Calculated Real-Time Deviation from Day-Ahead = 500 MW – 100 MW
= **400 MW**

- Participant's Share of Emergency Load Response Charges =

  Total PJM Emergency Load Response Energy Credits *

  (Participant's Positive Bal Net Interchange /

  Total PJM Bal Positive Interchange)

  = $500,000 * (400 MW / 10,000 MW)

  = $20,000

- Suppose the original RT Load value of 600 MW was updated using PJM's existing reconciliation process to 400 MW.

Assume previous values stay constant:

– Total PJM Emergency Load Response Energy Credits to be allocated = $500,000

– Total PJM Bal Positive Interchange = 10,000 MW

Updated Participant Specific Parameters (Reconciled Load = 400 MW)

Day-Ahead:
Cleared DA Demand Bid: 200 MW
Cleared Decrement Bid: 10 MW
Cleared DA Gen Offer: 100 MW
Cleared Increment Offer: 10 MW
Total DA Net Interchange: 100 MW

Real-Time:
RT Load: ~~600 MW~~   400 MW
Gen Actual Generation: 100 MW
Real Time Net Interchange: ~~500 MW~~
300 MW

Participant's Calculated Real-Time Deviation from Day-Ahead = 300 MW – 100 MW
= **200** MW

- Participant's Share of Emergency Load Response Charges using Reconciled Data =

    Total PJM Emergency Load Response Energy Credits *

      (Participant's Positive Bal Net Interchange /

        Total PJM Bal Positive Interchange)

    = $500,000 * (200 MW / 10,000 MW)

    = $10,000

- The participants charge allocation taking reconciled load values into consideration is $10,000 less than the amount using RT (unreconciled) load.