

# Transmission Outage Acceleration Process Overview

Rob Dropkin, Transmission Operations OC Special Session September 8, 2022

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- Defined in
  - PJM Tariff
  - Operating Agreement
  - Manual-03 Section 4.5
- Provide Generation Owner or Market Participants with a method for requesting an alternative outage schedule to alleviate FTR revenue inadequacy.
- "The affected Transmission Owner shall determine, in its sole discretion, whether to accelerate or reschedule a transmission outage."



#### Method 1

- Transmission Outages Requiring Coordination With A Specific Generation Owner.
  - Transmission outage isolates a unit/plant
  - Planned or forced outage
    - Planned outages have a 6 week notification requirement (M03, Sec 4.1.13)
  - No postings are made
- GO may make outage acceleration request prior to a planned transmission outage that bottles generation (minimum 2 weeks prior). GO can make outage acceleration request during the expected forced unit outage duration.



#### Method 2

- Transmission Outages That Could Cause Congestion Revenue Inadequacy.
  - PJM performs month-long assessment two months ahead
    - On Time Outages exceed five days scheduled to start in the month of the analysis window or Forced Outages projected to last into the month of analysis window.
    - Causes congestion revenue inadequacy in excess of \$500,000
  - PJM posts outages qualified for acceleration on OASIS by 15<sup>th</sup> of the month
- Market participants have 1 week from posting to express willingness to accelerate a qualified outage.



- PJM awards FTRs based on the capability of the transmission system
- There must be adequate revenue from congestion to fund the FTRs that were awarded
- Revenue adequacy issues occur when we under-collect congestion revenue to fund FTRs
  - Transmission outages and de-ratings can have a significant impact on FTR revenue adequacy



### Inputs

**Load Forecast Data** 

Historical Day Ahead Market Data

Scheduled Generation and Transmission Outages

Future FTR Data

Updated EMS Model

#### Calculation

Create cases for each day of study

Day Ahead Market tools calculate revenue inadequacy for each transmission ticket

## Analysis

Verify results

Post tickets that result in revenue inadequacy over \$500,000



### Inputs

**Load Forecast Data** 

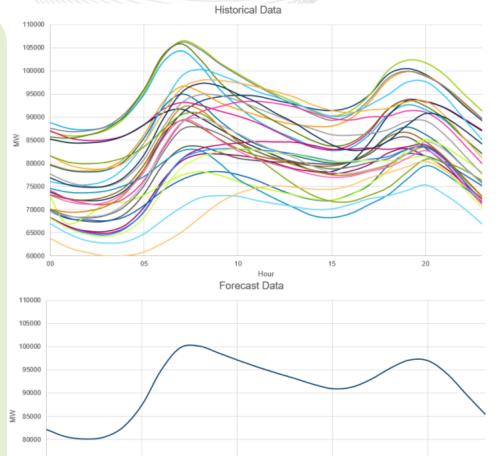
Historical Day Ahead Market Data

Scheduled Generation and Transmission Outages

Future FTR Data

Updated EMS Mode

75000 70000 65000



- Average of historical load data
- Scaled for study period
- Separate weekend and weekday profiles
- Separate profile for each zone and each month



### Inputs

Load Forecast Data

Historical Day Ahead Market Data

Scheduled Generation and Transmission Outages

Future FTR Data

**Updated EMS Mode** 

- Historical Day Ahead cases used for sample market data
  - Similar load day from past
  - Separate samples for weekday and weekend



#### Inputs

Load Forecast Data

Historical Day Ahead Market Data

Scheduled Generation and Transmission Outages

**Future FTR Data** 

**Updated EMS Mode** 

- All scheduled generation and transmission outages are modeled in study
  - Includes outages that start before the start of the study period and continue into the study period



### Inputs

Load Forecast Data

Historical Day Ahead Market Data

Scheduled Generation and Transmission Outages

Future FTR Data

**Updated EMS Mode** 

FTRs are input for the study month

### Inputs

Load Forecast Data

Historical Day Ahead Market Data

Scheduled Generation and Transmission Outages

**Future FTR Data** 

**Updated EMS Model** 

Latest quarterly EMS model is used.

Includes topology for new equipment cut in



### Inputs

Load Forecast Data

Historical Day Ahead
Market Data

Scheduled Generation and Transmission Outages

Future FTR Data

**Updated EMS Mode** 

### Calculation

Create cases for each day of study

Day Ahead Market tools calculate revenue inadequacy for each transmission ticket

## Analysis

Verify results

Post tickets that result in revenue inadequacy over \$500,000



# PJM Analysis for Qualifying Transmission Tickets Calculation Steps

Use Day Ahead Market tools to simulate each day on an hourly basis with all planned transmission outages implemented. Calculate revenue inadequacy for each hour of the day and for each day of the month.

For each ticket being studied, simulate each day with that ticket returned to service. Calculate revenue inadequacy for each hour of the day and for each day of the month.

Calculate difference in total revenue inadequacy for each studied ticket.



### Inputs

Load Forecast Data

Historical Day Ahead
Market Data

Scheduled Generation and Transmission Outages

Future FTR Data

**Updated EMS Mode** 

### Calculation

Create cases for each day of study

Day Ahead Market tools calculate revenue inadequacy for each transmission ticket

# Analysis

Verify results

Post tickets that result in revenue inadequacy over \$500,000





PJM posts qualified outages to OASIS (e.g. by September 15<sup>th</sup> for outages starting in November)

Market Participant (MP) makes request for acceleration to PJM (within 1 week)

PJM informs TO. TO provides cost estimate for acceleration or not possible (within 1 week)

PJM reviews creditworthiness and cost allocations. PJM informs MP.

MP decides whether or not accept.

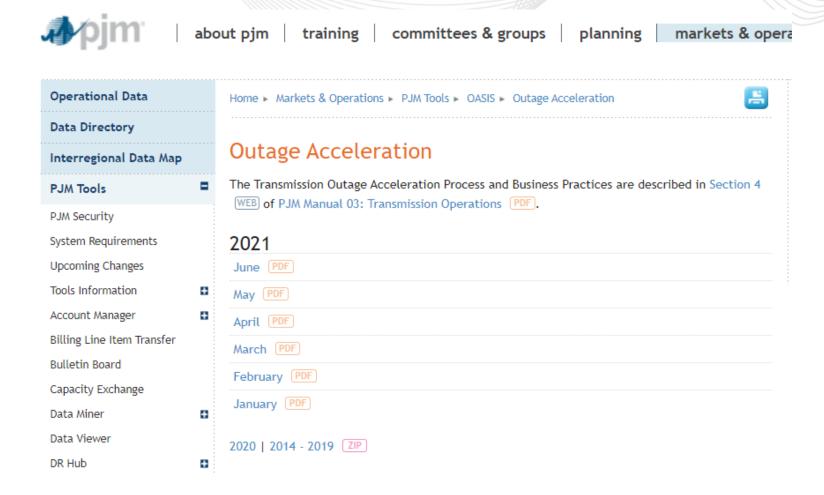
TO updates outage schedule.



- Up to 120% of estimate
  - GO/MP is responsible for actual costs (below 120%) incurred by the affected Transmission Owner.
- Exceeding 120% of estimate
  - Transmission Owner shall notify PJM prior to exceedance.
  - GO/MP will then decide whether to continue and pay the additional costs.



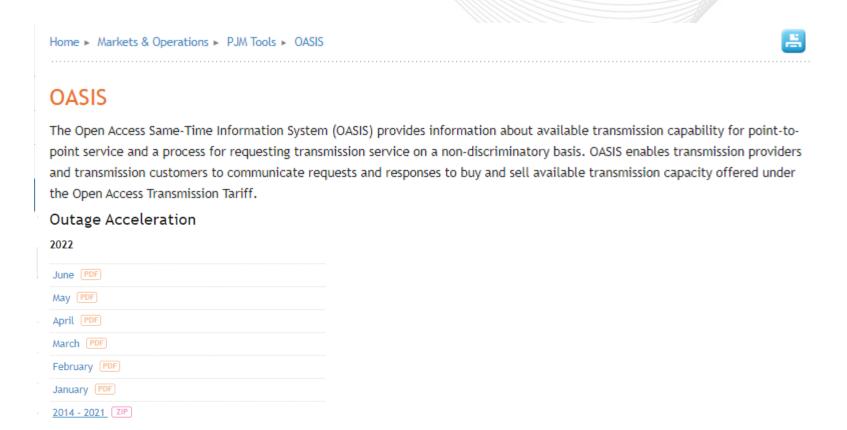
#### **Current Posting Site**



https://www.pjm.com/markets-and-operations/etools/oasis/outage-accel.aspx



#### **Future Posting Site**



https://pjm.com/markets-and-operations/etools/oasis





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**Transmission Outage Acceleration Process** 



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