



# PJM Thermal Facility Rating Transparency: *FERC Order 881* impact

Dave Hislop  
Manager, Outage Analysis Technologies  
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Coordination  
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On December 16, 2021, FERC issued Order 881 with an objective of improving “the accuracy and transparency of electric transmission line ratings.”

- ✓ <https://www.ferc.gov/media/e-1-rm20-16-000>
- ✓ Requires ambient-adjusted ratings [AAR] on all transmission service transmission lines
  - Allows for AAR Exceptions and Temporary ratings used for the safety & reliability
- ✓ Requires RTO/ISO to establish and implement systems necessary for hourly updates
  - Allows for the use of Rating Set Lookup Tables towards this end
- ✓ Requires the use of uniquely determined emergency ratings (from that of normal ratings)
- ✓ Requires TOs to share transmission line ratings and transmission line rating methodologies with their respective TP and with market monitors in RTO/ISOs
- ✓ **Requires TPs to maintain a database of TO ratings & methodologies on the TP’s OASIS or other password-protected website** [← Rating Transparency]

The above are high level objectives and associated caveats. The Order has over 400 paragraphs containing detail towards these objectives. FERC Orders speak for themselves and the above bullets are pulled from the Order’s *Introduction* paragraph and presented as a high level overview only.

## PJM AAR Definition

***Ambient-Adjusted Rating (AAR)***: A Thermal Transmission Facility Rating that:

- (a) Applies to a time period of not greater than one hour.
- (b) Reflects an up-to-date forecast of ambient air temperature across the time period to which the rating applies.
- (c) Reflects the absence of solar heating during nighttime periods where the local sunrise/sunset times used to determine daytime and nighttime periods are updated at least monthly, if not more frequently.
- (d) Is evaluated at least each hour, if not more frequently.

## PJM AAR & Seasonal Rating Exceptions Process

***AAR Exceptions:*** Where the Transmission Owner determines, consistent with Good Utility Practice, that a Thermal Transmission Facility Rating is not affected by ambient air temperature or solar heating, the Transmission Provider may use a transmission Facility Rating that is not an AAR or Seasonal Facility Rating.

**Rating Set** – Array representing the Normal (NL or continuous) and emergency (Long Term Emergency [LT/LTE], Short Term Emergency [ST/STE] & Load Dump [LD]) thermal Facility Ratings for a given condition or time of use.

**Rating Set Lookup Table** – Array of Rating Sets distinguished by, actual or forecasted, day/night timeframe and ambient conditions expressed in degrees Fahrenheit. Used in the selection of AAR, AAR Exceptions, Seasonal Facility Ratings, and Temporary/Conditional ratings.

**Real-time Telemetered Rating** – Facility Ratings that are directly telemetered from the TO to PJM, and hourly adjusted at minimum. Includes a subset known as Dynamic Line Ratings [DLR].

**Conditional / Temporary Rating** – Facility Rating override utilized for the safety & reliability of the transmission system, such as those found in Transmission Operating Procedures M-03B.

## Facility Ratings & Facility Rating Methodologies:

- Order 881 Requirement: Available via OASIS or via password protected location.
  - Location/technology is TBD, but likely to be via eDART access and available to all Generic users+.
- 5 year minimum historic record, including:
  - Effective duration (initiation and withdrawal) & data entry timestamp
  - UI, download and query options in standard formats/protocols
  - Nature and basis for *Exceptions & Temporary* (conditional) ratings

NOTE: Due to query & UI requirements, likely to move away from traditional txt format zip files to an application-based view offering machine-to-machine transfer. Technical design to be communicated in early 2023.

## Ratings in Real-time (in system priority order):

1. Conditional (Temporary) Overrides
2. *Real-time Telemetered Ratings* (including DLR) via ICCP
3. *Rating Set Lookup Tables* (including AAR & Exceptions) determined via:
  - Active Temperature value per TO Zone/Company in °F (i.e., Daytime temp of 78 °F in a given zone, leading to a 80-Day Temp Set)
  - ICCP of Active Rating Set (i.e., 80-Day) from PJM to TO



## 10-Day Hourly Ratings forecasts via the following priority order:

1. Transmission Owner hourly Facility Ratings forecasts.
  - Real-time Telemetered Facility projections:
    - 48 hour minimum Rating Set forecast **required** for TO using Real-time Telemetered Facility Ratings.
    - Up to the full 240 hourly (10-day) forecasts may *optionally* be provided by TO.
  - *Optional* projections provided by TO for all other Facilities. (Up to the full 240 hourly projections.)
2. PJM Hourly Ratings forecasts for remaining Facility Rating hours & Facilities.
  - Out through full 240 hours (10-day) for each individual Facility.
  - Derived from Temporary Ratings, Rating Set Lookup Tables & hourly weather forecasts.

NOTE: Forecasted ratings will not be provided via ICCP. Mechanism TBD.



## **Operations Planning *Seasonal Facility Ratings***

Within the Operations Planning time horizon, PJM to source appropriate Rating Set(s) from *Rating Set Lookup Tables* (including Temporary Ratings, AAR & AAR Exceptions) and projected temperatures for the given TO zone (or sub-zone) and time-horizon.

Order 881 Requirement: Minimum of four seasonal time-horizons.

- PJM to utilize 12 calendar-based monthly time periods.

NOTE: Seasonal Ratings are also leveraged in PJM Planning time-horizons, and are not bound by the obligations of FERC Order 881. (i.e., May remain as Summer / Winter.)

For each PJM Thermal Transmission Facility, Operations ratings metadata will include:

- Rating Set Lookup Table (AAR, Temporary & Exceptions)
- Seasonal Facility Rating (12 month projections)
- Hourly projections (240 hour outlook)
- Real-time Ratings (Including mid-hour if changing)

Will include historic, giving a user the ability to pull associated metadata through at least 5 year history for each facility.

Use Case	Real-time Ratings	10-Day Hourly Forecasts	Seasonal Forecasts
Real-time Assessment & Monitoring	R		
Constraint Mitigation & Determination	R	R	
AFC & ATC		R	R
Operational Planning Analysis		R	R
Real-time Market	R	R	
Day Ahead Market		R	

## Presenters / SME:

Dave Hislop

[David.Hislop@PJM.com](mailto:David.Hislop@PJM.com)

[Order881@pjm.com](mailto:Order881@pjm.com)

OC Special Session: Outage Coordination  
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## Member Hotline

(610) 666 – 8980

(866) 400 – 8980

[custsvc@pjm.com](mailto:custsvc@pjm.com)