

Order 881: Session #4

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Further information around previous sessions can be found within the Appendix at the end of this slide deck.

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 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.

In session #3, we covered what we do today and what the Order says for post-Compliance period. (7/12/2025 +)

Facility Ratings & Facility Rating Methodologies:

- Available via OASIS or via password protected location.
 - Location/technology is TBD
- 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 TBD.

- FERC Order allows for the use of *Rating Set lookup tables*.
- TO Survey indicated owner desire to continue this practice, and minimal interest in direct telemetry of AAR for all Facilities.

PJM will continue to leverage *Rating Set lookup tables*.

- Serve as primary or alternate source for AAR thermal ratings derivation.
- Serve as primary source for Seasonal Facility Ratings selection.

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:
 - *Either*, ICCP of Active Temperature value per TO Zone/Company in °F (i.e., 78 °F)
 - *Or*, ICCP of Active Rating Set (i.e., 80-Day)

NOTE: Telemetered ratings (Option 2 above) for every facility is not scalable in PJM's SCADA system at present. Desire is to keep *Real-time Telemetered Ratings* to DLR and other special cases. ICCP of either Temperature or Active Rating Set (Option 3 above) will be a single option across RTO, yet to be determined.

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 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 for entire Facilities.
 - Derived from Temporary Ratings, Rating Set Lookup Tables & hourly weather forecasts.

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

Seasonal Facility Ratings

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.

Minimum of four seasonal time-horizons.

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.)

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	
FTR Market			R

PJM to have a single construct for PJM RTO Rating Set lookup tables:

- Minimum Temperature range – 10°F below historic for RTO
- Maximum Temperature range – 10°F above historic for RTO
- Day/Night, in 5°F incremental bands, Rating Sets (i.e., 110-Day, 115-Night ...)

TO applies their Facility Ratings to the table per Facility:

- As today, populating entire table for each Rating Set.
- TO *either* calculates; *Or*, TO provides equivalent Rating Set if not applicable (i.e., Exception) or outside their methodology Rating Set bands.

NOTE: PJM Rating Set bands/framework anticipated to be est. by mid-2023 and communicated via OC.



Q. How would this impact transmission planning & planning use cases?

A. FERC indicated that transmission planning use cases are beyond the scope of the Order.
[See FERC Order 881, paragraph 203]

Q. What are the Owner obligations for Transparency?

A. While the Order and resulting Tariff changes have Owner obligations, the Transparency will be provided through PJM OASIS (or similar) mechanisms.

Q. Has PJM received methodologies related to Order 881? Does this obligate DLR owners for same today?

A. PJM Compliance Filing is due in July 2022. Compliance is due July 2025. DLR methodologies would be due by that date. PJM has no projected timeframe ahead of the Compliance date at this time, but will communicate updates via OC.

Q. NERC standards require a Facility Rating methodology today, but is the Order around sharing that methodology with PJM? What will that sharing look like?

A. Order requires sharing & transparency, beyond just PJM. PJM will serve as the hub for sharing, as it does with Rating Sets today. [See FERC Order 881, paragraphs 330 – 340 & Attachment M] While the Order provides framework requirements here, PJM has not as yet finalized the sharing mechanism but PJM will be compliant with the Order requirements.

Q. Who is the PJM Markets Monitor and will they have access?

A. [Monitoring Analytics](#) is the Market Monitoring Unit for PJM and it will have access to the Ratings and Methodologies as well.

Q. Would PJM desire Forecasted Ratings via ICCP?

A. No. Mechanisms to be determined and communicated in 2023.

Q. Can a TO flat line their rating? (i.e., No ratings deviation between sets or across bands.)

A. Yes. [See Order 881, paragraph 298] TOs calculate Facility Ratings and make determination as to any AAR Exceptions. Facility Rating Set lookup tables require full population of all ratings, with the TO making the determination as to applying an equivalent Rating Set across bands.

Q. Will TOs determine Seasonal Facility Ratings?

A. PJM as the transmission provider applies Markets & Operations use cases to the Ratings. Seasonal Facility Ratings are sourced from the TO-provided Rating Set lookup tables, and PJM will maintain and post them per Order 881. Transmission Planning Seasonal Ratings are not covered by the Order. [See FERC Order 881, paragraph 203]

Q. Will Order 881 impact DataMiner Ratings postings?

A. DataMiner and other PJM postings of Ratings identified in the *Thermal Facility Rating Use Cases* slide above are subject to the Order.

Q. How can a TO seek to break their PJM EMS zone into sub-zones for more granular Rating Set application?

A. Please reach out to EMSSupport@pjm.com or direct to Bilge.Derin@pjm.com.

Q. Today, PJM sends TO zonal temperature sets to my TO zone, going forward will that change and the TO sends to PJM?

A. Yes. See *Electronic Update of Ratings & Real-time Ratings* slides above in this slide deck.

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APPENDIX

Session [1](#) & [2](#) covered:

- FERC Ambient Adjusted Rating [AAR] definition
- FERC Transmission Line Rating [TLR] definition
- FERC AAR applicability requirements
 - Thermal Rating applicability in PJM today
 - Associated Facilities AND Monitored Priorities
- FERC Exceptions and Temporary rating requirements
 - Thermal Rating Exceptions in PJM today
 - Conditional (Temporary) Ratings in PJM today
- PJM definitions for AAR & approach for AAR Exceptions & Temporary Ratings

- Post-881 Compliance PJM needs thermal *Facility Ratings*, as it does today.
 - Applicable to *reliability-based* (i.e., Monitored Priorities MP1, MP2, & MP6) *thermally-rated* Facilities (Line, Transformer, Series Device, PAR & Flow Device) which are composite facilities reflecting equipment amalgamated into a single Facility.
 - Today, Ratings for the above reliability facilities are publically posted via ambient rating sets, regardless of conformity to solar gain applicability (Day vs. Night ratings) and full use of PJM rating sets or time of use.
 - Cont. on next page

- Post-881 Compliance PJM needs thermal *Facility Ratings*, as it does today.
 - Cont. from previous page
 - Ratings determined by the Facility Owner and communicated to PJM. Exception process will align with that paradigm and be determined/set by the Facility Owner.
 - This includes determination as to applicability of Exceptions to non-Tariff equipment for which PJM has ratings.
 - Temporary (Conditional) Ratings are determined by Facility Owner and applied by PJM per the use-case or where needed to protect the safety and reliability of the system.

Q. Are transmission Tariff facilities not monitored by PJM for Markets & Reliability in scope?

A. Order No. 881 applies to “Transmission Facilities” as that term is defined in the Operating Agreement, unless thermal ratings are not appropriate for such facilities. Facility owners should consult with their legal counsel to determine if they feel they have additional Transmission Facilities that may be in scope of FERC Order No. 881.

Note: Per the Operating Agreement, “Transmission Facilities” shall mean facilities that: (i) are within the PJM Region; (ii) meet the definition of transmission facilities pursuant to FERC’s Uniform System of Accounts or have been classified as transmission facilities in a ruling by FERC addressing such facilities; and (iii) have been demonstrated to the satisfaction of the Office of the Interconnection to be integrated with the PJM Region transmission system and integrated into the planning and operation of the PJM Region to serve all of the power and transmission customers within the PJM Region.

Q. Will TERM allow for single facility ratings to be uploaded from Excel or CSV?

A. TOs have multiple options to provide ratings, including UI or bulk upload via XML.

Q. Are Facilities not under FERC jurisdiction, such as 69kV, however part of PJM markets with ratings in scope?

A. See FERC Order 881, paragraph 231 for some clarity here. FERC does not give a blanket exception for transmission facilities below a specific voltage threshold, especially with regard to facilities that may drive congestion. To exclude them would reduce the benefit of AAR. PJM leverages the same ratings framework for all thermal facilities. As to a Facility owner's application of AAR, Seasonal, or Exception declaration, the owner's internal counsel can best advise here.

Q. Will differences be required between all 4 ratings? (NL, LTE, STE, LD)

A. Requirements should be similar to data validation today. In addition, not anticipating STE expansion, covered under M-03B section 2.1.2 & Attachment F.

Q. Will Exception need to be documented for a Facility that is not FERC jurisdictional?

A. Exceptions will be at the determination of Facility Owners and their legal counsel. Market & reliability facilities within PJM fall under FERC jurisdiction. These include the MP1, MP2, & MP6 thermally rated facilities which require thermal ratings within PJM in order to reliably operate the facilities. See the earlier discussion in these Q/A regarding Transmission Facilities.

Q. How will ratings be submitted?

A. Default (Permanent) and Temporary (aka, Conditional) ratings submittals will flow through eDART TERM. DLR ratings would be telemetered, where the Facility Owner desires and notifies PJM of that desire. Each would then be tracked within eDART.

PJM AAR Proposed Definition

Ambient-Adjusted Rating (AAR): a transmission Facility Rating that: (1) applies to a time period of not greater than one hour; (2) reflects an up-to-date forecast of ambient air temperature across the time period to which the rating applies; (3) 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; and, (4) is calculated at least each hour, if not more frequently.

PJM AAR & Seasonal Rating Exceptions Proposed Process

AAR Exceptions: Where the Transmission Owner determines, consistent with Good Utility Practice, that a 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.