



# FERC Order 881: Ambient Adjusted Ratings

PJM OC – Special Sessions:  
Order 881 Compliance

April 29, 2022

**AREAS OF REFORM:**

Revises  
FERC regulations  
**and *pro forma***  
Tariff to incorporate  
**new *pro forma*** OATT  
Attachment M

- 1 | Definition of Transmission Line Ratings
- 2 | Ambient-Adjusted Ratings (AAR)
- 3 | Seasonal Line Ratings
- 4 | Exceptions and Alternate Ratings
- 5 | Emergency Ratings
- 6 | Transparency Requirements
- 7 | Dynamic Line Ratings (DLR)

Compliance  
Filing Due  
**July 12, 2022**

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Full  
Compliance By  
**July 12, 2025**

- 15 TOs responded.**
  - Includes TOs representing multiple PJM TO zones.
  - TO Survey responses were due on 4/7/2022.
  
- Of the respondents, majority leveraged the Comments/Feedback to request further clarity / discussion within the Order and PJMs response to same.
  
- We plan to leverage these for further discussion in OC Special Sessions and finalized responses.
  
- Areas include:
  - **General:**
    - PJM meetings with the TOs needed to discuss Order 881 vision/direction.
    - Impact to existing emergency ratings sets. (STE, LTE, LD)
    - TO noted support for eDART TERM adjustment (i.e., slight modification to status quo).
    - Comment with regard to the cost/benefit of elements within the Order.
    - Flexible approach; Use of Lookup Tables vs. Telemetering all ratings.

□ (*Continued*):

- **Meteorological Data:**
  - Should PJM and the TOs leverage the same weather stations/feeds?
  - What should be the source for historic temperatures driving 10F° margin?
  
- **Coordination:**
  - Request for further clarity on EMS data exchange requirements; and, expectations between neighboring TOs.
  - Will PJM be working with neighbors & RTOs to ease ratings alignment between PJM and non-PJM TOs?
  
- **Exceptions:**
  - Non-conductor / station equipment considerations?

## PJM reached out to our Transmission Owners help inform compliance efforts with regard to FERC Order 881.

[ Q1 ] Does your company seek to directly telemeter one or more real-time facility ratings to PJM? [YES/NO]

[ Q2 ] If YES to Q1, will the TO be providing temp sets as well? [YES/NO]

[ Q3 ] If YES to Q1, how will coordination of ratings (RT & forecasted) take place with neighboring TOs/TOPs?

[ Q4 ] Will a TO be seeking to provide any portion of the 10 day hourly forecast for any facilities?

[ Q5 ] Will a TO have an issue with conforming to an RTO-based historic temp set? (i.e., Rather than one custom to their zone.)

➤ *Included space for **Comments** for each question above, as well as **Overall Comments/Feedback**.*

*Ambient-Adjusted Rating (AAR)* means a Transmission Line 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 calculated at least each hour, if not more frequently.

*Transmission Line Rating* means the maximum transfer capability of a transmission line, computed in accordance with a written **Transmission Line Rating methodology** and consistent with Good Utility Practice, considering the technical limitations on conductors and relevant transmission equipment (such as thermal flow limits), as well as technical limitations of the Transmission System (such as system voltage and stability limits).

Relevant transmission equipment may include, but **is not limited to, circuit breakers, line traps, and transformers.**

NOTE: For PJM Operations, system voltage and stability limits are typically calculated separately, and respected distinctly, from thermal limits derived within a TO's Facility Rating methodology.



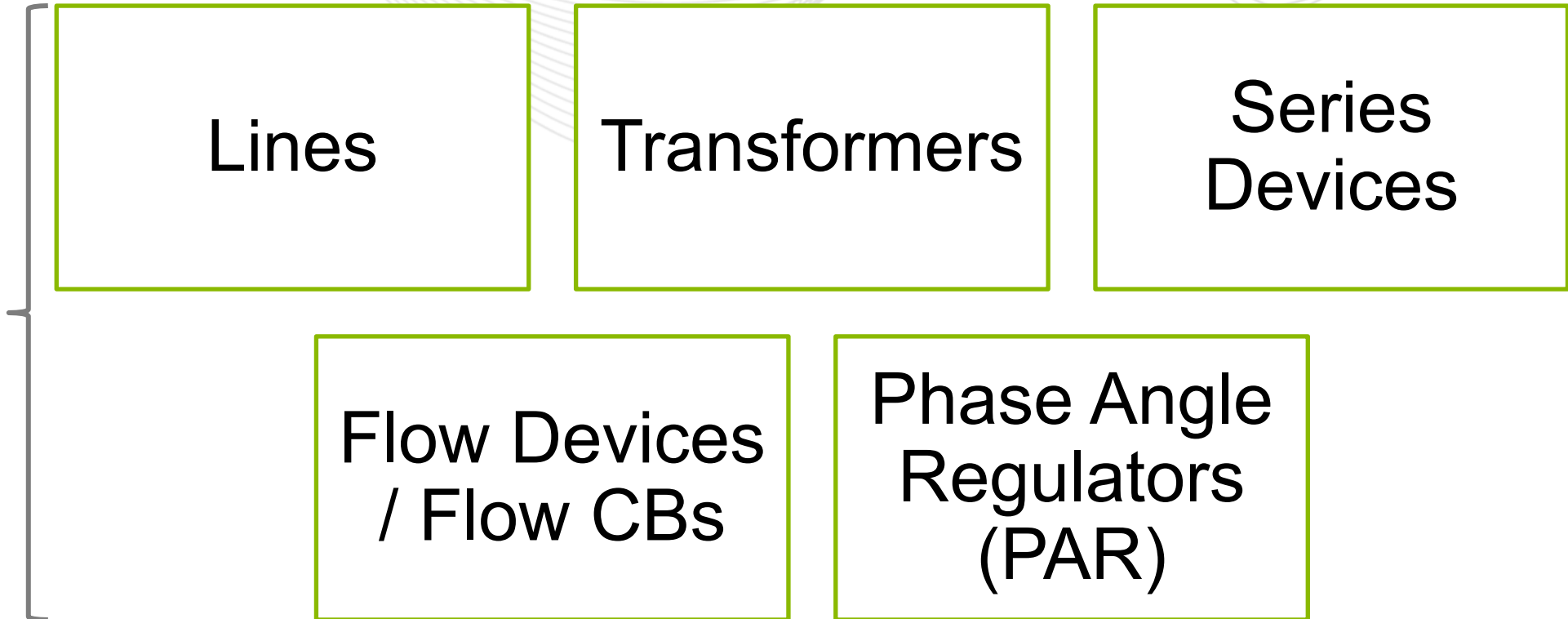
- Most limiting component from a set determines the transmission line rating. (Paragraph 44)
  - *“must incorporate a set of electrical equipment ratings that collectively operate as a single bulk electrical system and that the most limiting component from that set determines the transmission line rating”*
- Applies to more than lines. (Paragraphs 45-46)
  - *“includes more than just overhead conductors”*
  - *“we decline to provide a generic exception from the AAR requirement for power transformers”*
- Allows for exceptions. (Paragraph 227)
  - *“allow exceptions ... (AAR & seasonal) ... where ... not affected by ambient air temp...”*
- Allows for temporary ratings. (Paragraph 228)



PJM TO Thermal Facility ratings are required based upon Monitored Priority:

MP	Name	Thermal Ratings	Notes
0	Not Monitored, No Status	NO	No ratings for these facilities.
<b>1</b>	<b>Reliability &amp; Markets</b>	<b>YES</b>	Ratings essential.
<b>2</b>	<b>Reliability BES</b>	<b>YES</b>	Ratings essential.
3	Status Only	NO	No ratings for these facilities.
4	External	N/A	Not covered by PJM TO Ratings methodology.
5	External Status Only	N/A	No ratings for these facilities.
<b>6</b>	<b>Reliability Non-BES</b>	<b>YES</b>	Ratings essential.
7	GSU	N/A	Not covered by PJM TO Ratings methodology.
8	FUTURE	NO	Facilities may feed into a different MP which requires ratings.

Subject to Monitored Priority Setting



Additional **non-thermally** rated facilities include: Electrical Buses, Shunt Capacitors/Reactors, Static VAR Compensators (SVC), non-uniquely rated (flow device) Circuit Breakers and Disconnects, & Loads.

**Thermally Rated  
*Reliability* Facilities  
consist of  
MP1, MP2 & MP6 AND the  
following Facility Types:**

- Lines
- Transformers
- Series Devices
- Flow Devices (Flow CBs)
- PARs

**MP3, MP7 & MP8 Facilities:**  
-- Regardless of Facility Type

Includes TO & non-TO facilities: some of which no thermal rating applies, such as bus-work, which have voltage and not thermal limitations; includes modeling equivalencies, and underlying systems.

Any **thermally** relevant MP8 (OR MP3 OR MP7) facilities transitioning to *Reliability* (MP1, MP2 or MP6) facilities require ratings ahead of the designation for reliability/markets purposes.



# AAR/TLR Applicability Feedback

- Thoughts?
- Considerations?
- Feedback?

- No blanket exceptions. (Paragraph 229-232)
- Must be reevaluated for validity at least every five years. (P233)
- Temporary alternate ratings intended for short duration. (P233)
- Temporary alternate ratings intended for System Reliability. (P233)

- RTOs/ISOs—the transmission provider with the OATT on file—will need to rely on their member transmission owners to calculate transmission line ratings and provide them to the RTO/ISO. (P140)
- Exceptions and Temporary ratings posted to OASIS (or password-protected website), including the nature of and basis (**as determined by owner**) for such exceptions/alternate ratings, date/time of initiation & withdrawal. (P234)

For any relevant transmission equipment that have Transmission Line Ratings which:

- EITHER, apply to time periods greater than one hour;
- OR, do not reflect up-to-date forecasts of ambient air temperature across the time period to which the rating applies;
- OR, do not reflect the absence of solar heating during nighttime periods as determined by local daytime/nighttime periods with a minimum of monthly updates;
- OR, are not calculated once an hour, at minimum.

## **AAR Exception\*:**

- Cable – U/G or Submarine;
- Non-conductor element(s);
- Station equipment;
- Indoor equipment; (GIS);
- Relays;
- Others?

## **Conditional (Temporary):**

- Stability (Proxy);
- Directional;
- Single Breaker Derate;
- Common Trench (Cables);
- Reduced Oil Circulation (Cables);
- Safety;
- Others?

\* Could include temp-set range exceptions, 95F° + for example.





# Exceptions/Temporary Ratings Feedback

- Thoughts?
- Considerations?
- Feedback?

Presenters / SME:

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**FERC Order No. 881**



Member Hotline

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(866) 400 – 8980

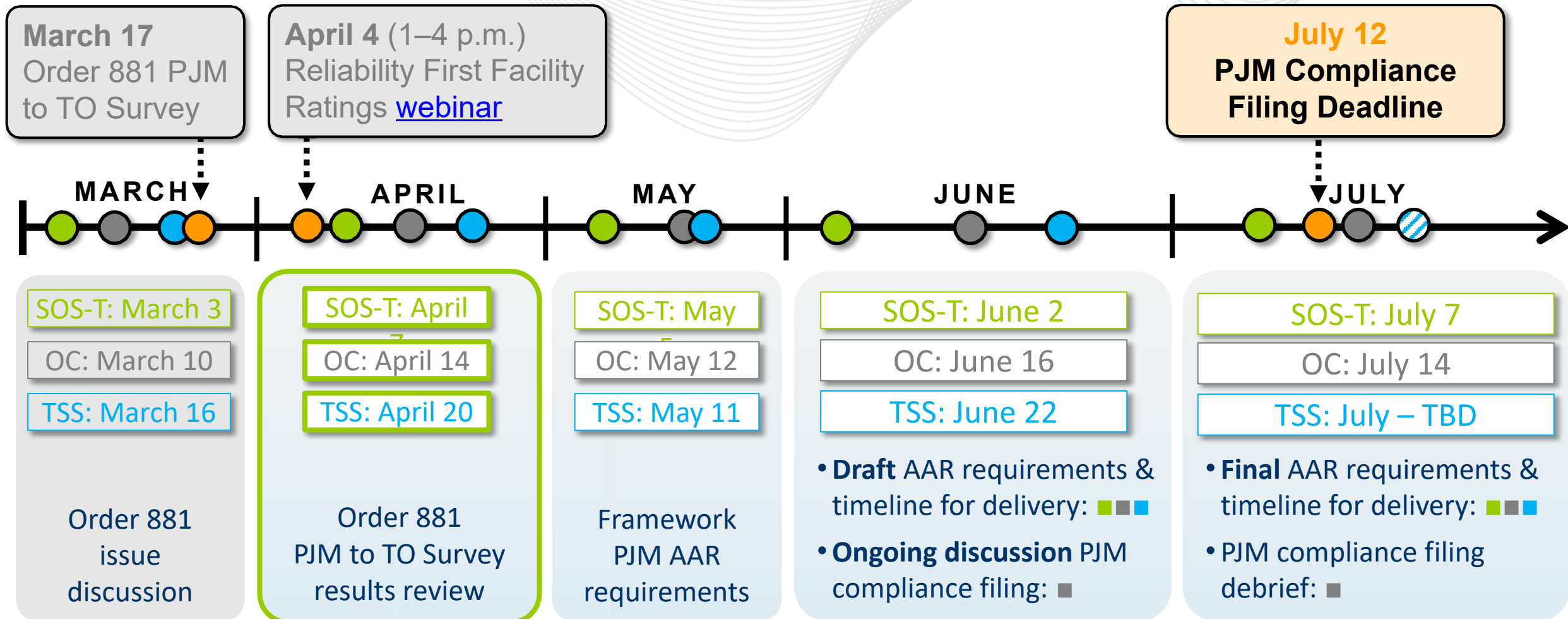
[custsvc@pjm.com](mailto:custsvc@pjm.com)

- For potential discussion, as needed.

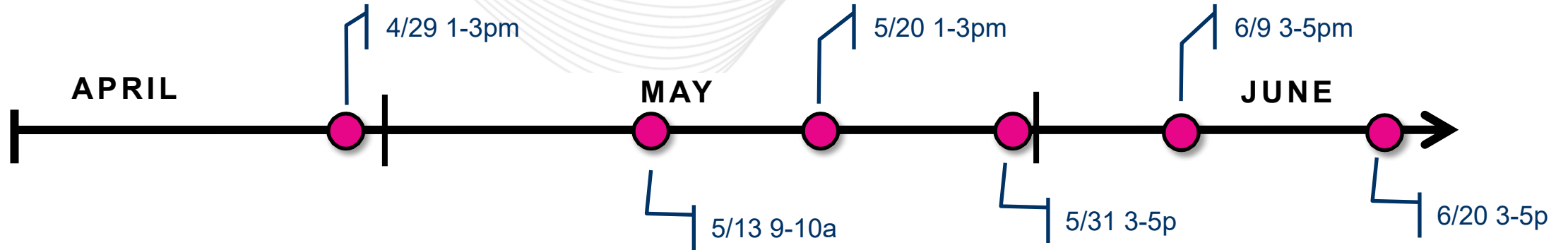
## **FERC Order 881 Topics (paragraphs noted):**

- **Sessions 1 & 2 – 4/29 & 5/13:**
  - **TO Survey Results/Concerns.**
  - **Transmission Line Rating & AAR applicability:** 44 thru 46, 83 & Attachment M
  - **Exceptions:** 45, 140, 180, 227 thru 234 & Attachment M
- **Sessions 3 & 4 – 5/20 & 5/31:**
  - **Electronic Update of Ratings:** 179 thru 182, 252 thru 255 & Attachment M
  - **TLR & Methodology Transparency:** 39, 330 thru 343 & Attachment M
  - **Seasonal Ratings:** 5, 185, 211 thru 216, 227 & Attachment M
  - **(Ambient) Rating set use:** 140 thru 143, 185 thru 188 & Attachment M
- **Sessions 5 & 6 – 6/9 & 6/20:**
  - **Finalize above & close out PJM Compliance filing questions.**
  - **Additional questions/concern.**

# Timeline for PJM Compliance Filing



NOTE: Beyond the above, PJM will collaborate with additional stakeholder bodies such as TOPWG, RSCS, DTS and others as needed to work towards requirements and compliance objectives.



- Directed towards PJM Compliance filing.

## **PJM reached out to our Transmission Owners help inform compliance efforts with regard to FERC Order 881.**

**[ Q1 ]** Does your company seek to directly telemeter one or more real-time facility ratings to PJM? [YES/NO]

- **Mix of YES/NO - Mostly NO; 3 Undecided**
- **Of the 3 Undecided:**
  - 1 – Desires telemetry option for RT ratings. Need work to apply to ALL facilities.
  - 1 – May seek to telemeter RT ratings.
  - 1 – May seek to do so, but preference for ambient rating tables.
- **Of those responding YES:**
  - **May look to do so related to DLR facilities. Ambient ratings tables for**



## **PJM reached out to our Transmission Owners help inform compliance efforts with regard to FERC Order 881.**

**[ Q2 ]** If YES to Q1 (telemeter real-time ratings), will the TO be providing temp sets as well? [YES/NO]

- **Mix of YES/NO - Mostly NO (aka, N/A); 2 Undecided**
- Of the 2 Undecided
  - Dependent upon PJM requirements.
- Of those responding YES:
  - Would still provide PJM RTO-based ambient look-up rating tables. As a fail-safe.

## **PJM reached out to our Transmission Owners help inform compliance efforts with regard to FERC Order 881.**

**[ Q3 ]** If YES to Q1, how will coordination of ratings (RT & forecasted) take place with neighboring TOs/TOPs?

- **Mix of YES/NO – Mostly NO (aka N/A); 2 Undecided**
- Of the 2 Undecided
  - Dependent upon PJM requirements.
- Of those responding YES:
  - Would still provide PJM RTO-based ambient look-up rating tables, as a fail-safe. And, expects ratings sharing done via PJM ICCP between TOs.

## **PJM reached out to our Transmission Owners help inform compliance efforts with regard to FERC Order 881.**

**[ Q4 ]** Will a TO be seeking to provide any portion of the 10 day hourly forecast for any facilities?

- **Mix of YES/NO; Mostly NO; 2 Undecided**
- Undecided
  - Dependent upon PJM requirements & Member company methods.
  - Could lead to data management issues, given volume of data.
- YES
  - No comment provided. (Further discussion needed.)

## **PJM reached out to our Transmission Owners help inform compliance efforts with regard to FERC Order 881.**

**[ Q5 ]** Will a TO have an issue with conforming to an RTO-based historic temp set? (i.e., Rather than one custom to their zone.)

### ➤ **Blend of YES/NO responses.**

### ➤ **Concerns:**

- Entire RTO region historic may extend beyond TO zonal historic. How would this be treated in Exceptions process?
- Concerns for facility ratings at proposed extremes. (-55F° & 130F°)
- Concerns with short time-frames to meet margins needs for real-time use if forecasted temps do not meet +/- 10F° margin.
- Need time to address expanded look-up tables.

**PROTECT THE  
POWER GRID  
THINK BEFORE  
YOU CLICK!**



Be alert to  
malicious  
phishing emails.

**Report suspicious email activity to PJM.**  
(610) 666-2244 / [it\\_ops\\_ctr\\_shift@pjm.com](mailto:it_ops_ctr_shift@pjm.com)

