
PJM EDC WORKSHOP

August 10, 2021

INTERCONNECTIONS + REGISTRATION

INTERCONNECTION SUBCOMMITTEE: STRAWMAN

REFERENCE

Operations/Telemetry

- Telemetry (47-48)**
- Operational Needs (49)
- Metering (69-70)**
- EDC Coordination (85-86)
- Operations Coordination (102-104)
- ***Reliability, Safety, and Security**

Market

- Weighting Factors (30,42-44)
- Locational Requirements (31-42)**
- Registration (35)**
- Telemetry (47-48)**
- Zonal Aggregation Model (45)
- Comparison of Mapping (46)
- Market Participation Model (50-64)
- Min/Max Size Requirements (65-68)
- ***Reliability, Safety, and Security**

Settlement/Metering

- Metering (69-70)**
- DR Participation (71)
- Day Ahead (72)
- Balancing (73)
- Operating Reserve (74)
- DERA Settlements (75)
- Demand Response (76)
- Examples (77-79)
- Double Counting (80-81)
- Use Case (82-84)
- Settlement and Compliance (106)

Interconnections / Registration

- Interconnection (15-18)
- Jurisdiction (25 – 26)
- Registration (35)**
- Market Participation Agreements (27)
- Opt-In Small Utility (28-29)
- EDC Interconnection (87)
- Registration (91-100)
- Locational Requirements (31-42)**
- ***RTO Governing Agreements**
- ***Customer Participation Changes**

Planning

- Planning (19 – 24)
- Min/Max Size
- ***Reliability, Safety, and Security**

***Topics identified in Foundational Principles but not discussed in PJM Strawman**

**** Indicates material is related to more than one section**

(#-#) – are page numbers in the updated PJM Strawman dated 4/23/21

DERA REGISTRATION & APPROVAL PROCESSES

DERA registration and approval must follow two distinct parallel processes – the Market Participation and the State Interconnection

MARKET PARTICIPATION

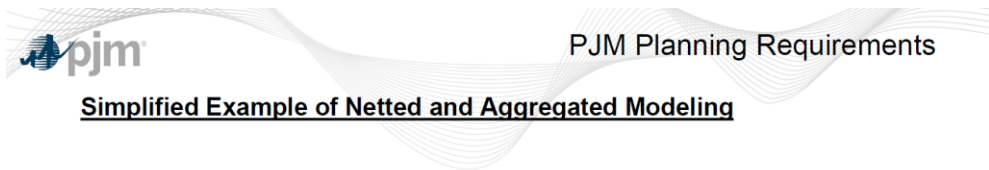
- A. **DERA FERC** : DERAs must submit a DERA registration to PJM to acquire a valid market participation agreement(s) (single Pnode) (15-18, 27,87)
- B. **TDU-TO role**: Transmission Owner/TDU role in DERA registration review is necessary (not only EDU responsibility) (35, 91-100)
- C. **DER–D system changes**: Periodic review by the EDC will be necessary when the EDC has determined that there is a material modification to the DERA or defined process when the EDC system configuration requires a permanent material change (25-26, 31-42)
- D. **OPT-In**: Small utilities must be responsible for data submissions and PJM processes when opting-in to the DERA for both wholesale load and energy. (28-29)

STATE INTERCONNECTION

- A. **DER/DERA**: : DERAs must submit a DERA registration to the EDC and acquire or validate the following:
 - a. Approved State Interconnection Agreement(s) for DERs
 - b. DERA – define DER resources for wholesale market participation
 - c. DERA must be a recognized as an approved DER Aggregator
- B. **DER–D system changes**: Periodic review by the EDC will be necessary when the EDC has determined that there is a material modification to the DERA or defined process when the EDC system configuration requires a permanent material change.
- C. **OPT-In**: Small utilities must be responsible for data submissions and PJM processes when opting-in to the DERA.

PLANNING

FERC 2222 PLANNING: PJM STRAWMAN REACTION

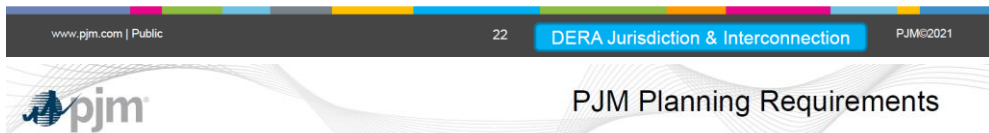


Discussion Item

- Proposed strawman slides for planning are relatively vague on requirements surrounding planning model data granularity, processes data exchange, and model maintenance requirements associated changes for FERC 2222.

Requirements

- Data exchange limited to only information necessary to perform associated studies.
- EDC study and interconnection process separate from PJM/TO interconnection process
- DERA Market Registration Inputs:
 - DERA request provided to EDC/DO with individual DER modeling information, and executed EDC-DER Interconnection agreements
 - Modeling details and data requirements as dictated by each EDC/DO interconnection process
- DERA Market Registration EDC/DO Outputs:
 - EDC/DO provides preliminary approval prior to execution of updated IC agreements followed by final approval or denial of DERA to PJM
 - If DERA denied, additional information regarding determination provided per EDC/DO interconnection requirements
 - If DERA receives final approved, consolidated modeling information being submitted to TO.
 - For purpose of PJM market registration, PJM must receive appropriate approvals

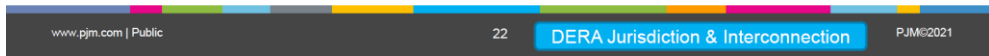
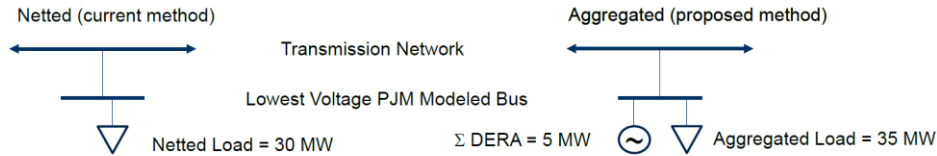
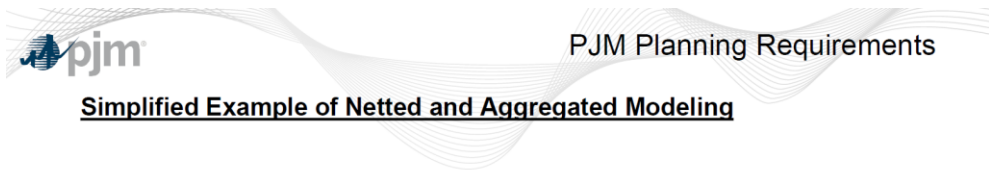


Proposed Data Requirements for Planning

- For each DER within a DER aggregation:
 - Address
 - Technology (solar, battery, landfill gas, wind, hybrid, etc.)
 - Maximum AC output (gross nameplate capability)
 - Interconnected distribution line identification
 - PJM Planning Model Bus ID distribution line is fed from
 - Ride through capability enabled? Y/N
 - Voltage control enabled? Y/N
- Both Aggregator and Electric Distribution Company will verify data annually



FERC 2222 PLANNING: PJM STRAWMAN REACTION

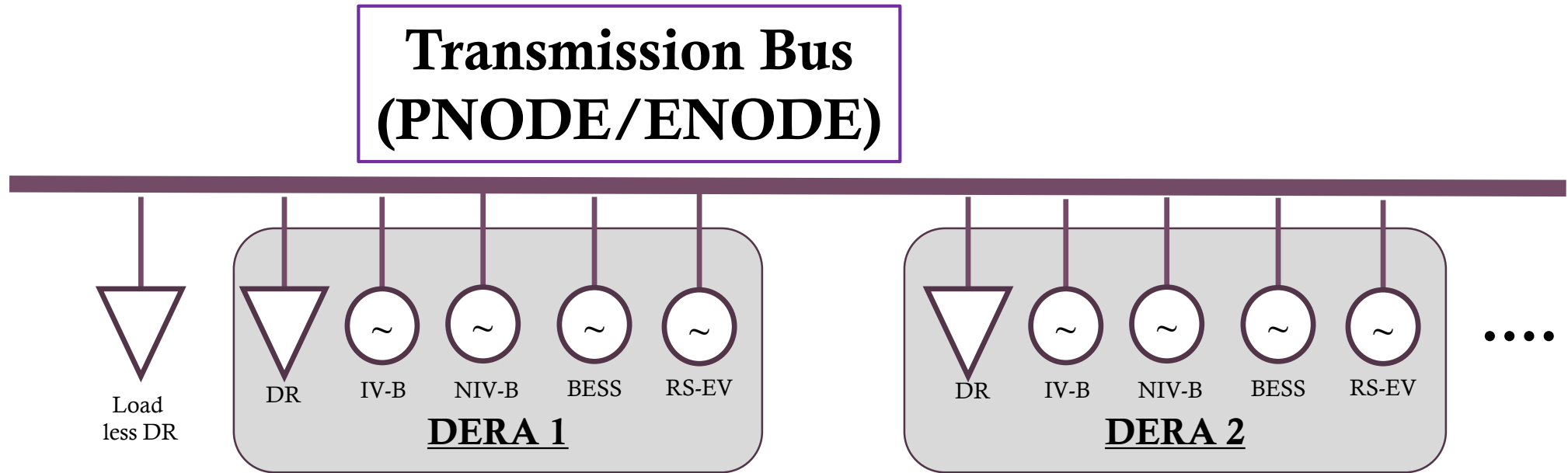


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 - Maximum AC output (gross nameplate capability)
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 - Ride through capability enabled? Y/N
 - Voltage control enabled? Y/N
- Both Aggregator and Electric Distribution Company will verify data annually



Requirements

- EDC Modeling Information Provided to Transmission Owner
 - Consistent with recommendations outline in NERC DER Reports.
 - TO provides PJM with consolidated representation of each DERA at their associated Transmission Node.
 - DERA will be separated into five distinct categories of DER resources.
 - Inverter-based Resources (IV-B), Non-Inverter based Resources (NIV-B), Battery Energy Storage System (BESS), Relocatable Storage – Electric Vehicles (RS-EV), Demand Response (DR)
- EDC/DO will not provide
 - Modeling details beyond Transmission/Distribution Point of Interconnection
 - Modeling information directly to PJM. All modeling information provided by EDC to TO, and subsequent modeling updates provided to PJM by TO
 - PJM or TO will not release any non-transmission asset information, maps, models or modeling data unless provided authorization from EDC/DO
- DERA telemetry and metering made available as required by EDC-DER Interconnection agreements for purpose of verifying and validating individual DERs modeling data. Coordinated updates made periodically as required by EDC/DO



- DERA component data is provided in the form of a consolidated model for each resource type
- Multiple DER resource types summed to a singular transmission bus point based upon affiliated DERA
- Routine updates provided by EDC to TO and incorporated into annual RTEP models utilizing existing RTEP processes