



Education on Current Requirements and Rules for Demand Response participation in PJM Regulation Market

PJM Demand Side Response
Operations

Distributed Resources Subcommittee
January 10, 2025

- Requirements for Demand Response participation in PJM Regulation Market
 - Telemetry and Communication
 - Metering & Sub-Metering Requirements
 - Qualification Testing
 - Notes on Regulation Only Registrations
- Current DR rules for Registrations with locations capable of producing power (e.g. batteries or generators) participation in PJM Regulation Market

Current Requirements: Telemetry

- Real Time Telemetry
- Curtailment Service Provider (CSP) to connect with PJM SCADA via the Jetstream system (DNP3 protocol)
 - See: <http://www.pjm.com/markets-and-operations/etools/jetstream.aspx>
- Scan rates for Real Time Telemetry data are to be at a two-second interval.
 - see Manual 12 section 4.3.2 Regulation Signals
- Regulation Performance Scoring allows ten-second latency for signal propagation delay
 - Note: Performance Scoring is same for Demand Response participants as it is for Generator Units

Current Requirements: Communication Links

- CSP must complete all necessary telemetry & communication setup and testing
- CSP to interact with PJM DNP SCADA Team to set up Real Time Telemetry communications using the Jetstream system (DNP3 protocol)
- CSP to provide PJM unique SCADA name up to 8 characters long that identifies the registration to be included in telemetry (once established this cannot be changed)
- Following completion of registration & data/telemetry preparations CSP will be notified to schedule check-out and testing of new links

Current Requirements: Metering

- 2 second scan rate
- Meter must be ANSI certified (See Manual 11, section 10.6 for details)
 - ANSI 12.1 (meter) and ANSI 57.13 (CT/PT)
 - Non-ANSI certified meters can be used on an exception only basis but must undergo a third party test at Accredited Metrology lab to verify accuracy and be approved by PJM
 - The tariff requirement is that the end to end meter accuracy is +/- 2%
- Metering is at Point of Interconnection (POI) with Utility
 - EDC Account Number Level
 - Behind Muni/Coop the POI is interconnection with Transmission Owner
- Meter must always be on AC side of inverter (where applicable)

Current Requirements: Sub-metering

- **Sub-metering** at end use level may be approved by PJM on an exception only basis after PJM review of single-line diagram submitted by CSP
 - See: Manual 11, Section 10.7 Use of Sub-meter Load Data to Support Demand Response Regulation Compliance
 - CSP must clearly identify for PJM all electrical devices beneath the EDC account meter (location) that provides Regulation and identify all other devices used for similar processes within the same location that do not provide Regulation. PJM will verify that all similar devices beneath the EDC account meter at the location are sub-metered and if similar devices are not sub-metered, PJM will deny use of sub-meter load data unless the CSP can demonstrate that the electricity usage of such similar devices not sub-metered will not offset change in electricity usages of the electrical device that will provide the regulation service
 - Sub-meter and any additional metering (e.g. for monitoring for injections at the POI) must be approved by PJM and also meet the Tariff standards for accuracy

Current Requirements: Sub-metering

- If the registration to participate in the Regulation market contains an aggregation of locations, the CSP will provide PJM with load data for each location's sub-meter through an after-the-fact load data submission process upon request by PJM. This allows PJM to confirm that the aggregate load data sent through telemetry consists of all locations on such registration
- Telemetry data to PJM will be based on device electricity consumption for each registration. The registration load data must include load data from all locations and from all devices approved at each Location on the registration. For example, if the registration has 3 Locations and each location has one (1) pump that regulates then the telemetry load data will include the aggregate load data for all three (3) pumps

Current Requirements: Testing

- Follow 'Regulation Testing' guideline in Manual 12 section 4.4 Qualifying Regulation Resources
 - Pass three consecutive tests with a performance score of 75% or better (new entrant)
 - Follow the RegA or RegD signal for 40 minutes
 - May complete one self-test and two PJM administered tests or three PJM administered tests
 - Can dual qualify for RegA and RegD by completing additional testing
 - Rest of Fleet not in the regulation market during the testing period
 - PJM Performance Compliance will score regulation tests and Notify member of Pass/Fail status
 - Upon successful completion, allowed to offer into Regulation market up to completed test value
 - Note: Performance Scoring is same for Demand Response participants as it is for Generator Units

Notes on Regulation Only Registrations

- CSP may register locations (in PJM's DRHub system) as an Economic Regulation Only registration - a registration that **only** allows participation in the PJM Regulation Market.
- Such registrations must undergo same certification process as outlined above and are subject to same rules for locations capable of producing power (e.g. batteries, generators) described in next section.
- For more, see Manual 11, Section 10: Overview of the Demand Resource Participation

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Current DR Rules: Power Producers

- A location capable of producing power (e.g. battery or generator) cannot participate in the PJM Regulation Market as Demand Response when there is no load or when there are injections at the Point of Interconnection (POI) with the utility unless there is a wholesale market interconnection agreement (WMPA or ISA).
- For a location that has a WMPA or ISA, the location will be modelled as 2 resources: the regulation activity will be modelled as Demand Response whereas injections over the POI will be modelled as a Generator Unit.

Current DR Rules: Power Producers

- For a location that has no WMPA or ISA, the location is modelled as a single resource: the regulation activity will be modelled as Demand Response. No compensation for injections are possible. Further, the location may be subject to audit:
 - CSP confirms to PJM that the CSP has coordinated installation of the behind the meter generator/battery with the EDC to meet EDC's installation/operation requirements.
 - If there is possibility of injection over the POI, the CSP must submit load data to PJM in order for PJM to perform a probability study to determine if metering for audit purposes is required at the POI.

- For locations required to meter at the POI for audit purposes:
 - Subject to random audit for injections
 - CSP required to maintain EDC account level meter data at two second intervals for a minimum of three months for audit purposes.
 - Violation assessed when frequency or the magnitude of data (2 second scan rate) is >2% injection
- If random audit determines that registration was injecting:
 - Resettlement of all hours from last three months unless CSP can show that there was no injection during certain hours.
 - PJM may suspend the registration from market as DR until CSP can certify that measures are in place to prevent injections. Warning that CSP may be referred to IMM/FERC OE for further violations.
 - If multiple locations on registration, if any single location is considered to be injecting, registration may be suspended until that location is removed from registration. PJM may do partial or full resettlement.

Brief Education on Wholesale Market Participation Agreement and its applicability to Reg Only resources

Local/State Interconnection Process

- Terms and conditions of interconnection
- Physical interconnection requirements (reactive, ride thru, droop, SCADA)
 - Distribution impacts
 - Attachment facility

PJM New Services Queue Process

- Transmission impacts
- Market-related requirements & hardware (incl. telemetry)

**Local/State
Interconnection
Agreement**

*EDC & Interconnection
Customer*

**Wholesale Market
Participation
Agreement**

*TO, Interconnection
Customer, & PJM*

**Start
Selling in
PJM**

Purpose of the WMPA: WMPA transmittal letter excerpts

- *“A contractual means to address these [distribution-level market participation] requests and provide to all affected parties a process to enable PJM to properly track and study this category of generator interconnection”*
- *“Serves to establish important revenue and (if necessary) operational metering requirements in order to give PJM visibility to pay the generator for output and for potential operational security requirements.”*
- *“In rare instances, a non-jurisdictional interconnection could impact the integrated transmission system. The WMPA process allows PJM to ensure that this contingency is studied and corrected, if necessary.”*
- *“Facilitating the wholesale sale and not the interconnection” ...“and to support the state interconnection processes as well.”*
- *“...a vehicle for PJM to examine the potential reliability impacts the interconnection may have on the grid.”*

- “This Wholesale Market Participation Agreement ("WMPA") ... is entered into by and among PJM Interconnection, L.L.C., ... ("Project Developer" or "Wholesale Market Participant"), and ("Transmission Owner") ... in order to effectuate Wholesale Transactions by Wholesale Market Participant in PJM's markets.”
 - As used in Tariff, Part IV, "Wholesale Transaction" shall mean any transaction involving the transmission or sale for resale of electricity in interstate commerce that utilizes any portion of the Transmission System.

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**Demand Response Regulation Market and
Wholesale Market Participation Agreement
Education**



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