

# PJM Manual 14D:

Generator Operational Requirements

Revision: ~~5354~~

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**Current Revision****Revision 54 (01/21/2021):**

- Added new Appendix B: Public Distribution Microgrid Business Rules
- Added new Appendix C: Voluntary Guideline on Public Distribution Microgrid Operations
- Section 4.2.4: Added telemetry requirement for Public Distribution Microgrid Generators

**Revision 53 (11/23/2020):****Periodic Review****Section 7.1.2 Voltage and Reactive Control**

- Clarified requirement that following an AVR replacement, if new AVR has PSS functionality, PSS should also be commissioned and placed in service
- Removed reference to email as alternative for voltage schedule communications. Sync up with latest revision of M-3.

**Section 7.3 Critical Information and Reporting Requirements**

- Clarified that change of state includes changing output of self-scheduled units.

**Section 7.5.1 Generation Resource Operational Exercise**

- Cold Weather Exercise – Reduce to recommendation for GOs to self-schedule in advance of winter
- Replaced entire section with statement that GOs should consider self-schedule units for test prior to cold weather operations

**Section 7.5.2 Generation Resource Cold Weather Checklist**

- Added clarification on timing based on latest NERC guidance

**Section 8.2.3 Real Time Meteorological Tower**

- Corrected typo ‘through’ versus ‘though’

**Section 10.1.2.H Implementation of Black Start Solutions**

- Clarified language regarding Black start terminations

**Section 12.2.3 Real Time Meteorological Station**

- Corrected typo ‘through’ versus ‘though’

**Attachment E: PJM Generator and Synchronous Condenser Reactive Capability Testing**

- **Section E-2 General Requirements**
  - Reworded to improve readability
  - Adding additional clarification regarding the intent of the testing

Criteria	Real-Time Telemetry Requirements
Generators participating in the PJM market as capacity resources	Real and reactive power
Generators 10 MW (Maximum Facility Output) or larger	Real and reactive power
Generators greater than 1 MW (Maximum Facility Output) and connected at a bus operating at 50 kV or greater	Real and reactive power
Solar parks 3 MW (Maximum Facility Output) or greater	Real and reactive power (see Section 12.2 for additional requirements)
Distributed generators (such as, the treatment of many units dispersed over a wide area as one aggregated unit) modeled less than 10 MW (Maximum Facility Output)	Real and reactive data at the BES injection point of accuracy within 10% of hourly MWh settlements data (revenue meter or accumulator data)
<b>Public Distribution Microgrid Generators</b>	<b>Real and reactive power</b> <b>Status of Public Distribution Microgrid (connected to or disconnected from grid)</b>
Generators that will also participate as PJM demand response resources when they will reduce load and have PJM-approved interconnection rights to inject power.	Real and reactive data, based on the Generator criteria in this table, at the point of interconnection and real and reactive power for the generators.

Generators not meeting any of the criteria above are generally not required to supply real-time telemetry to PJM. However, PJM may require real-time telemetry from any generator based on specific topology, network security, operations or market needs. Generators that are not required to supply real-time (two-second scan) metering will not be eligible to set real-time LMP. Revenue-related information is necessary for very small units. This information can be obtained from the local utility or manually read by the customer and supplied to PJM via Power Meter. If desired, a direct connection to PJM can be established.

Generators that are required to supply real-time and revenue information can supply this through the local utility's connection to PJM, or if desired, via a direct connection from the generator to PJM. Real-time information will be collected at a two- ten second data rate, and revenue information will be collected hourly. The revenue information represents the accumulated energy for the previous hour.

The required revenue information is necessary to satisfy the needs of PJM's Market Settlements program. The real-time information is required for PJM's Energy Management Applications (State Estimator, Security Analysis, etc.).

#### 4.2.3 Metering for Individual Generators

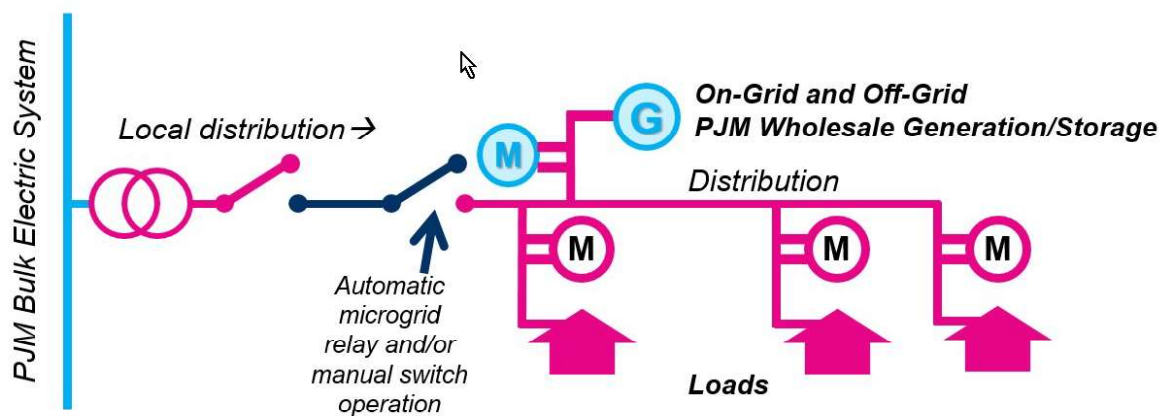
PJM does not require Generation Owners to directly connect to PJM, but leaves this as an option if it enhances the owner's ability to participate in PJM markets and functions.

## Appendix B: Public Distribution Microgrid Business Rules

### Definitions

A Microgrid is a pre-determined set of Generating Facilities and load that can operate both while connected to and while islanded (i.e., isolated) from the broader grid. A microgrid must include load, one or more Generating Facilities, one or more switches for isolating and connected to the broader grid, and a microgrid controller. A microgrid could include public utility distribution facilities.

Public Distribution Microgrid (“PDM”) shall mean a Microgrid that includes a PJM Generating Facility that is capable of generating while both connected to and while islanded from the broader grid, and which also includes dual use utility distribution facilities. A Public Distribution Microgrid shall not include any NERC Bulk Electric System facilities nor any Transmission Facilities, and is operated by an Electric Distributor or third party operator designated by the Electric Distributor.



Public Distribution Microgrid Operator shall mean an Electric Distributor that controls a Public Distribution Microgrid, or a Member that an Electric Distributor has designated to control a Public Distribution Microgrid on an Electric Distributor’s behalf. Control of a Public Distribution Microgrid means control of switch gear, relays, microgrid controller and other equipment required to island generation and load in a Public Distribution Microgrid.

Public Distribution Microgrid Generator is any share of a generator in a Public Distribution Microgrid that is a Generating Facility and that is capable of generating while both connected to and while islanded from the broader grid.

### Telemetry

A Public Distribution Microgrid Operator shall provide to Public Distribution Microgrid Generator the real-time status of any switching and/or relay that indicates the islanded status of the Public Distribution Microgrid.

A Public Distribution Microgrid Generator shall meet existing telemetry requirements for all PJM generators as specified in Manual 1: Control Center Requirements and Section 4.2.2 of Manual 14-D, Generator Operational Requirements. In addition, in order for PJM to know whether the

Public Distribution Microgrid Generator is islanded or not, it shall provide that status to PJM as well.

### **Operations**

A Transmission Owner that is planning or has a distribution affiliate that is planning a Public Distribution Microgrid with automatic separation should provide PJM with the details of how the relay would automatically open the switch.

A Public Distribution Microgrid Generator shall notify PJM of the start and end of planned and actual islanded conditions as soon as practicable. To facilitate this notification, the Public Distribution Microgrid Operator shall provide all necessary information to the Public Distribution Microgrid Generator operator on an ongoing basis.

### **Reporting**

When islanded, the Public Distribution Microgrid Generator should report a full outage in eDART. In GADS, if a Public Distribution Microgrid Generator's full ICAP MW is physically available and is only constrained because it is in island mode, no unplanned outage needs to be reported and the Microgrid Generator can be listed as fully available.

If the islanded Public Distribution Microgrid Generator is limited to less than its committed ICAP MW while serving load, due to reasons other than being constrained by the total load in the island, an unplanned outage should be reported in GADS.

If the Electric Distribution Company (EDC) determines a PDM is wholesale when islanded (that is, the islanded load is reported to PJM as wholesale load), then the EDC should expect the PDM Generators to submit their islanded output as PJM supply. In this case, the islanded PDM Generators serve PJM load when islanded.

To the extent the islanded PDM Generator is constrained in its output due to the islanded state, PJM will use reporting on islanding status to calculate a corresponding EFORD impact based on any reductions relative to committed ICAP MW due to reasons other than PJM dispatch or constraints on Transmission Facilities.

If the EDC determines a PDM is not wholesale when islanded (that is, the islanded load is not reported to PJM as PJM load), then any islanded PDM Generators should also not report their output as PJM supply. In this case, the islanded PDM Generators do not serve PJM load when islanded. PJM will use reporting on islanding status to calculate an EFORD for such Public Distribution Microgrid Generators consistent with them being unavailable to serve PJM load when islanded.

## **Appendix C: Voluntary Guidelines on Public Distribution Microgrid Operations**

A Public Distribution Microgrid Operator should not "economically island". The only reasons the Public Distribution Microgrid Operator should island include:

1. An emergency situation on the distribution and/or transmission system, or local or system-wide blackout;
2. An emergency situation on the transmission system, as defined by PJM Manual 13: Emergency Procedures, in which load shedding action is directed by PJM
3. Emergency declaration by appropriate local, state, or federal authority
4. Testing
5. Distribution facility maintenance

After islanding, a Public Distribution Microgrid Operator should reconnect the Public Distribution Microgrid as soon as reasonably possible.