



## “~~Inverter-based~~ DER Ride Through”

DER Ride Through and Trip Settings and IEEE standard 1547-2018

*Includes Problem/Opportunity Statement*

### Issue Source

PJM

### Stakeholder Group Assignment

The work is technical, and will require full-day workshops with stakeholders that cannot be done as part of the existing Standing Committee meetings. Additionally, it will be helpful to have a separate listserv and website for document sharing. Therefore, the work will be assigned to a new Task Force reporting to the Planning Committee, under the name *DER Ride Through Task Force*.

### Key Work Activities

1. Education on the new IEEE 1547 – 2018 standard, specifically the portion of the standard that details new Category I, Category II, and Category III voltage and frequency ride through and trip settings.
2. For inverter-based DER, ~~T~~ technical workshop(s) to discuss and debate the merits of Category I, Category II, or Category III and the adjustable trip settings therein.
3. Updates on local-jurisdictional and other activities across PJM and elsewhere to implement IEEE 1547-2018.
4. Develop a rule in the appropriate PJM manual and, if applicable, governing documents, to implement the ride through and trip provisions of IEEE 1547-2018 to be applied to wholesale ~~inverter-based~~ DER interconnecting under FERC jurisdiction<sup>1</sup>.
  - a. For the purposes of this effort, Distributed Energy Resource (DER) means a generation resource or electric energy storage resource connected to radial distribution at voltage < 50 kV.
  - 4-b. PJM does not intend any changes to ride through or trip requirements for existing generators.
5. For inverter-based DER, ~~p~~ produce a guidance document for local jurisdictions seeking to implement the ride through and trip provisions of IEEE 1547-2018.

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<sup>1</sup> Namely: wholesale DER that 1) seek interconnection to a distribution facility over which there is a prior FERC-jurisdictional service; or 2) wholesale DER that are PURPA Qualifying Facilities intending to make wholesale sales into the PJM market. For more detail see <http://www.pjm.com/-/media/committees-groups/committees/mrc/20160617-special/20160617-item-03-jurisdictional-over-interconnection-of-generation-onto-distribution-facilities.ashx>

Note that DER that interconnect under state jurisdiction, including net metered DER and certain wholesale DER interconnecting to distribution lines not subject to a FERC Tariff, are not subject to the interconnection requirements of PJM.



### Expected Deliverables

1. Manual language in PJM business manual M-14<sup>DG</sup> (or other as appropriate) and, if applicable, governing document language to implementing the ride through and trip provisions of IEEE 1547-2018 to be applied to wholesale inverter-based DER interconnecting under FERC jurisdiction. The goal is to specify a single PJM-wide IEEE 1547-2018 profile consisting of an abnormal voltage and frequency performance category and specified trip settings, if adjusted from the defaults. As a second-best alternative, the rule can instead specify minimum acceptable ride-through and trip times, and defer to distribution utilities on the specific implementation and/or performance category.
2. Policy document describing results of the process and discusses the considerations and justification for the new PJM rule. States, local regulators, and utilities can use this document to inform state and local rulemaking processes to implement the new IEEE 1547-2018 standard for inverter-based DER interconnecting under state jurisdiction to ensure they behave in a way that is coordinated with the BES, as required by the standard<sup>1</sup>.
  - a. In the event consensus cannot be reached, PJM will publish a 'best practice' document on same.

### Decision-Making Method

Tier 1, consensus (unanimity) on a single proposal

### Out of Scope Items

- ~~DER that interconnect under state jurisdiction, including not metered DER and wholesale DER interconnecting to distribution lines not subject to a FERC Tariff, are not subject to the PJM rule developed under this process.~~
- Provisions of IEEE 1547-2018 other than ride through and trip parameters under abnormal conditions are out of scope. This includes other “smart inverter” functions like voltage control or reactive power capability, communications, and ramp limits.
- Ride through and trip settings for generators connecting to BES transmission lines, to lines of voltage > 50 kV, or to meshed<sup>2</sup> subtransmission lines.

**Comment [ACL1]:** This has been moved to a footnote above

### Expected Duration of Work Timeline

Completion is targeted for Q3 2019, with a start date of August 2018. The first technical workshop is expected in October, 2018. The timeline will be reviewed and extended as necessary.

Priority Level: High – Medium

- Not an immediate risk to reliability, but growing rapidly as more and more DER connect to the power system.

<sup>2</sup> “Meshed” subtransmission facilities, also referred to as “networked” subtransmission, are subtransmission facilities that are not operated radially—that is, they are operated with a connection to the bulk power system on more than one end, similar to high-voltage transmission facilities.



## Issue Charge

- With publication of IEEE 1547-2018 revision, state and local implementation, including ride through requirements, is expected in 2019 and 2020.

Timing: Mid-Term

- IEEE 1547-2018 recently finalized, but testing certification for mass-market inverters is not expected to be ready until 2021

Meeting Frequency: Quarterly or less often with monthly or twice-monthly phone calls

- Technical workshops envisioned to be quarterly or less frequently.

Start Date	Priority Level	Timing	Meeting Frequency
	<input type="checkbox"/> High	<input type="checkbox"/> Immediate	<input type="checkbox"/> Weekly
	<input type="checkbox"/> Medium	<input type="checkbox"/> Near Term	<input type="checkbox"/> Monthly
	<input type="checkbox"/> Low	<input type="checkbox"/> Far Term	<input type="checkbox"/> Quarterly

<sup>i</sup> E.g., see *IEEE standard 1547-2018*, clause 6.4.1, *Mandatory Voltage Tripping Requirements*. "Area EPS operators may specify values within the specified range subject to the limitations on voltage trip settings specified by the regional reliability coordinator."