



# PJM DER Ride Through Task Force and Ride Through Guideline Document

December 3, 2019

MADRI

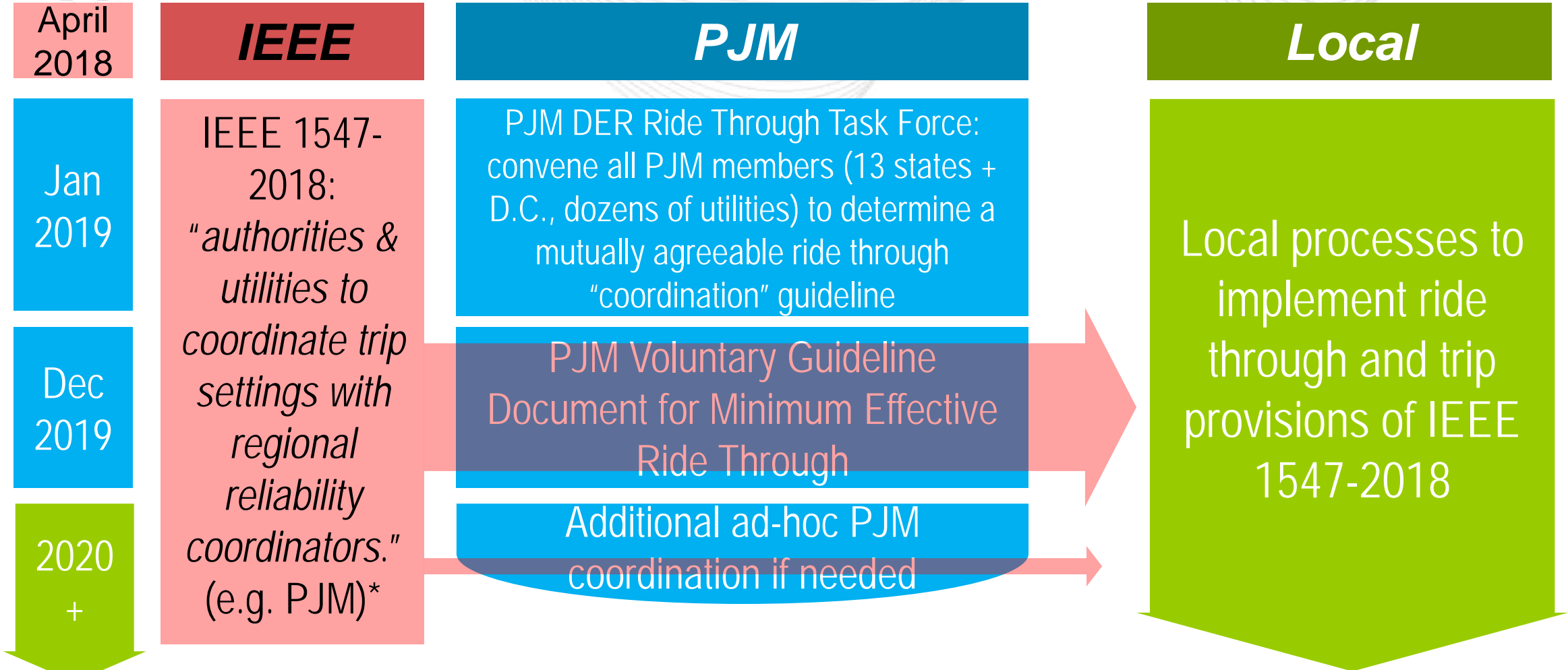
Andrew Levitt, Applied Innovation, PJM

1. **Old IEEE 1547-2003** is in state laws/regs, has been revised to more complex **new IEEE 1547-2018** standard for “smart inverters” → good for reliable and efficient integration of lots of distributed energy resources.
  - Manufacturers will move away from the old standard starting in the early 2020s.
2. PJM has a narrow interest in the “ride through” and “trip” portion of the IEEE 1547-2018 standard.
  - Ride through is important for regional reliability under high DER deployment.
3. IEEE standard 1547-2018 requires more policy engagement than the prior edition of the standard, timing of 2021 or 2022.
4. PJM worked with distribution utilities and others towards consensus on a ride through guideline for state/local authorities & distribution utilities.

*Current draft ride through guideline:*

<https://www.pjm.com/-/media/committees-groups/task-forces/derrttf/20190913/20190913-pjm-guideline-for-ride-through-performance-rev2.ashx>

# PJM DER Ride Through Task Force



*\*\*"Area EPS operators may specify [voltage trip clearing time] values within the specified range subject to the limitations on voltage trip settings specified by the regional reliability coordinator"*

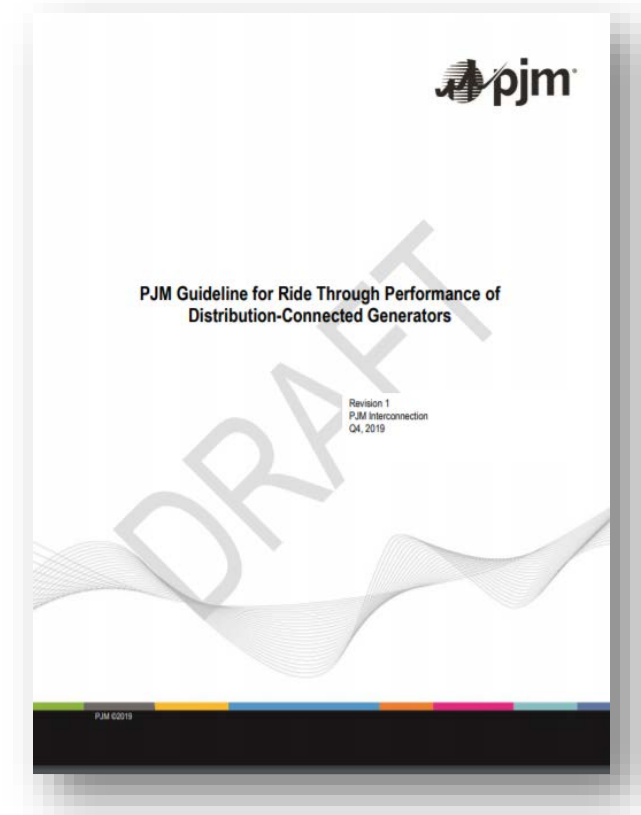
- Maryland PC-44 “grid modernization” docket chartered an Interconnection Working Group.
- Phase II of that working group worked collaboratively in many meetings to develop language for Code of Maryland including development of approach to smart inverter requirements.
- Recognition of PJM ride through guideline.

**COMAR 09.06.N.(4): “To the extent reasonable, pursuant to any modifications required by §N(5) of this Section, all utility required inverter setting profiles shall be consistent with applicable smart inverter recommendations from PJM Interconnection, LLC that are applicable.”**

# PJM Guideline for Ride Through Performance of Distribution-Connected Generators

- **Voluntary.**
- **Minimum** effective ride through times. Not a specific settings requirement (i.e., could not be used as a Utility Required Profile).
  - A Utility Required Profile could be **consistent with** the guideline.
- Minimum “effective” ride through time (i.e., trip clearing time minus 0.16 seconds) of 1.84+ seconds for  $88\% > V > 50\% \rightarrow$  **UV1 of 2+ seconds**
- Minimum effective ride through time of 0.16+ seconds for  $V < 50\% \rightarrow$  **UV2 of 0.32+ seconds.**
- Minimum ride through capability of DER of IEEE 1547-2018: either **Category II or Category III.**
- Momentary Cessation requirement is acceptable if threshold is 50% of nominal voltage or below.
- All other adjustable setting values (e.g., overvoltage settings) s are consistent with the guideline.
- In first public draft (2 pages long). Feedback welcome for next draft revision.

*Draft 1:* <https://www.pjm.com/-/media/committees-groups/task-forces/derrtf/20190913/20190913-pjm-guideline-for-ride-through-performance-rev1.ashx>





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Thank you!

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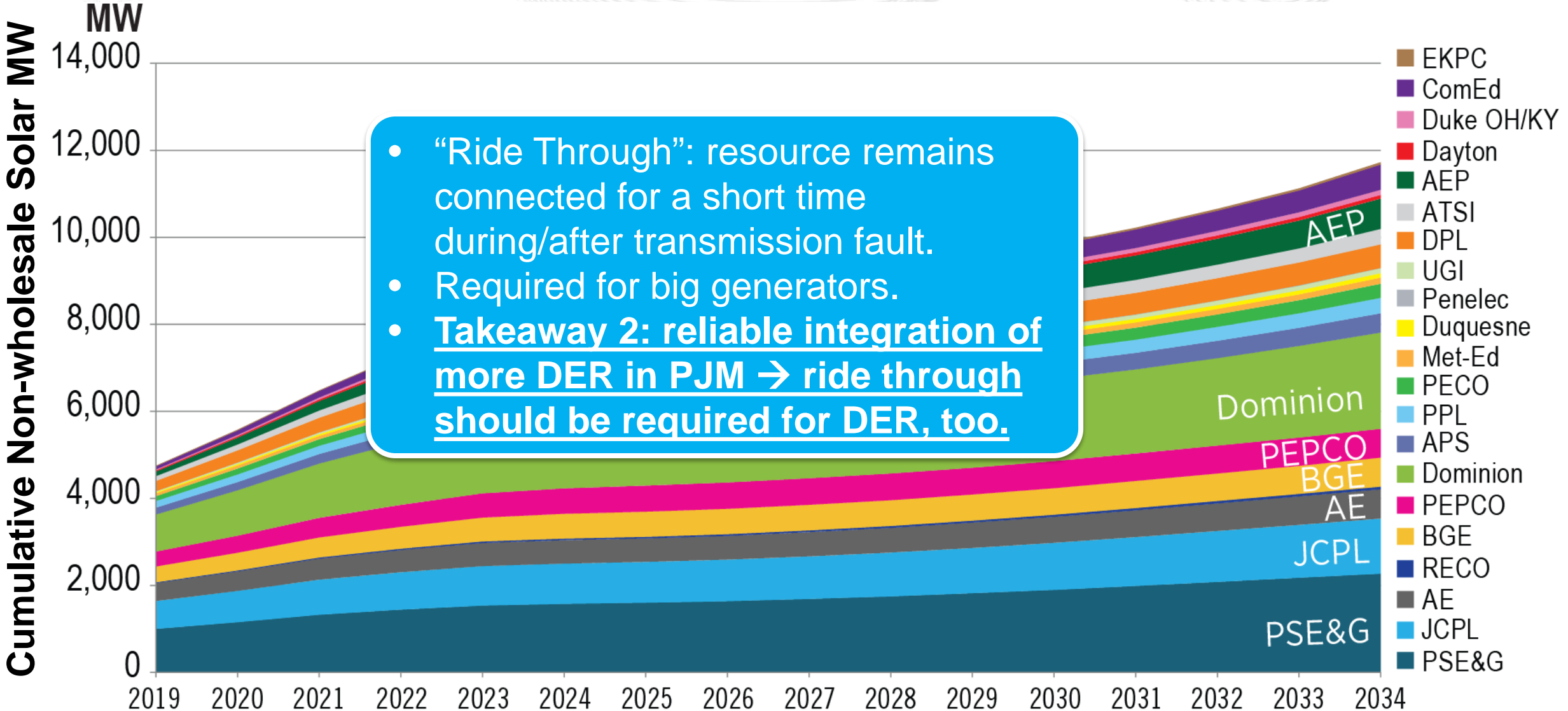
# Appendix: Takeaway Details

*IEEE standard 1547 facilitates DER interconnection.*

- **Takeaway 1: old IEEE 1547-2003 is retiring, is in laws & regs of most states.**
- PJM has long-term reliability concerns with old IEEE 1547-2003.
  - No immediate concerns, and no anticipated need for retrofits.
- New IEEE 1547-2018 is a “smart inverter” standard.
- Manufacturers moving away from IEEE 1547-2003 and towards “smart inverters” (e.g., CA, HI, MA). Starting in early 2020s, DER equipment will increasingly be designed for IEEE 1547-2018 and not old IEEE 1547-2003.



# More DER deployment in PJM → Ride Through for DER



## Old IEEE 1547-2003

Take it or leave it.

*“The small generator shall be listed to meet the requirements of IEEE 1547-2003”.*

## New IEEE 1547-2018

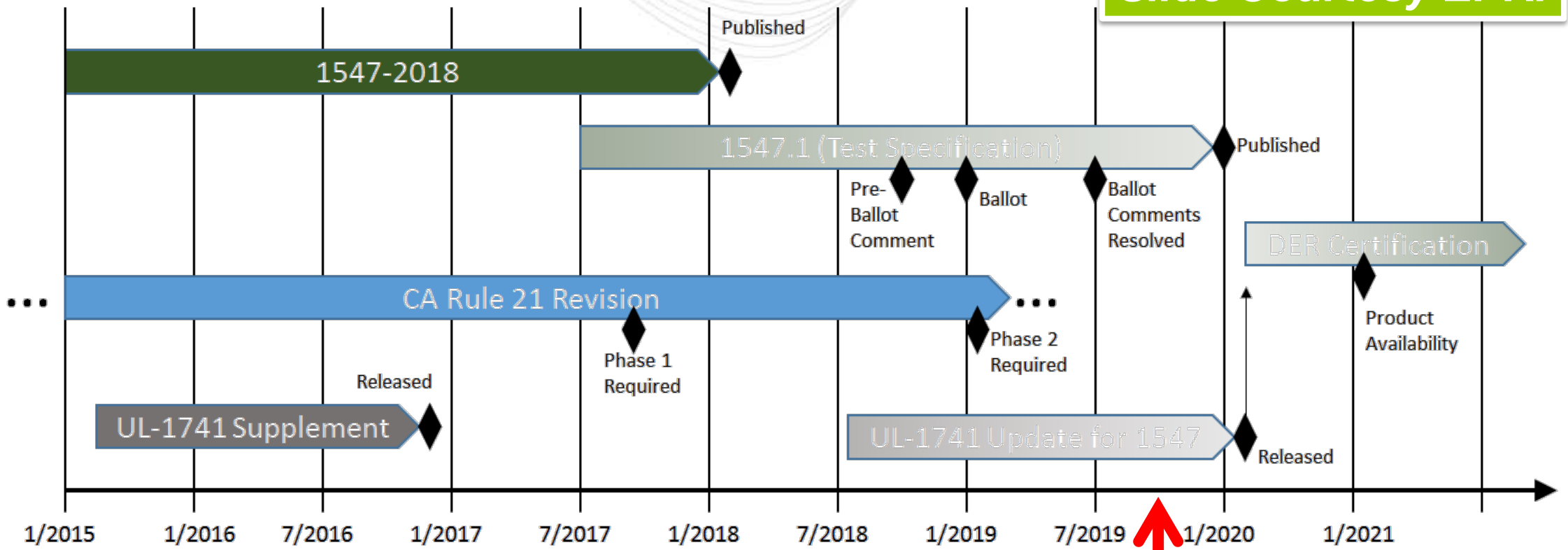
*Pick a flavor.*

*“The small generator shall be listed to meet the requirements of IEEE 1547-2018 using normal operating performance **Category A** and abnormal operation performance **Category II**, with the UV1 trip point adjusted to **[Y]** seconds and the UV2 trip point adjusted to **[X]** seconds.”*

Examples of state stakeholder working groups on ride through and trip settings : [Maryland PC-44](#) Phase II Interconnection Working Group, [Massachusetts Technical Standards Review Group](#), [Minnesota Distributed Generation Workgroup Technical Subgroup](#), [CA Smart Inverter Working Group](#)

# New IEEE 1547-2018 Standards: Done by 2021 or 2022

**Slide Courtesy EPRI**



**PJM ride through and trip recommendations**