Order 2222 & Order 2222-A

Reliability First
April 19, 2021
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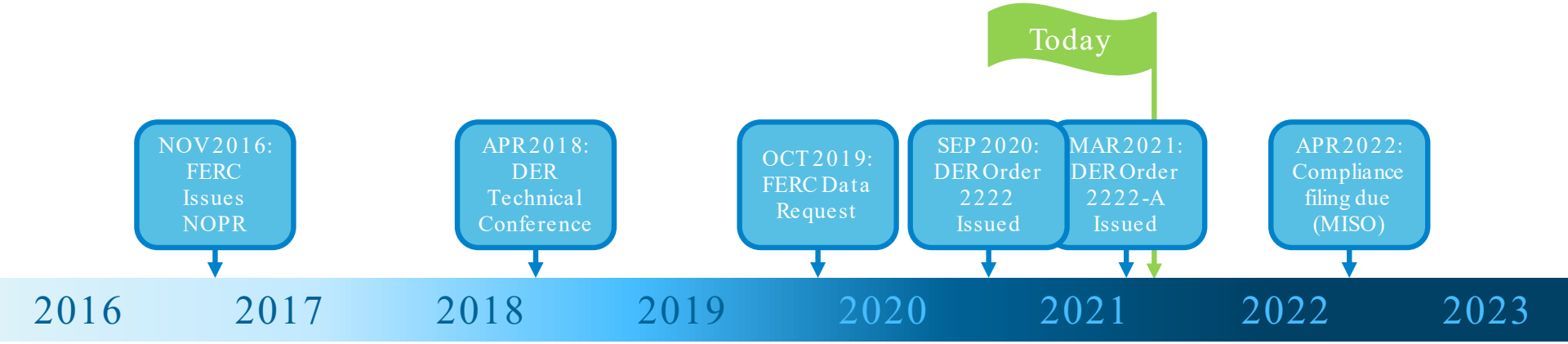
MISO DER Program Manager

FERC Order on DER has seen a long development



"We define a distributed energy resource as any resource located on the distribution system, any subsystem thereof, or behind a customer meter. These resources may include but are not limited to, electric storage resources, distributed generation, demand response, energy efficiency, thermal storage, and electric vehicles and their supply equipment."

FERC Order 2222, page 4

Reliability considerations of additional DER

- DER will be connected to the distribution system, and (if wholesale-market-participating) aggregated by a Distributed Energy Resources Aggregator (DERA); the DERA is responsible for all coordination with the distribution utility, including interconnection, and must attest they are in full compliance with the tariffs and operating procedures of the relevant distribution utilities and Relevant Electric Retail Rate Authorities (RERRAs).
- DERA interconnections will fall under state/RERRA jurisdictional processes, and will not be subject to the RTO/ISO queue – RTO/ISO's do have the flexibility to determine the maximum size of DER aggregations.
- Metering and telemetry requirements will be determined by the RTO/ISO, however such requirements "must not pose an unnecessary and undue barrier to individual DERs".

- Coordination between the distribution system and the transmission system is a significant task; planning processes cross jurisdictional boundaries.
- The speed at which DER can be added to distribution systems **challenges traditional planning processes**, and the consumer-driven nature of installation makes forward-looking estimation difficult.

Takeaways about O2222

Big challenges to solve:

- Coordination between RTO/ISO's, RERRA's, distribution companies, and DERAs must be clear to all parties, and have transparent and well-established communications to **ensure system reliability**.
- Measurement and Validation will take considerable thought; distribution operations and transmission **operations must be assured visibility**
- The distribution system is designed to be more dynamic than the transmission system, and routine switching operations will make the "path" between the DERs and the Bulk Electric System difficult to ascertain – important if DERA can inject energy.

- Some commenters have indicated this is the first time they remember a FERC Order leading (being ahead of) technology in this way.
- Sections of the Order read "including but not limited to" – language which reflects anticipated development of distributed energy resource aggregations.
- How much flexibility can/should MISO build for assets that don't exist yet, whose attributes and capabilities are unknown and evolving?

Snapshot of DER in MISO today

MISO system capacity	2020 peak load
~160,000 MW	~117,000 MW

Wholesale DER

- ~11,500 MW emergency-only load modifying resources (LMR)
- ~60/40 split between demand response and behind the meter gen
- Participating in the capacity market

- ~2000 MW market-participating demand response, ancillary services, capacity, or energy market
- Often cross-registered as LMR and within multiple DR products

Non-Wholesale DER

- ~4200 MW other DER
- Information gathered by survey of members
- This is the floor, there is likely more installed
- MISO starting to ask for DER in planning processes

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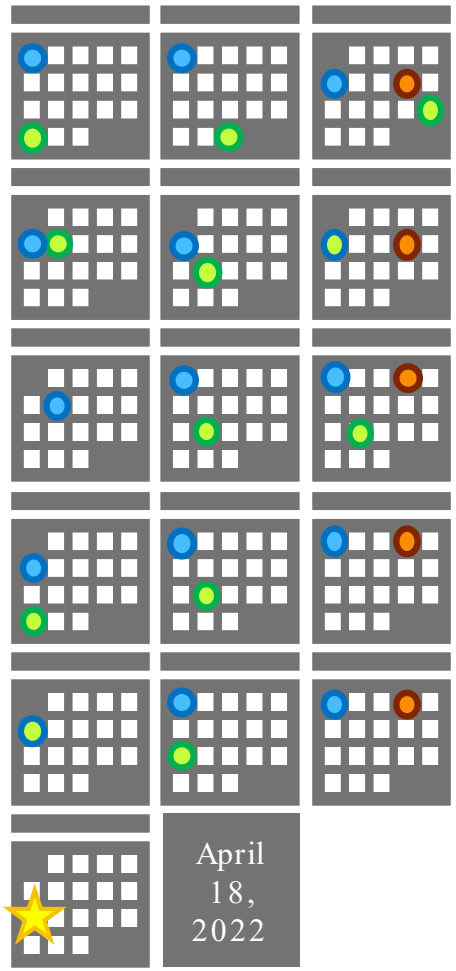
DER Task Force mailing list:
https://www.misoenergy.org/stakeholder-engagement/committees/DERTF/

Appendix

MISO filed, and was granted, a Motion for Extension of Time to file our compliance plan with FERC

A	Commission Jurisdiction and General Requirements
B	Definition of DER and DERA
C	Eligibility to Participate in RTO/ISO Markets through a DERA
D	Locational Requirements
E	Distribution Factors and Bidding Parameters
F	Information and Data Requirements
G	Metering and Telemetry Requirements
H	Coordination between the RTO/ISO, Aggregator, and Distribution Utility
I	Modification to List of Resources in Aggregation
J	Market Participation Agreements

- DER Task Force
- Market Subcommittee / Present Design
- Distribution Company Workshop
- FERC Filing



- MISO stakeholders created a Task Force to address DER compliance
- DER Task Force and DER Dist Co workshops will continue through extension period
- 9-month-extension calendar allows for additional collaboration
- Roles of RERRA, Dist Co, DERA, and MISO need to be established
- Further details can be found on MISO's DER Task Force site, and by joining the mailing list
- EPRI also has a robust O2222 effort, with participation by RTO/ISO's, utilities, and DER aggregators