



EDF Renewables

June 16th, 2020

Strategic

Roadmap Initiative 52:

- Relax Ramp Rate Requirements for DVERs

SIR#52: Relax Ramp Rate Requirements For DVERs

- Submitted by EDF Renewables
 - Member of SPP
 - EDF Renewables is a global renewable developer
 - With 4.5GW of installed capacity in North America
 - With a 12GW pipeline in the U.S., comprised of solar, storage, onshore and offshore wind projects,
 - Owner and operator of several wind farms in SPP footprint

SIR#52: Relax Ramp Rate Requirements For DVERs

Issue Description:

- This initiative is to discuss changes to ramp rate requirements for Dispatchable Variable Energy Resources (DVERs)
- Defined in the Market Protocol Section 4.2.2.5.5:
 - For DVERs with an Emergency Maximum Capacity Operating Limit of less than 200MW, the maximum ramp rate between MW specified in the Ramp-Rate-Up Curve and Ramp-Rate Down Curve in the RTBM Resource Offer multiplied by 5 cannot exceed 40MW.
 - **Effectively limiting to 8MW/min**
 - For DVERs with an Emergency Maximum Capacity Operating Limit greater than or equal to 200MW, the maximum ramp rate between MW levels specified in the Ramp-Rate-Up Curve and Ramp-Rate-Down Curve in the RTBM Resource Offer multiplied by 5 cannot exceed 20% of the DVER's Emergency Maximum Capacity Operating Limit
 - **Effectively limiting to 1/5 of 20% of nameplate capacity/min**

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- ✿ A practical path forward: SPP to undertake analysis and recommend changes that would optimize between market efficiency and reliability needs, **ideally allowing full ramp up/down within 5 minutes** or less

- ✿ **Potential benefits:**

- Increased market efficiency
 - Reduced magnitude and frequency of extreme LMP prices (high negative, high positive)
 - Reduced congestion costs for ratepayers
 - Reduction in out-of-market actions and reliability must run contracts
 - Improved system reliability
- Increase the benefits of any market based ramping product such as Ramp Up and Down Capability Down (FERC docket ER20)

- ✿ **Potential risks:**

- Increased reserve requirements or reliability risk in certain regions/conditions

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✿ Research/Analytical Work Supporting the SIR: ISO Comparison for VERs requirements

	Ramping Requirements	Renewable Penetration (avg hourly ren/load in 2019)
SPP	<ul style="list-style-type: none"> For plants <200MW, up to 8MW/min For plants ≥200MW, up to 1/5 of 20% of nameplate capacity/min 	28%
ERCOT	<ul style="list-style-type: none"> 20% of nameplate capacity/min <p>Renewable resources that were installed after 2009 are required to implement controls which limit per minute ramping to 20% of the unit's nameplate rating. (ERCOT Nodal Protocol 6.5.7.10 IRR Ramp Rate Limitations)</p> <ul style="list-style-type: none"> Generators define their own emergency rate limit to be used during reliability/emergency conditions 	21%
CAISO	<ul style="list-style-type: none"> No specific provision for ramp rate for VERs. <p>The CAISO will issue Real-Time Dispatch Instructions in the Real-Time Market for the Energy associated with the awarded capacity based upon the applicable Operational Ramp Rate submitted with the single Energy Bid Curve in accordance with Section 30.7.7.</p> <p>Based on EDFR's experience, all plants have to submit a worst operational ramp rate and best operational ramp rate for their various states of operation. EDFR plants' ramp rates allow full ramping up or down within one minute.</p>	19%
MISO	No specific provision for ramp rate for VER	9%
PJM	Realistic Ramp Rate should be entered in eMK. No further details in manuals or other agreements. Not required to submit a ramp rate, if left blank, PJM assumes no ramp limitation in the dispatch.	4%
NYISO	No specific provision for ramp rate for VERs	3%
NEISO	No specific provision for ramp rate for VERs	3%