



Strategic Roadmap Initiative 52:

- Two-Phased Approach
For Revised Ramp Rate
Requirements for DVERs



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SIR52: Two-Phased Approach For Revised Ramp Rate Requirements for DVERs

- Submitted by EDF Renewables
 - Member of SPP
 - EDF Renewables is a global renewable developer
 - With 20GW developed in North America
 - With a 34GW pipeline in the U.S., comprised of solar, storage, onshore and offshore wind projects,
 - Owner and operator of several wind farms in SPP footprint

SIR52: Two-Phased Approach For Revised 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 4% of nameplate capacity/min**

SIR#52: Relax Ramp Rate Requirements For DVERs

A practical path forward: two-phased approach:

1. A normal/restricted ramp rate to be defined as a %/minute so that DVERs are not treated in a discriminatory manner depending on their size.
 - Increase the %/min to a sweet spot
 - A 20%/min ensures a DVER can fully respond within a settlement interval
 - Consider a certification mechanism for resources to demonstrate their ramp rate capabilities
2. Further revisions based on SPP due-diligence if a more liberal use of emergency/physically possible ramp rates is found to not impact reliability

SIR#52: Relax Ramp Rate Requirements For DVERs

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**: current limitation is likely causing increased transmission violations that could be resolved otherwise by allowing the wind farms to operate at full capability
- **Increase the benefits of any market based ramping product** such as Ramp Up and Down Capability Down

Potential risks:

- Potentially increased reserve requirements if too fast or no ramp rate requirements

SIR#52: Relax Ramp Rate Requirements For DVERs

- RTO Comparison for VERs requirements

	Ramping Requirements
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
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
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>
MISO	No specific provision for ramp rate for VER
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.
NYISO	No specific provision for ramp rate for VERs
NEISO	No specific provision for ramp rate for VERs