

# SPP's Proposed Ramp Product

## INITIAL RECOMMENDATIONS FOR MAXIMIZING THE BENEFITS OF A RAMPING PRODUCT

### PRESENTED TO

Holistic Integrated Tariff Team

*Previously Presented to SPP MWG Meeting on 9/11/18*

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# Overview: Ramping Products Could Offer Significant Benefits to the SPP Region

**We support SPP staff and MMU recommendations to introduce a market-based “ramp” product to help manage increases in net load variability and ramp scarcity events**

**We offer a number of recommendations for maximizing the benefits of ramping products by:**

- 1. Developing ramping product definitions** that are driven by underlying system needs
- 2. Establishing efficient price formation** based on the **willingness to pay** for varying quantities of ramping reserves
- 3. Enabling technology-neutral, market-based** procurement
- 4. Ensuring that ramp products are aligned with other design elements and potential reforms**

Adapted from our full paper:

[\*Initial Comments on SPP's Draft Ramp Product Report\*](#)

# Ramping Products Are Needed to Manage Growing Net Load Variability

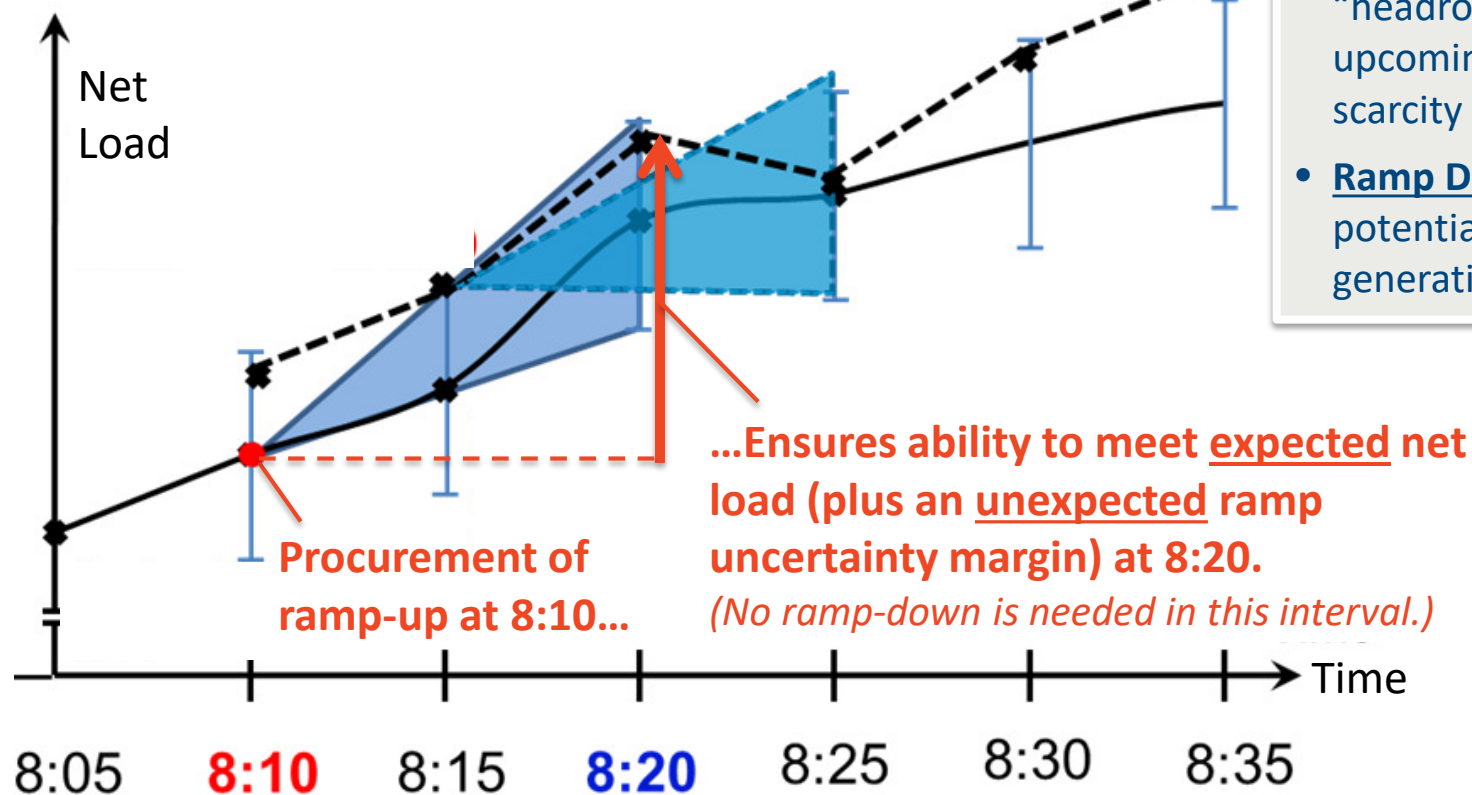
**Ramp products are needed to manage a distinct new system need that is not yet managed by any other market product**

Product	Needed for:
<b>Ramp</b> <i>Up &amp; Down, Possibly Multiple Timeframes</i>	Manage increasing ramping and net load variability <u>between</u> dispatch intervals (i.e. capability to meet net load ramps over 10 min, 30 min, or 1+ hours)
<b>Contingency Reserves</b> <i>Spinning &amp; Supplemental</i>	Respond to generation and transmission outages
<b>Regulation</b> <i>Up &amp; Down</i>	Manage net load variability <u>within</u> a 5-minute dispatch interval
<b>Energy</b>	Meeting customer demand

# What a Ramping Product Might Look Like

Ramping capability procured in the current interval ensures the ability to meet expected and unexpected ramping needs in future intervals

## Example: MISO's Ramp Product



- **Ramp Up:** holds back sufficient “headroom” to meet load in upcoming intervals & avoid scarcity events
- **Ramp Down:** mitigates the potential for minimum generation events

# MMU-Recommended Design Principles

**We support the MMU's five recommended ramp product design principles as presented in the 2017 SOM Report:**

- **Two products\*** ramp capability up and ramp capability down
- **Co-optimization** with energy and other products to ensure the most economical solution
- **Opportunity cost** basis for pricing
- **No limitations** on resource type as long as the resource can reliably provide the required ramp
- Consideration of both **expected and unexpected** ramping needs

**In [our comments](#), we also present a number of additional recommendations to maximize the benefit that ramp products can provide to the SPP market and its participants**

\* We agree that there should be at least two products for ramp-up and ramp-down, but recommend evaluating whether there is a need for additional ramping products to meet ramping needs at multiple forward timeframes

## Design Should be Driven by System Needs

**The design of the ramping product should be tailored to address SPP's unique patterns of net load variability and ramp-driven shortages:**

- Meet **multi-interval load following needs** that are not already met by other market products such as regulating reserves
- Possibly include several **ramp products for different time horizons** as distinct ramping requirements emerge (start with the already-identified need for a 5-10 min product)
- Meet both **expected and unexpected** ramping needs
- Ramp products should be **procured on a day-ahead basis** with adjustments in the real-time market
- Consider **lessons learned** and product design from other markets including MISO and CAISO; but ensure that the design recognizes how **SPP differs from other markets**



## Ramp Should Be Procured at an Efficient Price

**Efficient price formation can ensure that ramping needs are achieved cost-effectively via:**

- **Co-optimization** with energy and other products and **opportunity cost basis** for pricing
- Alignment with **proper scarcity pricing** in energy and ancillary services markets
  - If real-time prices are applied to unresponsive ramp-dispatch, scarcity pricing will provide proper performance incentives
  - Real-time price volatility will increase as more intermittent generation is added, but real-time market is only 0.05% to 1.5% the size of day-ahead settlements
- **Cost-effectiveness** ensured via economic analysis of:
  - The value proposition of ramp up (to avoid scarcity events and out-of-market unit commitments) and ramp down (to avoid wind curtailments and minimum generation events)
  - An appropriate willingness to pay for varying quantities of ramp (which can be incorporated into the day-ahead and real-time market)

## Ramp Should be Enable Technology-Neutral, Market-Based Procurement

**Ramping can be an effective in-market tool for meeting system variability needs from a broad set of resources, by:**

- Ensuring all resource types can participate** (thermal, demand response, storage, renewables, hydro)
  - Technical requirement and qualified MW is based on the ability to contribute to meeting system ramping needs within the relevant timeframe (e.g. within the 5-10 minutes)
- Enabling non-spinning quick-start resources and demand response** to participate as long as they can respond within the necessary timeframe



## Ramp Should Align with Other Design Elements and Potential Reforms

**The new ramping product will use a transparent, market-based product, reduce reliance on non-priced and manual interventions. To best align with other design elements, the ramp product can:**

- Integrate with SPP's Instantaneous Load Capacity (ILC) process** to reduce the need for (unpriced) procurement of headroom to address intra-hour ramping needs
- Reduce reliance on RUC, ST-RUC, and manual RUC processes** that tend to suppress market prices and introduce out-of-market uplift costs
- Recognize that ramp products and look-ahead real-time dispatch optimization are complementary** (if that is ultimately implemented by SPP)

# How Ramp Can Complement Other Elements of SPP's Market Design

**Market-based ramp products will enhance the performance of the existing market design and future enhancements**

## **Ramping Products Will Better Support Existing Market Systems**

- Reduce reliance on ILC, RUC, and ST-RUC for unit commitments (which are not reflected in market prices)
- Reduce out-of-market uplift payments
- Reduce the frequency and severity of contingency and regulating reserve shortages and scarcity pricing events
- Reduce the frequency of minimum generation events
- Reduce the quantity of wind curtailments

## **Ramp Product Will Be Complementary to Potential Reforms**

*But there is no need to implement other reforms at the same time as introducing ramp products.*

- Look-ahead real-time SCED
- Enhanced scarcity pricing
- Refined ancillary service products that may be needed to support other types of system needs

# Takeaways

- Ramp products have the potential to offer significant reliability and economic benefits to the SPP region
  - Reduce frequency and magnitude of ramp-related scarcity events
  - Co-optimization increases overall market efficiency, reduced total costs, and results in better pricing
  - Reduce out-of-market operational actions that distort market prices
- Benefits can be maximized if the design is driven by best practices:
  - Driven by underlying system needs
  - Efficient price formation
  - Technology-neutral participation of all resource types
  - Alignment with existing design elements and potential reforms

# Author Contact Information

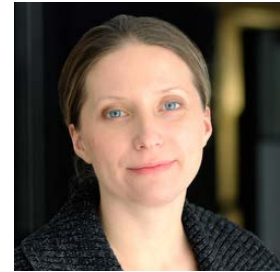


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