WHISKERLABS

Price Responsive Demand Proposal

Summary

Price Responsive Demand is not a supply-side product. Rather, it is intended to represent the capacity value of load that reduces consumption in response to price, outside of PJM markets or dispatch. The capacity value of a PRD resource should be our best estimate of the amount by which it reduces UCAP requirements.

Because of this, PRD value follows RPM cost allocation rules. Roughly speaking, 1MW of PLC pays for more or less than 1MW of UCAP because of differences between the load forecast used to purchase UCAP and the actual load used to set PLCs. Current status quo PRD rules include a variety of adjustment factors to account for this. The Whisker proposal extends this concept to cover winter months.

We also include a number of secondary changes to better accommodate seasonal loads: we propose allowing PRD resources to commit to separate summer and winter Maximum Emergency Service Levels, and expand aggregation rules to include seasonal PRD.

Differences from PJM Proposal

The high-level differences between Whisker's proposal and PJM's are:

- Adjust winter nominated capacity and load reduction measurements to account for changes in load forecast and actual peak loads. Our proposed method closely follows the current method used to adjust summer values.
- Allow PRD to participate in "RPM matchmaking" aggregation. That is, summer only PRD can offer into an RPM auction, and if a suitable winter only resource is available the two can be combined for Capacity Performance purposes.

Details

1. RPM Nominated Capacity Amount (design component 2)

PRD is currently measured relative to Expected Peak Load Value, which is the expected contribution to the Peak Load Forecast if the load were not responsive to price. (Manual 18, page 41) Whisker proposes keeping the status quo for summer, directly extending this approach to cover winter months, and valuing a PRD resource as the lesser of its summer and winter capacity value.

$$Nominal\ PRD\ Value = MIN(Summer\ Nominal\ PRD\ Value, Winter\ Nominal\ PRD\ Value)$$

Summer Nominal PRD value is determined using the status quo formula. The scaling factor applied to the PLC adjusts for differences between predicted and actual load:

$$Summer\ Nominal\ PRD\ Value = PLC * \frac{Final\ Zonal\ Peak\ Load\ Forecast}{Prior\ Summer\ W/N\ Zonal\ CP} - MESL * Loss\ Factor$$

Winter Nominal PRD value is determined using an analogous formula for winter months:

$$Winter\ Nominal\ PRD\ Value = Adjusted\ WPL * \frac{Zonal\ Winter\ Peak\ Load\ F'cast}{Prior\ Winter\ W/N\ Zonal\ CP} - WMESL * Loss\ Factor$$

Where:

Adjusted WPL is the Winter Peak Load as currently defined, adjusted to add back any load reductions due to price responsive behavior during WPL hours. Since PRD is expected to reduce in response to price regardless of PJM emergency procedures, failing to account for PRD reductions during WPL hours would undercount the PRD. These add-backs will be based on the Price-Demand curves included in the PRD Plan.

Zonal Winter Peak Load Forecast is the greater of the winter peak load forecast for the zone from the load forecast report posted prior to the auction in which the PRD committed (generally the BRA) or from the load forecast posted prior to the third IA. We use the greater of the two because if load decreases, PRD providers' commitments are not proportionately reduced, but if load increases, PJM purchases more capacity on the LSE's behalf.

Prior Winter Weather Normalized Zonal CP are the values published by PJM.

WMESL is the Winter Maximum Emergency Service Level. This is simply a different value from the summer MESL to reflect different load characteristics outside of summer months.

2. Load Reduction Amount (Design Component 6)

PRD actually does not currently have a direct method for measuring load reductions. Instead, it has rules for determining compliance and shortfalls. This reflects PRD's status as a demand-side resource: it is not committing to deliver capacity, but to not consume more than a limited amount of capacity. Our proposal keeps this basic concept and extends it to cover winter months.

$$Summer\ Shortfall = Hourly\ Load - MESL * Service\ Level\ Adjustment\ Factor$$

$$Service\ Level\ Adjustment\ Factor = MAX(1.0, \frac{actual\ Zonal\ Peak\ Load - actual\ total\ PRD\ load\ in\ zone}{Final\ Zonal\ Peak\ Load\ F'cast - final\ total\ Zonal\ Expected\ Peak\ Load\ of\ PRD})$$

This is the status quo (Manual 18, p48). The service level adjustment factor accounts for load being greater or lesser than the 50/50 forecast during an event. Note that actual zonal load and actual total PRD are based on the Delivery Year, not the prior Delivery Year as is usually the case.

We propose to 'simply' extend this to winter periods:

$$Winter\ Shortfall = Hourly\ Load - WMESL * Winter\ SLAF$$

$$Winter\ SLAF = MAX(1.0, \frac{actual\ Zonal\ Winter\ Peak\ Load - actual\ total\ winter\ PRD\ load\ in\ zone}{Final\ Zonal\ Winter\ Peak\ Load\ F'cast - final\ total\ Zonal\ Winter\ Expected\ Peak\ Load\ of\ PRD})$$

Where each of the values are simply the winter equivalent of those in the status quo formula:

Actual Zonal Winter Peak Load is the unrestricted zonal peak load at the time of the RTO winter peak.

Actual total Winter PRD Load In Zone is the load of end-use customers registered for PRD plus add-backs.

Final Total Zonal Winter Expected Peak Load of PRD is the Adjusted WPL of end-use customers registered for PRD.

Following PJM, we also propose to determine shortfalls and assess penalties hourly during trigger hours.

3. Aggregation

Finally, we propose to allow PRD to offer as Seasonal Capacity Performance Resources and participate in PJM facilitated aggregation. Although the exact clearing mechanisms should be left to PJM staff and/or subsequent manual revisions, we suggest:

When a Seasonal PRD Resource is paired with a Seasonal supply Resource (e.g., Gen, DR, EE, Storage), the resulting aggregate shall be treated as a supply offer with a UCAP value equal to:

$$Offered\ Supply\ UCAP * \frac{Days\ in\ which\ Supply\ Resource\ will\ receive\ Capacity\ Credit}{Days\ in\ Delivery\ Year}$$

Plus a PRD offer with a UCAP value of:

$$Offered\ PRD\ UCAP * \frac{Days\ in\ which\ PRD\ Resource\ will\ receive\ Capacity\ Credit}{Days\ in\ Delivery\ Year}$$

The VRR curve adjustment due to the PRD shall occur in the LDA in which the aggregate is determined to be located, as set by current rules.

Feedback and Questions are welcomed

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