TO BE ADDED AS SECTION 6 OF MANUAL 20:

Procedure for Establishing Limited-Availability Resource Constraints at RTO Level

Overview

The procedures described below are performed prior to each RPM Base Residual Auction and Incremental Auction. The procedures use the most recent IRM Study model and PJM load forecast model applicable to the Delivery Year (DY) being evaluated. Limited-Availability Resource Constraints are established for both the Base Capacity Demand Resource and the Base Capacity Resource for the RTO and for any LDA that is modeled as a separate area in the RPM auction. The Resource Constraints are posted with the other planning parameters prior to each RPM auction. The procedures are in effect for only the 2018/2019 and 2019/2020 Delivery Years.

Base Capacity Demand Resource Constraint

Load Model

1. The daily load forecast distributions for the applicable Delivery Year are obtained for all weekdays from the PJM load forecast model. The distributions are based on a range of historical weather scenarios. This results in approximately 260 daily load distributions.
2. The maximum load value from each weather scenario's summer period (June 1 – August 31) is determined. The median of the distribution of all these maximum load values represents the 50/50 forecasted summer RTO peak for the applicable Delivery Year.
3. The daily load distributions from step 1 are per-unitized on the 50/50 peak load value determined in step 2. In other words, the ratio of each weather scenario load to the median forecast peak is calculated. Using the ratio calculated, all weather scenario loads can be re-evaluated for any forecasted peak while preserving the shape of the original distributions. This allows all the daily load distributions to be shifted up or down by altering the forecasted summer peak load.

Capacity Model

4. The PJMRTO cumulative capacity probability table from the most recent IRM Study is obtained for all 52 weeks of the applicable Delivery Year. The cumulative capacity

probability table represents the distribution of available capacity each week. Available capacity is defined as generation that is not expected to be on a forced, maintenance or planned outage.

Analysis

5. As described in step 3, the daily load distributions are iteratively shifted to equal the IRM established for the applicable DY.
6. A reference annual LOLE is determined based on the daily load distributions from step 3 and the capacity distributions from step 4. The resulting case is the Base Case.
7. Varying amounts of Base Capacity Demand Resource (expressed as a percent of the unrestricted peak load) are then added to the capacity model. Base Capacity Demand Resource is modeled to be interruptible from June 1 through September 30 while being unavailable for the rest of the DY. Base Capacity Demand Resource is represented as a 100% available resource and is assumed to displace an equal amount of 100% available Capacity Performance Resource for the entire year
8. At each Base Capacity Demand Resource amount, the annual LOLE is determined and the percent increase in risk from the reference annual LOLE is calculated
9. The Base Capacity Demand Resource Constraint is equal to the Base Capacity Demand Resource amount at which the percent increase from the reference LOLE computed in step 6 is 5%. The Base Capacity Demand Resource Constraint in MW is expressed as a percent of the forecasted unrestricted peak.

Base Capacity Resource Constraint

Load Model

1. The weekly load model from the most recent IRM Study is obtained for all 52 weeks of the applicable Delivery Year. For more details on the load model used in the IRM Study, see Section 3.2.1 in this manual.

Capacity Model

2. The PJMRTO cumulative capacity probability table from the most recent IRM Study is obtained for all 52 weeks of the applicable Delivery Year. The cumulative capacity probability table represents the distribution of available capacity each week. Available capacity is defined as generation that is not expected to be on a forced, maintenance or planned outage.
3. The available capacity during the peak week of winter is adjusted to reflect winter ratings of thermal and wind units.

Analysis

4. The weekly load distributions are iteratively shifted to equal the IRM established for the applicable DY.
5. A reference annual LOLE is determined based on the weekly load distributions from step 4 and the capacity distributions from steps 2 and 3. The resulting case is the Base Case.
6. The weekly cumulative capacity probability tables are adjusted to reflect the unavailability of the amount of Base Capacity Demand Resource computed in the previous procedure (in other words, the Base Capacity Demand Resource is assumed to have cleared at its full constrained level).
7. Varying amounts of Base Capacity Resource (expressed as a percent of the unrestricted peak load) are then added to the capacity model. Base Capacity Resource is modeled to be unavailable during the peak winter week while being available for the rest of the DY. The Base Capacity Resource is represented as a 100% available resource and is assumed to displace an equal amount of 100% available Capacity Performance Resource for the entire year
8. At each Base Capacity Resource amount, the annual LOLE is determined and the percent increase in risk from the reference annual LOLE is calculated
9. The Base Capacity Resource Constraint is equal to the Base Capacity Resource amount at which the percent increase from the reference LOLE computed in step 5 is 10%, plus the Base Capacity Demand Resource Constraint. The Base Capacity Resource Constraint in MW is expressed as a percent of the forecasted unrestricted peak.

Procedure for Establishing Limited-Availability Resource Constraints at LDA level

The procedure for establishing the Base Capacity Demand Resource Constraint and the Base Capacity Resource Constraint for each of the LDAs that are modeled separately in RPM is identical to the procedure for the RTO detailed above with the following exceptions:

- In Step 1 of Base Capacity Resource Constraint
  - The weekly load model for the LDA is derived using the same time period as in the IRM Study's Load Model.
- In Step 4 of Base Capacity Demand Resource Constraint and Step 2 of Base Capacity Resource Constraint
  - The LDA's available internal capacity during each week is increased by the Capacity Emergency Transfer Limit (CETL). This is the maximum amount of resources expected to be available to the LDA during a local capacity emergency.
- In Step 5 of Base Capacity Demand Resource Constraint and Step 4 of Base Capacity Resource Constraint
  - The daily/weekly load distributions are shifted only once to match the LDA's 50/50 forecasted unrestricted non-coincident peak for the applicable Delivery Year

- In Step 9 of Base Capacity Demand Resource Constraint and Step 9 of Base Capacity Resource Constraint
    - The Base Capacity Demand Resource Constraint and the Base Capacity Resource Constraint for an LDA are expressed as a percent of the LDA's forecasted unrestricted coincident peak.