

CPQR

RASTF

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IMM



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CPQR

- **CPQR (Capacity Performance Quantifiable Risk) consists of the quantifiable and reasonably-supported costs of mitigating the risks of nonperformance associated with submission of a Capacity Performance Resource offer such as insurance expenses associated with resource non-performance risks.**



CPQR

- **The risk to a capacity resource that needs to be addressed in the CPQR variable is the risk of paying net nonperformance charges.**
- **Net nonperformance charges are nonperformance charges net of bonus payments**
- **Key variables: A, B, H, PPR, CPBR, and the stop loss limit.**
- **The stop loss limit is a cap at 1.5 times the net cost of new entry (\$/MW-year) times the committed MW in UCAP.**

Net Performance Penalties

- **Net performance penalties:**
- ***Net (Expected Penalties – Expected Bonuses)***
$$\begin{cases} CPBR \times H \times (B - A), & \text{if } \bar{B} < \bar{A} \\ PPR \times H \times (B - A), & \text{if } \bar{A} < \bar{B} \end{cases}$$
- **In all cases multiplied by UCAP value of resource.**
- **Where:**
 - **CPBR is the bonus payment rate during PAI (\$/MWh)**
 - **PPR is the nonperformance charge rate during PAI (\$/MWh)**
 - **H is the number of PAI divided by 12**
 - **A is the unit performance during PAI**
 - **B is the balancing ratio during PAI**

Calculation

- **The key variables can be estimated based on historical values.**
 - **Actual average values of H, A, B, CPBR, PPR**
- **Simulation analysis**
 - **Historical distribution of each variable and conditional distribution of each variable.**
 - **Actual history**
- **Simulation analysis**
 - **Expected distribution of each variable and expected conditional distribution of each variable.**
 - **Expectations bounded or calibrated by history**

Calculation

- **Conditional distribution of each variable:**
 - **For a given set of supply/demand conditions, PAI or not?**
 - **If PAI, then what is B?**
 - **If PAI and defined B, then what is A?**



Calculation

- **Result is a distribution of net performance penalties**
- **Distribution is expected to include net negative performance penalties and net positive performance penalties:**
 - **Some net penalties**
 - **Some net bonuses**
- **Expected value of net performance penalties is the mean of the distribution**
- **The mean can be positive, negative or zero**

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