Reserve Pick Up Penalty Concepts

Scott Harvey

NYISO

ICAP/MIWG

April 6, 2022

Topics

- Background
- Concept
- Revenue Component
  - Core Design
  - Design Choices
  - Complications
- Reliability Component
- Other Considerations
- Next Steps

Background

The reserve pick up penalty design has two goals:

- Incent better performance by all resources scheduled to provide reserves as the NYISO resource mix changes and RPU performance potentially becomes more important from a reliability perspective;
- Deter resources of which the NYISO has poor visibility from offering reserves they cannot provide.

Concept

Reserve pickup penalty design would have two components:

- Revenue Component: Set at a level that offsets expected profits over the year from offering reserves a resource cannot actually provide.
- Reliability Component: An additional charge to reflect reliability and out of market costs of poor performance.

Concept

Reserve pickup penalty design will have two benefits:

- Deter resources from offering reserves they cannot provide;
- Incent resources to incur costs to improve their reserve pickup performance.

Revenue Component Design

Revenue Component: Set at a level that offsets expected profits over the year from offering reserves a resource cannot actually provide. Conceptually charge is:

Revenue Component Charge =

Annual (8760 hour) reserve market revenue/expected number of reserve activations

Hence:

Revenue Component Charge * expected number of reserve activations = annual revenue

The charge would effectively offsets all of the reserve market revenues from a resource that clears in every hour but never performs.

Revenue Component Choices

Choices:

- Per failure charge or per MW of failure charge? We recommend per MW charge.
    - Per megawatt charge incents resources to perform as much as they can
    - Per megawatt charge is more consistent with the goal of offsetting payments for reserves that are not actually provided.
- Charge Design: We recommend separate charge for spinning and non-spinning reserves; separate charges for each reserve region
- Historical or forward looking calculation of revenues and expected activations?
    - What is the length of look back period for historical calculation?
    - Is the lookback period seasonal, annual, time of day?
- Update frequency (Daily, Weekly, Monthly, Seasonal, Annual)

Revenue Component Choices

- Generic or resource specific charge?
  - Resource specific charge will be more complex to implement and will likely run into statistical issues with rarely activated resources that will need to be addressed;
  - Generic charge may be set too low for resources that only participate when reserve prices are high or are rarely called upon.
- Performance Threshold:
  - We are considering within 98% of base point change **AND** within 1MW, but need to further consider design for small reserve providers.
- Penalty would be applied only to resources that receive a reserve award in the RTD interval prior to a RPU interval.

Revenue Component Complications

Complications:/Consequences

- Design envisions resources being able to submit real-time derates to reflect actual upper limit for reserve activations reflecting changes in ambient temperature and other factors.
    - The NYISO still needs to work through the timing of derate submissions and interplay with the proposed penalty rules
    - This change will have secondary benefits in providing more accurate information to operators.
- Penalty calculation will need to account for resource receiving out of merit instructions and not penalize them for following operator instructions;
- Design will interact with improvements to Duct Firing modeling

Reliability Component

Reliability Component: Set at a level reflecting cost of poor performance.

Factors to consider in setting penalty component:

- Potential NPCC and NERC penalties for NYISO failures;
- Cost of out of market actions taken by operators when resources fail to fully respond to a reserve pickup.

Other Considerations

- NYISO could continue to rely on audit performance to test the ability of resources providing reserves to sustain their output for one hour or could develop additional elements of the penalty design that would apply to the ability to sustain output.
- Performance would likely also be improved by price formation changes that provide an appropriate price signal during reserve pickup conditions;
    - This will be more important if there is an increase in price responsive behind the meter resources on the system (including behind the meter generating and storage units that respond to price but are not on dispatch).

Other Considerations

Continued

- Core design could be accompanied or followed by a reserve design which applied derated reserve scheduling values to reserves offered by resources with poor performance.
  - Such a design would better align scheduled reserves with expected response;
  - However, such a design would be difficult to apply to energy limited resources whose reserve capability varies with the status of their energy limit and might also be difficult to apply to demand side resources whose reserve capability varies with the power consumed by particular processes or other factors not observed by the NYISO.

Next Steps

- Continue dialogue on penalty design choices and other considerations
- Present a penalty structure and example calculations at an upcoming MIWG