Demand-Side Ancillary Services Issues & Straw Proposal

PRLWG

September 14, 2005

Alternatives

1. Current System (RTS)
   - 3-part bid (start-up, minimum generation, and incremental energy) is used to represent a supplier's costs.
   - Currently RTS assumes all suppliers are willing to provide energy therefore there is no additional cost to the supplier to provide reserves that cannot be represented in the normal 3-part bid → no RT availability bid.
   - RTS economically evaluates all reserve suppliers → economic efficiency.
2. Modification of RTS to provide additional bidding flexibility to demand-side reserve providers
   - Permit demand-side reserve suppliers to specify a RT availability bid to cover the additional cost of supplying reserve that cannot be recovered through the normal 3-part bid.
   - To use the availability bid, demand-side suppliers must prove that they incur additional costs that cannot be recovered through the normal 3-part bid.
   - RTS would still economically evaluate all reserve suppliers → economic efficiency.
3. Create an out-of-market 30-minute reserve product modeled on Special Case Resources

Input is Sought

- What costs would demand-side reserve suppliers incur that could not be reflected in the 3-part real-time bid (or 4-part day-ahead bid) that is used today?
  - Start-up, minimum generation, and incremental energy costs would still have to be specified.
  - Demand-side suppliers that have fixed costs for providing reserves, and need to know in advance if scheduled, can use the DAM bids that do allow availability bids. This capability exists today.

RT Scheduling of Reserve

- Reserve and energy would continue to be co-optimized → minimizes as-bid production cost for the load served
- Reserve clearing price would reflect:
  - Marginal lost opportunity cost + availability bid (as is done day-ahead)
  - Reserve demand curves (no change)
- Reserve clearing price would have to exceed the availability bid for a demand-side supplier to be scheduled → *"Schedule me only if it is worth my while & I can't express what is worth my while without the RT availability bid."*
- Demand-side reserve suppliers would be scheduled if it is the economically efficient thing to do → *"You'll be scheduled if it is the best (least cost) thing to do."*

Spinning Reserve

- NERC approval
- Synchronized to the network
- Two MW minimum
- Full response required within 10 minutes
  - Must be able to respond to activation order issued by the ISO
- Response may be required for up to one hour
- Metering
  - Load MW telemetry (as today)
  - Response MW telemetry (non-zero when supplying service)
- Periodic test to verify capability to provide service

10-Minute Non-synchronized Reserve

- Two MW minimum
- Full response required within 10 minutes
  - Must be able to respond to activation order issued by the ISO
- Response may be required for up to one hour
- Metering
  - Load MW telemetry (as today)
  - Response MW telemetry (non-zero when supplying service)
- Periodic test to verify capability to provide service

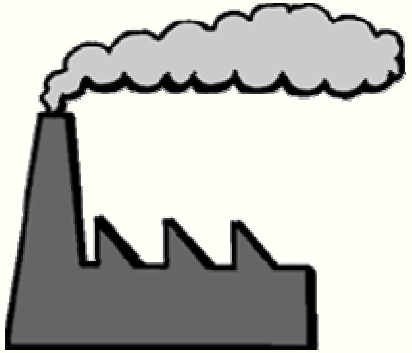
30-Minute Reserve

- Two MW minimum
- Full response required within 30 minutes
  - Must be able to respond to activation orders issued by the ISO
- Response may be required for up to several hours
- Metering
  - Load MW telemetry (as today)
  - Response MW telemetry (non-zero when supplying service)
- Periodic test to verify capability to provide service

Conceptual View of Demand-side Reserve Supplier

LMW

Load (eg. industrial process)



RMW

On-site (behind-the-fence) Generation

RT Energy Settlement

No change, nothing new

- LMW: load MW telemetry
- RMW: response MW telemetry
- LMP: real-time energy price

- Payment (by load) for energy consumed by the load

  (LMW + RMW) x LMP

- Payment (to supplier) for energy provided by the demand-side reserve supplier when asked to respond

  RMW x [higher of (LMP, Supplier's Energy Bid)]

  That is, supplier is eligible for a RT bid production cost guarantee (also covers startup & minimum generation costs)

Response Verification

- Expect to see a decrease in LMW upon activation
- Expect that the decrease in LMW and the increase in RMW will be (approximately) equal
- Details are yet to be worked out
- Sanctions for non-performance are yet to be worked out.

RT Reserve Clearing Prices

Normal day, average for the day 9/7/2005

- West of Central-East
  - 10-minute spinning reserve $0.00
  - 10-minute non-synchronized reserve $0.00
  - 30-minute reserve $0.00
- East of Central-East
  - 10-minute spinning reserve $0.00
  - 10-minute non-synchronized reserve $0.00
  - 30-minute reserve $0.00

RT Reserve Clearing Prices

Extreme day, average for the day 7/19/2005

- West of Central-East
  - 10-minute spinning reserve $0.00
  - 10-minute non-synchronized reserve $0.00
  - 30-minute reserve $0.00
- East of Central-East
  - 10-minute spinning reserve $62.41
  - 10-minute non-synchronized reserve $61.33
  - 30-minute reserve $1.40

RT Reserve Clearing Prices

Extreme day, average for the day 7/20/2005

- West of Central-East
  - 10-minute spinning reserve $0.00
  - 10-minute non-synchronized reserve $0.00
  - 30-minute reserve $0.00
- East of Central-East
  - 10-minute spinning reserve $0.00
  - 10-minute non-synchronized reserve $0.00
  - 30-minute reserve $0.00

RT Reserve Clearing Prices

Extreme day, average for the day 7/21/2005

- West of Central-East
  - 10-minute spinning reserve $0.00
  - 10-minute non-synchronized reserve $0.00
  - 30-minute reserve $0.00
- East of Central-East
  - 10-minute spinning reserve $0.28
  - 10-minute non-synchronized reserve $0.00
  - 30-minute reserve $0.00

RT Reserve Clearing Prices

Extreme day, average for the day 7/22/2005

- West of Central-East
  - 10-minute spinning reserve $0.00
  - 10-minute non-synchronized reserve $0.00
  - 30-minute reserve $0.00
- East of Central-East
  - 10-minute spinning reserve $0.34
  - 10-minute non-synchronized reserve $0.00
  - 30-minute reserve $0.00

RT Reserve Clearing Prices

Extreme day, average for the day 7/26/2005

- West of Central-East
  - 10-minute spinning reserve $10.12
  - 10-minute non-synchronized reserve $10.12
  - 30-minute reserve $0.65
- East of Central-East
  - 10-minute spinning reserve $54.67
  - 10-minute non-synchronized reserve $54.59
  - 30-minute reserve $0.65

RT Reserve Clearing Prices

Extreme day, average for the day 7/27/2005

- West of Central-East
  - 10-minute spinning reserve $0.03
  - 10-minute non-synchronized reserve $0.00
  - 30-minute reserve $0.00
- East of Central-East
  - 10-minute spinning reserve $47.64
  - 10-minute non-synchronized reserve $47.60
  - 30-minute reserve $25.31

Estimated Upper Bound on Annual Revenue

Per MW of Reserve (based on select dates)

- West of Central-East
  - 10-minute spinning reserve $240
  - 10-minute non-synchronized reserve $240
  - 30-minute reserve $0
- East of Central-East
  - 10-minute spinning reserve $3,950
  - 10-minute non-synchronized reserve $3,925
  - 30-minute reserve $650