RTS – Bidding Overview

Presented to MSWG
05/09/02

Presentation Agenda – Follows ConOp

- **Generation**
  - *Energy Bids (Section 2.2.1 & 2.2.1.1)*
  - *Ancillary Service Bids (Section 2.2.1.2)*
  - *Inter-Temporal Constraints (Section 2.2.1.3)*
- **Demand Side Resource Bids (Section 2.3)**
- **Transaction Bids (Section 2.4.1)**

Generator Bids (Section 2.2.1 & 2.2.1.1)

Bid Parameters	Description
General Bidding Features	• 3-part bidding in real-time • Bids for energy and ancillary services will be locked one hour before the beginning of the hour • Price under DAM scheduled portion of Bid Curve cannot be increased. • Valid bid required at all times to stated upper operating limit or have scheduled the unit on an outage
Gas Turbine Bidding	• Can bid a startup cost, minimum generation cost and incremental energy bids like a steam unit • May choose to submit bids with a minimum operating level plus a dispatchable range. A GT that chooses a minimum operating level equal to it maximum operating level will be treated as gas turbines are today. • Will have a real time startup cost that will be used by RTC

Generator Bids (Section 2.2.1 & 2.2.1.1)

Bid Parameters	Description
Unit Status	Self-Commit/Self-Schedule capability: • **On-Dispatch** - follows a 5 minute (or 6 second) basepoint • **Self-Scheduled Flexible** – self-scheduled lower limit with a dispatchable range - follows a 5-minute or 6-second basepoint above a MP specified lower limit. • **Self-Scheduled Fixed** - fixed schedule provided by MP
Upper Operating Limit	Option under consideration: • Specify Normal and Emergency UOL • Procedures would dictate which is used Day-Ahead • Operators could call for Emergency UOL operation in-day Further review required: • Operational & Market Monitoring impacts need to be fully assessed

Generator Bids (Section 2.2.1 & 2.2.1.1)

Bid Parameters	Description
Startup Cost Bid Representation	Can choose between a startup cost defined by: • Hour of the day • Time dependent increasing cost function (to model warm start steam) • Time dependent decreasing cost function (to model gas turbine reluctance to be restarted too frequently in-day)
Minimum Generation Bid	• Minimum generation operating level is defined by a MW level • May change hourly in SCUC and quarter-hourly in RTS. • Minimum generation cost is defined by a total minimum generation cost in $
Incremental Energy Bid	• Bid like in SCUC today with some number of incremental block bids • 12 blocks have been proposed - Balance of bidding flexibility versus SCUC/RTS performance. • Must have monotonically increasing bid prices

Generator Ancillary Service Bids - DAM & RT (Section 2.2.1.2)

	10-Minute Spinning	10-Minute Non-Spin	30-Minute Spinning	30-Minute Non-Spin	Regulation
On-Dispatch	✓		✓		✓
Self-Schedule Flex	✓		✓		✓
Self-Schedule Fixed					
Fast-Start Units (10-Min Start)	✓	✓	✓		✓
Slow-Start Units (30-Min Start)	✓		✓	✓	✓
Availability Bid	Must bid $0/MW	Provided by the bidder. $0/MW assumed if no bid provided	Must bid $0/MW	Provided by the bidder. $0/MW assumed if no bid provided	Provided by the Bidder
MW Quantity	Defined by ramp rate and capped at UOL	Defined by ramp rate and capped at UOL	Defined by ramp rate and capped at UOL	Defined by ramp rate and capped at UOL	Provided by the bidder. (MWs and MW/Min.)

Generator Inter-Temporal Constraints (Section 2.2.1.3)

Inter-temporal Constraint	Description
Startup Time	• Will be limited to a maximum of 30 minutes • Units can specify a startup time of as little as 15 minutes
Minimum Run Time	• The maximum allowable minimum run time will be 1 hour. • The minimum runtime can be as short as 15 minutes
Minimum Down Time	• The maximum allowable minimum down time will be 168 hours
Maximum Number of Stops (Starts)	• SCUC will continue to honor. RTS will not honor but will track. • Must be at least 1. • See Startup Cost parameter for units with issues managing the number of stops in-day

Demand Side Resource Bids (Section 2.3)

- Load that has demonstrated that it meets all metering and deliverability requirements can be scheduled by RTC and dispatched by RTD (Fixed Schedule or Dispatchable)
- Participation in a given service subject to bidding qualifications to be developed by the PRLWG and subject to Operations requirements and procedures.

	10-Minute Spinning	10-Minute Non-Spin	30-Minute Spinning	30-Minute Non-Spin	Regulation
Dispatchable Loads	✓		✓		✓
Availability Bid	Must bid $0/MW		Must bid $0/MW		Provided by the Bidder
MW Quantity	Defined by ramp rate and capped at UOL		Defined by ramp rate and capped at UOL		Provided by the bidder. (MWs and MW/Min.)

Transaction Bids (Section 2.4.1)

Transaction Bids	Description
Pre-scheduled before SCUC	• Highest economic priority. • Maintains priority whenever economic evaluations are performed.
Economically scheduled by SCUC converted to pre-scheduled	• Economically bid into the day-ahead market • Following receipt of a DAM schedule and approved conversion to a real-time PST, RTC price assures priority over other economically scheduled.
Pre-scheduled before RTC	• No DAM schedule, Approved as a real-time PST • Passed to RTC with economic priority over economically scheduled transactions, but less than other PSTs
Economically scheduled by RTC	• Bids will be restricted to a level that ensures PSTs an economic priority • DAM economic transactions have no priority over Real-Time economic transactions
Short notice external transactions	• Must be approved by both control areas before scheduling • If approved after RTC evaluation, then viewed as fixed injection. • Prior to RTC economic run, would be treated as a RTC PST.

Transaction Bids (Section 2.4.1)

Transaction Bids	Description
General Rules	• SCUC - bid hourly or as multi-hour block transactions • RTC - hourly or can be ¼ hourly on external interfaces that support it. • Interfaces that allow quarter hourly schedule changes will permit quarter hourly pre-schedules in real time
RTS Prescheduled Transactions	• May pre-schedule at ¼ hour Start/Stop intervals • User defined Minimum Run Time at ¼ hour intervals • Can submit different MW quantities for each ¼ hr interval
RTS Economic Transactions	• Economic evaluation will be hourly • Can provide only one MW quantity and one price for the transaction per hour

Transaction Bids (Section 2.4.1)

Transaction Bids	Description
SCUC Modeling	Hourly SCUC model has limited ability to recognize ¼ hour scheduling possibilities in Real-Time Options under consideration: • No ¼ hour scheduling in the DAM – only allow in HAM • Apply a conservative increase in DAM ramp • Based on bidder willingness to slip transaction start, schedule transactions that exceed top of hour ramp limit on ¼ or ½ hour. Further review required: • Assess imbalance impacts between generation and load. • ABB input on complexity and level of effort to model additional ramp rate constraint in SCUC that would allow option to be scheduled at ¼ or ½ hour.