

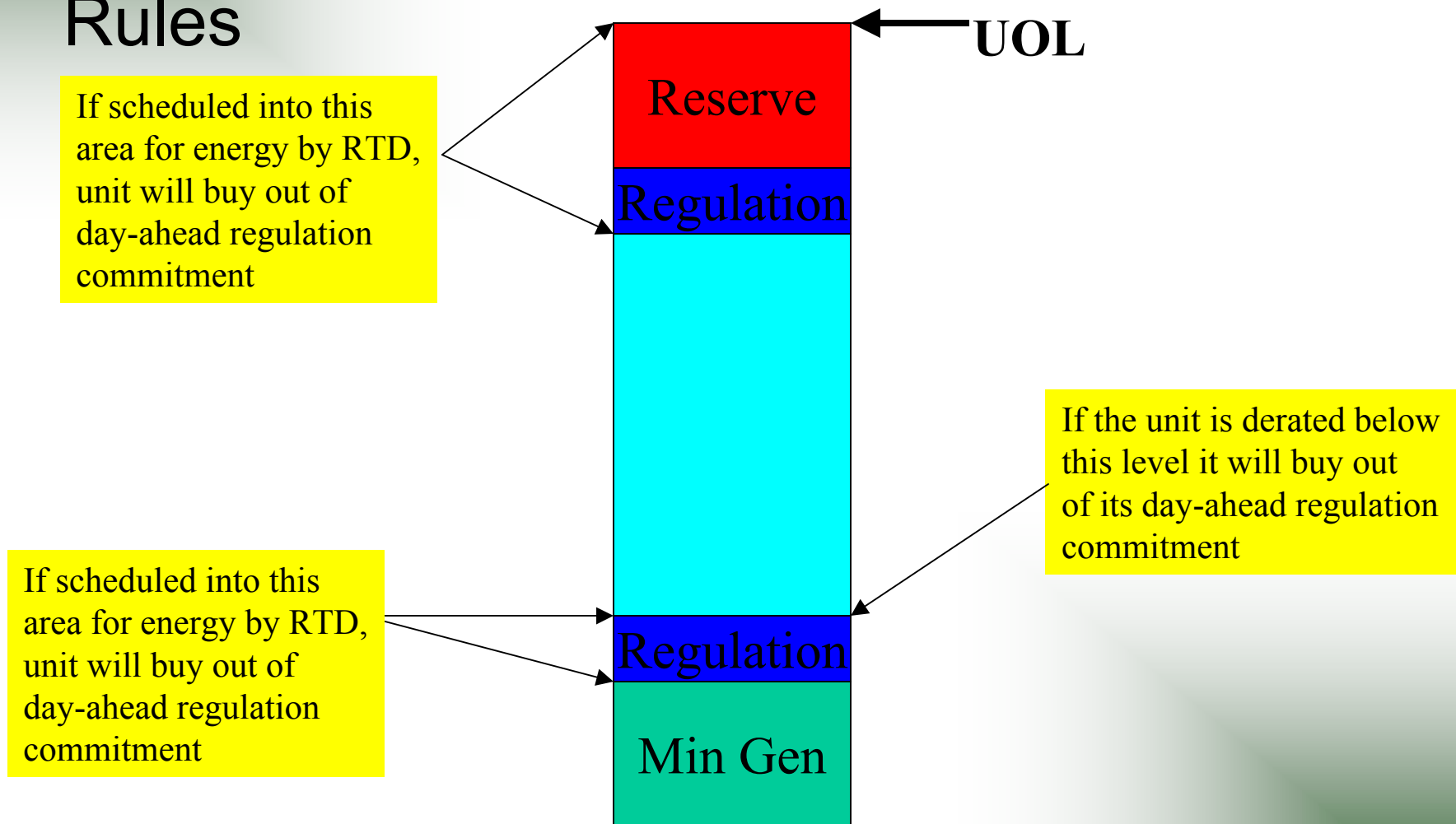
Real Time Scheduling

Regulation Settlements

General Settlement Rules

- **There will be a full two settlement. Regulation service will be scheduled and settled nominally on a 5-min. basis.**
- **A unit that is scheduled by RTD into an area bounded by the UOL and the UOL less the combined day-ahead reserve and regulation awards will buy out of its day-ahead regulation commitment.**
- **A unit that is scheduled by RTD into the area bounded by the minimum generation and the minimum generation plus the day-ahead regulation award will buy out of its day-ahead regulation commitment**
- **A unit can be de-scheduled for regulation and not be capacity constrained**
- **A unit changing status from on- to off- control will buy out of its day-ahead regulation commitment**
- **A de-rated unit may be required to buy out of its day-ahead regulation commitment**

General Settlement Rules



Regulation Schedules

- **BAS will use real-time regulation schedules from RTD**
- **RTD considers unit constraints when determining schedules**
 - *Ramp rate*
 - *De-rates*
 - *On/off-control status*
- **Settlement for regulation is based on schedule. Therefore, if a unit does not perform as required it still buys out of its day-ahead commitment**

Balancing Regulation in Real-Time

- **Settlement made for each RTD period.**
- **Scheduled by RTD**
- **If the regulation schedule from RTD is less than the DAM schedule the unit will buy out of its day-ahead commitment.**
- **For each RTD interval the unit shall pay the balancing regulation MWs multiplied by the real-time regulation clearing price.**

Example: The DAM

Consider a unit with a UOL of 100 MW and a min gen of 20 MW and a response rate of 5 MW/min. A bid for HB xx is submitted in the DAM as follows:

- Energy: 100 MW @ \$50/MW
- Regulation: 25 MW @ \$5/MW

The DAM clears as follows:

- LBMP for energy: \$55
- Clearing price for regulation: $LOC + Availability = (\$55 - \$50) + \$5 = \10

The unit is accepted for 75 MW of energy and 25 MW of regulation for HB xx.

Example: Real Time, Scenario 1

The next day, the unit is scheduled for 100 MWs of energy and 0 MWs of regulation for the entire HB xx. The LBMP is \$100 and the clearing price for regulation is \$10. The unit performs as expected.

Settlement is as follows:

DAM:

- Energy: 75 MWs x \$55 = \$4,125
- Regulation: 25 MWs x \$10 = \$250

Real-time:

- Energy: 25 MWs x \$100 = \$2,500
- Regulation: -25 MWs x \$10 = (\$250)

Total settlement: \$6,625

Example – Real Time, Scenario 2

In this scenario, the unit fails to move from 75 MW. Settlement will be as follows:

DAM:

- Energy: 75 MWs x \$55 = \$4,125
- Regulation: 25 MWs x \$10 = \$250

Real-time:

- Energy: 25 MWs x \$100 = \$0
- Regulation: -25 MWs x \$10 = (\$250)

Total settlement: \$4,125

RTD will Adjust Regulation Schedules based on Unit Status

- **If the unit goes off-control, RTD will pass a zero regulation schedule**
- **If a unit is derated, RTD will adjust the regulation schedule as required**
- **If unit response rate changes, RTD will adjust regulation schedules accordingly**

Remove Explicit Reduction of DAM Availability Payment

- **Currently, a unit's DAM availability payment can be reduced based on the amount of time a unit is on-control**
- **Since RTD will pass a zero regulation schedule when a unit is off-control, it will buy out of its day-ahead commitment**
- **Therefore, the explicit reduction of the availability payment can be removed**