



Commitment Decision Making

Energy Market Uplift Senior
Task Force

August 20, 2013

Reliability Engineer
Studies 3-7 days

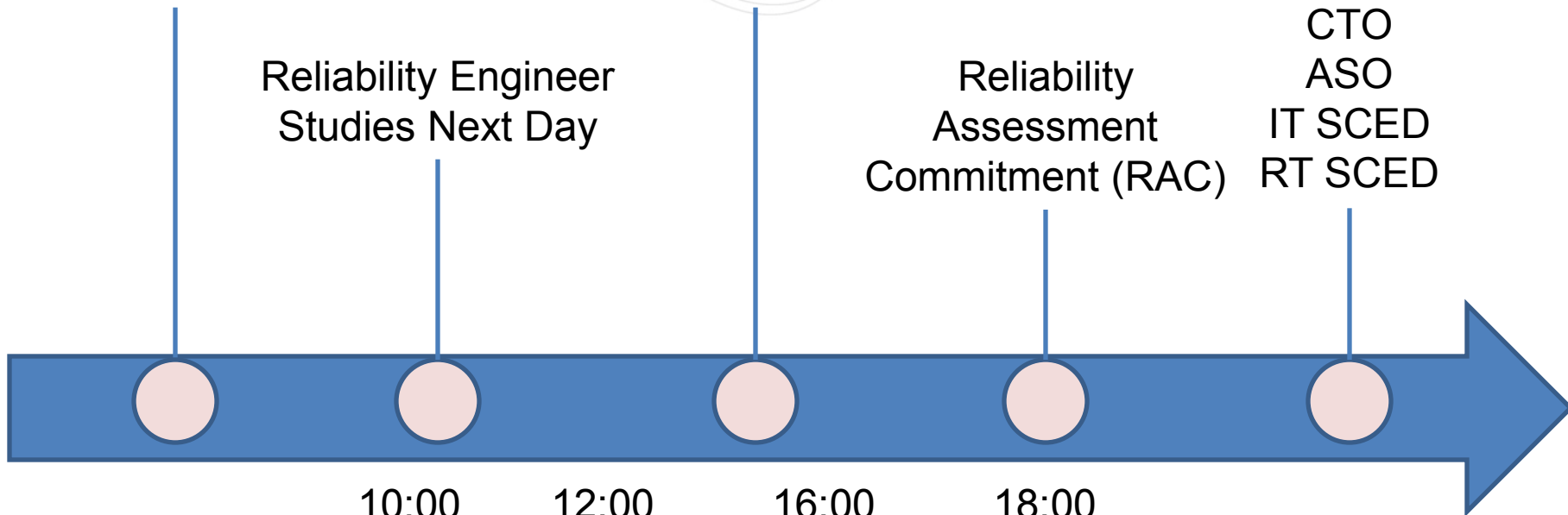
Reliability Engineer
Studies Next Day

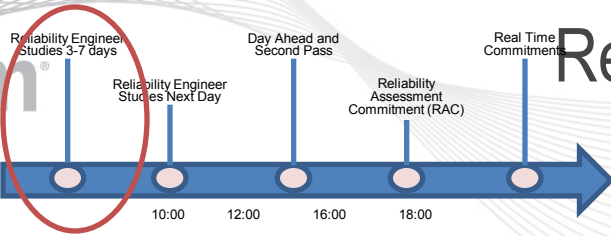
Day Ahead

Reliability
Assessment
Commitment (RAC)

Real Time
Commitments

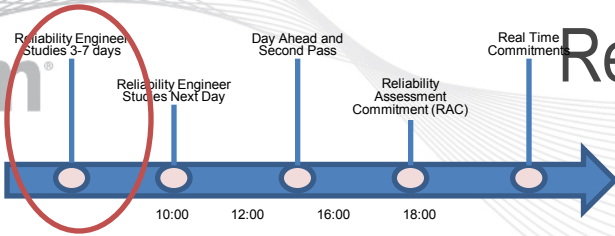
CTO
ASO
IT SCED
RT SCED





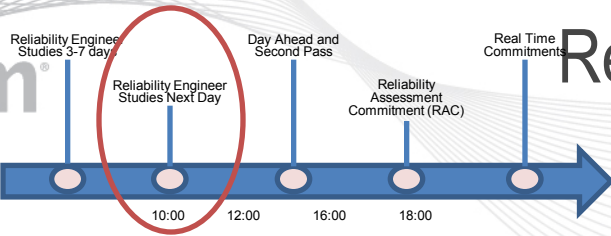
Reliability Engineer Studies 3-7 days

- Power flow studies (full contingency list) are preformed for scheduled transmission outages
 - Thermal constraints
 - Reactive constrains (real time or post contingency voltage)
 - Units are identified based on distribution factors (dfax) or for voltage - proximity to the problem, thermal surrogate



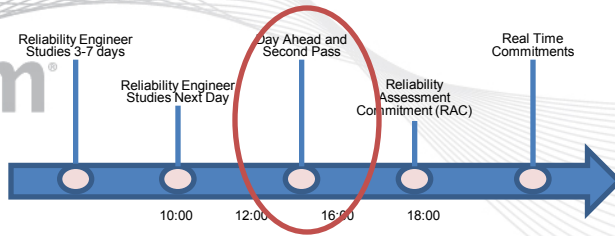
Reliability Engineer Studies 3-7 days

- Other reasons
 - Black Start / Automatic Load Rejection
 - Extreme weather Hot, Cold, Hurricane, etc.
 - Geography
- Long Lead units are called
- Unit with >32 hours time to start cannot be committed in the DA

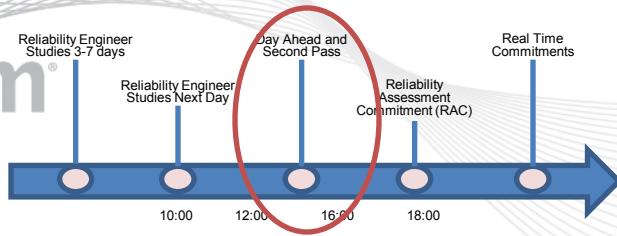


Reliability Engineer Studies next day

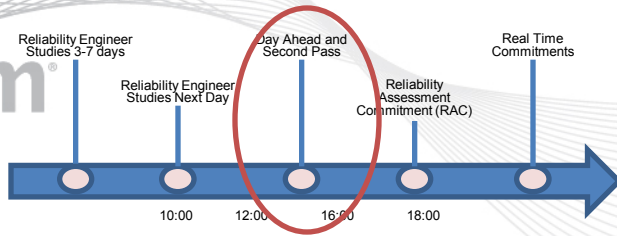
- Power flow studies (EMS) same as 3-7 day
- Before the Day Ahead is run next day commitments are given to the DA operators



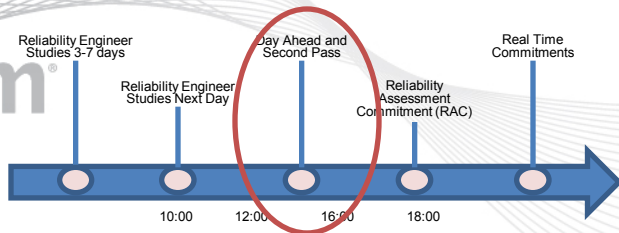
- Objective - minimize total production cost
- Balances generation and bid in demand
- Generation = generators and increment bids
- Demand = fixed, price sensitive and decrement bids
- Up to Congestion transactions are also cleared



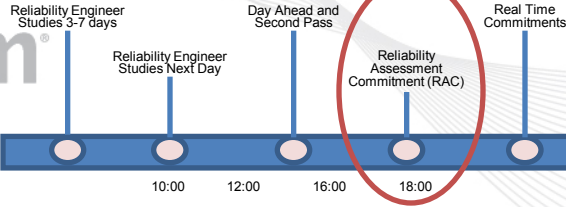
- RSC – Resource Scheduling and Commitment
 - Initial unit commit
 - Limited Contingency list
- SPD – Scheduling Pricing and Dispatch
 - Dispatches committed units and calculates LMPs



- SFT - Simultaneous Feasibility Test
 - Contingency Analysis
- SPD
 - Second SPD iteration uses results from SFT
- Probe –
 - Full contingency list
 - Fine tunes the commitment

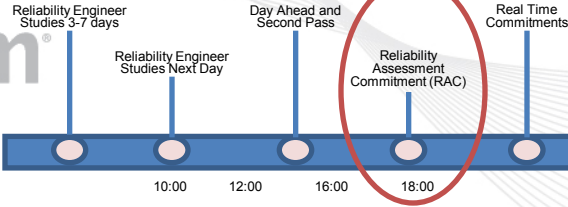


- Start with a Reactive and Blackstart unit from RE analysis, committed as must run but dispatched according to their offer curve
- DA is run with a limited to contingency set identified by RE studies, Reactive Interfaces, M2M flowgates and common constraints
- DA Scheduling Reserves are optimized



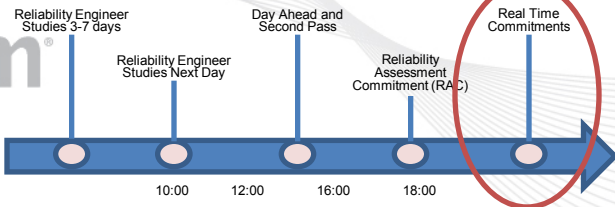
Reliability Assessment Commitment

- Load is based on PJM forecast
- Interchange is based transaction schedules at 18:00
- RAC minimizes cost to bring units on line
- Energy and Reserve co-optimization
- Focuses on Steam Commitments

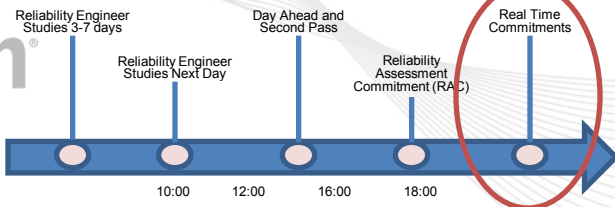


Reliability Assessment Commitment

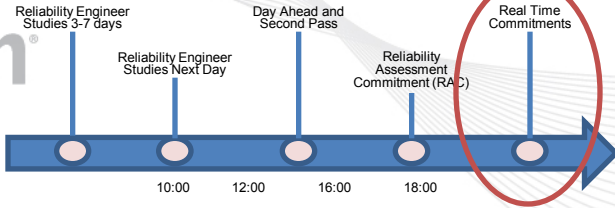
- Same constraint set as Day Ahead
- Same topology as Day Ahead



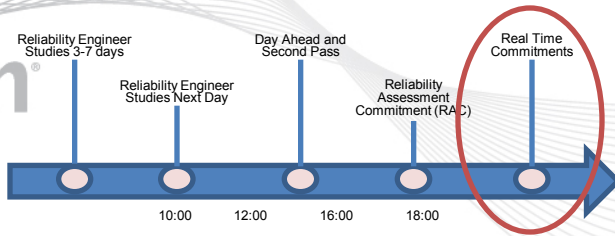
- Combustion Turbine Optimizer (CTO)
 - Typically run 03:00-07:00
 - Same inputs as RAC but updated closer to the peak
 - Objective, Minimize total production cost
 - Focus on CT commitment
 - Used to commit > 2 hour time to start and long minimum run time units



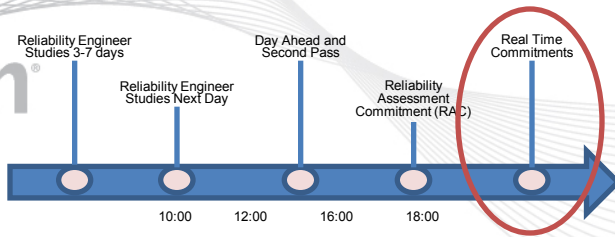
- Co-optimizes Energy and Reserves
 - 2 hour look ahead, hourly assignments
 - Regulation assignments
 - Steam or CTs
 - Synchronize Reserve assignments
 - Inflexible Resources (Condensers and DSR)
 - Double checking



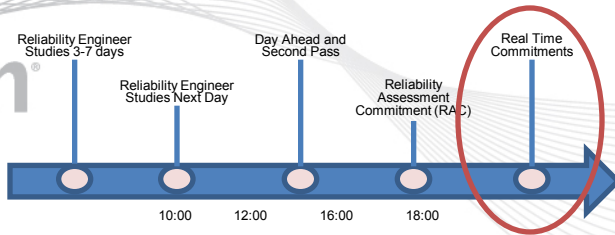
- Security Constrained Economic Dispatch
 - Enforce Security Constraints
 - Minimize total production cost
 - Energy and reserve co-optimization



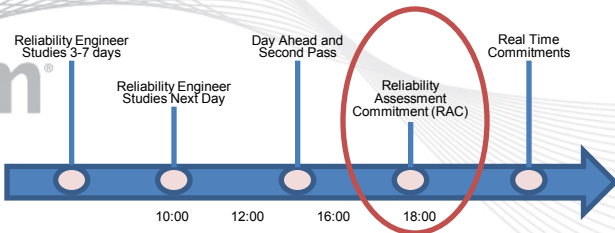
- Inputs – Current system conditions
 - Very Short Termed Load Forecast (VSTLF)
 - Topology
 - Generation
 - Load
 - Interchange
 - EMS Constraints, operator selected



- 2 hour look ahead
- Focus on CT commitment
 - Gives CT recommendations
 - Dispatchers have operational discretion
 - Enforces Reserve Requirements (Synchronized and Primary)



- 15 minutes look ahead
- Dispatches on line units
 - Sends unit base points or dispatch signal
 - Respects the reserve requirements (synchronized and primary)
 - Dispatches economic Demand Side Response



Day Ahead Vs. Real Time

- Differences between Day Ahead and Real Time
 - Load, bid in vs. forecast
 - Interchange, historical model vs. actual interchange
 - Financial Instrument DA only
 - Up to transactions
 - Inc & Dec
 - Creates flow not present in RT

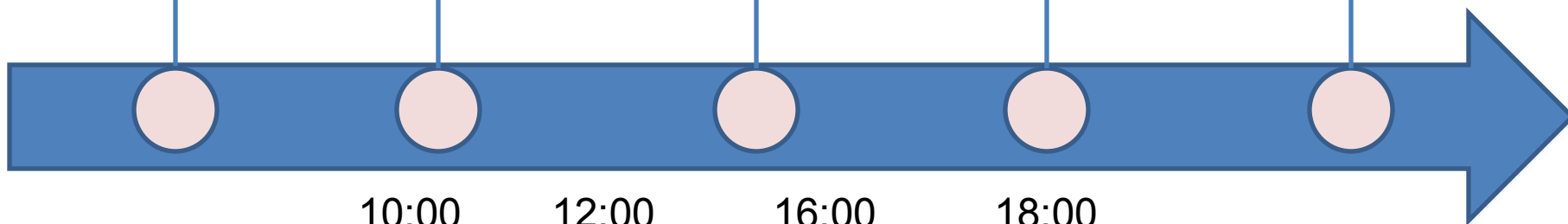
Reliability Engineer
Studies 3-7 days

Reliability Engineer
Studies Next Day

Day Ahead and
Second Pass

Reliability
Assessment
Commitment (RAC)

Real Time
Commitments



10:00

12:00

16:00

18:00