



Day Ahead Market Clearing Process & Unit Contingency Modeling

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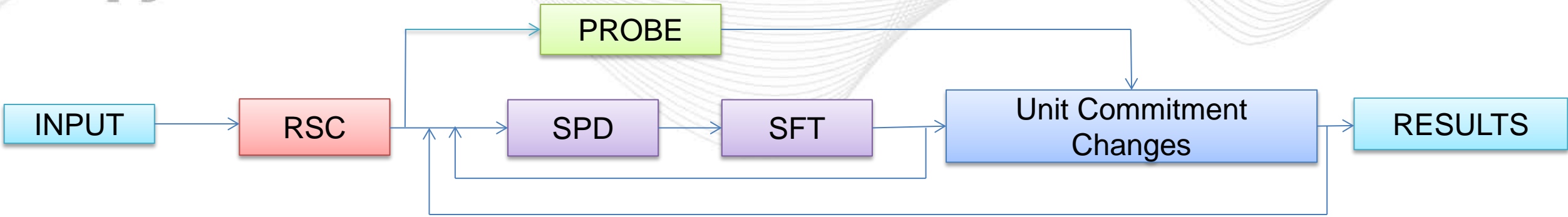
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MIC Special Session – Gas Contingency Costs

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- DA Operator includes the following information provided by Reliability Engineer into DA Case
 - Scheduled outages (from eDart system)
 - Reliability units required for next day*
 - Reactive interface limits
 - Expected constraints and switching solutions

*Units will be committed on cheapest available schedule.



The **Resource Scheduling and Commitment (RSC)** application is the first step in the DAM clearing process. This is a mixed linear program that provides unit commitment solutions by modeling major transfer constraints and includes various market inputs such as increment and decrement bids, price sensitive demand, economic demand response, import and export bids, and transactions. Up-to congestion transactions are not included in this application.

The **Scheduling Pricing and Dispatch (SPD)** application is the second step to solve the DAM and models all constraints, including up-to congestion transactions and provides the dispatch solution with pricing.
 The **Simultaneous Feasibility Test (SFT)** runs following SPD and solves for Base Case and Contingency Power Flow Analysis. Provides overloaded constraints to SPD.

PROBE runs concurrent to SPD and SFT and provides a recommendation to the DA Operator that modifications to the RSC Commitment may be necessary. PROBE models all constraints and includes the application of the TPS test and optimizes pumped storage resources. The PROBE application acts as a separate decision support tool that is not connected to the PJM network or databases.

Unit Commitment Changes accounts for PROBE recommendations, as well as real-time constraints, run-time adjustments, etc.

200 MW
EcoMax
\$30/MWh
Offer



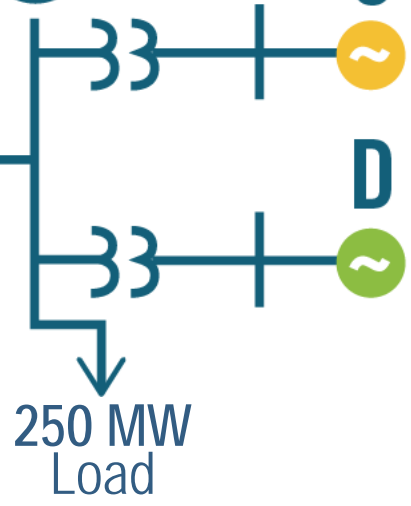
100 MW
EcoMax
\$20/MWh
Offer



1

Normal Limit = 110 MW
CTG Limit = 150 MW

2

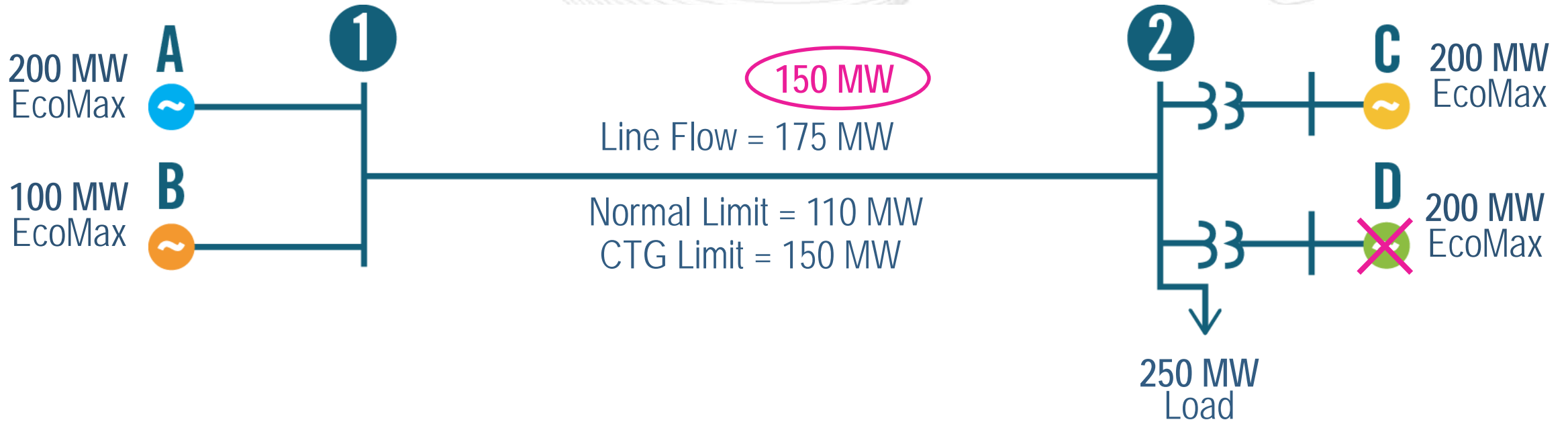


200 MW
EcoMax
\$40/MWh
Offer

200 MW
EcoMax
\$25/MWh
Offer

Without Contingency Analysis			
Gen A	Gen B	Gen C	Gen D
0 MW	100 MW	0 MW	150 MW

\$25/MWh			
LMP A	LMP B	LMP C	LMP D



Contingency Power Flow Analysis			
Gen A	Gen B	Gen C	Gen D
75 MW	100 MW	75 MW	0 MW

Gen D is out during ctg. Distribute 150 MW to online units according to its available capacity to achieve power balance

Unit Contingency Example – Solution Including Contingency

200 MW
EcoMax
\$30/MWh
Offer



100 MW
EcoMax
\$20/MWh
Offer



Normal Limit = 110 MW
CTG Limit = 150 MW



250 MW
Load

200 MW
EcoMax
\$40/MWh
Offer



200 MW
EcoMax
\$25/MWh
Offer



Optimized Solution with CTG			
Gen A	Gen B	Gen C	Gen D
0 MW	100 MW	25 MW	125 MW

\$25/MWh		\$40/MWh	
LMP A	LMP B	LMP D	LMP C