



Operations Approach to a Peak Day

Energy/Reserve Pricing &
Interchange Volatility
MIC Special Session
January 15th, 2014

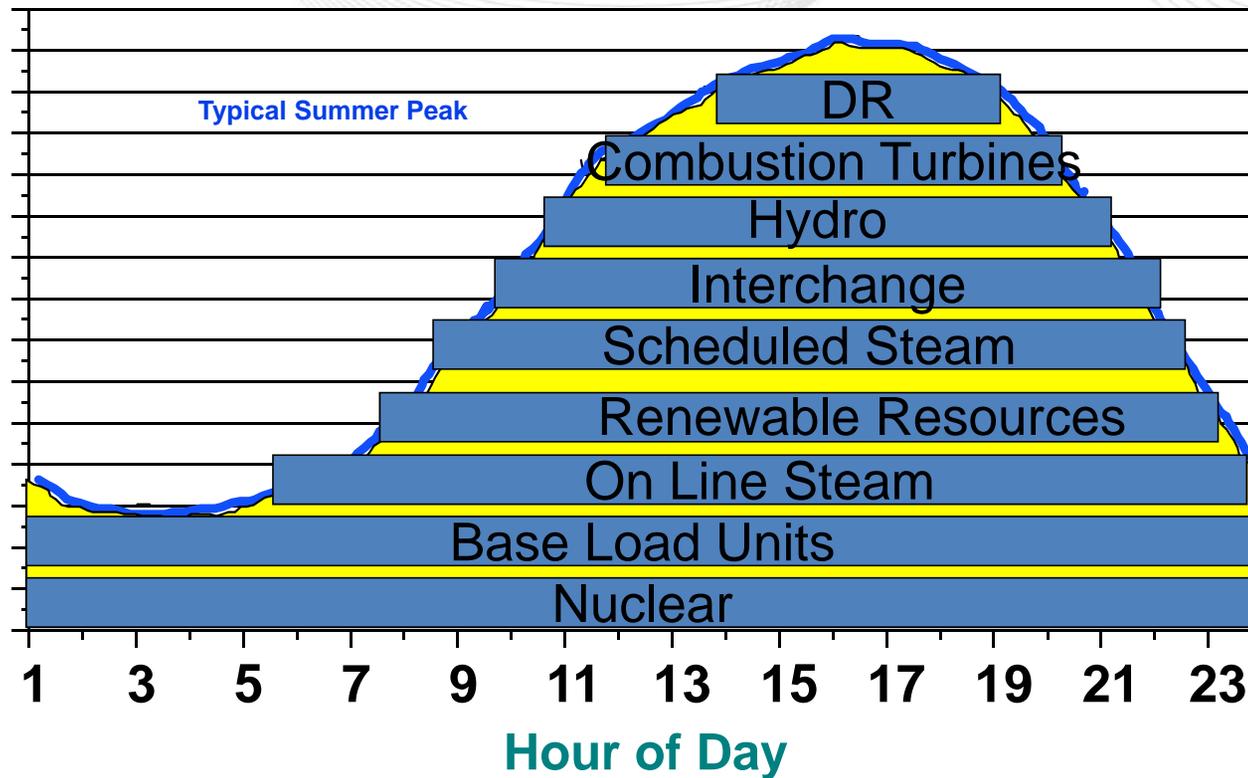
- Evaluate Load Projections
 - Weather Forecast
 - Neural Net
 - Similar Days
- Monitor Transmission and Generation outages
 - Reliability analysis (EMS Power Flow studies)
 - Cancel or reschedule those that affect reliability
- Evaluate Long Lead Generation
 - Day ahead commitment limited to ≤ 36 hours

- Reliability Evaluation is performed each day leading up to a peak day
 - 7, 3, 2, Next, Day look ahead
- Day Ahead Commitment 16:00
 - Bid in Load
 - Virtual Transactions (Incs and Decs)
 - Results passed to operations
- RAC (Reliability Assessment Commitment) 18:00
 - PJM Forecasted Load
 - No Financial instruments
 - Bid in transaction schedules

- Operating Day
 - Communications with neighbors
 - Reserves, availability of economic and emergency energy
 - Transmissions limitations, boarder issues
 - CTO (Combustion Turbine Optimizer)
 - Optimizes long lead CTs
 - Minimize Production Dollars
 - Outputs 24 hour plan
 - SCED (Security Constrained Economic Dispatch)
 - IT SCED 2 hour look ahead commits/de-commits CTs
 - RT SCED 15 minute look ahead dispatches online resources



- Operating Day continued
 - ASO
 - 2 hour look ahead
 - Regulation Assignments
 - Synchronized Reserve Assignments



Area	Ancillary Service Market Area	Day-ahead Scheduling (Operating)	Contingency (Primary)	Synchronized Reserve
RTO		Annual %	150% Largest Unit	Largest Unit
	Mid-Atlantic & Dominion	N/A	1700 MW	Largest Unit
SERC	Dominion	VACAR ARS%	VACAR ARS%	VACAR ARS%

- **The reserve requirements above are document in PJM Manual M-13 Section 2.2.**
 - These reserves are required for DCS compliance with NERC BAL-002-2 and RFC_Criteria_BAL-002-02 standards.
- **If Reserves are not met, PJM is obligated to enter into Emergency Procedures as outlined in M-13 Section 2.3 and as mandated by NERC standard EOP-002-2, which include the use of:**
 - Loading generation above their eco max (Max Emergency Action)
 - Demand Response
 - Voltage Reduction Action
 - Manual Load Dump

- Peak Load Pickup Plan
 - Peak @ 16:00
 - Example @ 13:00
 - Shows need for High Cost Generation and DR
- Why is Interchange Confidence so low?
 - Price Responsive
 - No market caps, only reliability caps
 - ATC, Ramp restrictions
- What happens when we get more interchange than forecasted?
 - Market is flooded with supply, prices drop

Load Pickup Plan		Confidence of Forecast
Load Peak + Reserve Req.	145,000	High
Load Now	120,000	
Generation Needed	25,000	
Hyro Remaining	3,500	High
CTs Off-line	12,000	Med-High
Off-line Stm Scheduled On	3,000	Med-High
Interchange Projected	3,000	Low
Total Available Resources	21,500	
Generation Shortfall	-3,500	
DSR Needed	3,500	



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- Questions