



ERPIV - Interchange Volatility

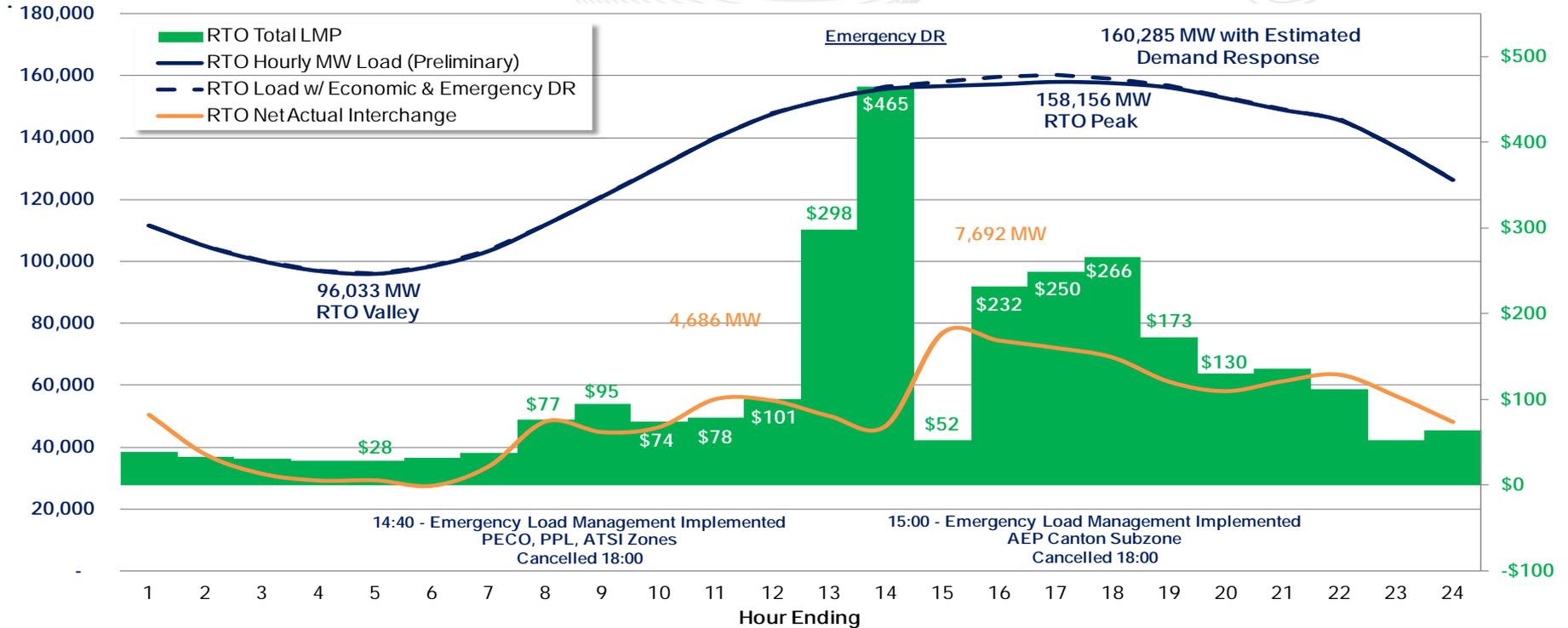
August 20, 2014



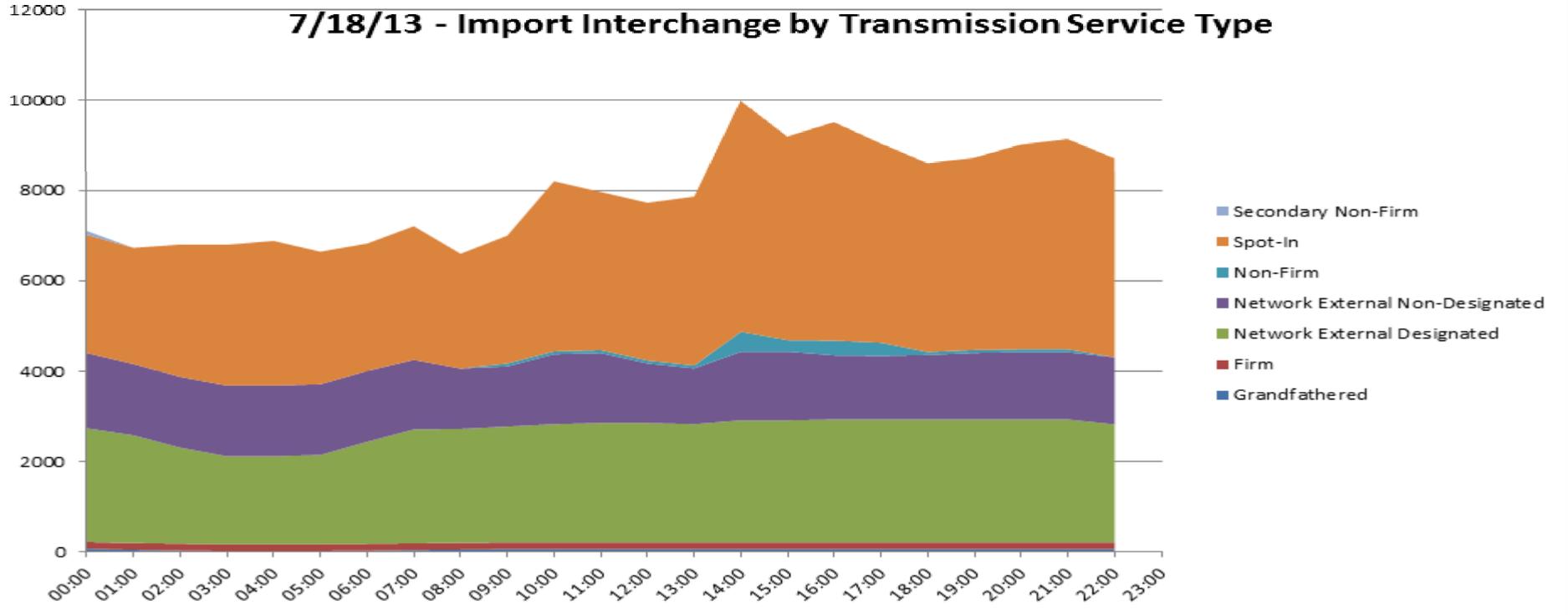
PJM typically sees uplift for the following reasons:

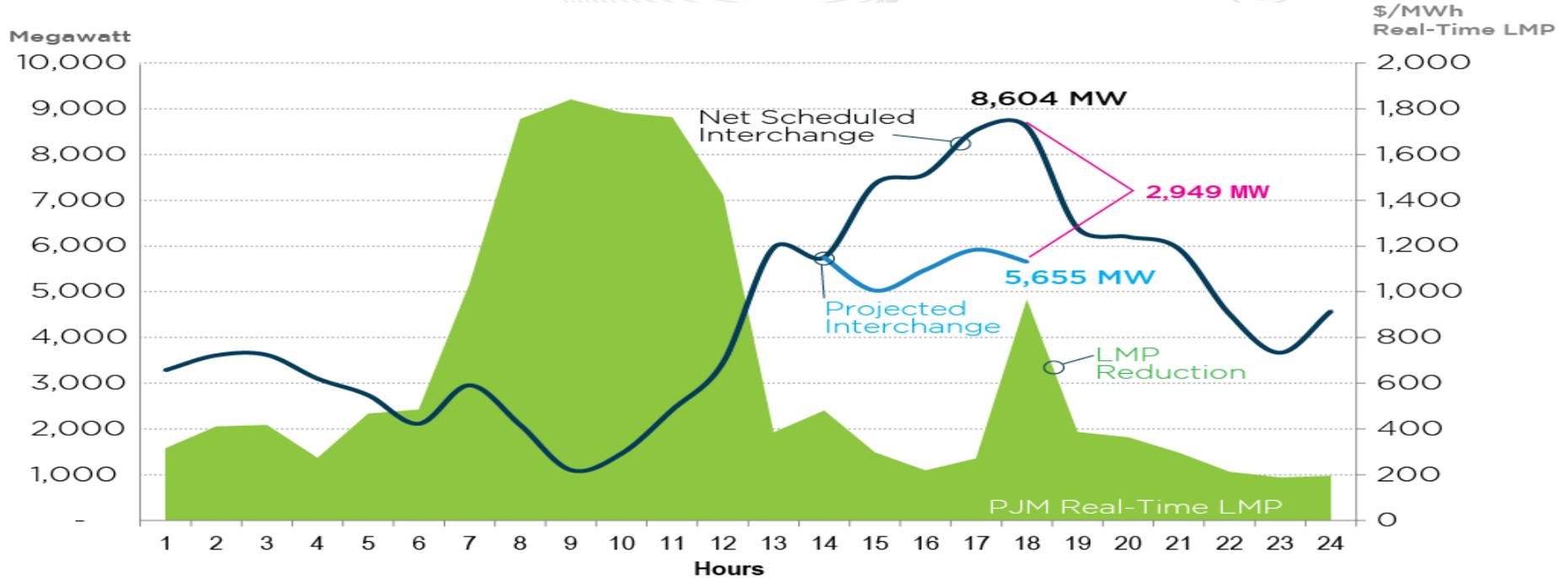
- Resources with large min output values committed for constraints that are not needed above min
- Resources with min run times in excess of the time the resource is actually needed
- Resources committed for the purpose of meeting system restoration requirements that are otherwise uneconomic
- Committing CTs in DA and not running them in RT when the RT LMP exceeds that DA LMP (CT LOC)
- Opportunity cost incurred for manual dispatch
- Commitment of resources in the DA Market based on economics that are subsequently not economic in RT due to differences in the market outcomes
- The deployment of emergency demand response
- Emergency purchases that are loaded and then become uneconomic during their min flow period
- Interchange during emergency conditions that is in excess of what was projected or planned for. This can result in low prices and high uplift.

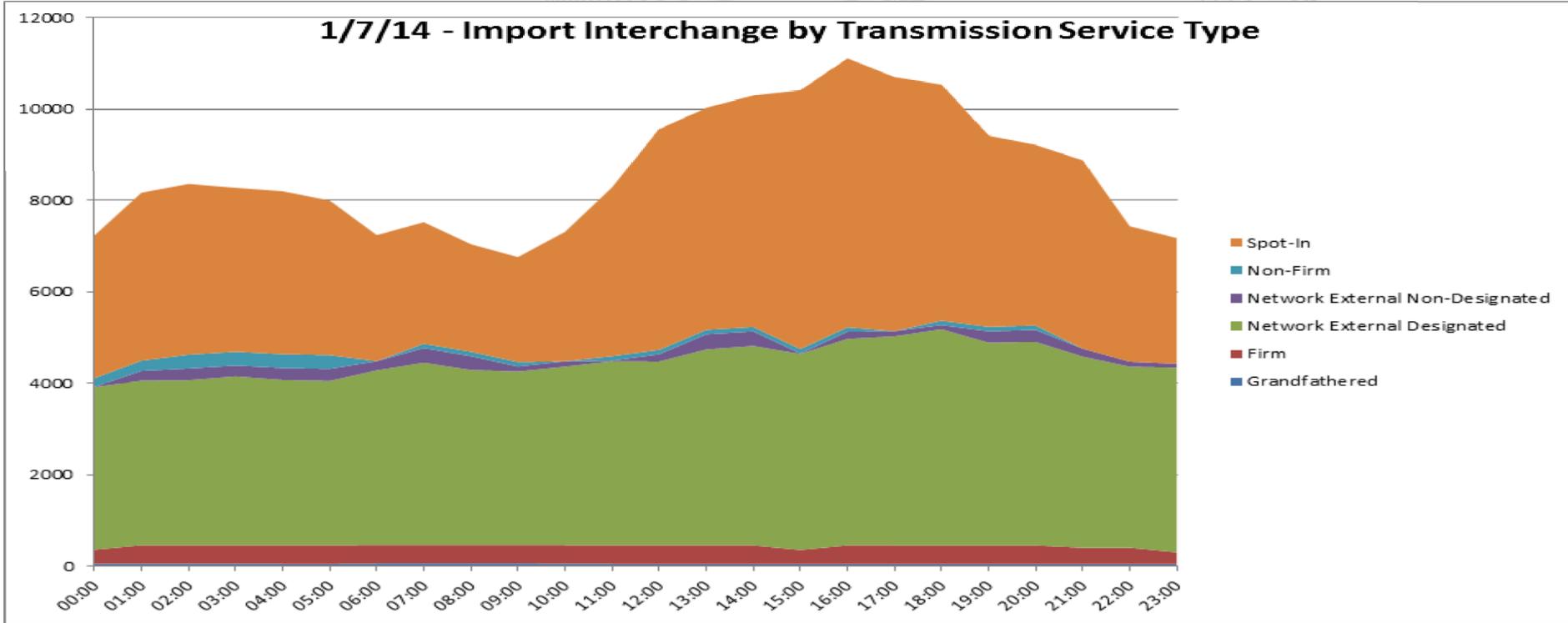
July 18, 2013: RTO Load, LMP and Interchange



7/18/13 - Import Interchange by Transmission Service Type







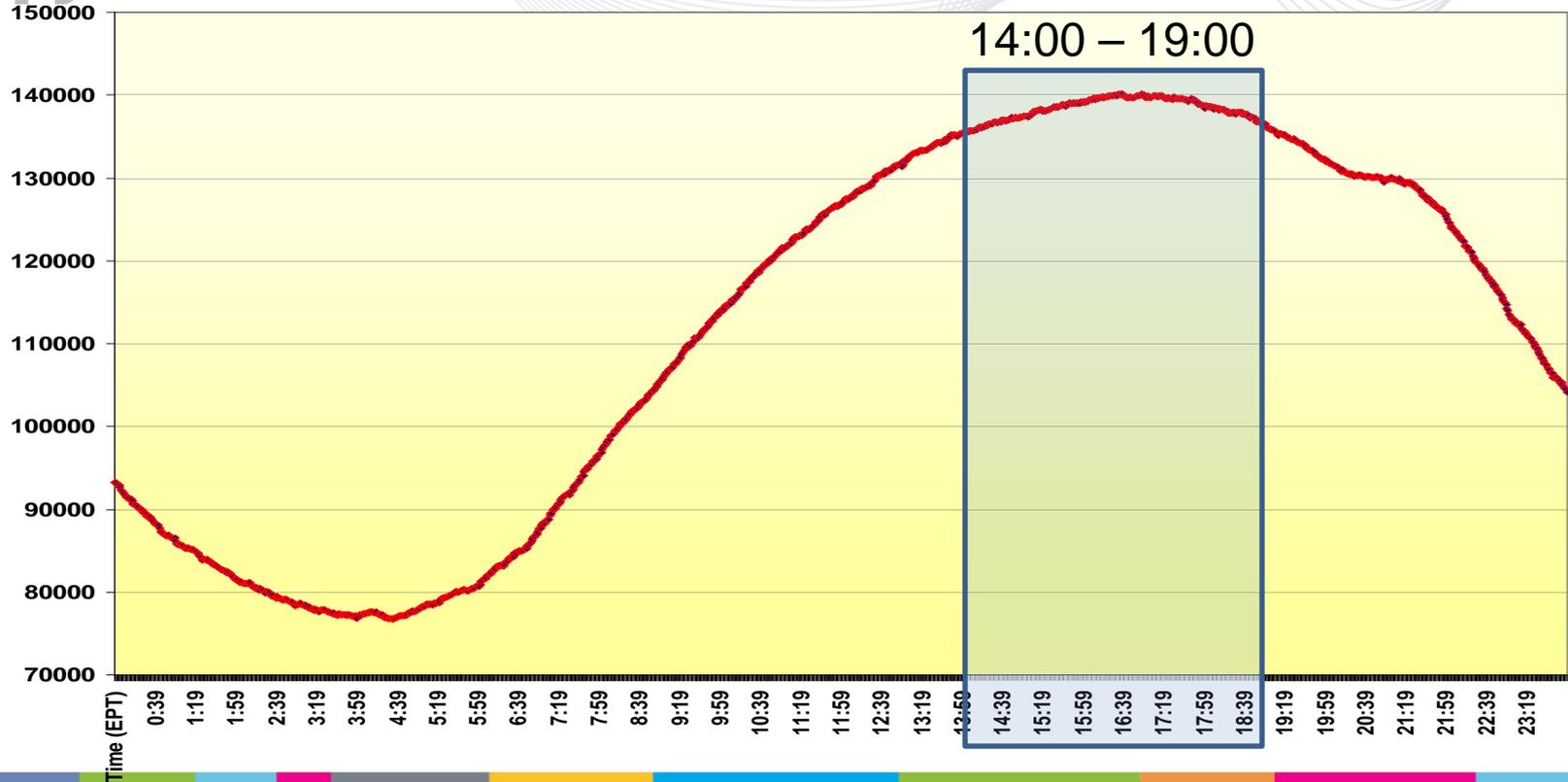
- Creates additional challenge to controlling ACE
- Creates strain on internal units
- May prompt use of limited number of starts per day (CTs)
- Lack of certainty on availability, magnitude and duration of interchange

- Interchange cap will limit spot imports and hourly non-firm point-to-point transactions once net interchange reaches the interchange cap
 - Schedules with firm or network designated transmission service will not be limited
- Cap will apply on an hourly basis to the forecasted peak hour(s) and surrounding hours
 - Can be adjusted intra-hour for reliability reasons
- Cap will apply on an RTO basis, rather than for each interface

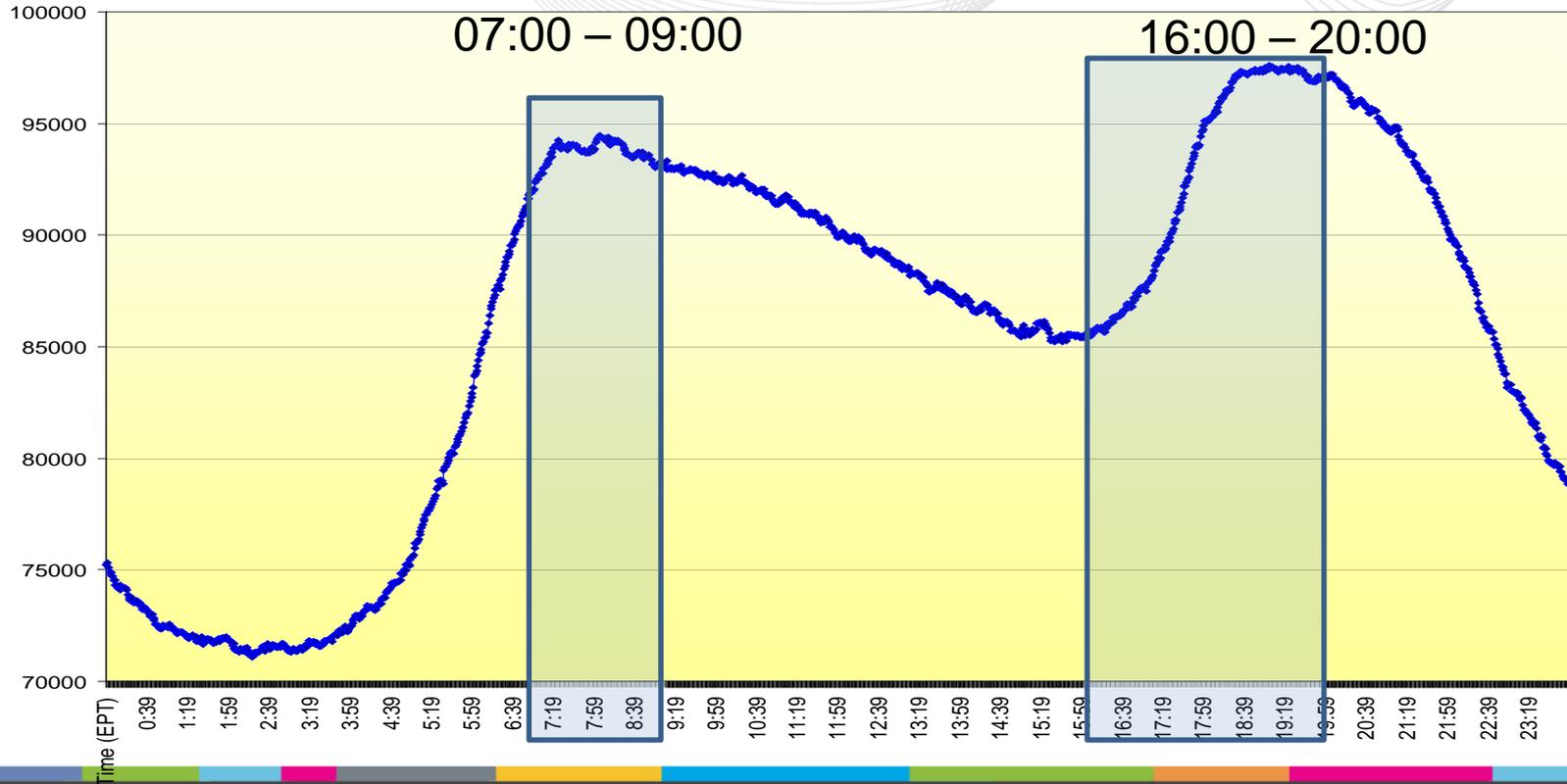


RTO Load (MW)

Summer Peak - Example Only



RTO Load (MW)



- Only applied while Emergency Procedures are effective
 - Hot Weather Alerts, Cold Weather Alerts, Max Emergency Gen Alerts/Actions, Weather / Environmental Emergency conditions, Sabotage / Terrorism Emergency conditions or more severe Emergency Procedures

AND

- Operators have made firm resource commitments and anticipated interchange schedules are sufficient to meet projected load

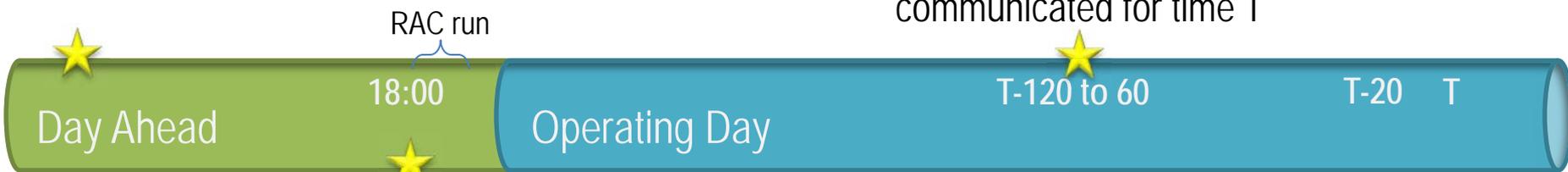
- The interchange cap is calculated based on:
 - Operator expectation of interchange for time T at the time the cap is calculated
 - Schedules entered in ExSchedule
 - Information from neighboring RTOs
 - Historical experience
 - System topology
 - Firm resource commitments that have been made to meet forecasted load
 - Additional margin
 - Set at half of largest unit on the system (700 MW)
 - Allows T-20 interchange to contribute to economically backfilling the loss of a unit or deviation between actual load and forecasted load
- The cap will be bounded by the max sustainable interchange from reliability studies

- Timing
 - Notification of the potential for an interchange cap will be issued day ahead
 - Notification of cap implementation will be made as soon as the cap is determined
 - Includes MW amount and hour(s) to which cap applies
 - Will typically occur one to two hours in advance of the operating hour
- Communication Method
 - ExSchedule banner notification plus 'special notification' message in Emergency Procedures
 - Emergency Procedure message will create an alert in eData
- Same notification methods will be used if the cap is lifted

- Change to submission deadline for RT with Price (dispatchable) transactions
 - Currently submission timelines are set at 12:00 day ahead
 - Propose moving to 18:00 (close of re-bid period)
- Aims to provide additional incentive to use RT with Price transactions to give operators greater visibility into available interchange

Interchange Cap Alert issued

Cap implemented and communicated for time T



New submission deadline for RT with Price transactions

Peak resource commitments being made based upon expectation of interchange and projected load

Spot import and hourly non-firm PTP schedules accepted up to net interchange cap value

Interchange Cap Calculation Example

Calculation Time: 14:45	16:00	17:00
Projected Load at T	150,000 MW	155,000 MW
Current Load	<u>135,000 MW</u>	<u>135,000 MW</u>
Load pick up remaining	15,000 MW	20,000 MW
Additional available capability from online generation	7,000 MW	7,000 MW
Expected Interchange	<u>5,000 MW</u>	<u>6,000 MW</u>
Additional Supply Needed	3,000 MW	7,000 MW
CTs committed	3,000 MW	7,000 MW
Interchange Cap	5,700 MW	6,700 MW