



# Energy/Reserve Pricing & Interchange Volatility Overview

Market Implementation Committee Special Session  
January 15, 2014

- Problem statement items
  - Market price formation
  - Interchange volatility
- Initial discussion of issue at November 6 MIC
  - Desire for more information/education
- Approved Problem Statement/Issue Charge at the November 21, 2013 MRC

- Shortage Pricing implementation in 2012 largely intended to address this
  - Incorporated emergency procedures and demand response into market pricing
  - Joint optimization of energy and reserves
- Laid the groundwork more closely tying operations with market outcomes
- 2013 Summer results show room for improvement



## Items Shortage Pricing Did Not Capture That We Saw This Summer

- **Significantly inaccurate data**
  - Being addressed at the OC
- **Uncertainty**
  - Resource data and performance
  - Load forecast
  - Interchange
  - Impact on DR dispatch – being addressed at CSTF
- **Interchange volatility**

- **Reliability is the primary goal.**
  - Uncertainty in the control room will likely result in a conservative action being taken.
- Long is always better than short.
- Does not mean the operators do not focus on economics and market outcomes.

- These two do not interact well under today's rules
  - Conservative operator actions lead to lower prices
- Goal is to find a way to incorporate this dynamic into market prices
- PJM believes adjusting the reserve requirement to account for this is a good option
- Open to other ideas
  - 30-minute reserve requirement brought up at the MIC



## Example 1: Projected Peak Conditions

Data Point	MW
Load Forecast	150,000
Generation Capability	149,000
Projected Interchange	3000 (import)
<b>Anticipated Available Reserves**</b>	<b>2000</b>

*\*\* Assume a 1,000 MW reserve requirement*

Should DR be called in this case? *Probably not.*



## Example 1A: Projected Peak Conditions

Data Point	MW
Load Forecast	150,000
<u>Generation Capability</u>	<del>149,000</del> → <u>147,500 ??</u>
Projected Interchange	3000 (import)
<b>Anticipated Available Reserves**</b>	<del>2000</del> → <b>500 ??</b>

\*\* Assume a 1,000 MW reserve requirement

***What if you also knew there were 1,500 MW of generation with tube leaks at risk of tripping?***

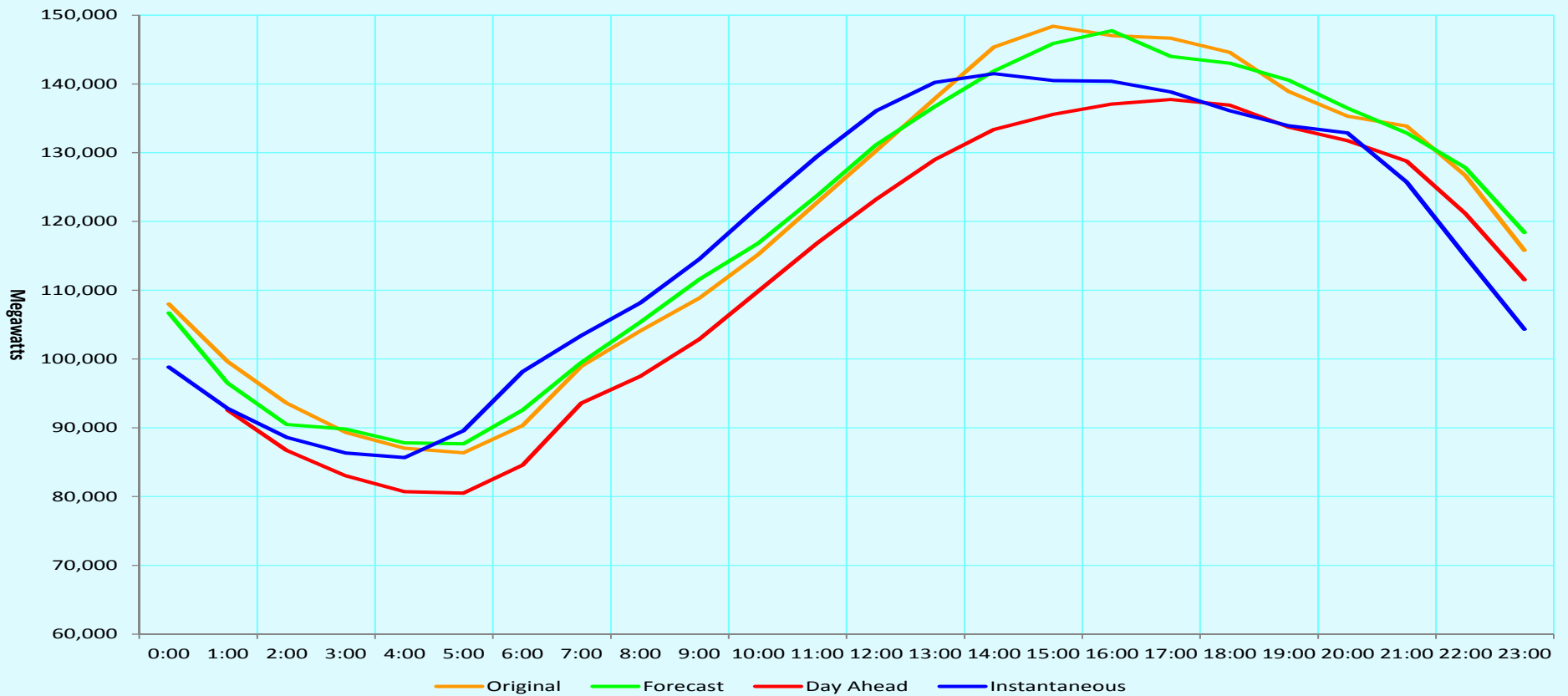


- There is no question that DR should be called in this case
  - How much...500 MW? 1,000 MW? 1,500 MW?
- The optimal answer - the one that yields the expected market outcome, depends on how much is called and the generation tripping
- Generation is not the only unknown and potentially not the biggest



# September 11, 2013 Loads

## 9/11/2013 PJM RTO Total



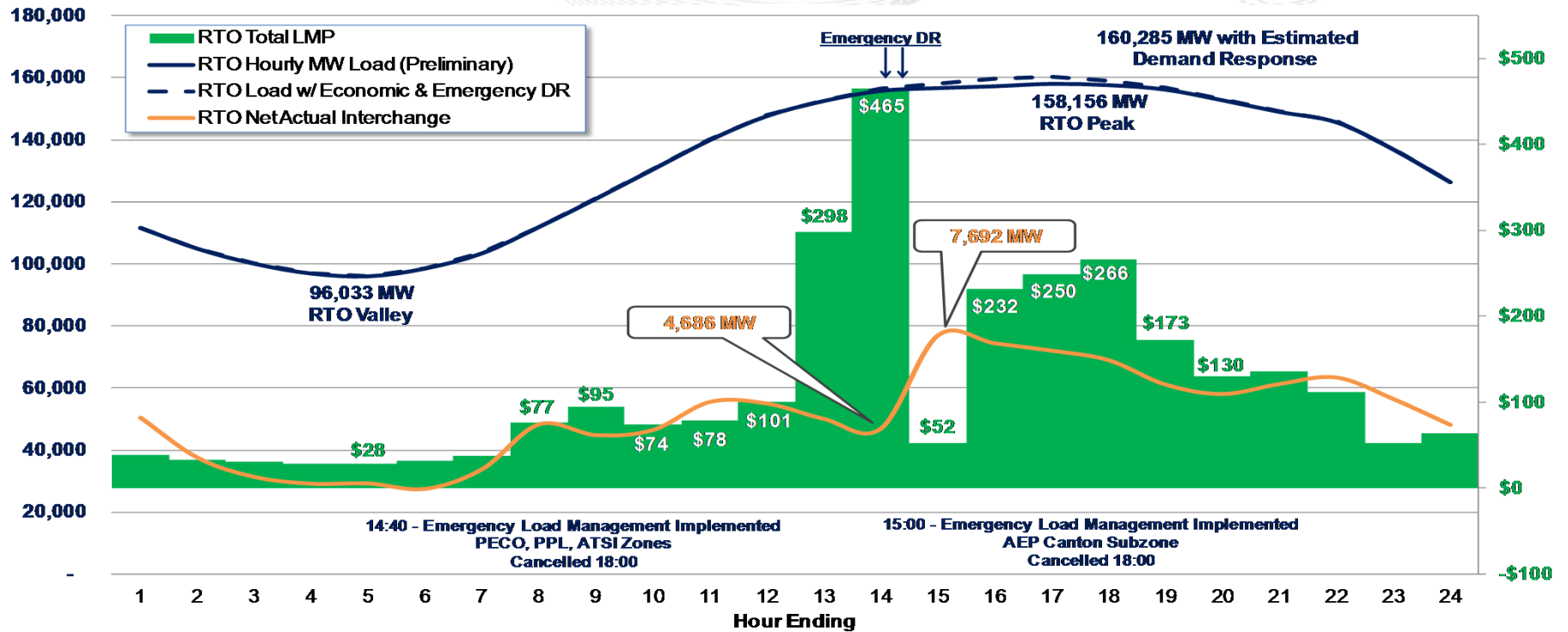
1. Load trending over-forecast on current day
  - **149,000 proj. vs. 153,000 trending → 4,000 MW**
2. Day prior reserve estimates showed excess that did not exist
  - **~3500 MW estimate on 9/10/13 was ~250 MW when activated**
  - **Similar estimates on 9/11/13 → 3500 MW**
3. Additional units at risk of tripping or with potential fuel limitations

- DR called based on
  - An expectation of a 153,000 MW load
    - Adding back the ~6,000 MW of DR yields an estimated 147,500 MW peak load
  - Uncertainty in reserve data
- This “creates” an additional 5,500 MW of reserves from a market pricing and dispatch perspective
- Without accounting for these additional reserves, prices will drop
  - LMP is set by the marginal resource
  - DR is not “forced” to set price when dispatched

- 5,500 MW extra reserves assumes all other things are constant. *They are not.*
- Interchange can swing with 20 minutes notice
- Even if every MW of generation, load and reserves are “needed”, interchange can significantly impact pricing



# July 18, 2013: RTO Load, LMP and Interchange





- ***Even if operators make the “perfect” commitment of resources, interchange can impact pricing and system stability***
- Problem statement proposes discussion on this topic
  - Price-based forecasting
  - Dispatchable transactions – why are these not used?
  - Economic clearing like NYISO
- PJM does not have a proposed solution at this time



