

This document contains the education topics requested by EMUSTF participants. The strikeouts (on the high-level topic) indicate that the topic and all subtopics have been addressed. Topics that are highlighted in yellow are new topics recently added.

~~1. A narrative on BOR focusing on decision-making processes.~~

- a. How is real time dispatch decision made? And/or a “challenging period” like min-gen.
  - i. What decisions are made by applications (e.g. SCED, Day Ahead, RT) vs. people?
  - ii. Differences between RT and DA commitment
- b. What are other factors that could increase uplift charges (that are out of PJM’s control)? Example would be a substation that is out and causing high uplift. Cost causality.
- c. Why is congestion relief done outside of the LMP market mechanism considered for anything other than reliability?

~~2. Discuss how BOR is settled, focusing on topics such as segmented make-whole payments~~

- a. Different treatment for reasons run (thermal, voltage and stability)
- b. Segmented make-wholes (more or less helpful or hurtful).
- c. Scenarios that are based on two-settlement process, to help stakeholders deconstruct the numbers.

~~3. Talk through real world scenarios. Will include breaking down numbers to better understand the causes of high volatility~~

- a. Deconstruct what contributed to high numbers / high volatility.
  - i. Include how day ahead works vs. BOR.
- b. Look at what emergency payments are comprised of
- c. How much of the operating reserves and balancing operating reserves charges are for congestion relief?

**4. PJM is working on putting together these data requests and will present them at the September EMUSTF meeting.**

- a. Settlement information
- b. Rates (max and min)/statistical analysis on volatility, total quantities
- c. How many of deviations (from RT) are from virtual transactions vs. load and gen.
- d. Costs of OR over past five years, vs. congestion costs
- e. Total costs in \$/MWh for OR and lost opportunity costs
- f. 1999 to present net energy cost, lost cost, congestion cost and OR cost (side-by-side)

- g. BOR charges by transaction type (incs, decs, load and gen)
  - h. Look at the rules around deviations to see if there are less true deviations (Look at numerator and denominator). We need to understand the reasons behind the apparent trend to fewer deviations over time.
    - i. Pick a few days scattered across the last few years.
    - ii. What is normal vs. outliers?
  - i. Data on IBT Netting and PSEG/CONED Wheel (from SOM)
  - j. Longer Term Work
  - k. Develop a process map to show how uplift costs are allocated and how they interact (between products such as DA, RT)
5. **What is/isn't captured in LMP? LPC engine rules: (when can/can't units set LMP?)**
- a. Why do certain CTs receive payments in DA when not operating in RT? What makes CTs different in this respect
    - i. Post-mortem on events Adam described (CTs received LOC in DA, but not called on in RT). Include analysis on the impact to the OR.
6. **Topics that are not within the scope of the EMUSTF**
- a. Who is paying BOR by voting sector? - **It is not possible to provide this information.**
  - b. How is Day Ahead Scheduling Reserve was determined – **This is out of scope for this group (not related to market uplift)**
  - c. How much of the operating reserves and balancing operating reserves charges are actually due to having to maintain 7% operating reserves? How much of the operating reserves and balancing operating reserves charges are for anything other than maintaining the 7% operating reserve requirement? – **This is out of scope for this group (not related to market uplift)**
  - d. The current operation summary report according to PJM falsely represents the amount of operating reserves that are scheduled on a daily basis? If this report is currently wrong, can we get this fixed to see how much PJM is actually carrying in operating reserves on a daily basis? The report shows the amount operating reserves PJM is carrying which is often 3 to 8 times the required 7%. If the operating reserves that are being reported in this file are accurate, then why is PJM carrying so many MW's of operating reserves above and beyond the 7% required? – **This is out of scope for this group (not related to market uplift)**