



Addressing Uplift in the RTEP

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PJM Planning Committee
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- At their meeting in March, the Markets and Reliability Committee directed the Planning Committee to “develop rules to require that uplift formally be treated as an input to the Regional Transmission Expansion Plan.
- Uplift = Make Whole Payment = Operating Reserves
 - This is the quantity of money paid to supply resources in order to ensure they recover their cleared offer price.
 - A resource’s operating cost may not be fully covered by the market clearing price (LMP in this case) for a number of reasons
 - Uplift ensures that the resource is incentivized to follow PJM’s instructions by ensuring that when it does it at least recovers its cleared offer price

- Reviewed the assignment from the MRC
- Reviewed 14B language related to Operational Performance
 - Section 2.7 – Evaluation of Operational Performance Issues
 - Discussed adding language to specifically note that excessive uplift could also be an operational performance driver
 - What metrics should be used?
- Stakeholders requested examples of the type of uplift that would be addressed in the planning process

	2013 Charges (Millions)						2014 Charges (Millions)					
	Day-Ahead	Balancing	Reactive Services	Synchronous Condensing	Black Start	Total	Day-Ahead	Balancing	Reactive Services	Synchronous Condensing	Black Start Services	Total
Jan	\$11.1	\$79.3	\$23.6	\$0.0	\$8.5	\$122.4	\$35.8	\$565.7	\$3.8	\$0.1	\$4.0	\$609.4
Feb	\$5.1	\$67.1	\$17.6	\$0.0	\$7.0	\$96.9	\$9.5	\$56.1	\$1.0	\$0.0	\$0.9	\$67.5
Mar	\$6.7	\$17.4	\$14.4	\$0.0	\$6.8	\$45.2	\$5.7	\$59.5	\$2.7	\$0.0	\$2.6	\$70.5
Apr	\$5.7	\$23.4	\$13.7	\$0.0	\$9.2	\$52.1	\$4.2	\$9.7	\$5.3	\$0.0	\$2.8	\$22.0
May	\$12.5	\$22.5	\$17.2	\$0.0	\$8.7	\$60.9	\$6.4	\$21.0	\$5.3	\$0.0	\$1.8	\$34.5
Jun	\$10.1	\$17.9	\$22.1	\$0.0	\$8.0	\$58.0	\$5.3	\$15.9	\$4.2	\$0.0	\$2.1	\$27.4
Jul	\$8.3	\$43.5	\$19.6	\$0.4	\$5.9	\$77.7	\$6.7	\$11.5	\$2.9	\$0.0	\$4.4	\$25.5
Aug	\$4.2	\$14.7	\$27.8	\$0.0	\$7.6	\$54.2	\$5.8	\$9.9	\$1.0	\$0.0	\$4.1	\$20.8
Sep	\$12.0	\$31.1	\$27.5	\$0.0	\$7.4	\$78.1	\$8.0	\$12.5	\$1.3	\$0.0	\$3.9	\$25.6
Oct	\$2.5	\$12.8	\$41.7	\$0.0	\$6.7	\$63.7	\$9.5	\$9.8	\$0.8	\$0.0	\$2.6	\$22.8
Nov	\$2.8	\$17.7	\$42.7	\$0.0	\$6.7	\$69.9	\$5.6	\$10.1	\$0.5	\$0.0	\$1.4	\$17.6
Dec	\$5.3	\$36.2	\$43.5	\$0.0	\$4.4	\$89.3	\$9.0	\$9.1	\$0.6	\$0.0	\$2.3	\$21.1
Total	\$86.3	\$383.6	\$311.4	\$0.4	\$86.7	\$868.4	\$111.4	\$790.8	\$29.4	\$0.1	\$33.0	\$964.7
Share	9.9%	44.2%	35.9%	0.0%	10.0%	100.0%	11.5%	82.0%	3.1%	0.0%	3.4%	100.0%

- Make whole payments for generation needed to serve load or manage a constraint. Examples include:
 - Running generation to support a specific outage
 - Unit is scheduled economically but the unit's start up costs or no-load costs are not covered in LMP
 - Units with physical limitations
 - A unit that is needed for the day period but can't cycle on and off and as a result needs to run through the midnight period
 - Minimum run time for the unit extends beyond when the unit is needed
 - Lost Opportunity Cost (LOC): for example a unit needed to be dispatched down due to a specific issue

- Blackstart Uplift
 - Make whole payment for a noneconomic unit that is required to be on-line to satisfy a blackstart requirement
 - Relatively small percentage of overall uplift
- Condensing Uplift
 - Very small percentage of overall uplift
 - Units needed to condense for something other than reactive support

- Make whole payments for generation needed to be brought on-line to support system voltages. Examples include:
 - A unit called on to support area voltages
 - Could be both pre-contingency or post-contingency voltages
 - A unit that is running so that it can absorb vars on the system to help reduce voltages during light load periods

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- Our focus will be on uplift associated with Reactive Services

- Evaluation of Operational Performance issues in the RTEP is required under the Operating Agreement and is further defined in Section 2.7 of M14B
 - Typical areas of interest include TLRs, PCLLRW, 500/230 kV PRA and min-gen high voltages
 - Metrics used include 1000 hours or 100 instances of TLR level 3 or higher on an annual basis, and avoided risk for PRA
 - PCLLRWs are evaluated following peak season and compared with planned RTEP upgrades and need for additional upgrades is evaluated
- Recommend adding language to Section 2.7 of M14B to specifically address uplift

- Use dollars of uplift to flag potential issues for further evaluation
- Determine if uplift is a chronic issue or if it was due to an event (i.e. outage)
 - Comparison of the 2013 and 2014 reactive services dollars are considerably different
 - Were they outage related? Addressed by RTEP upgrades?
- If the uplift is considered to be a chronic issue and historic dollars related to a certain issue are significant, should we develop a B/C test?
 - Benefit Metric would be avoided uplift for a certain number of years
 - Expected cost of the upgrade
 - What type of payback period would be appropriate?

- The EMUSTF recommended add “high uplift” scenarios to studies done in the RTEP
- A significant amount of the historic uplift (excluding operations around the polar vortex) were driven by reactive issues
 - High voltages during light load (e.g. units called on to absorb vars)
 - Continue to develop light load voltage procedures and criteria
 - Low voltages during shoulder and peak (e.g. unit only called on to support voltage in the area)
 - Would need to address limitation of existing production cost tools and methodology

- Draft M14B changes
- Continue to develop light load procedures (i.e. generator reactive dispatches) that are consistent with conditions observed in real-time operation
- Investigate ways to address limitations with existing production cost simulations
- Stakeholders to provide PJM with feedback related to benefit metrics and B/C test