

## RMISTF Executive Summary – PJM/IMM Package

RMISTF – February 27, 2017

Through PJM signal and design analysis, in support of the Regulation Market Issues Senior Task Force (RMISTF), a new regulation signal design and regulation requirement will be implemented into PJM operations in January 2017. The regulation signal design introduces a Regulation D signal that is conditional neutral over a 30-minute period; the signal will try to respect the energy limitation of Regulation D resources, but, when required, the Regulation D signal will still dispatch resources outside of their anticipated energy capabilities. The regulation requirement will be updated from its current definition (700 MW on-peak and 525 MW off-peak) to 800 MW ramp and 525 MW non-ramp. This will allow for more regulation on the system when more variability in control is observed.

Following the signal and requirement implementation, the system and resource performance will be evaluated to determine a Marginal Rate of Technical Substitution (MRTS) curve definition. The MRTS curve definition will describe the trade-off between Regulation A and Regulation D MWs to provide regulation service.

In support of the regulation signal redesign, regulation requirement update and MRTS curve definition, PJM and IMM have developed a package of updates to the design components of the Regulation Market to ensure the redesign allows for efficient and proper market, settlements and operation structures. A summary of the key design components in the PJM/IMM package is as follows:

### **10. Effective MW calculation - MRTS Application: Area under the MRTS curve**

Calculate the effective MW as the area under the MRTS curve (vs.  $MRTS * MW * PS$ ) to capture the full benefit of the resource providing regulation and effectively meeting the regulation requirement.

### **16: Components of performance scoring and weighting: precision only calculation**

$$Performance\ Score_{10sec} = 1 - MIN_{t0-t10} \left( \frac{Response - Signal}{0.5 * ABSHourlyAvgSignal + 0.5 * AREG} \right)$$

$$Performance\ Score_{hourly} = Average (PerformanceScore_{10sec})$$

16A Accuracy Calculation: NA

16B: Delay Calculation: NA

16C: Precision Calculation: The lowest of the absolute error between the signal at t0 and the response at t0 and t10. The denominator in the precision calculation will be an average of the regulation award and the absolute average hourly signal

### **17: Minimum allowable participation threshold: Threshold to be raised from status quo 40% to 50%**

It is important to maintain a minimum allowable participation threshold to ensure we are not committing (Self-Scheduling) poor performing resources for regulation that are not helping system control or providing adequate regulation service. Given the new regulation signals, performance scoring and other regulation market changes, PJM/IMM propose to raise the minimum allowable participation threshold to 50%, and evaluate during quarterly reviews for any additional adjustments.

### **19. Application of a substitution factor: Replace Mileage Ratio from the Performance Credit with Marginal Rate of Technical Substitution. Add MRTS to the Capability Credit.**

The new settlements equation will be:  $Credit = CCP * MW * PS * MRTS + PCP * MW * PS * MRTS$

The new proposed settlements will ensure that the resources are settled on the effective MW they are providing to the regulation service. This change will provide consistency between the market clearing and settlements, and provide the correct financial signals to the market place.

**Transition Plan: Implement conditional neutrality and requirement Q1 2017. Transition MRTS over 24 month period.**

Implemented conditional neutrality signals and new regulation requirement on January 9<sup>th</sup> 2017.

Implement a 24 months transition period on MRTS: The 1st 12 months of the 24 month transition period will have a minimum (floor) MRTS value of 0.65. This means that the maximum amount of RegD MW (performance adjusted mw) that could clear in this period would be at the point where the MRTS value = 0.65. The last 12 months of the 24 month transition period would have a minimum (floor) MRTS value of 0.50. This means that the maximum amount of RegD MW (performance adjusted mw) that could clear in this period would be at the point where the MRTS value = 0.50. At the end of the 24 months transition period, the minimum MRTS (floor) can go to 0.

**11. Procurement floor: Floor at 0 for all hours (following transition)**

**13. Schedule used for LOC: Use the schedule the resource is committed on**

**14. Qualification testing: Up-rate testing once per month. Up-rate testing is categorized as two attempts at an updated capability (one failed test and one re-test) per month**

**18A. Change in cleared commitment- performance score: Self de-selection results in zero score for remainder of hour. PJM dispatcher de-selection does not impact performance.**

**21. Calculation of mileage: Status Quo**