



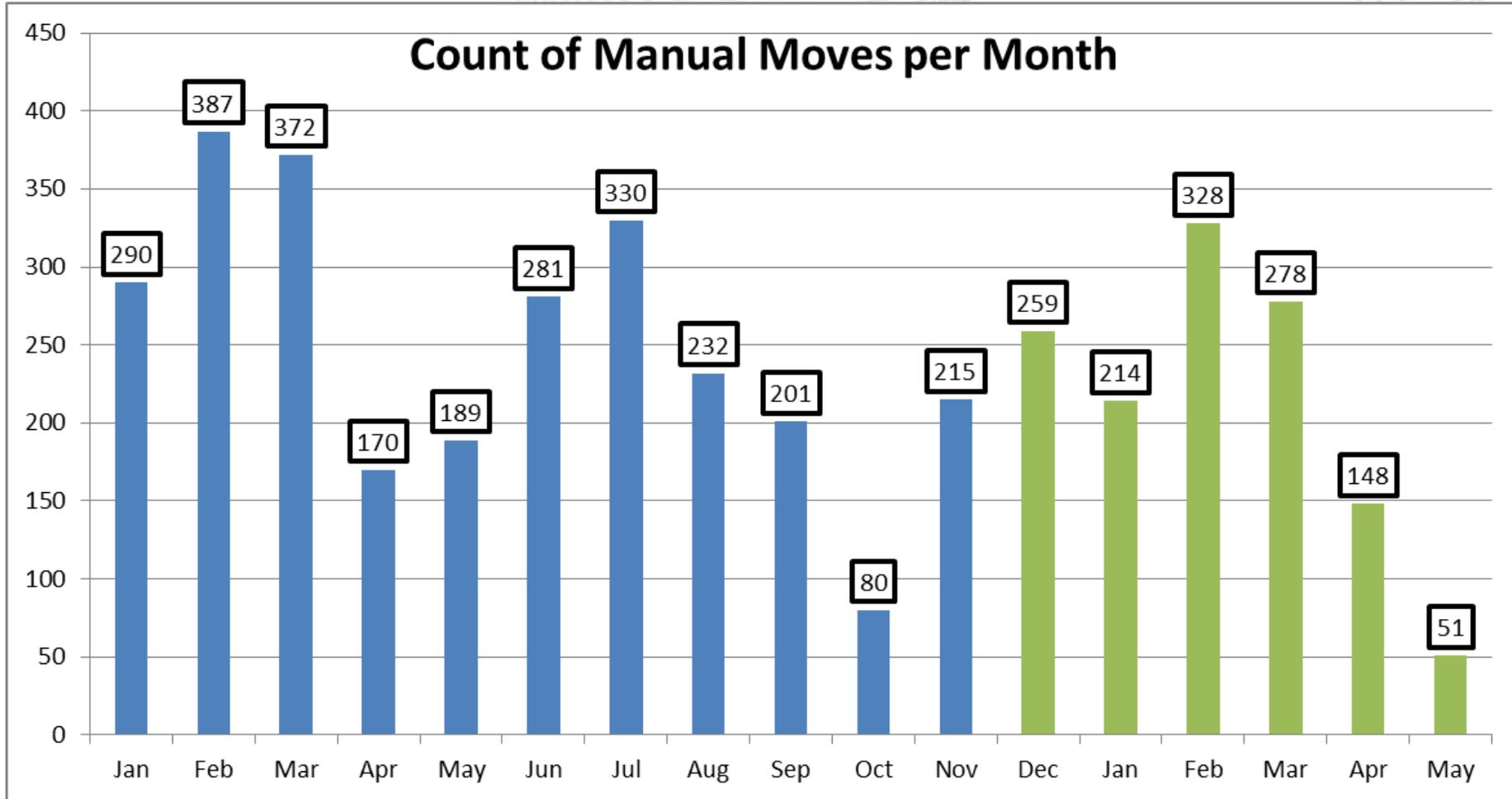
Regulation Performance Impact Updates

Regulation Market Issues Senior Task Force

June 22, 2016

Danielle Croop, senior engineer –
Performance Compliance

- RPI changes were implemented into PJM software on 12/14/2015 00:00:00
 - Tie-breaker logic changes minimize the BF curve changes
- Observed changes to date:
 - Non-excursion hours (BF40) do not provide much change from previous operations; Excursion hours (BF26.2) are in the right direction
 - Reg D offer MW increased after changes; new resources qualifying late 2015
 - See some improvement on manual moves since RPI in comparison to last year, no large changes to manual action on regulation signals
 - Market Clearing Prices have been lower than average since RPI; unable to relate this to RPI with mild system conditions and LMPs over winter period



* May data through May 23, 2016



Reg D Clearing Since RPI – Performance Score- UPDATE

| Average 'Marginal' RegD Performance Score | | | | | |
|---|---------|----------|-----------|---------------|-----------------------|
| | On Peak | Off Peak | Excursion | Non-Excursion | Non-Excursion On Peak |
| Feb | 0.79 | 0.80 | 0.81 | 0.79 | 0.79 |
| Mar | 0.83 | 0.91 | 0.93 | 0.82 | 0.78 |
| Apr | 0.82 | 0.90 | 0.94 | 0.80 | 0.76 |
| May | 0.81 | 0.90 | 0.93 | 0.79 | 0.75 |
| Jun | 0.86 | 0.92 | 0.94 | 0.85 | 0.83 |

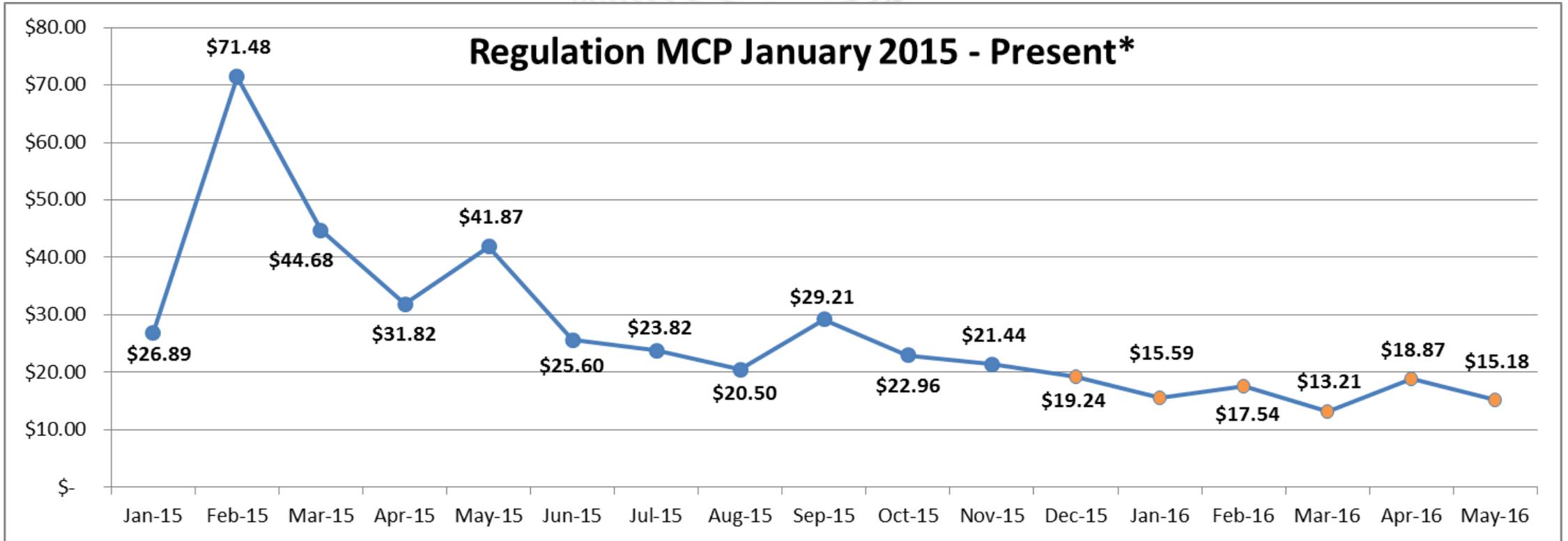
| Maximum 'Marginal' RegD Performance Score | | | | | |
|---|---------|----------|-----------|---------------|-----------------------|
| | On Peak | Off Peak | Excursion | Non-Excursion | Non-Excursion On Peak |
| Feb | 0.95 | 0.92 | 0.95 | 0.92 | 0.86 |
| Mar | 0.95 | 0.94 | 0.95 | 0.94 | 0.87 |
| Apr | 0.95 | 0.94 | 0.95 | 0.94 | 0.88 |
| May | 0.95 | 0.93 | 0.95 | 0.93 | 0.87 |
| Jun | 0.95 | 0.94 | 0.95 | 0.94 | 0.90 |

* May data through Jun 17, 2016



Regulation Market Composition- UPDATE

| MW | Steam | Hydro | CT | Energy Storage | DSR | Total |
|------------------------|---------|-------|---------|----------------|------|---------|
| Regulation A Qualified | 3,724.5 | 1,013 | 1,236.4 | 0 | 4.2 | 5,978.1 |
| Avg. Performance Score | 74% | 82% | 85% | NA | 85% | |
| Regulation D Qualified | 0 | 420 | 75.4 | 265.1 | 18.6 | 779.1 |
| Avg. Performance Score | NA | 77% | 90% | 94% | 83% | |
| Requirement On-Peak | | | | | | 700 |
| Requirement Off-Peak | | | | | | 525 |



* May data through May 23, 2016