Uplift and Phase 1

Adam Keech
EMUSTF
11/26/13
Table 4-4 Monthly operating reserve charges: 2012 and 2013

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th></th>
<th></th>
<th></th>
<th>2013</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Day-Ahead</td>
<td>Balancing</td>
<td>Reactive</td>
<td>Synchronous</td>
<td>Condensing</td>
<td>Black Start</td>
<td>Total</td>
<td>Day-Ahead</td>
<td>Balancing</td>
</tr>
<tr>
<td></td>
<td>$8,311,574</td>
<td>$27,341,331</td>
<td>$2,934,337</td>
<td>$27,037</td>
<td>$0</td>
<td>$38,614,279</td>
<td>$11,161,579</td>
<td>$79,219,217</td>
<td>$23,604,234</td>
</tr>
<tr>
<td>Jan</td>
<td>$5,858,308</td>
<td>$24,877,526</td>
<td>$13,108,017</td>
<td>$18,592</td>
<td>$0</td>
<td>$43,862,444</td>
<td>$5,126,444</td>
<td>$66,886,126</td>
<td>$17,624,984</td>
</tr>
<tr>
<td>Feb</td>
<td>$3,852,873</td>
<td>$29,758,387</td>
<td>$6,731,994</td>
<td>$1,648</td>
<td>$0</td>
<td>$40,344,903</td>
<td>$6,900,518</td>
<td>$17,493,458</td>
<td>$14,350,138</td>
</tr>
<tr>
<td>Mar</td>
<td>$2,967,302</td>
<td>$34,172,651</td>
<td>$4,521,280</td>
<td>$0</td>
<td>$0</td>
<td>$41,661,233</td>
<td>$5,712,618</td>
<td>$23,089,668</td>
<td>$13,570,581</td>
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<tr>
<td>Apr</td>
<td>$7,956,965</td>
<td>$43,761,595</td>
<td>$5,392,428</td>
<td>$0</td>
<td>$0</td>
<td>$57,110,987</td>
<td>$10,437,734</td>
<td>$22,560,252</td>
<td>$17,214,142</td>
</tr>
<tr>
<td>May</td>
<td>$6,973,548</td>
<td>$46,011,835</td>
<td>$5,133,099</td>
<td>$0</td>
<td>$0</td>
<td>$58,118,391</td>
<td>$9,350,026</td>
<td>$17,900,744</td>
<td>$22,055,239</td>
</tr>
<tr>
<td>Jun</td>
<td>$11,773,179</td>
<td>$66,931,225</td>
<td>$2,960,922</td>
<td>$0</td>
<td>$0</td>
<td>$81,665,326</td>
<td>$8,309,568</td>
<td>$44,202,434</td>
<td>$20,305,968</td>
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<tr>
<td>Jul</td>
<td>$8,692,702</td>
<td>$47,785,303</td>
<td>$4,112,186</td>
<td>$0</td>
<td>$0</td>
<td>$60,591,911</td>
<td>$4,159,471</td>
<td>$14,124,338</td>
<td>$30,738,131</td>
</tr>
<tr>
<td>Aug</td>
<td>$28,877,736</td>
<td>$32,849,356</td>
<td>$4,458,891</td>
<td>$24,366</td>
<td>$0</td>
<td>$66,210,349</td>
<td>$12,452,502</td>
<td>$30,079,327</td>
<td>$34,875,468</td>
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<tr>
<td>Sep</td>
<td>$23,235,166</td>
<td>$26,884,798</td>
<td>$1,253,642</td>
<td>$38,762</td>
<td>$0</td>
<td>$51,412,367</td>
<td>$18,077,440</td>
<td>$24,488,338</td>
<td>$120,820</td>
</tr>
<tr>
<td>Oct</td>
<td>$7,888,340</td>
<td>$27,902,608</td>
<td>$25,282,650</td>
<td>$37,845</td>
<td>$0</td>
<td>$83,846,561</td>
<td>$69,476,094</td>
<td>$65,290,457</td>
<td>$10,073,457</td>
</tr>
<tr>
<td>Dec</td>
<td>$85,264,187</td>
<td>$353,489,210</td>
<td>$49,353,063</td>
<td>$71,643</td>
<td>$0</td>
<td>$488,178,103</td>
<td>$73,610,524</td>
<td>$315,555,563</td>
<td>$194,438,886</td>
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<tr>
<td>Total</td>
<td>$134,445,132</td>
<td>$432,764,953</td>
<td>$76,010,175</td>
<td>$148,250</td>
<td>$8,384,651</td>
<td>$651,753,162</td>
<td>$113,139,179</td>
<td>$316,218,225</td>
<td>$277,254,563</td>
</tr>
</tbody>
</table>

Share (Jan - Sep) 17.5% 72.4% 10.1% 0.0% 0.0% 100.0% 11.3% 48.3% 29.8% 0.1% 10.6% 100.0%
What actually changed Dec 1, 2012?

- Prior to 12/1/12
  - Cost to make a generator whole running for Blackstart or Reactive was done through DA OR/BOR and allocated through the BORCA flow chart
  - Only credits specifically for Blackstart or Reactive were allocated through those provisions

- Post 12/1/12
  - Cost to make a generator whole running for Blackstart or Reactive now allocated through these specific Tariff provisions, not through DA OR/BOR
  - Additional credits specifically for Blackstart or Reactive still allocated through those provisions
Simplified Example

• Prior to 12/1/12
  – GEN A for local REACTIVE in DPL Zone (< 500 kV)
    • DA OR payment = $50,000
    • Reactive Credits = $1,500
  – $50,000 allocated to all DA load + DECs + exports
  – $1,500 allocated to DPL zonal load

• Starting 12/1/12
  – GEN A for local REACTIVE in DPL Zone (< 500 kV)
    • DA OR payment = $50,000
    • Reactive Credits = $1,500
  – $50,000 + $1,500 allocated to DPL zonal load
Did we get a matching decrease in BOR?

- There are outliers...

**Uplift Per Month - 2012/2013**

- Dec 12 – Feb 13
- Extremely high gas prices in Northern NJ
- Resources in this area run for reliability
- Account for > 50% of the total BOR charges since Dec 12
### Net Change Since Dec 1, 2012

<table>
<thead>
<tr>
<th>Time Period</th>
<th>DA OR</th>
<th>RT BOR</th>
<th>REACTIVE</th>
<th>BLACKSTART</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior 10 Months</td>
<td>118.5</td>
<td>378</td>
<td>47.7</td>
<td>0</td>
<td>543.9</td>
</tr>
<tr>
<td>10 Months Since</td>
<td>81.5</td>
<td>343.5*</td>
<td>219.8</td>
<td>77.5</td>
<td>722.3</td>
</tr>
<tr>
<td>Difference</td>
<td>-37</td>
<td>-34</td>
<td>172.1</td>
<td>77.5</td>
<td>178.4</td>
</tr>
</tbody>
</table>

* Raw data

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<tr>
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<td>0</td>
<td>543.9</td>
</tr>
<tr>
<td>10 Months Since</td>
<td>81.5</td>
<td>247**</td>
<td>219.8</td>
<td>77.5</td>
<td>625.6</td>
</tr>
<tr>
<td>Difference</td>
<td>-37</td>
<td>-131</td>
<td>172.1</td>
<td>77.5</td>
<td>81.65</td>
</tr>
</tbody>
</table>

* January and February 2013 RT BOR values replaced with average of March through September to accommodate outliers.
• There was a net decrease in DA OR and BOR
  – Accounting for outliers…~ $170M
  – Actual… ~ $71M

• Still there is a net increase
  – Accounting for outliers…~ $82M
  – Actual… ~ $180M

• Uneconomic units are becoming less economic!
Some statistics YTD 2013:
- DA OR Top 10 = 60% of total DA OR
  - Top 5 are 55% of total
- BOR Top 10 = 58% of total BOR
  - Top 5 are 46% of total
- Reactive Top 10 = 62% of total Reactive
Specific Problem Areas

- Top 5 DA OR and BOR units are committed for local constraint relief but are not needed above min
  - Ineligible to set LMP if not dispatched above min
- For reactive there are specific sensitive areas
  (http://www.pjm.com/markets-and-operations/energy/~/media/markets-ops/energy/real-time/transmission-outage-and-voltage-problem-zone-mapping.ashx)
  - BGE/PEP for APSOUTH/BED-BLA
  - Seneca area of PN
  - DPL actual high voltages
  - CLVLND Interface area of ATSI
- Same scenario for DA OR/BOR units
• DA OR, BOR and Reactive units are running day-after-day
• Most uplift is from covering incremental cost at min and no-load
• Start up may impact a single day at a time but is a smaller portion of the costs
For Phase 1 to be successful we should look to address

- Units sitting at min for either reactive or thermal constraint control
  - Incremental cost at a minimum
  - No-load would be nice but there are side-effects
- Must maintain consistency between pricing and dispatch
  - Injection of fixed costs into LMP will jeopardize, if not violate, this
Other points for discussion…

- Allowing units at min to set LMP will create additional congestion
- Break points between binding additional constraints and allowing uplift to be incurred
  - Lines need to be drawn clearly to eliminate ambiguity
- Impacts on FTRs
  - Need to be cognizant of this
  - May require FTR rule changes
    - Allocate less for these facilities?
    - Allocate underfunding on these facilities differently?