FTR/ARR Funding and Education

FTRSTF
June 25, 2014
## FTR Funding History

<table>
<thead>
<tr>
<th>Planning Period</th>
<th>Revenue Adequacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007-08</td>
<td>100%</td>
</tr>
<tr>
<td>2008-09</td>
<td>100%</td>
</tr>
<tr>
<td>2009-10</td>
<td>97%</td>
</tr>
<tr>
<td>2010-11</td>
<td>85%</td>
</tr>
<tr>
<td>2011-12</td>
<td>81%</td>
</tr>
<tr>
<td>2012-13</td>
<td>66%</td>
</tr>
<tr>
<td>2013-14</td>
<td>72%</td>
</tr>
</tbody>
</table>
**2013/2014 Revenue Inadequacy Assignments ($millions)**

- Balancing Congestion: -$419.7 (60.7%)
- Day-Ahead Inadequacies: -$271.7 (39.3%)

**2013/2014 Detailed Revenue Inadequacy Assignments ($millions)**

- Stage 1A Infeasible Rights: -$199.7 (28.9%)
- Transmission Outages (FTR vs. Day-Ahead differences): -$154.2 (22.3%)
- M2M constraints Including M2M Payments: -$165.8 (24.0%)
- Uncontrollable Inadequacy (Forced Outages, Real-Time Switching, Polar Vortex, Demand Response, Voltage/Thermal Surrogates/NERC Derates): -$165.8 (24.0%)
- Transmission Outages (Day-ahead vs. Real-Time differences): -$99.7 (14.4%)

**2013/2014 Balancing Congestion Day-Ahead Inadequacies**

- Stage 1A Infeasible Rights: -$199.7 (28.9%)
- Transmission Outages (FTR vs. Day-Ahead differences): -$154.2 (22.3%)
- M2M constraints Including M2M Payments: -$165.8 (24.0%)
- Uncontrollable Inadequacy (Forced Outages, Real-Time Switching, Polar Vortex, Demand Response, Voltage/Thermal Surrogates/NERC Derates): -$165.8 (24.0%)
- Transmission Outages (Day-ahead vs. Real-Time differences): -$99.7 (14.4%)
Quantity of Infeasible facilities have increased over last several years

- Increased Transmission Outages
- Increased uncompensated power flow (i.e. Loop Flow)
- Additional M2M Flowgates
Stage 1A Allocation – Inadequacy

FTR revenue shortfall from Stage 1A infeasible facilities continues to increase

- Inadequacy of Stage 1A ARRs calculated as follows:
  - Value the MWs of infeasible Stage 1A ARRs utilizing the day-ahead congestion prices (MW * (DA Sink LMP – DA Source LMP) * hours in period)
  - Day-ahead congestion LMPs used because the MWs of infeasible ARRs translates into additional FTR MW capability available in FTR auctions as either Self Scheduled FTRs or purchased FTRs.
  - PJM can “buy back” capability on infeasible facilities by utilizing excessive auction revenue but this is difficult and only moves the risk of inadequacy into the FTR auctions as reduced revenues.

<table>
<thead>
<tr>
<th>Planning Period</th>
<th>Congestion Credits ($millions)</th>
<th>Total FTR Revenue Inadequacy ($ millions)</th>
<th>FTR Revenue Adequacy %</th>
<th>FTR Revenue Inadequacy from Stage 1A Infeasible ARRs ($ millions)</th>
<th>Stage 1A Infeasible ARRs % of FTR Revenue Inadequacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012/2013</td>
<td>$623</td>
<td>$288</td>
<td>68%</td>
<td>$75.3</td>
<td>26%</td>
</tr>
<tr>
<td>2013/2014</td>
<td>$1,819</td>
<td>$691</td>
<td>72%</td>
<td>$199.7</td>
<td>29%</td>
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</tbody>
</table>
Stage 1A Allocation – Inadequacy

Stage 1A Over allocated Inadequacy Distribution

### 2012/2013
- Network Load (Internal and M2M Flowgate): 69%
- Network Load (M2M Flowgate): 30%
- Transmission Outages: 1%

### 2013/2014
- Network Load (Internal and M2M Flowgate): 53%
- Network Load (M2M Flowgate): 32%
- Transmission Outages: 15%

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<thead>
<tr>
<th>Component</th>
<th>2012/2013</th>
<th>2013/2014</th>
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</thead>
<tbody>
<tr>
<td>Network Load (Internal and M2M Flowgate)</td>
<td>$52.3</td>
<td>$107.0</td>
</tr>
<tr>
<td>Network Load (M2M Flowgate)</td>
<td>$22.6</td>
<td>$63.5</td>
</tr>
<tr>
<td>Transmission Outages</td>
<td>$0.4</td>
<td>$29.2</td>
</tr>
<tr>
<td>Total</td>
<td>$75.3</td>
<td>$199.7</td>
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</table>
**Annual ARR Credits and Modeled Outages**

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Annual Outages Modeled</td>
<td>36</td>
<td>145</td>
<td>199</td>
</tr>
<tr>
<td>ARR Credits ($ millions)</td>
<td>$560</td>
<td>$504</td>
<td>$711</td>
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</table>
Stage 1 Allocation – Historical Resources

Generation Retirements

- Requires remapping historical resources to an equivalent generator or creating a dummy generator for ARR/pricing purposes only
  - Idea was to preserve the historical transmission system rights
  - May create additional Stage 1A infeasibilities
- Substantial amount of retirements not expected when Stage 1A process originally designed.

15.4% of Stage 1 historical generation has retired or submitted deactivation notices representing 25,543.7 MWs
Possible Stage 1 changes

1. Allow proration in Stage 1A
   - Improves FTR funding by removing infeasibilities
   - Improves confidence in FTR values
   - Minimal impact on ARR revenues
     - More constrained ARR/FTR facilities usually increases ARR credits (i.e. 2014/2015 ARR credits higher although less ARRs cleared)
     - Revenue Adequacy should improve and provide confidence to FTR bidders to not devalue bids
   - Stage 1A 10-Year process still exists

2. Remove Stage 1 historical resources when they physically retire
   - Units do not exist so transmission system rights from generator not necessary
   - Should reduce stage 1A infeasibilities
   - Creates correct model