Regulation Overview - Dispatch

Mike Handlin,
Dispatch Shift Supervisor

RMDSTF
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What is Regulation

Purpose:

• To control small mismatches (imbalance) between load and generation (ACE).

  Corrects for both High and Low ACE deviations

• Regulation signals automatically sent to committed resources to immediately begin correcting ACE deviations.

• Manual Dispatcher intervention to the signal is available for more extreme scenarios and not common practice

Imbalance Conditions

Over-Generation
- Total Generation > Total Demand
- Frequency > 60 Hertz
- Generators momentarily speed up

Under-Generation
- Total Generation < Total Demand
- Frequency < 60 Hertz
- Generators momentarily slow down
The PJM RTO’s Regulation requirement is 525 effective MW during non-ramp hours and 800 effective MW during ramp hours. The ramp and non-ramp period will be determined seasonally, based on system conditions.

- Ramp hours carry larger regulation requirements to address the expected larger volatility in those hours.

PJM dispatch may increase or decrease the regulation requirements as needed to accommodate system conditions.

- Generally implemented during Peak Days / Hot and Cold Weather Alerts
### Regulation Requirement Definition

<table>
<thead>
<tr>
<th>Season</th>
<th>Dates</th>
<th>Non-Ramp Hours</th>
<th>Ramp Hours</th>
<th>Effective MW Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring</td>
<td>Mar 1 – May 31</td>
<td>HE1 – HE5, HE9 – HE17</td>
<td>HE6 – HE8, HE18 – HE24</td>
<td>Non-Ramp = 525MW, Ramp = 800MW</td>
</tr>
<tr>
<td>Fall</td>
<td>Sep 1 – Nov 30</td>
<td>HE1 – HE5, HE9 – HE17</td>
<td>HE6 – HE8, HE18 – HE24</td>
<td>Non-Ramp = 525MW, Ramp = 800MW</td>
</tr>
</tbody>
</table>
Traditional Regulation Signal (REGA)

- A function of slow filter of RTO Area Control Error (ACE)
- Can remain full raise or lower for extended periods

Dynamic Regulation Signal (REGD)

- A function of fast filter of RTO ACE

PJM’s RegA and RegD signals are *interdependent* and work together to help PJM dispatch with balancing and ACE control
Items To Consider

• Is A Static Regulation Requirement Reflective of System Needs?
  – Sudden Load increase or decrease can vary from 100mw to 1000mw
  – Seasonal Requirement and changing Weather Patterns

• Does Current Structure Consider Impact of Intermittent Resources?
  – Solar characteristics, Behind the Meter, Battery Response

• Effective Regulation Can be Misleading!
  – Magnified by amount of RegD that is assigned (due to benefits factor)
  – More misleading during off ramp hours due to lower (525MW) reqt.
Mike Handlin,  
Dispatch Shift Supervisor  
Michael.Handlin@pjm.com

Member Hotline
(610) 666 – 8980
(866) 400 – 8980
custsvc@pjm.com
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