Primary Frequency Response Sr. Task Force (PFRSTF)
Inertial Response

Dave Souder
Director, Operations Planning
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• Kinetic energy stored in the rotating mass of all of the synchronized turbine-generators and motors on the interconnection

• Produced by the slowing of the spinning inertial mass of rotating equipment on the interconnection that both releases the stored kinetic energy and arrests the decline of the interconnection frequency

• Happens immediately following a disturbance
Classic Frequency Excursion Recovery

Arresting Period
Rebound Period

Recovery Period

Nadir
Primary Response Evaluation Period

Secondary Response Control

Primary Response Control

Seconds
Minutes

A
B
C
D

50
59.95
59.90
59.85
59.80
### Types of Control

<table>
<thead>
<tr>
<th>Control</th>
<th>Service</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inertial Control</td>
<td>Inertia</td>
<td>0-10 Seconds</td>
</tr>
<tr>
<td>Primary Control</td>
<td>Primary Frequency Response</td>
<td>10-60 Seconds</td>
</tr>
<tr>
<td>Secondary Control</td>
<td>Regulation / Reserves</td>
<td>1-10 Minutes</td>
</tr>
<tr>
<td>Tertiary Control</td>
<td>System Re-dispatch (SCED)</td>
<td>10-30 Minutes</td>
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</tbody>
</table>
• PJM is NOT proposing to separate Inertial response from PFR
  – Not seeing a reliability problem with inertia
    • System Planning evaluates in stability studies
    • Eastern Interconnection has adequate inertial response
  – Difficult to separate inertia from overall PFR
  – Difficult to measure
    • No MW “response”
  – Much of inertia comes from load
  – No costs associated with inertia