System Operations Report

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MC Webinar
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Average Load Forecast Error

December 2022
Hourly Error: 2.08%  Peak Error: 2.20%

25-month Average
Daily Peak Forecast Error (December)

- Error at Peak Hour
- Weekend / Holiday

Over-forecasting

Under-forecasting
PJM's BAAL performance has exceeded the goal of 99% for each month in 2022.
• Five Spinning Events
• Eight Shared Reserve Event

• The following Emergency Procedures occurred:
  – 2 Maximum Generation Emergency Alerts
  – 5 Emergency Load Management Reduction Actions
  – 2 Maximum Generation Emergency Actions
  – 3 Cold Weather Alerts
  – 2 NERC EEA Level 1
  – 5 NERC EEA Level 2
  – 53 Post-Contingency Local Load Relief Warnings (PCLLRW)
• 185 Shortage Cases Approved

• The approved Shortage Cases occurred on:
  – 12/23/2022:
    – 58 Shortage Cases for intervals between 16:35 – 22:15
    – Factors: Load came in much higher than forecast and generation tripping or FTS
  – 12/24/2022:
    – 125 Shortage Cases for intervals between 00:20 – 00:40, 00:55, 01:59 – 12:20
    – Factors: Load came in much higher than forecast and generation tripping or FTS
  – 12/25/2022:
    – 1 Shortage Case for 04:40 interval
    – Due to load increase
  – 12/26/2022:
    – 1 Shortage Case for 00:20 interval
    – Due to low ACE
The 13-month average forced outage rate is 4.89% or 9,795 MW. The 13-month average total outage rate is 16.12% or 32,363 MW.
2021-2022 Planned Emergency, Unplanned, and Total Outages by Ticket

Note: “Unplanned Outages” include tripped facilities. One tripping event may involve multiple facilities.
<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
<th>Start Time</th>
<th>End Time</th>
<th>Duration</th>
<th>Region</th>
<th>Assigned (MW)</th>
<th>Response (MW)</th>
<th>Penalty (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12/23/22</td>
<td>10:14:04</td>
<td>10:25:11</td>
<td>00:11:07</td>
<td>RTO</td>
<td>1791.4</td>
<td>948.9</td>
<td>842.5</td>
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<tr>
<td>2</td>
<td>12/23/22</td>
<td>16:17:51</td>
<td>18:09:20</td>
<td>01:51:29</td>
<td>RTO</td>
<td>1845.6</td>
<td>812.3</td>
<td>1033.3</td>
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<tr>
<td>3</td>
<td>12/24/22</td>
<td>00:05:01</td>
<td>00:30:44</td>
<td>00:25:43</td>
<td>RTO</td>
<td>1766.5</td>
<td>329.9</td>
<td>1436.6</td>
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<tr>
<td>4</td>
<td>12/24/22</td>
<td>02:23:38</td>
<td>02:54:13</td>
<td>00:30:35</td>
<td>RTO</td>
<td>1664.8</td>
<td>534.7</td>
<td>1130.1</td>
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<td>5</td>
<td>12/24/22</td>
<td>04:23:41</td>
<td>05:51:13</td>
<td>01:27:32</td>
<td>RTO</td>
<td>1097.0</td>
<td>258.6</td>
<td>838.4</td>
</tr>
</tbody>
</table>

*Response is equal to Assigned for events with duration less than ten minutes*
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System Operations Report

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Goal Measurement: Balancing Authority ACE Limit (BAAL)

• The purpose of the new BAAL standard is to maintain interconnection frequency within a predefined frequency profile under all conditions (normal and abnormal), to prevent frequency-related instability, unplanned tripping of load or generation, or uncontrolled separation or cascading outages that adversely impact the reliability of the interconnection. NERC requires each balancing authority demonstrate real-time monitoring of ACE and interconnection frequency against associated limits and shall balance its resources and demands in real time so that its Reporting ACE does not exceed the BAAL (BAAL\_LOW or BAAL\_HIGH) for a continuous time period greater than 30 minutes for each event.

• PJM directly measures the total number of BAAL excursions in minutes compared to the total number of minutes within a month. PJM has set a target value for this performance goal at 99% on a daily and monthly basis. In addition, current NERC rules limit the recovery period to no more than 30 minutes for a single event.
The 13-month average forced outage rate is 4.89% or 9,795 MW.
The 13-month average total outage rate is 16.12% or 32,363 MW.
PCLLRW Count Vs. Peak Load – Daily Values For 13 Months

MW (Thousands)

- RTO Peak Load
- PCLLRW Count

12/01/21 to 12/01/22
PROTECT THE POWER GRID
THINK BEFORE YOU CLICK!

Be alert to malicious phishing emails.

Report suspicious email activity to PJM.
(610) 666-2244 / it_ops_ctr_shift@pjm.com