



## Item 4.3: Operations Report (May–June 2016)

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President & CEO  
ERCOT

Board of Directors Meeting

ERCOT Public  
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# Summary – May 2016

## Operations

- The peak demand of 57,282 MW on May 10th was greater than the day-ahead mid-term forecast peak of 51,947 MW of the same operating period. In addition, it was greater than the May 2015 actual peak demand of 53,311 MW. The instantaneous peak load on May 10th was 57,559 MW.
- Day-ahead load forecast error for May was 3.86%
- ERCOT issued five notifications
  - Two advisories issued due to a GMD alert of K7.
  - Two advisories issued due to ERCOT's Voltage Security Assessment Tool being unavailable.
  - One Transmission Emergency Notice issued for the Rio Grande Valley due to the Valley Import.

## Planning Activities

- 236 active generation interconnection requests totaling 56,751 MW, including 25,304 MW of wind generation, as of May 31, 2016. Five fewer requests yet an increase of 172 MW from April 30, 2016.
- 16,129 MW wind capacity in commercial operations on May 31, 2016.

# Summary – June 2016

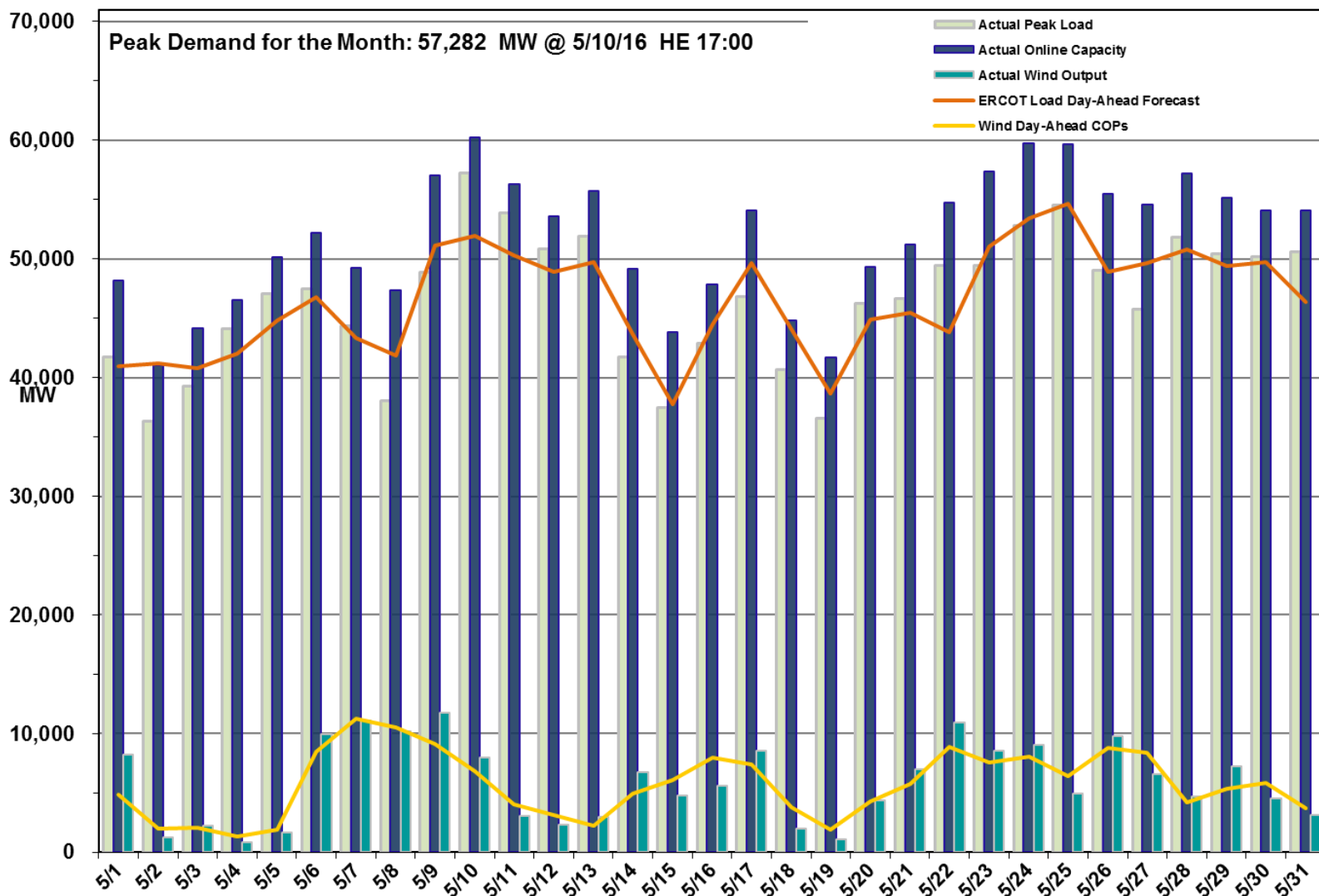
## Operations

- The peak demand of 65,184 MW on June 15<sup>th</sup> was greater than the day-ahead mid-term forecast peak of 62,607 MW for the same operating period. In addition, it was greater than the June 2015 actual peak demand of 61,741 MW. The instantaneous peak load on June 15<sup>th</sup>, 2016 was 65,030 MW.
- Day-ahead load forecast error for June was 2.80%
- ERCOT issued two notifications:
  - One Advisory issued due to Physically Responsive Capability being less than 3,000 MW.
  - One Transmission Emergency Notice issued for a post-contingency overload in the Laredo-Hamilton Road area.

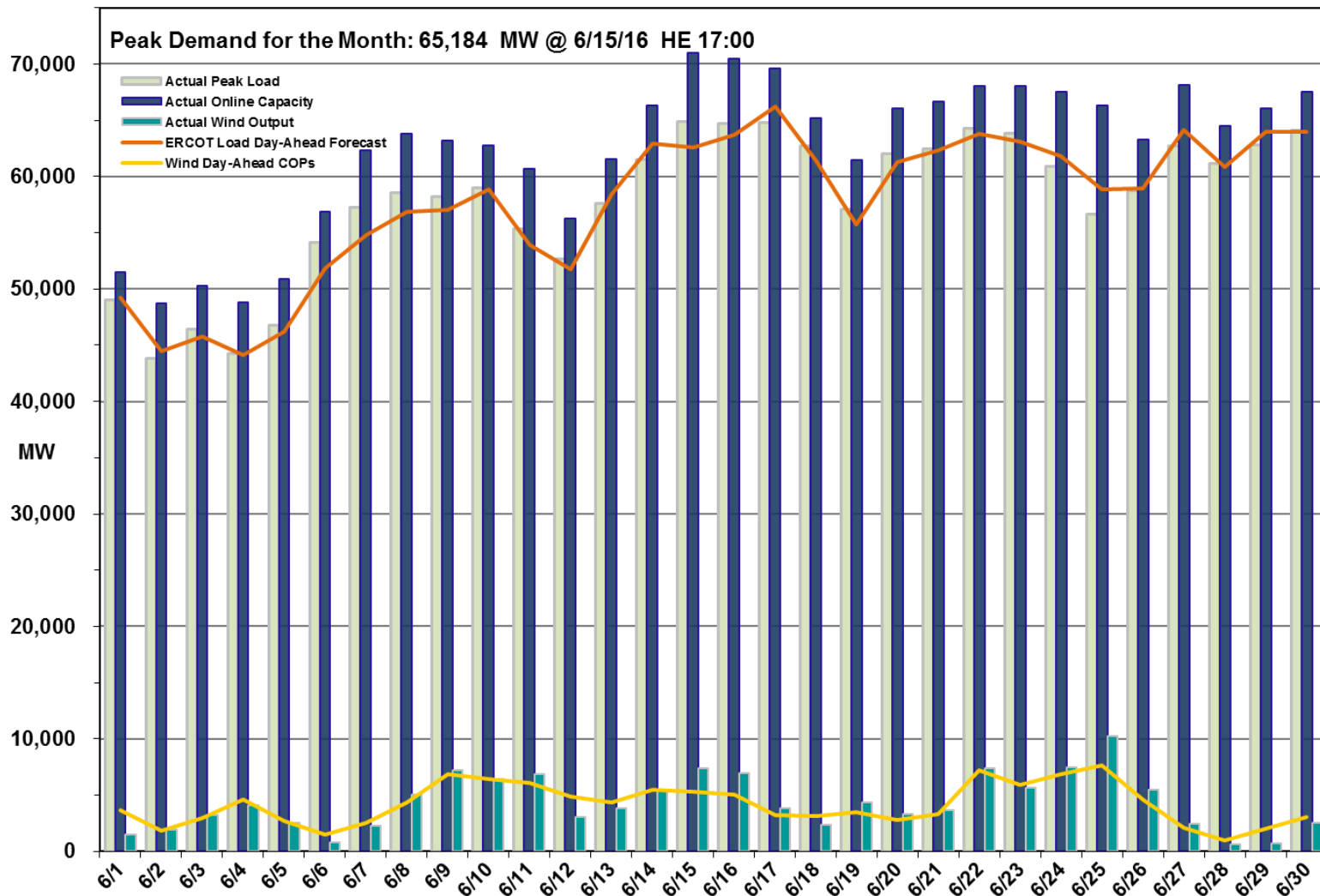
## Planning Activities

- 232 active generation interconnection requests totaling 56,891 MW, including 25,215 MW of wind generation, as of June 30, 2016. Four fewer requests and a decrease of 89 MW from May 31, 2016.
- 16,631 MW wind capacity in commercial operations on June 30, 2016.

# Daily Peak Demand: Hourly Average Actual vs. Forecast, Wind Day-Ahead COPs, & On-Line Capacity at Peak – May 2016



# Daily Peak Demand: Hourly Average Actual vs. Forecast, Wind Day-Ahead COPs, & On-Line Capacity at Peak – June 2016



# Market Statistics – May 2016

Market Statistics	May 2015	May 2016	2015 Average	2016 YTD Average
Percentage of Real-Time load hedged in Day-Ahead Market	132.14%	121.60%	131.26%	127.01%
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Day-Ahead Market (\$/MWh)	25.18	19.38	28.38	18.36
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Real-Time (\$/MWh)	29.54	18.01	26.05	17.78
Average East Houston Fuel Index Price (\$/MMBtu)	2.80	1.85	2.57	1.90

# Market Statistics – June 2016

Market Statistics	June 2015	June 2016	2015 Average	2016 YTD Average
Percentage of Real-Time load hedged in Day-Ahead Market	125.13%	115.07%	131.26%	125.02%
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Day-Ahead Market (\$/MWh)	26.18	26.23	28.38	19.98
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Real-Time (\$/MWh)	23.76	23.87	26.05	19.03
Average East Houston Fuel Index Price (\$/MMBtu)	2.71	2.46	2.57	1.99

# Operational Performance Measures – May & June 2016

Performance Measure	Target Met	Further Information
Retail Transaction Performance (Target 98%)	Yes	<ul style="list-style-type: none"><li>• Retail transaction processing performance was near 100%.</li></ul>
Settlements Performance (Target 99%)	Yes	<ul style="list-style-type: none"><li>• 100% timely statement and invoice posting</li></ul>



# Operational Dashboard – May & June 2016

Metric	Trending as Expected	Further Information
Day-Ahead Schedule	Yes	<ul style="list-style-type: none"> <li>• Normal level of market activity and liquidity.</li> <li>• Loads appear to have hedged against exposure to Real-Time prices.</li> </ul>
Day-Ahead Electricity And Ancillary Service Hourly Average Prices	Yes	<ul style="list-style-type: none"> <li>• Hourly average prices correctly reflect the opportunity cost of energy.</li> </ul>
Day-Ahead vs Real-Time Load Zone Settlement Point Price (Hourly Average)	Yes	<ul style="list-style-type: none"> <li>• Day-Ahead &amp; Real-Time prices for different Load Zones reflect relative transmission congestion.</li> </ul>
Day-Ahead vs Real-Time Trading Hub Settlement Point Price (Hourly Average)	Yes	<ul style="list-style-type: none"> <li>• The average energy price across the system reflects marginal offers and scarcity pricing impacts.</li> <li>• Higher average Day-Ahead energy prices reflect the risk premium between Day-Ahead &amp; Real-Time.</li> </ul>
Day-Ahead Reliability Unit (DRUC) Commitment Monthly Summary	Yes	<ul style="list-style-type: none"> <li>• Capacity committed by the DRUC process indicates the level of out-of-market activity needed Day-Ahead to maintain reliability.</li> <li>• No resource was committed in DRUC in this period.</li> </ul>

# Operational Dashboard – May & June 2016

Metric	Trending as Expected	Further Information
Hourly Reliability Unit Commitment (HRUC) Monthly Summary	Yes	<ul style="list-style-type: none"> <li>Capacity committed by the HRUC process indicates the level of out-of-market activity needed during the Operating Day to maintain reliability.</li> <li>12 resources in May and 22 resources in June were committed to resolve congestion.</li> <li>Number of RUC commitments consistent with system conditions.</li> </ul>
Supplemental Ancillary Service Market Monthly Summary	Yes	<ul style="list-style-type: none"> <li>Normal trend indicates that deliverability was not a major concern.</li> </ul>
Non-Spinning Reserve Service Deployment	Yes	<ul style="list-style-type: none"> <li>No Non-Spin was deployed in May or June.</li> </ul>
Congestion Revenue Rights Price Convergence	Yes	<ul style="list-style-type: none"> <li>Normal trend indicates good ability of market participants to estimate value of hedges.</li> </ul>

# Operational Dashboard – May 2016

Metric	Trending as Expected	Further Information
Retail Transactions	Yes	<ul style="list-style-type: none"> <li>Seasonal variations in transaction volumes trending as expected</li> </ul>
Advanced Metering	Yes	<ul style="list-style-type: none"> <li>98.8% of ERCOT load settled with 15-minute interval data</li> <li>6.9M Advanced Metering System (AMS) Electric Service Identifier (ESIID)s included in settlement as of May 2016.</li> </ul>
Settlement Dollars	Yes	<ul style="list-style-type: none"> <li>As of settlement of Operating Day 5/31/2016, the daily average settlement dollars for May are \$9.34M, which is up from \$8.73M in April 2016 and down from May 2015 which had an average of \$10.65M.</li> </ul>
Revenue Neutrality	Yes	<ul style="list-style-type: none"> <li>As of settlement of Operating Day 5/31/2016, Revenue Neutrality uplift is a charge of \$3.65M, which is up from a \$2.75M charge in April 2016 and up from a \$2.47M charge in May 2015.</li> </ul>
Market-Based Uplift to Load	Yes	<ul style="list-style-type: none"> <li>As of settlement of Operating Day 5/31/2016, the market-based uplift to load is a charge of \$7.37M, as opposed to an \$18.28M charge in April 2016 and a charge of \$7.75M in May 2015.</li> </ul>

# Operational Dashboard – June 2016

Metric	Trending as Expected	Further Information
Retail Transactions	Yes	<ul style="list-style-type: none"> <li>Seasonal variations in transaction volumes trending as expected</li> </ul>
Advanced Metering	Yes	<ul style="list-style-type: none"> <li>98.9% of ERCOT load settled with 15-minute interval data.</li> <li>6.9M Advanced Metering System (AMS) Electric Service Identifier (ESIID)s included in settlement as of June 2016.</li> </ul>
Settlement Dollars	Yes	<ul style="list-style-type: none"> <li>As of settlement of Operating Day 6/30/2016, the daily average settlement dollars for June are \$13.62M, which is up from \$9.34M in May 2016 and down from June 2015 which had an average of \$9.96M.</li> </ul>
Revenue Neutrality	Yes	<ul style="list-style-type: none"> <li>As of settlement of Operating Day 6/30/2016, Revenue Neutrality uplift is a credit of \$1.55M, which is down from May 2016 which was a charge of \$3.65M and down from June 2015 which was a charge of \$2.64M.</li> </ul>
Market-Based Uplift to Load	Yes	<ul style="list-style-type: none"> <li>As of settlement of Operating Day 06/30/2016, the market-based uplift was a credit of \$1.36M. This is normal within the range of historically observed values for Uplift to Load.</li> </ul>

# Major Project Highlights – (as of 07/28/2016)

Project	Trending as Expected	Further Information
<b>EMS Upgrade Program</b> – Upgrade EMS and OTS from ALSTOM EMP 2.3 to EMP 3.0	Yes	<ul style="list-style-type: none"> <li>• Very successful cutover June 16<sup>th</sup>, no major issues</li> <li>• Budget forecast is favorable to the \$18.9M estimate</li> <li>• Plan to begin closing the upgrade on schedule November this year</li> <li>• Several stabilization defect releases and system decommissioning before closing</li> </ul>
<b>NMMS Upgrade Project</b> – Replace the current Siemens NMMS application with the next generation of model management software available from Siemens	No	<ul style="list-style-type: none"> <li>• Factory Acceptance Testing (FAT) of NMMS is running longer than planned, and a go-live date of September 22<sup>nd</sup> is no longer achievable.</li> <li>• Management has taken the following actions:             <ul style="list-style-type: none"> <li>○ Co-location of project team resources and on-site vendor presence</li> <li>○ Daily checkpoints with the vendor to review defects, assess progress</li> <li>○ Improved test script and defect tracking</li> <li>○ Streamlined code release process</li> <li>○ Added multiple ERCOT internal and contract resources, and vendor resources</li> <li>○ Established executive and vendor leadership forum to remove barriers</li> </ul> </li> <li>• The team is monitoring the effectiveness of these actions on the project's cost and duration.</li> <li>• The team has identified a delivery plan, supported by defect closure rates and testing completion metrics, that achieves the next critical path milestone: FAT complete by September 2<sup>nd</sup>. At that time, ERCOT will determine the final go-live schedule</li> <li>• Final schedule and budget impacts will be reported at the October Board meeting.</li> </ul>
<b>CIP v5 Readiness Program</b> – Develop, modify and implement processes, procedures, workflows, and tools to ensure ERCOT's compliance with NERC CIP v5 standards	Yes	<ul style="list-style-type: none"> <li>• NERC Critical Infrastructure Protection (CIP) Cyber Security Standards version 5 (CIPv5) is a regulatory requirement that went into effect July 1, 2016.</li> <li>• Readiness Project completed on schedule and on budget, currently in closing</li> <li>• CIPv5 compliance readiness transitioned over to ERCOT compliance and operations teams.</li> <li>• NERC Audit materials submitted week of July 18<sup>th</sup></li> <li>• Q&amp;A in August, audit in September</li> </ul>

# Major Project Highlights – (as of 07/28/2016) – continued

Project	Trending as Expected	Further Information
<p><b>Data Center 4.0 Optimization (DC<sup>4</sup>) Program</b> – Replace the aging data center infrastructure with modernized infrastructure technologies to minimize the impact of failures, support future business growth, deliver highly automated next-generation infrastructure services, and ensure sustained reliability</p>	Yes	<ul style="list-style-type: none"> <li>• The DC<sup>4</sup> Program is in Planning and is tracking to the approved schedule and program budget:               <ul style="list-style-type: none"> <li>◦ The DC<sup>4</sup> procurement negotiations are in progress for x86 system purchase, as well as the core network hardware, with finalization occurring in 3Q 2016.</li> <li>◦ The physical and logical DC4 architecture has been completed.</li> <li>◦ Application migration planning is continuing for x86 systems.</li> </ul> </li> <li>• Other projects under the program:               <ul style="list-style-type: none"> <li>◦ The DC<sup>4</sup> Compute-DB Infrastructure Install and Migration project is successfully continuing the deployment of the Stage 1 systems in Production.</li> <li>◦ DC<sup>4</sup> Network-Core Network was gated to Execution on July 27<sup>th</sup>.</li> <li>◦ DC<sup>4</sup> Telecom-Control Room &amp; Grid Ops projects are in the Planning phase, have completed the design, and are wrapping-up the procurement negotiations.</li> <li>◦ Network-Command &amp; Control, as well as Compute-x86 Base Install projects, are in the Concept phase and expected to Initiate in August.</li> </ul> </li> </ul>
<p><b>Enterprise Resource Planning (ERP)</b> – Provide a single, integrated software solution for Human Resource, Accounting/Finance, Purchasing, Asset Management and related general business planning, strategy, and reporting functions</p>	Yes	<ul style="list-style-type: none"> <li>• The project is on schedule and budget and continues to track to a go-live date of September 26<sup>th</sup></li> <li>• Testing activities have been underway since the April timeframe:               <ul style="list-style-type: none"> <li>◦ Functional and end-to-end integration testing activities completed in June</li> <li>◦ User Acceptance and Parallel Payroll Testing underway; expected to complete by mid-August</li> <li>◦ Validation of converted and migrated data into the ERP solution will run through September.</li> </ul> </li> <li>• Operational readiness activities, including organizational awareness, training, procedural updates, and a production support model have begun and continue through August into September, leading up to the go-live date.</li> </ul>
<p><b>NPRR219 and SCR783, Outage Scheduler Enhancements – Group 2, Usability and Filtering Enhancements</b> – Implements changes to enable Resource Entities to enter outages; restores functionality that existed in the Zonal Market and adds functionality that is needed for the Nodal Market</p>	Yes	<ul style="list-style-type: none"> <li>• Project is in Execution and continues tracking to approved budget and schedule.</li> <li>• Vendor code completed earlier in the year, and integration to internal components is complete.</li> <li>• Integration Testing began in June and continues through September.</li> <li>• Project is on schedule, with Market Participant testing begun in July.</li> <li>• Instructor-led Market Training was successfully completed in May. ERCOT Operator Training is underway through September. The online training materials are scheduled to post in August.</li> </ul>

The *ERCOT Monthly Operational Overview* is posted on or about the 15<sup>th</sup> of the following month to (<http://www.ercot.com/committees/board/>)