



Item 4.3: Operations Report (September – October 2016)

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President & CEO
ERCOT

Board of Directors Meeting

ERCOT Public
December 13, 2016

Summary – September 2016

Operations

- The preliminary Settlements hourly peak demand of 66,853 MW, on September 19, was less than the day-ahead mid-term load forecast peak of 66,887 MW for the same operating hour
 - The operational instantaneous peak demand was 67,118 MW (telemetry).
- Day-ahead load forecast error for September was 2.16%
- ERCOT issued nine notifications:
 - One OCN issued due to projected capacity shortage
 - Six Advisories issued due to Physical Responsive Capability being less than 3,000 MW
 - One Watch due to a SCED failure

Planning Activities

- 226 active generation interconnection requests totaling 55,010 MW, including 25,254 MW of wind generation, as of September 30, 2016. Ten fewer requests and a decrease of 784 MW from August 31, 2016
- 16,861 MW wind capacity in commercial operations on September 30, 2016

Summary – October 2016

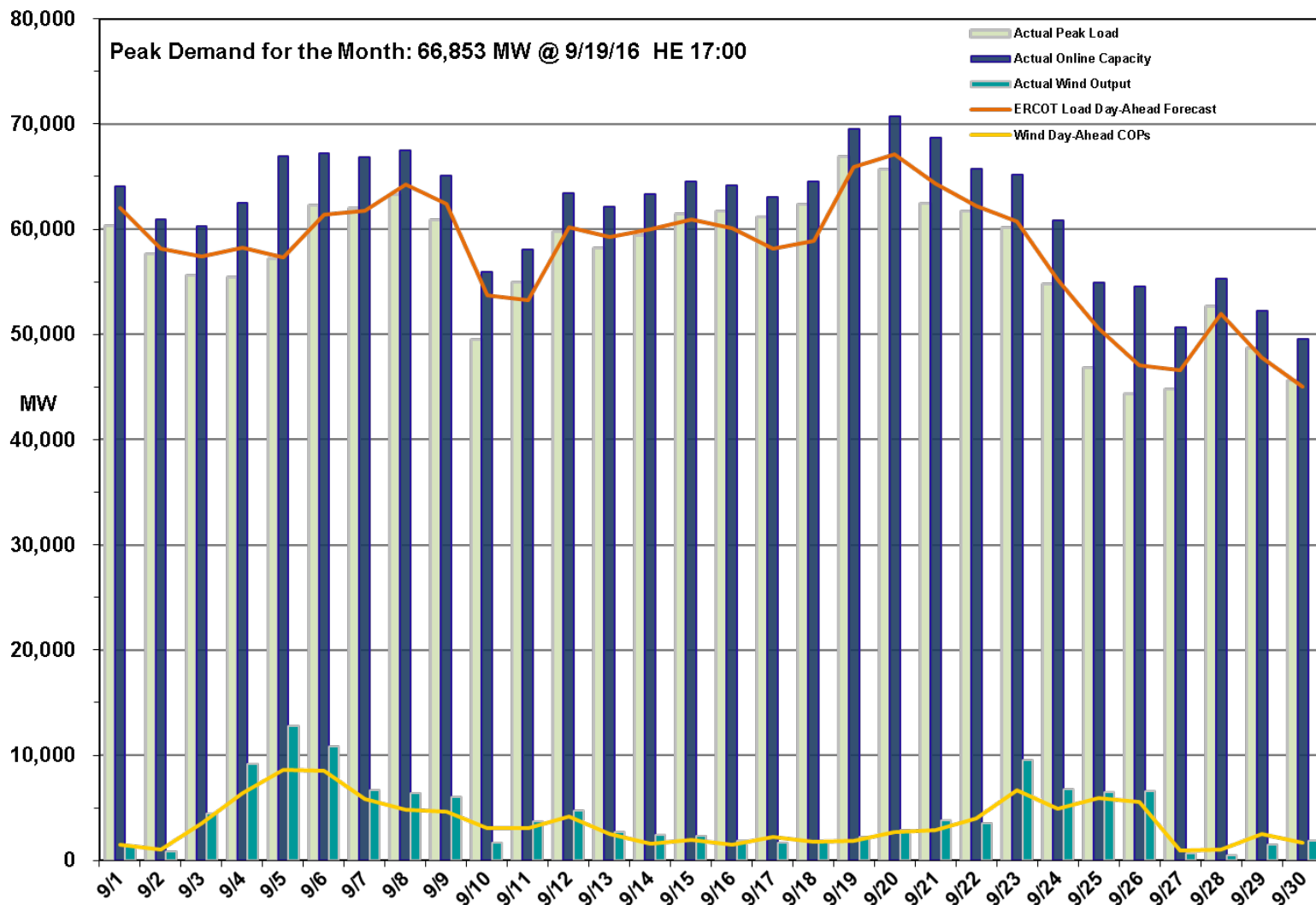
Operations

- The preliminary Settlements hourly peak demand of 59,848 MW, on October 5, was greater than the day-ahead mid-term load forecast peak of 59,437 MW for the same operating hour
 - The operational instantaneous peak demand was 60,057 MW (telemetry).
- Day-ahead load forecast error for October was 2.21%
- ERCOT issued 10 notifications:
 - One Watch issued due to SCED failure
 - One Watch issued due to HRUC not completing
 - One OCN issued due to capacity insufficiency
 - One OCN issued due to insufficient ramping capability
 - One Advisory issued due to a GMD Alert of K-7 until 13:00
 - Five public appeals for voluntary energy conservation in the Rio Grande Valley area

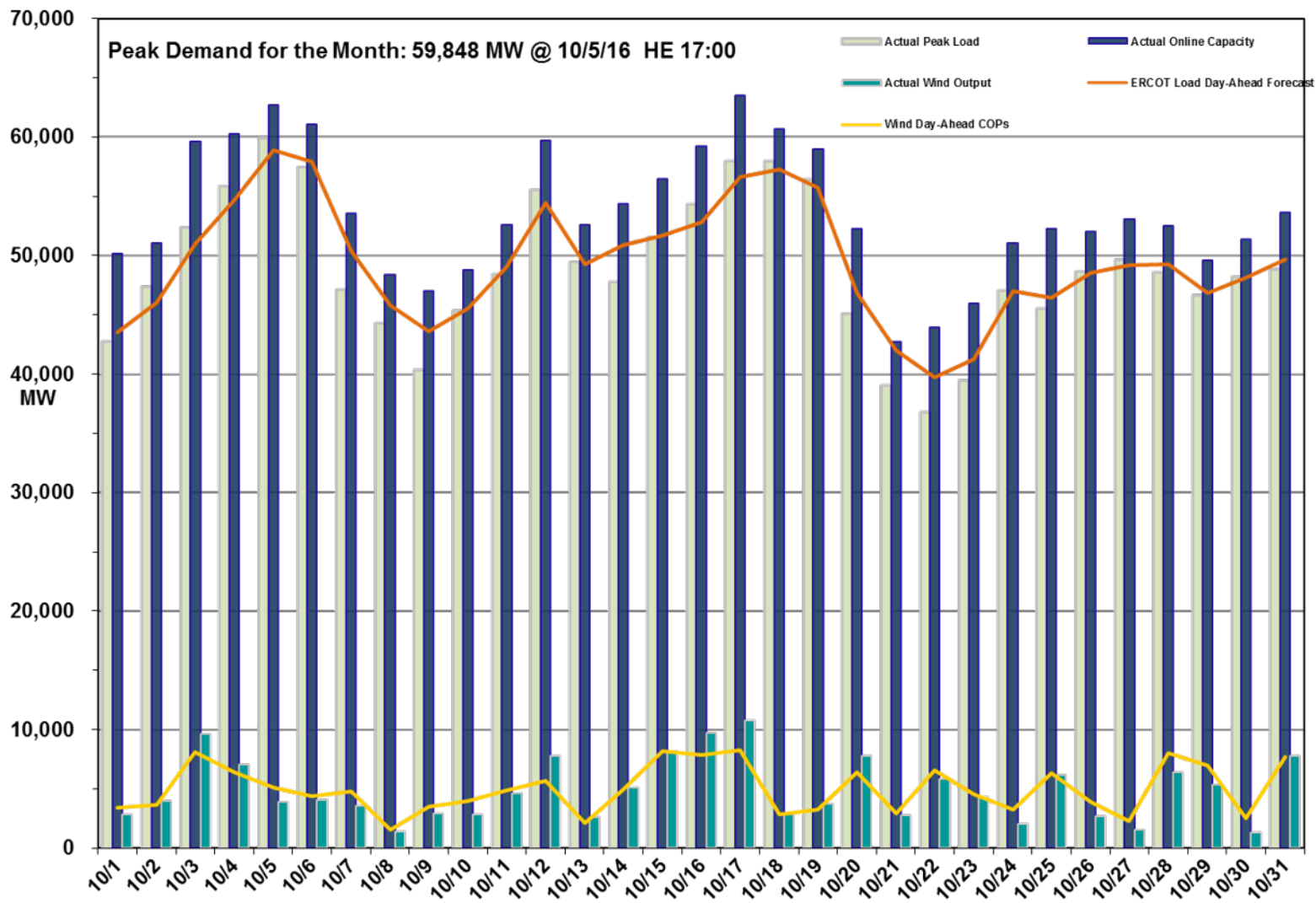
Planning Activities

- 238 active generation interconnection requests totaling 57,926 MW, including 25,833 MW of wind generation, as of October 31, 2016. Twelve additional requests and an increase of 2,916 MW from September 30, 2016
- 17,189 MW wind capacity in commercial operations on October 31, 2016.

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



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



Market Statistics – September 2016

Market Statistics	September 2015	September 2016	2015 Average	2016 YTD Average
Percentage of Real-Time load hedged in Day-Ahead Market	123.35%	117.52%	131.26%	122.01%
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Day-Ahead Market (\$/MWh)	26.20	29.25	28.38	24.40
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Real-Time (\$/MWh)	24.53	30.03	26.05	23.35
Average East Houston Fuel Index Price (\$/MMBtu)	2.61	2.93	2.57	2.26

Market Statistics – October 2016

Market Statistics	October 2015	October 2016	2015 Average	2016 YTD Average
Percentage of Real-Time load hedged in Day-Ahead Market	126.47%	121.38%	131.26%	121.95%
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Day-Ahead Market (\$/MWh)	22.55	27.84	28.38	24.74
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Real-Time (\$/MWh)	21.41	25.48	26.05	23.56
Average East Houston Fuel Index Price (\$/MMBtu)	2.35	3.08	2.57	2.34

Operational Performance Measures – September & October 2016

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

Operational Dashboard – September & October 2016

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

Operational Dashboard – September & October 2016

Metric	Trending as Expected	Further Information
Hourly Reliability Unit Commitment (HRUC) Monthly Summary	Yes	<ul style="list-style-type: none"> Capacity committed by the HRUC process indicates the level of out of market activity needed during the Operating Day to maintain reliability. 18 resources in September and 15 resources in October were committed to resolve congestion or provide capacity. In 2015, ERCOT committed 9 resources in September and 14 resources in October. Number of RUC commitments consistent with system conditions.
Supplemental Ancillary Service Market Monthly Summary	Yes	<ul style="list-style-type: none"> Normal trend indicates that deliverability was not a major concern.
Non-Spinning Reserve Service Deployment	Yes	<ul style="list-style-type: none"> Non-Spin was not deployed in September or October.
Congestion Revenue Rights Price Convergence	Yes	<ul style="list-style-type: none"> Normal trend indicates good ability of market participants to estimate value of hedges.

Operational Dashboard – September 2016

Metric	Trending as Expected	Further Information
Retail Transactions	Yes	<ul style="list-style-type: none"> Seasonal variations in transaction volumes trending as expected
Advanced Metering	Yes	<ul style="list-style-type: none"> 99% of ERCOT load settled with 15-minute interval data. 6.9M Advanced Metering System (AMS) Electric Service Identifier (ESIIDs) included in settlement as of September 2016.
Settlement Dollars	Yes	<ul style="list-style-type: none"> As of settlement of Operating Day 09/30/2016, the daily average settlement dollars for September 2016 are \$14.94M, which is down from \$15.57M in August 2016 and up from September 2015, which had an average of \$9.99M.
Revenue Neutrality	Yes	<ul style="list-style-type: none"> As of settlement of Operating Day 09/30/2016, Revenue Neutrality uplift is a credit of \$0.97M, which is down from a \$0.92M charge in August 2016 and down from a \$4.74M charge in September 2015.
Market-Based Uplift to Load	Yes	<ul style="list-style-type: none"> As of settlement of Operating Day 09/30/2016, the market-based uplift to load is a charge of \$9.48M, as opposed to a \$15.04M charge in August 2016 and a charge of \$4.18M in September 2015.

Operational Dashboard – October 2016

Metric	Trending as Expected	Further Information
Retail Transactions	Yes	<ul style="list-style-type: none"> Seasonal variations in transaction volumes trending as expected
Advanced Metering	Yes	<ul style="list-style-type: none"> 99% of ERCOT load settled with 15-minute interval data. 6.9M Advanced Metering System (AMS) Electric Service Identifier (ESIID)s included in settlement as of October 2016.
Settlement Dollars	Yes	<ul style="list-style-type: none"> As of settlement of Operating Day 10/31/2016, the daily average settlement dollars for October are \$13.58M, which is down from \$14.94M in September 2016 and up from October 2015 which had an average of \$8.95M.
Revenue Neutrality	Yes	<ul style="list-style-type: none"> As of settlement of Operating Day 10/31/2016, Revenue Neutrality uplift is a charge of \$3.50M, which is up from September 2016 which was a credit of \$0.97M and up from October 2015 which was a charge of \$3.25M.
Market-Based Uplift to Load	Yes	<ul style="list-style-type: none"> As of settlement of Operating Day 10/31/2016, the market-based uplift was a charge of \$19.05M, as opposed to a charge of \$9.48M in September 2016 and a charge of \$16.25M in October 2015.

Major Project Highlights – (as of 11/30/2016)

Project	Trending as Expected	Further Information
<p>NMMS Upgrade Project – Replace the current Siemens NMMS application with the next generation of model management software available from Siemens</p>	No	<ul style="list-style-type: none"> • The go-live date has been reset to the approved alternate date, 2/13/17, due to delays in completion of Site Acceptance Test (SAT) activities. The project team and vendor remain focused on resolving performance issues and the remaining high severity defects. • Market Participant training is scheduled to start in January. ERCOT has already partnered with some key Market Participants to download the client application, test access to the environment and ensure readiness for the training start • The project remains high risk. ERCOT continues to leverage various mitigation measures to minimize risks including daily ERCOT-vendor touch points, co-location of team resources, daily review of defects and progress with focus on defects that are critical for go-live, definition of work-around procedures where practical, and improvements to testing and code release processes.
<p>Enterprise Resource Planning (ERP) – 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"> • Following the Workday go-live on 9/26/16, the project continues in a Stabilization period which also includes rollout-out of new functionality and processes. <ul style="list-style-type: none"> ◦ Finance-related functions went live on 10/3/16 and the first month-end process was completed in early November. The team is currently preparing to run a second month-end process with support from the implementation vendor. ◦ Benefits Open-Enrollment and Merit cycles are currently in progress using Workday ◦ Operational readiness activities continue to proceed as planned, with finalization of legacy system data retention plans, completion of on-going support documentation, and project close out activities being identified and assigned ◦ The Stabilization period continues through January.
<p>Load Forecast Enhancements – Provide for higher availability of Load Forecast data feeds to EMS environment, additional column in EMS to import internal Short Term Load Forecast (STLF) and provide Mid-Term Load Forecast (MTLF) tuning and training</p>	Yes	<ul style="list-style-type: none"> • Project has delivered interim release and is on track for completion per approved schedule and budget. • Successfully delivered the STLF enhancement merge into EMS and improved the Valley Forecast in November • MTLF training and tuning activities have also completed as planned: training for 12 resources completed mid-September; followed by tuning deliveries in late October. • The move to a higher availability environment is planned for Q2 2017. Currently migrating components to the integration test environment in support of upcoming testing activities

Major Project Highlights – (as of 11/30/2016) – continued

Project	Trending as Expected	Further Information
<p>Data Center 4.0 Optimization (DC⁴) Program – 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"> • The DC⁴ Program is in Planning and is tracking to the approved schedule and program budget: <ul style="list-style-type: none"> ◦ The procurement of DB Storage is underway as architectural designs are being vetted and finalized. Impact Analysis is underway and project is expected to Gate to Initiation in early December. • Projects under the program: <ul style="list-style-type: none"> ◦ Compute-DB INF Install and Migration Project – successfully migrated the Commercial systems and decommissioned the old systems in Bastrop and Taylor Production. Continue planning to migrate the Grid/EMS systems (Stage 2) ◦ Network-Core Network Project – Taylor MGMT Network cutover completed and now planning for the Taylor Production network cutover in mid-December ◦ Telecom-Control Room & Grid Ops Project – in the Planning phase, including the build-out of the Operator Training System (OTS), as well as planning and procuring the IPC and Hotline hardware for Production Execution ◦ Network-Command & Control Project – in the Planning phase, to plan the replacement of the eternal/global network load balancers. Also working to complete the design and procurement of the Global Traffic Managers (GTM) by mid-December ◦ Compute-x86 Base Install Project – All hardware has been received, and project is currently executing the build-out, configuration, and deployment of the Dev / Test systems. Production build-out of hardware is being planned for early next year. ◦ App Stack Migration Project – is in the Initiation phase, preparing to move to the Planning phase and continue the detailed application migration planning to the new x86 systems
<p>NPRR219 and SCR783, Outage Scheduler Enhancements – Group 2, Usability and Filtering Enhancements – 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"> • The project went live on 9/26/16 as planned and was under Stabilization efforts during October and November <ul style="list-style-type: none"> ◦ Transition of submitted outages from ERCOT to QSE's was successfully completed. ◦ A post go-live release addressing minor defects went live in October. • The Stabilization period is now complete; project will be closed in December.

Major Project Highlights – (as of 11/30/2016) – continued

Project	Trending as Expected	Further Information
<p>CRR Framework Upgrade Project – Improves the ability to support and maintain the CRR system by upgrading the User Interface framework and its related components to current versions</p>	<p>Yes</p>	<ul style="list-style-type: none"> • The project is in the Execution phase and tracking to approved schedule and budget. • Development activities underway with incremental software releases from the vendor to demonstrate system functionality and requirement fulfillment • Factory Acceptance Testing (FAT) will commence in mid-January at the vendor's site, followed by an onsite FAT cycle at ERCOT in late January. • A three-month market trials/requalification period will commence in July 2017; Market Participant Training to coincide with Market Trials. • Go Live is scheduled for early October 2017.
<p>2015 CMM NPRRs and Tech Refresh – Combines eight CMM NPRRs, a technical refresh and new functionality into a single project to gain efficiencies</p>	<p>Yes</p>	<ul style="list-style-type: none"> • Project is in the Planning phase, which runs through mid-March 2017. • The team is currently compiling and finalizing requirements to support the scope of work. • During the Planning phase the team will evaluate and recommend the delivery approach for this project, to possibly include multiple phased releases of bundled functionality through 2017 and into 2018. • Scope includes: <ul style="list-style-type: none"> ◦ NPRR484 Phase 1b – Revisions to Congestion Revenue Rights Credit Calculations & Payments ◦ NPRR519 – Exemption of ERS-Only QSEs from Collateral and Capitalization ◦ NPRR683 – Revision to Available Credit Limit Calculation ◦ NPRR620 – Collateral Requirements for Counter-Parties with No Load or Generation ◦ NPRR660 – Remove CRR State Change Adder ◦ NPRR702 – Flexible Accounts, Payment of Invoices, Disposition of Interest on Cash Collateral ◦ NPRR741 – Clarifications to TPE and EAL Credit Exposure Calculations ◦ NPRR743 – Revision to MCE to Have a Floor For Load Exposure ◦ Tech Refresh – CMM UI Rewrite ◦ Delivery of new Credit screens ◦ Merge Financial Transfer functionality into CMM

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