Item 4.2: Operations Report
(January – February 2017)

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President & CEO
ERCOT

Board of Directors Meeting

ERCOT Public
April 4, 2017

Summary – January 2017

Operations

- The preliminary Settlements hourly peak demand of 59,636* MW on January 6 was higher than the day-ahead mid-term load forecast peak of 55,526 MW for the same operating hour.
  - The operational instantaneous peak demand was 59,734 MW (telemetry)
- Day-ahead load forecast error for January was 4.07%.
- ERCOT issued four notifications:
  - One OCN issued due to reserve capacity shortage
  - One Advisory issued due to Physical Responsive Capability being below 3,000 MW
  - One Advisory issued due to extreme cold weather
  - One Advisory issued due to VSAT unavailability

Planning Activities

- 254 active generation interconnection requests totaling 60,108 MW, including 26,270 MW of wind generation, as of January 31, 2017. This is the same number of requests and an increase of 212 MW from December 31, 2016.
- 18,064 MW wind capacity in commercial operations on January 31, 2017.

*Per Demand and Energy Report as of 03/07/17

Summary – February 2017

Operations

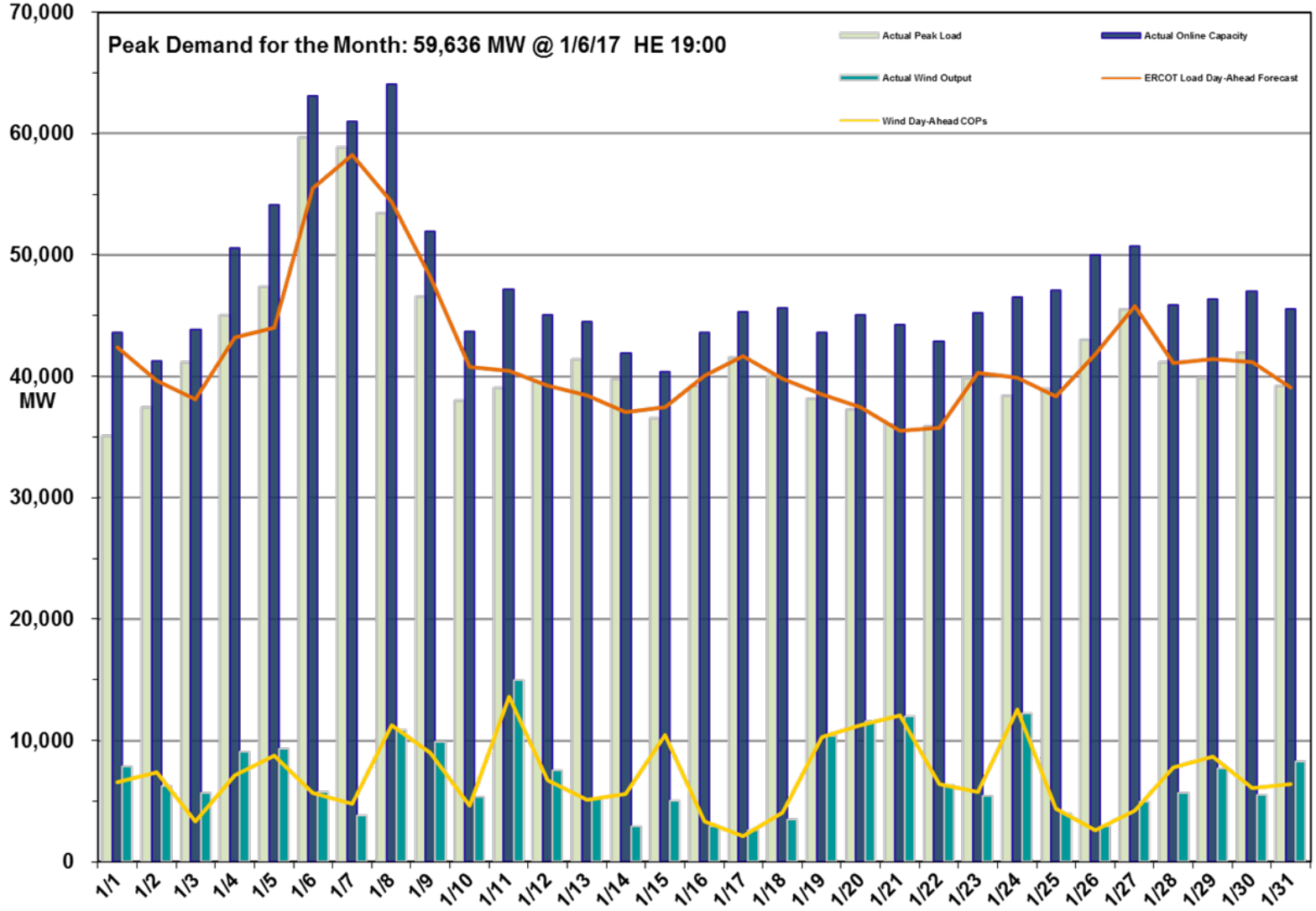
- The preliminary Settlements hourly peak demand of 42,729* MW on February 16 was higher than the day-ahead mid-term load forecast peak of 41,478 MW for the same operating hour.
  - The operational instantaneous peak demand was 43,370 MW (telemetry).
- Day-ahead load forecast error for February was 2.02%.
- ERCOT issued three notifications:
  - One Advisory issued due to Physical Responsive Capability being below 3000 MW
  - One Advisory issued due to Delay in DAM Solution
  - One Watch issued due to DRUC not completing on schedule

Planning Activities

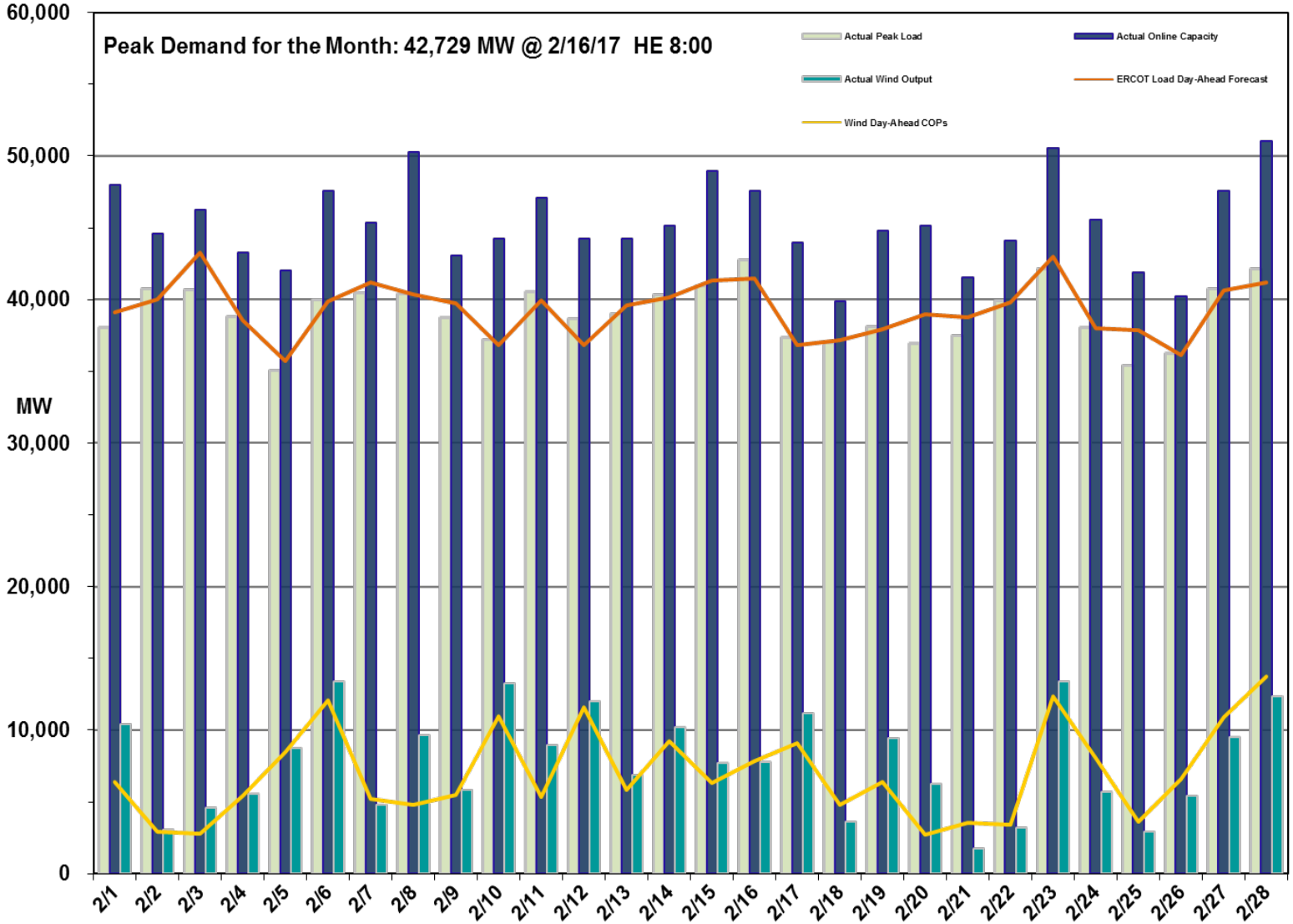
- 260 active generation interconnection requests totaling 60,267 MW, including 26,510 MW of wind generation, as of February 28, 2017. Six additional requests and an increase of 159 MW from January 31, 2017.
- 18,358 MW wind capacity in commercial operations as of March 1, 2017.

*Per Demand and Energy Report as of 03/07/17

Daily Peak Demand: Hourly Average Actual vs. Forecast, Wind Day-Ahead COPs & On-Line Capacity at Peak – January 2017



Daily Peak Demand: Hourly Average Actual vs. Forecast, Wind Day-Ahead COPs & On-Line Capacity at Peak – February 2017



Market Statistics – January 2017

Market Statistics	January 2016	January 2017	2016 Average	2017 YTD Average
Percentage of Real-Time load hedged in Day-Ahead Market (%)	130	127	122	127
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Day-Ahead Market ($/MWh)	19.72	24.09	24.56	24.09
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Real-Time ($/MWh)	18.51	24.87	23.51	24.87
Average East Houston Fuel Index Price ($/MMBtu)	2.21	3.22	2.45	3.22

Market Statistics – February 2017

Market Statistics	February 2016	February 2017	2016 Average	2017 YTD Average
Percentage of Real-Time load hedged in Day-Ahead Market (%)	136	133	122	130
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Day-Ahead Market ($/MWh)	15.76	20.97	24.56	22.66
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Real-Time ($/MWh)	15.09	20.55	23.51	22.90
Average East Houston Fuel Index Price ($/MMBtu)	1.89	2.78	2.45	3.01

Operational Performance Measures – January & February 2017

Performance Measure	Target Met	Further Information
Retail Transaction Performance *(Target 98%)*	*Yes*	• Retail transaction processing performance was near 100%.
Settlements Performance *(Target 99%)*	*Yes*	• 100% timely statement and invoice posting.

Operational Dashboard – January & February 2017

Metric	Trending as Expected	Further Information
Day-Ahead Schedule	*Yes*	• 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*	• Hourly average prices correctly reflect the opportunity cost of energy.
Day-Ahead vs. Real-Time Load Zone Settlement Point Price (Hourly Average)	*Yes*	• 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*	• The average energy price across the system reflects marginal offers and scarcity pricing impacts.
Day-Ahead Reliability Unit (DRUC) Commitment Monthly Summary	*Yes*	• 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. • 1 DRUC was missed due to late completion of DAM (2/12).

Operational Dashboard – January & February 2017

Metric	Trending as Expected	Further Information
Hourly Reliability Unit Commitment (HRUC) Monthly Summary	*Yes*	• Capacity committed by the HRUC process indicates the level of out-of-market activity needed during the Operating Day to maintain reliability. • 6 resources committed in January to resolve congestion or provide additional capacity. • 2 resources committed in February to resolve congestion.
Supplemental Ancillary Service Market Monthly Summary	*Yes*	• Normal trend indicates that infeasibility was not a major concern.
Non-Spinning Reserve Service Deployment	*Yes*	• Non-Spin was not deployed in January or February.
Congestion Revenue Rights Price Convergence	*Yes*	• Normal trend indicates good ability of market participants to estimate value of hedges.

Operational Dashboard – January 2017

Metric	Trending as Expected	Further Information
Retail Transactions	*Yes*	• Seasonal variations in transaction volumes trending as expected.
Advanced Metering	*Yes*	• 98.8% of ERCOT load settled with 15-minute interval data. • 7 million Advanced Metering System (AMS) Electric Service Identifier (ESIID)s included in settlement as of January 2017.
Settlement Dollars	*Yes*	• As of settlement of Operating Day 01/31/2017, the daily average settlement dollars for January 2017 are $12.62 million, up from $11.7 million in December 2016 and up from an average of $7.57 million in January 2016.
Revenue Neutrality	*Yes*	• As of settlement of Operating Day 01/31/2017, Revenue Neutrality uplift is a charge of $10.46 million, up from a $0.18 million charge in December 2016 and up from a $3.85 million charge in January 2016.
Market-Based Uplift to Load	*Yes*	• As of settlement of Operating Day 01/31/2017, the market-based uplift to load is a charge of $33.71 million, as opposed to a $35.43 million charge in December 2016 and a charge of $18.58 million in January 2016.

Operational Dashboard – February 2017

Metric	Trending as Expected	Further Information
Retail Transactions	*Yes*	• Seasonal variations in transaction volumes trending as expected.
Advanced Metering	*Yes*	• 98.8% of ERCOT load settled with 15-minute interval data. • 7 million Advanced Metering System (AMS) Electric Service Identifier (ESIID)s included in settlement as of February 2017.
Settlement Dollars	*Yes*	• As of settlement of Operating Day 02/28/2017, the daily average settlement dollars for February are $9.51 million, down from $12.62 million in January 2017 and up from an average of $6.65 million in February 2016.
Revenue Neutrality	*Yes*	• As of settlement of Operating Day 02/28/2017, Revenue Neutrality uplift is a charge of $5.73 million, down from January 2017, which was a charge of $10.46 million, and up from February 2016, which was a charge of $2.32 million.
Market-Based Uplift to Load	*Yes*	• As of settlement of Operating Day 02/28/2017, the market-based uplift was a charge of $21.48 million, as opposed to a charge of $33.71 million in January 2017 and a charge of $26.25 million in February 2016.

Major Project Highlights – (as of 03/22/2017)

Project	Trending as Expected	Further Information
NMMS Upgrade Project – Replace the current Siemens NMMS application with the next generation of model management software available from Siemens	*Yes*	• As previously reported, ERCOT has postponed the go-live date of this project. Although the project had successfully met the targeted defect count and completed market participant training, the steering committee agreed that the system needed additional time before it is operationally ready. Specifically, the Development, Operations, and business teams needed more time to resolve some performance and stability issues and validate the model load process end-to-end. • Since February, performance and stability issues appear to be resolved and only a small number of critical defects remain. The project team continues to test the system while the vendor works to address remaining critical functional defects. Validation testing for the resolution of performance and stability issues continues. The team has been running weekly tests of the model load process and resolving issues as they are identified. • A new go-live target in Q2 2017 has been identified and will be communicated once production-ready milestones are achieved. The new date will account for necessary time to communicate to the Market, complete all ERCOT pre-production activities, and address any open operational readiness activities. • An extended stabilization period after go-live will include additional releases to address any post-production defects identified and deferred defects.
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	*Yes*	• The project is in the Execution phase and tracking to approved schedule and budget. Go-live is scheduled for late January 2018. • Factory Acceptance Testing (FAT) commenced in mid-January at the vendor's site and concluded in early March. Onsite FAT cycle at ERCOT will begin in late March. • A three-month market trials/requalification period will commence in July 2017; Market Participant Training to coincide with Market Trials.
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), provide Mid-Term Load Forecast (MTLF) tuning and training along with Itron software upgrade	*Yes*	• The project is in the Execution Phase and is tracking to approved schedule and budget. • Integration test activities are currently underway. • The system is scheduled to go live with the functional improvements and tool enhancements, in a high availability environment, in May 2017.

Major Project Highlights – (as of 03/22/2017) – continued

Project	Trending as Expected	Further Information

2015 CMM NPRRs and Tech Refresh – Combines CMM NPRRs, a technical refresh and new Treasury functionality into a single project to gain efficiencies	*Yes*	• This project will deliver in three phases – the phases are in Planning/Execution and tracking to approved schedule and budget.
		  • Phase 1 is in Execution and will deliver the CMM technical refresh along with the majority of the Credit-related NPRRs. This phase will go live in May 2018.
		  • Phase 2, which continues in Planning, will deliver Financial Transfer functionality and additional Credit/Treasury efficiencies. The go-live date will be set late Summer 2017.
		  • Phase 3 will deliver any remaining low-priority scope. The go-live date for this phase will be addressed following completion of Planning for Phase 2.

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	*Yes*	• The DC4 Program projects are in Planning/Execution and are tracking to the approved schedule and program budget. The following projects are active under this program:
		  o Compute-DB INF Install and Migration Project – in Stage 2–Execution phase and has successfully migrated to the POWER8 Grid Test environment and decommissioned the old Grid Test Power7 systems. The Grid Production DB systems will be migrated to the new POWER8 systems from late March through the end of May.
		  o Network-Core Network Project – in Execution phase and has completed all Taylor network cutovers, as well as the Bastrop MGMT and PROD network cutover. The remaining Bastrop network cutovers (Internet, WAN, GRID and Core) will occur by the middle of April.
		  o Telecom-Control Room & Grid Ops Project – in the Planning phase, with the build-out of the Operator Training System (OTS) and Transport Pod underway. The IPC/NICE hardware for OTS is installed and ready for configuration. Planning was extended to better align with the DC4 Network-Core Project.
		  o Network-Command & Control Project – in Stage 1–Execution phase, the project is conducting a proof-of-concept, to determine the best solution for enterprisewide network load balancing. Stage 2 of the project is in the Planning phase and is planning and defining a solution for a new network logging system (Syslog).
		  o Compute-x86 Base Install Project – in Execution phase, with the Taylor converged infrastructure (FlexPod) deployments completed. The Bastrop production deployment of the new FlexPods will be completed by the end of March.
		  o Application Migration Project – in Stage 1–Execution phase, having completed migrating all Dev and Test virtual-to-virtual (V2V) systems and conducting the production V2V system migrations in April and May. The physical-to-virtual system migration planning (Stage 2) begins in late March.
		  o Storage-DB INF Install and Migration – in Planning phase, with all procurement for the DB Storage (Commercial DB Storage and Grid DB Storage) near complete and the backup and tape components now purchased. The planning for the hardware standup, as well as the DB migration planning has begun.

Appendix

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