Item 4.3: Operations Report
(March & April 2015)

H.B. "Trip" Doggett
President & CEO

Board of Directors Meeting
ERCOT Public
June 9, 2015

Summary – March 2015

Operations

- The peak demand of 53,084 MW on March 6th was less than the mid-term forecast peak of 54,721 MW of the same operating period. In addition, it was less than the March 2014 actual peak demand of 54,549 MW. The instantaneous peak load on March 6th was 54,161 MW.

- Day-ahead load forecast error for March was 3.81%

- ERCOT issued six notifications

    – One advisory due to cold weather (3/3)

    – One watch due to cold weather (3/4)

    – One advisory for a GMD Alert of K-7, later upgraded to K-8 (3/17)

    – One watch due to failure of SCED (3/30)

    – One watch due to failure of HRUC for HE 0700 (3/30)

    – One advisory due to postponing of the DAM Solution (3/30)

Planning Activities

- 251 active generation interconnection requests totaling over 63,400 MW, including 25,300 MW of wind generation as of March 31, 2015. Six additional requests and 341 additional MW from February 28, 2015.

- 12,569 MW wind capacity in commercial operations on March 31, 2015.

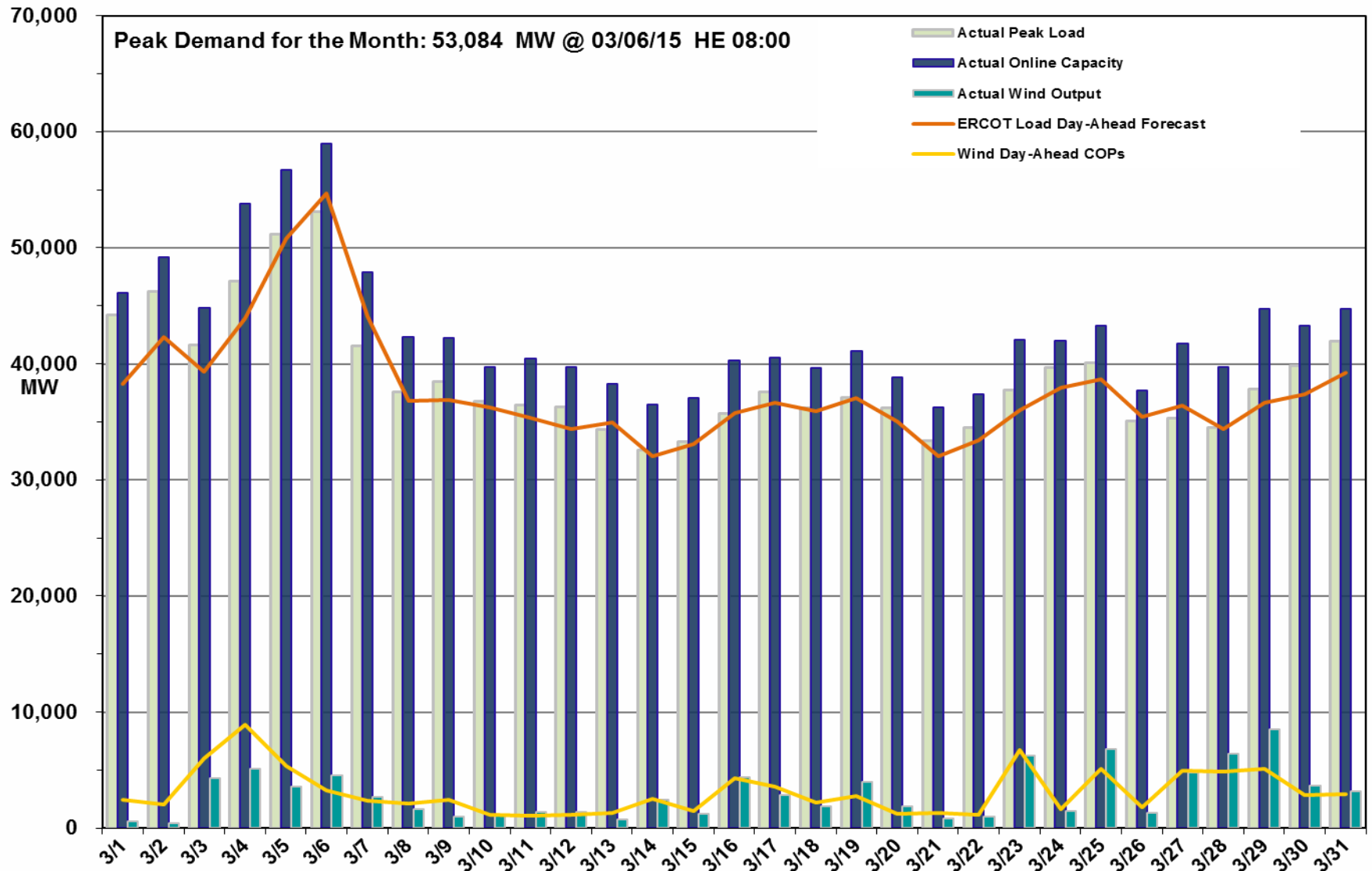**Item 4.3**
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Summary – April 2015

Operations

- The peak demand of 45,242 MW on April 9th was greater than the mid-term forecast peak of 44,561 MW of the same operating period. In addition, it was less than the April 2014 actual peak demand of 48,464 MW. The instantaneous peak load on April 9th was 45,497 MW.

- Day-ahead load forecast error for April was 2.41%

- ERCOT issued one notification

  - One advisory due to the Voltage Security Assessment Tool (VSAT) being unavailable (4/24)

Planning Activities

- 252 active generation interconnection requests totaling 61,718 MW, including 24,557 MW of wind generation as of April 30, 2015. One additional request yet a decrease of 1,682 MW from March 31, 2015.

- 13,060 MW wind capacity in commercial operations on April 30, 2015.

Daily Peak Demand: Hourly Average Actual vs. Forecast, Wind Day-Ahead COPs & On-line Capacity at Peak – March 2015

Peak Demand for the Month: 53,084 MW @ 03/06/15 HE 08:00

Legend:
- Actual Peak Load
- Actual Online Capacity
- Actual Wind Output
- ERCOT Load Day-Ahead Forecast
- Wind Day-Ahead COPs

Daily Peak Demand: Hourly Average Actual vs. Forecast, Wind Day-Ahead COPs & On-line Capacity at Peak – April 2015
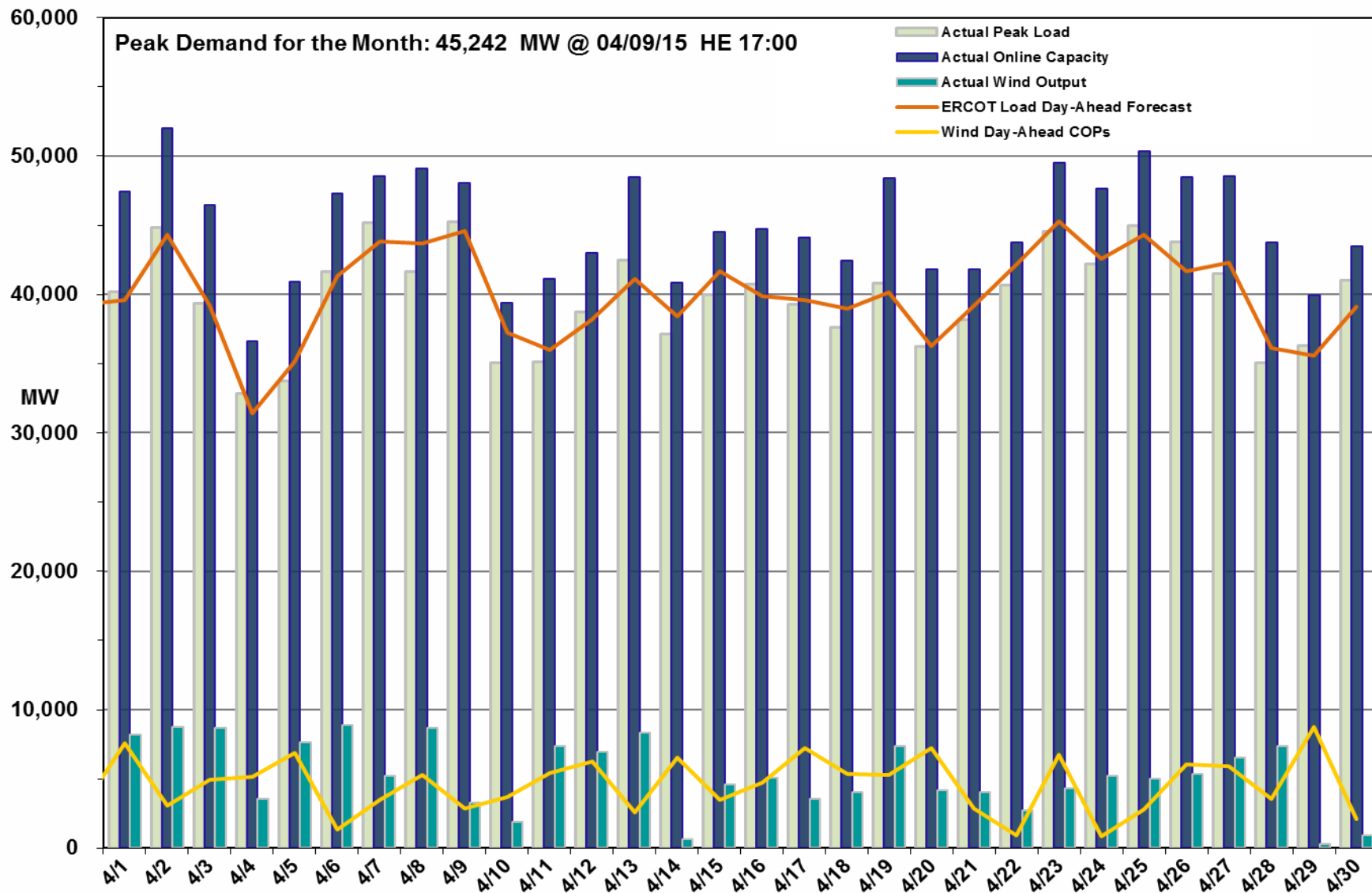
Market Statistics – March 2015

Market Statistics	March 2014	March 2015	2014 Average	2015 YTD Average
Percentage of Real-Time load hedged in Day-Ahead Market	133.84%	143.27%	124.80%	137.87%
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Day-Ahead Market ($/MWh)	57.02	27.34	40.81	26.19
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Real-Time ($/MWh)	57.02	28.59	38.87	26.73
Average East Houston Fuel Index Price ($/MMBtu)	4.75	2.70	4.31	2.77

Market Statistics – April 2015

Market Statistics	April 2014	April 2015	2014 Average	2015 YTD Average
Percentage of Real-Time load hedged in Day-Ahead Market	130.67%	141.51%	124.80%	138.78%
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Day-Ahead Market ($/MWh)	42.07	24.65	40.81	25.82
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Real-Time ($/MWh)	40.85	24.32	38.87	26.16
Average East Houston Fuel Index Price ($/MMBtu)	4.58	2.56	4.31	2.72

Operational Performance Measures – Mar. & Apr. 2015

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 – March & April 2015

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 • Higher average Day-Ahead energy prices reflect the risk premium between Day-Ahead & Real-Time
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

Operational Dashboard – March & April 2015

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 • No resource was committed in March • 1 resource was committed in April to resolve congestion
Supplemental Ancillary Service Market Monthly Summary	*Yes*	• Normal trend indicates that deliverability was not a major concern
Non-Spinning Reserve Service Deployment	*Yes*	• Offline Non-Spin was deployed for voltage support
Congestion Revenue Rights Price Convergence	*Yes*	• Normal trend indicates good ability of market participants to estimate value of hedges

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Operational Dashboard – March 2015

Metric	Trending as Expected	Further Information
Retail Transactions	*Yes*	• Seasonal variations in transaction volumes trending as expected
Advanced Metering	*Yes*	• 98.4 % of ERCOT load settled with 15-minute interval data. • 6.7M Advanced Metering System (AMS) Electric Service Identifier (ESIID)s included in settlement as of March 2015.
Settlement Dollars	*Yes*	• As of settlement of Operating Day 03/31/2015, the daily average settlement dollars for March are $9.88M, which is up from $9.28M in February 2015 and down from March 2014 which had an average of $20.14M.
Revenue Neutrality	*Yes*	• As of settlement of Operating Day 03/31/2015, Revenue Neutrality uplift is a charge of $2.08M, which is up from a $0.21M charge in February 2015 and down from a $12.61M charge in March 2014.
Market-Based Uplift to Load	*Yes*	• As of settlement of Operating Day 03/31/2015, the market-based uplift to load is a charge of $22.91M, as opposed to a $10.40M charge in February 2015 and a charge of $59.27M in March 2014.

Operational Dashboard – April 2015

Metric	Trending as Expected	Further Information
Retail Transactions	*Yes*	• Seasonal variations in transaction volumes trending as expected
Advanced Metering	*Yes*	• 98.5 % of ERCOT load settled with 15-minute interval data. • 6.7M Advanced Metering System (AMS) Electric Service Identifier (ESIID)s included in settlement as of April 2015.
Settlement Dollars	*Yes*	• As of settlement of Operating Day 04/30/2015, the daily average settlement dollars for April are $8.76M, which is down from $9.88M in March 2015 and from April 2014 which had an average of $14.52M.
Revenue Neutrality	*Yes*	• As of settlement of Operating Day 04/30/2015, Revenue Neutrality uplift is a charge of $0.97M, which is down from March 2015 which was a charge of $2.08M and down from April 2014 which was a charge of $8.92M.
Market-Based Uplift to Load	*Yes*	• As of settlement of Operating Day 04/30/2015, the market-based uplift was a charge of $13.57M, as opposed to a charge of $22.91M in March 2015 and a charge of $35.38M in April 2014.

Market Enhancements Under Consideration

Enhancement	Further Information
Evaluating market design improvement proposals	Operating Reserve Demand Curve (ORDC) • NPRR 568 Phase 2 implementation has been put on hold until further decision by PRS Future Ancillary Services Team (FAST) Activity • NPRR 667 was posted on 11/18/2014 • Four workshops have occurred this year • Brattle is working on the Cost Benefit Analysis (CBA) on the Future Ancillary Services framework • Target is to complete the CBA by Oct 2015
Evaluating Pilot Project Feasibility	• No current pilot projects

Major Project Highlights (as of 05/28/2015)

Project	Trending as Expected	Further Information

EMS Upgrade Program – Upgrade EMS and OTS from ALSTOM EMP 2.3 to EMP 3.0	*Yes*	• The program is in the Execution Phase and tracking to the planned schedule and budget
		• ALSTOM Development
		  ○ Completed development deliverables ahead of schedule and under budget with good quality
		  ○ Vendor will now be providing defect fixes and testing support
		• ERCOT Development
		  ○ Delivering good quality, on schedule and budget
		  ○ Phase 4 on track for end of June delivery; one more major development phase ends in August
		  ○ Will move into defect fixes and testing support mode in September
		• Infrastructure
		  ○ New Dev/iTest converged infrastructure online at Taylor datacenter
		  ○ Taylor and Bastrop Production systems received; will be online in July allowing for a seven month window running on new infrastructure leading up to March 2016 Closed Loop testing
		• Testing
		  ○ Currently in Functional Acceptance Testing (FAT)
		  ○ Integrated testing between EMS applications starts in July; followed by integrated testing with down stream systems in November
		  ○ Failover, backups and recovery testing also begins in November
		  ○ Close Loop testing begins in March 2016

NMMS Upgrade Project – Replace the current Siemens NMMS application with the next generation of model management software available from Siemens	*Yes*	• Project in Execution Phase and tracking to planned schedule and budget
		• The team continues its progress on development and test script documentation activities; development complete milestone in August remains intact
		• Development for core system components continues as planned with no major issues
		• User interface (UI) development tasks, which were reported as falling behind schedule in late April, have shown good progress against the schedule recovery plan ERCOT put in place
		  ○ Staff traveled to the vendor site in late April to assess the UI development progress and to address the recovery plan with the vendor
		  ○ Additional UI checkpoints are planned for late May and late June

Major Project Highlights (as of 05/28/2015) – continued

Project	Trending as Expected	Further Information
ABB MMS/OS Technology Refresh – Improve ERCOT's ability to support and maintain the Market Management System (MMS) and Outage Scheduler (OS) system by upgrading the underlying infrastructure and its required components to versions on mainstream vendor support	*Yes*	• Stabilization period following the March go-live continues, with support teams continuing to actively monitor the production environment for any issues or defects; overall schedule and budget remain intact • Only 14 production defects have been logged and a stabilization release to address these defects is scheduled to migrate to Production in late June (R3 release) • Decommissioning activities are running in parallel to stabilization; scheduled to complete by end of May
Market System Enhancements 2015 – Deliver NPRR626, Reliability Deployment Price Adder, along with other related NPRRs	*Yes*	• The project is currently in the Execution phase and continues on track with approved schedule and budget and the R3 go-live date remains June 28th • After reviewing scope and delivery alternatives with the Market, the go-live scope has been confirmed to include NPRR626, as well as NPRR598, NPRR645, NPRR665 and OBD • Code developed by both the vendor and ERCOT has been merged and migrated to functional and integration test environments. Functional testing completed in mid-May and the team is currently running integration, load and regression testing that is scheduled to complete by June 19th
OSI PI Visualization Enhancements – Provide hardware and OSI PI tools for improved visualization to Operations staff to support development of control room displays and web-based tools that delivers fast, easy, and secure access to all PI System data.	***No***	• *The Project is currently in the Execution Phase and schedule has slipped by two months due to unexpected resource constraints and delays with configuration of the test environment* • Planned Go-Live has moved from June 2015 to August 2015; however, the budget remains intact • Team is working through environment setup tasks as well as revisiting the software licensing plans to ensure optimal pricing and service coverage for the planned user base counts • "Train the trainer:" training sessions supplied by the vendor to ERCOT staff were completed in April and May. Other training sessions for ERCOT Operators, to be delivered by ERCOT staff, are planned to occur in parallel with ongoing user acceptance testing that is scheduled for late June

Project	Trending as Expected	Further Information
CIP v5 Readiness Program – Develop, modify and implement processes, procedures, workflows, and tools to ensure ERCOT's compliance with NERC CIP v5 standards	*Yes*	- NERC Critical Infrastructure Protection (CIP) Cybersecurity Standards version 5 is a regulatory requirement that is effective April 1, 2016 - The program is comprised of a dedicated Readiness Project which is on schedule and budget. - The following projects have deliverables for the program in addition to other requirements. ○ Configuration Management System ○ Privileged Account Management ○ Information Technology Change Management ○ Firewall Access System ○ Next Generation Scanning ○ NERC/CIP ESP Network Isolation project (delayed due to pending NERC ruling on virtualization) - Changes to policies, procedures and workflows continue on track with the program schedule

Appendix

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