Item 4.3: Operations Report
(July & August 2015)

H.B. "Trip" Doggett
President & CEO

Board of Directors Meeting
ERCOT Public
October 13, 2015

Summary – July 2015

Operations

- The peak demand of 67,624 MW on July 30th was less than the mid-term forecast peak of 68,126 MW of the same operating period. In addition, it was greater than the July 2014 actual peak demand of 63,500 MW. The instantaneous peak load on July 30th was 67,716 MW.

- Day-ahead load forecast error for July was 1.89%.

- ERCOT issued five notifications
    - Two advisories issued due to Physically Responsive Capability being less than 3,000 MW (7/29 and 7/31).
    - One OCN issued due to a Capacity Insufficiency (7/30).
    - Media appeal issued for energy conservation as a precautionary measure to ensure system reliability due to hot weather causing high ERCOT demands and reduced generation capability due to unplanned generation outages (7/30).
    - One OCN due to the development of a new Generic Transmission Constraint (GTC) due to transmission outages in the region (7/31).

Planning Activities

- 271 active generation interconnection requests totaling 63,939 MW, including 25,466 MW of wind generation as of July 31, 2015. Five additional requests, yet a decrease of 183 MW, from June 30, 2015.

- 13,424 MW wind capacity in commercial operations on July 31, 2015.
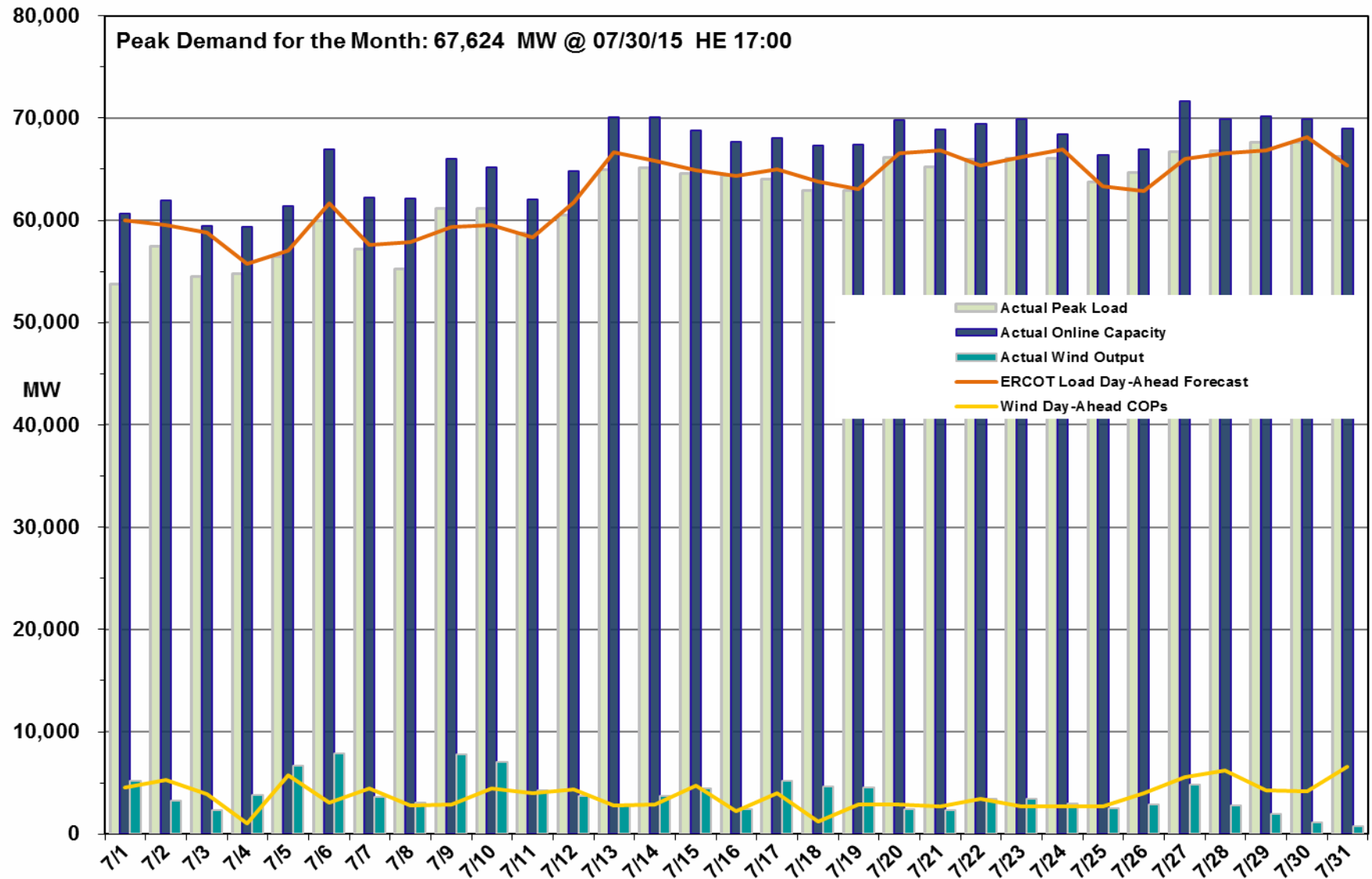
Summary – August 2015

Operations

- The peak demand of 69,783* MW on August 10th was less than the mid-term forecast peak of 69,813 MW of the same operating period. In addition, it was greater than the August 2014 actual peak demand of 66,725 MW. The instantaneous peak load on August 10th was 69,858 MW.

- Day-ahead load forecast error for August was 2.91%.

- ERCOT issued twelve notifications

  - Five advisories due to Physical Responsive Capability being less than 3,000 MW.

  - Four OCNs due to a projected reserve capacity shortage.

  - One advisory due to extreme hot weather.

  - One advisory due to the Voltage Security Assessment Tool being unavailable.

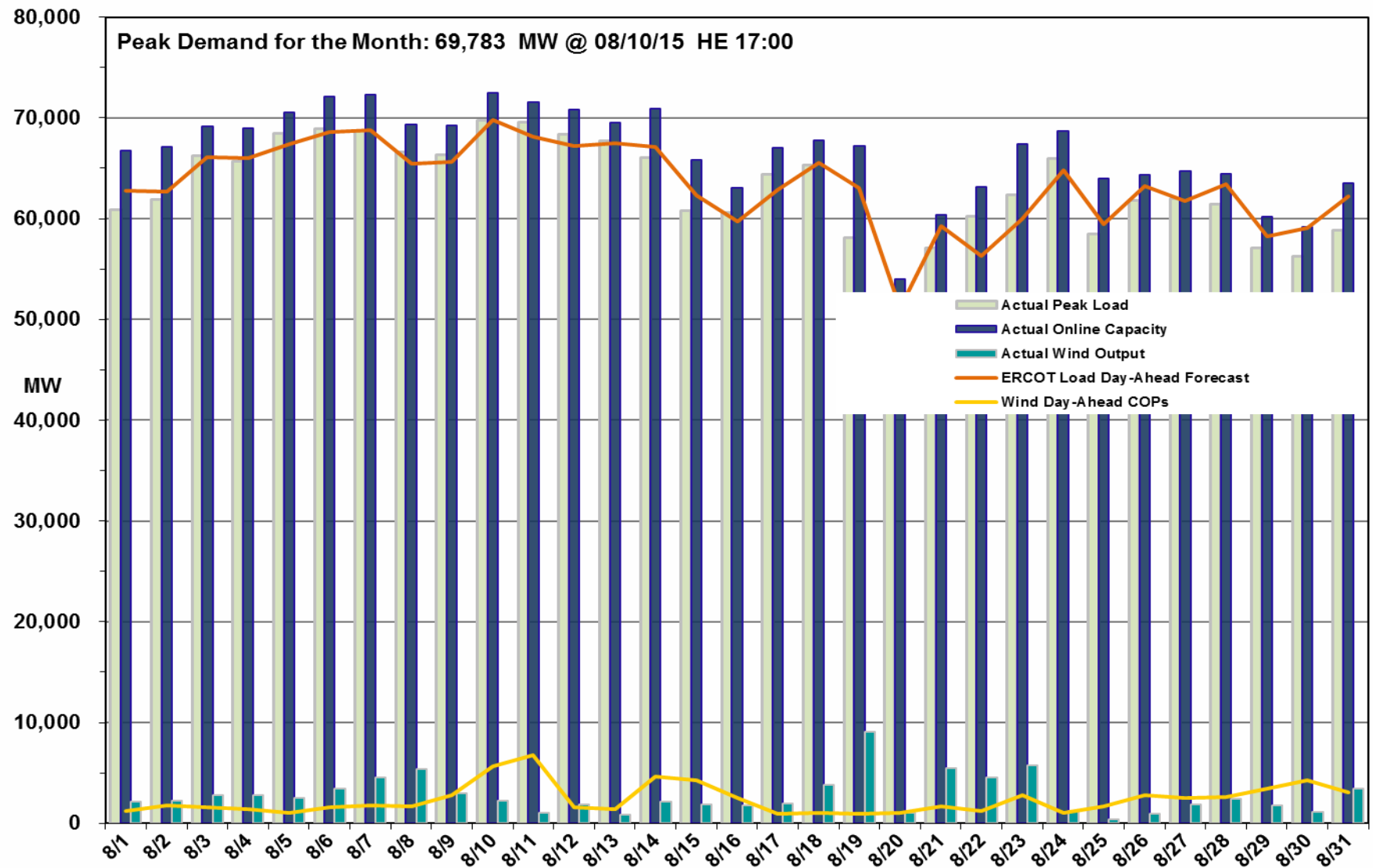 - One watch due to Physical Responsive Capability being less than 2,500 MW.

Planning Activities

- 269 active generation interconnection requests totaling 63,395 MW, including 25,271 MW of wind generation as of August 31, 2015. Two fewer requests and a decrease of 544 MW from July 31, 2015.

- 13,574 MW wind capacity in commercial operations on August 31, 2015.

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

Peak Demand for the Month: 67,624 MW @ 07/30/15 HE 17:00

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 – August 2015

Peak Demand for the Month: 69,783 MW @ 08/10/15 HE 17:00

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

Market Statistics – July 2015

Market Statistics	July 2014	July 2015	2014 Average	2015 YTD Average
Percentage of Real-Time load hedged in Day-Ahead Market	115.89%	123.26%	124.80%	133.66%
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Day-Ahead Market ($/MWh)	38.48	32.22	40.81	26.97
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Real-Time ($/MWh)	34.75	29.13	38.87	26.79
Average East Houston Fuel Index Price ($/MMBtu)	4.05	2.83	4.31	2.74

Market Statistics – August 2015

Market Statistics	August 2014	August 2015	2014 Average	2015 YTD Average
Percentage of Real-Time load hedged in Day-Ahead Market	113.25%	124.74%	124.80%	132.55%
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Day-Ahead Market ($/MWh)	42.95	54.68	40.81	31.25
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Real-Time ($/MWh)	37.27	37.40	38.87	28.43
Average East Houston Fuel Index Price ($/MMBtu)	3.92	2.74	4.31	2.74

Item 4.3
ERCOT Public

Operational Performance Measures – Jul & Aug 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 – July & August 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 – July & August 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 • 2 resources were committed in July to resolve congestion • 4 resources were committed in August 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*	• No Offline Non-Spin deployment in July • Offline Non-Spin was deployed in August due to low available capacity, transmission congestion and voltage support
Congestion Revenue Rights Price Convergence	*Yes*	• Normal trend indicates good ability of market participants to estimate value of hedges

Operational Dashboard – July 2015

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. • 6.8M Advanced Metering System (AMS) Electric Service Identifier (ESIID)s included in settlement as of July 2015.
Settlement Dollars	*Yes*	• As of settlement of Operating Day 07/31/2015, the daily average settlement dollars for July are $12.93M, which is up from $9.96M in June 2015 and down from July 2014 which had an average of $13.56M.
Revenue Neutrality	*Yes*	• As of settlement of Operating Day 07/31/2015, Revenue Neutrality uplift is a charge of $2.79M, which is up from a $2.64M charge in June 2015 and down from a $4.39M charge in July 2014.
Market-Based Uplift to Load	*Yes*	• As of settlement of Operating Day 07/31/2015, the market-based uplift to load is a charge of $17.51M, as opposed to a $7.68M charge in June 2015 and a credit of $5.73M in July 2014.

Operational Dashboard – August 2015

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. • 6.8M Advanced Metering System (AMS) Electric Service Identifier (ESIID)s included in settlement as of August 2015.
Settlement Dollars	*Yes*	• As of settlement of Operating Day 08/31/2015, the daily average settlement dollars for August are $18.27M, which is up from $12.93M in July 2015 and up from August 2014 which had an average of $14.99M.
Revenue Neutrality	*Yes*	• As of settlement of Operating Day 08/31/2015, Revenue Neutrality uplift is a charge of $0.14M, which is up from July 2015 which was a charge of $2.79M and up from August 2014 which was a charge of $3.83M.
Market-Based Uplift to Load	*Yes*	• As of settlement of Operating Day 08/31/2015, the market-based uplift was a charge of $63.44M, as opposed to a charge of $17.51M in July 2015 and a charge of $10.30M in August 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 and will be removed from the project schedule and from protocol after approval of NPRR 710 by the ERCOT Board
	
	• Future Ancillary Services Team (FAST) Activity
	   • NPRR 667 was posted on 11/18/2014
	   • Six workshops have occurred this year
	   • Another workshop will be held in November
	   • 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 09/30/2015)

Project	Trending as Expected	Further Information

EMS Upgrade Program – Upgrade EMS and OTS from ALSTOM EMP 2.3 to EMP 3.0	*Yes*	• Program is in the Execution Phase and tracking to the planned schedule and budget
		• ALSTOM Development
		   ○ Providing defect fixes and testing support
		• ERCOT Development
		   ○ Phase 5 delivered in August
		   ○ Providing defect fixes and testing support for remaining phases
		• Infrastructure
		   ○ iTest server builds and application installations completed
		   ○ Production server builds completed, application installations in progress
		• Testing
		   ○ Functional Acceptance Testing (FAT) ongoing
		   ○ Integrated testing ongoing
		   ○ Integrated testing with down stream systems in November
		   ○ Failover, backups and recovery testing also begins in November
		   ○ Close Loop testing begins in March 2016
		   ○ Go-live schedule for May 2016

NMMS Upgrade Project – Replace the current Siemens NMMS application with the next generation of model management software available from Siemens	***No***	• *The Project is in Execution Phase. Since the last update, the project team has identified the need to modify the scope and the approach of the project. The business process needs did not align with the limited capabilities of the vendor solution. A change in the approach for what is delivered by the Vendor versus internal development is expected to impact overall schedule and budget.* • In the meantime, work continues to address development of the Siemens base functionality and to complete the user interface (UI) screens. • The team also continues to closely monitor progress and quality with on site visits to the vendor to demo products and functionality, as well as to recover and/or minimize risks to milestone delivery dates in the current schedule

Major Project Highlights (as of 09/30/2015) – continued

Project	Trending as Expected	Further Information
Market System Enhancements 2015 – Deliver NPRR626, Reliability Deployment Price Adder, along with other related NPRRs	*Yes*	• The project successfully migrated to Production on schedule in late June • Stabilization efforts completed in early September and the project is now in the Closing phase. It will complete under budget • The scope for this project included NPRR626, as well as NPRR598, NPRR645, NPRR665 and OBD

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 in Execution; currently tracking to the approved budget but with a delay to the August go-live target due to security risk mitigation steps deemed prudent to implement*
		   • *A security assessment completed in early September resulted in a change to implemented connections between the corporate domain environment and the Critical Cyber Assets (CCA) environment. The change will result in a more secure connection and domain for OSI PI.*
		   • *Completion of the environment changes are expected to take another 3 to 4 weeks, pushing the final go-live date to late October.*
		• Other work has completed as needed to support the go-live plans
		   • Server build up and application installs for Development, Testing, Operator Training and Production environments are complete
		   • Functional testing activities also are complete, as well as Operator Training

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 CIP v5 is a regulatory requirement that is effective April 1, 2016
		• The overall program is managed by the Readiness Project which is on schedule and budget. The following efforts are ongoing.
		   ○ Changes to policies, procedures and workflows
		   ○ Changes to corporate standards
		   ○ Enterprise wide compliance training
		   ○ Access management & recovery plans
		   ○ Change and configuration management
		   ○ Information protection & incident response
		   ○ Asset management
		   ○ Remote access
		• The following projects are on track to deliver program dependencies
		   ○ Configuration Management System, Privileged Account Management, Information Technology Change Management, Firewall Access System, and Next Generation Scanning

Appendix

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