Item 4.3: Operations Report
(March & April 2014)

Trip Doggett
President & CEO

Board of Directors Meeting
ERCOT Public
June 10, 2014

Summary – March 2014

- **Operations**
  - The peak demand of 54,549 MW on March 3rd was greater than the mid-term forecast peak of 54,426 MW as well as the March 2013 actual peak demand of 41,710 MW. The instantaneous load on March 3rd was 54,669 MW.
  - The March peak was about 11,500 MW higher than the previous March record.
  - Day-ahead load forecast error for March was 3.36%
  - ERCOT issued five notifications
    - Two advisories for delayed posting of DAM related information
    - A single watch due to extreme weather affecting the ERCOT region
    - Two watches due to SCED failure

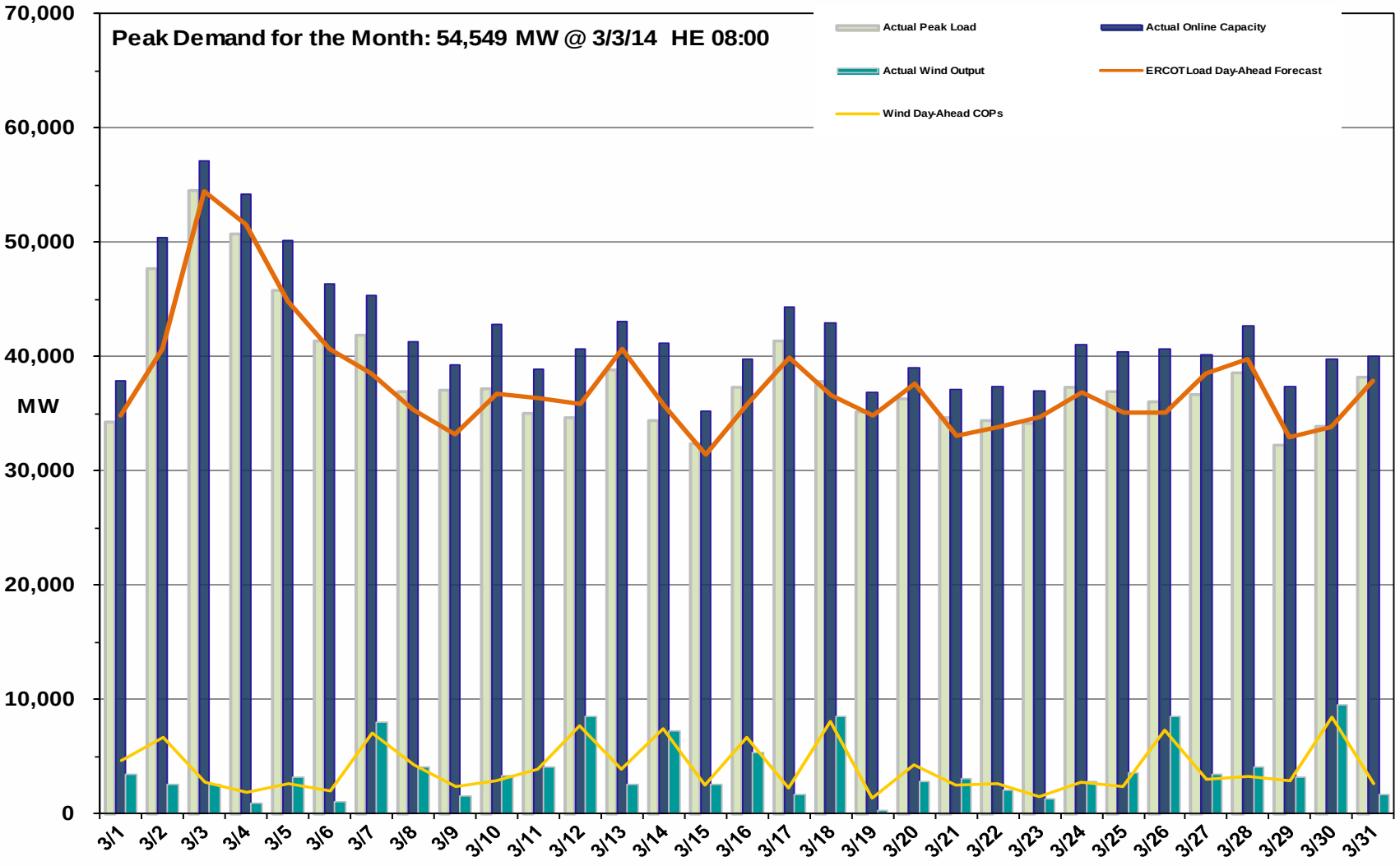
- **Planning Activities**
  - 230 active generation interconnection requests totaling over 58,100 MW, including 26,700 MW of wind generation as of March 31, 2014. Eleven more requests and 2,800 more MW from February 28, 2014.
  - 11,065 MW wind capacity in commercial operations March 31, 2014; no change from February 2014.

Summary – April 2014

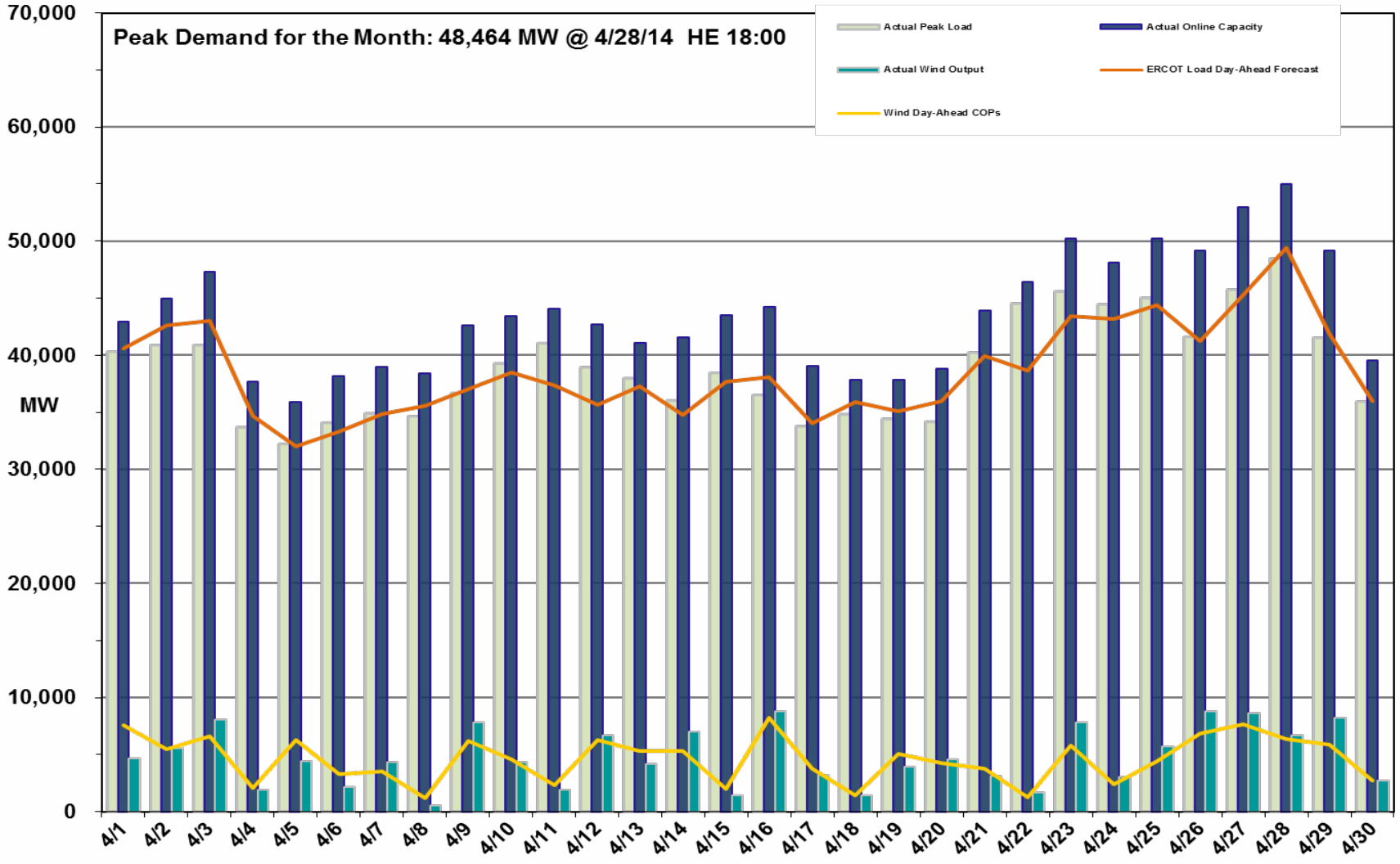
- **Operations**
  - The peak demand of 48,464 MW on April 28th was less than the mid-term forecast peak of 49,429 MW but greater than the April 2013 actual peak demand of 45,602 MW. The instantaneous load on April 28th was 48,689 MW.
  - Day-ahead load forecast error for March was 2.38%
  - ERCOT issued no emergency condition notifications in April

- **Planning Activities**
  - 234 active generation interconnection requests totaling over 60,400 MW, including 26,900 MW of wind generation as of April 30, 2014. Four more requests and 2,300 more MW from March 31, 2014.
  - 11,059 MW wind capacity in commercial operations April 30, 2014.

Daily Peak Demand: Hourly Average Actual vs. Forecast, Wind Day-Ahead COPs & On-line Capacity at Peak – March 2014



Daily Peak Demand: Hourly Average Actual vs. Forecast, Wind Day-Ahead COPs & On-line Capacity at Peak – April 2014



Market Statistics – March 2014

Market Statistics	March 2013	March 2014	2013 Average	2014 YTD Average
Percentage of Real-Time load hedged in Day-Ahead Market	115.65%	133.84%	121.18%	128.69%
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Day-Ahead Market ($/MWh)	30.80	57.02	34.14	50.27
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Real-Time ($/MWh)	29.81	57.02	32.45	51.46

Market Statistics – April 2014

Market Statistics	April 2013	April 2014	2013 Average	2014 YTD Average
Percentage of Real-Time load hedged in Day-Ahead Market	113.00%	130.67%	121.18%	129.19%
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Day-Ahead Market ($/MWh)	34.08	42.07	34.14	48.34
Average 'ERCOT Hub Average 345 kV Hub' Settlement Point Price in Real-Time ($/MWh)	34.95	40.85	32.45	48.97

Operational Performance Measures – March 2014

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

Operational Performance Measures – April 2014

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 2014

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 • 1 resource was committed in DRUC in this period

Operational Dashboard – April 2014

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 2014

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 • 23 resources were committed in March to help resolve congestion or capacity.
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 not deployed during this period
Congestion Revenue Rights Price Convergence	*Yes*	• Normal trend indicates good ability of market participants to estimate value of hedges

Operational Dashboard – April 2014

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 April to help 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 not deployed during this period
Congestion Revenue Rights Price Convergence	***No***	• *The total CRR value was about 2 times of the total CRR cost; CRRs were valued much higher in Day-Ahead due primarily to outages.*

Operational Dashboard – March 2014

Metric	Trending as Expected	Further Information
Retail Transactions	***No***	• *On March 11th ERCOT experienced a storage failure resulting in the loss of retail transaction capability. Transaction processing was restored on March 12th.* • Normal seasonal variations in transaction volumes
Advanced Metering	*Yes*	• 98.2 % of ERCOT load settled with 15-minute interval data. • 6.5M Advanced Metering System (AMS) Electric Service Identifier (ESIID)s included in settlement as of March 2014.
Settlement Dollars	*Yes*	• As of settlement of Operating Day 03/31/2014, the daily average settlement dollars for March are $20.1M, which is up from $18.9M in February 2014 and higher than March 2013 which had an average of $10.5M.
Revenue Neutrality	*Yes*	• As of settlement of Operating Day 03/31/2014, Revenue Neutrality uplift is a charge of $12.61M, which is up from a $2.49M charge in February 2014 and a $0.10M charge in March 2013.
Market-Based Uplift to Load	*Yes*	• As of settlement of Operating Day 03/31/2014, the market-based uplift to load is a charge of $47.76M, as opposed to a $38.19M charge in February 2014 and a charge of $0.29M in March 2013.

Operational Dashboard – April 2014

Metric	Trending as Expected	Further Information
Retail Transactions	*Yes*	• Normal seasonal variations in transaction volumes
Advanced Metering	*Yes*	• 98.3 % of ERCOT load settled with 15-minute interval data. • 6.6M Advanced Metering System (AMS) Electric Service Identifier (ESIID)s included in settlement as of April 2014.
Settlement Dollars	*Yes*	• As of settlement of Operating Day 4/30/2014, the daily average settlement dollars for April are $14.5M, which is down from $20.1M in March 2014 and higher than April 2013 which had an average of $13.4M.
Revenue Neutrality	*Yes*	• As of settlement of Operating Day 4/30/2014, Revenue Neutrality uplift is a charge of $8.92M, which is down from March 2014 which was a charge of $12.61M and up from April 2013 which was a charge of $5.55M.
Market-Based Uplift to Load	*Yes*	• As of settlement of Operating Day 4/30/2014, the market-based uplift was a charge of $24.22M, as opposed to a $47.76M charge in March 2014 and a charge of $9.39M in April 2013.

Market Enhancements Under Consideration

Enhancement	Further Information
Evaluating market design improvement proposals	• ERCOT BOD approved NPRR 568 and corresponding Other Binding Document (OBD) on 11/19/2013 • NPRR 568 implemented on 6/1/2014 • Updates given to TAC on 3/27/2014, 4/24/2014 and 5/29/2014 on Implementation Status • ERCOT is working with stakeholders in RATF meeting to improve the ORDC design

Major Project Highlights (as of 4/30/2014)

Project	Trending as Expected	Further Information
2014 Market Enhancements – Delivery of several Market related NPRRs including • NPRR568, Real-Time Reserve Price Adder Based on Operating Reserve Demand Curve, and • NPRR555, Load Resource Participation in Security-Constrained Economic Dispatch	*Yes*	• Project in Execution phase and tracking to approved schedule. Budget is slightly over forecast due to more internal labor required than originally expected • Testing wrapping up for the following scope components: o NPRR568 – Real-Time Reserve Price Adder Based on Operating Reserve Demand Curve; o NPRR555 – Load Resource Participation in Security-Constrained Economic Dispatch; o NPRR532 – Performance Measurement and Verification and Telemetry Requirements for Load Resources Providing Non-Spin; o NPRR591 – As-Built Clarification & Corrections Related to NPRR568 o NPRR598 – Clarify Inputs to PRC & ORDC • Production changes occurring in three releases: o February 2014: NPRR240 – Complete o April 2014: NPRR564 – Complete o June 1, 2014: Remainder of enhancements (NPRR532, NPRR555, NPRR568, NPRR591, NPRR598) as well as updates to MIS Dashboards, ERCOT.com and Mobile App
EMS Upgrade – Upgrade EMS and OTS from ALSTOM EMP 2.3 to EMP 3.0	*Yes*	• The project is tracking to approved schedule and budget baselines • Planning Phase 2 – Completed development, update and review of test scripts of all applications. The tasks in progress are: o Review and update of Work Breakdown Structure for the Execution Phase with Development focus o Preliminary SOW development at ALSTOM o Expansion of Early Development Environment platform • Early Risk Mitigation – involves development of a subset of key application subsystems by both ERCOT and ALSTOM and continues on track with no major issues. Work completed or in progress : o Load Forecast code development by ALSTOM complete; application testing in progress o Generation subsystem code development complete; display conversion in progress o Network Analysis code development of a subset of groups of changes/customs complete o SCADA development & testing by ERCOT complete o ETS (CIM Importer) development by ERCOT and ALSTOM complete; testing in progress

Major Project Highlights (as of 4/30/2014) – continued

Project	Trending as Expected	Further Information
Oracle 11g Upgrade – Upgrade Oracle databases and related tools that support ERCOT's application portfolio from Oracle 10g to Oracle 11g	*Yes*	• Change control approved in early May to extend execution go-live date • Date change resulted from resource contention with higher priority projects (2014 Market Enhancements and CMS and MIR Replacement) • Work underway on final 4 system upgrades to be delivered with this project: o Market Information System (MIS) o Credit Monitoring and Management (CMM) o Congestion Revenue Rights (CRR) o Nodal TIBCO • No issues reported with Development environments upgrades • Integration test environment upgrades are occurring in June • The CMM upgrade has completed functional regression testing and is scheduled to be upgraded to production on May 31st
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	***No***	• Project currently in Planning phase • Move to Execution Phase will be delayed pending discussions with vendor • *ERCOT and the vendor discussions over recent change in scope and cost* o *ABB April 2014 reforecast of remaining project work included scope that was not in original baseline* o *Completed negotiations with ABB and will be finalizing overall project estimates for the gate to Execution Phase.* • Other Planning milestones are underway or have been met, including: o Completion of hardware setup at the vendor's site o Installation of third party software to development/testing environments o Completion of initial code merge of base product with ERCOT customs by ABB o Completion of initial draft of the MM OS Technical Architecture document; currently in review cycles o Review of test strategy and test scripts has started and is currently in progress

Major Project Highlights (as of 4/30/2014) – continued

Project	Trending as Expected	Further Information
Settlement System Upgrade – Replace proprietary code, data structures and tools with an ERCOT supported solution	*Yes*	• Project team is making very good progress against the schedule and budget o Code development is 73% complete for required components (up from 68% reported in March 2014) o Functional Acceptance Testing (FAT) completion is at 57% and on target to complete as planned (percentage reported lower than in April report; this is due to additional breakdown of testing components into detailed modules for tracking purposes) • Project continues to track to approved schedule that delivers to production in Q4 2014 o On track for production release of Data Aggregation functionality with R4 release in July 2014 o Settlements and Billing functionality will follow, going live with the R6 release in December 2014 • Continuing to monitor Eligibility coding efforts to avoid any delays with this critical path work
CMS and MIR Replacement – Re-architect the Market Information Repository (MIR) and replace the Oracle Content Management Software Development Kit (CM SDK) with a more scalable, auditable, and cost effective solution	*Yes*	• Project successfully went live with new technology in April 2014 and no major issues to Production o Moved from Oracle 10g to 11g o Fully leveraging Enterprise Service Bus architecture o No longer bound to CMSDK o Removed 1 Oracle Application Server (OAS) dependency o Archiving content onto ERCOT Archival System (ISM) – follows data governance process • Project currently in extended Stabilization period through September 2014 during which time the team will install servers to provide high availability of the environment • Final project budget significantly higher than original estimate (by about $1M) o Utilized a new development approach at ERCOT (Agile) o Resulted in ongoing increases or changes to requirements and design • Final product improves ERCOT capability for providing market information • Detailed Lessons Learned will be help improve approach using Agile methodology

Appendix

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