Item 7.3: Passport Program Update

Matt Mereness
ERCOT Senior Director, Compliance

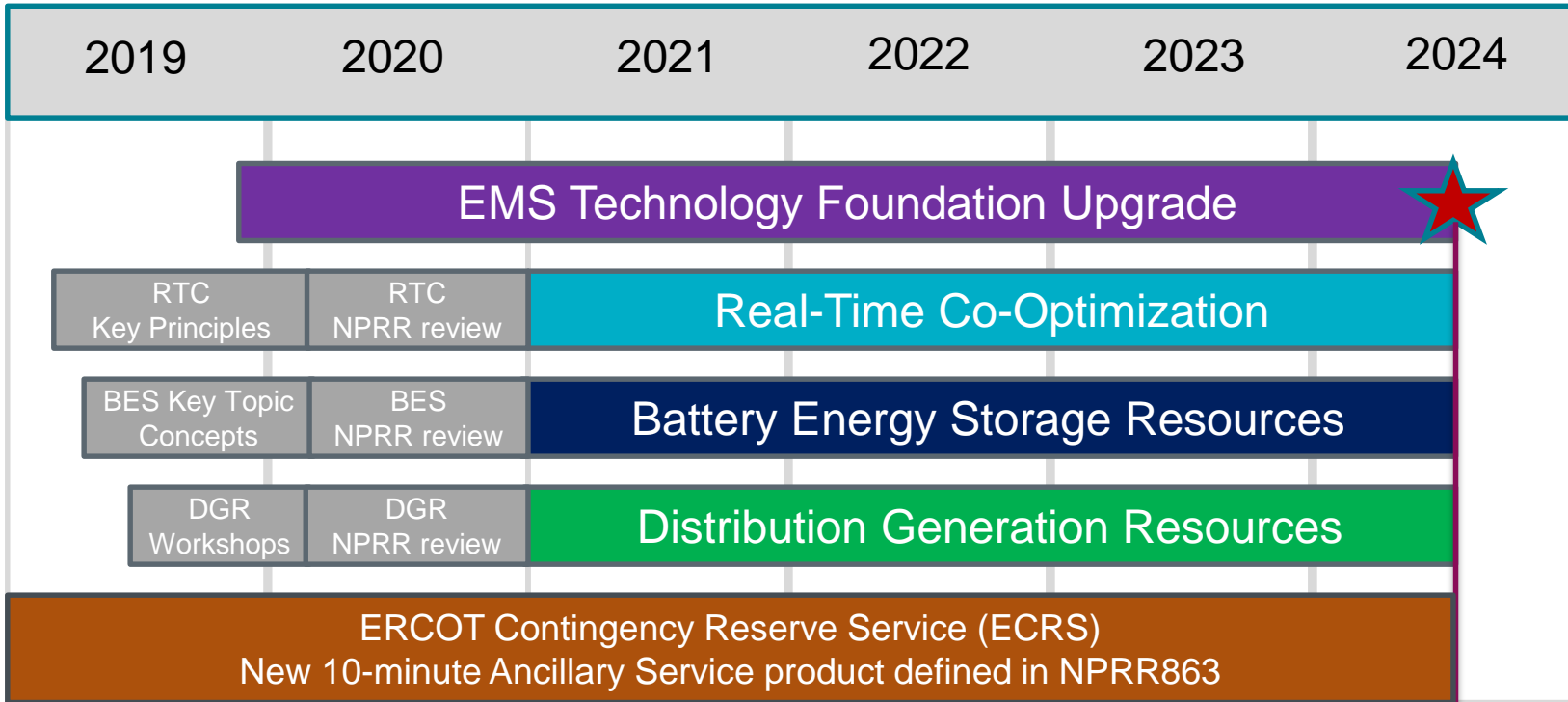Urgent Board of Directors Meeting

ERCOT Public
February 9, 2021

Passport Update

- Scope of Passport

- Passport Sequence of Milestones through 2024

- Passport Near-Term Milestones through 2021

- Current Status

- Future NPRR consideration

Passport Scope and Delivery

2019	2020	2021	2022	2023	2024

EMS Technology Foundation Upgrade

RTC Key Principles	RTC NPRR review	Real-Time Co-Optimization
BES Key Topic Concepts	BES NPRR review	Battery Energy Storage Resources
DGR Workshops	DGR NPRR review	Distribution Generation Resources

ERCOT Contingency Reserve Service (ECRS)
New 10-minute Ancillary Service product defined in NPRR863

"Pre-Passport" deliveries before 2024:
- Distribution Generation Resource (DGR) enhancements to re-open registration
- Battery storage functionality enhancements

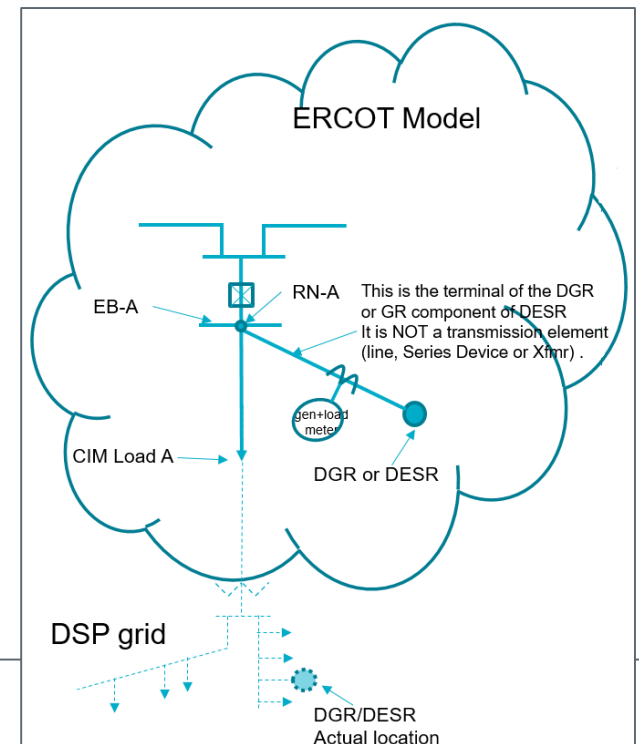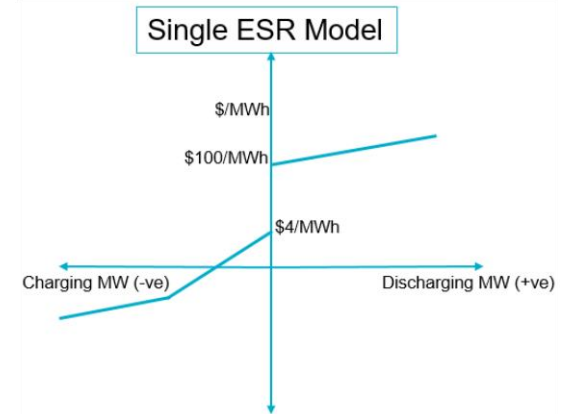# Real-Time Co-optimization Scope

- Real-Time Market (RTM) will be expanded to clear Energy <u>and Ancillary Services (AS)</u> every five minutes
  - Already in place at most ISOs; ERCOT currently co-optimizes in Day-Ahead Market (DAM)

- Real-Time Co-Optimization (RTC) design also creates benefits and changes:
  - Provides ability for ERCOT to select and dispatch full capability of Resources (previously AS capacity was managed by Market Participants based on their DAM awards).
  - Retires an Adjustment Period AS market
  - Reliability Unit Commitment (RUC) will also co-optimize the full capability of Resources
  - DAM will allow virtual AS Offers

- Operating Reserve Demand Curve (ORDC) <u>price adders</u> will be discontinued, and replaced by converting ORDC into AS Demand Curves for each AS and <u>reflected in Real-Time energy and AS prices</u>.

Passport Storage and Distribution Level Scope

- Modeling and Dispatching Battery Energy Storage as a Single Device
    - Same device can be a Load when charging and a generator when discharging.

- Distribution-Level Generator or Energy Storage
    - Device can be within Distribution System and still be dispatched by ERCOT with improved mapping techniques.

Passport Protocol Scope

Design	Revision Requests*
Real-Time Co-optimization	NPRR1007 – 1013
Battery Energy Storage Resources	NPRR1014 & 1029
Distribution Generation Resources	NPRR1016 (mapping improvements only)
ERCOT Contingency Reserve Service	NPRR863 (ECRS only)

Merging these requirements into design scenarios, for example:

Security-Constrained Economic Dispatch (SCED) is being re-developed to economically co-optimize and award all AS (an RTC requirement), including the clearing of a new Energy Storage Resource (ESR) type (Battery Energy Storage Resource requirement where a single model Resource can inject or withdraw), and the ESR is within the Distribution System (per Distribution Generation Resource requirement), and can be awarded a new 10-minute AS (ECRS requirement).

Additional supporting Market Guide changes are also within Passport scope.

Passport Sequence of Milestones through 2024

◆ Planned milestone
◆ Estimated milestone

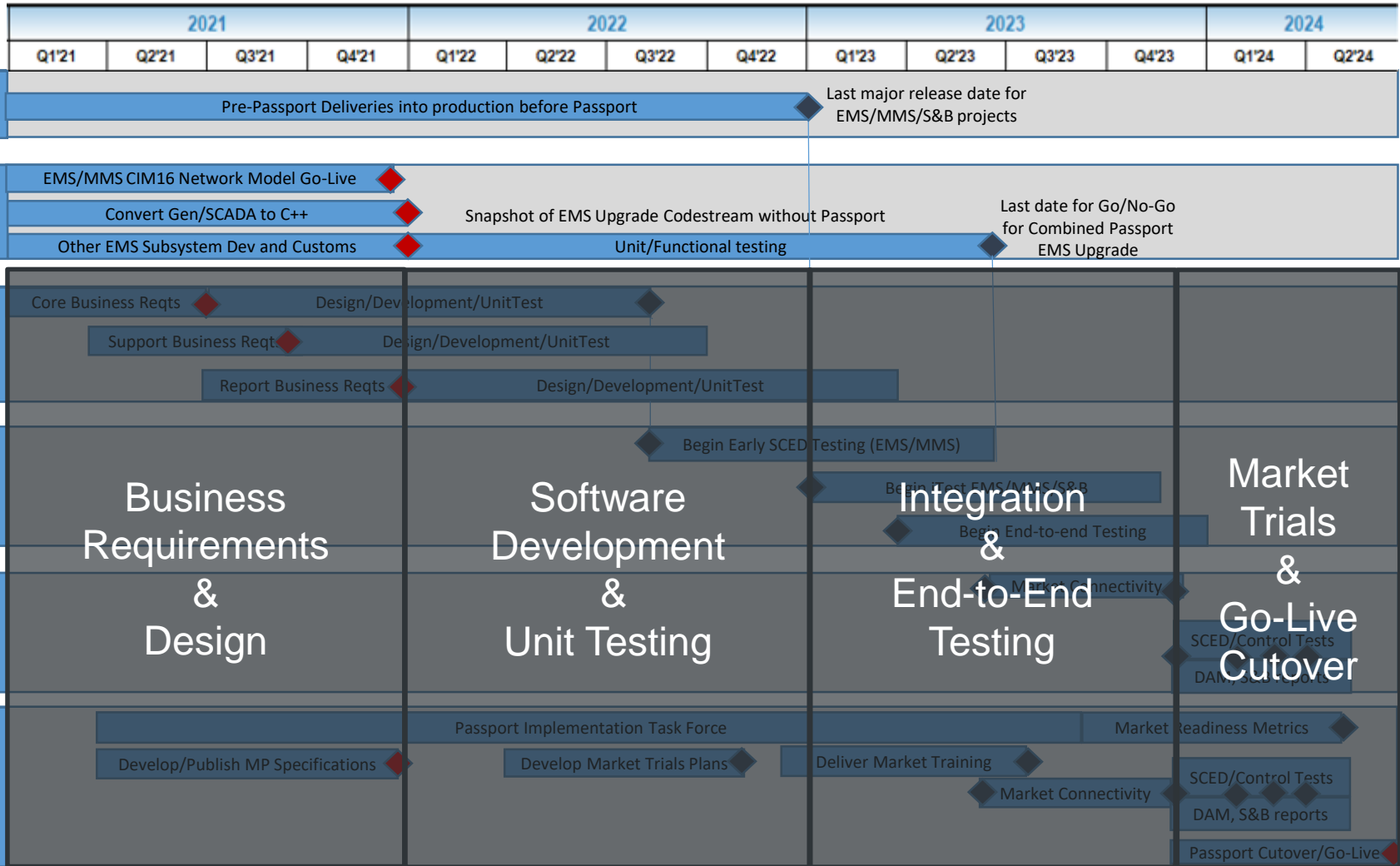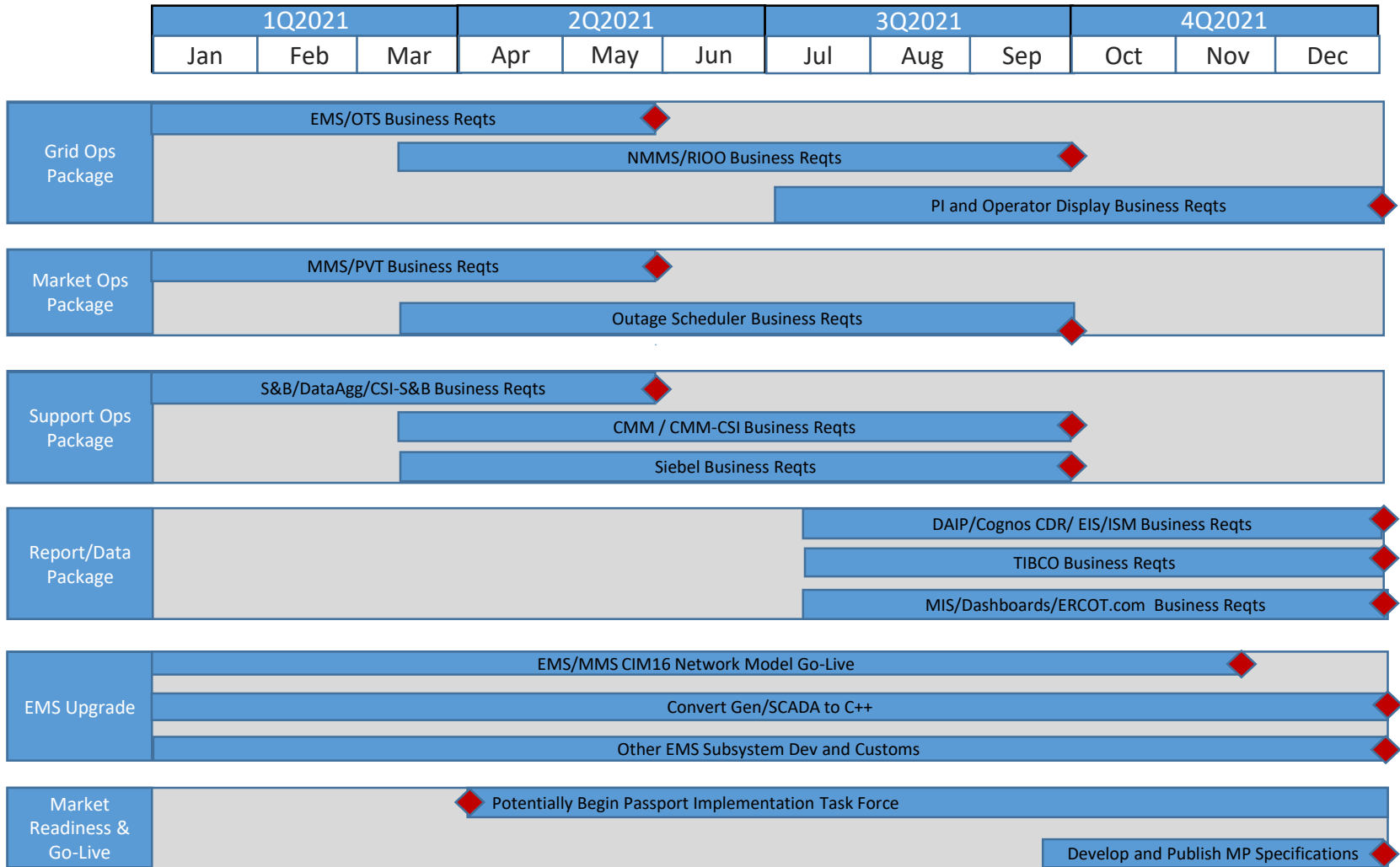|	2021				2022				2023				2024	
	Q1'21	Q2'21	Q3'21	Q4'21	Q1'22	Q2'22	Q3'22	Q4'22	Q1'23	Q2'23	Q3'23	Q4'23	Q1'24	Q2'24

Pre-Passport
- Pre-Passport Deliveries into production before Passport ◆
- Last major release date for EMS/MMS/S&B projects

EMS Upgrade
- EMS/MMS CIM16 Network Model Go-Live ◆
- Convert Gen/SCADA to C++ ◆
- Snapshot of EMS Upgrade Codestream without Passport
- Other EMS Subsystem Dev and Customs ◆ | Unit/Functional testing
- Last date for Go/No-Go for Combined Passport EMS Upgrade ◆

Passport Market Design
Core - EMS/MMS/SB
Support - OS/Reg...
Report - EIS/MIS
- Core Business Reqts ◆ | Design/Development/UnitTest ◆
- Support Business Reqts ◆ | Design/Development/UnitTest
- Report Business Reqts ◆ | Design/Development/UnitTest

Integration Testing
- ◆ Begin Early SCED Testing (EMS/MMS)
- ◆ Begin iTest EMS/MMS/S&B
- ◆ Begin End-to-end Testing

Market Trials
- ◆ Market Connectivity ◆
- ◆ SCED/Control Tests
- ◆ DAM, S&B reports

Market Readiness & Go-Live
- Passport Implementation Task Force | ◆ Market Readiness Metrics ◆
- Develop/Publish MP Specifications ◆
- Develop Market Trials Plans ◆
- Deliver Market Training ◆
- ◆ Market Connectivity
- ◆ SCED/Control Tests
- ◆ DAM, S&B reports
- Passport Cutover/Go-Live ◆

Passport Sequence of Milestones through 2024

Passport Near-Term Milestones through 2021

1Q2021			2Q2021			3Q2021			4Q2021		
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Grid Ops Package
- EMS/OTS Business Reqts
- NMMS/RIOO Business Reqts
- PI and Operator Display Business Reqts

Market Ops Package
- MMS/PVT Business Reqts
- Outage Scheduler Business Reqts

Support Ops Package
- S&B/DataAgg/CSI-S&B Business Reqts
- CMM / CMM-CSI Business Reqts
- Siebel Business Reqts

Report/Data Package
- DAIP/Cognos CDR/ EIS/ISM Business Reqts
- TIBCO Business Reqts
- MIS/Dashboards/ERCOT.com Business Reqts

EMS Upgrade
- EMS/MMS CIM16 Network Model Go-Live
- Convert Gen/SCADA to C++
- Other EMS Subsystem Dev and Customs

Market Readiness & Go-Live
- Potentially Begin Passport Implementation Task Force
- Develop and Publish MP Specifications

Item 7.3
ERCOT Public

Passport Current Status

- Business Requirements for core Passport systems are in-flight
  - Market Management System (MMS) and Settlements & Billing (S&B) Business Requirements are slightly ahead of schedule.
  - Energy Management System (EMS) Business Requirements have resource constraints, but are currently recoverable.

- EMS Upgrade
  - Vendor has been delivering software releases on-schedule
  - ERCOT EMS Upgrade team is on-schedule

- Budget

(Dollars in Millions)

2024 Passport Program	Budget
Real-Time Co-Optimization (RTC)	$ 51.6
Energy Management System (EMS) Upgrade 2024	27.1
Battery Energy Storage (BES)	5.1
NPRR 863 ERCOT Contingency Reserve Service (ECRS)	1.2
Distributed Generation Resources (DGR)	0.5
Passport Program Projects	$ 85.5

  - More details in February 2021 Board F&A Report

Future Stakeholder Discussions

- Limited resources and project funding for initiatives beyond the large projects identified below until 2024.

  FFR Advancement   **BES Pre-Passport Project**

  DGR Pre-Passport   **Passport Program**

- Strict controls are needed to ensure delivery of these large projects on time and within budget.

  - Internal discipline for ERCOT to focus on the strategic efforts above, and still be aligned to deliver other critical work within the project portfolio and operations.

  - Initiated discussions with the Technical Advisory Committee (TAC) on how to manage on-going influx of NPRRs while focusing on delivery of these strategic initiatives.

  - Proposal to leverage existing processes (internally and externally) and provide an initial Passport assessment and feasibility of delivery for any proposed system design changes, and then allow for discussion of timing of when to analyze changes for designs to occur after Passport implementation.

  - Still allow bandwidth for changes that are critical to reliability or instructed by Public Utility Commission of Texas (PUCT).

Wrap-up and Questions

- ERCOT plans to regularly present Passport updates and is open to Board direction on content.

- ERCOT will be working with TAC leadership on scope and timing for a Passport Implementation Task Force.

- ERCOT will continue to work internally and externally on controls for managing NPRRs and other future changes that overlap with Passport scope or resources.

- Questions?
  - Contact: Matt.Mereness@ercot.com