Item 4.2: Passport Program Update

Matt Mereness
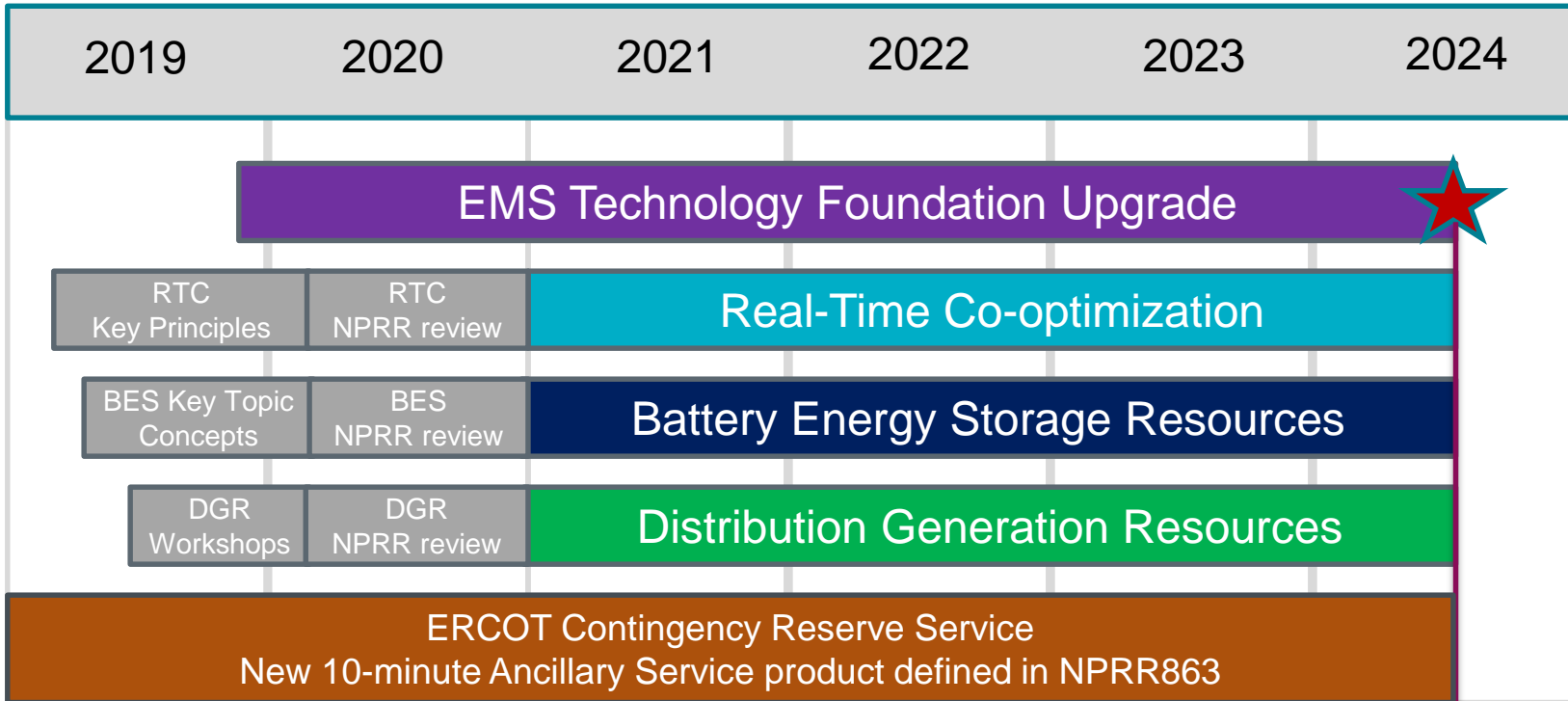Senior Director, Passport Program
ERCOT

Urgent Board of Directors Meeting

ERCOT Public
April 13, 2021

Passport Update

- Scope of Passport

- Milestones for Passport

- Current Status

- Future NPRR consideration

- Passport stakeholder meetings and future actions

- Appendix:
  - Passport Scope Details
  - Detailed Passport Milestones (2021-2024)
  - RTCTF Items for Future Consideration by TAC

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
New 10-minute Ancillary Service product defined in NPRR863

"Pre-Passport" deliveries before 2024:
- FFR advancement
- DGR enhancements to re-open registration
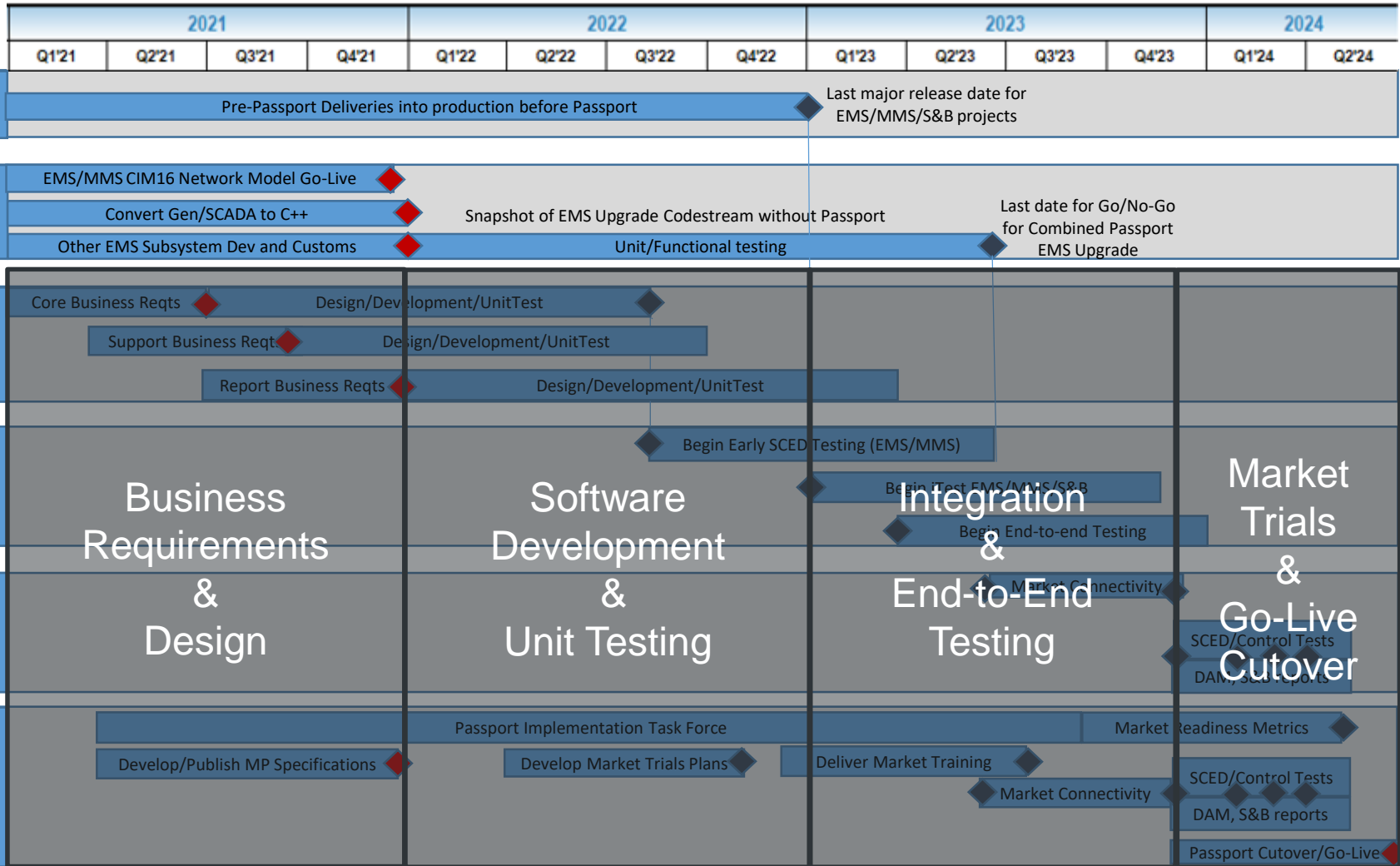- Battery storage functionality enhancements

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)

Additional supporting Market Guide changes are also within Passport scope.

Passport Sequence of Milestones through 2024

Legend:
- ◆ 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 Test EMS/MMS/S&B
- Begin End-to-end Testing
- Market Connectivity

Market Trials

Business Requirements & Design

Software Development & Unit Testing

Integration & End-to-End Testing

Market Trials & Go-Live Cutover
- 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

Item 4.2
ERCOT Public

5

Passport Current Status

- ## Key Passport Activities and Risks
    - ### 2021 Program objectives
        - Upgrade EMS to new version for Passport development to be built upon
        - Develop and integrate the EMS, MMS, S&B Business Requirements in first half of year to then develop supporting system requirements in second half of year
        - Passport scope and shared staff resources with FFR, pre-Passport BES and DGR.
    - ### Challenges and Risks
        - Passport planning has aggressive EMS upgrade schedule as well as supporting key Pre-Passport projects (risk connected to a go/no-go milestone).
        - MMS/OS Tech project went live three-months late affecting IT resources and other planned project work.
        - Winter event impacts to staffing resources and recognition of potential policy-driven system changes.
    - ### Currently the Market Management System (MMS) and Settlements & Billing (S&B) Business Requirements are on schedule.
    - ### The Energy Management System (EMS) Upgrade and EMS Passport Business Requirements have staffing constraints that are being evaluated.
    - ### No change in combined $85.5M 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
NPRR863 ERCOT Contingency Reserve Service (ECRS)	1.2
Distributed Generation Resources (DGR)	0.5
Total Passport Program	$ 85.5

Future NPRR consideration

- Reminder that Passport program is engaged with on-going Protocol and Impact Analysis activities to file comments on stakeholder Revision Requests identifying high-level assessment of impacts and risks to Passport Program delivery.

- ERCOT feedback is provided through comments or the Impact Analysis to provide a recommendation for "before or after" Passport Program delivery.

- If impact to Passport Program delivery, Sponsor can decide next step for the Revision Request – withdraw or pursue.

- If pursue, then PRS may recommend approval and/or tabling of the Revision Request. If recommended for approval by PRS, ERCOT will file additional comments indicating that Impact Analysis will not be completed until ERCOT has bandwidth to consider post-Passport Program efforts.

- Exceptions to this recommendation:
  - Revision Requests that are critical to reliability or instructed by PUCT (would include any Revision Requests from February 2021 Extreme Winter Weather Event).

Passport stakeholder meetings and future actions

- Working with the Technical Advisory Committee (TAC) to sunset the Real-Time Co-optimization Task Force (RTCTF).
    - Development of Real-Time Co-optimization (RTC) Principles and RTC Protocols completed.

- Recommendation that TAC consider ownership and assignments of the RTCTF-identified items that will require stakeholder engagement prior to 2024 Passport implementation (details in Appendix).
    - Policy items- Potentially to WMS
    - Analysis items- Potentially to WMS
    - Supporting details- Future implementation working group / task force
    - Market Participant needs- Future implementation working group / task force

- ERCOT proposes working with TAC leadership to develop a Passport Implementation Working Group or Task Force in the coming months.

Wrap-up and Questions

- ERCOT is continuing work on Passport efforts.

- ERCOT acknowledges there is risk to Passport and will keep stakeholders (PUCT staff, TAC, and Board) updated on the risks.

- ERCOT will continue work to evaluate NPRRs that overlap with Passport scope or resources.

- ERCOT willing to support next steps on transitioning stakeholder processes to support Passport implementation effort in coming months.
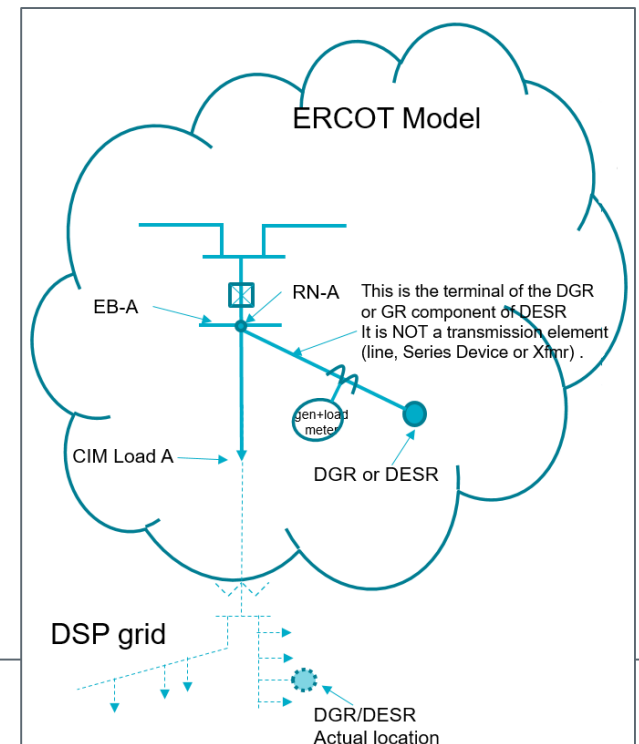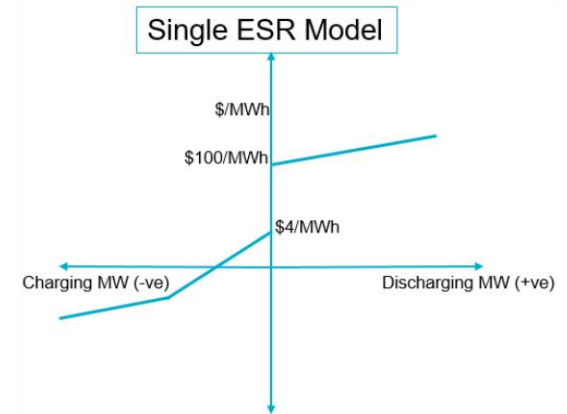
Questions?

Appendix

- Passport Scope Details

- Detailed Passport Milestones (2021-2024)

- RTCTF Items for Future Consideration by TAC

Item 4.2
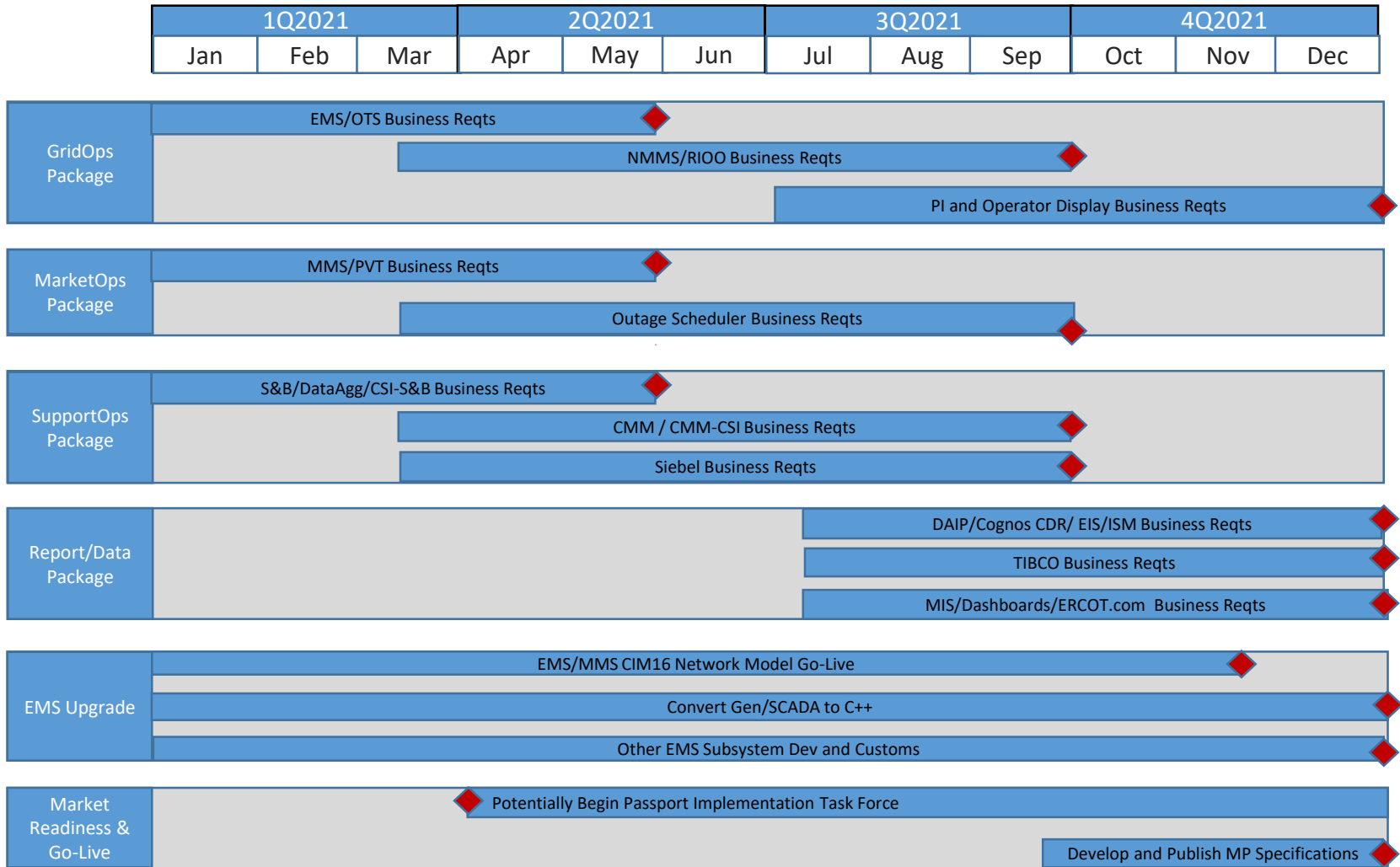ERCOT Public

Real-Time Co-optimization Scope

- Real-Time Market 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

- 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 MPs based on their Day-Ahead Market awards).
  - Retires an adjustment period AS market
  - Reliability Unit Commitment will also co-optimize the full capability of Resources
  - Day-Ahead Market 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 Near-Term Milestones through 2021

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

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

MarketOps Package
- MMS/PVT Business Reqts
- Outage Scheduler Business Reqts

SupportOps 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

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
Last date for Go/No-Go for Combined Passport EMS Upgrade
Other EMS Subsystem Dev and Customs
Unit/Functional testing

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

Item 4.2
ERCOT Public

14

RTCTF Items for Future Consideration

- POLICY - Open policy discussion items:
  - Parameters for Ancillary Service proxy offers
  - Ancillary Service Demand Curves (ASDCs) for use in Reliability Unit Commitment (RUC) studies
  - Any needed discussion on triggers for initiating off-cycle Security-Constrained Economic Dispatch (SCED) executions
    - Largely driven by ERCOT Operator desk procedures and discretion today
  - Consideration of NPRR for allowing real-time updates to offers in current Real-Time Market and future with RTC.

- ANALYSIS - Requested analysis going forward:
  - Framework for periodic analysis comparing RTC and the current ORDC design – Key Principle 1.1(8)

RTCTF Items for Future Consideration (continued)

- SUPPORTING DETAILS - Other documentation that may need review:
  - Verifiable Cost Manual (Change for on-line hydro Resources per Key Principle 1.3(3))
  - Additional review of transmission constraint max. shadow price values
  - Operation Procedures (e.g., removing SASM and HASL/LASL)
  - Business Practice Manuals (e.g., changes to COP and telemetry)

- MARKET PARTICIPANT NEEDS - Market needs for the transition and implementation:
  - Mapping of bill determinants to extracts and reporting for developing shadow settlement
  - Changes to Inter-Control Center Communications Protocol (ICCP) handbook, and documentation for non-ICCP market submissions
  - Market trials/training/annual seminar engagement
  - Any details MPs need for designing their control systems