



PUBLIC

## Item 6.2: Real-Time Co-Optimization Implementation Update

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Senior Vice President and Chief Digital Officer

Technology and Security Committee Meeting

December 8, 2025

- **Purpose**

Periodic Update on RTC+B project status

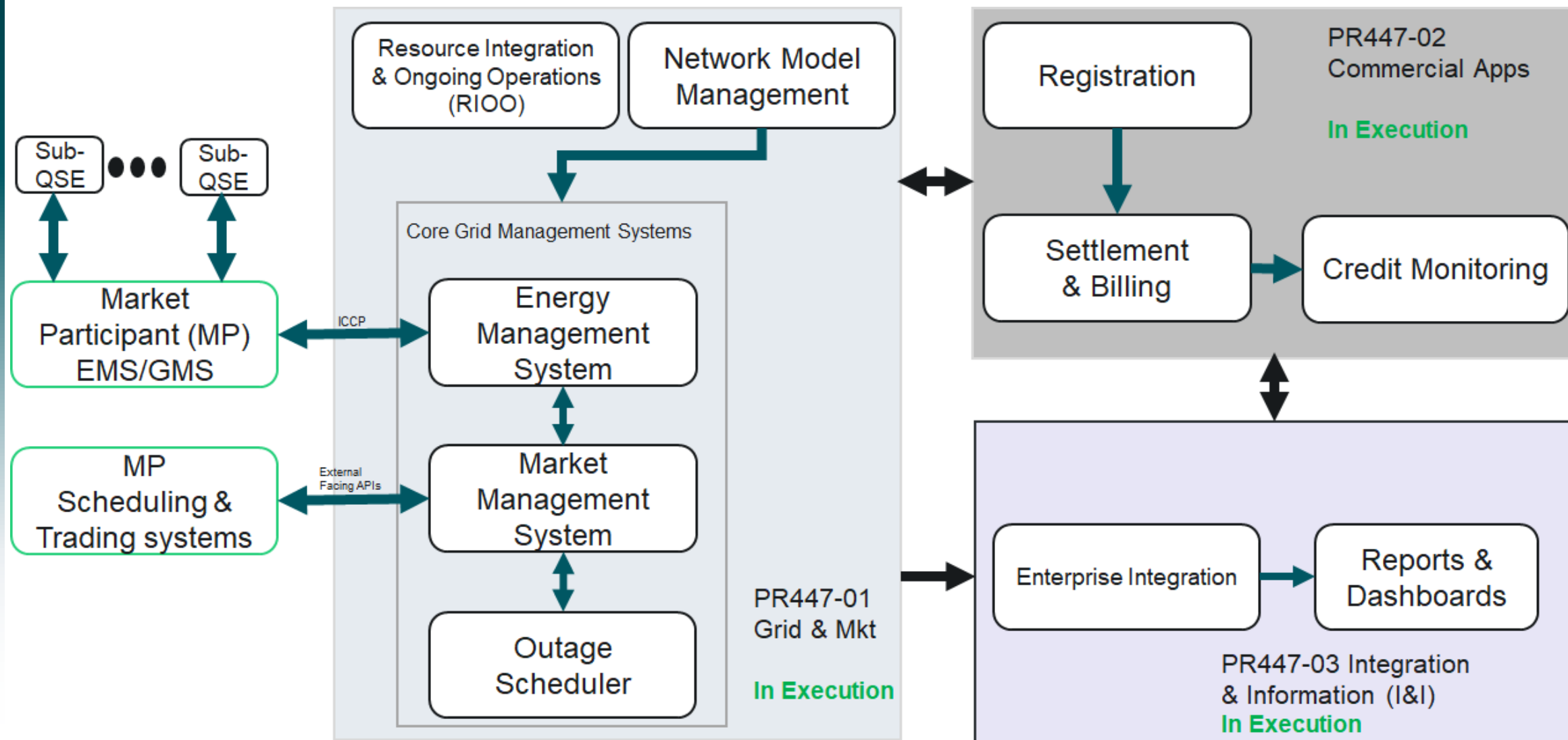
- **For Information Only**

No action is requested of the ERCOT Board; for discussion only

### Key Takeaways

- Open Loop SCED Market Trials concluded (July – August)
- 2 successful Closed Loop SCED/LFC tests (September – October)
- Cutover workshop with QSEs/TSPs conducted (November)
- 30-day Market Notices sent on November 5<sup>th</sup>
- December 5<sup>th</sup> planned go-live on-track (Operator discretion for 1 week weather delay)

# Overview of System Changes – RTC+B+SOC Program



# RTC+B+SOC Program Structure

Project	IA Budget	G2E Budget	Estimate at Completion (EAC)	Expenditure to Date	Trend	Description
PR447-00 Program Control	\$13.9M	\$5.4M	\$3,925,381	\$8,381,968	●	Includes Hardware, Software
PR447-01 Grid & Markets	\$24.8M	\$20.8M	\$19,627,836	\$15,365,244	●	MMS/EMS/OTS/NMMS/RIOO/PI/OS/ GridGeo
PR447-02 Commercial Apps	\$5.8M	\$2.3M	\$2,086,849	\$1,665,124	●	S&B/CMM/Registration
PR447-03 Integration & Information (I&I)	\$5.3M	\$6.4M	\$6,802,125	\$5,716,707	●	Middleware, dashboards, reports, data warehouse
<b>Total</b>	<b>\$49.9M</b>	<b>\$34.9M</b>	<b>\$32,442,191</b>	<b>\$31,129,043</b>		

- Total budget may not foot due to rounding
- Expenditure to Date as of end of Oct 2025

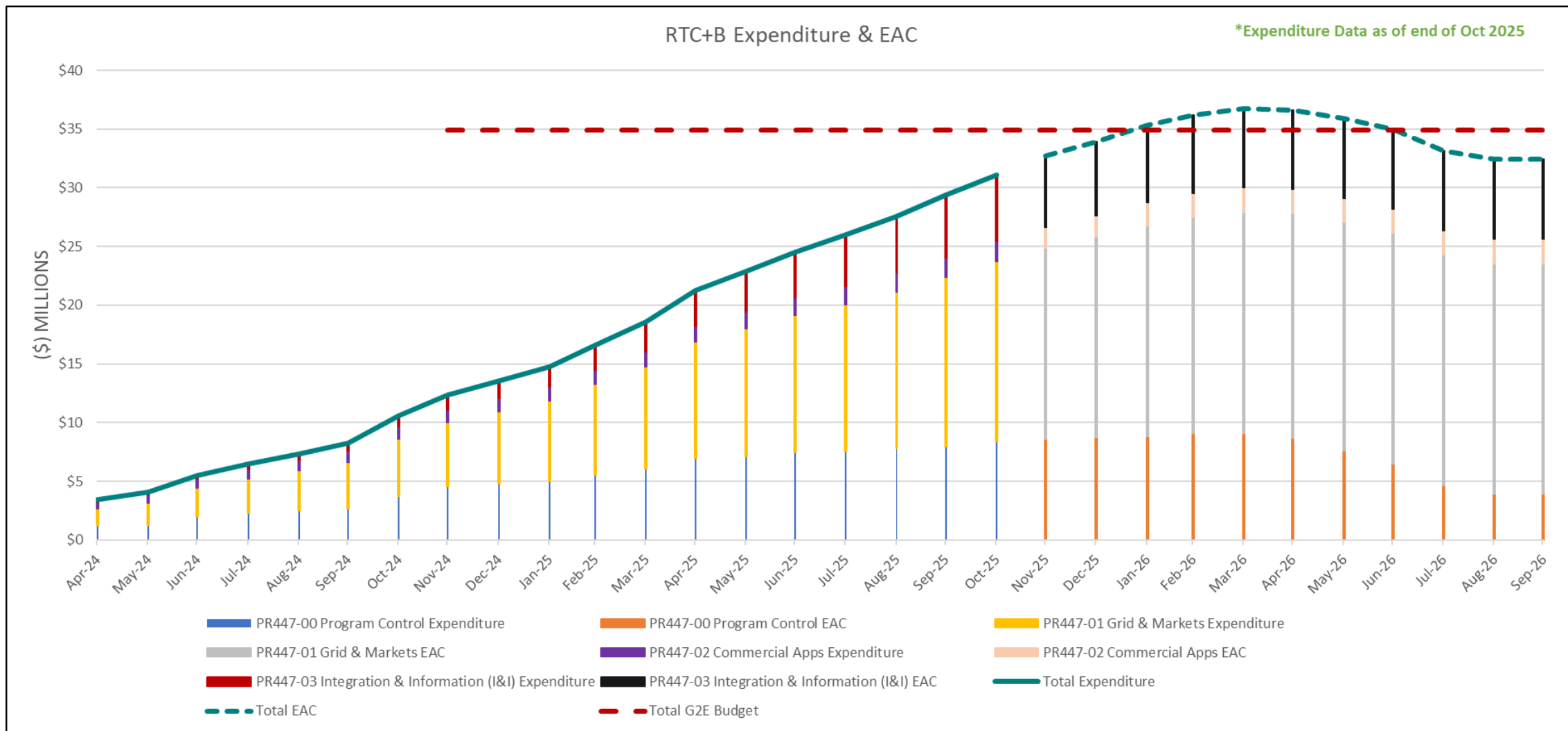
- Not Tracking to Plan
- At Risk
- Tracking to Plan

## Key Takeaway:

- Centralized Program Control structure with 3 project tracks are all on track.

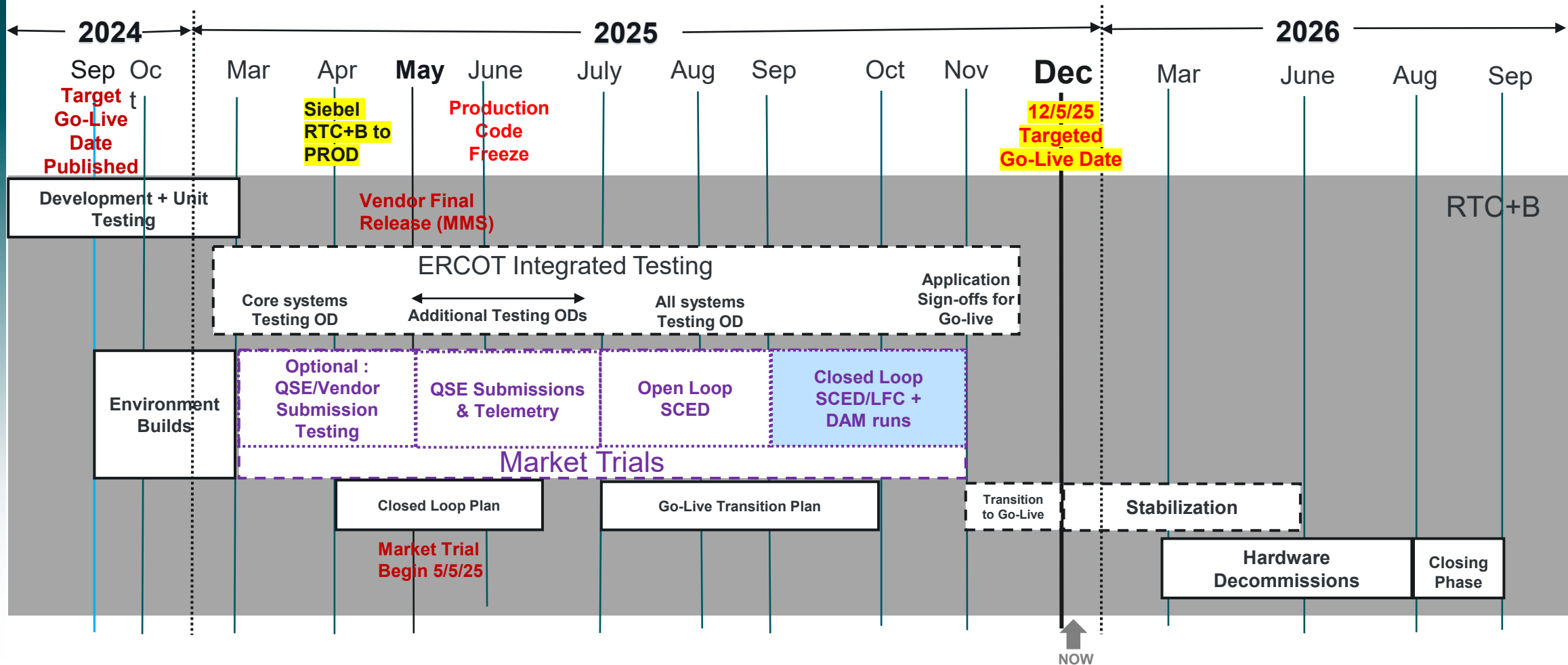


# RTC+B Overall Expenditure & EAC



**Key Takeaway:** RTC+B Program (and the 3 projects) are tracking to plan.

# Major Dependencies in our critical path



**Key Takeaway:** RTC+B Open Loop Testing concluded July-August (achieved score-card targets). 2 successful Closed Loop LFC Tests conducted with the market (September 11<sup>th</sup> and October 30<sup>th</sup>).



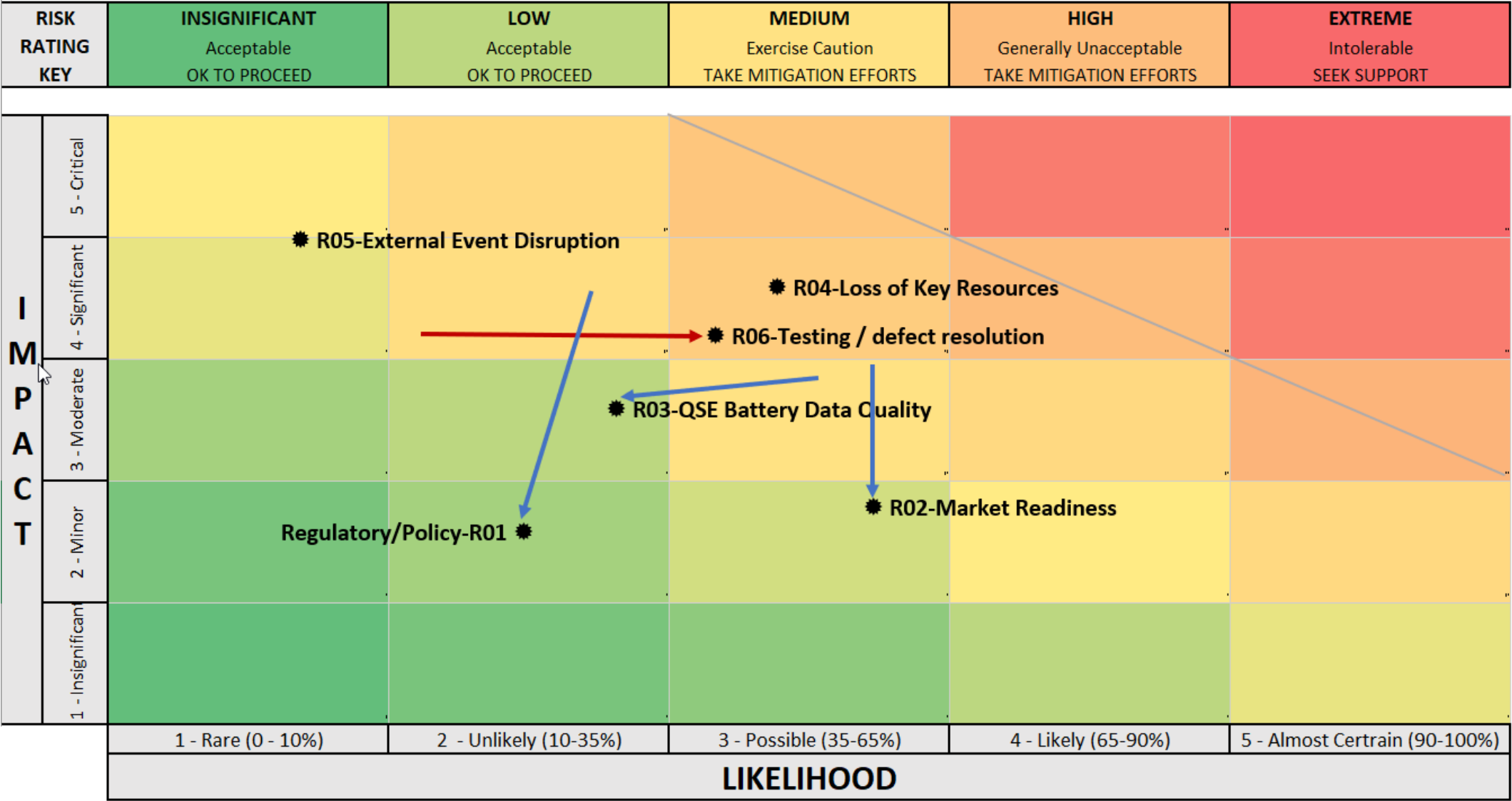
# Major Program Milestones for 2025

Task	Due by	Status
PR447-00 RTC+B ITEST Environment Readiness (Server Builds/Data refreshes)	Jan 31, 2025	Complete
PR447-01 MMS Vendor SCED Delivery	Feb 25, 2025	Complete
PR447-00 RTC+B Market Trials EMS/MMS Server Readiness	Feb 28, 2025	Complete
PR447-02 Commercial Applications ITEST Entry	Mar 03, 2025	Complete
PR447-00 Sandbox Deployment for QSEs/Vendors Market Submissions Testing	Mar 03, 2025	Complete
<b>PR447-00 First ITEST Operating Day (OD) Test for core systems (EMS/MMS/S&amp;B)</b>	<b>Apr 16, 2025</b>	Complete (met stretch goal Mar 28)
PR447-03 Sign-off Reports Needed for Open-Loop Market Trials	Apr 21, 2025	Complete
<b>PR447-00 Open Market Trials for QSE Testing</b>	<b>May 05, 2025</b>	Complete (met target goal, stretch N/A)
PR447-01 MMS Vendor Final Release (all applications)	May 13, 2025	Complete
PR447-00 Begin Open-Loop RTC SCED	July 07, 2025	Complete
PR447-03 Sign-off Reports Needed for Closed-Loop Market Trials	Aug 13, 2025	Complete
<b>PR447-00 First ITEST Operating Day (OD) Test for all Systems</b>	<b>Aug 27, 2025</b>	Complete (met target goal Aug 27)
<b>PR447-00 Achieve Successful Closed-Loop Test</b>	<b>Oct 29, 2025</b>	Complete (met stretch goal) Test#1 Sep 11 <sup>th</sup> , Test#2 Oct 30 <sup>th</sup>
PR447-00 ITEST Application Sign-off	Nov 21, 2025	On-Track
<b>PR447-00 Go-live with RTC+B</b>	<b>Dec 05, 2025</b>	On-Track

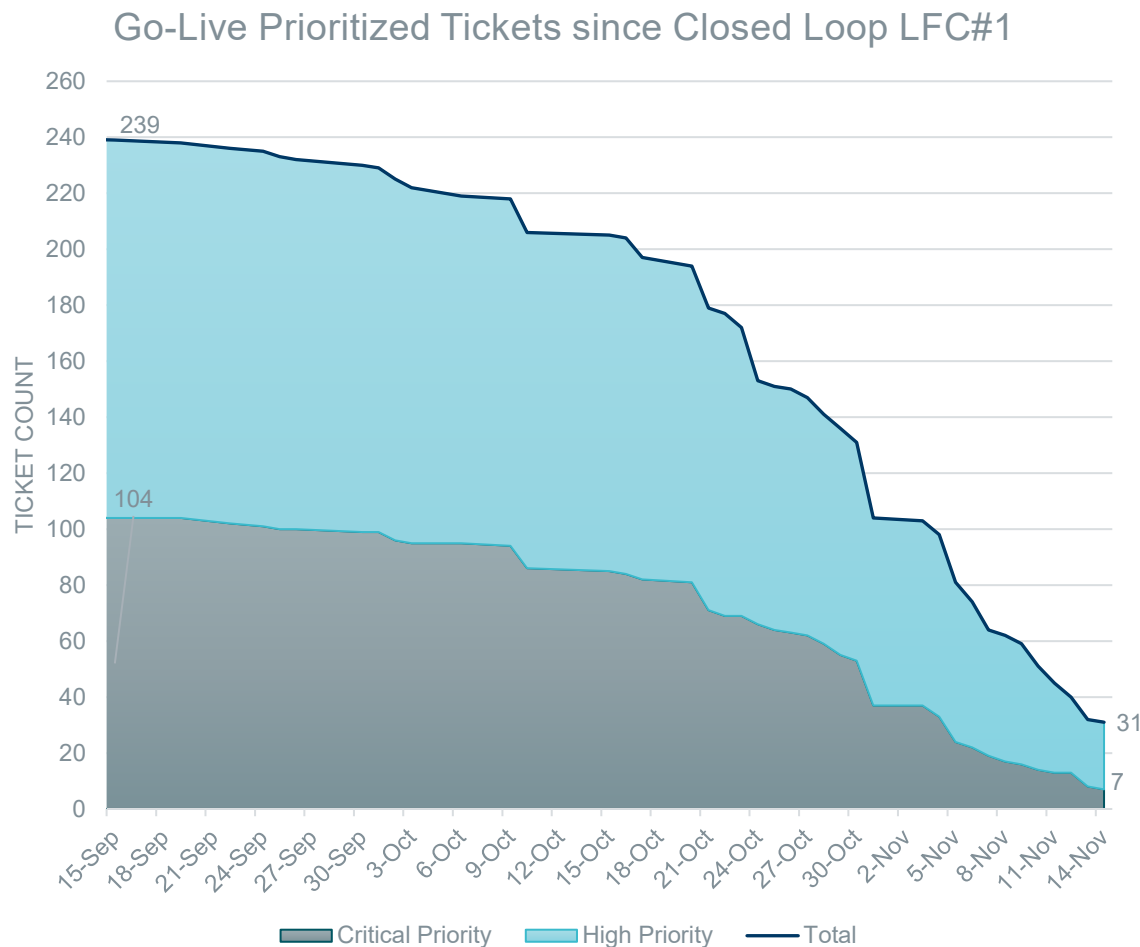
**Key Takeaway:** Select Key milestones for Committee updates (2025 KRs are noted in bold)



# RTC+B Program Risk Map



# ERCOT Internal Testing/Defect Resolution (Burn-down by Priority)



## Before Go-Live

- 7 pending Critical tickets on-track for Nov 21<sup>st</sup> sign-off.
- Most of 24 pending High Priority tickets are on-track for Nov 21<sup>st</sup> sign-off, some have viable work-arounds.

## After Go-Live

- Emergency fixes/stabilization for the first 2 weeks (as required).
- 4 issues have been identified as potential protocol violations to be filed with PUCT after go-live. Those filings will include estimated resolution dates.
- First few months of 2026 will include multiple releases for remaining non-critical defects.

\*Data as of Nov 15





# RTC+B Program Risks

ID	Risk Title	Risk Description	Mitigation
R01	Regulatory/Policy	Potential of stakeholder legal or regulatory concerns to stop implementation (examples, stakeholder pressure or lawsuits around loss of revenue, AS Demand Curves, or battery state of charge issues)	All know issues being addressed by RTCBTF and report up through every TAC and ERCOT Board meeting in 2025.
R02	Market Readiness	Potential of one or many significant vendors or companies not having their systems ready for go-live.	Early releases of market interface documentation and live systems to IT/vendors, and ERCOT scorecards for each QSE to provide transparency on success rate provided to ERCOT Board.
R03	QSE Battery Data Quality	Market submission data quality of batteries related to Telemetry, COP, and Bid/Offer Curves	Implement additional Model Build Environment and ERCOT scorecards for each QSE to provide transparency on success rate provided to ERCOT Board.
R04	Loss of Key Resources	Retention of highly specialized SMEs. Impact of potential loss of key resources creates a knowledge loss and schedule disruption.	Executive awareness to build depth of defense in Execution schedule (particularly testing).
R05	External Event Disruption	Possibility for disruption due to External event out of ERCOT control	Monitor out of our control items that may present risk: - Cyber Vulnerabilities, Tech health, Significant Weather Event
R06	Testing / Defect Resolution	Possible identification of critical defects during integration testing could impact or delay key milestones	Defect prioritization process implemented to ensure high-impact defects are resolved promptly while continuously monitoring need for related contingency plans.



# Appendix

## Links to educational material on the mechanics of RTC, Single Model and State of Charge:

- [RTC Updates to Reliability and Markets Committee - Overview of market design concepts & benefits](#)
- [RTCBTF \(Refreshers, Market Trial Handbooks, Workshop materials and Technical documents\)](#)
- [RTC+B Training Videos](#)

## Links to associated key documents:

- [RTC Key Principles](#)
- [NPRR1186 Interim SOC - Key Documents](#)
- [NPRR1204 SOC Considerations with RTC - Key Documents](#)

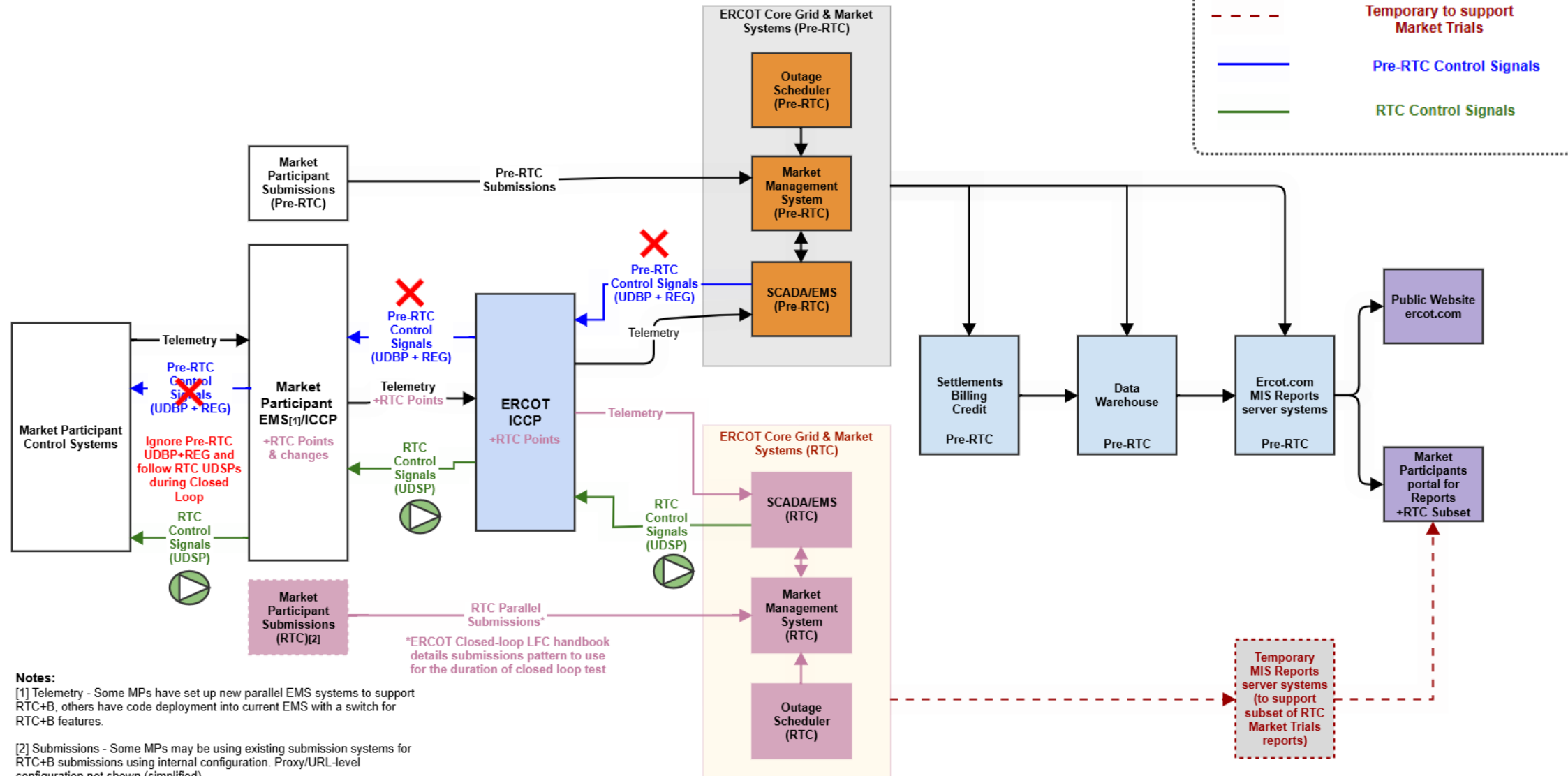


## Acronyms used in this slide deck

CIM	Common Information Modeling	OS	Outage Scheduler
CMM	Credit Monitoring & Management	OTS	Operator Training Simulator
DSA	Dynamic Stability Analysis	RIOO	Resource Integration and Ongoing Operations
EMS	Energy Management System	RLC	Resource Limit Calculator
GMS	Generation Management System	RTC	Real-Time Co-Optimization
I&I	Integration and Information	RTCA	Real-Time Contingency Analysis
ICCP	Inter control Center Protocol	S&B	Settlements & Billing
LFC	Load Frequency Control	SCADA	Supervisory Control and Data Acquisition
MMS	Market Management System	SE	State Estimator
MP	Market Participant	SOC	State of Charge
NMMS	Network Model Maintenance System	VSA	Voltage Stability Analysis
		G2E	Gate to Execution

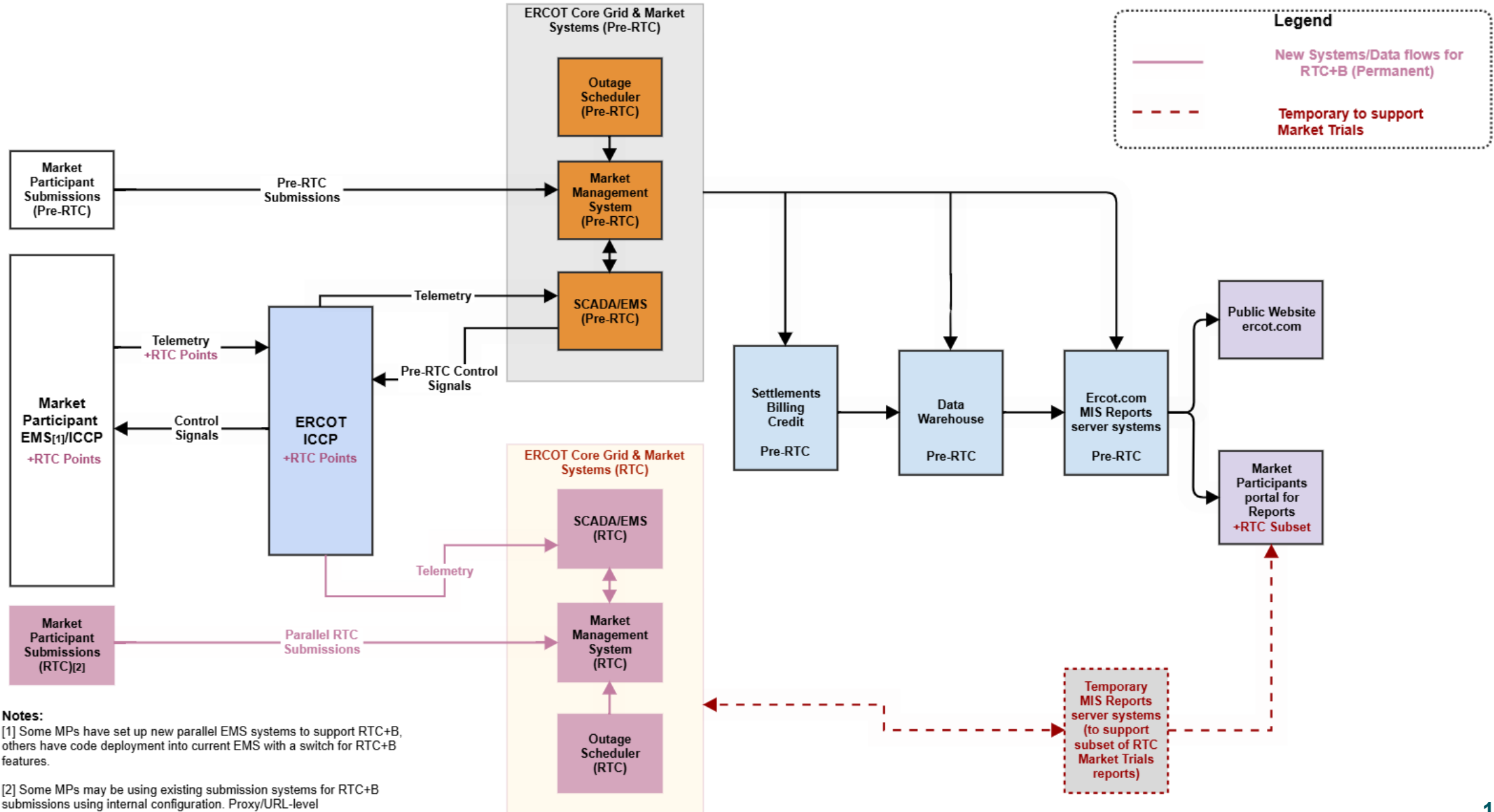


# RTC+B Closed-Loop/LFC Test (Simplified View)

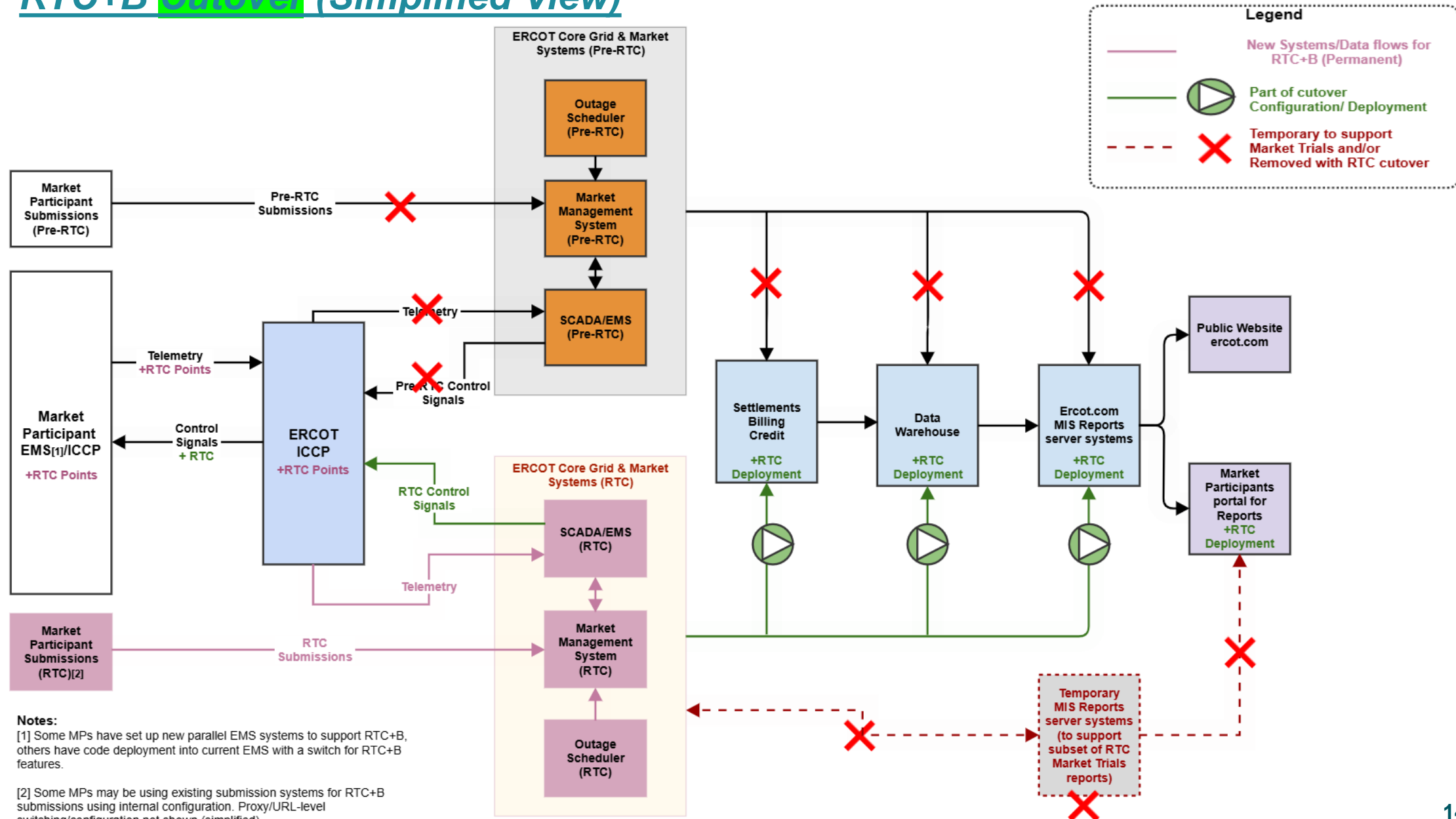


**Key Takeaway:** ERCOT and QSEs will conduct multiple live-production tests of RTC-SCED and Load Frequency Control to ensure effective RTC-SCED dispatch and Frequency Control prior to go-live.

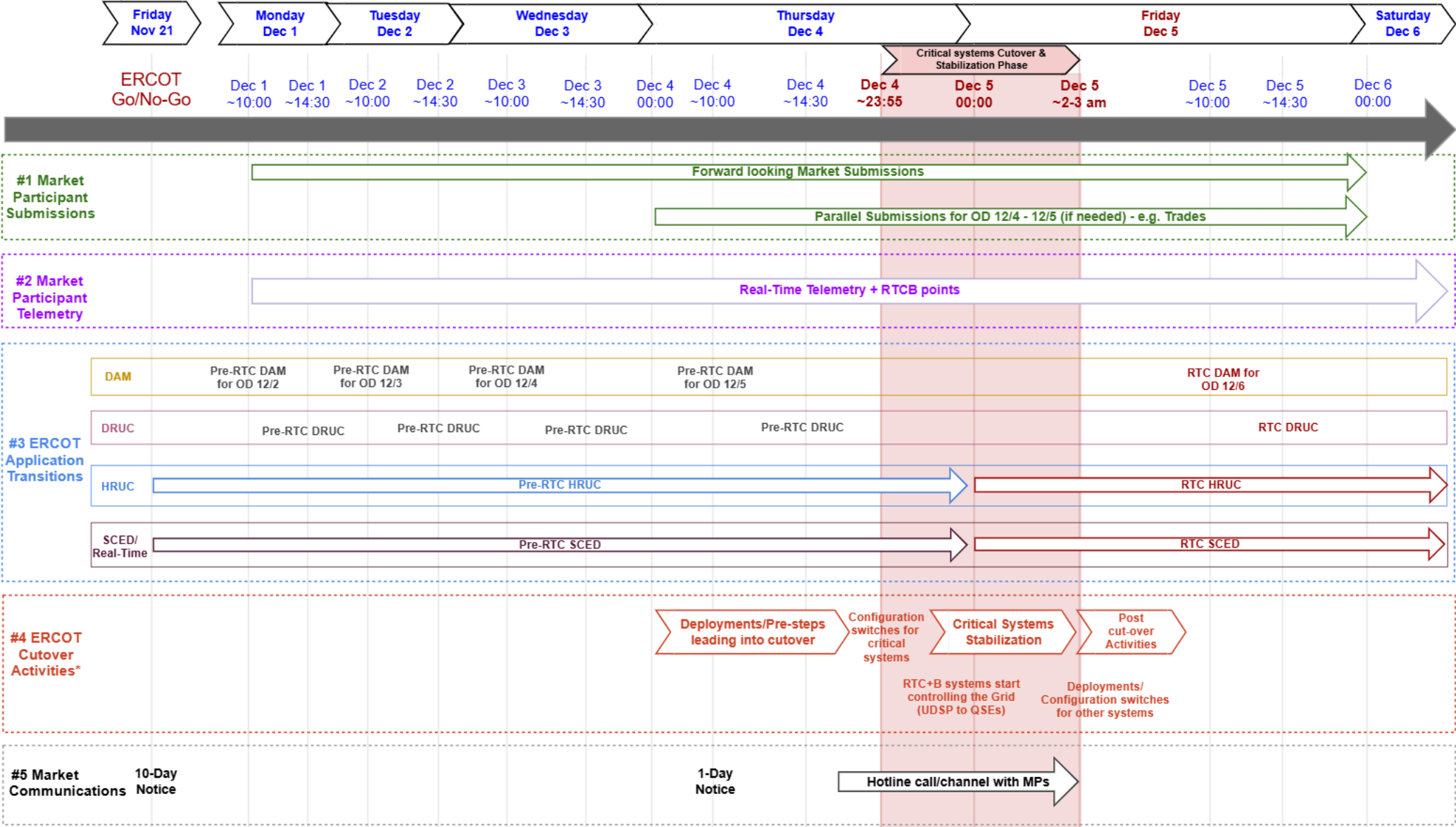
# RTC+B Pre-Cutover (Simplified View)



# RTC+B Cutover (Simplified View)



ERCOT RTC+B Cutover (Timeline View)



\*Cutover Activities proceed conditional on ERCOT Control Room Approval

