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MEMORANDUM

FROM: Jason M. Ryan, ADER Task Force Chair
Arushi Sharma Frank, ADER Task Force Vice-Chair

RE: Project No. 53911, *Aggregate Distributed Energy Resource (ADER)*
ERCOT Pilot Project

DATE: September 2, 2022

On September 2, 2022, the ADER Task Force held a workshop titled “Overview of ERCOT Wholesale Market, Ancillary Services, Settlements.”

The following attached material was presented:

- ERCOT, An Introduction to ERCOT’s Ancillary Services
 - Any questions regarding the Oncor presentation may be directed to Dave Maggio at david.maggio@ercot.com

A recording of the workshop is available on the Texas ADER Task Force YouTube channel at: <https://youtu.be/ov2g0cs9Fok>.



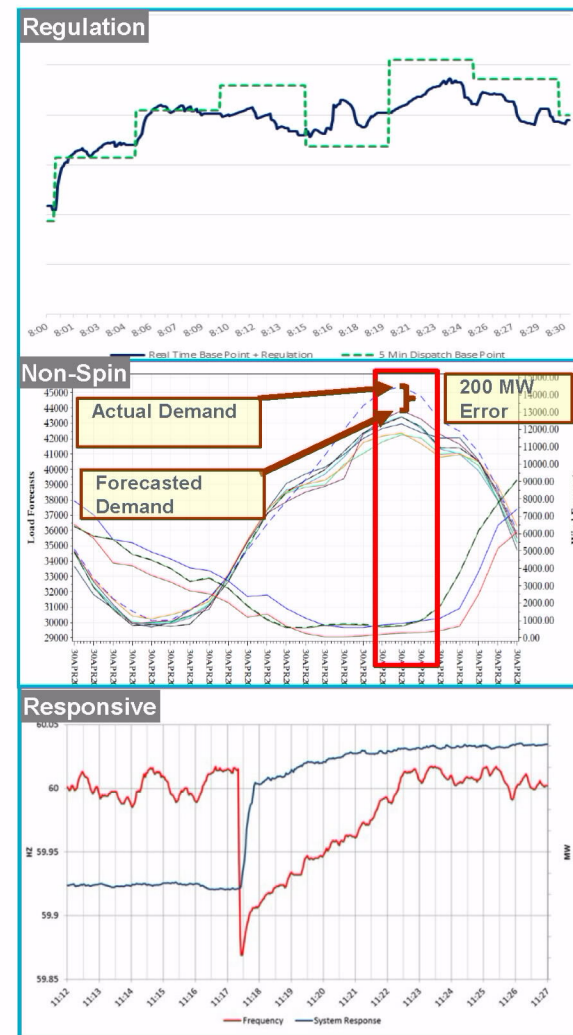
AN INTRODUCTION TO ERCOT'S ANCILLARY SERVICES

ERCOT Staff

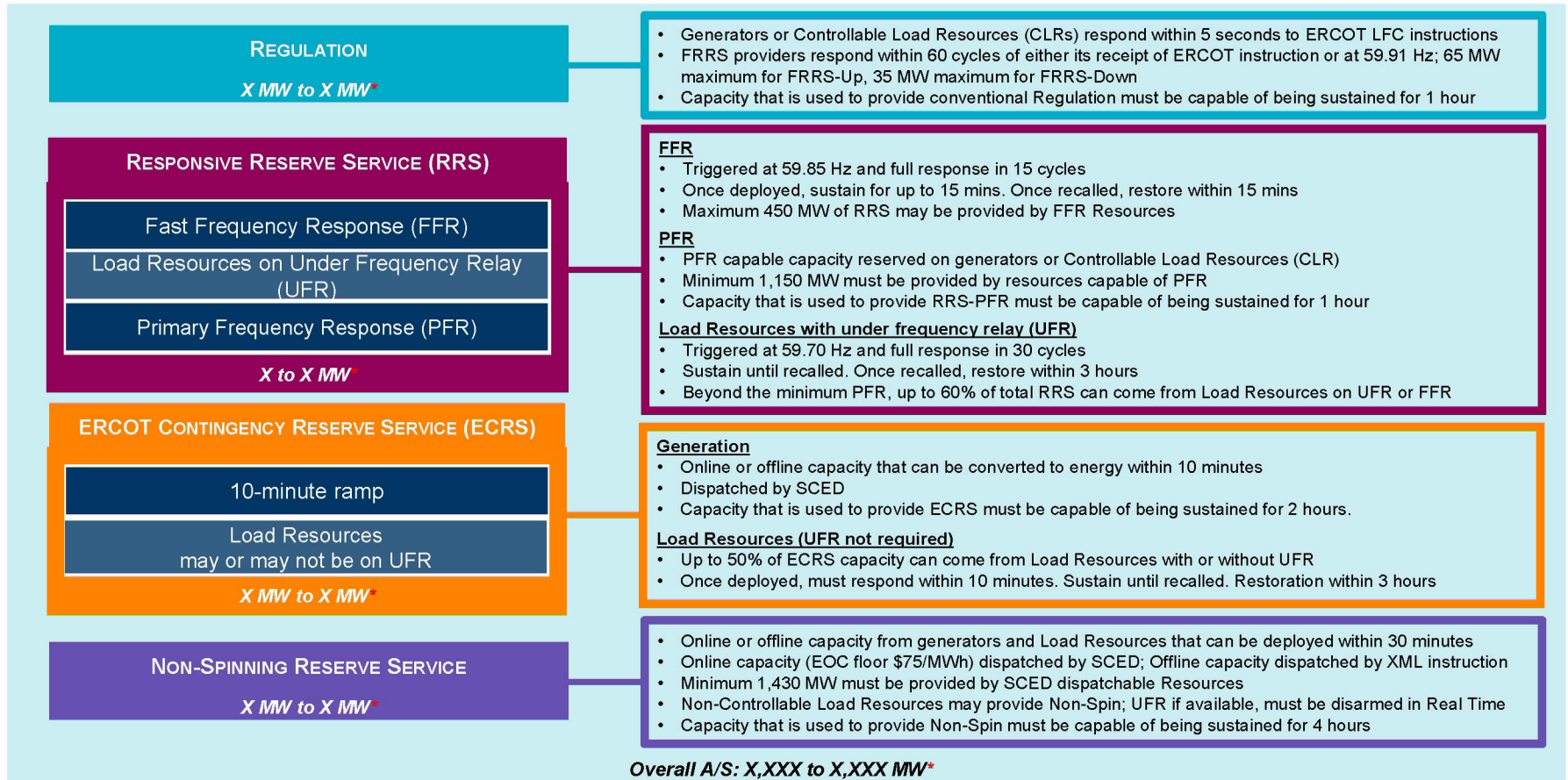
SEPTEMBER 2, 2022
PUC ADERTF MEETING

Overview of ERCOT's Ancillary Services

- Ancillary Services (AS) are procured to ensure sufficient resource capacity is on-line, or able to be brought on-line in a timely manner, to balance the variability that cannot be covered by the 5-minute energy market.
- Following three types of AS that are currently active in ERCOT
 - Regulation Service:** Capacity that is deployed to maintain balance between supply & demand between 5-min dispatch intervals.
 - Non-Spinning Reserve Service (Non-Spin):** Capacity that can be started in 30 minutes to cover net load forecast errors (NLFE) or net load ramps and forced outages of thermal resources.
 - Responsive Reserve Service (RRS):** Procured to ensure sufficient capacity is available to respond to frequency excursions during unit trips.
- Lastly, ERCOT is in the process of implementing a 10-min Ancillary Service named **ERCOT Contingency Reserve Service (ECRS)** that will help recover frequency following unit trips and provide additional capacity to respond to short-term net load ramps.



Ancillary Service (AS) Framework including ECRS**



Summary of Ancillary Services (Page 1)

ANCILLARY SERVICE	DURATION	WHO CAN PROVIDE	QUALIFICATION CRITERIA	PERFORMANCE CRITERIA
Regulation (Up/Down) Service Fast Responding Regulation Service (FRRS)	Conventional Regulation – 1 hour FRRS – 8 min	Generation Resources (GRs), Energy Storage Resources (ESRs), Controllable Load Resources (CLRs)	<p>Nodal Protocol (NP) Section 8.1.1.2.1.1, Regulation Service Qualification</p> <p>Co-ordinated test to demonstrate that a QSE control system can follow ERCOT Reg-Up/Reg- Down dispatch signals.</p> <p>Coordinated test for FRRS to demonstrate that the resource can remain deployed at requested MW for 8 minutes</p> <p>Self Test to demonstrate ability to autonomously provide full response within 60 cycles. (FRRS resource are required to have a data recorder that can record data with a resolution of no less than 32 samples per second.)</p>	<p>NP Section 6.6.5, Generation Resource Base-Point Deviation Charge</p> <p>Np Section 8.1.1.4.1, Regulation Service and Generation Resource/Controllable Load Resource/Energy Storage Resource Energy Deployment Performance, and Ancillary Service Capacity Performance Metrics</p> <p>NP Section 3.16, Standards for Determining Ancillary Service Quantities</p>

Summary of Ancillary Services (Page 2)

ANCILLARY SERVICE	DURATION	WHO CAN PROVIDE	QUALIFICATION CRITERIA	PERFORMANCE CRITERIA
Responsive Reserve Service (RRS)	<p>Primary Frequency Response (PFR) – 1 hour</p> <p>Fast Frequency Response (FFR) – 15 min</p> <p>Under Frequency Relay Response (UFR) – Till Recalled</p>	GRs, ESRs, CLRs, Non-Controllable Load Resources (NCLRs)	<p>NP Section 8.1.1.2.1.2, Responsive Reserve Service Qualification</p> <p>Co-ordinated telemetry test to demonstrate that the QSE can respond to RRS-PFR or RRS-FFR deployment instruction by updating the RRS Ancillary Service (AS) Schedule telemetry for the qualifying resource.</p> <p>Self-test to demonstrate maximum 1 hour (RRS-PFR) or 15 min (RRS-FFR) injection capability.</p> <p>Self-test to demonstrate 15 cycle RRS-FFR response capability. (FFR resource are required to have a data recorder that can record data with a resolution of no less than 32 samples per second.)</p> <p>Co-ordinated test to demonstrate NCLR can respond to RRS-UFR deployment instruction within 10min.</p> <p>NCLRs providing RRS-UFR are required to perform an annual telemetry test and biennial under frequency relay test to stay qualified.</p> <p>Nodal Operating Guide (NOG) Attachment 8C Turbine Governor Speed Tests</p> <p>RRS-PFR: Self-test to demonstrate governor/frequency response capability to a ± 0.217 Hz frequency deviation.</p>	<p>NP Section 8.1.1.4.2, Responsive Reserve Energy Deployment Criteria</p> <p>NP Section 8.5.1.1, Governor in Service</p> <p>NOG Section 2.2.7, Turbine Speed Governors</p> <p>NOG Section 2.2., Performance/Disturbance/Compliance Analysis</p> <p>NOG Section 2.3.1.2, Additional Operational Details for Responsive Reserve Providers</p> <p>NOG Section 8 Attachment C, Turbine Governor Speed Tests</p> <p>NOG Section 8, Attachment G, Load Resource Tests</p> <p>NOG Section Attachment 8J, Initial and Sustained Measurements for Primary Frequency Response</p> <p>Limits on provision of RRS-PFR Procedure for Calculating Responsive Reserve Limit (RRS) for Individual Resources</p>

Summary of Ancillary Services (Page 3)

ANCILLARY SERVICE	DURATION	WHO CAN PROVIDE	QUALIFICATION CRITERIA	PERFORMANCE CRITERIA
Non-Spinning Reserve Service (Non- Spin)	<p>SCED Dispatchable - 1 hour (4 hours upon NPRR 1096 implementation)</p> <p>NCLR – Till recalled</p>	GRs, ESRs, CLRs, NCLRs, Aggregate Load Resources (ALRs)	<p>NP Section 8.1.1.2.1.3, Non-Spinning Reserve Qualification</p> <p>Co-ordinated test to demonstrate that a QSE can receive and respond to ERCOT XML deployment. Qualifying offline GR is expected to synchronize and ramp to its Non-Spin obligation within 30 minutes. Qualifying CLR is expected update Non-Spin Schedule telemetry and be available to SCED. Qualifying NCLR is expected to respond by reducing consumption by the deployment amount within 30 minutes</p> <p>Self-test to demonstrate maximum 1 hour (or 4 hours upon NPRR 1096 implementation) injection capability.</p> <p>NP Section 6.5.7.6.2.3, Non-Spinning Reserve Service Deployment</p> <p>Self telemetry test to demonstrate that the QSE can update the Non-Spin Schedule telemetry for qualifying resource no sooner than 30 seconds before the top of the hour and maintain across the operating hour</p>	<p>NP Section 8.1.1.4.3, Non-Spinning Reserve Service Energy Deployment Criteria</p> <p>NP Section 8.1.1.4.1, Regulation Service and Generation Resource/Controllable Load Resource/Energy Storage Resource Energy Deployment Performance, and Ancillary Service Capacity Performance Metrics</p> <p>NOG Section 2.3.2.1, Additional Operational Details for Non-Spinning Reserve Service Providers</p>

Summary of Ancillary Services (Page 4)

ANCILLARY SERVICE	DURATION	WHO CAN PROVIDE	QUALIFICATION CRITERIA	PERFORMANCE CRITERIA
ERCOT Contingency Reserve Service	<p>SCED Dispatchable - 2 hour (2 hours upon NPRR 1096 implementation)</p> <p>NCLRs – Till recalled</p>	GRs, ESRs, CLRs, NCLRs	<p>NP Section 8.1.1.2.1.6, ERCOT Contingency Reserve Service Qualification</p> <p>All Resources qualified to participate in SCED are qualified to provide ECRS. Co-ordinated telemetry test to demonstrate that the QSE can respond to ECRS deployment instruction by updating the ECRS Ancillary Service (AS) Schedule telemetry for the qualifying resource</p> <p>Co-ordinated test to demonstrate QSGRs can respond to an ECRS deployment within 10mins.</p> <p>Co-ordinated test to demonstrate NCLR can respond to ECRS deployment instruction within 10min.</p> <p>Self-test to demonstrate maximum 2 hours injection capability.</p>	<p>NP Section 8.1.1.4.4, ERCOT Contingency Reserve Service Energy Deployment Criteria</p> <p>NP Section 8.1.1.4.1, Regulation Service and Generation Resource/Controllable Load Resource/Energy Storage Resource Energy Deployment Performance, and Ancillary Service Capacity Performance Metrics</p>



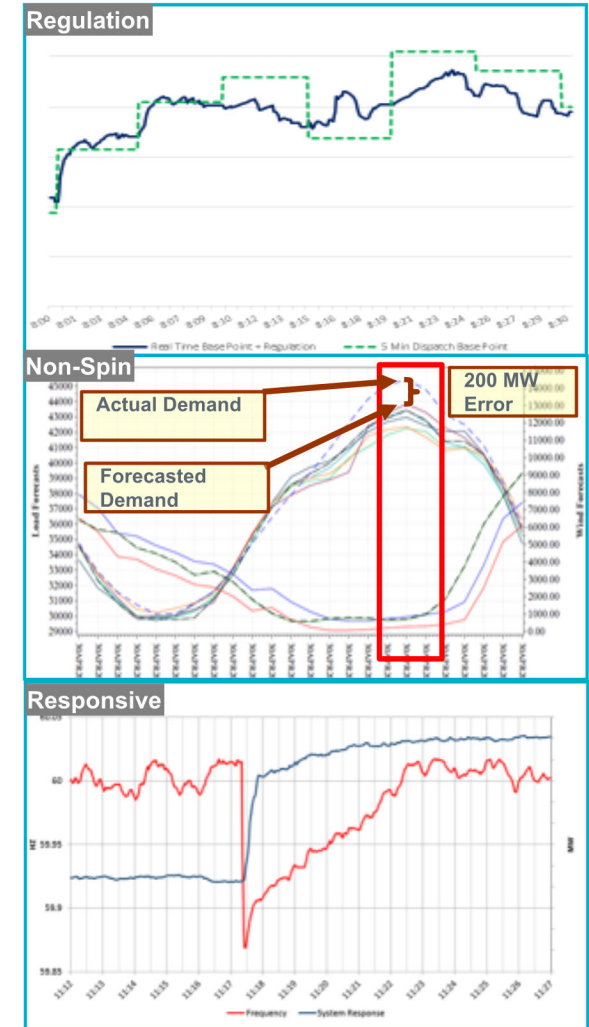
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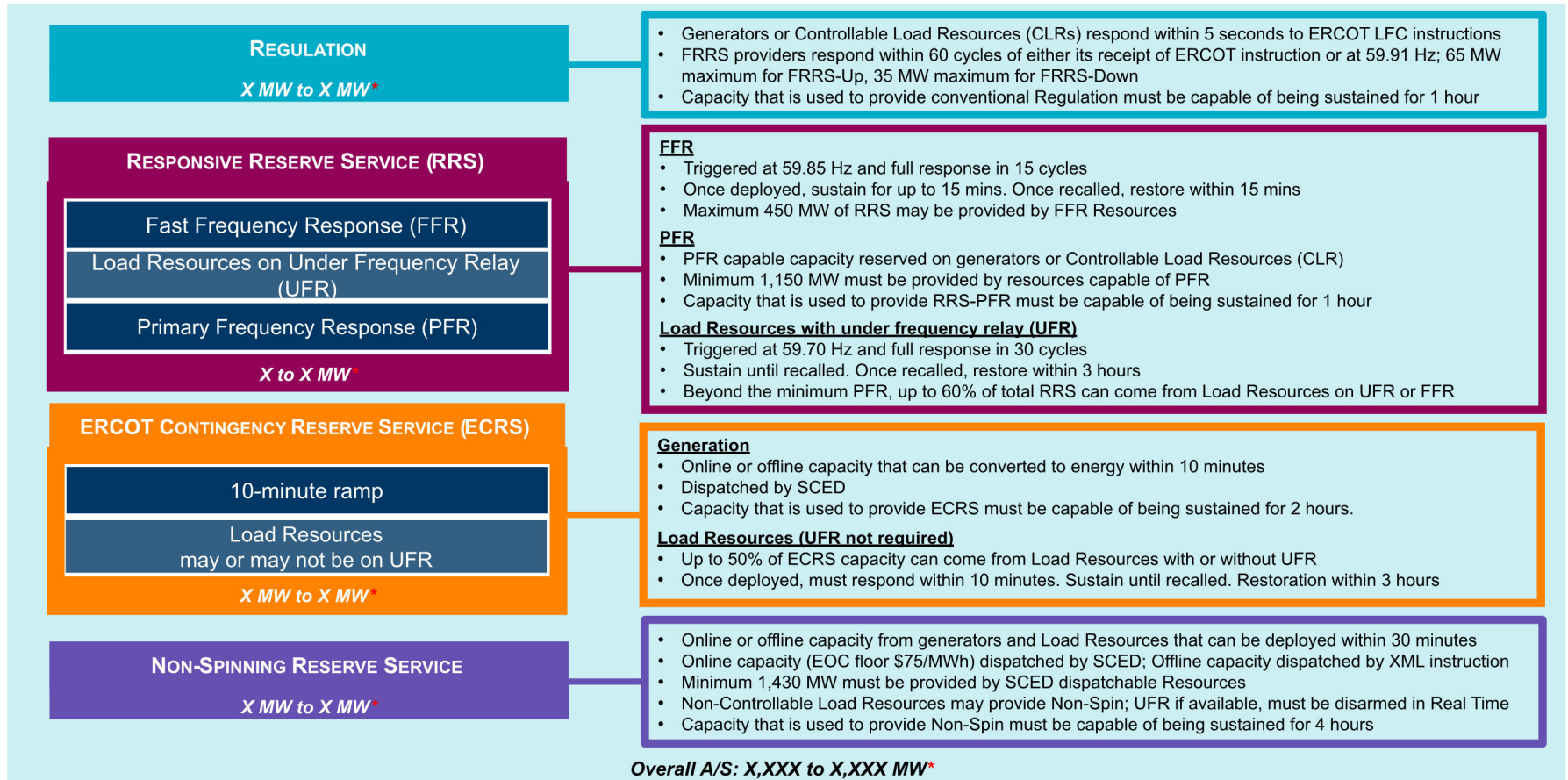
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