

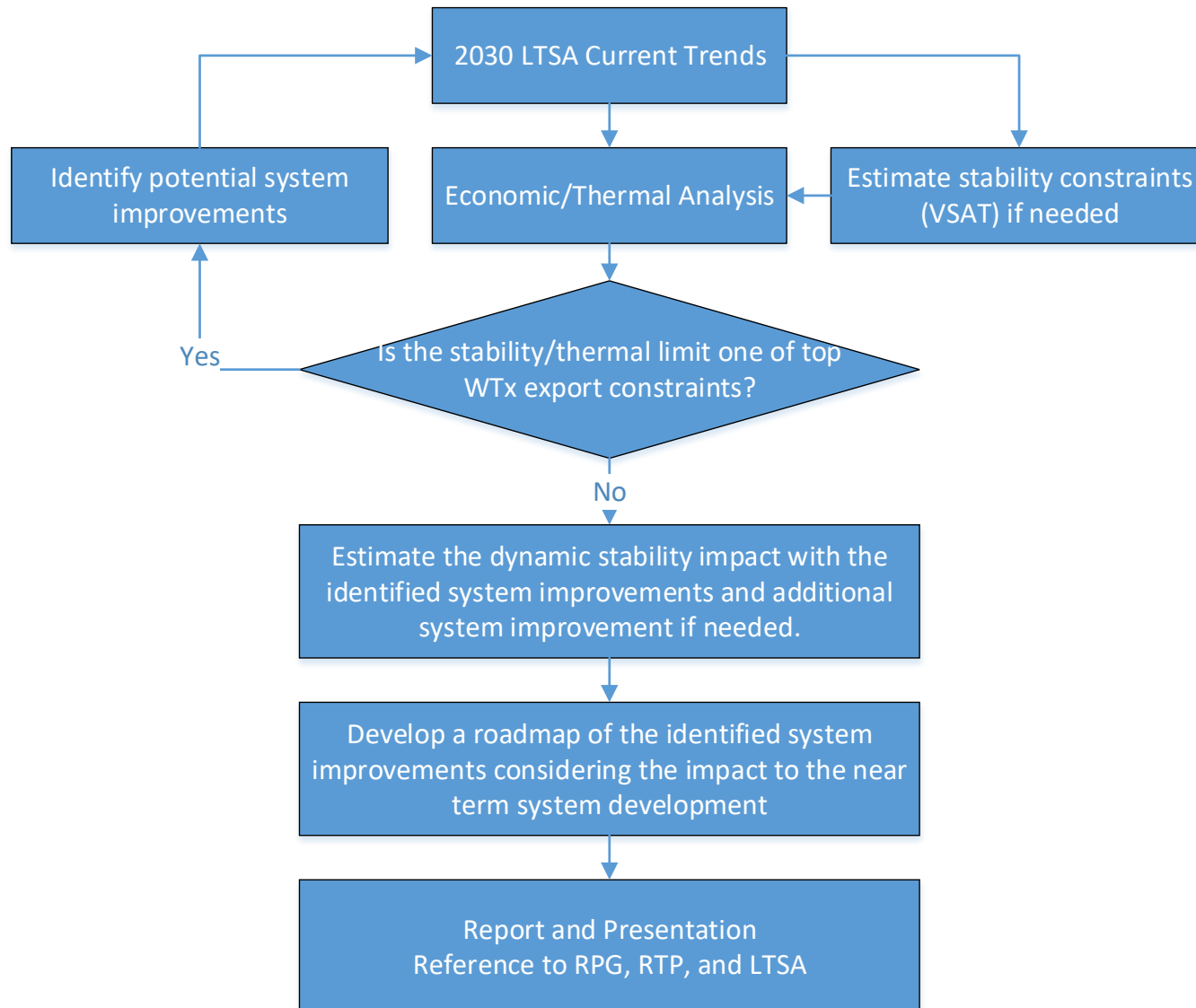


Long-Term West Texas Export Special Study - Update

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Methodology



Study Cases and Study Tools

- Study Case Development
 - Reliability and economic cases will be developed for the near-term 2023 and long-term 2030 assessments.
 - Seed cases:
 - 2020RTP2023Min reliability case is used as the seed case for the 2023 and 2030 reliability assessment
 - 2020RTP2023 and 2020LTSA2030CT economic cases are used as the seed case for the economic assessment
- Study Tools
 - VSAT: to evaluate the West Texas export voltage stability constraint
 - PSS/e: to evaluate the West Texas export dynamic stability constraint
 - UPLAN: to assess the congestion and economic impact of tested and identified potential system improvements

Progress Update

Tasks	Description	Status
1	Study Case Developments	In Progress
2	2030CT Simulation and Improvement Identification	Not Started
3	2023MIN Simulation and Improvement Identification	Not Started
4	Roadmap Development	Not Started
5	Reports	Not Started

- ERCOT plans to complete the study by Q2 2021

Notable Updates and Assumptions

- Steady State Cases
 - Synchronous generators are assumed off in West Texas
 - Review and adjust reactive devices and voltage profile based on the system conditions
 - New or projected generators are assumed to meet ERCOT voltage support requirements
- Dynamic Cases
 - New flat start cases will be prepared based on the developed steady state cases
 - Dynamic models provided by Resource Entities will be used for the existing resources
 - Assumed generic dynamic models and parameters will be used for new or projected IBRs
- Economic Cases
 - Generation and transmission topology are consistent with reliability cases

Preliminary Steady State Cases

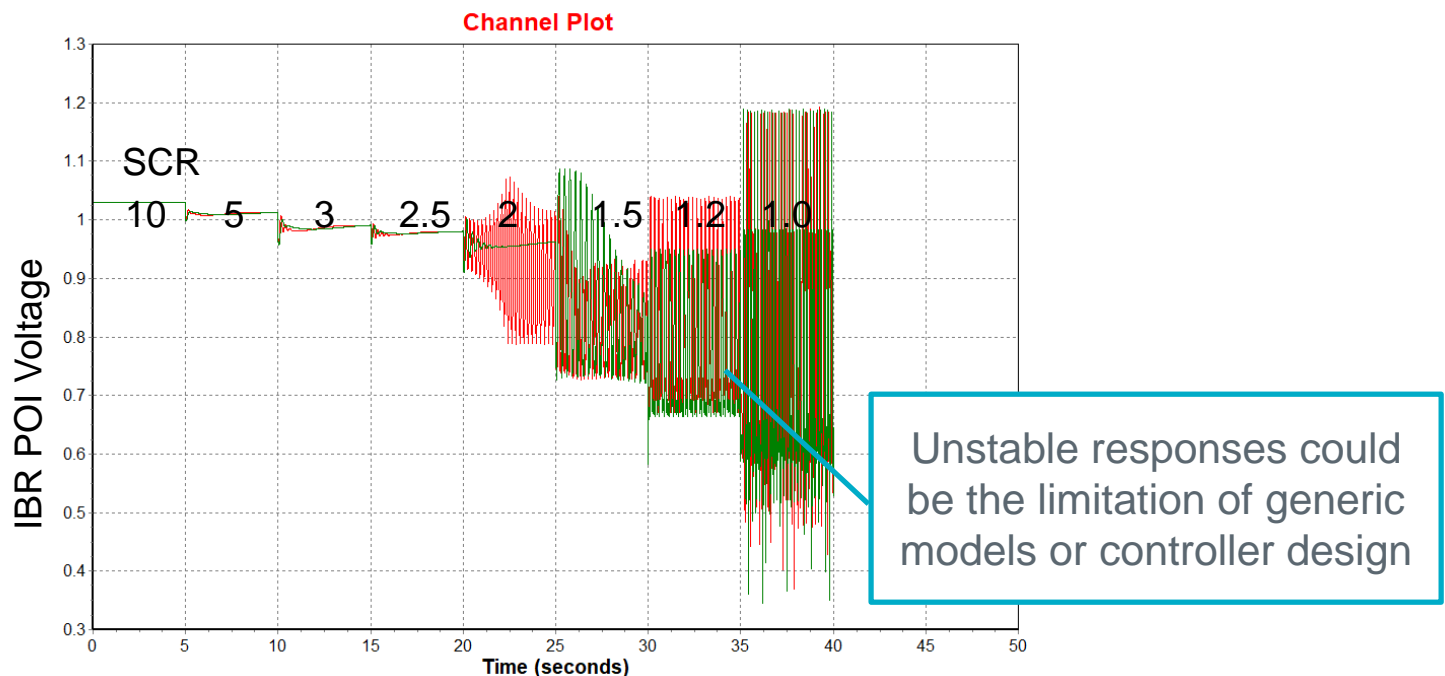
- Inverter-Based Resource Capacity and System Load

Scenarios	Wind (MW)	Solar (MW)	Battery (MW)	System Load (MW)
2023 ⁽¹⁾	~37 GW	~15.5 GW	~1.3 GW	~42.4 GW
2030 ⁽²⁾	~60 GW	~27.7 GW	~1.9 GW	~52 GW

(1) Include new generation resources that met Planning Guide 6.9(1) between April and November 2020. New added resources include ~5GW Solar, ~2GW Wind and 0.7 GW Battery.
(2) Based on the 2020LTSA2030CurrentTrends economic seed case.

Preliminary Test: Assumed Generic Models for Inverter-based Resource (IBR)

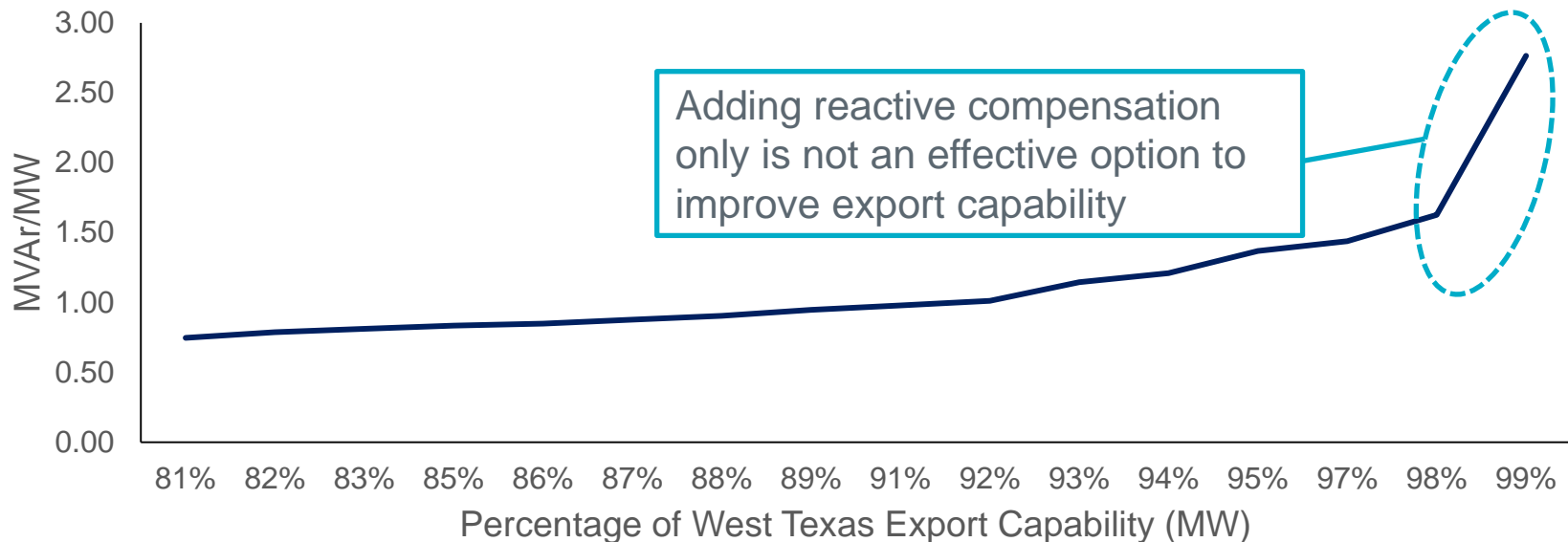
- System strength test for two assumed IBR generic models



Actual user-defined models may better reflect actual performance that cannot be presented in the generic model under weak grid conditions.

Preliminary Steady State Observations

Reactive Compensation Requirement for West Texas Export



Notes:

1. Horizontal axis: percentage of estimated WTX export voltage stability constraint on 16 345-kV circuits
2. Vertical axis: ratio of additional reactive compensation requirement for power transfer increase

Discussion and Next Steps

- Models are critical to assess the impact of the potential system improvement options
- ERCOT plans to host a transmission workshop in Q1 2021
 - To invite subject matter experts (SMEs) to present system improvement technologies that can help the West Texas transfer capability
 - Topics include HVAC, HVDC, reactive support, etc.
 - Please contact Shun Hsien (Fred) Huang, shuang@ercot.com if interested in presenting