



Transmission Constraint Workshop Follow Up -

- 1. Potential Enhancements to QSA & GTC**
- 2. Need for Additional Stability Assessment**

Prabhu Gnanam
Shun Hsien (Fred) Huang

ERCOT Planning Working Group (PLWG)
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1. Potential Enhancements to QSA and GTC

What is the Quarterly Stability Assessment (QSA)?

- QSA is a stability assessment conducted every three months to assess the impact of planned Generation Resources and Settlement Only Generators (SOGs) connecting to the ERCOT Transmission Grid
- QSA is a cluster study that includes all Generation Resources and Settlement Only Generators (SOGs) with planned Initial Synchronization for a specific three month period
- The assessment shall derive the conditions to be studied with consideration given to the results of the Full Interconnection Study (FIS) stability studies for Generation Resources or SOGs, also may study conditions other than those identified in the FIS stability studies

QSA Prerequisites – Planning Guide Section 5.9(4)

- Prerequisites to be satisfied prior to the planned new Generation Resource or SOG being included in the quarterly stability assessment:
 - (a) The Generation Resource or SOG has met the requirements of Section 6.9, Addition of Proposed Generation to the Planning Models.
 - (b) The IE has provided all Generation Resource or SOG data in accordance with the Resource Registration Glossary, Planning Model column, including but not limited to steady state, system protection and stability models.
 - (c) The following elements must be complete:
 - (i) FIS studies;
 - (ii) Reactive Power Study; and
 - (iii) System improvements or mitigation plans that were identified in these studies as required to meet the operational standards established in the Protocols, Planning Guide, Nodal Operating Guides, and Other Binding Documents prior to synchronizing the Generation Resource or SOG.
 - (d) The data used in the studies identified in paragraph (4)(c) above is consistent with Generation Resource or SOG data submitted by the IE as required by Section 6.9.

Potential QSA Enhancement– Additional information

- Provide more information related to the instability findings in the QSA/GTC report
- The information will include qualitative description about the instability such as angular stability, dynamic voltage stability, oscillatory response, and etc.
- Challenges:
 - Different instability phenomena could be observed under different system configurations (e.g., different prior outages)
 - No ERCOT Critical Energy Infrastructure Information (ECEII) will be released (Nodal Protocol 1.3.2.1)

Potential QSA Enhancement– Future Generation

- Provide a qualitative summary on the upcoming generation additions in the subsequent QSA
- The purpose is to facilitate the market participants to better understand the potential impact on future generation
- Challenges:
 - Need more time to prepare additional qualitative information
 - How to address the potential liability concerns with this additional information

Potential QSA Enhancement– Additional Data

- Post QSA study cases for market participants
 - With the study cases, market participants may have a better understanding of the stability issue
 - With the study cases, market participants may be able to help ERCOT to propose some stability tuning and/or enhancement to improve the dynamic performance
 - Challenges:
 - Dynamic cases could be changed/improved at any time
 - Engineering judgement is often needed for dynamic simulation
 - ERCOT Critical Energy Infrastructure Information (ECEII) concerns

Potential GTC Study Enhancement

- Complete and post the market notice of GTC update earlier
 - The purpose is to give market participants more time before the GTC update is implemented
 - Challenge:
 - GTC study starts when the QSA study is finished, which is 2-5 months prior to the initial sync. date of the new gen
 - At least one month is needed for the GTC implementation
 - There are a lot of uncertainties with the exact date that the GTC update will be implemented since many new units often get delayed for commission.

Potential GTC/QSA Process Change

- Combine 2 current QSA and add a pre-GTC study and present it in two stability assessments/year
 - The purpose is to give market participants preview of potential GTC changes and provide more time for market participants to prepare and for GTC changes
 - There will be a separate GTC study and market notice before each GTC is effective (based on the initial sync. date)

Current Timeline for QSA Planning Guide Section 5.9(2)

Generation Resource or SOG Initial Synchronization Date	Last Day for an IE to meet prerequisites as listed in paragraph (4) below	Completion of Quarterly Stability Assessment
Upcoming January, February, March	Prior August 1	End of October
Upcoming April, May, June	Prior November 1	End of January
Upcoming July, August, September	Prior February 1	End of April
Upcoming October, November, December	Prior May 1	End of July

Potential Changes to QSA Planning Guide Section 5.9(2) timeline

Generation Resource or SOG Initial Synchronization Date	Last Day for an IE to meet prerequisites as listed in paragraph (4) below	Completion of Quarterly Stability Assessment
Upcoming January, February, March, April, May, June	Prior May 1	End of September
Upcoming July, August, September, October, November, December	Prior November 1	End of March

Potential GTC/QSA Process Change – Pros/Cons

- Pros
 - Provide an advanced preview of upcoming GTC changes and impact
 - Provide time for market participants to evaluate potential solutions (tuning and/or control changes to improve the dynamic performance)
- Cons
 - The current QSA pre-requisite date for the generator with the earliest initial sync. date will be change from 5 months to 8 months
 - Uncertainties/delays to the initial sync. could have impact the results



2. Need for Additional Stability Assessment

Need for Additional Stability Assessment – Market Participants' feedback

- Appreciate stakeholders' feedback in the previous PLWG meetings and written comments
- Summary of received comments:
 - MPs need long term awareness of potential stability constraints in the planning horizon, for example years 1-6
 - MPs need to be capable of conducting the stability assessment
 - ERCOT should incorporate the potential stability constraints in the planning process to identify system improvements

Existing Process – Planning Models

Criteria to be included in the Planning Models	Steady State Case (e.g., SSWG)	Dynamic Case (e.g., DWG)
Not Meet PG 6.9*	No	No
Meet PG 6.9(1)	Simple Model	Negative Load**
Meet PG 6.9	Yes	Yes

* ERCOT Planning Guide Section 6.9, <http://www.ercot.com/mktrules/guides/planning/current>

** Projects are represented as negative load in the dynamic cases if acceptable dynamic models are not provided by developers.

Discussions

- Types of assessments
 - PV voltage stability analysis: may provide indicative information for the potential stability constraints related to limited power transfer capability
 - Steady state cases, such as SSWG cases, are posted to the MIS Secure Area
 - Generation interconnection status report is posted to the ERCOT webpage
 - Dynamic stability analysis: require sufficient dynamic information, including acceptable dynamic models
- Challenges if ERCOT was to perform such assessment
 - Projects without dynamic models: developers need to provide sufficient dynamic related information, including acceptable dynamic models
 - Scope, methodology, purpose, schedule, staff/process impact, etc., need to be further discussed and defined
- Revision request that could allow Market Participants (MPs) greater flexibility to conduct stability assessments.

Appendix

SSWG Cases Schedule

YR (YR=Current Year)											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
YR-1 SSWG Update 2			YR SSWG Build (Apply YR ALDR)				YR SSWG Update 1				
			Update YR-1 SSWG Fall and Win cases				Update YR-1 SSWG Win cases				
	March 1 - Post SSWG Cases and TPIT				July 1 - Post SSWG Cases and TPIT				Oct 15 - Post SSWG Cases and TPIT		
	Update Con Files and Planning Data Dictionary				Update Con Files and Planning Data Dictionary				Update Con Files and Planning Data Dictionary		

DWG Dynamic Cases Target Schedule

YR (YR=Current Year)									YR + 1			
Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	
YR SSWG Build Process July 1 - Cases Posted												
		Prepare DWG Flat Start Schedule	DWG Dynamic Flat Start Case Development Near Term On-Peak Case Near Term Off-Peak Case Long Term On-Peak Case									
								Final DWG Data Sets Posted				
									Submit Dynamic Contingency Files and Dynamic Load Models			
									Stability Book Finalized and Posted			