



**West to Central (W\_TO\_C) GTC**

**Transmission Operations Planning**

**ROS Meeting  
7/9/2020**

## Background

- On June 24, ERCOT implemented a new West to Central GTC to manage the stability constraint with the installation of new Generation Resources in the ERCOT West Central area
- 2020 Q2 QSA study identified this stability issue while analyzing new generation added in the Divide – McCamey – San Angelo area and the analysis was updated in the 2020 Q3 QSA study
- W\_TO\_C is the outcome of the GTC study to address the Divide – McCamey – San Angelo stability issue identified in the 2020 Q2 & Q3 QSA

# W\_TO\_C GTC Study Scope

- The W\_TO\_C GTC study case was based on QSA Q2 2020 study case
- A variety of generation dispatch levels (20% – 60%) in Divide – McCamey – San Angelo area were studied in Steady-state and dynamic simulation
- The following NERC Planning Event 345kV contingencies in West Central area were studied:
  - P1 (single)
  - P6 (single + single)
  - P7 (double)
  - P1 + P7 (single + double)
  - P7 + P1 (double + single)
  - P7 + P7 (double + double)

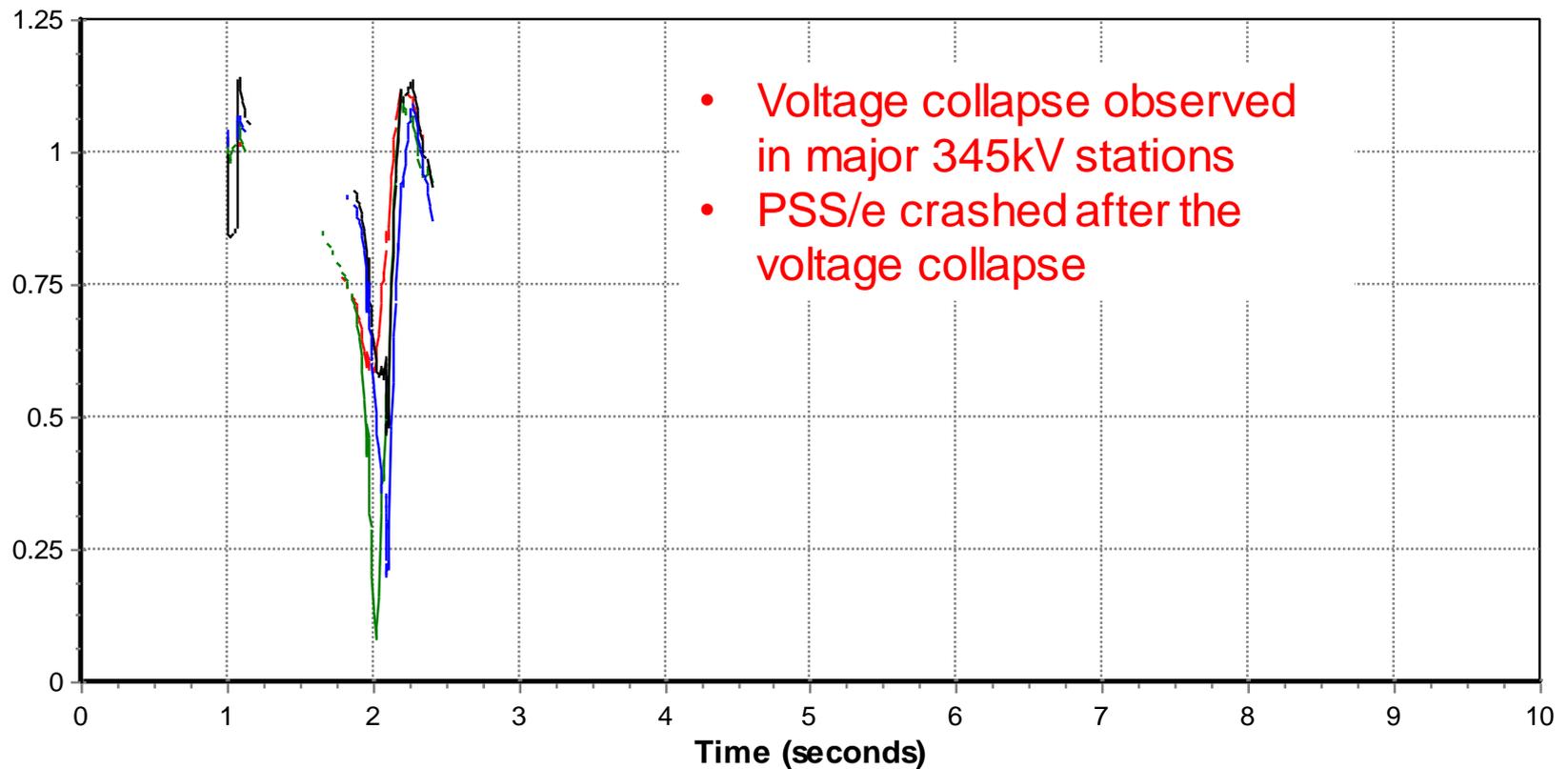
## W\_TO\_C Stability Issue

- Voltage collapse observed in the dynamic simulation for a P7 event
- No voltage collapse observed in the steady-state power flow analysis for the same P7 event, indicating that dynamic limits are more binding than PV limits (VSAT limits)
- The nature of the dynamic voltage stability phenomenon identified in the W\_TO\_C GTC study is same as the stability issue identified in the planning West Texas Export study

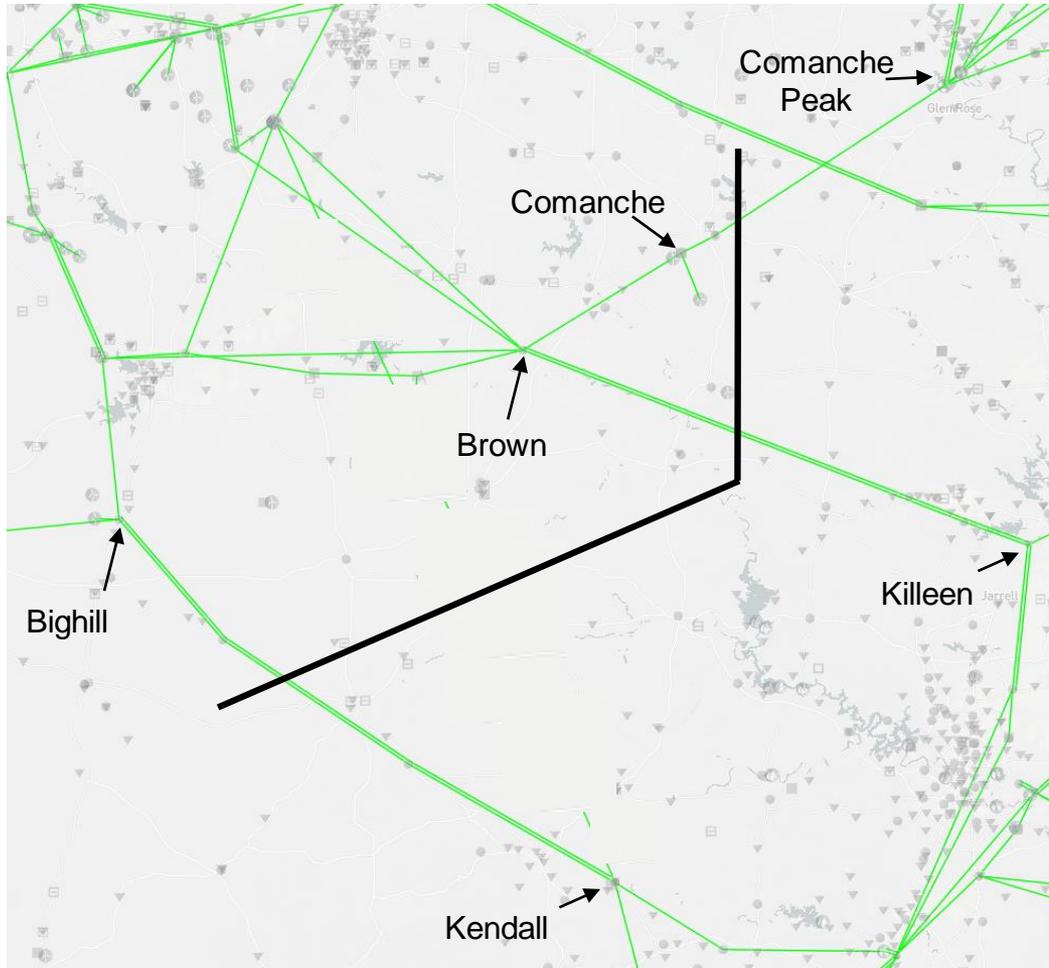
[http://www.ercot.com/content/wcm/lists/197392/2020\\_West\\_Texas\\_Export\\_report\\_final.pdf](http://www.ercot.com/content/wcm/lists/197392/2020_West_Texas_Export_report_final.pdf)

# W\_TO\_C Dynamic Voltage Stability Plot

- System unstable under a P7 contingency (SLG fault)



# W\_TO\_C GTC



## W\_TO\_C GTC Interface (5\*345kV lines)

- Bighill – Kendall (2)  
(measured at Bighill)
- Brown – Killeen (2)  
(measured at Brown)
- Comanche – Comanche Peak (1)  
(measured at Comanche)

These lines represent the significant transfer related to the West to Central voltage stability issue

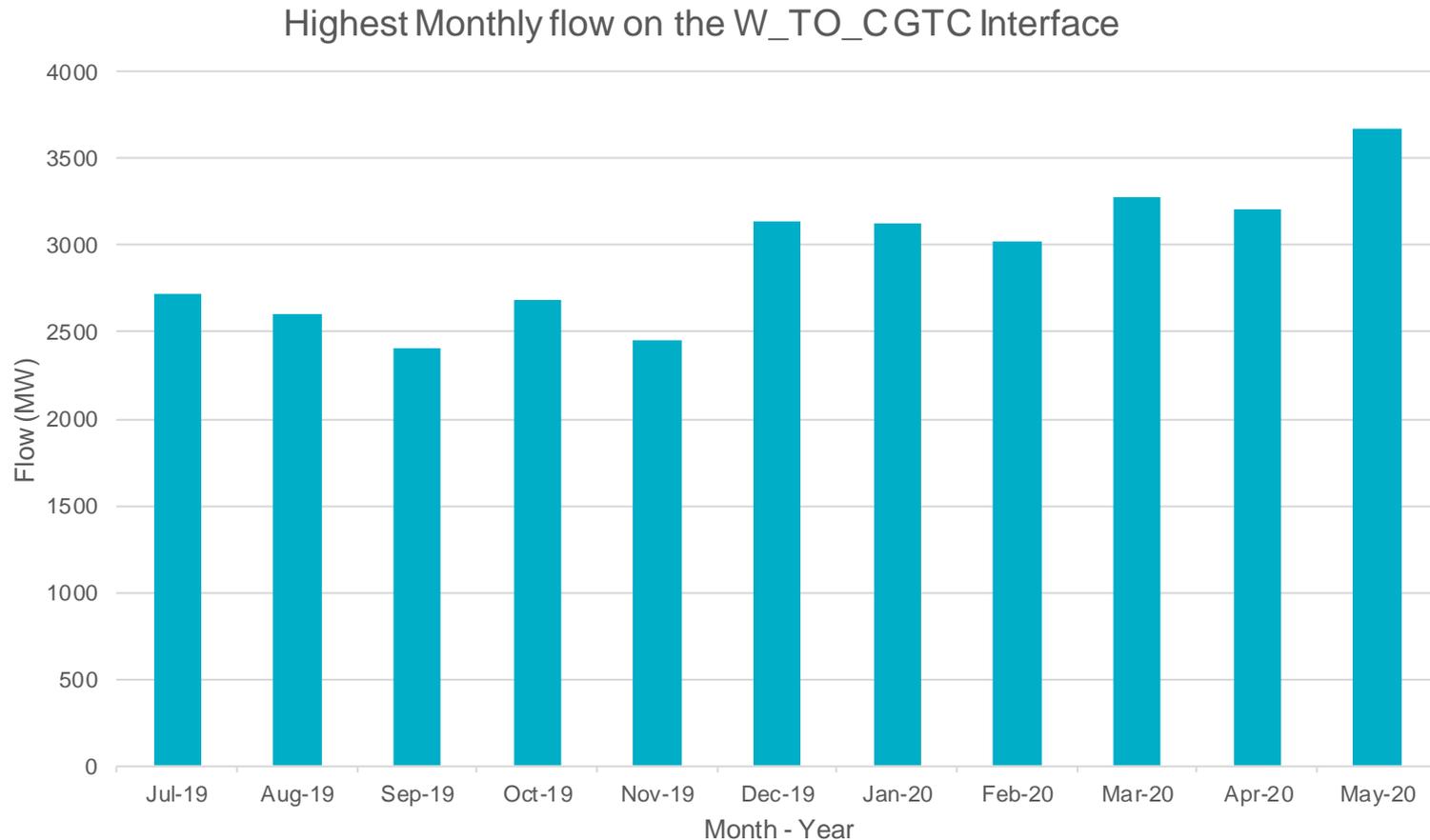
# W\_TO\_C GTLs

## System Operating Limits for the W\_TO\_C GTL Table

Prior Outage	System Operating Limit (MW)
None	4178
Big Hill – Kendall 345 kV double circuit	2393
Brown Switch – Bow Wood / Twin Buttes 345 kV double circuit	3546
Divide – Twin Buttes 345 kV double circuit	3812
Big Hill – Schneeman Draw 345 kV single circuit	3900
Corn Trail Switch – Comanche Switch (ONCOR) 345 kV single circuit	3786
Brown Switch – Killeen Switch 345 kV double circuit	2635
Big Hill – Kendall 345 kV single circuit	3900
Twin Buttes – Brown Switch 345 kV single circuit	3952
Bow Wood – Brown Switch 345 kV single circuit	3894
Divide – Twin Buttes 345 kV single circuit	4115
Brown Switch – Killeen Switch 345 kV single circuit	3667

# Recent Historical Data

- **Maximum flow of 3,677 MW observed from 6/10/2019 to 6/10/2020**



## Current QSA (Q4 2020)

- West Texas export is being studied in Q4 2020
  - Study area similar to the planning West Texas Export study
  - Additional 2.4 GW of wind and solar compared to W\_TO\_C GTC study

West Texas IBRs (Capacity)	QSA Q2 2020/ W_TO_C GTC	QSA Q3 2020	QSA Q4 2020
Wind (GW)	21.8	22.2	22.3
Solar(GW)	3.8	4.3	5.7
Wind + Solar(GW)	25.6	26.5	28

- The study results will be released by August 1<sup>st</sup>, 2020

# W\_TO\_C compared to West Texas Export Study

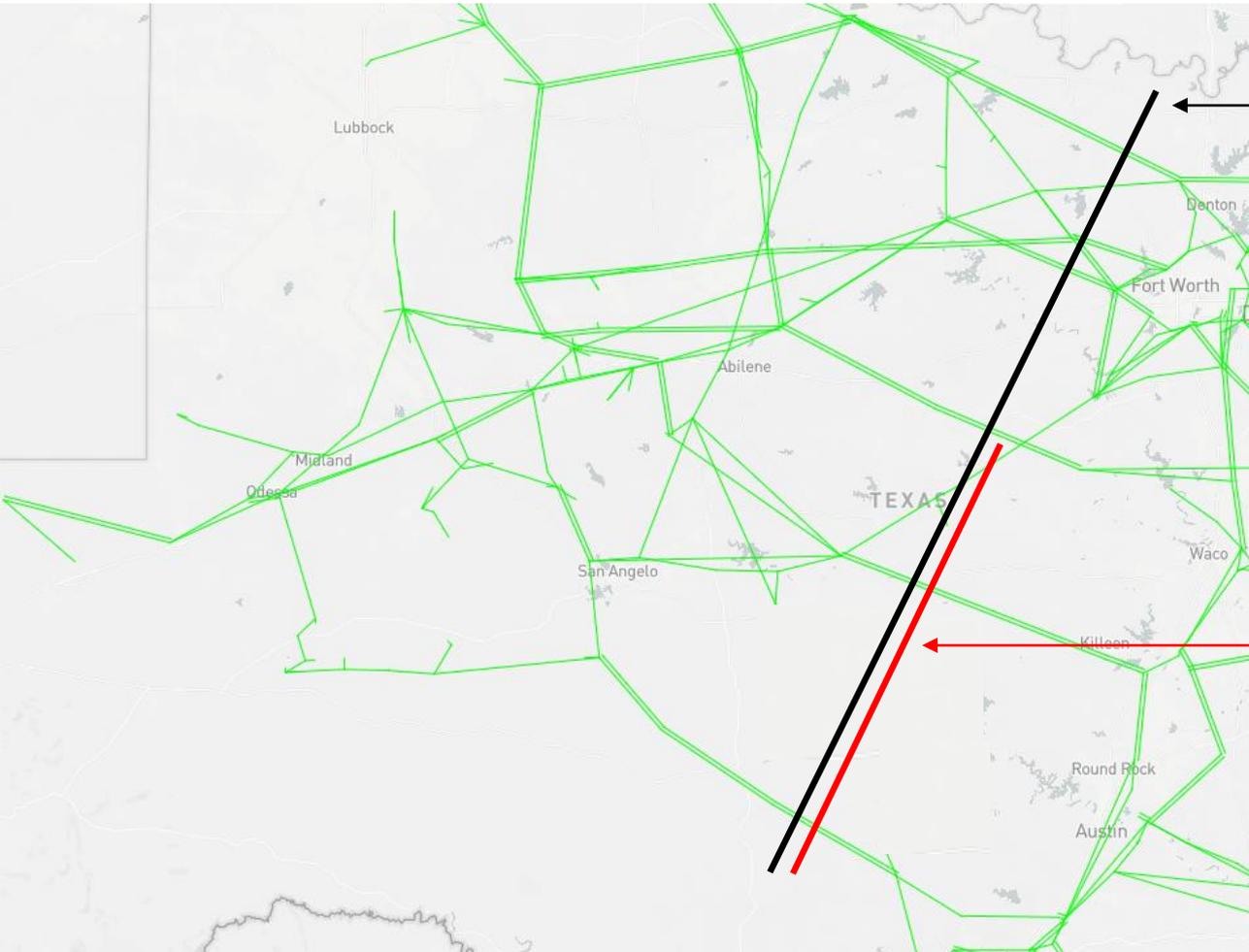
West Export Path (16\*345kV lines)  
“West Texas Export Analysis”,  
ERCOT Planning, 5/7/2020 ROS  
meeting

[http://www.ercot.com/content/wcm/key\\_documents\\_lists/189388/04\\_Panhandle\\_and\\_West\\_Texas\\_Stability\\_Studies\\_Update.pdf](http://www.ercot.com/content/wcm/key_documents_lists/189388/04_Panhandle_and_West_Texas_Stability_Studies_Update.pdf)

The GTC interface  
definition will be re-  
evaluated as generation  
and transmission changes

W\_TO\_C GTC Interface  
(5\*345kV lines):

- Bighill – Kendall (2)  
(measured at Bighill)
- Brown – Killeen (2)  
(measured at Brown)
- Comanche – Comanche  
Peak (1)  
(measured at Comanche)



# Management of the W\_TO\_C GTC Limits

- No change in enforcement of GTC Limits
- GTC Limits will be based on a static off-line table (i.e. will not use VSAT in real-time)
- This is an “Open” GTC
  - Definition is based on system flows from West Texas towards Central Texas
  - Definition is not based on a generation injection “pocket”
- Shift Factors will vary based on system conditions just like other open GTCs today