



West Texas Sensitivity (WTS) Study – Update

RPG
August 27, 2013



West Texas Sensitivity Study

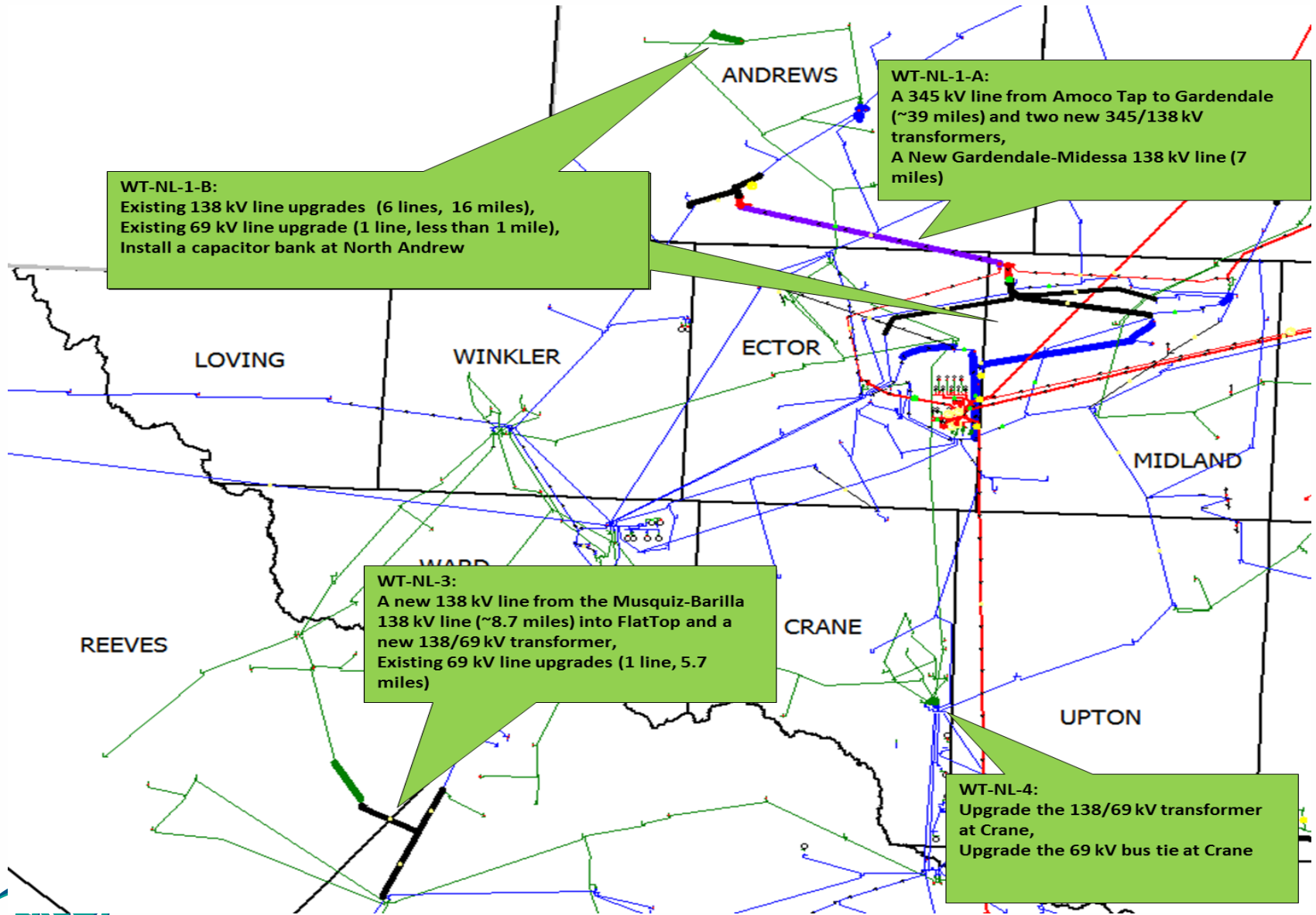
- ERCOT is conducting a study to analyze the system needs in west Texas due to the oil and gas load growth
- Reliability Analysis/ Assumptions:
 - 2015 and 2017 steady-state reliability and economic analysis
 - final summer peak cases from the 2012 5YTP with an updated load forecast from the TDSPs
 - Cases include all recently approved RPG projects in the area

	2017 Summer Peak (2012 5YTP case) MW	2017 Summer Peak (WTS Normal) MW	2017 Summer Peak (WTS High) MW
West	2362	2585	2696
Far West	2192	3569	3944

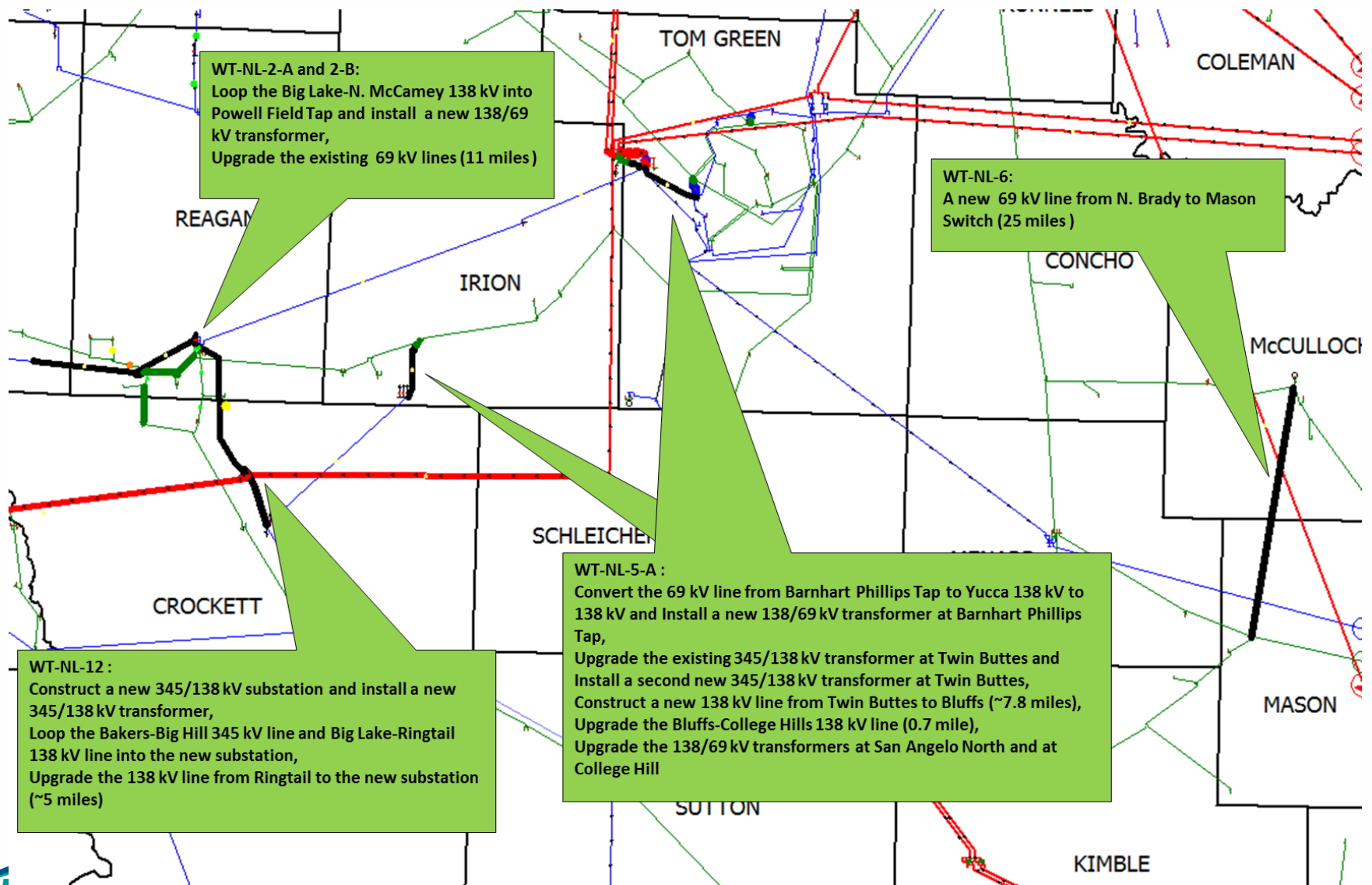
- Reliability analysis assumes zero MW wind output for West zone and 10% output for the Coastal zone



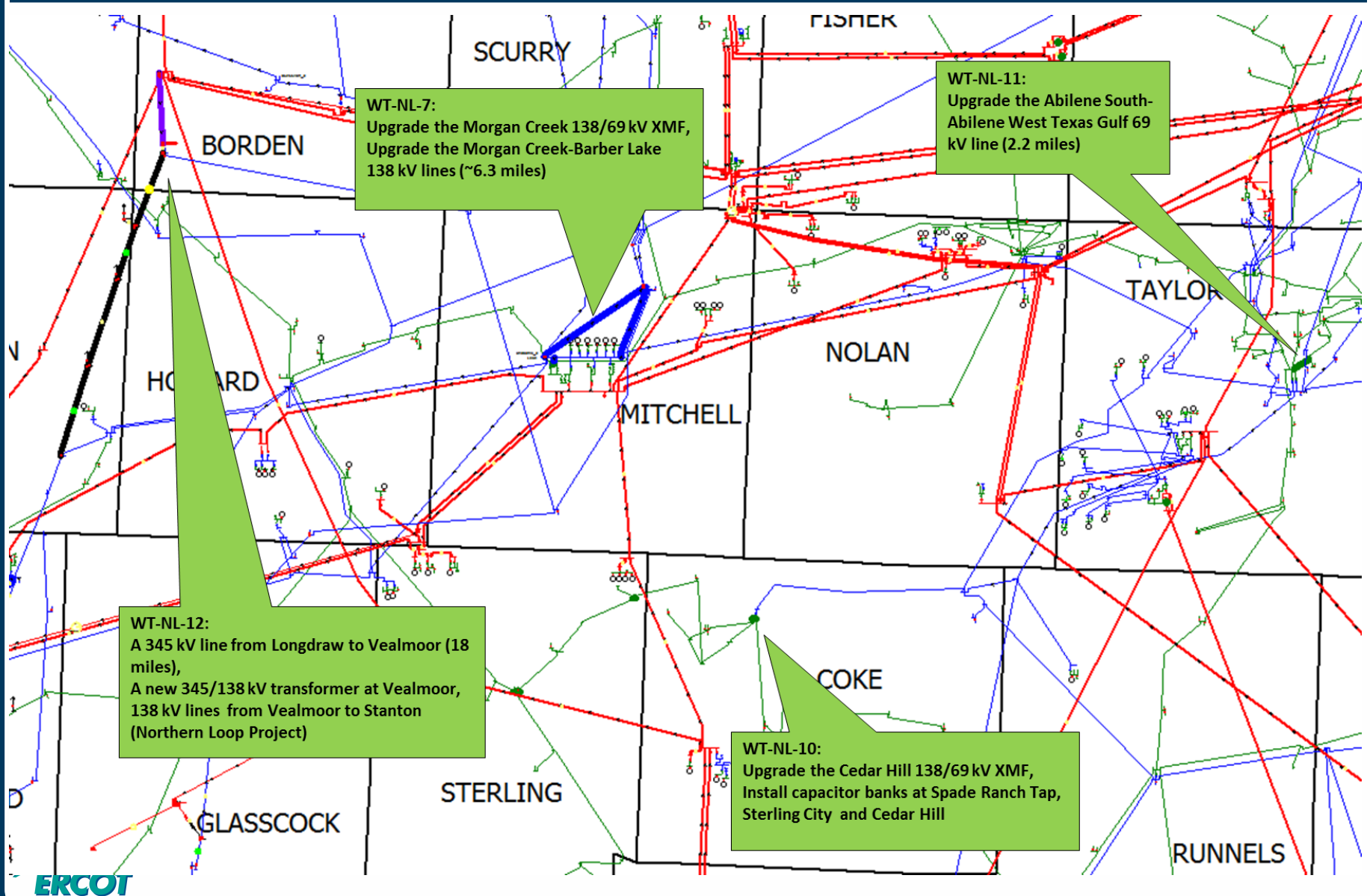
2017 WTS Reliability Projects (Northwest of WT)



2017 WTS Reliability Projects (South of WT)



2017 WTS Reliability Projects (Northeast of WT)



2017 West Texas Economic Analysis

- Economic Case Assumption
 - Study years
 - 2015 and 2017
 - Generation
 - Same as 2012 5YTP
 - Demand
 - West and Far West weather zones used the West Texas reliability study demand forecast
 - Other weather zones remained the same as 2012 5YTP
 - Transmission Model
 - Same as the West Texas reliability study (includes all WT Reliability projects)



2017 West Texas Economic Project

- One economic project was proposed in Far West in 2017
- Andrews North 138/69 kV autotransformer #1 upgrade in 2017
 - Currently the emergency ratings of the two Andrews North 138/69 kV autotransformers are 41 and 84 MVA respectively.
 - The Andrews North autotransformer #1 with 41 MVA was congested 5.15% of the hours in 2017 under the contingency loss of the Andrews North auto 2.
 - Upgrading the Andrews North autotransformer #1 to 84 MVA would reduce the annual production cost by \$12 million in 2017.
 - The estimated capital cost to upgrade this autotransformer is less than \$2 million.



West Texas Sensitivity Study Timeline

- ERCOT is currently preparing the draft report
- The final report issued by Sept. 13th



Questions?



2017 WTS Reliability Projects (Northwest of WT)

Project Index	Project Description
WT-NL-1-A (Midland-Ector-Andrew County Reliability Project)	<ol style="list-style-type: none"> 1. Construct a new 345/138 kV substation adjacent to the existing Gardendale substation 2. Loop the existing Moss-Midland 345 kV line into the new 345/138 kV substation 3. Install a new 500 MVA 345/138 kV transformer at the new 345/138 kV substation near Gardendale 4. Loop the existing double circuit 138 kV lines (Grandview-Mocking Bird and Texaco Tap-Ector Hill) 5. Construct a new 138 kV line from Gardendale to Midessa (~7.2 miles) 6. Construct a new 345/138 kV substation adjacent to the existing Amoco-Arena 138 kV line 7. Connect a 345 kV line from the new 345/138 kV substation near Gardendale to the new 345/138 kV substation adjacent to the existing Amoco-Arena 138 kV line in Andrews County 8. Loop the existing Amoco-Arena 138 kV line into the new 345/138 kV substation 9. Install a new 500 MVA 345/138 kV transformer at the new 345/138 kV substation adjacent to the existing Amoco-Arena 138 kV line
WT-NL-1-B (Midland-Ector-Andrew County Reliability Project)	<ol style="list-style-type: none"> 1. Upgrade Midland East-Windwood 138 kV line 2. Upgrade Westover-Amoco South Foster 138 kV line 3. Upgrade Odessa North-Amoco South Foster 138 kV line 4. Upgrade Fullerton-Exxon Fullerton 69 kV line 5. Upgrade CRMWD 8 Tap-Glenhaven 138 kV line 6. Upgrade CRMWD 8 Tap-Midland Airport 138 kV line 7. Upgrade Odessa EHV Switch-Odessa 138 kV line 8. Install 36.8 Mvar capacitor bank at North Andrew 138 kV substation
WT-NL-3 (Reeves County)	<ol style="list-style-type: none"> 1. Construct a new 138 kV substation adjacent to the existing Barilla-Musquiz 138 kV line 2. Loop the existing Barilla-Musquiz 138 kV line into the new 138 kV substation 3. Expand the existing Flat Top 69 kV substation to accommodate new 138/69 kV facilities 4. Install a new 138/69 kV transformer at Flat Top 5. Construct a new 138 kV line from the new 138 kV substation to Flat Top (~8.7 miles) 6. Upgrade the existing Barilla Draw Field Tap-Flat Top 69 kV line
WT-NL-4 (Crane County)	<ol style="list-style-type: none"> 1. Upgrade the existing 138/69 kV transformer at Crane 2. Upgrade the existing 69 kV bus tie at Crane

2017 WTS Reliability Projects (South of WT)

Project Index	Project Description
WT-NL-2-A (Reagan-Crockett County Reliability Project)	<ol style="list-style-type: none"> 1. Close the normally-open Powell Field-Powell Field Junction 69 kV line 2. Close the normally-open Illinois #4-Pandale 69 kV line 3. Bypass the existing normally-closed phase shifter at Big Lake 4. Expand the existing Humble Tap (Powell Field Tap) 69 kV substation to accommodate new 138/69 kV facilities 5. Loop the existing Big Lake-North McCamey 138 kV line into the expanded Humble Tap substation 6. Install a new 138/69 kV transformer at the expanded Humble Tap substation
WT-NL-2-B (Reagan-Crockett County Reliability Project)	<ol style="list-style-type: none"> 1. Upgrade the existing Big Lake-Kemper Exxon Tap 69 kV line (6534-6543-1) 2. Upgrade the existing Kemper Exxon Tap-Humble Tap 69 kV line (6543-6544-1) 3. Upgrade the existing Shell Powell Tap-Powell Field 69 kV line (6540-6545-1)
WT-NL-5-A (Tom Green -Irion County)	<ol style="list-style-type: none"> 1. Convert the existing 69 kV line from Barnhart Phillips Tap to Yucca 138 kV to 138 kV 2. Install a new 138/69 kV transformer at Barnhart Phillips Tap 3. Upgrade the existing 345/138 kV transformer at Twin Buttes 4. Install a second new 345/138 kV transformer at Twin Buttes 5. Construct a new 138 kV line from Twin Buttes to Bluffs (~7.8 miles) 6. Upgrade the existing Bluffs-College Hills 138 kV line 7. Upgrade the existing 138/69 kV transformer at San Angelo North 8. Upgrade the existing 138/69 kV transformer at College Hill
WT-NL-6 (Menard-Mason County)	<ol style="list-style-type: none"> 1. Expand the existing North Brady 69 kV substation 2. Construct a new 69 kV line from Mason Switch to North Brady (~25 miles)



2017 WTS Reliability Projects (Northeast of WT)

Project Index	Project Description
WT-NL-7 (Mitchell County)	1. Upgrade the two existing Morgan Creek-Barber Lake 138 kV lines 2. Upgrade the existing Morgan Creek 138/69 kV transformer
WT-NL-10 (Coke County)	1. Upgrade Cedar Hill 138/69 kV transformer 2. Install 12 Mvar capacitor bank at Spade Ranch Tap 69 kV bus 3. Install 12 Mvar capacitor bank at Sterling City 69 kV bus 4. Add 12 Mvar capacitor bank to the existing capacitor bank at Cedar Hill 69 kV substation
WT-NL-11 (Taylor County)	1. Upgrade Abilene South-Abilene West Texas Gulf 69 kV line
WT-NL-12 (Due to G-1+N-1) Borden, Martin, Mitchell Upton, Reagan, Crockett, Irion, Tom Green	1. Expand the existing Vealmoor 138 kV substation to accommodate 345/138 kV facilities 2. Install a new 450 MVA 345/138 kV transformer at Vealmoor 3. Connect 345 kV line from Vealmoor to Longdraw 4. Connect W Stanton to Vealmoor (Northern Loop Project) 5. Construct a new 345/138 kV substation at the junction where the Bakers-Big Hill 345 kV line (CREZ line) and the Ringtail-Big Lake 138 kV line cross (50% of the Bakers-Big Hill 345 kV line, ~5 miles north of Ringtail 138 kV bus) 6. Loop the Bakers-Big Hill 345 kV line into the new substation 7. Loop the Big Lake-Ringtail 138 kV line into the new substation 8. Install a new 345/138 kV transformer at the new substation 9. Upgrade the existing 138 kV line from Ringtail to the new substation (~5 miles)

