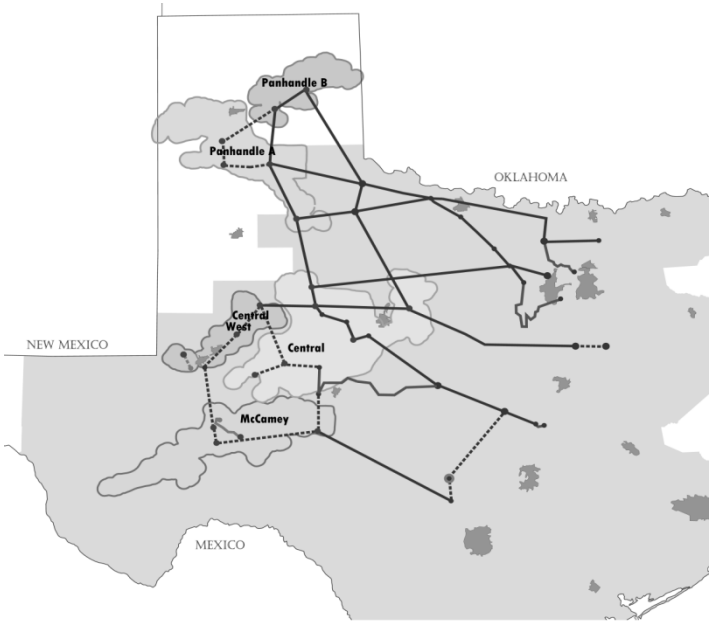
WEST TEXAS SECURITY ANALYSIS

Dynamic Studies Group
ERCOT System Planning

Regional Planning Group Meeting

December 7, 2012

Major concerns



- **The impact of existing West-North stability transfer limit during CREZ implementation.**
- **The need of existing West-North stability transfer limit after CREZ implementation.**
- **Identify any stability related system constraints in West Texas after CREZ implementation.**

- **Study cases**

Study Case	Load (MW)	Wind Generation Dispatch %		Conventional Units in west Texas
		West + North	Rest of ERCOT	
2015 Summer Peak	76245	66%	39.9%	All In-service
2015 HWLL	33251	76%	63.6%	N/A
2015 HWLL	33251	91.4%	63.6%	N/A

- **The total installed wind generation capacity in the study case was approximately 11 GW, with approximately 9 GW in the West and North regions and approximately 2 GW in the rest of ERCOT**
- **All of the existing and IA-signed generation resources as of March 19, 2012 were modeled in the study cases.**

Performance Criteria

- **Total loss of wind generation capacity should be less than 2800MW.**
- **The damping ratio of inter-area oscillation modes should be no less than 3%.**
- **No conventional generators tripped in the dynamic simulation.**
- **Post-contingency steady state voltage should be larger than 0.9 p.u.**
- **Maintain a stable operation state in the post contingency.**

Study results – after full CREZ implementation

- **Largest generation trip**
  - 903 MW capacity of WGRs that don't have voltage ride through capability
- **Largest frequency deviation**
  - 59.46 Hz after tripping two STP units
- **No observable inter-area oscillations**
- **Acceptable voltage recovery above 0.9 p.u. after disturbance**

There will be no need for the existing West-North stability transfer limit after full CREZ implementation.

West-North Stability Transfer Limit updates

- **Only study the condition with no conventional units online in west Texas.**
- **To determine West-North stability transfer limit during the CREZ construction period (from 2012 to 2014)**
- **Complete WN transfer stability limits at different CREZ implementation stages.**

WN limits

Scenario*	Description	Interface	Highest Limit (No outage condition)
2012_October	Existing operational condition	Existing six 345 kV lines	2556 MW
2013_February	After Brown-Killeen double circuits in service	As above plus Brown-Killeen double circuit (8 circuits total)	3414 MW
2013_May	After W. Shackelford-SamSW/Navarro double circuits in service	As above plus W.Shackelford-SamSW/Navarro double circuits (10 circuits total)	3800 MW
2013_September	After Riley-WKrum double circuits in service	As above plus Riley-WKrum double circuits (12 circuits total)	3994 MW
2014_January	After Clear Crossing-Willow Creek & Big Hill-Kendall double circuits in service	As above plus Clear Crossing-Willow Creek & Big Hill-Kendall double circuits (16 circuits total)	5800 MW**

* Based on TPIT schedule

** 850 MW is able to switch between the West and South zones and is connected in the West zone.

Conclusion

- **The impact of existing West-North stability transfer limit during CREZ implementation.**
  - Study results show an increase in the West-North transfer stability limit as additional CREZ lines are placed in service.

- **The need of existing West-North stability transfer limit after CREZ implementation.**
  - There will be no need for the existing West-North stability transfer limit after full CREZ implementation.

- **Identify any stability related system constraints in West Texas after CREZ implementation.**
  - The impact of future generation projects that could cause a system constraint will be studied as normal planning process.