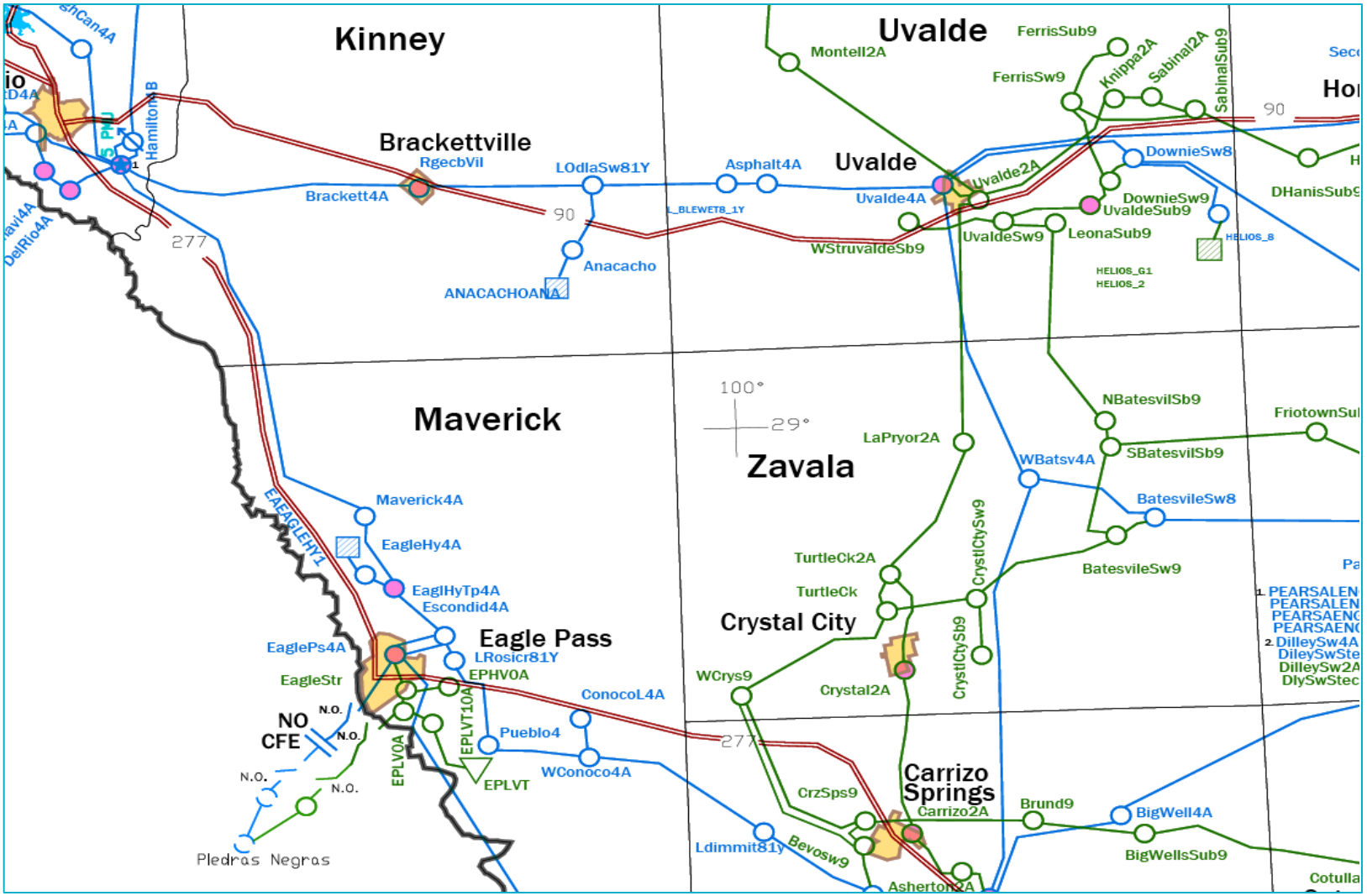
ERCOT Independent Review of AEP Maverick County Transmission Project

Regional Planning Group
January 24, 2017

Introduction

- The load growth in the Maverick County area located in South Texas has created the need for transmission improvement
- AEP submitted a project for Regional Planning Group (RPG) review in 2016
- LCRA commented on this RPG project and submitted project alternatives
- The transmission need in this area has also been identified during the Regional Transmission Plan (RTP) study

Transmission System map of the study area



Study Case

- **Base Case**
  - The 2018 and 2021 South/South Central (SSC) summer peak cases from the 2016 Regional Transmission Plan (RTP) was used to create the base case for this study.
- **Transmission Changes**
  - The 2016 RTP secure cases included a placeholder project in the study area
  - The project related to this RPG proposal was removed from the 2016 RTP secure case in order to create a study base case
- **Generation Changes**
  - Add new generator resources which meet Planning Guide criteria 6.9 since the 2016 RTP study
- **Criteria**
  - The reliability criteria used in this independent review is consistent with the RTP study

Reliability Analysis of the Base Cases

- Thermal overloads were observed in 2018 and 2021 summer peak cases under N-1 contingency condition

Monitored Element	Contingency	2018	2021
Hamilton Road (8255) - Maverick (8692) 138kV	W Conoco (8274) - Dimmit (78281) 138kV	128.2%	132.1%
Maverick (8692) - Eagle Hydro Tap (8264) 138kV	W Conoco (8274) - Dimmit (78281) 138kV	125.4%	129.3%
Eagle Hydro Tap (8264) - Escondido (8260) 138kV	W Conoco (8274) - Dimmit (78281) 138kV	116.7%	122.7%
West Batesville (8236) - Asherton (8283) 138kV	Dilley (8212) - Big Wells (8613) 138kV	101.4%	106.7%
Batesville (5849) - Crystal City (5855) 69kV	OPEN Bus ASHERTON4A (8283) 138kV	98.9%	108.0%

Project Options

Option	Description of the project	Project Cost Estimate ($Million)
Option 1	Upgrade the existing Hamilton – Escondido 138kV & West Batesville – Asherton 138 kV (~90 miles)	83
Option 2	New 138kV line from West Batesville to Escondido (~48 miles)	48
Option 3	New 138kV line from Brackettville to Escondido (~42 miles)	44
Option 4	New 138kV line from Odlaw Switch to Escondido (~42 miles)	44
Option 5	New 138kV line from Odlaw Switch to Rosita Creek (~41 miles)	44
Option 6	New 138kV line from Blewett to Rosita Creek (~41 miles)	44
Option 7	New 138kV line from Blewett to W Conoco Load & upgrade existing W Conoco Load to W Conoco (~40 miles)	44

Reliability Analysis Results

- Among all seven options, Option 1 upgrades the existing 138kV lines, while Option 2 – Option 7 add a new 138kV line
- Thermal loadings in 2021 summer peak case for all options under N-1

Monitored Element	O1	O2	O3	O4	O5	O6	O7
Hamilton Road (8255) - Maverick (8692) 138kV	<90%	<90%	<90%	<90%	94%	94%	131%
Maverick (8692) - Eagle Hydro Tap (8264) 138kV	<90%	<90%	<90%	<90%	91%	91%	128%
Eagle Hydro Tap (8264) - Escondido (8260) 138kV	<90%	<90%	<90%	<90%	<90%	<90%	122%
West Batesville (8236) - Asherton (8283) 138kV	<90%	<90%	93%	92%	90%	<90%	<90%
Batesville (5849) - Crystal City (5855) 69kV	104%	<90%	<90%	<90%	<90%	<90%	<90%

Reliability Analysis Results - Cont.

- Option 1 and Option 7 didn’t resolve all the overloads identified in the study area
- Option 2 – Option 6 resolved all the reliability issues in the study area identified in the 2018 and 2021 summer peak cases

Economic Study

- Due to the increase in renewable generation in the area, an economic analysis was performed to evaluate the congestion
- Economic analysis was performed for Options 2 – 6 by using the 2022 economic case built for the 2016 RTP
- Economic study shows that none of the options provides significantly better production cost savings than others
- Different congestions were observed in the area for Options 2 – 6 under normal system conditions

Congested Line	Congestion (Percentage of hours) in 2022				
	Option 2	Option 3	Option 4	Option 5	Option 6
Hamilton – Maverick 138kV line	16.5%	1.0%	4.3%	3.9%	15.8%
Eagle Pass – Escondido 138kV line	2.1%	0.7%	1.2%	1.2%	2.3%

Option Evaluation

- Among all seven options, Option 2 – Option 6 resolve all the reliability issues identified in the area in the summer peak cases of 2018 and 2021
- The cost estimates for Option 3 – Option 6 are similar (~$44 million), which are lower than the cost estimate for Option 2 (~$48 million)
- The economic study shows that less congestion incurred in the study area in Option 3 when compared to other select options

ERCOT Recommendation

- ERCOT recommends Option 3 as the preferred option to meet the reliability need in the area
  - Expand the existing Brackettville 138kV substation to include new breakers and protection equipment for a new 138kV transmission line
  - Expand the existing Escondido 138kV substation to include new breakers and protection equipment for a new 138kV transmission line
  - Construct approximately 42 miles of new 138 kV line from the existing Brackettville substation to the existing Escondido substation with an emergency rating of approximately 531 MVA

    The total cost estimate for Option 3 is approximately $44.3 million

Questions?