



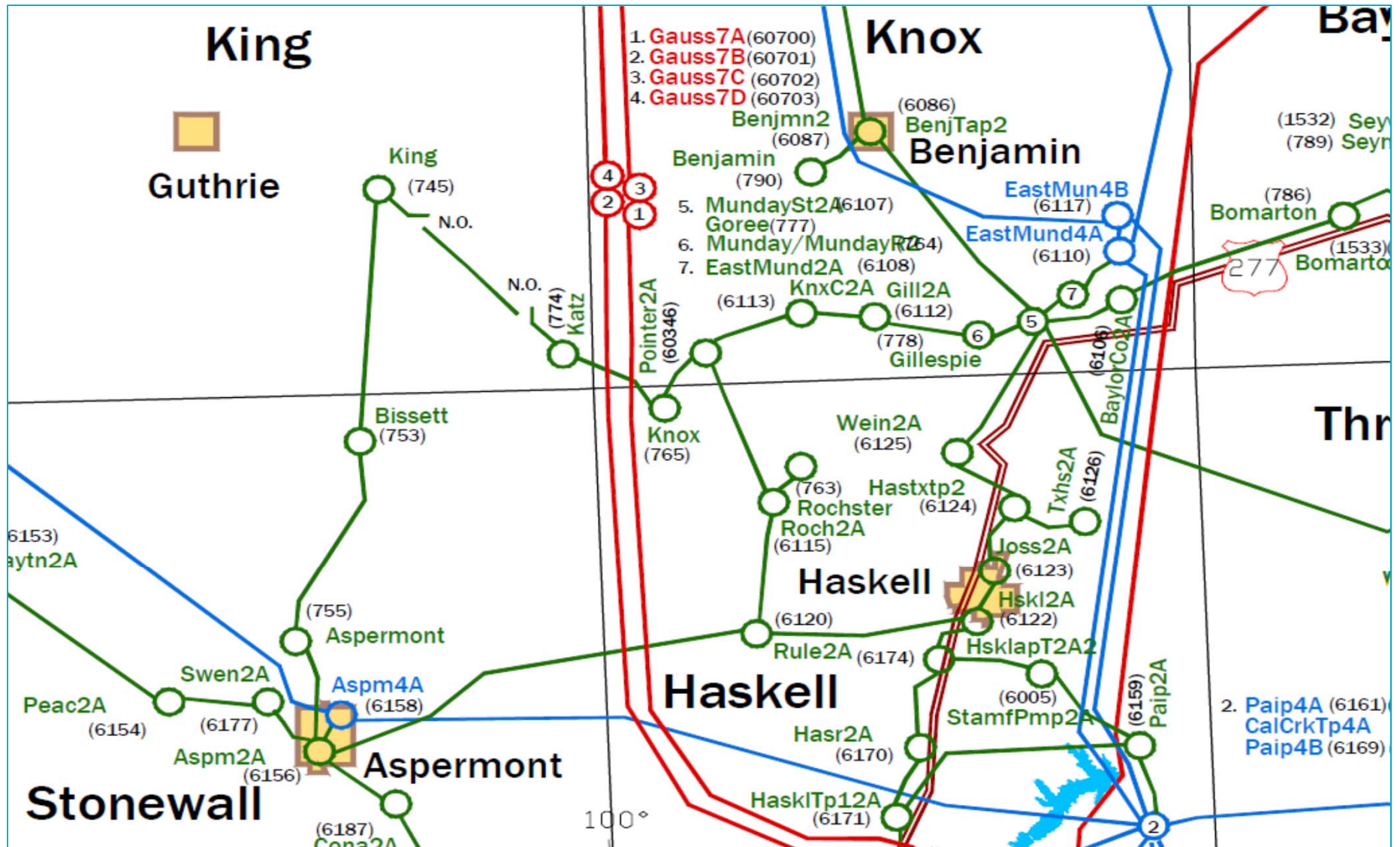
**ERCOT Independent Review of BEC and  
AEP Katz to Tardis Transmission Project**

**Regional Planning Group**  
May 17, 2016

# Introduction

- The load growth in the study area has created the need for transmission improvement in this area
- With the present transmission system, it is difficult to schedule the maintenance
- BEC and AEP jointly submitted a project for Regional Planning Group review in February 2016

# Transmission System map of the study area



# Study Case

- **Base Case**

- The 2020 North/North Central (NNC) summer peak case from the 2015 Regional Transmission Plan (RTP) was used to create the base case for this study
- To study the maintenance outage conditions, 2020 spring peak case was created based on the summer peak case by scaling down the load in North, West, and Far West weather zones to the spring peak level
- BEC/AEP 2020 load forecasts for the study area were used

- **Criteria**

- The reliability criteria used in this independent review is consistent with the RTP study
- N-1-1 analysis was performed to study the maintenance outage conditions

# Reliability Analysis of the Base Case

- No reliability issues under N-1 contingency
- N-1-1 contingency analysis (2020 spring peak case)
  - Unsolved contingencies with maintenance on either Aspermont – Aspermont – Bissett 69 kV line or Munday – Munday 69 kV line followed by an outage of the opposite line section
  - Additional thermal overloads in 2020 spring peak case under N-1-1

Branch	Contingency	Loading
Aspermont - Asperment 69 kV (6156 - 755)	Knox-Pointer 69 kV; Aspermont 138/69 kV auto	112.6%
Aspermont 138/69 kV autotransformer (6158 - 6156)	Rule - Haskell 69 kV; Munday - Munday 69 kV	106.4%
Haskell - Rule 69 kV (6122 - 6120)	Munday - Munday 69 kV; Aspermont 138/69 kV auto	102.8%
Roch - Pointer 69 kV (6115 - 60346)	King - Bissett 69 kV; Munday - Munday 69 kV	129.7%
Rule - Roch 69 kV (6120 - 6115)	King – Bissett 69 kV; Munday – Munday 69 kV	137.0%

- Low voltage in 2020 spring peak case under N-1-1

# Project Options

- **Option 1**

- Add a second autotransformer at Aspermont

The total cost estimate for Option 1 is approximately \$11.0 million

- **Option 2**

- Add a second autotransformer at Aspermont
- Convert the existing East Munday to Pointer 69 kV line to 138 kV operation
- Add a 138/69 kV autotransformer at Pointer

The total cost estimate for Option 2 is approximately \$28.4 million

- **Option 3**

- Add a second autotransformer at Aspermont
- Build a new 138 kV line from East Munday to Pointer
- Add a 138/69 kV autotransformer at Pointer

The total cost estimate for Option 3 is approximately \$35.1 million

## Project Options (cont.)

- **Option 4**

- Construct a new 138 kV switching station, Tardis, in the existing AEP East Munday to Paducah 138 kV line
- Construct a new 138/69 kV switching station at or near the existing Katz station
- Install a 138/69 kV autotransformer at Katz
- Convert the Benjamin 69 kV station to 138 kV operation
- Rebuild the existing 69 kV Benjamin radial line for 138 kV to connect the Tardis and Benjamin
- Construct ~ 18 miles of a new 138 kV line from the new Katz station to the Benjamin station

The total estimated cost for Option 4 is about \$30.5 million

# Project Options Evaluation

- Option 1 and Option 2 didn't resolve the unsolved contingencies with maintenance on either Aspermont – Aspermont – Bissett 69 kV line or Munday – Munday 69 kV line followed by an outage of the opposite line section
- Option 3 and Option 4 provide another 138 kV source to the study area and will facilitate future maintenance to be performed and improve transmission reliability to the area
- Option 3 resolves the N-1-1 thermal issues identified in 2020 spring peak case, but does not resolve the low voltage on 69 kV bus at Katz under N-1-1
- Option 4 resolves all the N-1-1 reliability issues identified in 2020 spring peak case
- Option 4 has a lower cost estimate (\$30.5 million) compared to Option 3 (\$35.1 million)



## ERCOT Recommendation

- ERCOT recommends Option 4 as the preferred option to meet the reliability need in the area
  - Construct a new 138 kV switching station, Tardis, in the existing AEP East Munday to Paducah 138 kV line
  - Construct a new 138/69 kV switching station at or near the existing Katz station
  - Install a 138/69 kV autotransformer at Katz
  - Convert the Benjamin 69 kV station to 138 kV operation
  - Rebuild the existing 69 kV Benjamin radial line for 138 kV to connect the Tardis and Benjamin
  - Construct ~ 18 miles of a new 138 kV line from the new Katz station to the Benjamin station

The total estimated cost for Option 4 is about \$30.5 million

