



Cross Valley Brownsville Loop Study

*Sharyland Utilities & Brownsville Public Utilities Board
May 15th, 2011*





Agenda

- Introduction/Background
- Operational History
- Power Flow Analysis – Results Overview
- Transmission Enhancement Options
- Recommendation
- Questions



Introduction/Background

- Key Study Drivers
 - Poor historic transmission reliability
 - Blackouts and/or Brownout instances
 - Limited customer expansion capability of the existing 138kV transmission system into BPUB & LRGV
- Contributing Factors
 - Susceptibility to Severe Weather Events and Aging Infrastructure
 - Limited Import Capability into BPUB
 - High Reliance on the Sole Local Generation Near the City
 - Expected Demand Growth



Operational History

- Increasing concerns associated with outage of Silas Ray units (forced or scheduled)
 - Limited generation re-dispatch options available to ERCOT
 - Increased potential for load shedding in preparation for the next transmission contingency

Date	Event	Cause for Rolling Blackouts	MWs that ERCOT Requested BPUB to Shed	MWs Shed by BPUB	Approx # of Customers Affected
7/24/2008	Hurricane Dolly	Import problem due to Loss of Multiple Transmission Lines within the Valley	34	35.3	7000
9/7/2010	Tropical Storm Hermine	Import problem due to Loss of Multiple Transmission Lines within the Valley	15	16.1	3200
2/3-4/2011	Severe Cold Weather	Valley Import Limit problems due to high loads and lack of Valley Generation	50	50.3	10,000

Recent Rolling Blackouts, Brownsville

Operational History

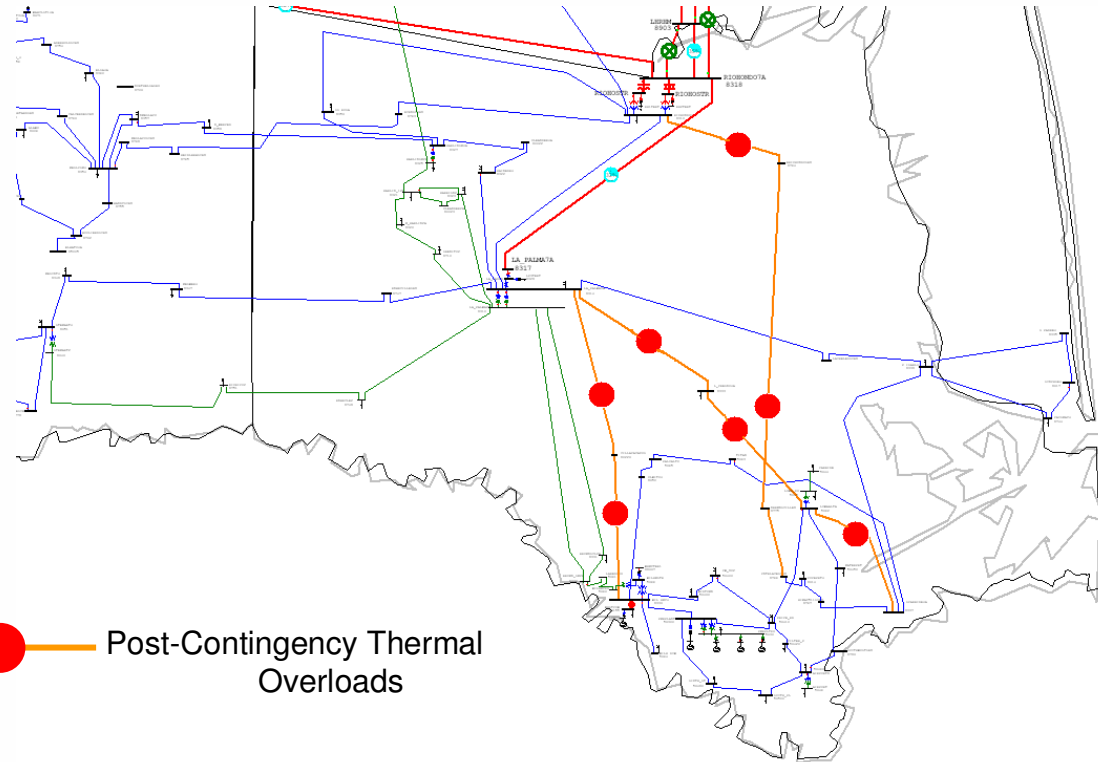
- Limited import capability into LRGV and within BPUB
 - Voltage Stability Concerns
 - Severe voltage deviations and the possibility of voltage collapse studied and documented by ERCOT
 - 138kV Airport & Sixth Street stations identified as locations of concern
 - Both stations in the BPUB region
- Large dependence on Silas Ray generation to maintain acceptable voltage profile in BPUB
- Transmission system inadequacy to handle N-1-1 conditions
 - Need for enhanced transmission connection from BPUB to remaining LRGV region
 - ERCOT results documented in “Valley Voltage Stability Limit” corroborate observation



Power Flow Analysis

- 2014 Base Case Assessment
 - Numerous thermal overload and post-contingency low voltage concerns
 - Post-contingency thermal overloads concentrated on the 138kV transmission system feeding into the Brownsville region
 - Widespread post-contingency low voltage concerns on 138kV and/or 69kV system in Brownsville region
 - Thermal Overloads & Voltage Violations exacerbated in the wake of N-1-1 assessment
 - Outage of Silas Ray units – Sole local generation in the area
 - Manual system adjustments between the first and second event, if applicable

Power Flow Analysis



Post-Contingency Thermal Overload Concerns, Base Case Brownsville Area



Power Flow Analysis

- 138kV Option #1
 - Add second 138kV circuit between existing 138kV LaPalma & Loma Alta stations
 - Add second 138kV circuit from 138kV LaPalma station through 138kV Port Isabel station to 138kV Union Carbide station
- 138kV Option #2
 - Add second 138kV circuit between existing 138kV LaPalma & Loma Alta stations
 - Add second 138kV circuit from 138kV LaPalma station through 138kV Military Highway station to 138kV Union Carbide station
- 138kV Option #3
 - Add second 138kV circuit between existing 138kV LaPalma & Loma Alta stations
 - Add second 138kV circuit from 138kV LaPalma station through 138kV Military Highway station to 138kV Loma Alta station
- 138kV Option #4
 - Add second 138kV circuit between existing 138kV LaPalma & Loma Alta stations
 - Add second 138kV circuit between existing 138kV Rio Hondo & Union Carbide stations
- 138kV Option #5
 - Add new double circuit 138kV line between existing 138kV LaPalma & Loma Alta stations

138kV Transmission Enhancement Options Assessed



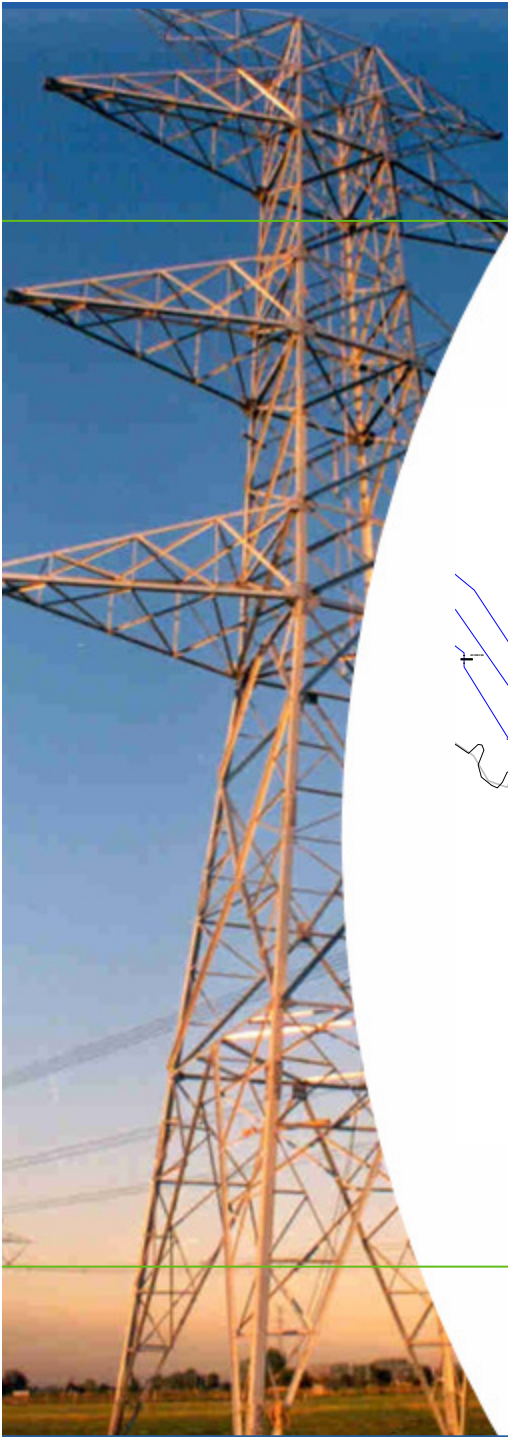
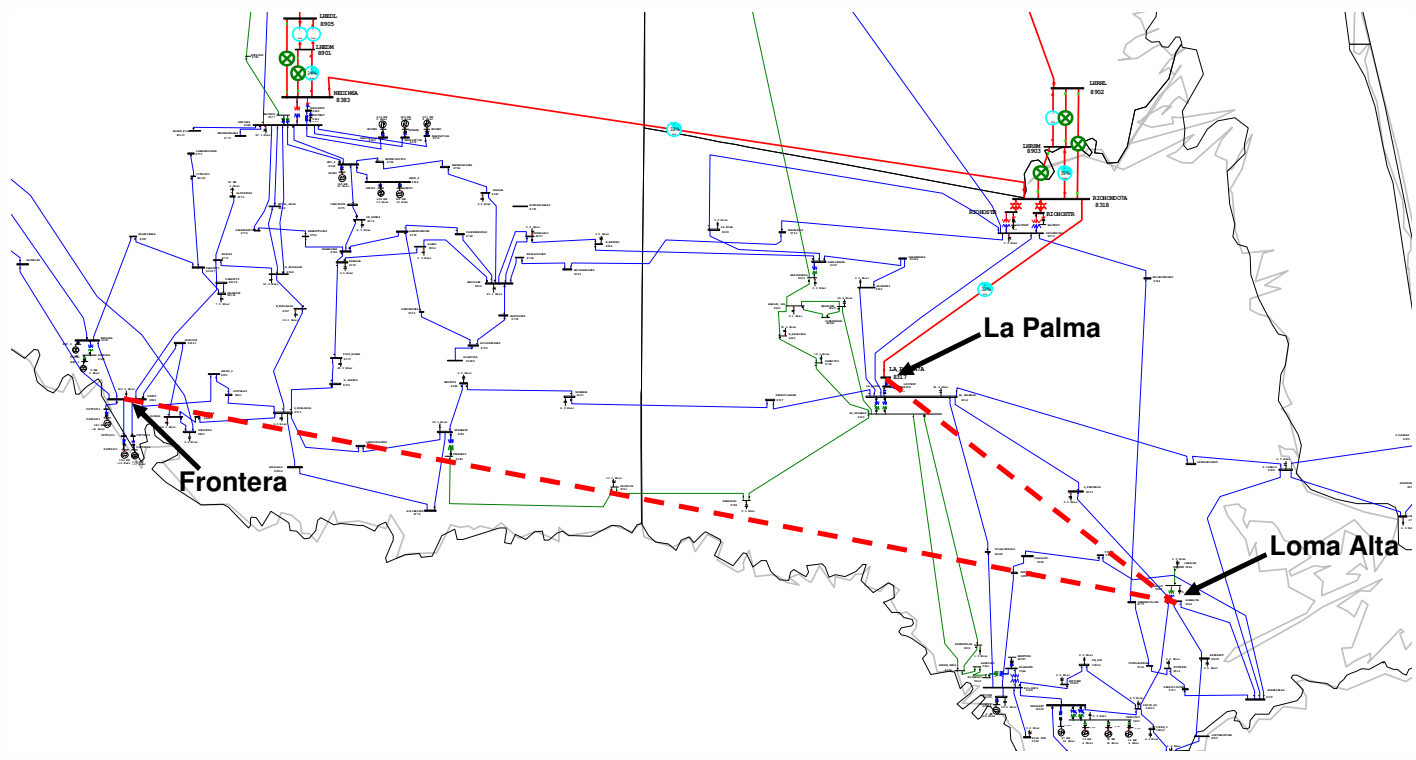
Power Flow Analysis

- 345kV Options
 - Option #1
 - New 345kV Loma Alta Station
 - 14 mile 345kV transmission line from existing 345kV LaPalma station to new 345kV Loma Alta
 - One (1) 345/138kV 450 MVA auto at Loma Alta
 - Option #2
 - 345kV Option #1
 - 59 mile 345kV transmission line from new 345kV Loma Alta station to new 345kV Frontera station across valley
 - Option #3
 - 345kV Option #1
 - New 345kV Railroad station
 - One (1) 345/138 450 MVA auto at Railroad
 - 53 mile 345kV transmission line from new 345kV Loma Alta station to new 345kV Railroad station across valley

Power Flow Analysis

- Impact of AEP proposed Lobo-Frontera project assessed
- 138kV transmission enhancement solutions deemed inadequate
 - Combinations of 138kV & 345kV enhancements also assessed
- 345kV Option #2 deemed optimal solution
 - Alleviation of thermal overload and post-contingency voltage concerns
 - N-1-1 adequate solution
 - Lower costs when combined with the AEP proposed Lobo-Frontera project
 - Enhancement of overall reliability of BPUB & LRGV

Transmission Enhancement – Recommended Option





Recommendation

- Recommended Option
 - New 345kV Loma Alta station with one (1) 345/138kV auto
 - 14 mile 345kV transmission Line from existing 345kV LaPalma station to new 345kV Loma Alta station
 - 59 mile 345kV transmission line from new 345kV Loma Alta station to new 345kV Frontera station
- Planning Level Cost Estimates
 - Cost Estimate: \$117.9M



Questions

