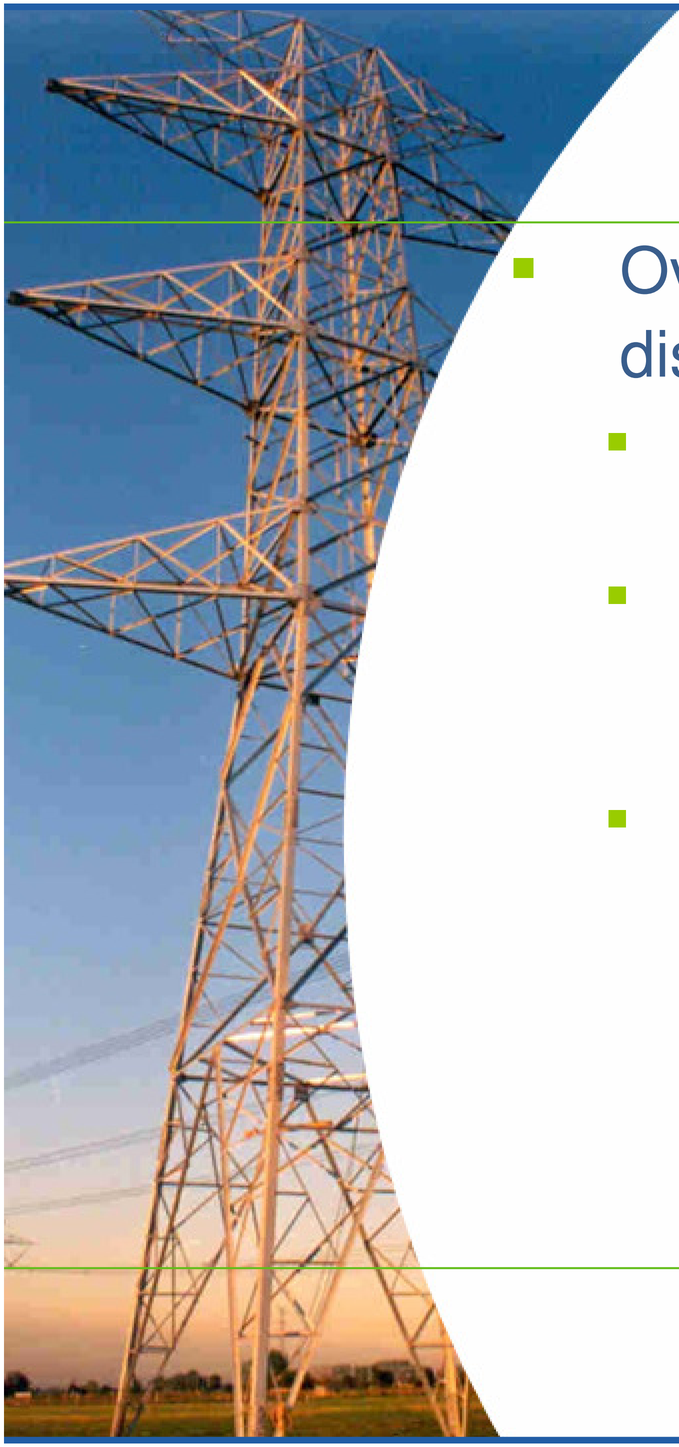
Cross Valley Study Addendum

Sharyland Utilities, Brownsville Public Utilities Board
& South Texas Electric Co-operative
June 17th, 2011

Agenda

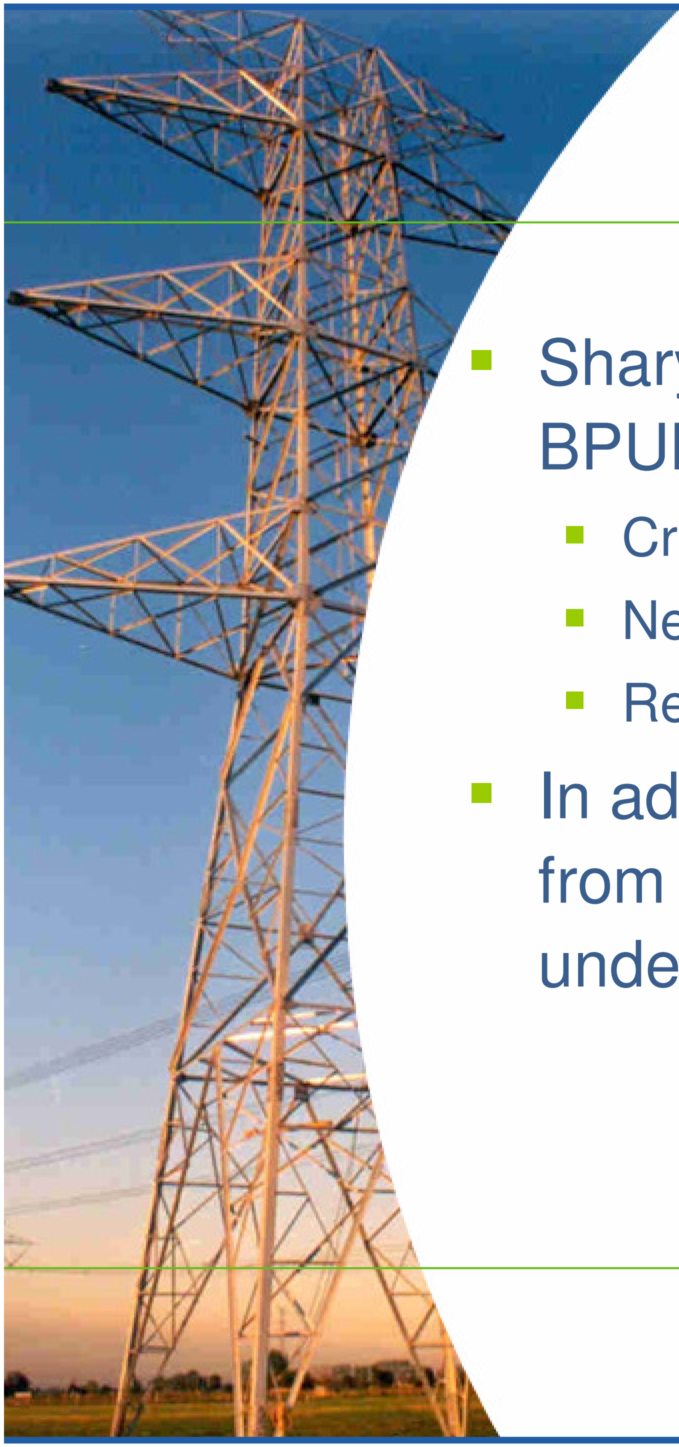
- Project Summary and Background
- Power Flow Analysis
- Proposed HVDC Technology
- Cost Estimates & Schedule
- Conclusions & Next Steps

Project Summaries and Background



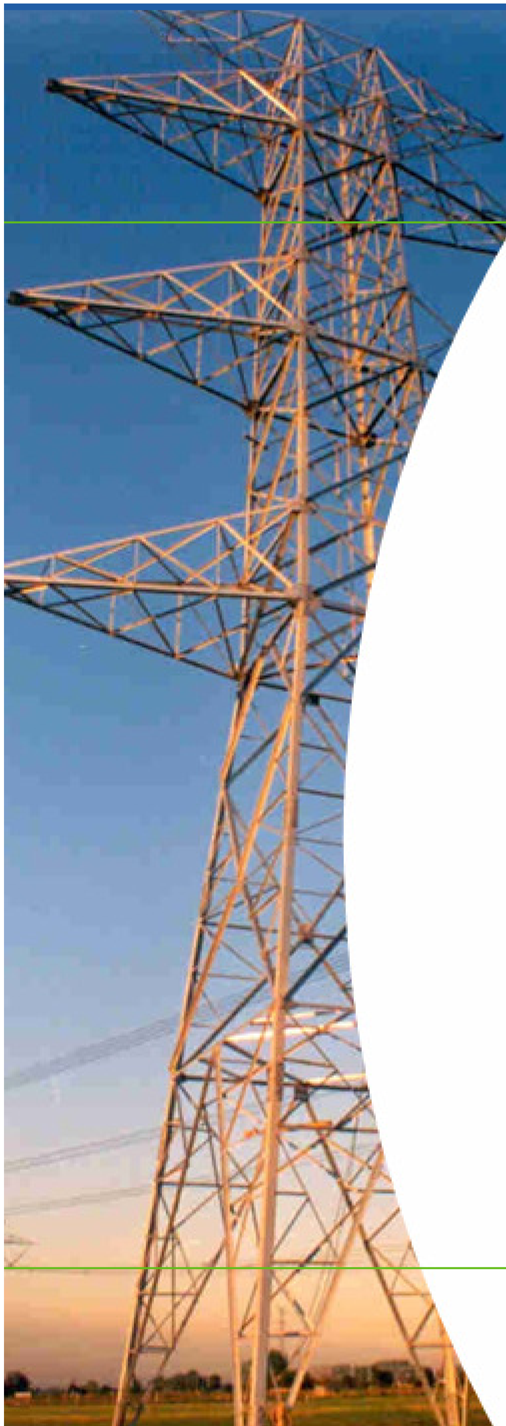
Background

- Overview of May 13th RPG meeting discussion:
  - Sharyland's proposed Cross Valley loop may not help alleviate LRGV import limitations
  - What is the impact on the Cross Valley loop if ERCOT does not recommend a line termination at Frontera for AEP's project from the Laredo region?
  - ERCOT to review alternatives to AEP's Laredo to Frontera/N. Edingburg Line to improve LRGV import
    - Options to include HVDC lines
    - Stakeholder suggestions encouraged



Background

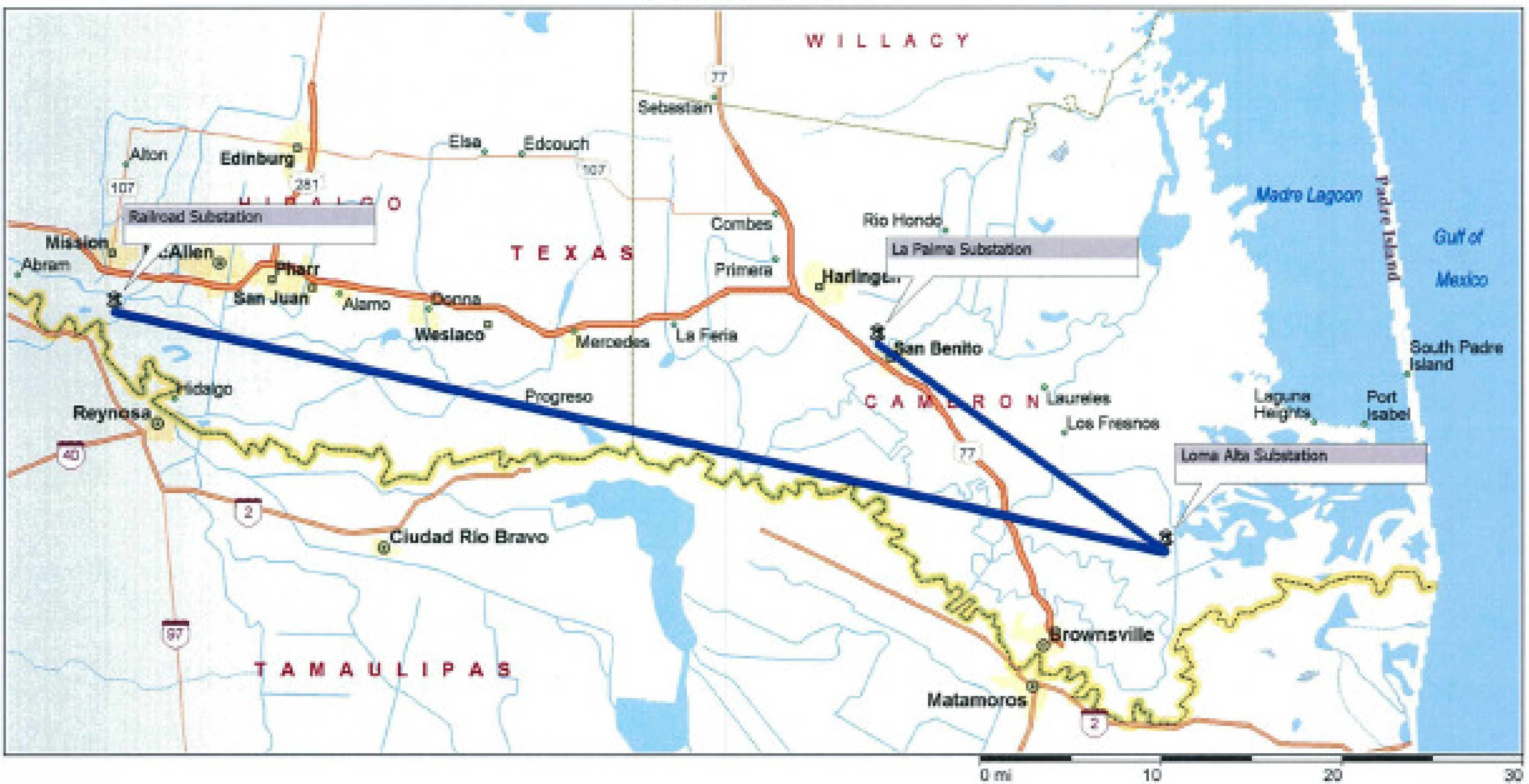
- Sharyland in collaboration with STEC & BPUB studied the following:
  - Cross Valley Line with Railroad DC Tie Expansion
  - New Pawnee – Loma Alta 1,000 MW HVDC Line
  - Report submitted to ERCOT on June 15, 2011
- In addition, a study of an underwater cable from Corpus Christi to Brownsville is underway



Cross Valley Line with Railroad DC Tie Expansion

- Provision of capacity from CFE
- Reliability option to the operator
  - LRGV import limitations
  - Transmission/Generation Outages
- Timing fits well to bridge and complement long-term permanent fixes for LRGV import constraints
- Site preparations, rights-of-way and border crossing permits for expansion already in place
- Project completion possible by 2014
- Cost Estimates
  - Cross Valley Option #3: $120M
  - Railroad DC Tie Expansion : $35M

Cross Valley Option 3

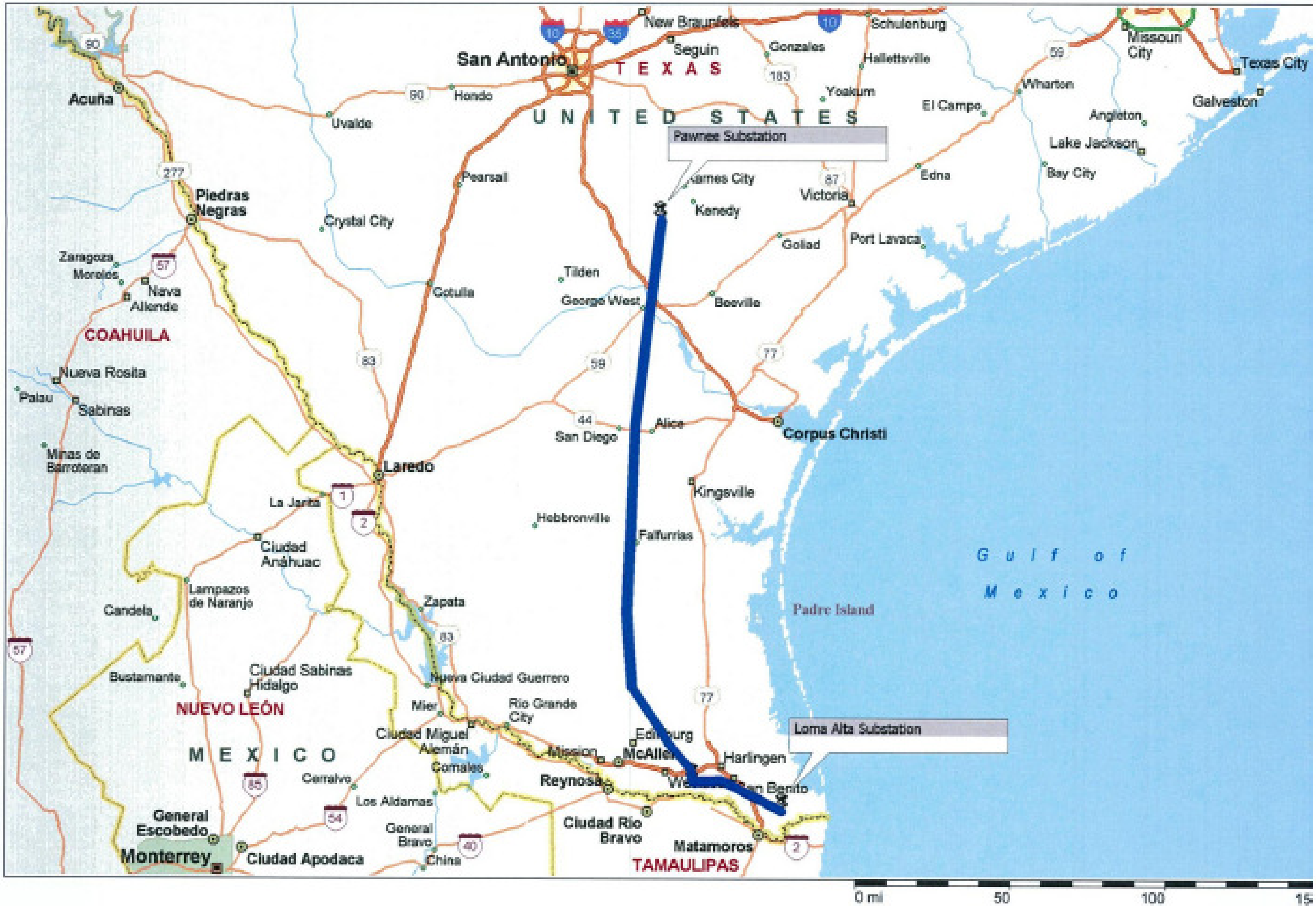


Sharyland Utilities' Railroad Substation and DC Tie

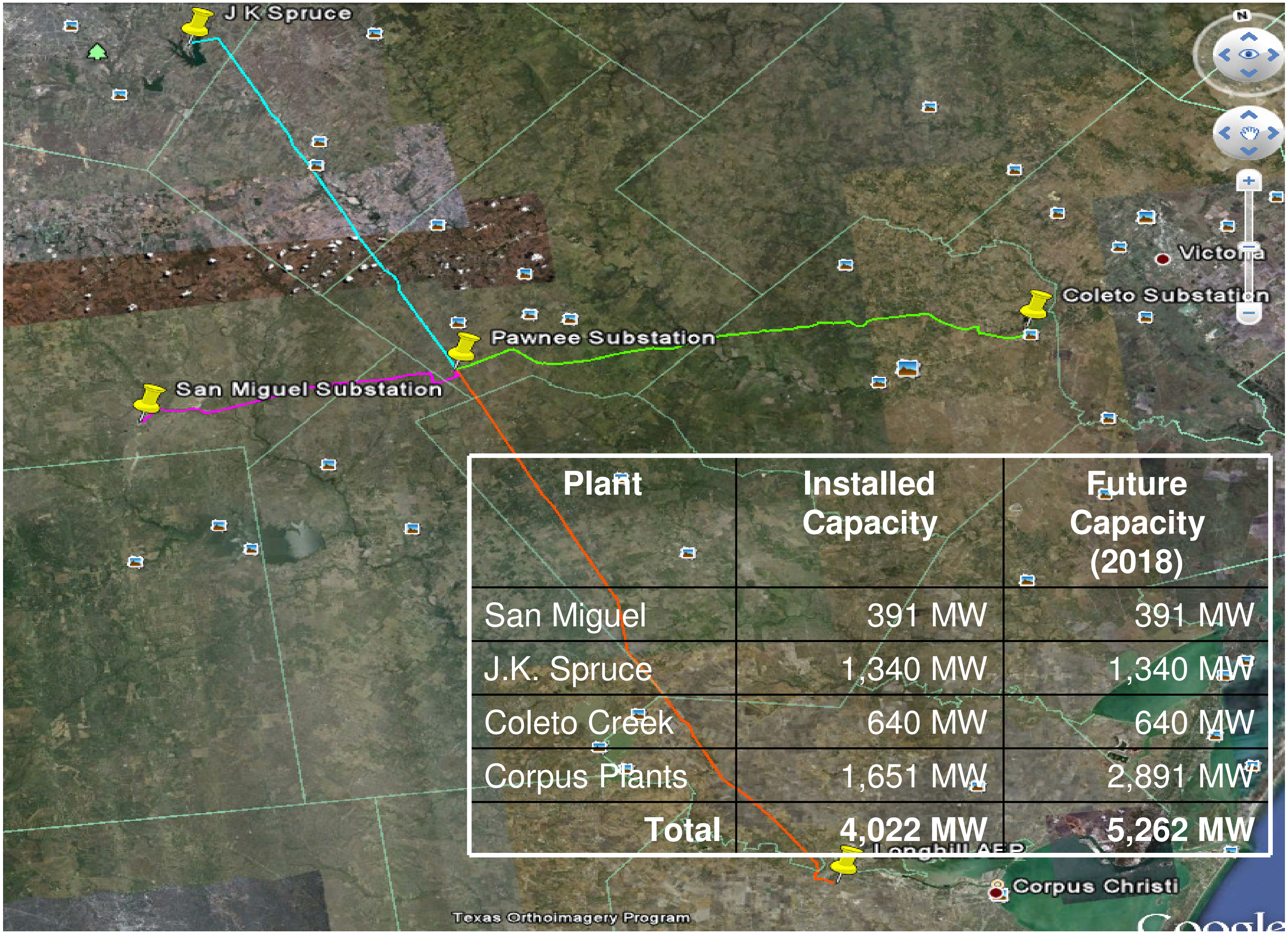
New Pawnee – Loma Alta 1,000 MW HVDC Line

- Bi-directional power control capability
- Guarantees up to 1,000 MW of additional transmission capacity into LRGV
- Excellent *"interconnection source"* at Pawnee
  - Access to over 5,000 MW of existing and/or planned generation
  - Reduced system losses & increased operational flexibility
- Cost Estimates
  - Range between $604M and $626M
  - Estimates technology dependent
  - Lower cost options for smaller converters

New Pawnee – Loma Alta 1,000 MW HVDC Line

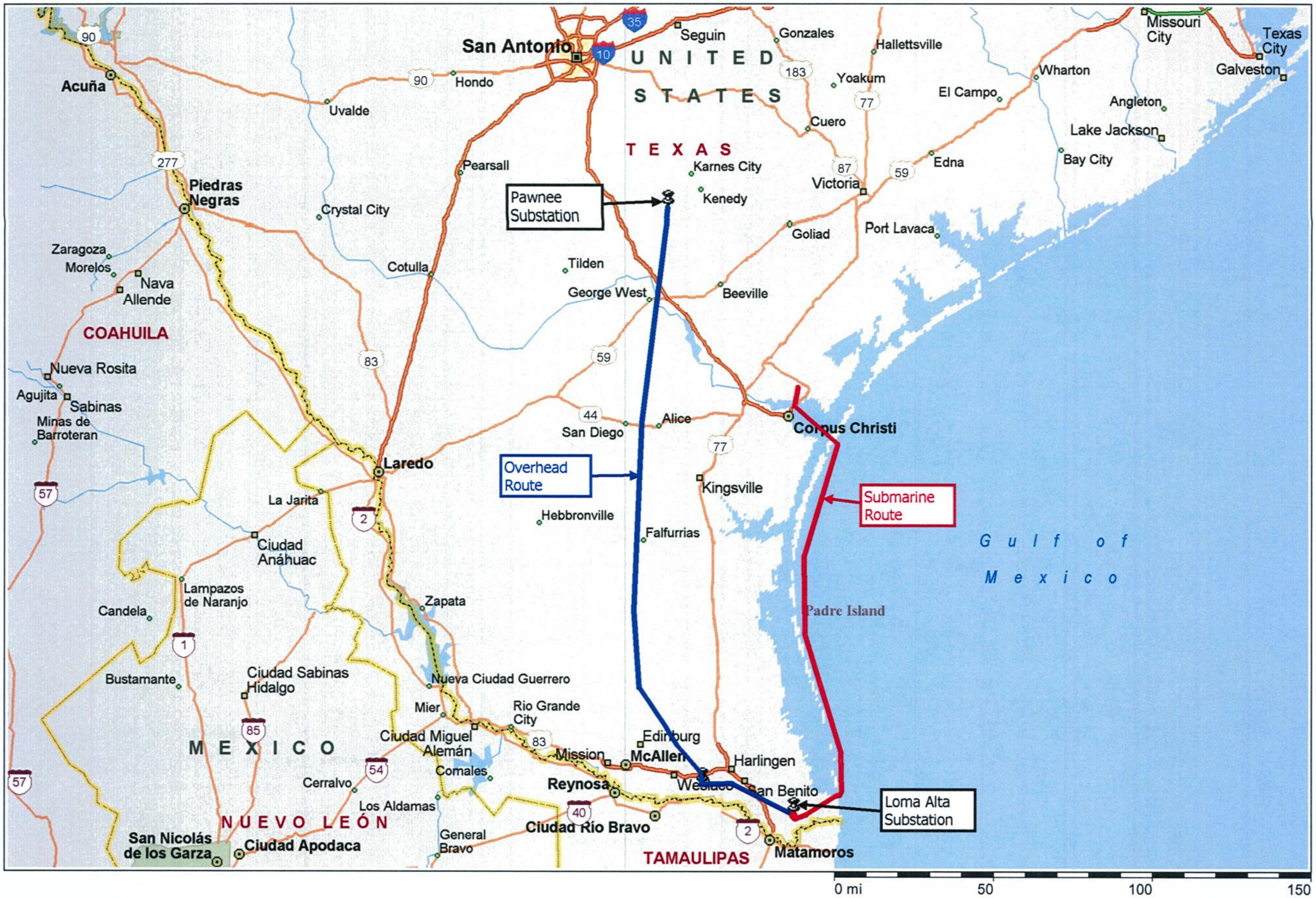


Installed and Planned Generation into Pawnee Sub.



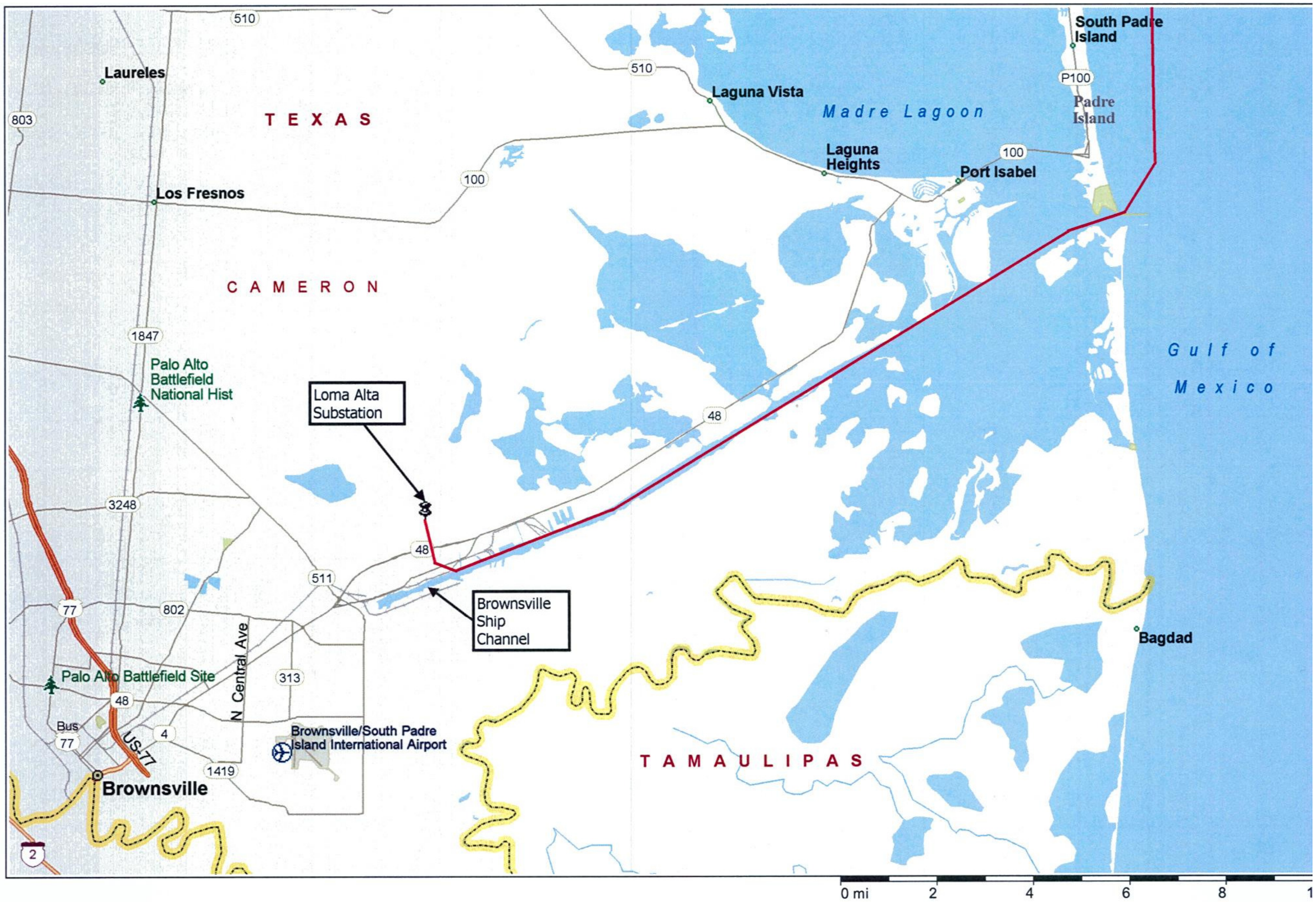
Plant	Installed Capacity	Future Capacity (2018)
San Miguel	391 MW	391 MW
J.K. Spruce	1,340 MW	1,340 MW
Coleto Creek	640 MW	640 MW
Corpus Plants	1,651 MW	2,891 MW
Total	**4,022 MW**	**5,262 MW**

Underwater Concept: Preliminary Route



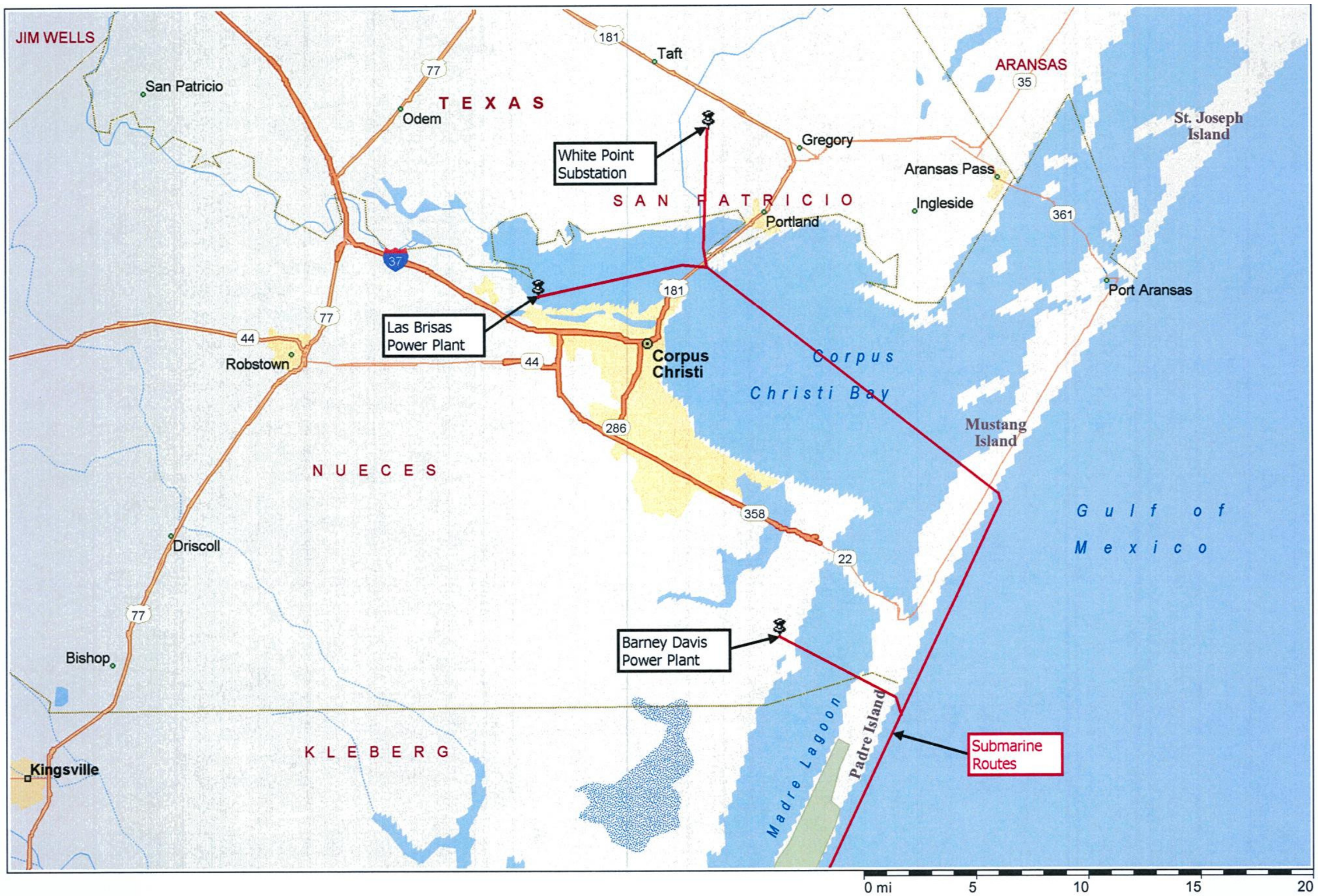
Underwater Concept: Brownsville Terminal

Submarine option would utilize Brownsville Ship Channel to get inland



Underwater Concept: Corpus Terminal

Three potential sites: White Point Substation, Las Brisas Power Plant or Barney Davis Power Plant



Power Flow Analysis

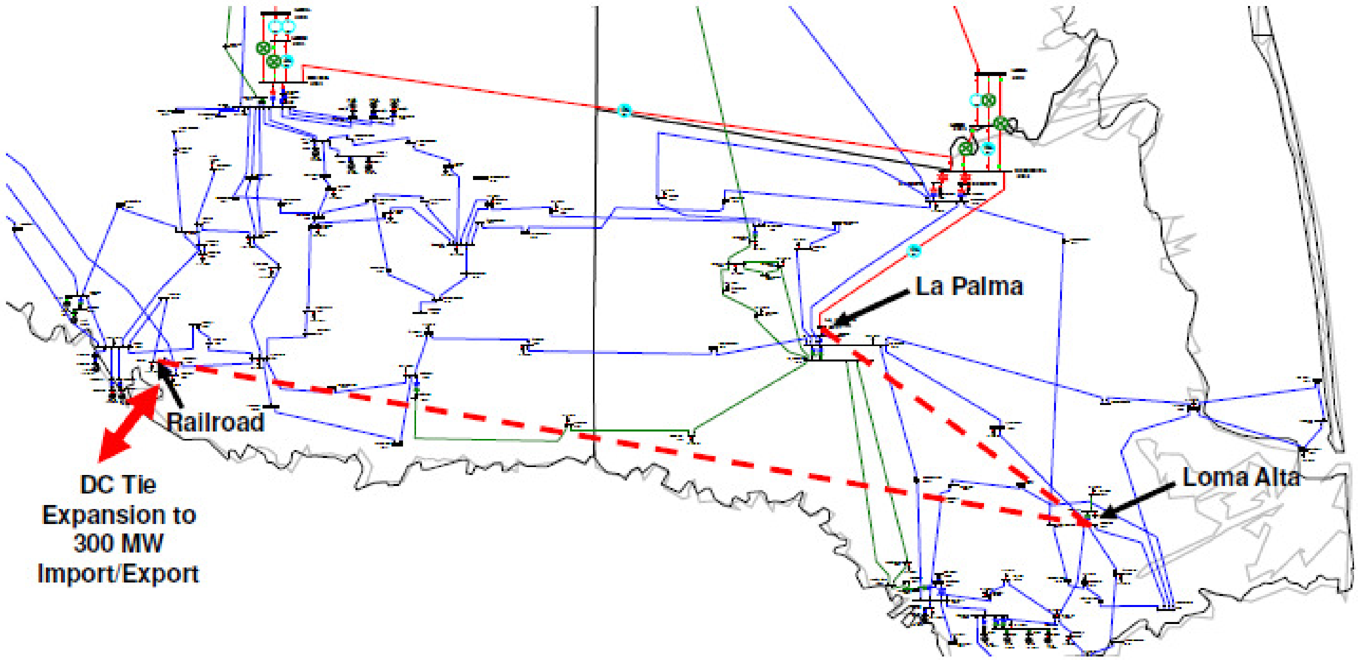
Introduction/Background

- Power Flow Analysis
  - Full AC power flow analysis performed to assess ability of Cross Valley Option #3 to accommodate Railroad DC Tie expansion
    - Normal Operation & Contingency Conditions
    - 11DSB 14SUM Case
  - Preliminary screening analysis performed for Pawnee – Loma Alta HVDC line
    - Asses ability of existing transmission system to accommodate HVDC line from thermal capacity standpoint
    - Identify transmission system upgrades/enhancements required to accommodate 1000 MW HVDC line
    - Perform high-level feasibility of the terminal points associated with HVDC line
    - 11DSB 16SUM case

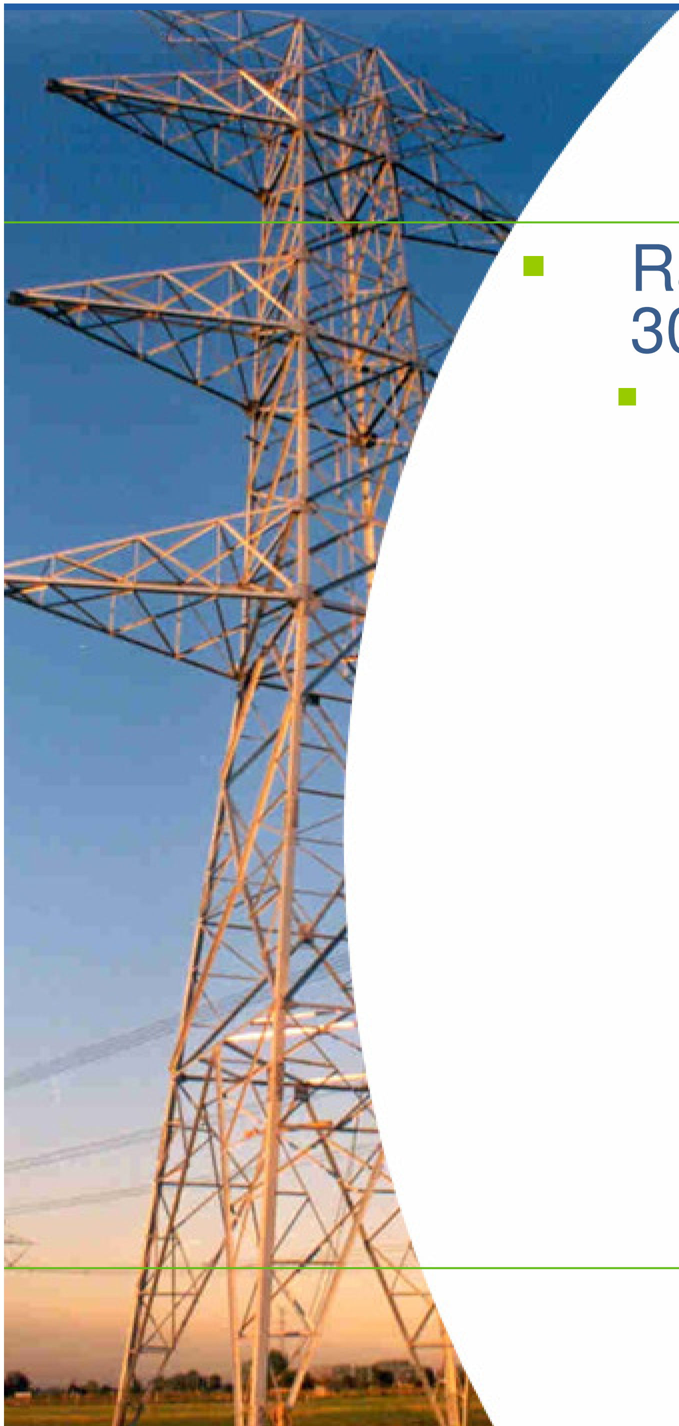
Power Flow Analysis

- Cross Valley Line with Railroad DC Tie Expansion
  - Cross Valley 345kV Option #3 as proposed in the original report
    - New 345kV Loma Alta station
    - 14 mile 345kV transmission line from existing 345kV LaPalma station to new 345kV Loma Alta station
    - One (1) 345/138 kV 500 MVA auto at Loma Alta
    - New 345kV Railroad station
    - One (1) 345/138kV 500 MVA auto at Railroad
    - 53 mile 345kV transmission line from new 345kV Loma Alta station to new 345kV Railroad station across the valley
  - Expansion of existing Railroad DC Tie from 150 MW to 300 MW

Power Flow Analysis



One-line Schematic, Cross Valley Option #3 & Railroad DC Tie Expansion



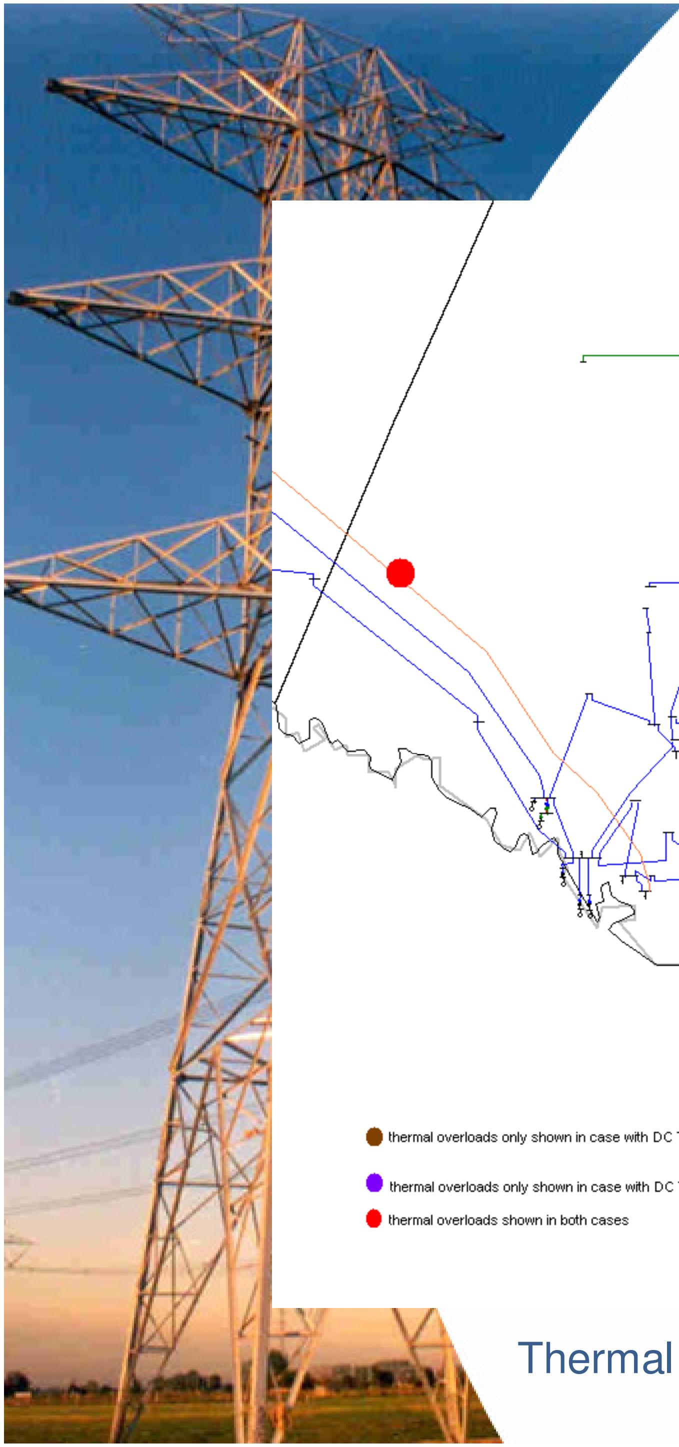
Power Flow Analysis

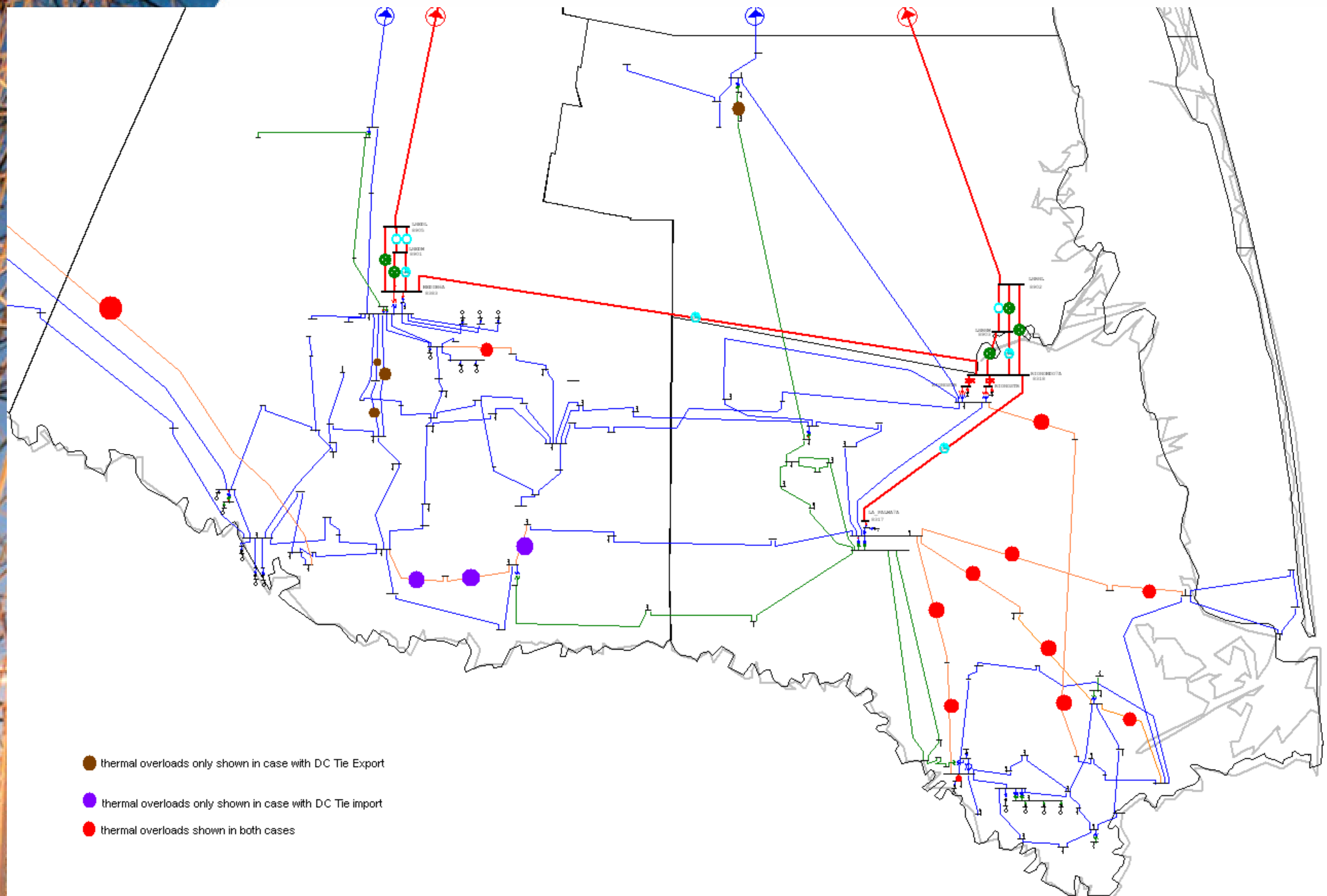
- Railroad DC Tie expansion from 150 MW to 300 MW
  - 2014 Base Case Assessment
    - Full Import and Export Scenarios
    - Numerous thermal overload and post-contingency low voltage concerns in absence of Cross Valley Option #3
      - Increased power transfer to Brownsville by virtue of load expansion
      - Increased power transfer across the valley after DC Tie expansion
    - Thermal Overloads & Voltage Violations exacerbated in the wake of N-1-1 assessment
      - Outage of Silas Ray units – Sole local generation in the area
      - N-1-1 as per criteria – Silas Ray Units & single transmission element

Power Flow Analysis

- Impact of Cross Valley Option #3 on ability to accommodate Railroad DC Tie expansion
  - Alleviates a majority of the thermal overload and voltage magnitude concerns
  - Only persisting thermal overload found for the 300 MW import condition at the Railroad DC Tie:
    - South McAllen – Las Milpas 138kV line
    - Marginally overloaded – 100.9%
  - No reliability concerns associated with Railroad DC Tie Expansion in the wake of Cross Valley Option #3

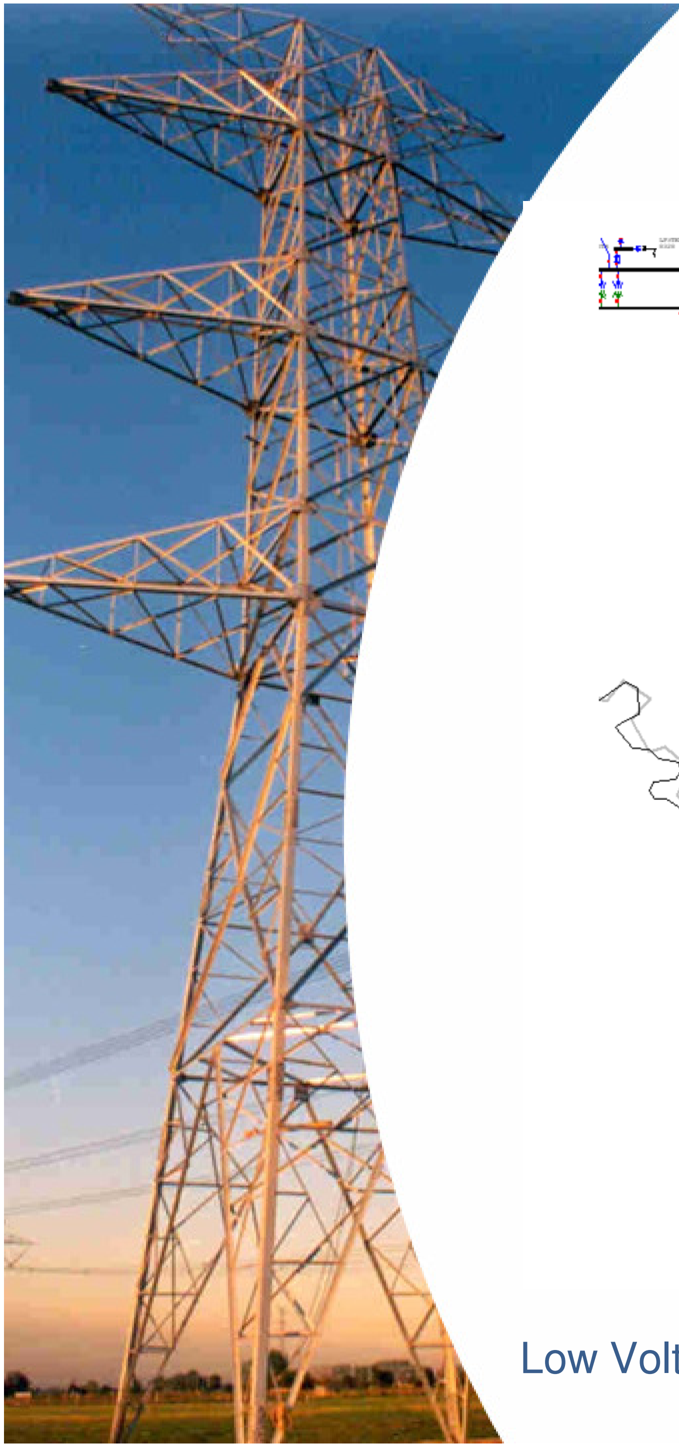
Power Flow Analysis

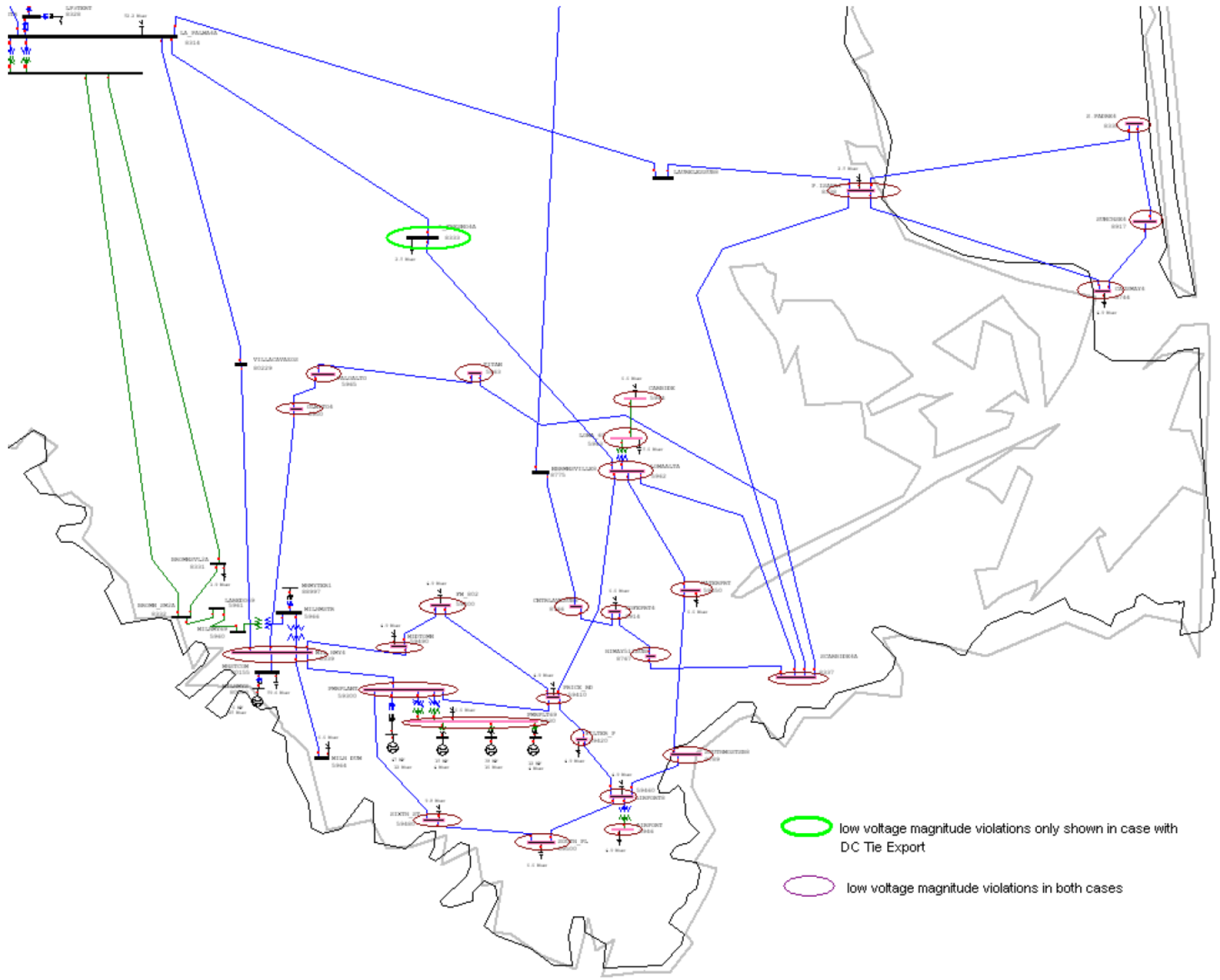




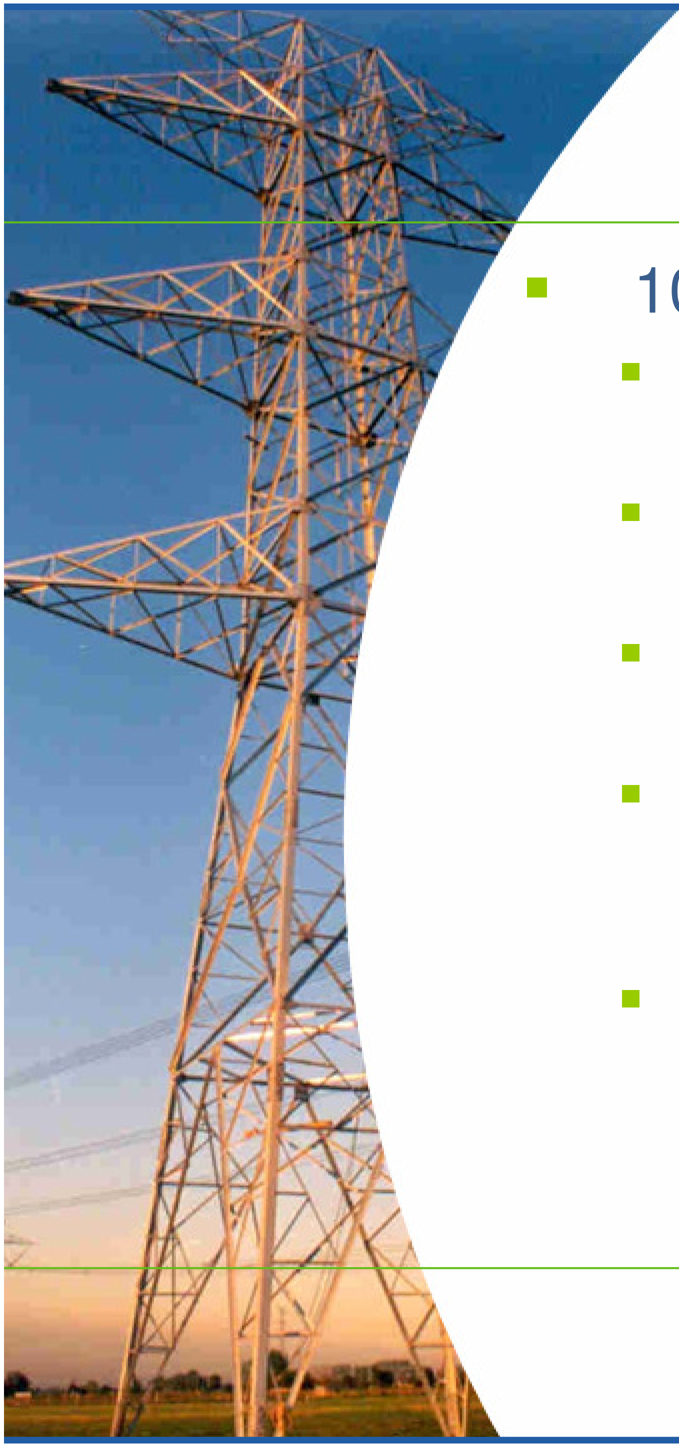
Thermal Overloads alleviated by the 345kV Option #3 for Railroad DC Tie Expansion

Power Flow Analysis





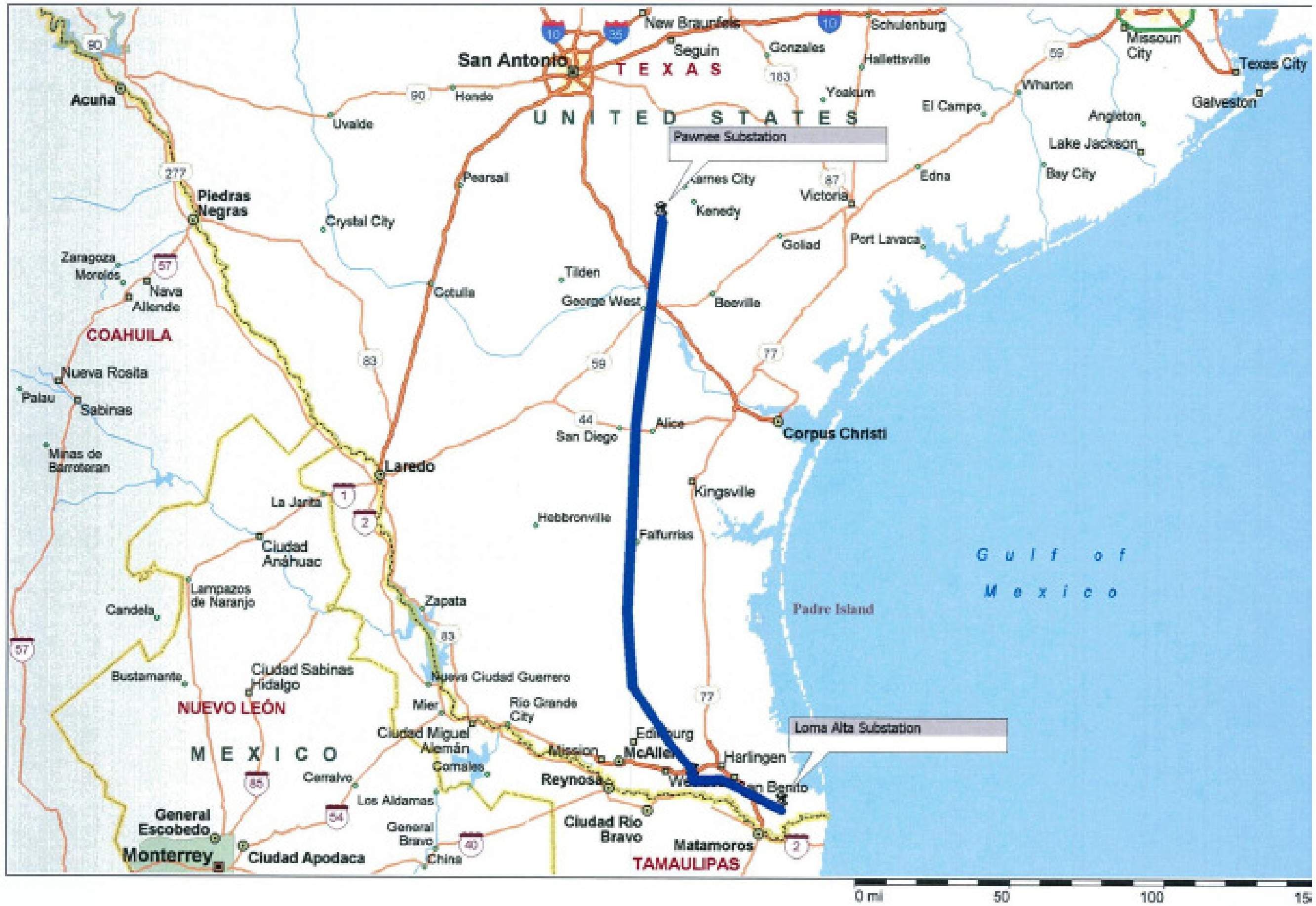
Low Voltage conditions alleviated by the 345kV Option #3 for Railroad DC Tie Expansion



Power Flow Analysis

- 1000 MW Pawnee-Loma Alta HVDC line
  - New 345kV Loma Alta Station with a 1,000 MW AC-DC Converter
  - Expanded 345kV STEC Pawnee Station with a 1,000 MW AC-DC Converter
  - Two (2) 345/138kV 500 MVA autos at Loma Alta
  - 14 mile 345kV transmission Line from existing 345kV LaPalma station to new 345kV Loma Alta station
  - A new 220 mile 1,000 MW HVDC line between the 345kV Pawnee & 345kV Loma Alta Stations

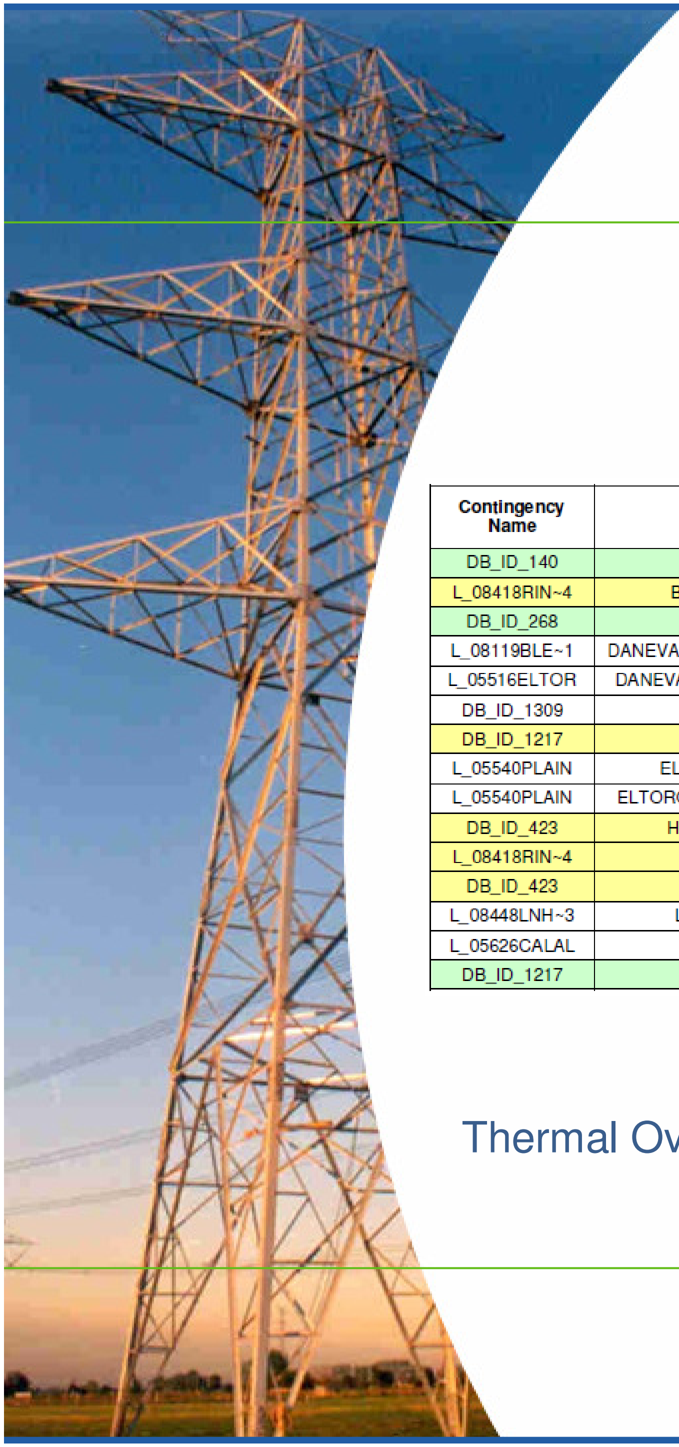
Power Flow Analysis



Pawnee-Loma Alta HVDC Line Segment

Power Flow Analysis

- 1000 MW Pawnee – Loma Alta HVDC Line
  - 2016 Base Case Assessment – 11DSB 16SUM case
  - DC power flow analysis (thermal overload standpoint)
    - With and without the HVDC transmission line
    - Couple of thermal overloads on the 138kV system in the Brownsville area of the LRGV region
    - Thermal overloads on the Pawnee area and the AEP-TCC North and Central Region Zones at 1000 MW DC flows
  - Cross Valley Option #3 complements the ability of the transmission system in the valley to reliably receive up to 1000 MW via the HVDC line

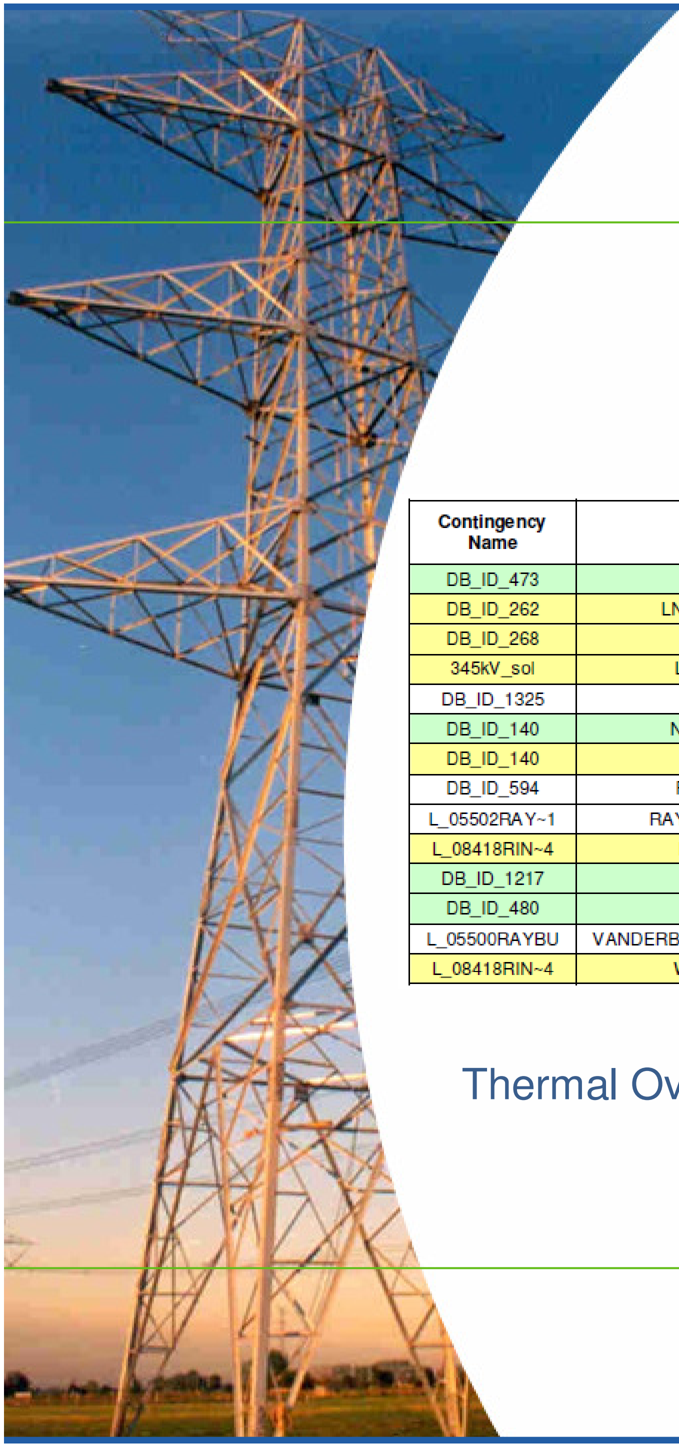


Power Flow Analysis

Contingency Name	Element	Region of incremental Overload	Nom kV Assoc.	Limit (MVA)	Percent Overload	
					Without DC	With DC
DB_ID_140	BEEVLLE2 (8198) -> NORMANA2 (8592) CKT 1 at BEEVLLE2	n/a	69	38	112.26	124.11
L_08418RIN~4	BONEVEW2 (8805) -> WDSBRO 2 (8804) CKT 1 at BONEVEW2	AEP-TCC – N Region	69	38		115.91
DB_ID_268	COLETO 4 (8162) -> KENDYSW4 (8186) CKT 1 at COLETO 4	n/a	138	207	128.32	142.75
L_08119BLE~1	DANEVANGSW9 (5544) -> DANEVANGSUB9 (5548) CKT 1 at DANEVANGSW9	n/a	69	45	103.64	104.08
L_05516ELTOR	DANEVANGSW9 (5544) -> PLAINVIEWSB9 (5540) CKT 1 at DANEVANGSW9	n/a	69	45	119.98	121.46
DB_ID_1309	DUP1-I2 4 (8817) -> DUPSW-I4 (8422) CKT 1 at DUP1-I2 4	n/a	138	206	103.26	103.26
DB_ID_1217	EDROY 2 (8408) -> MATHIS 2 (8407) CKT 1 at EDROY 2	AEP-TCC – C Region	69	61		117.76
L_05540PLAIN	ELTOROSW9 (5518) -> EDNASUB9 (5522) CKT 1 at ELTOROSW9	n/a	69	45	108.58	110.26
L_05540PLAIN	ELTOROSWSTA9 (5516) -> ELTOROSW9 (5518) CKT 1 at ELTOROSWSTA9	n/a	69	45	115.55	117.23
DB_ID_423	HAINEDR4 (8322) -> OLEANDER4A (80022) CKT 1 at HAINEDR4	Valley Region	138	211		100.09
L_08418RIN~4	HEARD T2 (8802) -> REFUGIO2 (8410) CKT 1 at HEARD T2	AEP-TCC – C Region	69	38		104.23
DB_ID_423	LAPALM 4 (8314) -> HAINEDR4 (8322) CKT 1 at LAPALM 4	Valley Region	138	211		115.41
L_08448LNH~3	LNHILL 2 (8448) -> CALALLENSUB9 (5626) CKT 1 at LNHILL 2	n/a	69	106	105.98	103.32
L_05626CALAL	LNHILL 2 (8448) -> RBSTN T2 (8884) CKT 1 at LNHILL 2	n/a	69	69	113.62	111.09
DB_ID_1217	LNHILL 2 (8448) -> SMITH 2 (8866) CKT 1 at LNHILL 2	n/a	69	61	112.32	134.04

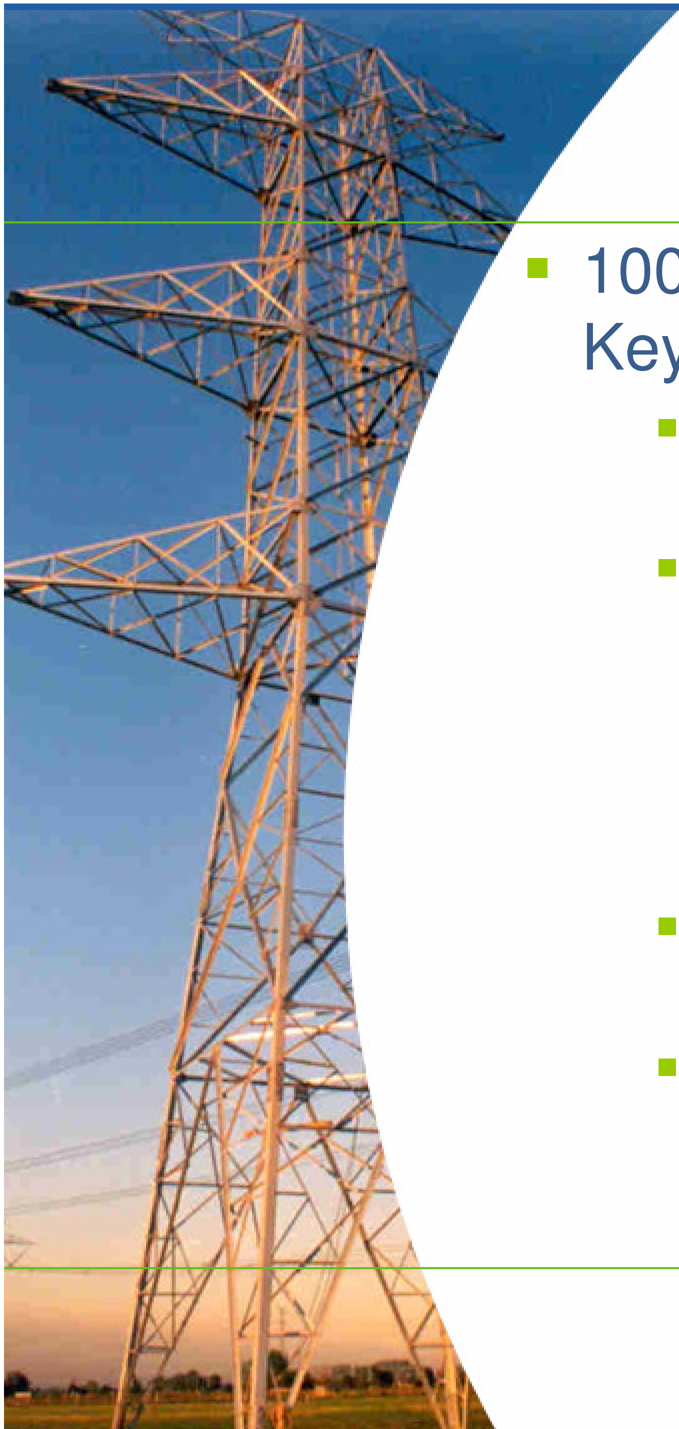
Thermal Overloads, Pawnee – Loma Alta HVDC Line, Power Flow Analysis

Power Flow Analysis



Contingency Name	Element	Region of incremental Overload	Nom kV Assoc.	Limit (MVA)	Percent Overload	
					Without DC	With DC
DB_ID_473	LNHILL 4 (8452) -> LNHILL 2 (8448) CKT 1 at LNHILL 4	n/a	138	91.3	116.34	123.42
DB_ID_262	LNHILL 4 (8452) -> ORANGEGRVSW8 (5660) CKT 1 at LNHILL 4	Pawnee region	138	211		102.96
DB_ID_268	LNHILL 6 (8455) -> PAWNEESW5 (5725) CKT 1 at LNHILL 6	Pawnee Region	345	1011		125.09
345kV_sol	LOMAALTA (5962) -> CARB-VL4 (8337) CKT 1 at LOMAALTA	Valley Region	138	202		157.71
DB_ID_1325	N BAY 4 (8441) -> MORRIS 4 (8474) CKT 1 at N BAY 4	n/a	138	206	170.13	165.64
DB_ID_140	NORMANA2 (8592) -> PETTUS 2 (8593) CKT 1 at NORMANA2	n/a	69	38	111.04	122.89
DB_ID_140	PETTUS 2 (8593) -> KENEDY 2 (8188) CKT 1 at PETTUS 2	AEP-TCC – N Region	69	38		108.61
DB_ID_594	PTLAVAC2 (8135) -> B.HOLOW2 (8133) CKT 1 at PTLAVAC2	n/a	69	41	103.76	107.54
L_05502RAY~1	RAYBURN9 (5500) -> NURSERYSUB9 (5504) CKT 1 at RAYBURN9	n/a	69	45	108.97	110.16
L_08418RIN~4	RINCON 2 (8416) -> BONEVEW2 (8805) CKT 1 at RINCON 2	AEP-TCC – C Region	69	38		121.72
DB_ID_1217	SMITH 2 (8866) -> EDROY 2 (8408) CKT 1 at SMITH 2	n/a	69	61	101.58	123.3
DB_ID_480	UPRIVER2 (8469) -> HERN RD2 (8860) CKT 1 at UPRIVER2	n/a	69	104	121.71	128.88
L_05500RAYBU	VANDERBLTSW9 (5582) -> ELTOROSWSTA9 (5516) CKT 1 at VANDERBLTSW9	n/a	69	36	129.15	130.4
L_08418RIN~4	WDSBRO 2 (8804) -> HEARD T2 (8802) CKT 1 at WDSBRO 2	AEP-TCC – N Region	69	38		105.41

Thermal Overloads, Pawnee – Loma Alta HVDC Line, Power Flow Analysis

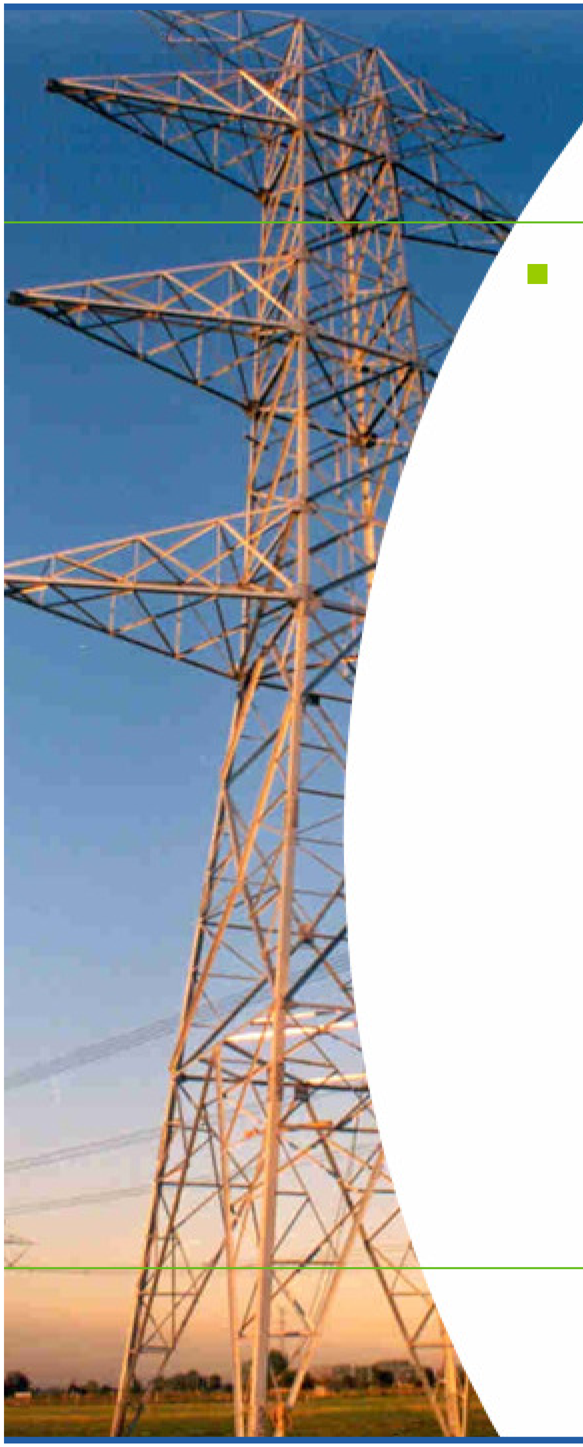


Power Flow Analysis

- 1000 MW Pawnee – Loma Alta HVDC Line – Key Observations
  - Cross Valley Option #3 ensures reliable incorporation of the HVDC line at the valley end
  - Several thermal overloads at the Pawnee end
    - Presents “worst case” condition of using entire 1000 MW capacity by 2016
    - Overloads may get alleviated with load growth in valley
  - Pawnee provides a good interconnection source with abundant access to generation
  - Load expansion at Loma Alta served reliably

Power Flow Analysis

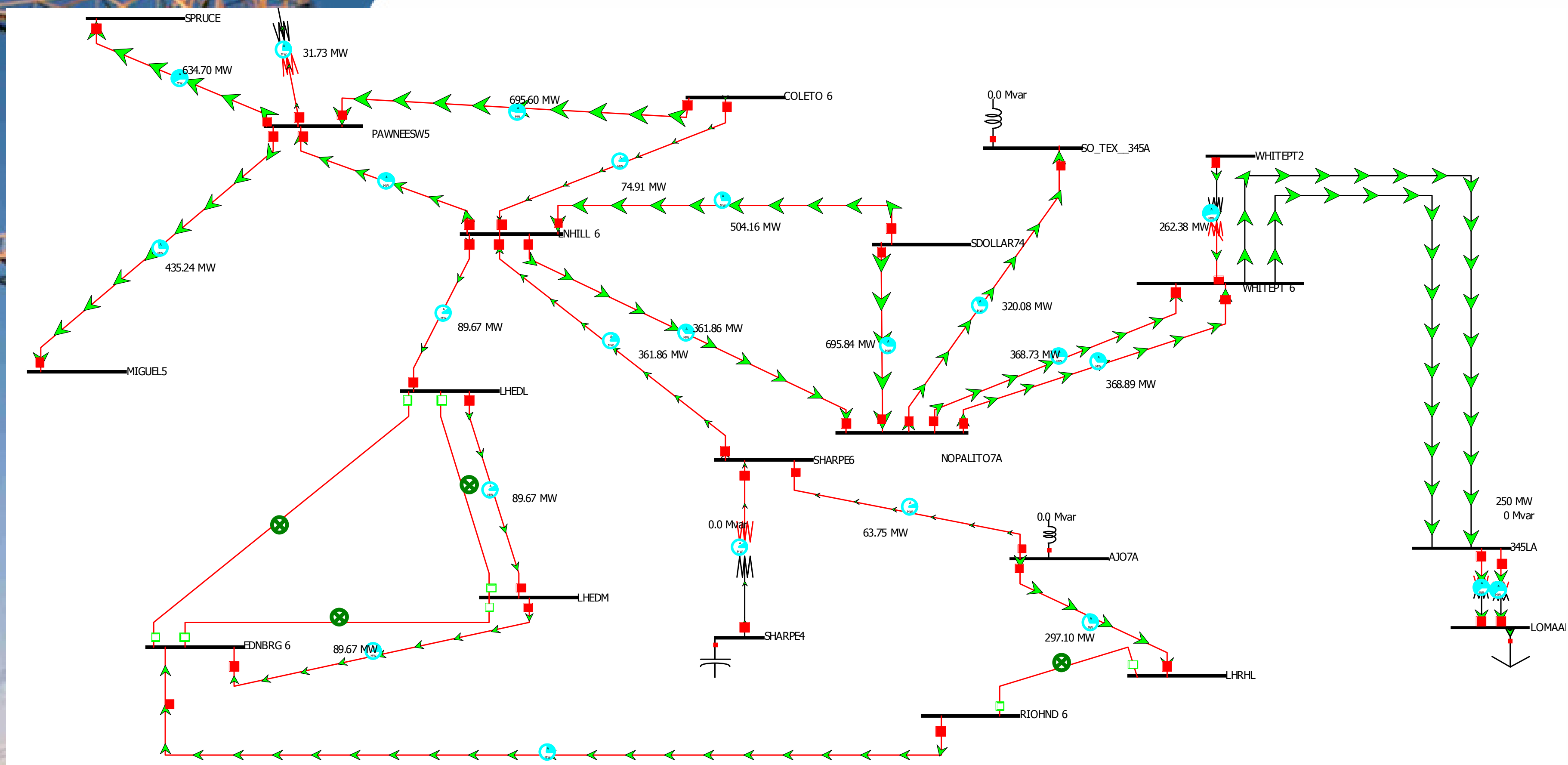
- Submarine DC Cable options assessed
  - White Point – Loma Alta
    - 1000 MW submarine DC cable from 345kV White Point to new 345kV Loma Alta
    - New 345kV Loma Alta station
    - Two (2) 345/138kV 500 MVA autos at Loma Alta
    - 14 mile 345kV line from Loma Alta - LaPalma
  - Sand Dollar – Loma Alta
    - 1000 MW submarine DC cable from 345kV Sand Dollar to new 345kV Loma Alta
    - New 345kV Loma Alta station
    - Two (2) 345/138kV 500 MVA autos at Loma Alta
    - 14 mile 345kV line from Loma Alta - LaPalma
  - Barney Davis – Loma Alta
    - 1000 MW submarine DC cable from Barney Davis to new 345kV Loma Alta
    - New 345kV Loma Alta station
    - Two (2) 345/138kV 500 MVA autos at Loma Alta
    - 14 mile 345kV line from Loma Alta - LaPalma



Power Flow Analysis

- Preliminary analysis to assess feasibility of existing transmission system to accommodate cable
  - Assessment performed using 11DSB 16SUM case
  - Submarine DC cable studied at 1000 MW capacity
  - Power flow analysis performed with and without DC line under contingency conditions
  - Assessment limited to thermal capacity limitations on the existing system
  - All ERCOT planning & single line contingencies in the area of interest

Power Flow Analysis



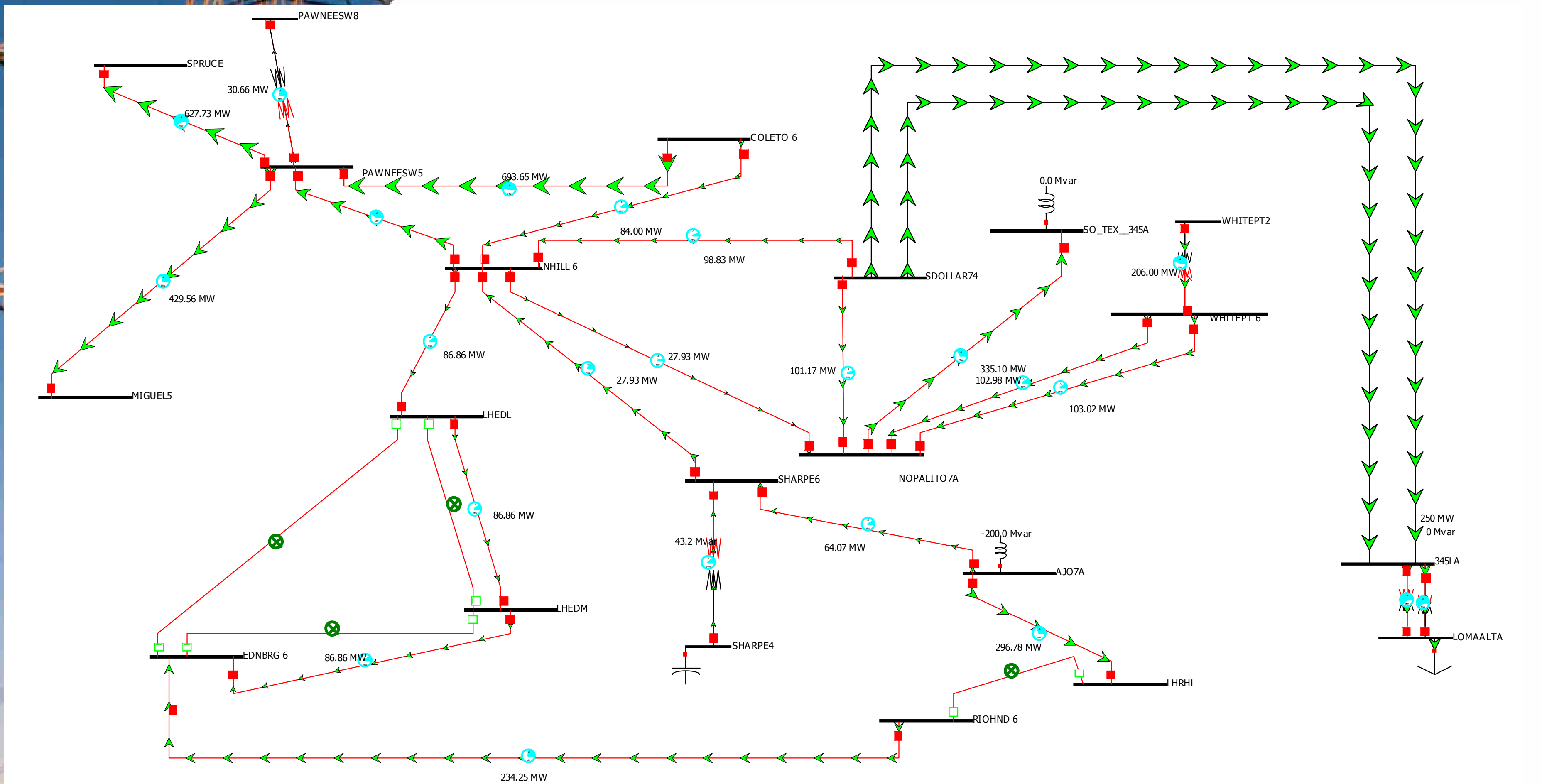
One-line Schematic, White Point – Loma Alta DC Submarine Cable

Power Flow Analysis

Contingency Name	Element	Nom kV Assoc.	Limit	Percent Overload	
				Without DC	With DC
DB_ID_362	BEEVLLE2 (8198) -> NORMANA2 (8592) CKT 1 at BEEVLLE2	69	38	112.26	112.76
DB_ID_268	COLETO 4 (8162) -> KENDYSW4 (8186) CKT 1 at COLETO 4	138	207	128.32	128.1
L_08119BLE~1	DANEVANGSW9 (5544) -> DANEVANGSUB9 (5548) CKT 1 at DANEVANGSW9	69	45	103.64	103.71
L_05516ELTOR	DANEVANGSW9 (5544) -> PLAINVIEWSB9 (5540) CKT 1 at DANEVANGSW9	69	45	119.98	119.85
DB_ID_1227	DUP1-I2 4 (8817) -> DUPSW-I4 (8422) CKT 1 at DUP1-I2 4	138	206	103.26	103.26
L_05540PLAIN	ELTOROSW9 (5518) -> EDNASUB9 (5522) CKT 1 at ELTOROSW9	69	45	108.58	108.66
L_05540PLAIN	ELTOROSWSTA9 (5516) -> ELTOROSW9 (5518) CKT 1 at ELTOROSWSTA9	69	45	115.55	115.63
/* Failu~213	LAPALM 4 (8314) -> HAINEDR4 (8322) CKT 1 at LAPALM 4	138	211		114.08
L_05626CALAL	LNHILL 2 (8448) -> RBSTN T2 (8884) CKT 1 at LNHILL 2	69	69	113.62	105.78
DB_ID_1304	LNHILL 2 (8448) -> SMITH 2 (8866) CKT 1 at LNHILL 2	69	61	112.32	112.76
DB_ID_473	LNHILL 4 (8452) -> LNHILL 2 (8448) CKT 1 at LNHILL 4	138	91.3	116.34	111.74
345kV_sol	LOMAALTA (5962) -> CARB-VL4 (8337) CKT 1 at LOMAALTA	138	202		157.77
DB_ID_1325	N BAY 4 (8441) -> MORRIS 4 (8474) CKT 1 at N BAY 4	138	206	170.13	163.28
DB_ID_362	NORMANA2 (8592) -> PETTUS 2 (8593) CKT 1 at NORMANA2	69	38	111.04	111.54
DB_ID_3905	P_H_R___138C (42015) -> TNSOUSHORE1 (38890) CKT 1 at P_H_R___138C	138	242	101.23	101.3
DB_ID_597	PTLAVAC2 (8135) -> B.HOLOW2 (8133) CKT 1 at PTLAVAC2	69	41	103.76	103.73
DB_ID_3720	RAYBURN9 (5500) -> NURSERYSUB9 (5504) CKT 1 at RAYBURN9	69	45	108.97	109.67
DB_ID_1304	SINTON 2 (8413) -> SKIDMOR2 (8405) CKT 1 at SINTON 2	69	38		117.67
DB_ID_1304	SKIDMOR2 (8405) -> CFLD2TP2 (8904) CKT 1 at SKIDMOR2	69	38	113.6	110.92
DB_ID_2822	SKYLINE_5 (5371) -> HILLCTY_5 (5211) CKT 1 at SKYLINE_5	345	1171	102.27	102.38
DB_ID_1304	SMITH 2 (8866) -> EDROY 2 (8408) CKT 1 at SMITH 2	69	61	101.58	102.02
DB_ID_3908	TNISP_____1 (38500) -> P_H_R___138C (42015) CKT 1 at TNISP_____1	138	663	106.24	106.24
DB_ID_480	UPRIVER2 (8469) -> HERN RD2 (8860) CKT 1 at UPRIVER2	69	104	121.71	118.88
L_05500RAYBU	VANDERBLTSW9 (5582) -> ELTOROSWSTA9 (5516) CKT 1 at VANDERBLTSW9	69	36	129.15	129.37
DB_ID_2483	WESFLD__138B (46570) -> TRSWIG__138A (46550) CKT 66 at WESFLD__138B	138	280	101	101.04

Thermal Overloads, White Point – Loma Alta Submarine DC Cable

Power Flow Analysis



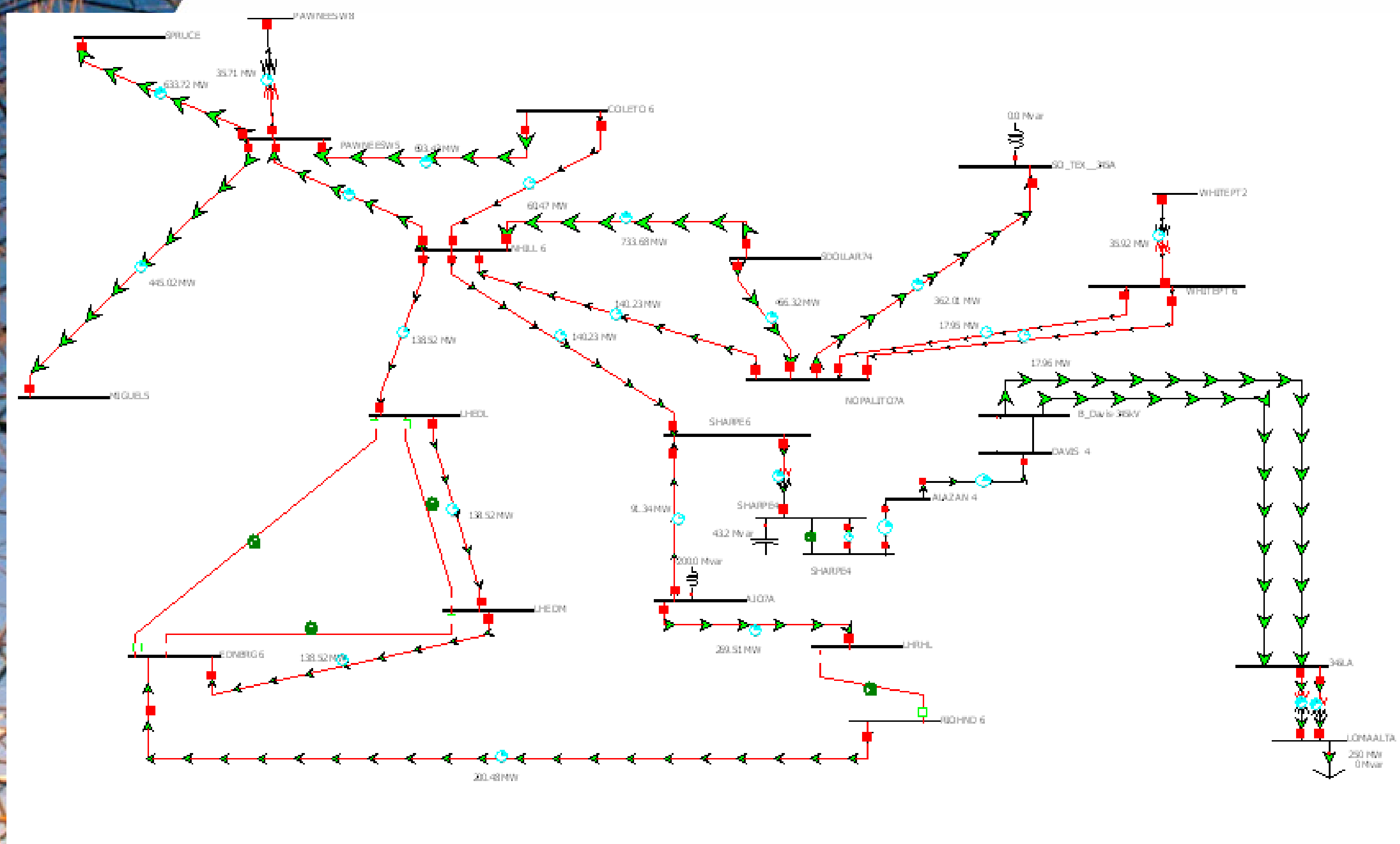
One-line Schematic, Sand Dollar – Loma Alta DC Submarine Cable

Power Flow Analysis

Contingency Name	Element	Nom kV	Limit	Percent Overload	
				Without DC	With DC
DB_ID_362	BEEVLLE2 (8198) -> NORMANA2 (8592) CKT 1 at BEEVLLE2	69	38	112.26	113.13
L_05725PAW~1	COLETO 4 (8162) -> KENDYSW4 (8186) CKT 1 at COLETO 4	138	207	128.32	127.68
L_08119BLE~1	DANEVANGSW9 (5544) -> DANEVANGSUB9 (5548) CKT 1 at DANEVANGSW9	69	45	103.64	103.69
L_05516ELTOR	DANEVANGSW9 (5544) -> PLAINVIEWSB9 (5540) CKT 1 at DANEVANGSW9	69	45	119.98	119.91
DB_ID_1309	DUP1-I2 4 (8817) -> DUPSW-I4 (8422) CKT 1 at DUP1-I2 4	138	206	103.26	103.26
L_05540PLAIN	ELTOROSW9 (5518) -> EDNASUB9 (5522) CKT 1 at ELTOROSW9	69	45	108.58	108.65
L_05540PLAIN	ELTOROSWSTA9 (5516) -> ELTOROSW9 (5518) CKT 1 at ELTOROSWSTA9	69	45	115.55	115.62
/* Failu~213	LAPALM 4 (8314) -> HAINEDR4 (8322) CKT 1 at LAPALM 4	138	211		114.01
L_05626CALAL	LNHILL 2 (8448) -> RBSTN T2 (8884) CKT 1 at LNHILL 2	69	69	113.62	106.55
DB_ID_1217	LNHILL 2 (8448) -> SMITH 2 (8866) CKT 1 at LNHILL 2	69	61	112.32	113.06
345kV_sol	LOMAALTA (5962) -> CARB-VL4 (8337) CKT 1 at LOMAALTA	138	202		157.76
DB_ID_1245	N BAY 4 (8441) -> MORRIS 4 (8474) CKT 1 at N BAY 4	138	206	170.13	165.56
DB_ID_362	NORMANA2 (8592) -> PETTUS 2 (8593) CKT 1 at NORMANA2	69	38	111.04	111.91
DB_ID_3905	P_H_R___138C (42015) -> TNSOUSHORE1 (38890) CKT 1 at P_H_R___138C	138	242	101.23	101.27
DB_ID_597	PTLAVAC2 (8135) -> B.HOLOW2 (8133) CKT 1 at PTLAVAC2	69	41	103.76	103.87
DB_ID_3720	RAYBURN9 (5500) -> NURSERYSUB9 (5504) CKT 1 at RAYBURN9	69	45	108.97	109.41
DB_ID_1217	SKIDMOR2 (8405) -> CFLD2TP2 (8904) CKT 1 at SKIDMOR2	69	38	113.6	113.1
DB_ID_2822	SKYLINE_5 (5371) -> HILLCTY_5 (5211) CKT 1 at SKYLINE_5	345	1171	102.27	102.22
DB_ID_1217	SMITH 2 (8866) -> EDROY 2 (8408) CKT 1 at SMITH 2	69	61	101.58	102.33
DB_ID_3908	TNISP_____1 (38500) -> P_H_R___138C (42015) CKT 1 at TNISP_____1	138	663	106.24	106.24
DB_ID_480	UPRIVER2 (8469) -> HERN RD2 (8860) CKT 1 at UPRIVER2	69	104	121.71	120.15
L_05500RAYBU	VANDERBLTSW9 (5582) -> ELTOROSWSTA9 (5516) CKT 1 at VANDERBLTSW9	69	36	129.15	129.3
DB_ID_2486	WESFLD__138B (46570) -> TRSWIG__138A (46550) CKT 66 at WESFLD__138B	138	280	101	101.03

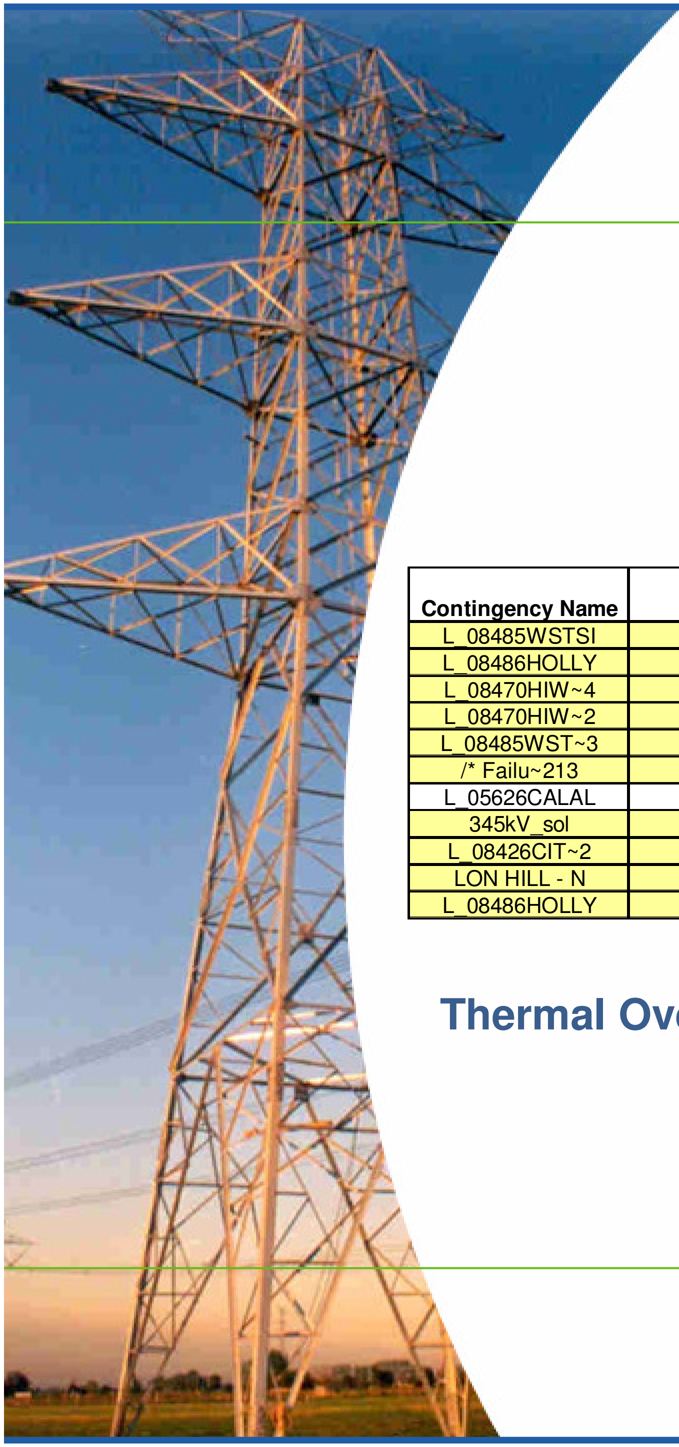
Thermal Overloads, Sand Dollar – Loma Alta Submarine DC Cable

Power Flow Analysis



One-line Schematic, Barney Davis – Loma Alta DC Submarine Cable

Power Flow Analysis

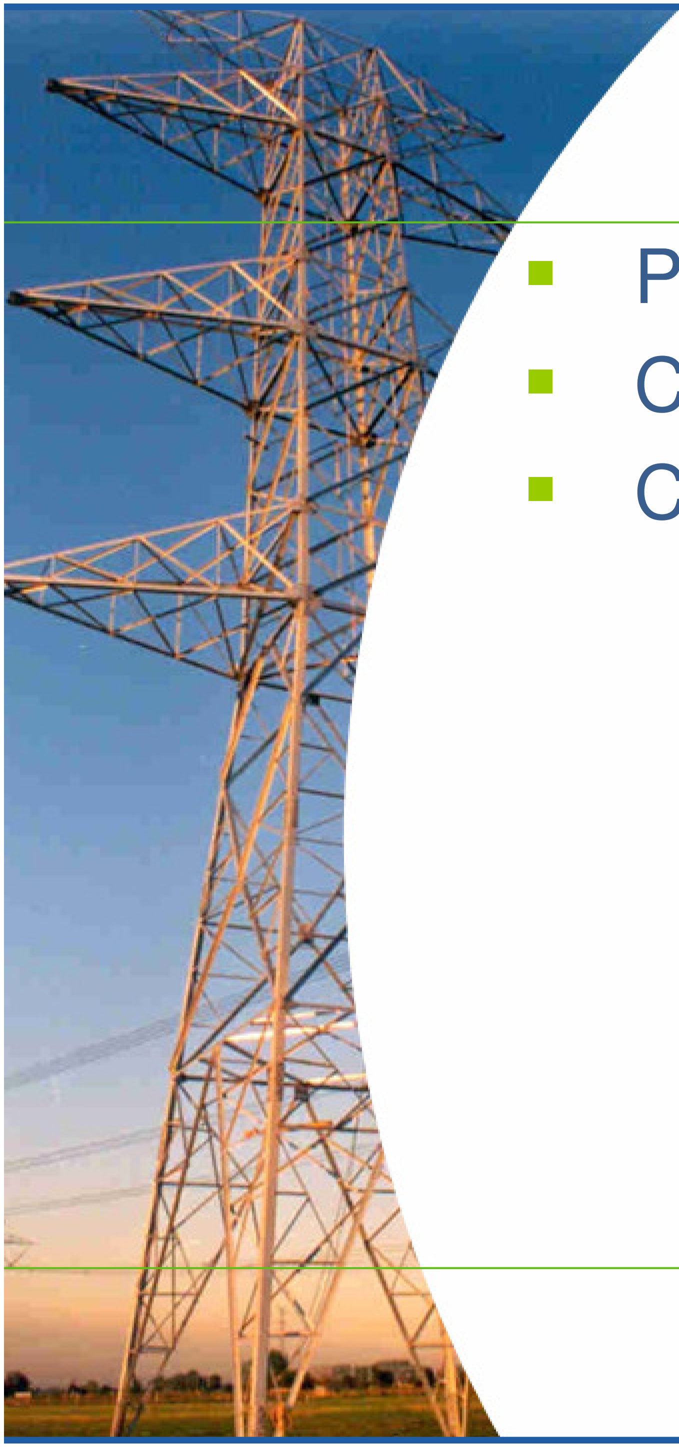


Contingency Name	Element	Nom kV	Limit	Percent Overload	
				Without DC	With DC
L_08485WSTSI	ARCADIA4 (8496) -> S.SIDE 4 (8483) CKT 1 at ARCADIA4	138	206		123.84
L_08486HOLLY	CABINES4 (8882) -> AIRLINE4 (8490) CKT 1 at CABINES4	138	320		127.49
L_08470HIW~4	GILA4A (80260) -> HIWAY9 4 (8470) CKT 1 at GILA4A	138	255		100.43
L_08470HIW~2	HIWAY9 4 (8470) -> JAVELIN4 (8475) CKT 1 at HIWAY9 4	138	267		105.94
L_08485WST~3	HOLLY 4 (8486) -> R.FIELD4 (8883) CKT 1 at HOLLY 4	138	320		114.58
/* Failu~213	LAPALM 4 (8314) -> HAINEDR4 (8322) CKT 1 at LAPALM 4	138	211		113.42
L_05626CALAL	LNHILL 2 (8448) -> RBSTN T2 (8884) CKT 1 at LNHILL 2	69	69	113.62	100.97
345kV_sol	LOMAALTA (5962) -> CARB-VL4 (8337) CKT 1 at LOMAALTA	138	202		157.86
L_08426CIT~2	N BAY 4 (8441) -> MORRIS 4 (8474) CKT 1 at N BAY 4	138	206		135.6
LON HILL - N	SINTON 2 (8413) -> SKIDMOR2 (8405) CKT 1 at SINTON 2	69	38		106.5
L_08486HOLLY	WSTSIDE4 (8485) -> CABINES4 (8882) CKT 1 at WSTSIDE4	138	320		134.08

Thermal Overloads, Barney Davis – Loma Alta Submarine DC Cable

Power Flow Analysis

- Key Observations
  - Transmission enhancements associated with Cross Valley Option #3 are sufficient to accommodate the 1000 MW submarine DC cable at Loma Alta end
    - Cross Valley Option #3 is compatible with incorporation of submarine DC cable
  - All three (3) north end terminals seem to provide acceptable options from a thermal capacity standpoint
    - Minimal transmission system upgrades needed to accommodate 1000 MW DC cable for Sand Dollar & White Point
    - Barney Davis option results in a few additional 138kV & 69kV transmission system overloads
  - Relative merits of each of the 3 options to be explored via additional technical analysis



RPG Presentation – Part 2

- Proposed HVDC Technology
- Cost Estimates & Schedule
- Conclusions & Next Steps

Questions