Lower Rio Grande Valley Regional Planning Group Projects

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ERCOT System Planning

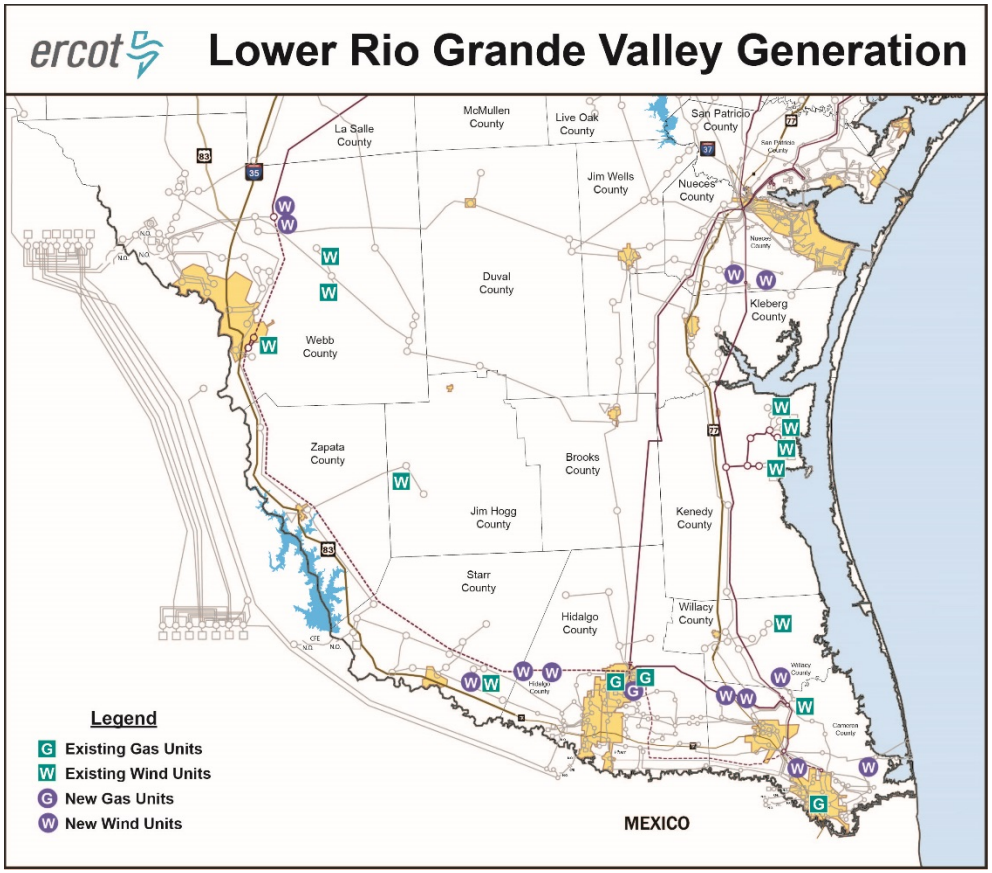
May 17, 2016

ERCOT Regional Planning Group Meeting

Agenda

- Background
- Drivers for Development
- Assumption and Sensitivity Analysis
- Recommendation
- Next Step

Valley Import Background



- The Lower Rio Grande Valley (LRGV) import paths currently include:
  - (3) 345 kV lines,
  - (3) 138 kV lines,
  - 300 MW DC tie to Mexico

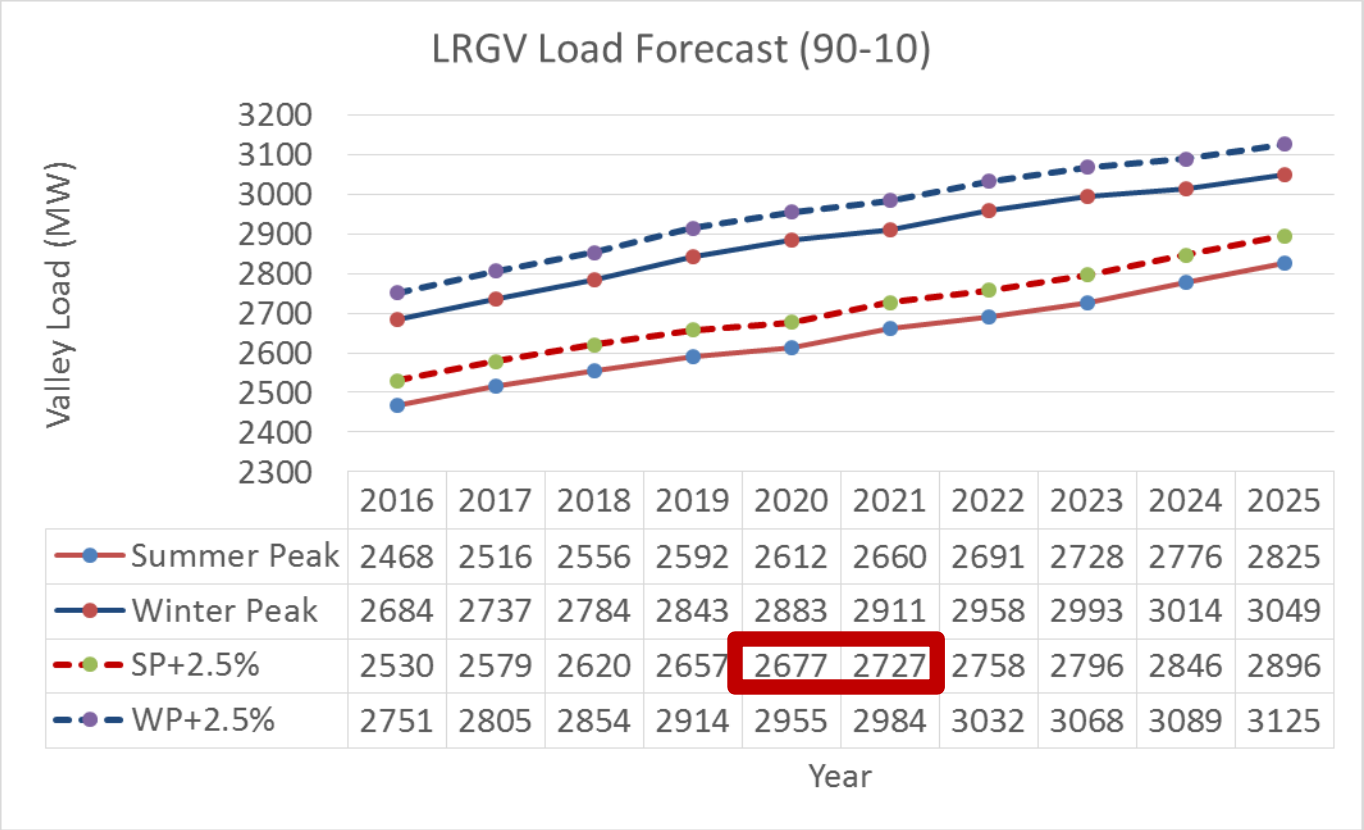
Generation in and near LRGV Area		
Capacity (MW)	Gas	Wind
Existing (a)	1245	1737
Planning (Meet PG6.9)	225	2641
Total	1470	4378

(a) Exclude Frontera Facility

Drivers for Development

- More Stringent NERC TPL-001-4 Criteria
  - Upgrades, if identified, need to be Implemented by 2021 to prevent loss of non consequential load under NERC P3 Events (including G-1-G-1)
- Frontera Plant Facilities (524MW) no longer plan to participate in the ERCOT
  - http://www.ercot.com/content/news/presentations/2014/ERCOT%20Frontera%20Letter.pdf

LRGV Existing Load Serving Capability and Load Forecast



	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Summer Peak	2468	2516	2556	2592	2612	2660	2691	2728	2776	2825
Winter Peak	2684	2737	2784	2843	2883	2911	2958	2993	3014	3049
SP+2.5%	2530	2579	2620	2657	2677	2727	2758	2796	2846	2896
WP+2.5%	2751	2805	2854	2914	2955	2984	3032	3068	3089	3125

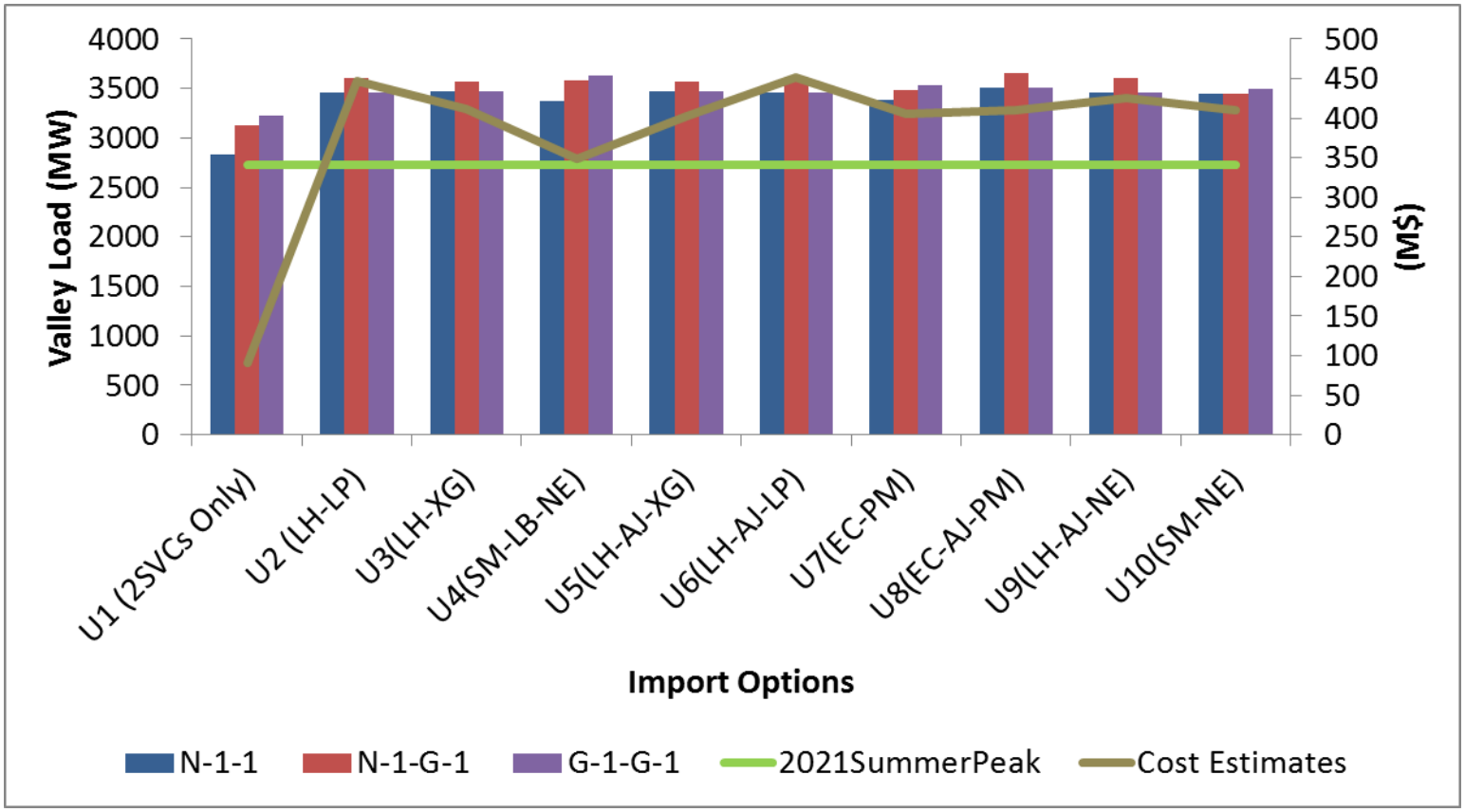
- ERCOT 2016 Regional Planning Plan (RTP) is consistent with AEP's load projection
- Valley Summer Peak Load Serving Capability: 2700 MW (less than 100 MW UVLS)
- **Upgrades are required prior to 2021 Summer**

- AEPSC proposed LRGV area transmission improvements in April, 2015
  - Three +600/-200 MVAR SVCs (South McAllen, LaPalma, Weslaco)
  - New NSUBLH-Ajo-NSUBXING 345 kV BOLD Transmission Line
  - Two 345/138 kV transformers
- Sharyland and CPS jointly proposed LRGV import project in September, 2015
  - Three 400~600 MVAR SVCs (Loma Alta, Railroad, North Edinburg)
  - New Elm Creek-Palmito 345 kV double circuit
  - New La Palma-Palmito 345 kV single circuit
  - One 345/138kV transformer

ERCOT Independent Review Study Approach

- Evaluated 2021 summer peak condition
  - Steady State: from 2015 RTP case
  - Dynamic Stability: from 2015 DWG flat start case (include dynamic load models in the Valley region)
  - Dispatched wind output at 10% of rated capacity in the Valley region
- Ten upgrade options were developed (appendix)

Voltage Stability Assessment and Cost Comparison



Reduced to Three Alternatives

- Option 1: ~91 M$
  - One 300 MVAr SVC at LaPalma 138 kV substation, and one 300 MVAr SVC at AEP Pharr 138 kV substation

- Option 4: 330 M$~348 M$ (higher cost estimate is based on “hot” construction)
  - Option1 with San Miguel-Lobo-North Edinburg string 2nd circuit, no series compensation

- Option 5: ~403 M$
  - Option 1 with one new 345 kV circuit NSUBLH-Ajo-NSUBXING (BOLD), two 345/138 kV autotransformers

Comparisons

Items	Option 1 (2 SVCs)	Option 4 (2 SVCs + 2nd circuit)	Option 5 (2 SVCs + new import)
Load Serving Capability (MW)	2800	3300	3400
Reliability Criteria	2023	Beyond 2025	Beyond 2025
Cost Estimate (M$)	91	330~348	403
Total New ROW Required (miles)	0	~7	~140
Implementation Time (year)	3	3	5

Sensitivity Analysis: LNG Load and New Generation

- LNG Load
  - Currently, there is no LNG commitment in the Valley region
  - Assumed 700 MW LNG load in Cameron County
  - New import option terminated at east of Valley region will have better LNG load serving capability
  - The actual LNG implementation may require a new import path or additional local generation
- New Generation
  - Assumed one generation project (~780MW with SGIA) in Cameron County
  - No upgrades were needed under 2021 summer peak conditions with a 780 MW generation addition
  - No upgrades were needed under 2021 summer peak conditions with 700 MW of LNG load added along with a 780 MW generator addition

ERCOT Recommendation

- Improvements associated with option 1:
  - One 300 MVAR SVC at La Palma 138 kV substation
  - One 300 MVAR SVC at AEP Pharr 138 kV substation
- Estimated Capital Cost: 91 M$

- Further improvements will be needed to meet 2023 load conditions. Recommending option 1 at this time will allow ERCOT and TSPs time to:
  - Evaluate proper long-term solution with potentially more certainty about location generation and LNG load plans
  - Evaluate the dynamic load model assumptions

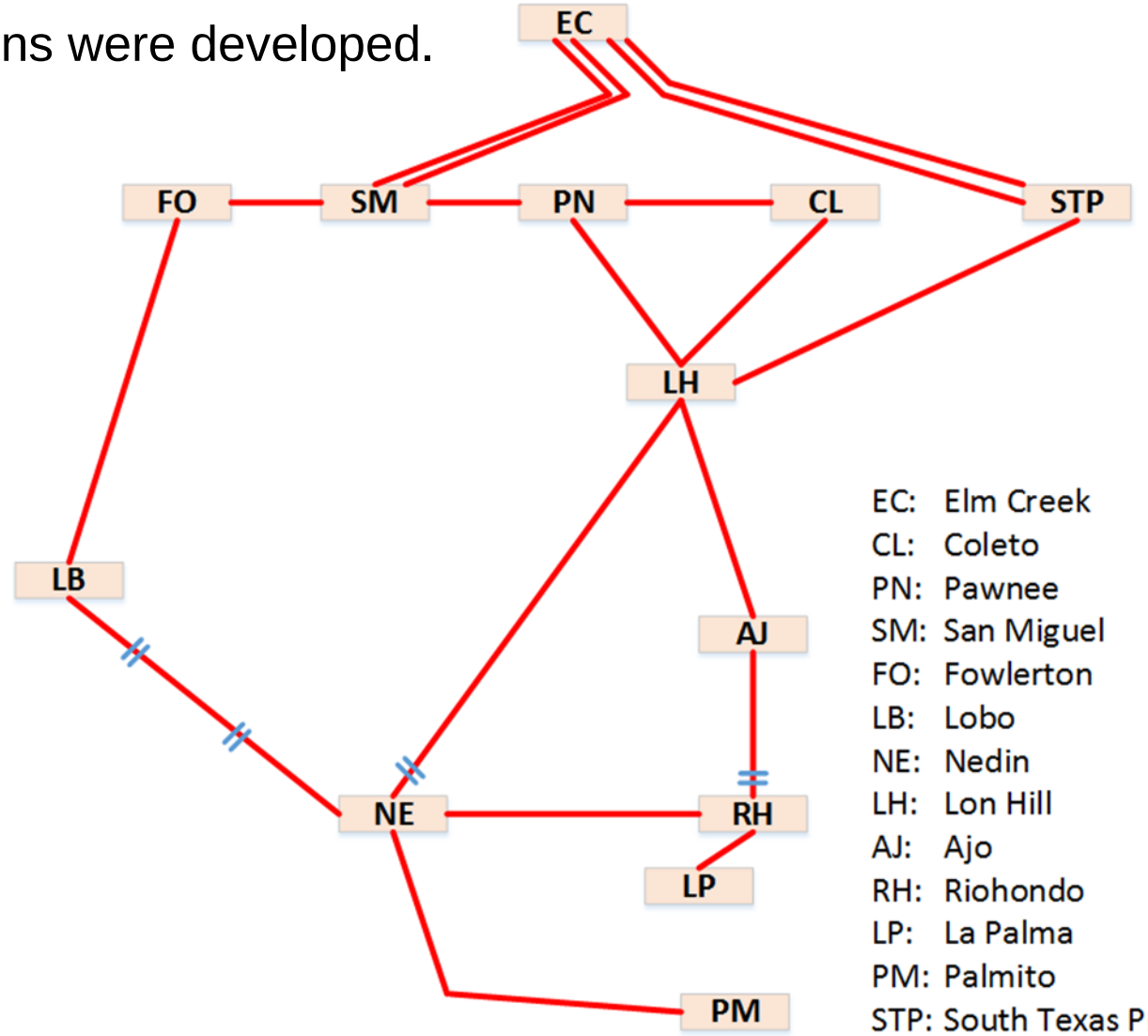
Next Step

- Complete the study report
- Present the independent review results to
  - TAC on May 26, 2016
  - BOD on June 14, 2016

Appendix

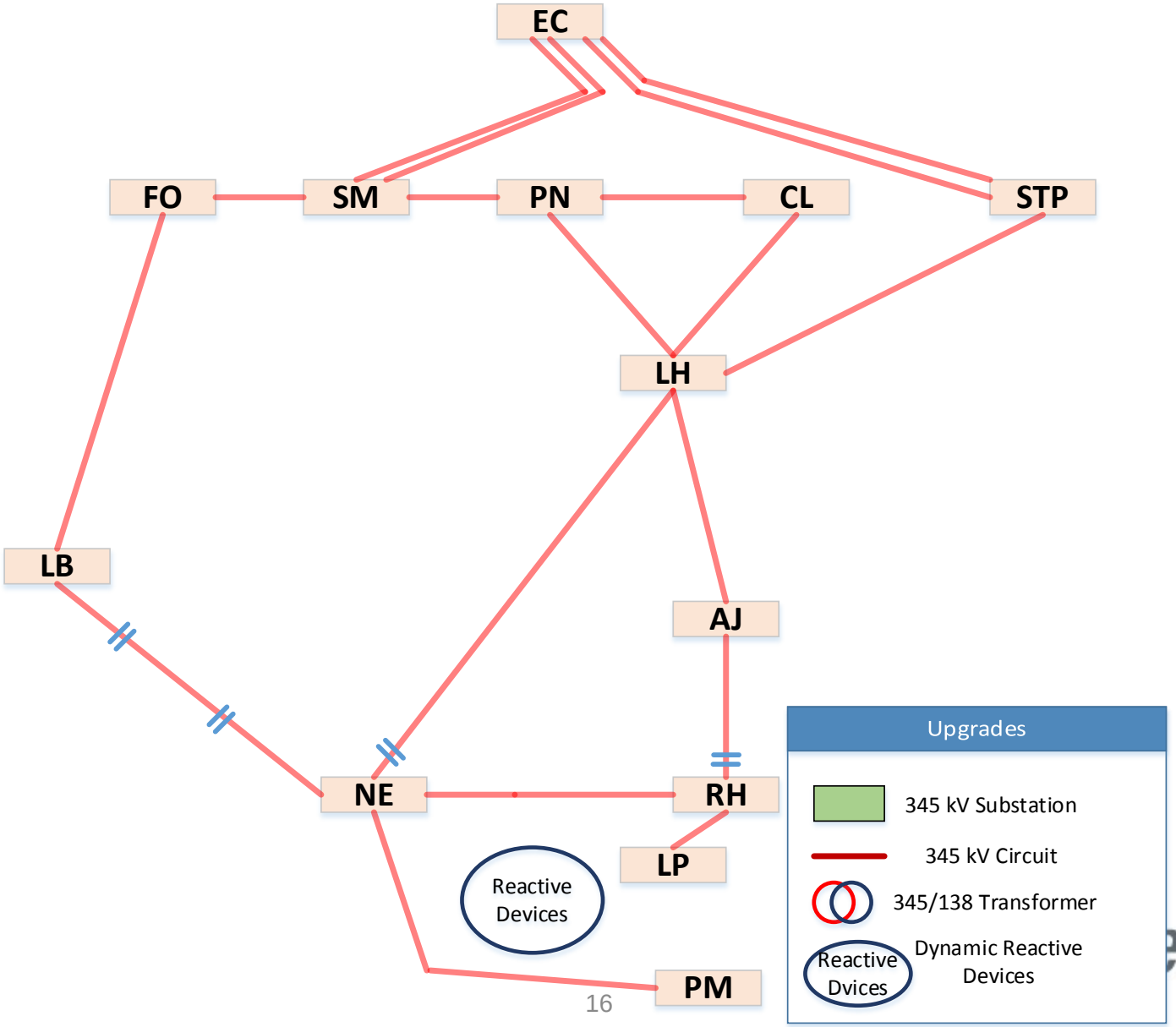
Upgrade Options

- Ten upgrade options were developed.

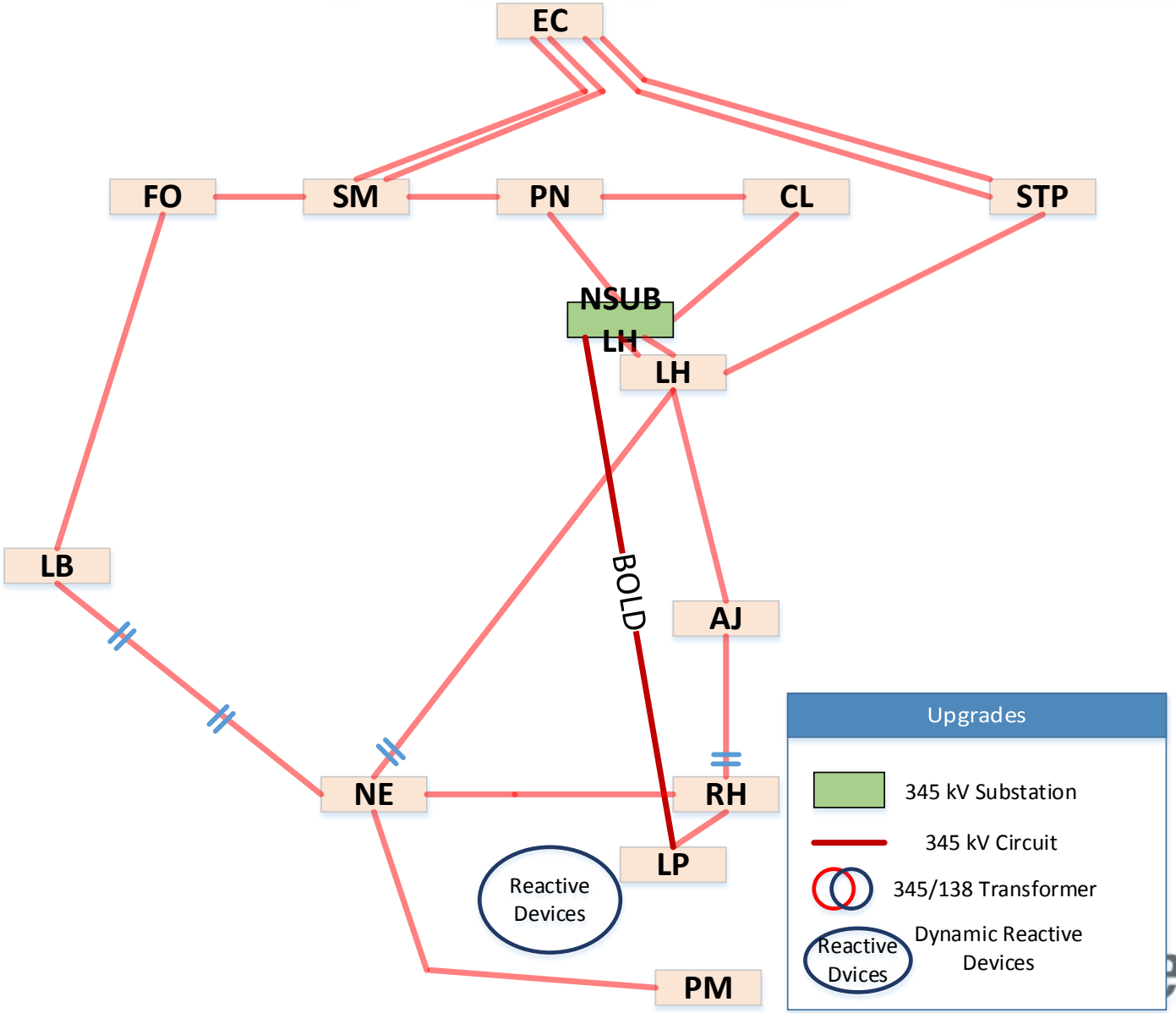


system topology after 2016 summer

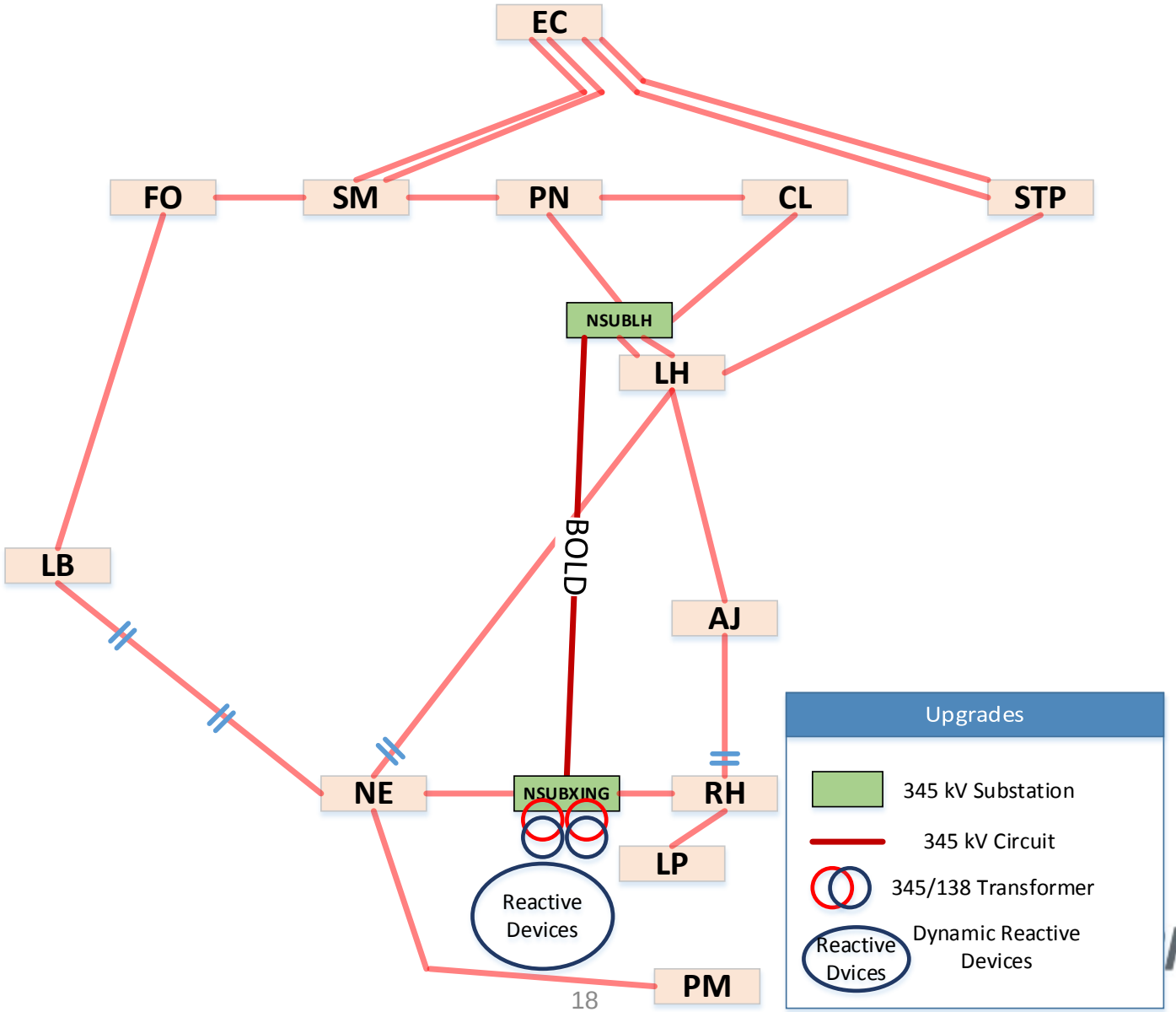
Option 1: One 300 MVAr SVC at LaPalma 138 kV substation, and one 300 MVAr SVC at Pharr 138 kV substation



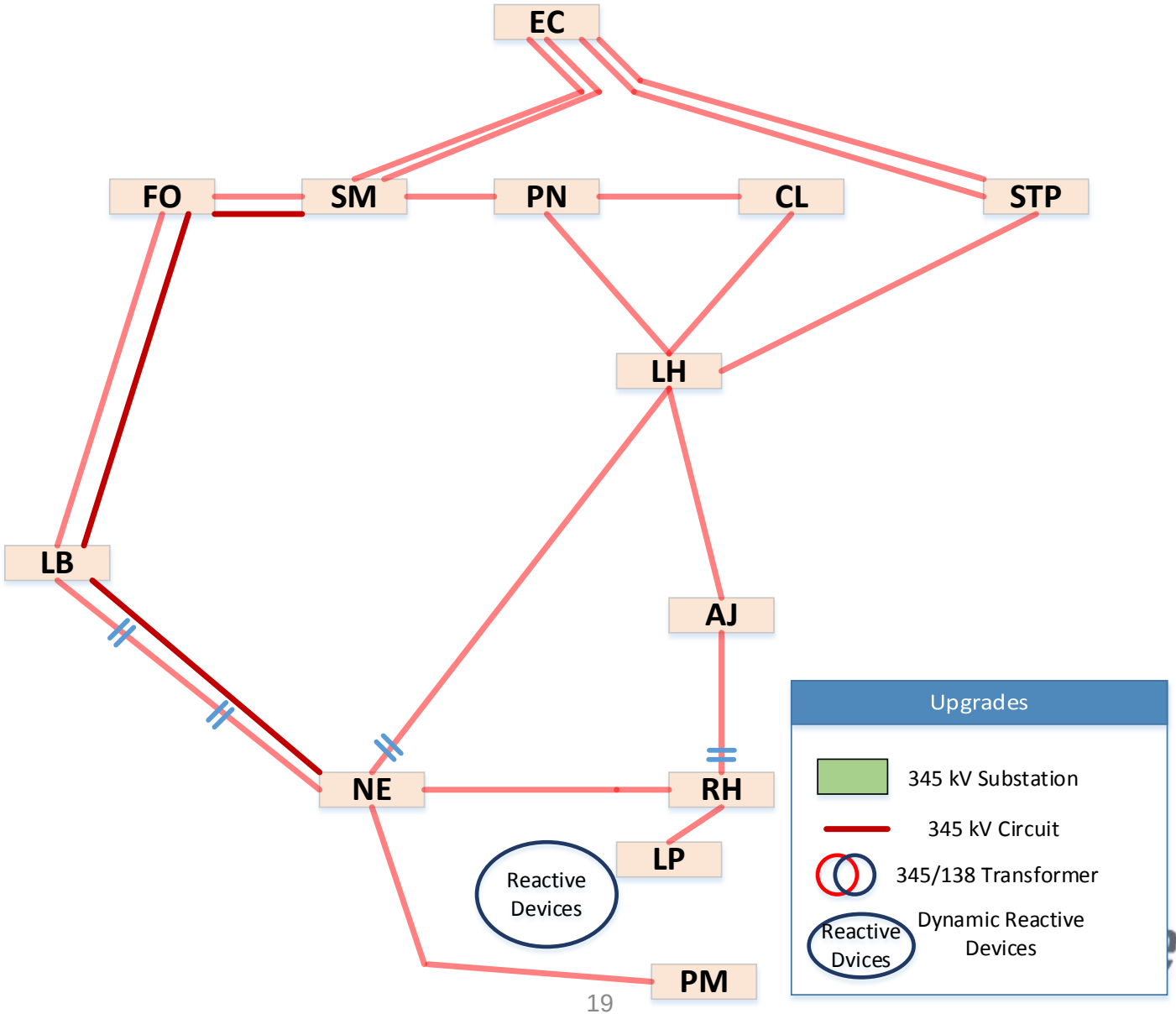
Option 2: Option1 with one new 345 kV circuit NSUBLH-LaPalma (BOLD)



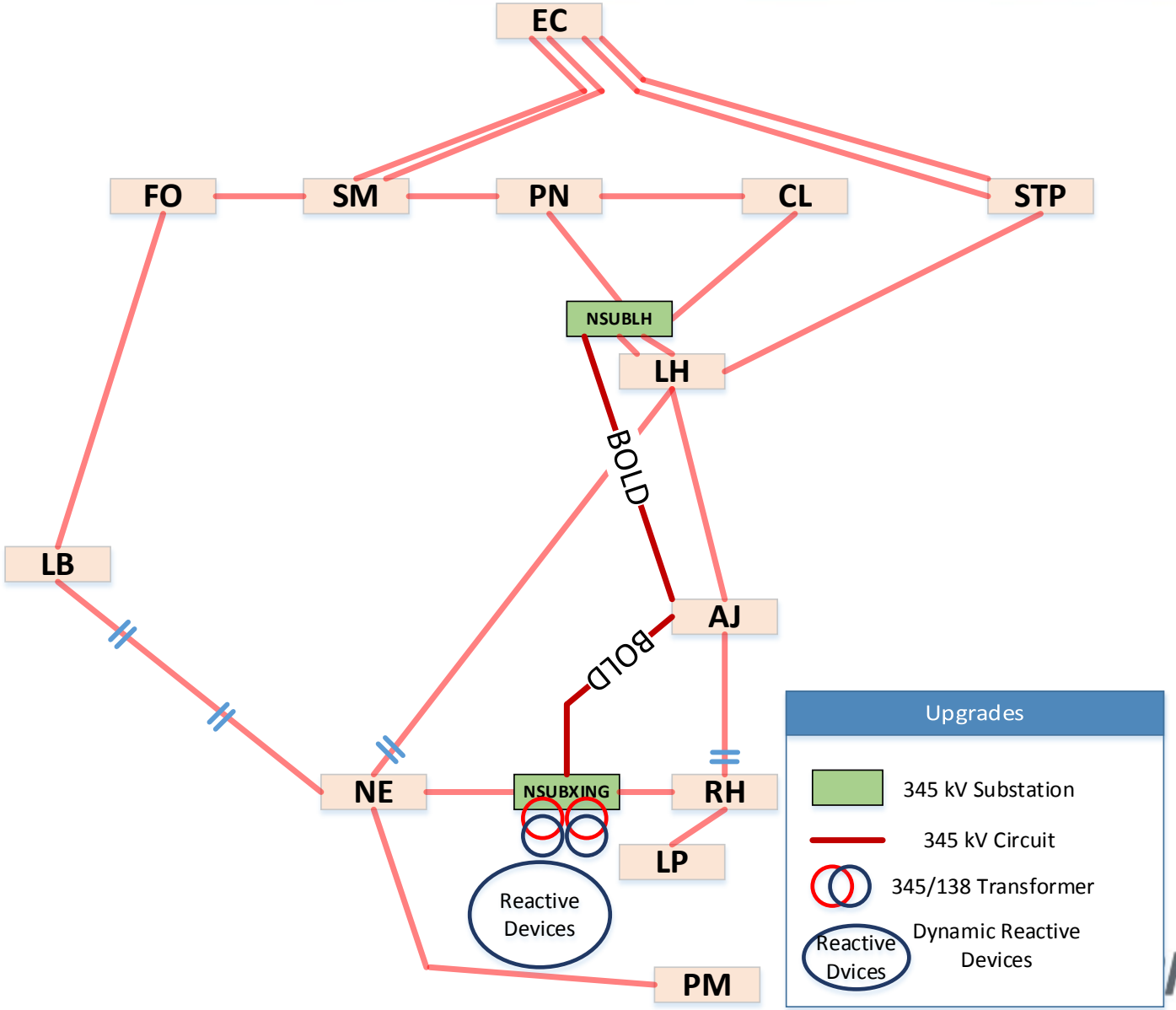
Option 3: Option 1 with one new 345 kV circuit NSUBLH-NSUBXING (BOLD), two 345/138 kV transformers



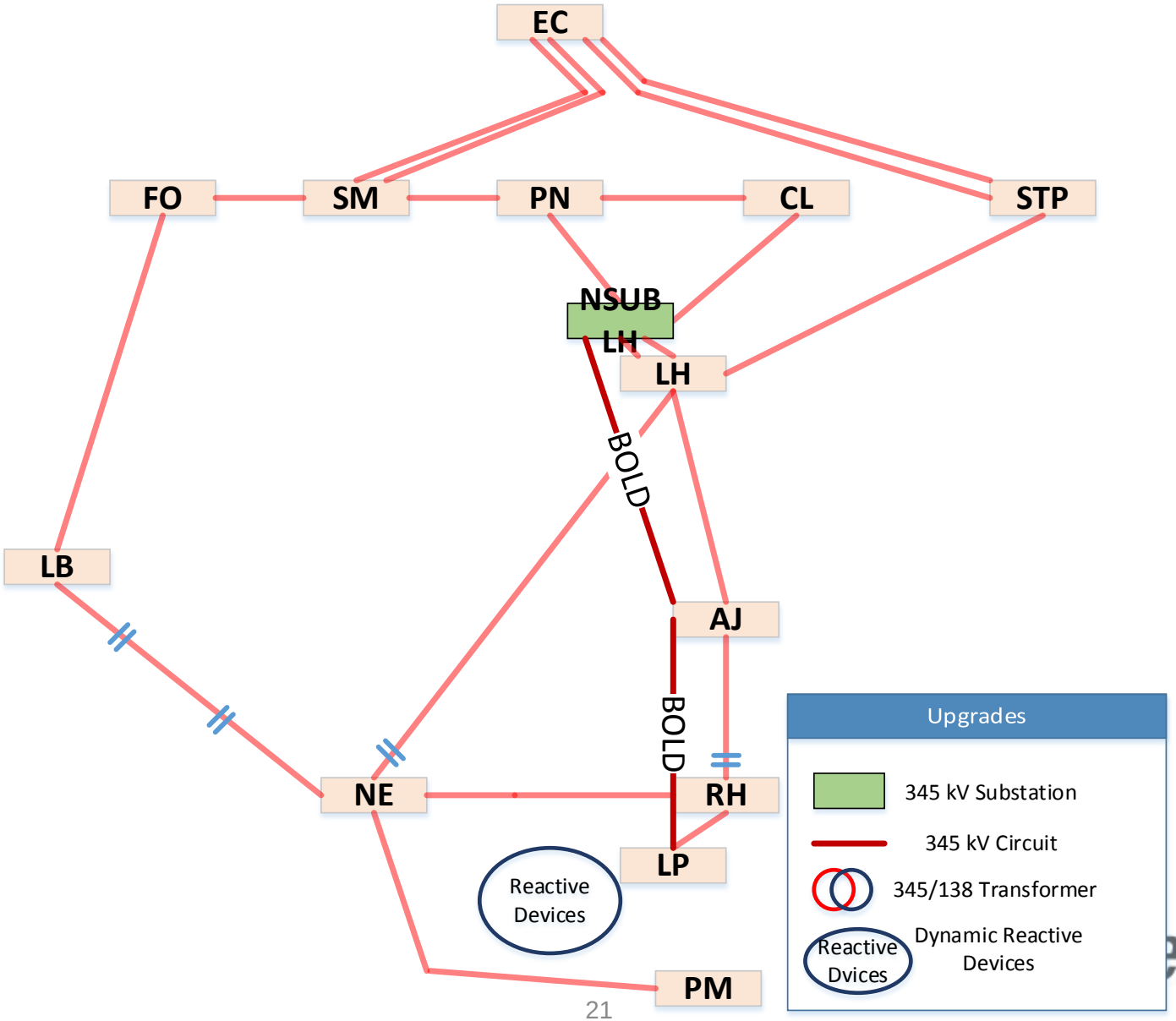
Option 4: Option1 with San Miguel-Lobo-North Edinburg string 2nd circuit, no series compensation



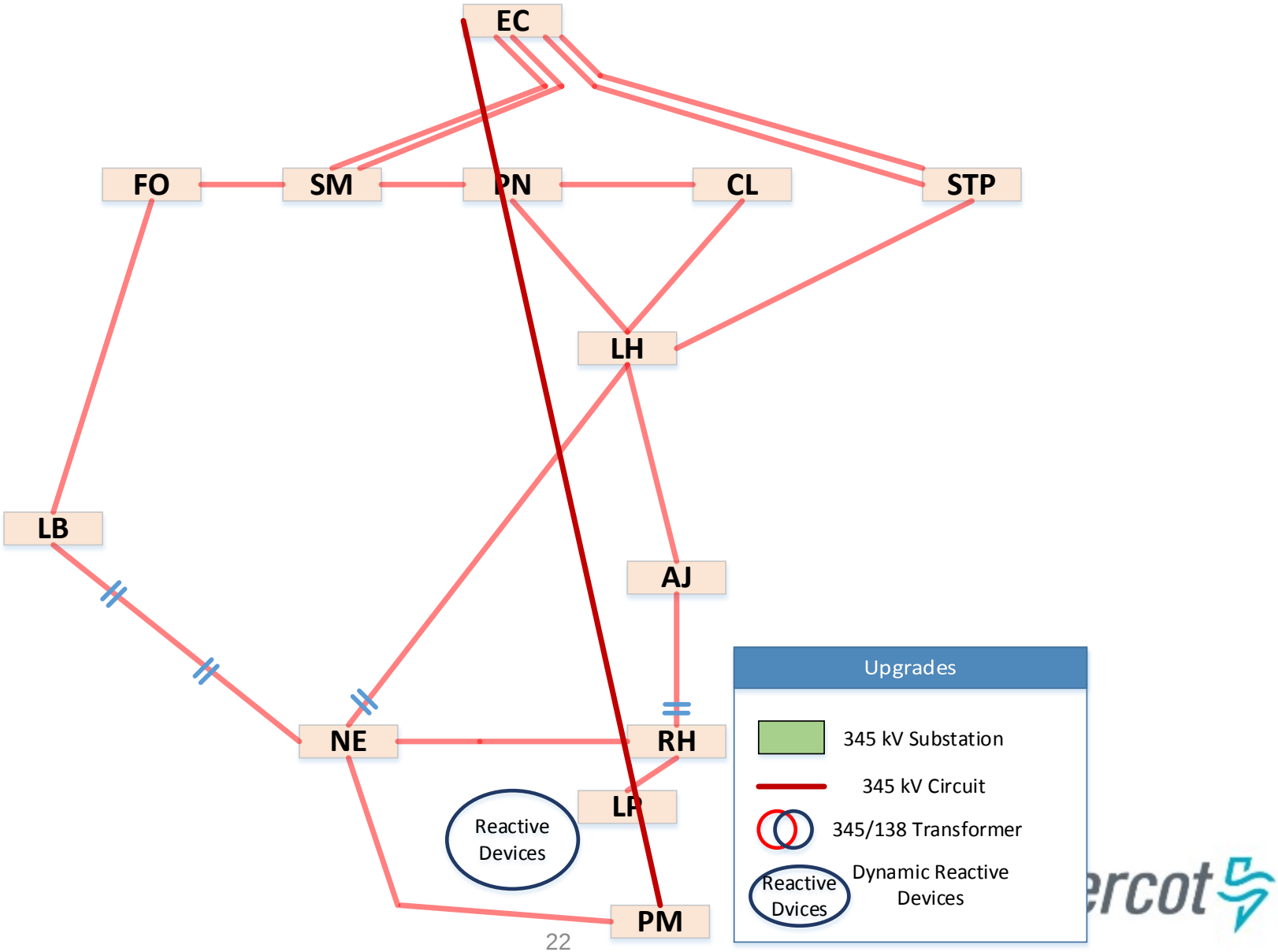
Option 5: Option 1 with one new 345 kV circuit NSUBLH-Ajo-NSUBXING (BOLD), two 345/138 kV transformers



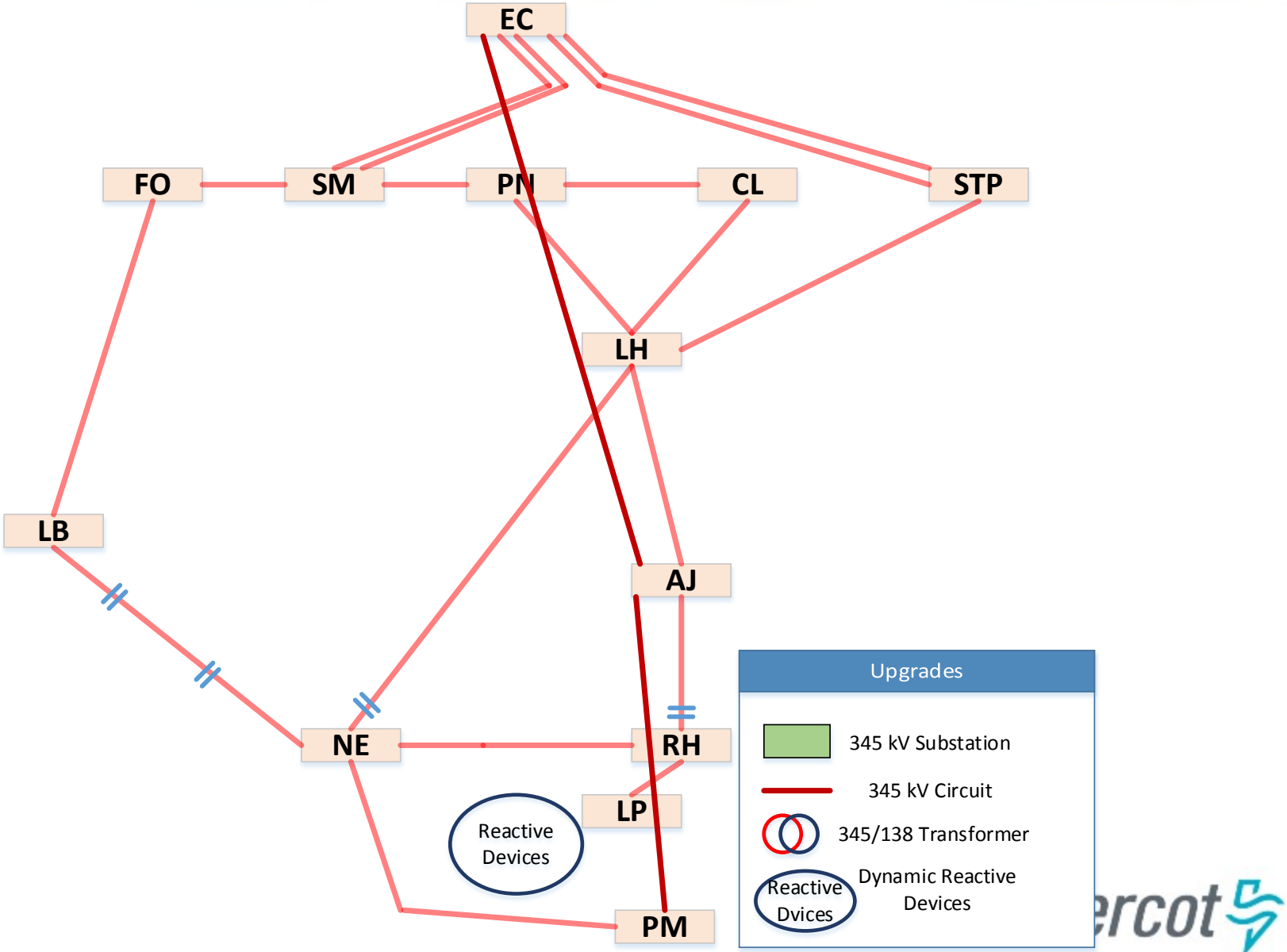
Option 6: Option 1 with one new 345 kV circuit NSUBLH-Ajo-LaPalma (BOLD)



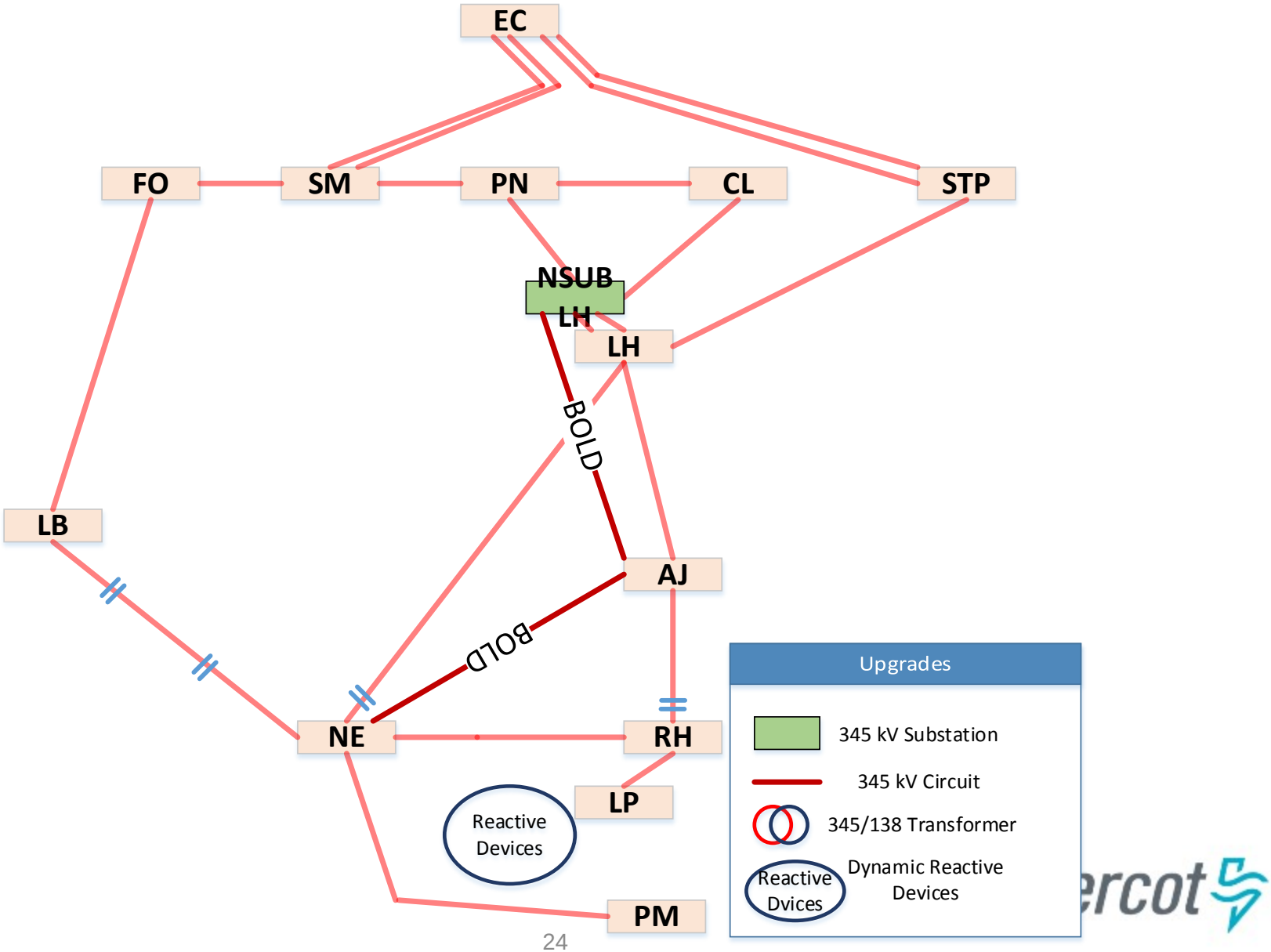
Option 7: Option 1 with one new 345 kV circuit Elm Creek-Palmito



Option 8: Option 1 with one new 345 kV circuit Elm Creek-Ajo-Palmito



Option 9: Option1 with one new 345 kV circuit NSUBLH-Ajo-North Edinburg (BOLD)



Option 10: Option 1 with one new 345 kV circuit San Miguel-North Edinburg