Public Service Company of New Mexico

Open Transmission Planning Meeting

November 3, 2016

Albuquerque, NM

INTRODUCTION

- Public Stakeholder Meeting
  - Order 890 Objective to improve transparency and stakeholder involvement.
  - Planning Process Defined in Attachment K of OATT
- March Meeting Reviewed
  - Planning Process
  - Coordination with WECC (PCC & TEPPC), WestConnect
  - PNM 10-Year Plan Study Scope
- November Meeting
  - Review 10-Year Plan Results
  - Input to Next Planning Cycle
  - Certain Other Business

10-YEAR TRANSMISSION PLAN

Overview of TPL-001-WECC-CRT-3

Conditions	Steady State			
	Voltage (per unit)		Voltage Drop	
	Previous	New	Previous	New
Normal ALIS (P0)	0.95-1.05	0.95-1.05[1]	Not Applicable	
	0.95-1.1			
Single Contingency (P1)	0.925-1.08	0.9-1.1	6 %	8%
	0.95-1.1		6 %	
	0.925-1.08		7%	
	0.90 – 1.08		6 %	
	0.90 – 1.08		7%	
Multiple Contingency (P2-P7)	0.90-1.087	0.9-1.1	10 %	None Specified
	0.95-1.1			

Conditions	Transient Voltage Response	
	Previous	WECC
Single Contingency (P1)	Dip > 25% of pre-fault voltage Dip > 20% of pre-fault voltage for more than 20 cycles	Following fault clearing, recover to 80% of pre-fault voltage within 20 seconds of the initiating event for each applicable BES bus serving load Following voltage recovery above 80%, voltage at applicable BES bus serving load shall not dip below 70% of pre-contingency for more than 30 cycles or remain below 80% of pre-contingency for more than two seconds for P1-P7 For Contingencies without a fault (P2.1), voltage dips at applicable BES bus serving load shall not dip below 70% of pre-contingency for more than 30 cycles or remain below 80% of pre-contingency for more than two seconds Oscillations that do not show positive damping within 30 seconds after the start of the studied event shall be deemed unstable.

10-YEAR TRANSMISSION PLAN

- **OBJECTIVES OF STUDY EFFORT:**
  - **Support Data Base Development for PNM and Regional Studies**
    - **2018 (1-yr), 2021 (5-yr) , 2026 (10-yr)**
  - **Maintain Reliability**
  - **Define Transmission for Native, Network and Point-Point Customers**
  - **Incorporate Plans Developed Through FERC Processes, NM IRP and Regional Planning Analysis**

STUDY SCOPE

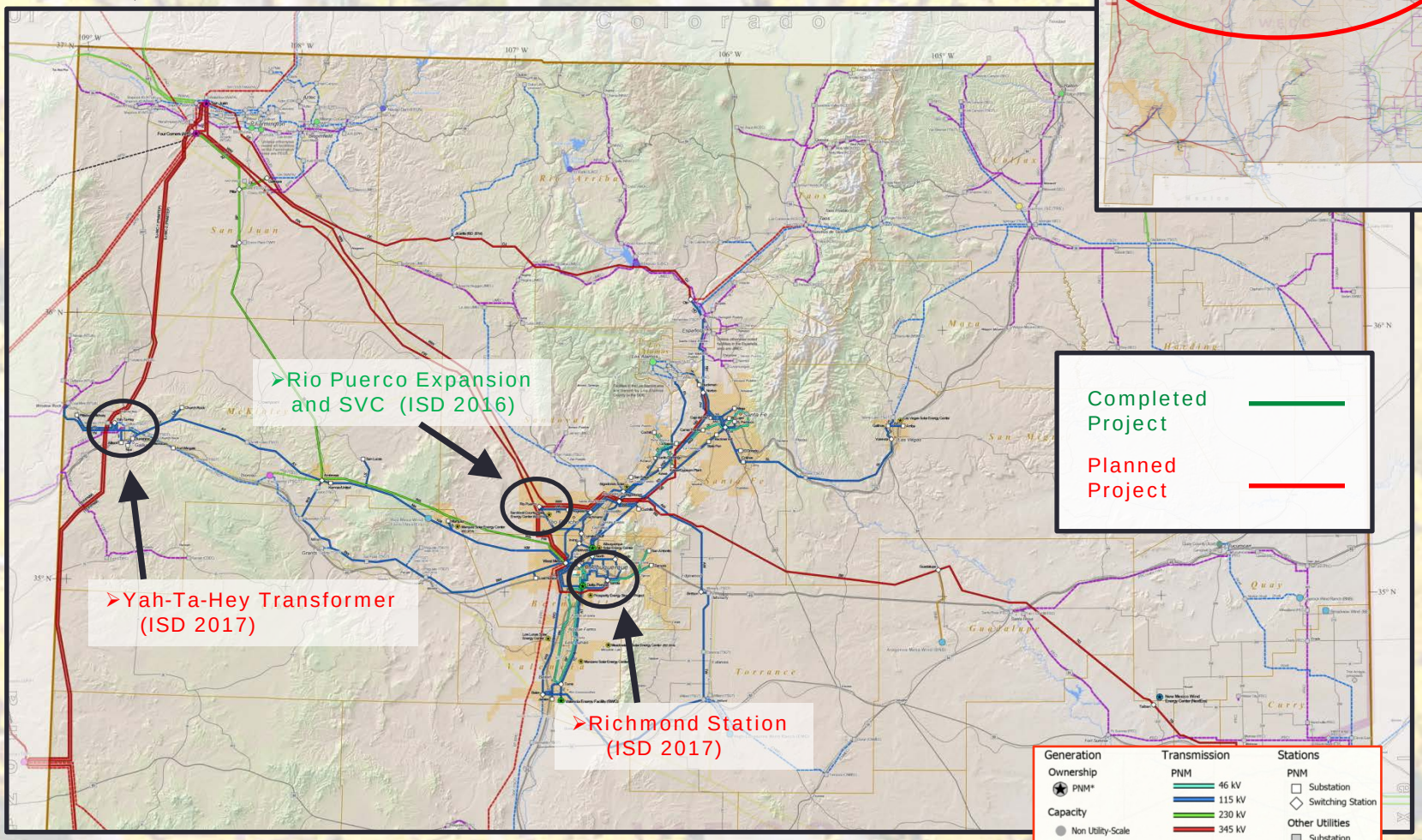
- Review transmission adequacy with retail and network customer updates to designated network resources and load.
- Determine if system mitigations are needed to serve expected obligations (load forecasts and expected firm transfers) during the 10 year planning horizon without violating WECC/NERC reliability standards.
- Develop operational mitigations or system improvements to maintain system reliability and associated cost estimates and schedule.
- Incorporate assessments of economic congestion to the extent a need is identified by PNM's or other's involvement in the WECC/TEPPC process for providing this type of assessment.

PROJECT DRIVERS

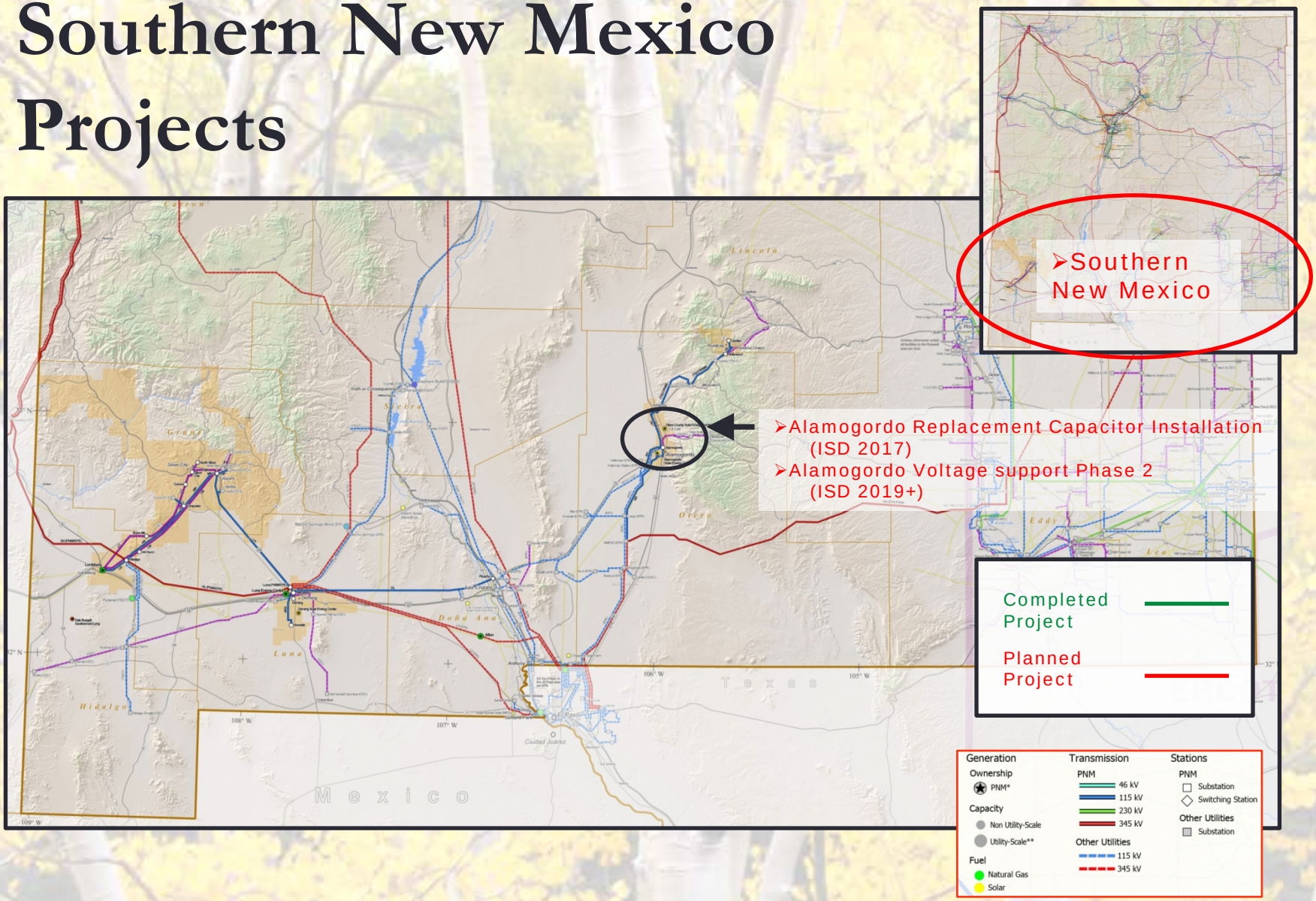
- Compliance with Reliability Standards
- Provide Service to New Load Locations
- Interconnection Projects
- Recommendations for projects requiring joint study or solutions

Project Overview

Northern New Mexico Projects



Southern New Mexico Projects



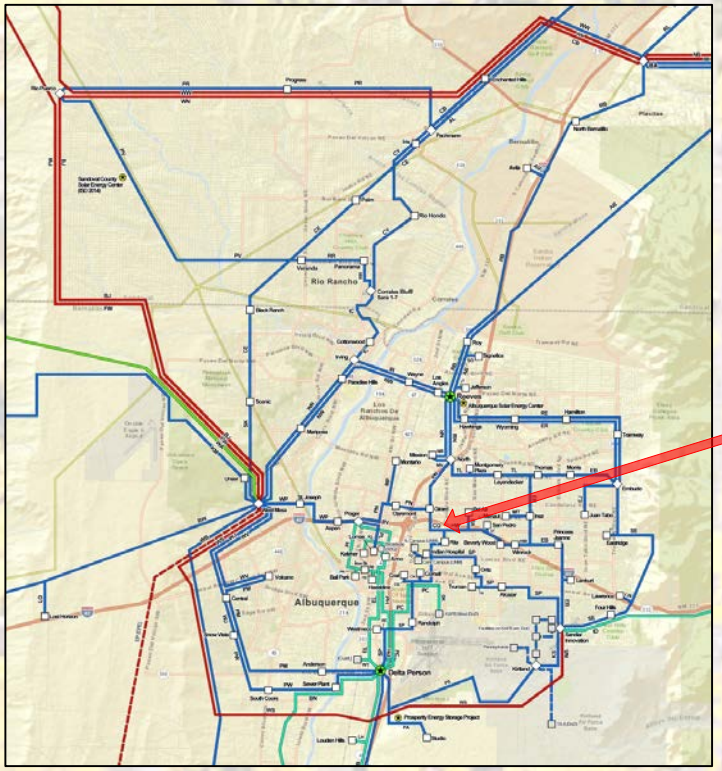
COMPLETED RELIABILITY PROJECTS

- Rio Puerco Station Expansion and SVC

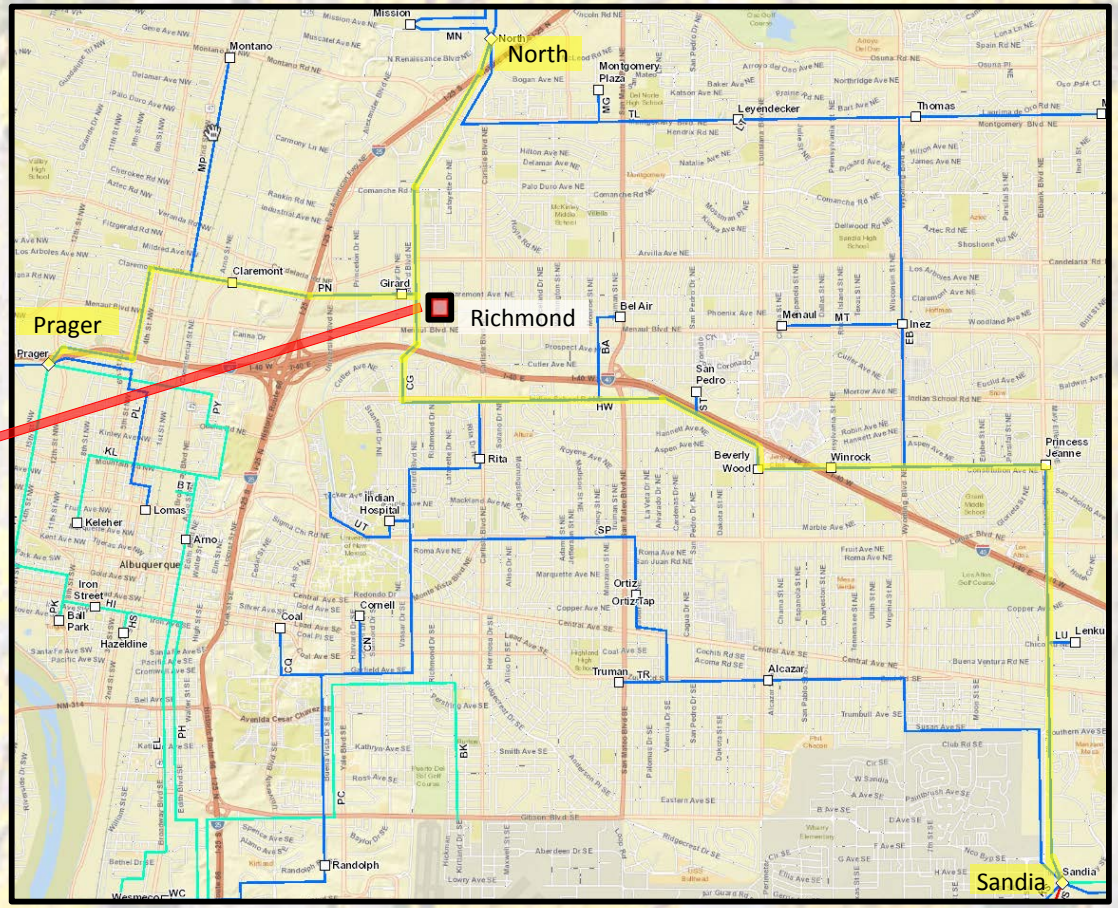
RELIABILITY PROJECTS UNDER CONSTRUCTION

RICHMOND SWITCHING STATION

Metro Albuquerque



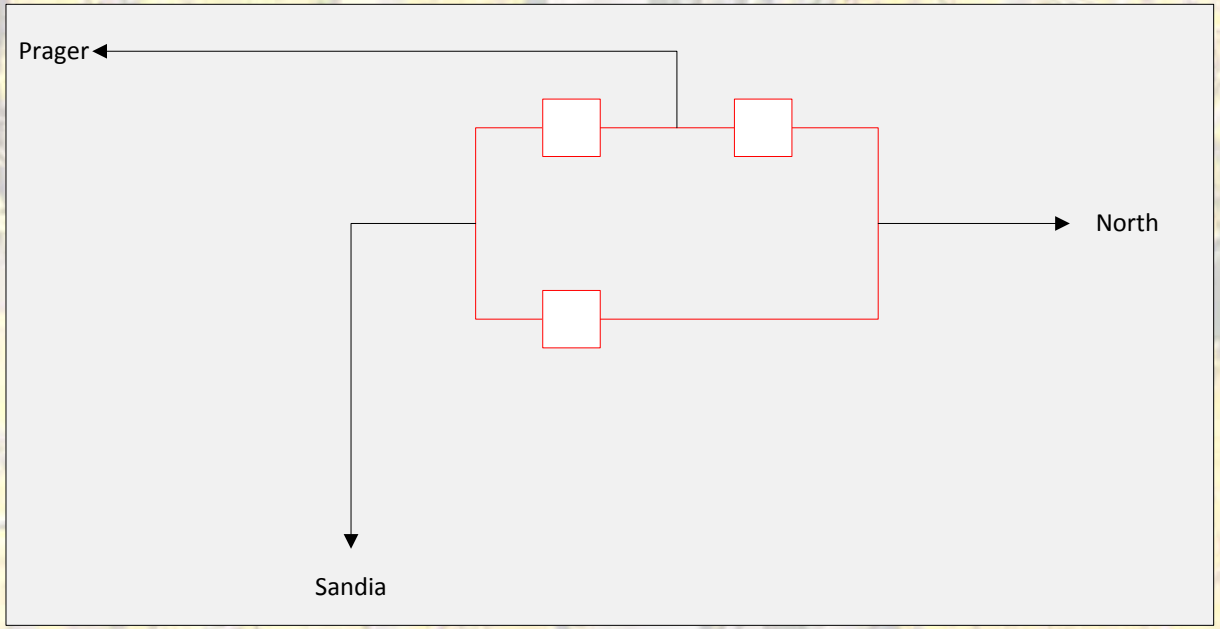
Detailed Area (Project lines highlighted in yellow)



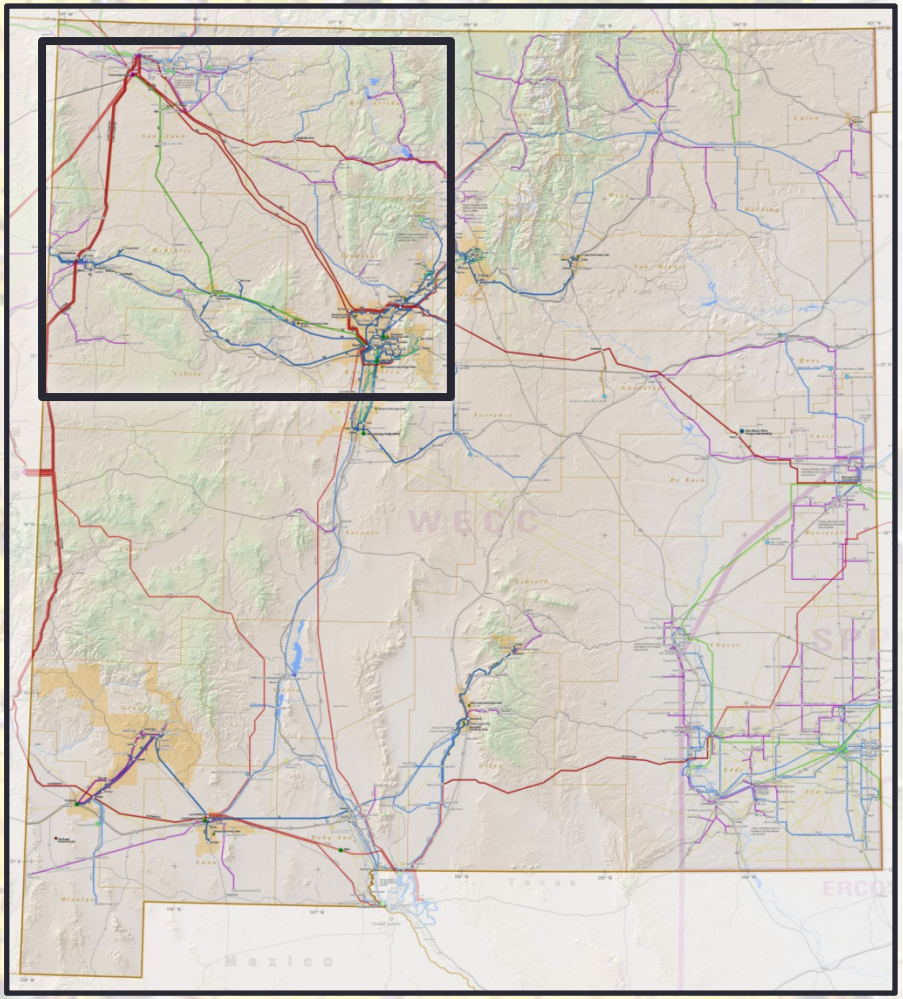
RICHMOND SWITCHING STATION

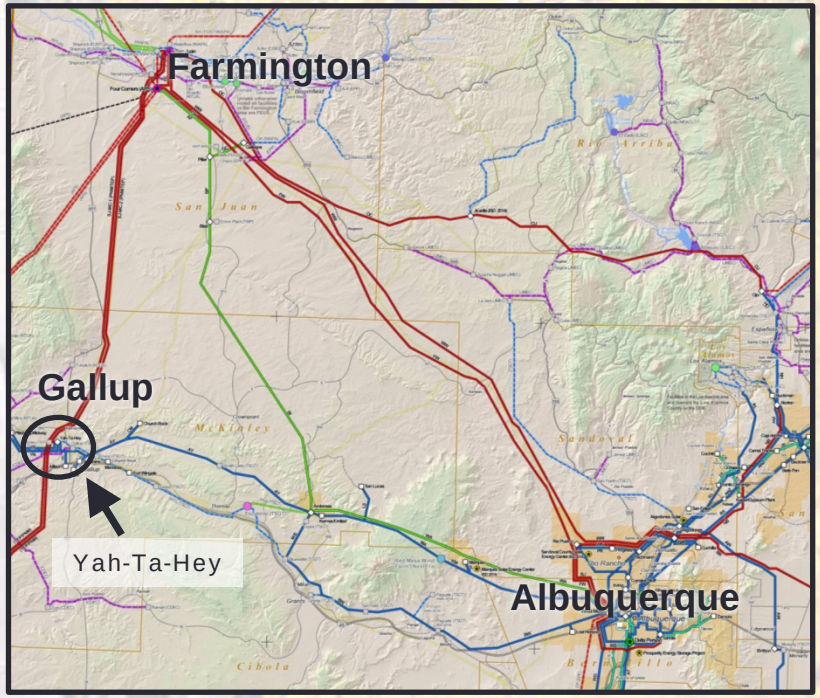
- In Service Date – 2017
- Purpose
  - Mitigate Albuquerque 115 kV overloads.
  - Provide additional source and voltage support for the Sandia Switching station.
- Project Includes:
  - A new 115 kV three breaker ring bus switching station on the existing line between Sandia and North
  - Closing a normally open switch between North and Sandia.

RICHMOND SWITCHING STATION



2nd YAH-TA-HEY TRANSFORMER

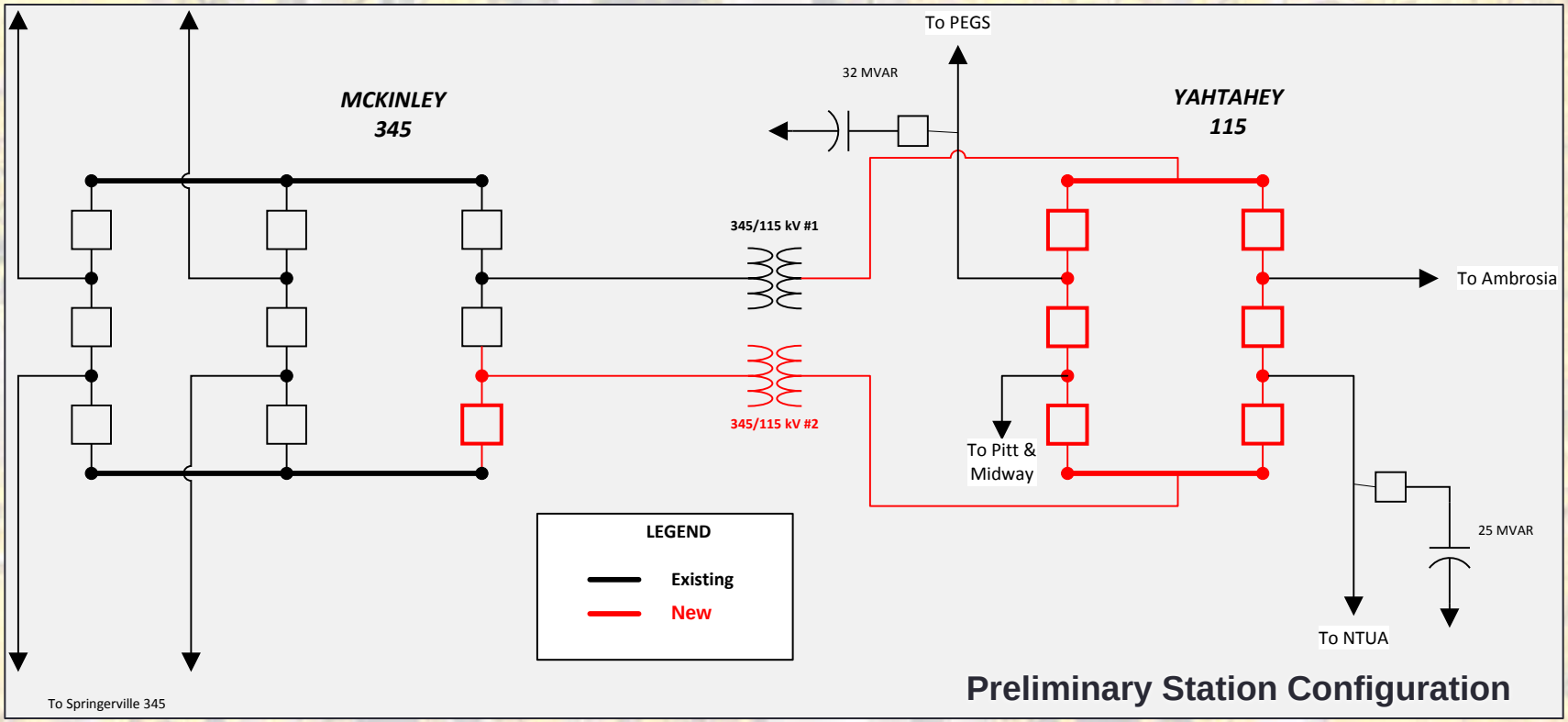




2nd YAH-TA-HEY TRANSFORMER

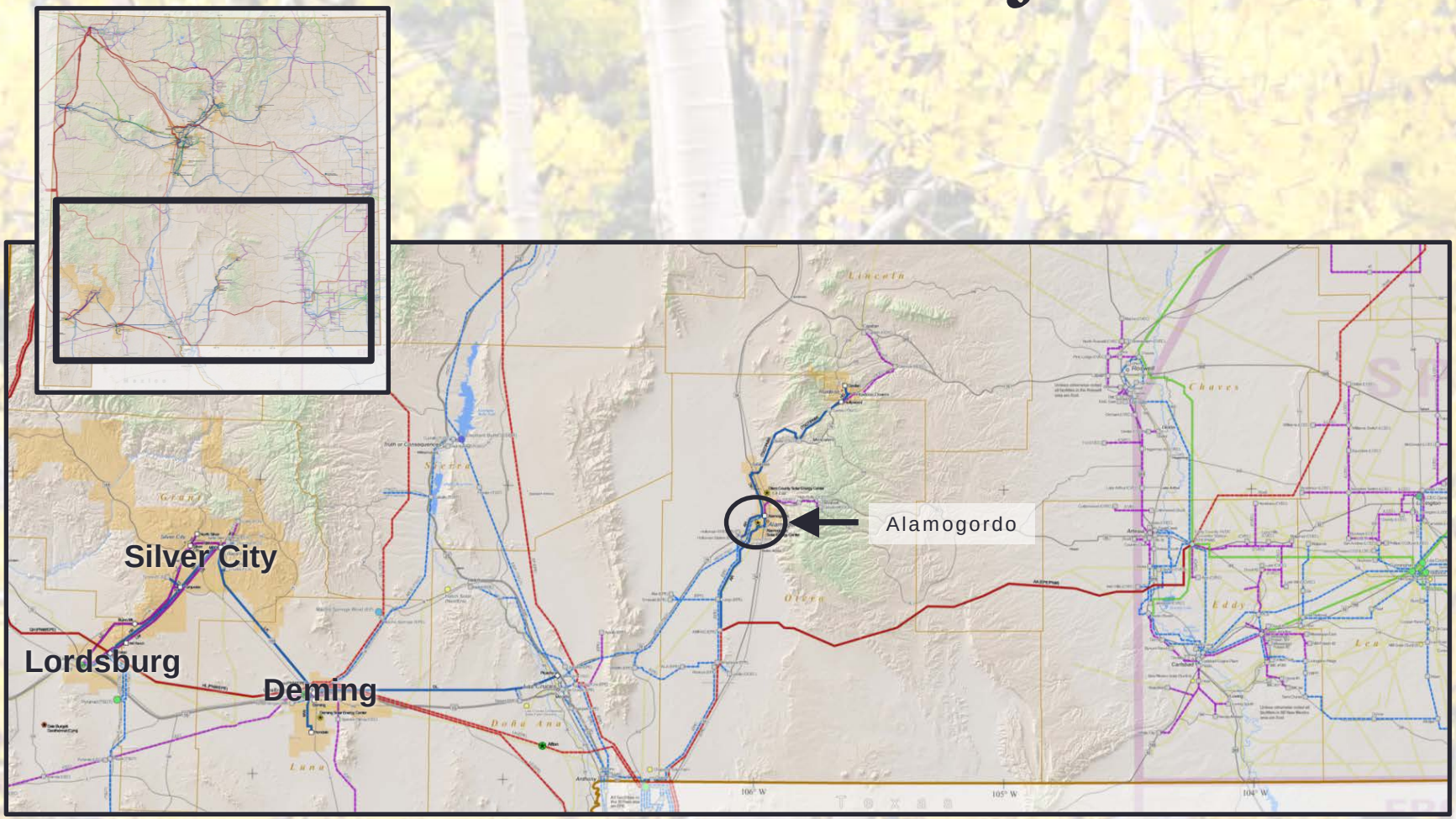
- In Service Date – 2017
- Purpose – Mitigate overloads of existing transformer and improve Yah-Ta-Hey contingency voltage performance
- Project Includes:
  - Expanding the McKinley 345 kV and Yah-Ta-Hey 115 kV stations
  - Expanding and upgrading Yah-Ta-Hey 115 kV station
  - Installation of a second transformer

2nd YAH-TA-HEY TRANSFORMER



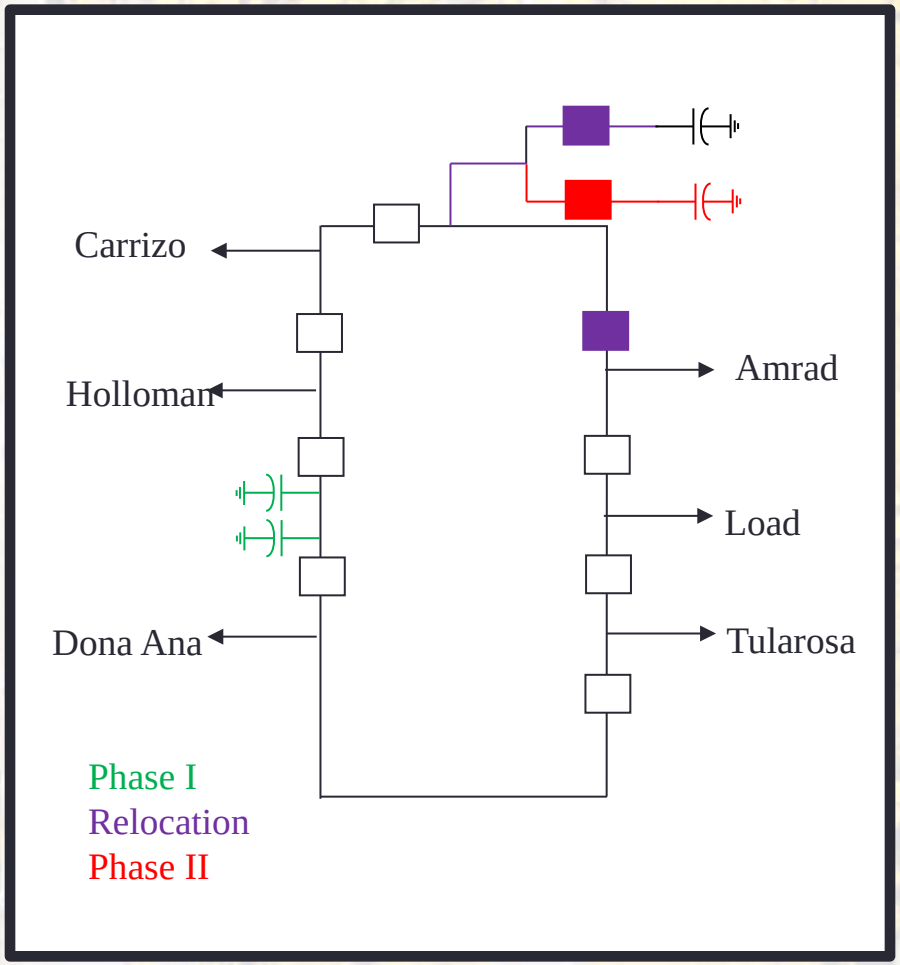
PLANNED RELIABILITY PROJECTS

ALAMOGORDO PROJECTS



ALAMOGORDO VOLTAGE SUPPORT PHASE 2

- In-Service Date: 2019+
- Purpose – Provide adequate voltage support and operational flexibility by increasing the transmission load serving capability.
- Project includes
  - Installation of an additional switchable shunt capacitor



OTHER PROJECTS

OPERATOR OR RAS SOLUTIONS

- Only Local Area Impacts
- Certain N-2 overloads addressed by RAS or Operator action.
  - Generation Re-dispatch
  - Load Shedding
  - Capacitor switching
  - Transformer Tap Adjustments

10-YEAR PLAN QUESTIONS?

Ten-Year Plan Report Available for Stakeholders completing CEII Request

2017 STUDY PLAN INPUT

- March Meeting to Review 10-Year Plan Scope
- 2017 TEPPC study request window typically closes January 31.
- Discussion

Large Generator Interconnection Cluster Activity

- Fifth Definitive Cluster closed November 13th, 2014
  - One project is in LGIA negations
  - One project is in Facilities Study Process
- Six Definitive Cluster closed August 10th, 2015
  - three requests of 158 MW are in study mode.
- Seventh Definitive Cluster closed May 6th, 2016
  - One request of 400 MW are in study mode.

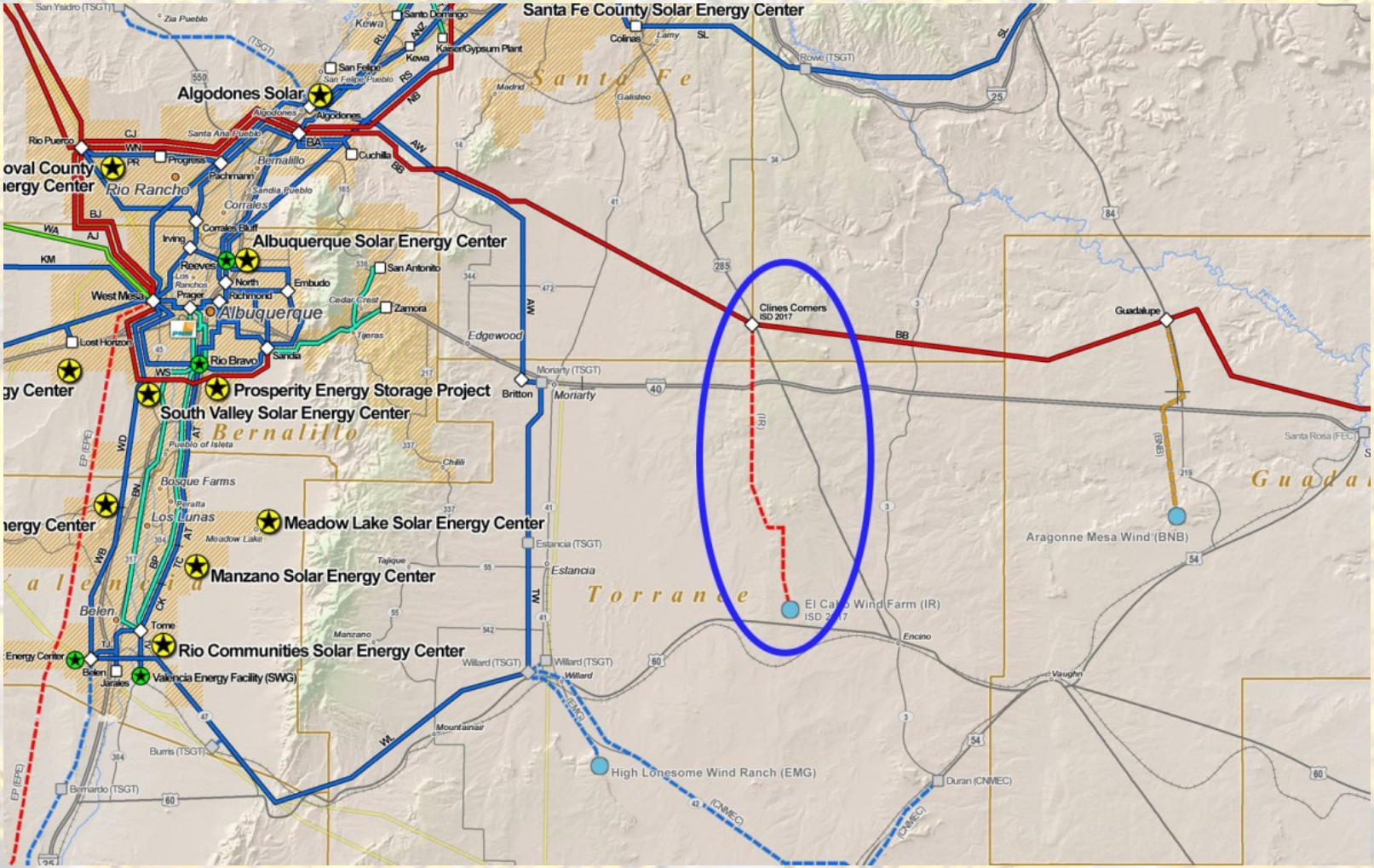
Next Cluster Window

- Definitive Interconnection Cluster Window opens November 3rd, 2016 and closes January 31st, 2017
- Preliminary Interconnection Cluster Window opened March 5thth, 2017 and closes June 6, 2017

Interconnection and Transmission Service Related Projects

- Generator Interconnection
  - El Cabo Wind Farm interconnection at Clines Corners.
- Wire-Wire Interconnections
  - Cabezon Switching Station
  - Blackwater Expansion for Western Interconnect Tie
- Transmission Service Projects
  - Guadalupe SVC

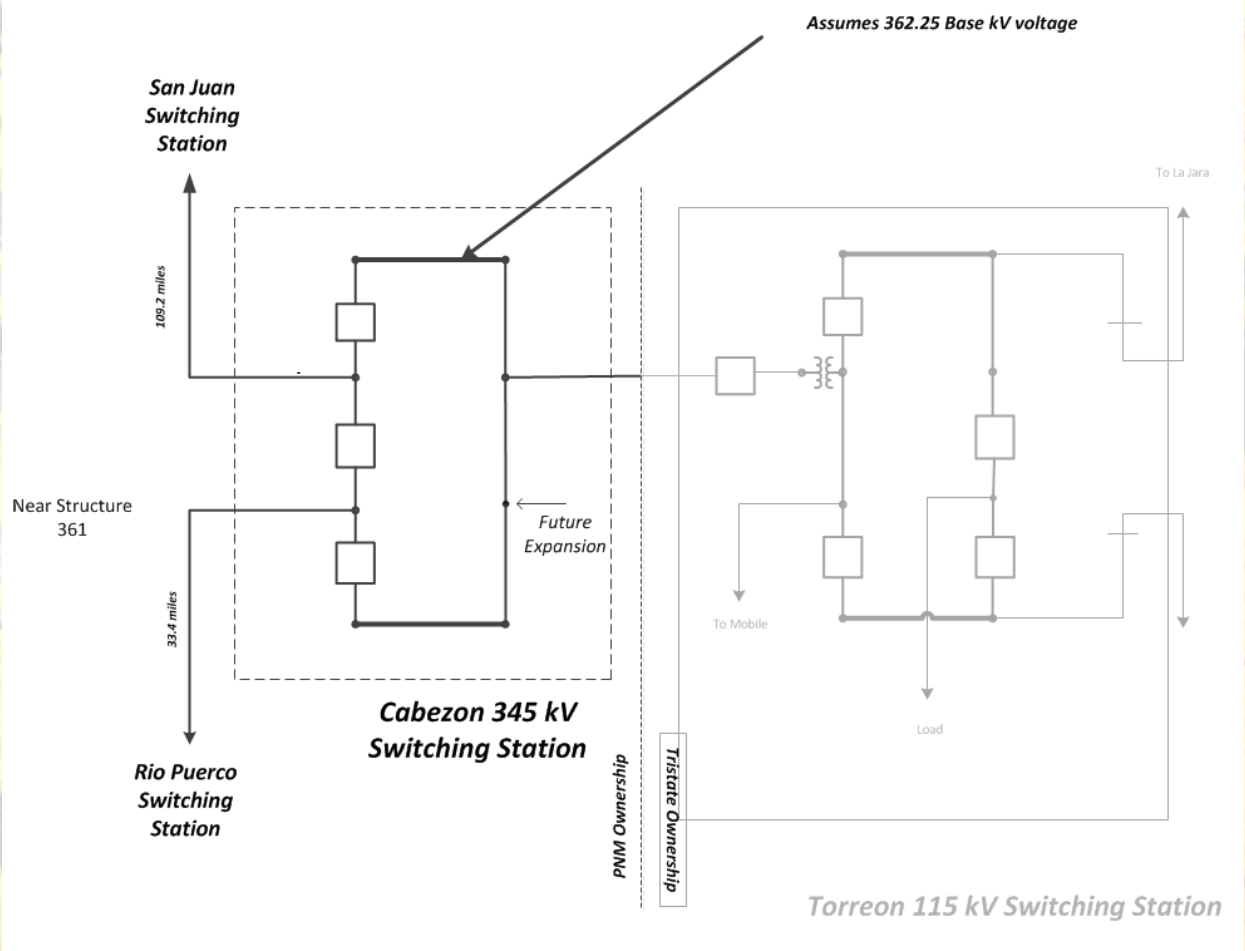
El Cabo Wind Farm



Cabezon Switching Station

- 33 miles north of Rio Puerco on the San Juan – Rio Puerco 345 kV transmission line.
- A 3 breaker ring that provides a new delivery point Tristate G &T under the Network Transmission Service Agreement.
- Tristate will provide a 345 to 115 kV transformer which ties into the Algodones – La Jara 115 kV line segment.
- In-service fourth quarter of 2017

Wires to Wires Interconnections



Blackwater 345 kV Switchyard Expansion

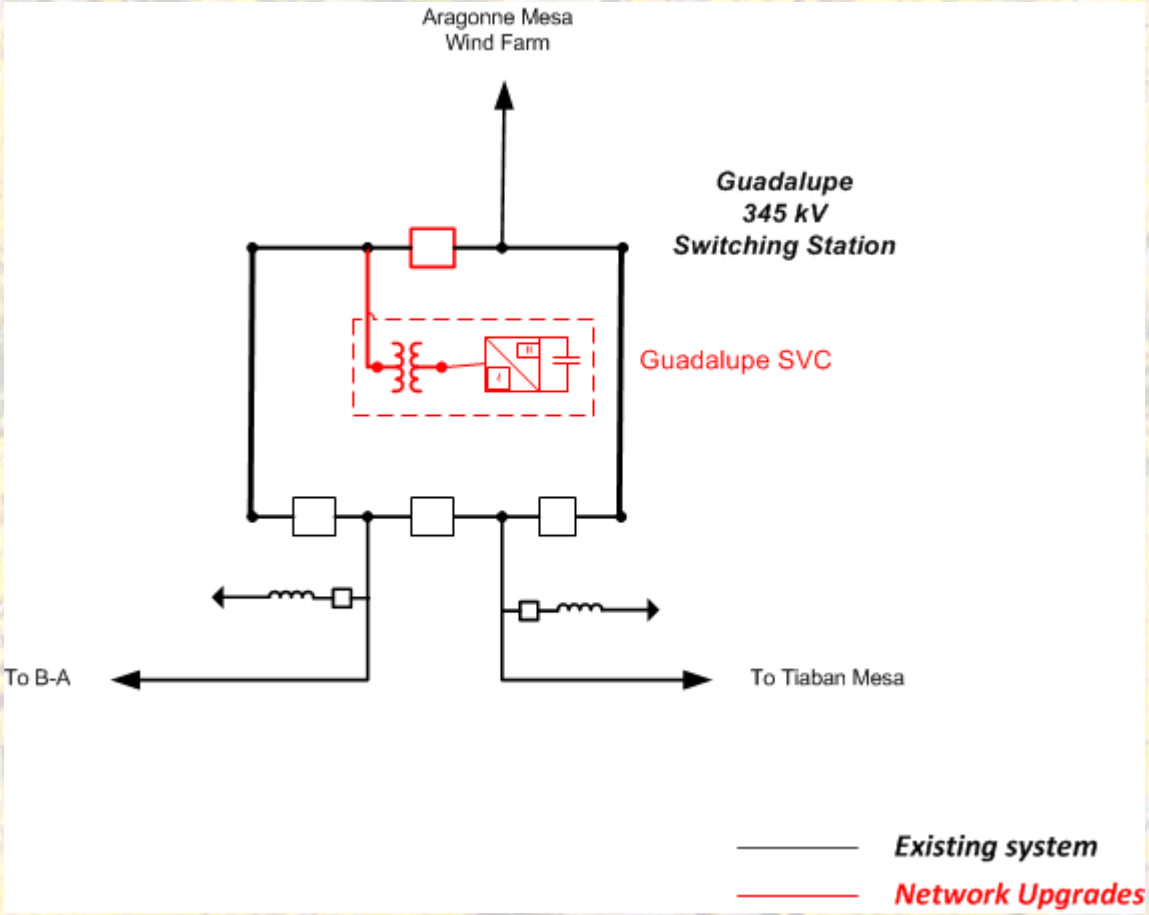
- Expand to a 3 breaker ring bus configuration to accommodate an interconnection to Western Interconnect line.
- Western Interconnect line will interconnect Broadview and planned Grady wind generation facilities.
- In-service date December 2016 (Broadview)

Blackwater 345 kV Switchyard Expansion

Guadalupe SVC

- Size: -100 to +250 MVAR
- Voltage support for transmission service provided to Pattern and Avangrid.
- Guadalupe Switching Station expanded to four terminations to accommodate SVC.
- 2018 in-service date.

Guadalupe SVC



REGIONAL ACTIVITIES

- SunZia
  - Permitting activities Ongoing
  - Commercial operation date in 2021
  - Completed selection of its anchor customer in August 2016
- Tres Amigas
  - Tres Amigas LLC and Pattern Energy Group LP formed Western Interconnect LLC to develop, finance, construct, own and operate line that will interconnect Broadview and Grady.
  - Interconnection at Blackwater December 2016
- Lucky Corridor
  - Project modified to single 345 kV line from Gladstone area to Ojo switching station
  - Completed WECC Project Coordination Review Group report
- Mora Line Project
  - Lucky Corridor's Mora Line project is designed to carry 180 MW at 115 kV.
  - 102 miles
  - Working on interconnection studies with PNM and Tri-State

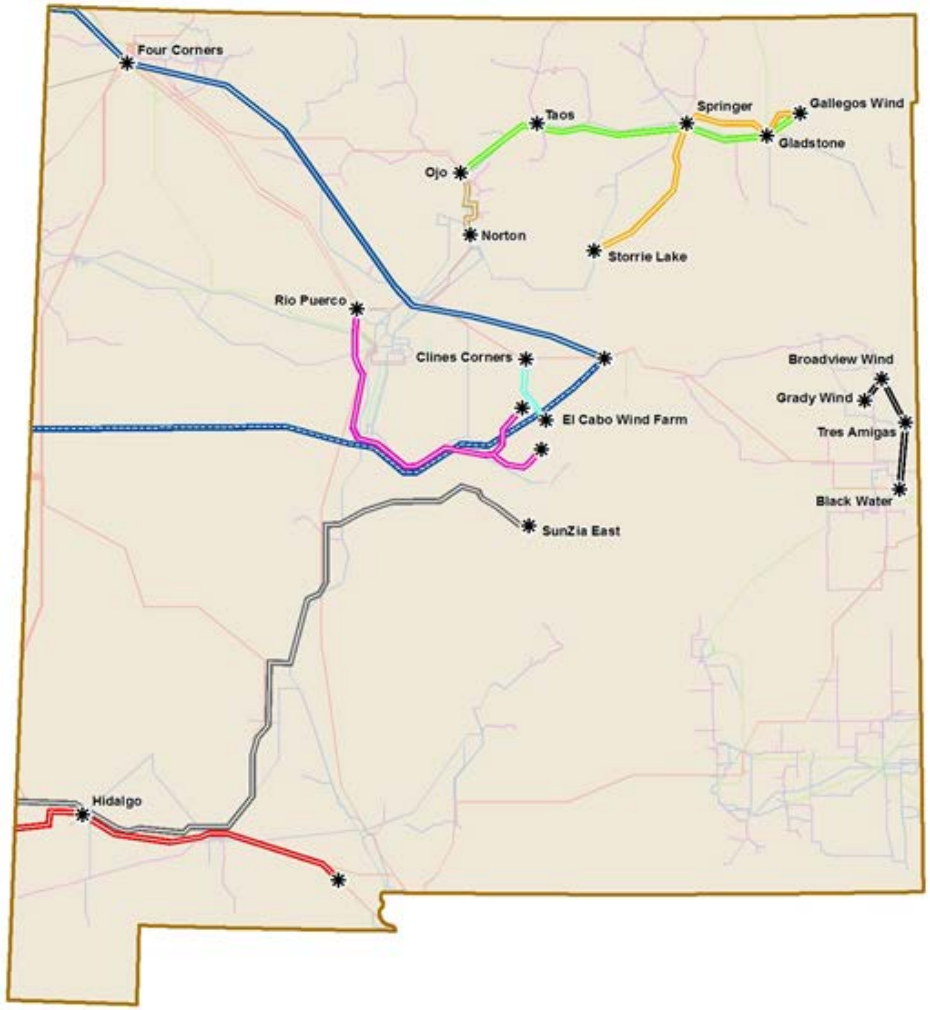
REGIONAL ACTIVITIES

- Southline Project
  - WECC Rating Process Completed March 23, 2015
  - Final EIS Issued
  - Construction expected to begin in 2017
  - In Service Date: In phase between 2018 and 2020
- Centennial West Clean Line Project
  - Development agreement with Western Area Power Administration
  - See project website for latest developments.
- Western Spirit Clean Line Project
  - Approximately 1500 MW 345 kV Project to increase access from Central New Mexico to the Four Corners hub.
  - Currently performing System Impact Study for interconnection to PNM's system at the Rio Puerco Switching Station.

REGIONAL ACTIVITIES

- Verde Project
  - Interconnects to PNM's Ojo and Norton 345 kV stations
  - PNM is currently performing a System Impact Study
  - 2016-2017 Permitting, Public Engagement, ROW, Engineering
  - 2018-2019 Construction, In Service Date 2020

Map of Regional Transmission Projects

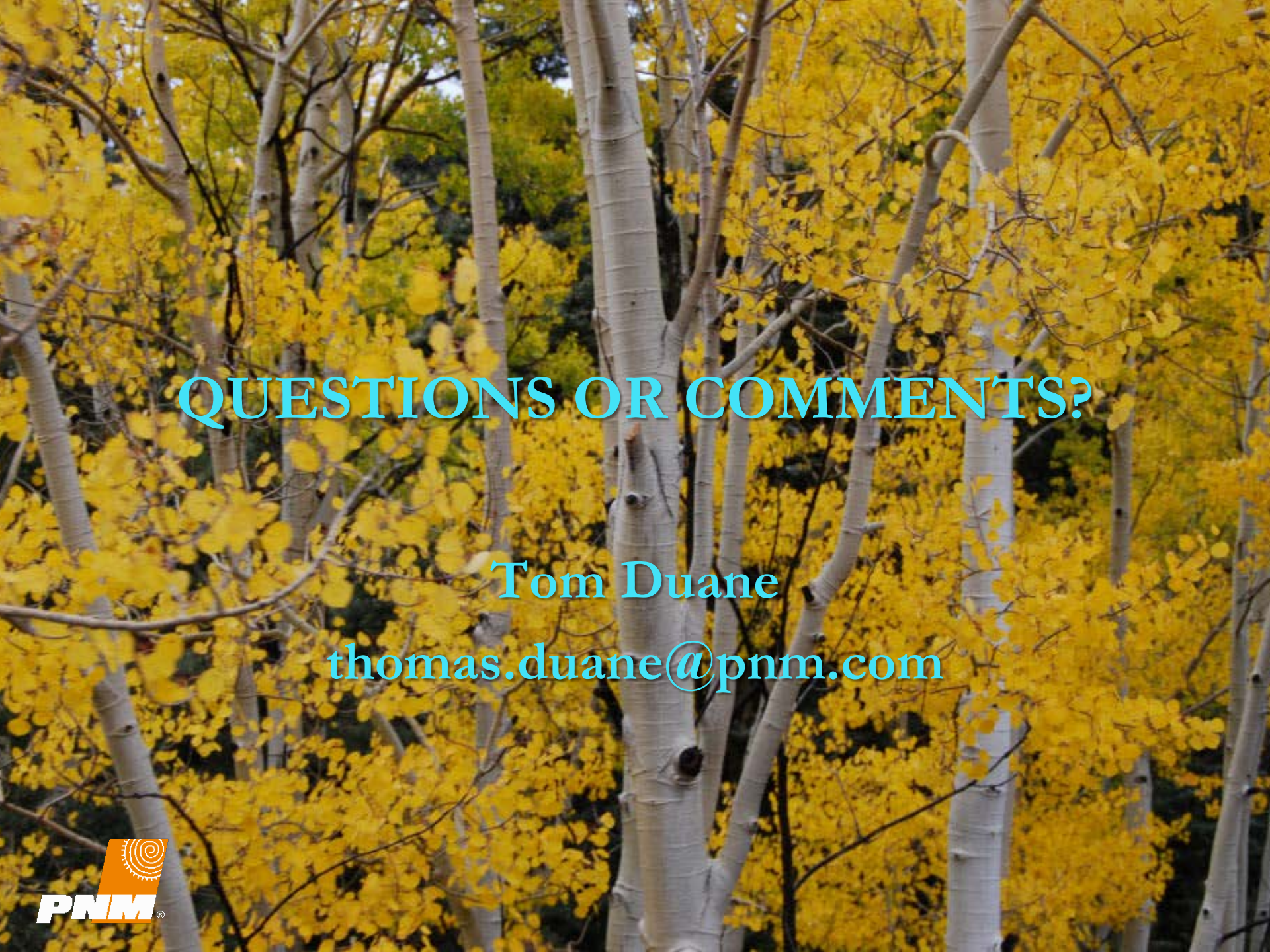


ORDER 1000 UPDATE

- Adds planning process for identifying regional projects that are more cost effective and efficient than projects in local plans.
- Establishes cost allocation methodology for regional projects.
- Full Biennial Cycle 2016-2017
- Current Activities:
  - Approved 2016-2017 Base models for Regional Analysis – October 2016
  - Scenario Cases still under development
  - Planning Subcommittee and Cost Allocation Subcommittee meeting bi-weekly
  - Planning Management Subcommittee meeting monthly.

NEXT MEETING

March 9, 2017


QUESTIONS OR COMMENTS?
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