Southwestern Public Service Company

10 Year Transmission Plan

December 18, 2012

This report contains transmission planning data which is conceptual in nature and is subject to change. The transmission projects listed may change scope, in-service dates, or may not be constructed.

Executive Summary

This report documents the Southwestern Public Service Company (SPS) transmission plans for a 10 year planning horizon.

10 Year Plan Summary

The development efforts for this plan are a combination of internal SPS transmission planning efforts and Southwest Power Pool (SPP) Integrated Transmission Plan (ITP) activities. ITP looks at a Near Term (years 1-6) reliability study and a 10 year economic and reliability study (ITP10). The studies are conducted to determine the necessary improvements to meet NERC reliability standards TPL-001 and TPL-002. This year's Integrated Transmission Plan (ITP) effort identified economic projects that would be needed by 2023. The ITP process integrated the results of the reliability study effort and the economic study effort to produce projects that satisfied both study objectives. Environmental Protection Agency's (EPA) Cross State Air Pollution Rule (CSAPR) was not analyzed in detail nor simulated in the dispatch of the SPS or SPP systems.

Independent transmission projects are discussed in the report. No discussion has been provided of perceived transmission – market interactions.

Introduction

This transmission plan is a summary of the transmission capital construction needs for the Southwestern Public Service (SPS) transmission system over a 10 year period starting with 2012 and going through 2023. It is based on the study work done by Southwest Power Pool (SPP) through their Integrated Transmission Planning (ITP) process, the SPS Transmission Planning group, and the results of processing new load and delivery point interconnections, transmission service requests, and generation interconnection requests.

The certainty of needed projects decreases in the later years due to the uncertainty of new load projects, new generation requests, and new resource additions.

I. Methodology & Assumptions

A. Scope & Purpose

The purpose of this study is to document the transmission additions needed on the SPS transmission system 10 years into the future. The study is based on the most recent set of power flow models and includes all firm loads, firm transactions, but no non-firm or economy energy transactions in the planning studies.

B. Transmission Grid Description

SPS's service territory is primarily agricultural, containing large areas of oil and gas production. SPS serves electric consumers in most of the towns within the service territory. Many areas outside those towns are served by rural electric cooperatives.

Oil and natural gas production is a major industrial activity within SPS's service region. The agricultural areas are mostly irrigated by pumping water from natural underground sources. Crops include cotton, corn, grain sorghum, soybeans, and peanuts. There is also a large investment in cattle feeding, and more recently, dairy operations, in the service territory.

SPS has an installed net generation capability of 4,365 megawatts (MW), with 48 percent of this capacity in coal-fired plants and 52 percent in plants utilizing other fuels (primarily natural gas). SPS purchases 221 MW of firm power and energy from Borger Energy Associates, L.L.P. (BEA-Blackhawk), a qualifying facility (QF) whose purchased power contract was certified in NMPRC Case No. 2770. Other firm QF purchases by SPS are Orion Engineered Carbons (15 MW) and Sid Richardson (9 MW). SPS has long term purchase agreement for energy from 443 MW of wind generation facilities connected to SPS's New Mexico and Texas system and another 238 MW of QF wind purchases.

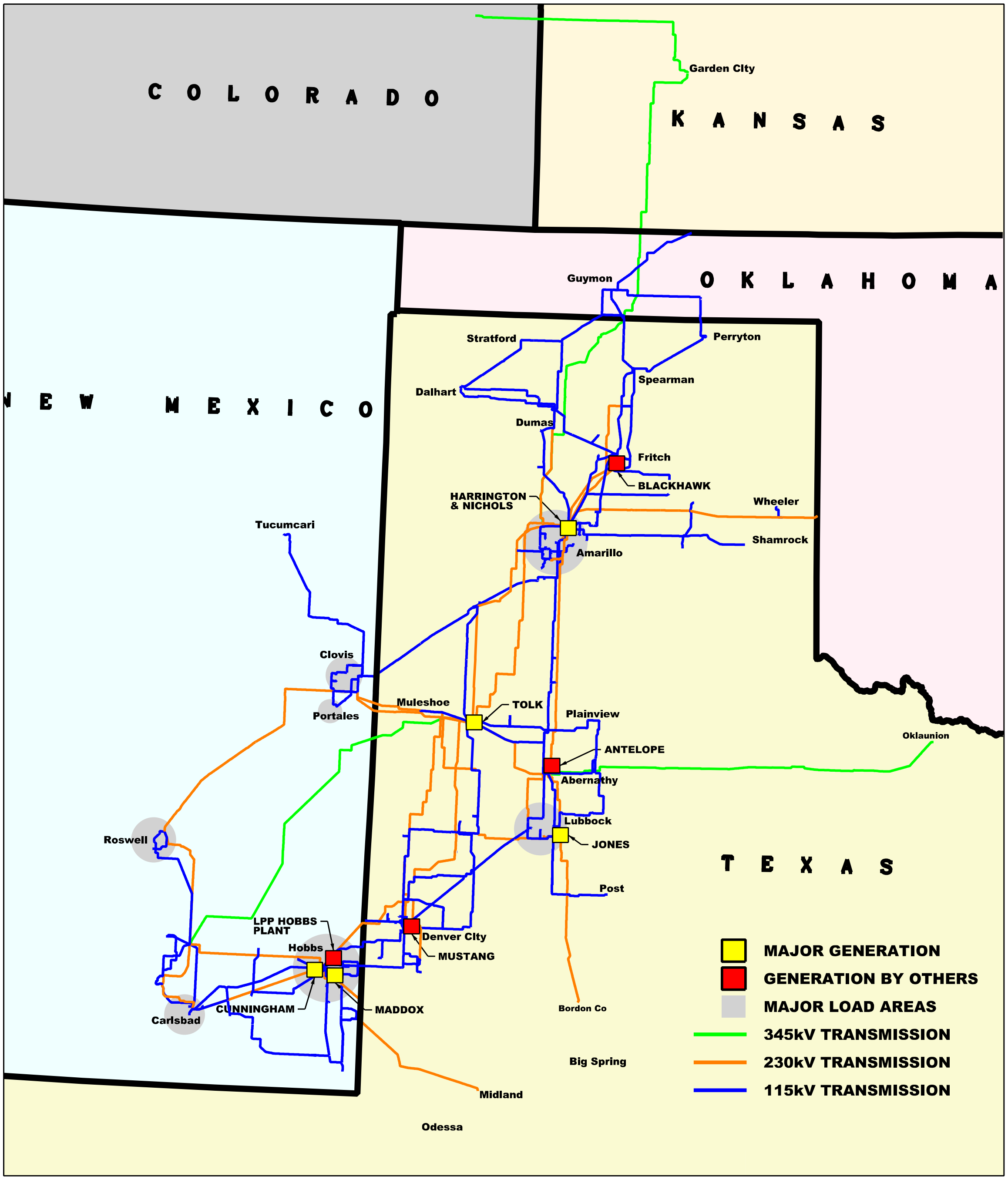


Figure 1 – SPS Service Territory

Figure 1 is a map of SPS's service territory showing the locations of SPS's generating facilities and its major transmission lines. SPS's transmission system contains 345 kV, 230 kV, 115 kV, and 69 kV transmission lines. The interconnections from SPS to eastern utilities are primarily at 345 kV and 230 kV, but there are also some 115 kV interconnections. Retail and wholesale load is served at all voltages except 345 kV. Generation is located on the SPS system in five main complexes – the Nichols/Harrington Plants near Amarillo, Texas; the Cunningham/Maddox/Hobbs

Generating Station complex, near Hobbs, New Mexico; the Jones Plant and LP&L generation facilities in Lubbock, Texas; the Tolk Plant/Plant X complex near Earth, Texas; and the Golden Spread Mustang Plant facility near Denver City, Texas. There are smaller plant locations such as Moore County Plant, near Dumas, Texas and Blackhawk Plant, near Borger, Texas.

SPS is interconnected with the Western Electricity Coordinating Council (WECC) and the SPP. SPS's location and tie lines are shown in the attached Figure 2. SPS's has three interconnections with utilities in the WECC. The first interconnection is the 200 MW HVDC tie with Public Service Company of New Mexico (PNM) and El Paso Electric Company (EPE) near Artesia, New Mexico (Eddy County HVDC Converter) and that converter is owned by EPE and PNM. SPS operates Eddy County HVDC for EPE and PNM and the facility is shown by Line H on Figure 2. The second interconnection with WECC is the 200 MW (nominal rating) Blackwater HVDC Tie, which is owned and operated by PNM near Clovis, New Mexico. It is shown by Line E in Figure 2. The third interconnection with WECC is the Lamar HVDC (210 MW nominal rating) that is owned and operated by PSCo. The Lamar facility is shown by Line A in Figure 2 (Finney – Lamar HVDC).

Additionally, SPS has three primary interconnection facilities with the SPP, a 230 kV transmission line and two 345 kV transmission lines. The first interconnection is a 230 kV transmission line that interconnects SPS's Wheeler Substation to Public Service Company of Oklahoma's (PSO) Sweetwater Substation, (shown as Line D on Figure 2). The second interconnection with PSO is a 345 kV transmission line from SPS's TUCO Interchange to PSO's Oklaunion Interchange near Oklaunion, Texas (shown as Line I on Figure 2). The third interconnection is a 345 kV transmission line that interconnects Potter County Interchange near Amarillo, Texas, to the Finney Interchange to Holcomb Station near Garden City, Kansas. Sunflower Electric Power Corporation (Sunflower) owns Holcomb Station. This line is shown as Line B on Figure 2.

SPS's interconnection with West Texas Utilities (WTU), an American Electric Power operating company (shown as Line G on Figure 2). There is a 115 transmission kV line from the Nichols Station to WTU's 115 kV interchange at Shamrock, Texas. At this interchange, there is a voltage transformation from 115 kV to 69 kV and from 69 kV to 138 kV. This is necessary because SPS's system is designed for 115 kV, but WTU's system is designed for 138 kV, as is most of western and southern Oklahoma. Additionally, SPS has another 115 kV interconnect with WTU (shown as Line F on Figure 2). At Jericho, WTU has a 115/69 kV transformer and 69 kV transmission line to connect to their 69 kV transmission system in the Clarendon, Texas area.

SPS also has a 115 kV interconnection with Sunflower from SPS's Texas County Interchange near Guymon, Oklahoma, to Sunflower's Liberal Interchange at Liberal, Kansas. This interconnection has a phase shifter located at SPS's Texas County Interchange, which prevents loop flow problems in western Kansas (shown as Line C on Figure 2, below).

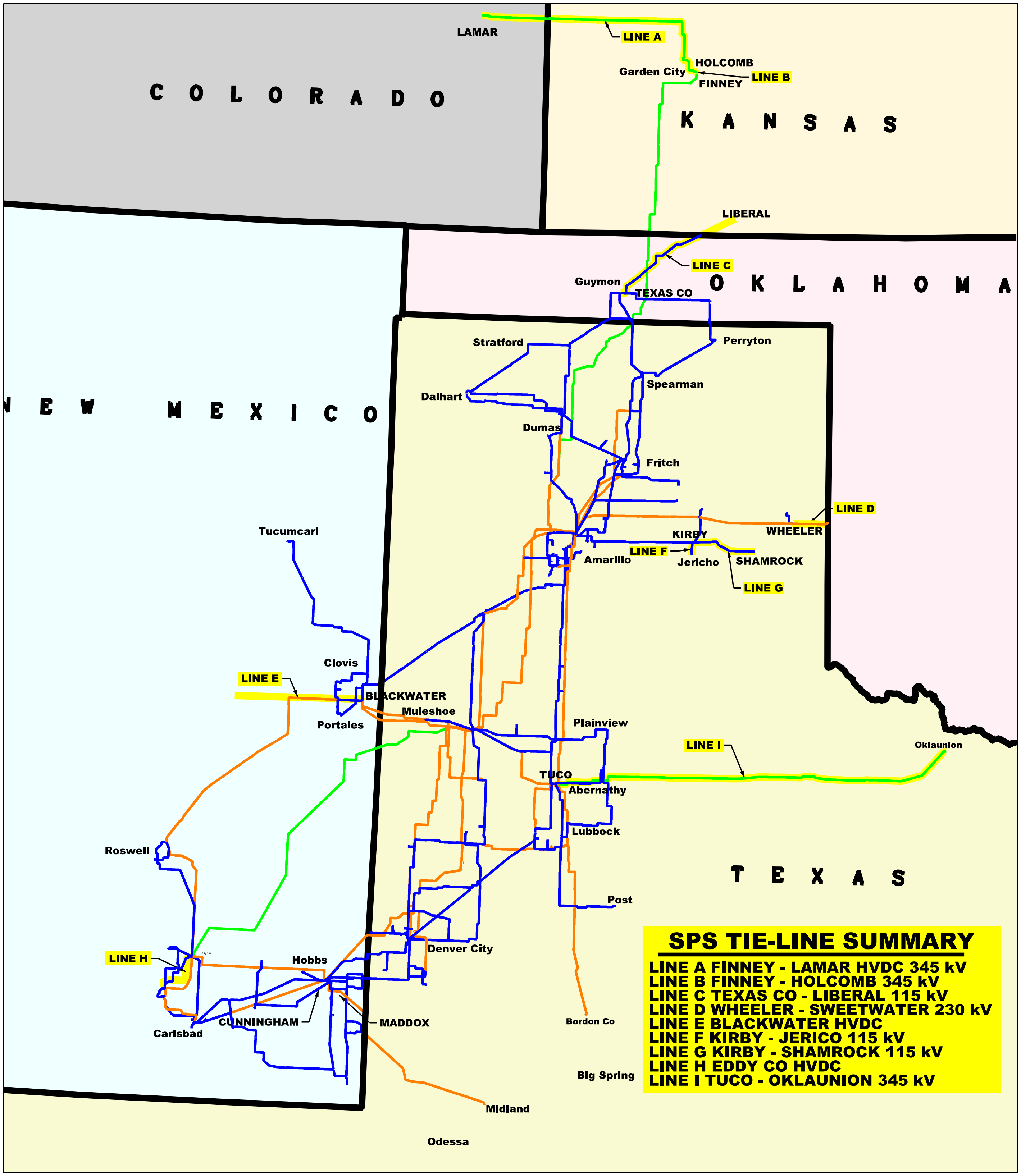


Figure 2 – SPS Transmission Interconnections

C. Planning Process

1. FERC 890 – Sub regional/others

The SPP Regional Transmission Organization (RTO) has functional control over the high voltage (60kV and above) transmission systems of SPS under Attachment AI of the SPP Open Access Transmission Tariff (OATT). As an RTO, SPP performs coordinated and transparent regional planning for all transmission facilities in the multistate SPP footprint through the annual SPP ITP process. Attachment O of the SPP OATT describes the ITP process. It is through this process that most transmission planning for the SPS system complies with FERC's Order No. 890 planning principles. SPP also functions as the Regional Entity (RE) for the SPP region and is responsible for reliability oversight (including transmission planning and reliability standards compliance) for the SPP region pursuant to a Delegation Agreement between SPP and the North American Electric Reliability Corporation (NERC). SPS is also a member of the SPP Reserve Sharing group.

In addition to the ITP regional planning process, SPS also conducts local planning to identify transmission improvements. These necessary improvements are to ensure the adequacy and reliability of the SPS system for the benefit of interconnected entities and transmission customers that utilize SPS system transmission facilities to receive transmission service. This local planning process is described in this Attachment R – SPS to the Joint OATT. Attachment R – SPS should be reviewed in coordination with Attachment O to the SPP OATT, since the SPS local planning process is coordinated with and supplements the SPP regional planning process.

The SPS transmission planning region is limited to the boundary of SPS's electrical system.

SPS's internal transmission planning process is responsive to direct transmission requests by wholesale NITS customers and native loads for new load interconnections.

SPS meets the nine principles in the following manner:

- Coordination – periodic meetings, study coordination, new project submission to SPP through their modeling efforts.
- Openness – works through SPP ITP process, but also coordinates directly when working on 115 and 69 kV systems, studies are posted on SPS OASIS, open coordination and planning meetings.
- Transparency – posted planning criteria (including study methodology), posted guidelines for interconnections.
- Information exchange – SPS uses NITS load forecasts from customer, if provided, for input to SPP modeling.
- Comparability – SPP currently does studies of long term firm transmission service requests under their Aggregate Transmission Service Study methodology. All new load and delivery point requests are studied by both SPP and SPS under Attachment AQ of the SPP OATT. SPP clusters studies together

for new retail and wholesale load requests when it will be beneficial and more efficient. SPS typically considers impacts on neighboring systems. SPS is implementing a load and delivery point request queue to provide additional comparability.

- Dispute resolution – any issues for customers of SPP OATT are resolved under the procedures of that OATT and any issues for customers of the XE Joint OATT are resolved under the procedures of that OATT.
- Regional participation – SPS provides the modeling data for itself and its customers, if provided, to SPP for their modeling processes. SPS is active in SPP reviews, working groups, committees
- Economic planning studies – SPP has a regional economic planning process and SPS participates in that process. Any customer requesting economic studies may do so under SPP's processes.
- Cost allocation – SPP OATT addresses cost allocation (Attachment J) and SPS subscribes to this approach. SPS has its own policy for cost allocation related to new load interconnections.

SPS is located in Sub-region 1 of the SPP. Sub-region 1 includes SPS, Sunflower Electric Power Corp., and MidWest Electric. SPP doesn't have their own sub-regional planning meetings but participates in SPS's local planning meeting. SPP has revised their planning process to gather input from sub-regional participants at the Planning Summits rather than host separate SPP sub-regional meetings.

2. SPP Integrated Transmission Plan (ITP)

The (ITP) process integrates three existing processes that individually emphasized long-term, short-term, reliability, and economic aspects of transmission planning into a single coordinated process. The ITP process features distinct, but linked, stages:

- A 20 year-out study cycle
- A 10 year-out study cycle
- A near term (generally 6 to 7 years out) study

The 20 year-out and 10 year-out studies are single year studies performed over alternating 18 month periods, while the near term study is a multi-year study performed annually. The results of the 20 year-out study are considered when performing the 10 year-out and near term studies. Similarly, the results of the 10 year-out study are considered when performing the near-term studies. Figure 3 illustrates the ITP planning cycle.

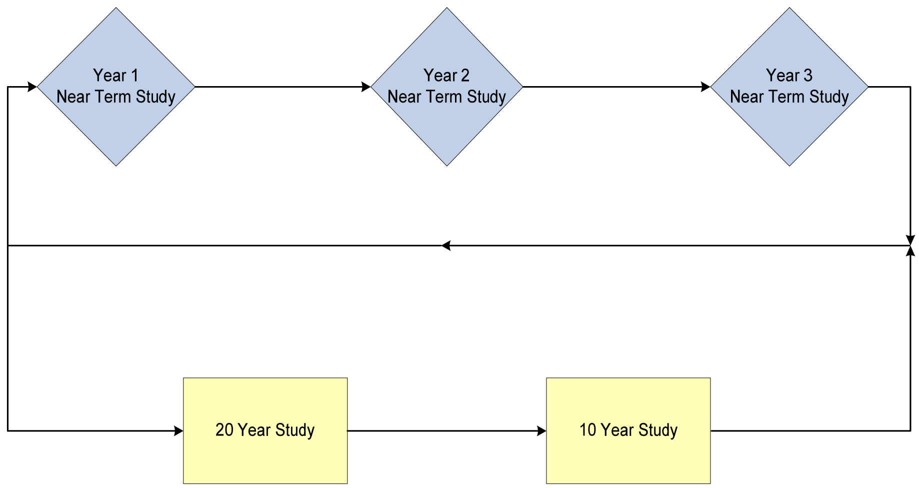


Figure 3 – Illustrates the ITP study cycle

The 20 year-out and 10 year-out studies are primarily economic studies with limited reliability screening performed. The near-term studies are reliability-based studies. In 2010, the ITP20 study was performed over a 12 month period. In 2011, the ITP10 study was conducted over a 12 month period. Beginning in 2012 the ITP20 and ITP10 studies will be performed over an 18 month period as illustrated in Figure 3.

The SPP specifically creates the power flow models from the data submitted by its members and customers. SPP then considers all sold firm transmission service and then models the region for the next 6-7 years. Power flow contingency studies are done and some stability studies to evaluate the regions performance over the planning horizon. Should improvements be necessary, the SPP will provide Notices to Construct (NTC) for facilities to meet the planning criteria.

Model development for the ITP10 or 10 year analysis is done by using the model development process for the load and topology information. Generation is added to the study year model as necessary by the Economic Studies Working Group (ESWG) to balance load and generation, maintain the SPP reserve margin, and to account for study assumptions or public policy such as renewable energy mandates. Unit dispatch is determined by economic analysis using PROMOD software. Because the future is unknown, the ESWG develops multiple futures as necessary in order to plan the system to meet the needs of multiple future outcomes. The ESWG develops futures from guidance provided by the SPP Strategic Planning Committee.

The same process is followed for studies of ITP20 or the 20 year-out analysis.

SPS submits most, if not all, of its future transmission projects through this process for validation by SPP.

The results of the SPP ITP plans are incorporated in to the SPS Transmission Plan along with any new load serving or reliability projects developed by SPS.

Links to the SPP ITP Planning documents are:
http://www.spp.org/section.asp?pageID=128

3. SPP Balanced Portfolio

The Balanced Portfolio projects were developed by SPP to provide a group of economic upgrades that would benefit the entire SPP region and allocating the costs for those projects over that full region. Savings are realized when transmission upgrades reduce congestion on the SPP transmission system and produce lower production cost for operation of member systems.

Projects were analyzed by SPP and many were proposed to increase flow gate ratings, increase import or export capability, reduce congestion, or provide a benefit which leads to greater economy of operation.

Through this effort, SPP is expecting lower overall fuel and customer costs by the implementation of this group of projects. The value of the entire portfolio is $692 million and was approved by the SPP Board of Directors in April 2009. Notifications to Construct were issued in June 2009.

SPS received a Notification to Construct for the Tuco - Woodward 345 kV transmission line. This project will be jointly constructed with Oklahoma Gas and Electric (OGE). SPS will construct and own the transmission line from Tuco to approximately 3 miles inside the Ok/TX state line and OGE will construct and own the transmission line from Woodward to this location. Expected in-service date of this project is spring 2014.

The results of the Balanced Portfolio exercise are shown below in Figure 4.

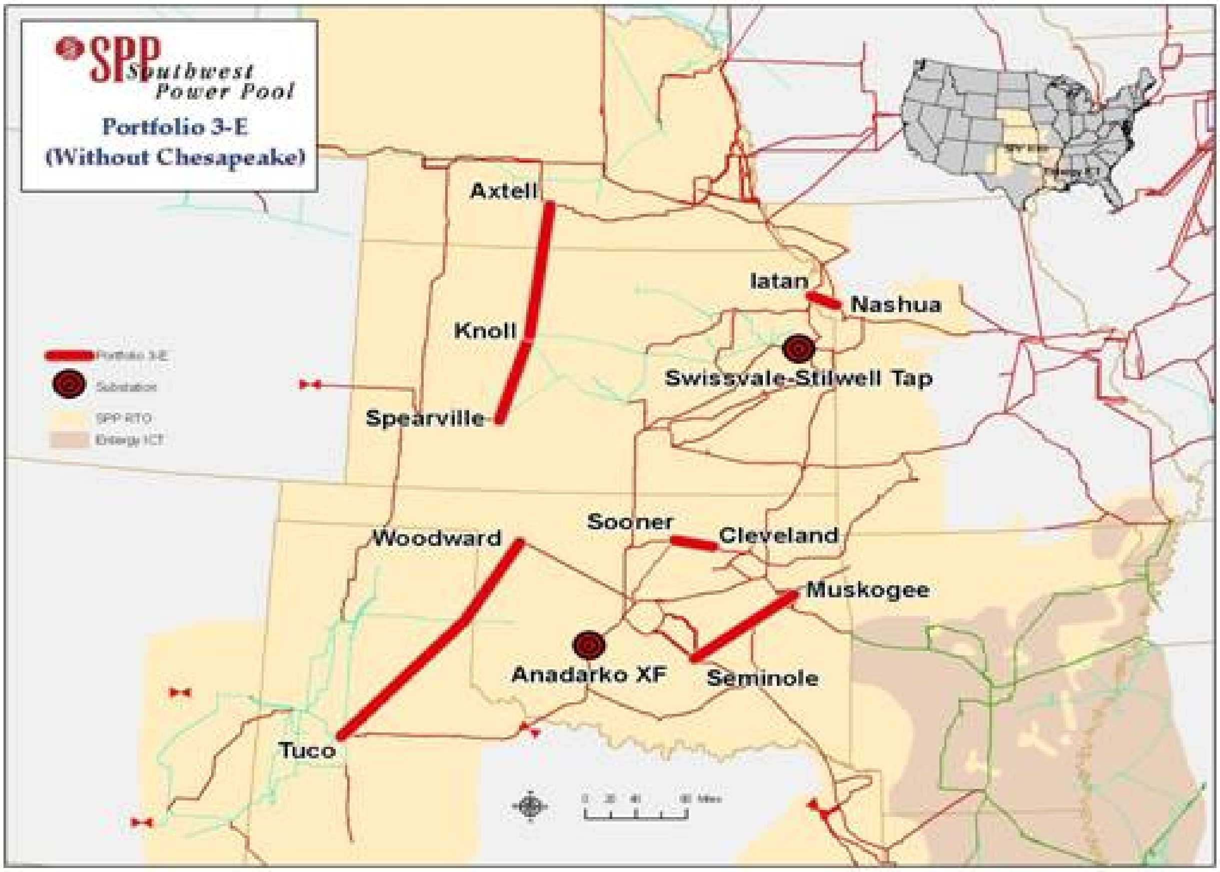


Figure 4 – SPP Balanced Portfolio Projects

4. Priority Projects

SPP approved a group of 345 kV expansion projects, called the Priority Projects. A diagram is shown below in Figure 5. These projects were based on recurrent needs, either transmission service or generation interconnection, for projects to grant service. From that rough list, detailed economic analysis was done to develop the best projects which produce benefits for the whole SPP region.

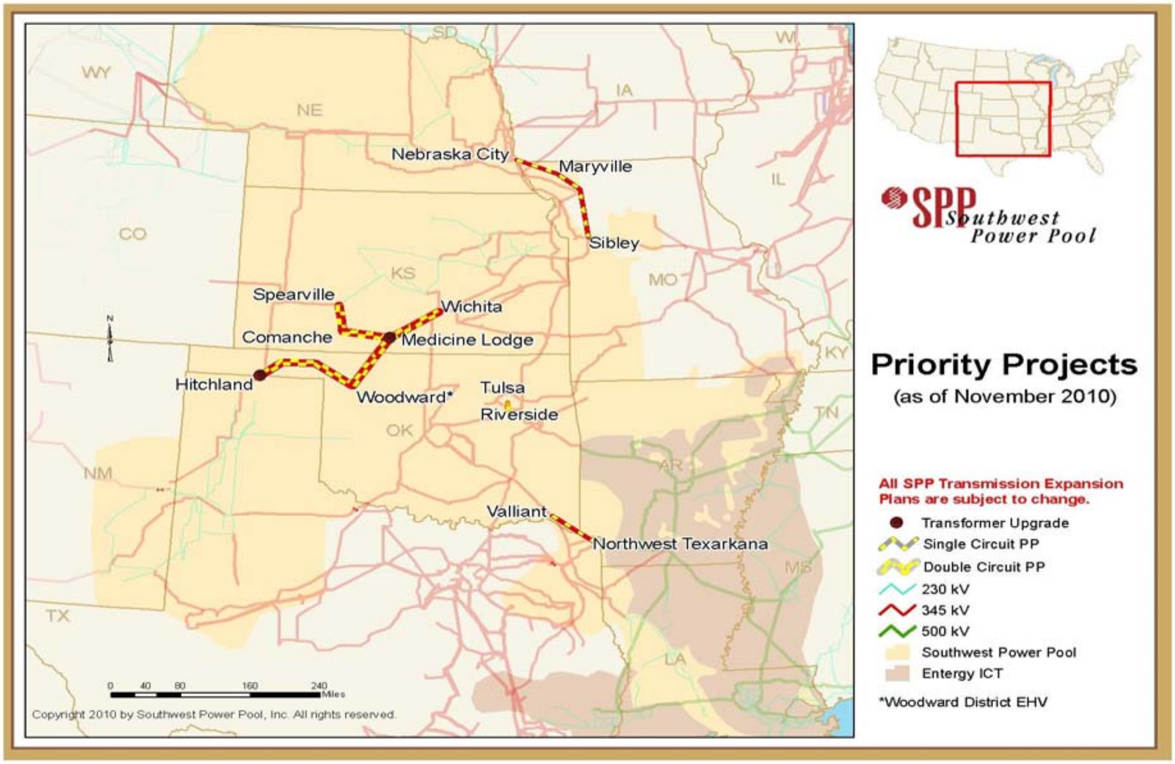
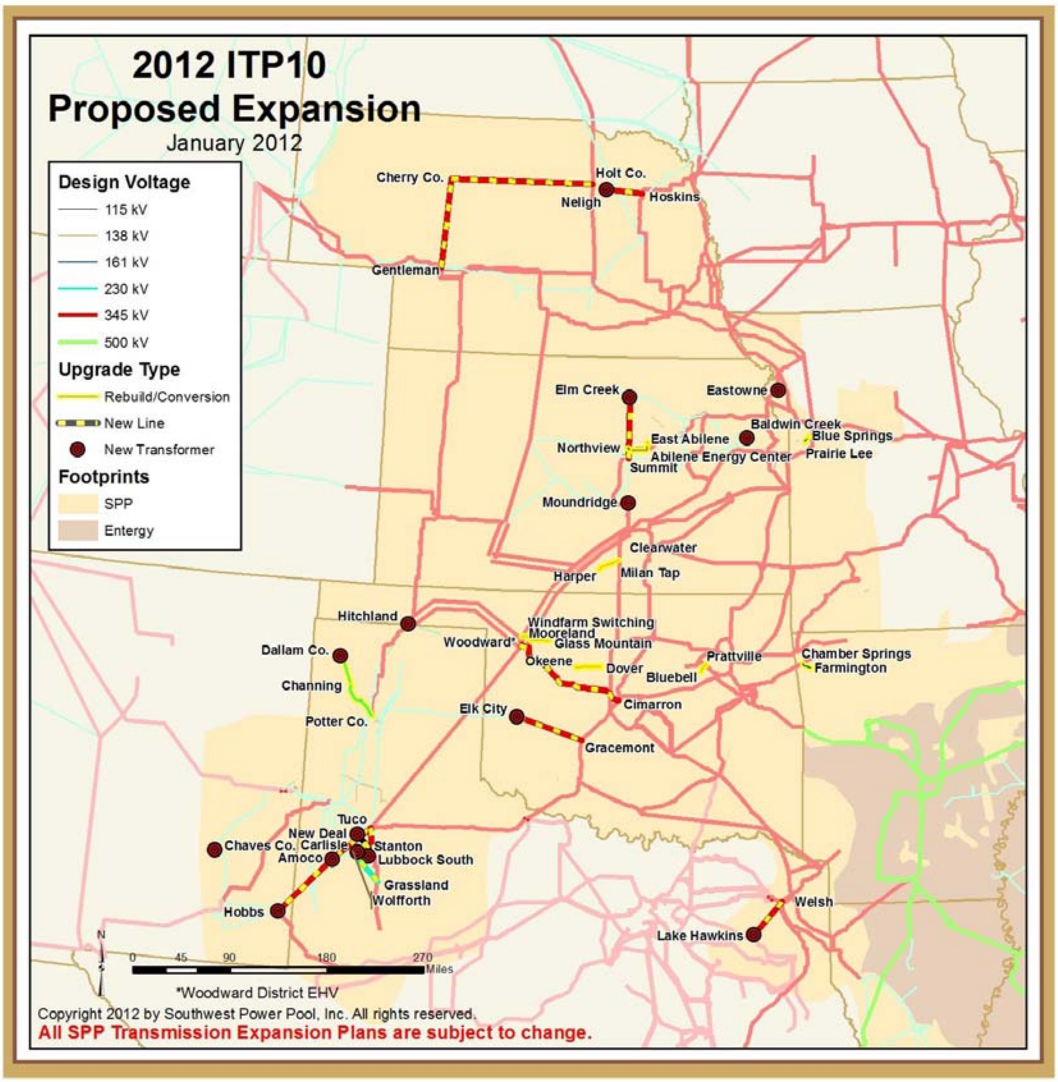


Figure 5 – SPP Priority Projects

SPS will be constructing approximately 30 miles of the Hitchland – Woodward 345 kV double circuit line. It is planned that the line will have bundled 1590 MCM ACSR conductors. The estimated costs for the Priority Projects are ~ $1.1 billion and the cost recovery will be spread across the SPP footprint.

5. **SPP 2012 ITP10 Projects**

SPP listed a 345 kV transmission project from Tuco – Amoco – Hobbs with 345/230 kV transformers at Amoco and Hobbs. This project was identified for Authority to Plan (ATP) status. SPP will issue a NTC for this project with language initiating a refined cost estimate analysis, but not directing the start of construction. SPP has sent the NTC to SPS for this project as shown below:



D. Drivers Impacting Transmission Planning

1. Regulatory / Environmental Considerations

SPS is regulated by the FERC for wholesale customers and by two state regulatory agencies: the Public Utility Commission of Texas (PUCT) and the New Mexico Public Regulation Commission (NMPRC). These bodies are responsible for approving SPS's rate requests and also approving SPS's permits for new transmission line construction and siting of those new transmission lines. Siting approval is done at a state level in both Texas and New Mexico. In Oklahoma, SPS has no retail loads. Oklahoma has their transmission and siting approval only at county levels and no processes at the state levels.

SPS service territory is mostly privately owned land in Texas, and considerable public land in New Mexico. Much of New Mexico land is owned by the State of New Mexico therefore permitting activities frequently require the approvals of the federal Bureau of Land Management, federal Bureau of Reclamation, and the State of New Mexico. Both states have permit issuing processes for cultural and historic resources in addition to requirements for mitigation of archeological sites that are found along rights of way.

2. SPP Generator Interconnection Queue

SPP performs generation interconnection studies for SPS and other members of the SPP region, under the requirements of the SPP OATT. Currently, the queue consists of:

- 3,215 MW wind energy
- 889 MW fossil fuel based energy
- 56 MW solar energy

These inter connection queue levels are greatly reduced as compares to prior years where wind generation interconnection request might total more than 10,000 MW.

Due to the large volume of requests, SPP adopted an approach that would allow the study of multiple interconnection requests within a region to be done in concert to determine interconnection facilities and system improvements necessary to maintain system reliability. If a requester is still sufficiently interested in pursuing the interconnection to the transmission, SPS would then conduct a facility study for that requester, which would state the construction scope and construction methods, addressing the details necessary to put the new facility into service.

One major issue from these requests is that most generation developers are not requesting firm transmission service. Some of these are being constructed and will impact the operation of the SPS transmission system on a non-firm basis. Once these are connected to the SPS transmission system, SPS Transmission Operations must frequently review outputs from these types of generators to see if their output must be curtailed to prevent operating security issues on the transmission system.

Another issue is the revised SPP OATT Tariff which allows generation interconnection studies in groups or clusters. In the past SPP has grouped 3,000 or 4,000 MW of generation together and determine the network upgrades required to connect them. This frequently requires extensive 345 kV transmission lines just for interconnection. If one developer drops out of the study, the network upgrades must be restudied and this provides confusion as to what final facilities must be built. SPS is continuing to work with SPP to resolve these issues and the results of those cluster studies are not shown in this report. Currently, the SPP tariff requires the generation developers and requesters to fund the construction of the network upgrades for interconnection.

3. Transmission Service Studies

The SPP Aggregate Transmission Service study is a process where customers that want transmission service can request a study three times per year. All requests are made through an open season process combined into one study effort, with system upgrade costs being determined in the study.

4. Load Interconnection Studies

The supervision and coordination of delivery point changes to SPS's system are managed under Attachment AQ of the SPP OATT. SPS will still have the responsibilities of executing study agreements and performing Load Connection Studies (LCS). Meanwhile, SPP will also perform their analysis initiated through the AQ process, and then SPS and SPP will coordinate study results. If there is a customer agreement reached on the load connection upgrades, SPS will notify SPP of this agreement and the delivery point changes will be migrated to the SPP planning models.

5. Texas / New Mexico State Renewable Mandates

New Mexico has implemented the Renewable Energy Act, NMSA 1978 Section 62-16-1, et seq. (NMREA) to bring significant economic development and environmental benefits to New Mexico. SPS will require approximately 435,000 MWH (10% of New Mexico retail sales) of annual renewable energy or renewable energy certificates (RECs) beginning in 2011 in order to comply with the regulation. The above requirement increases to 15% of NM retail sales beginning Jan 2015 and beginning January 2020 to 20% of NM retail sales. Certain technologies have been earmarked with the following minimums:

Wind	>= 20%
Solar	>= 20%
Other	>= 10% (biomass/geothermal)
Distributed Generation	>= 1.5% (increasing to 3% in 2015
Remainder	>= 48.5%

The remaining category can be filled with any of the above four identified energy technologies. SPS is developing plans to meet this requirement.

Texas has implemented a statewide renewable mandate and portfolio standard (RPS). The 2005 Texas Legislature increased the state's total renewable-energy mandate to 5,880 MW by 2015 and a target of 10,000 MW in 2025. Each provider is required to obtain new renewable energy capacity based on their market share of energy sales times the renewable capacity goal.

The RPS mandated that electricity providers (competitive retailers, municipal electric utilities, and electric cooperatives) collectively generate 2,000 MW of additional renewable energy by 2009. The Texas RPS has been so successful that its 10-year goal was met in just over six years. SPS has met its requirements under this mandate.

6. Stakeholder Groups and Their Concerns

a. Cooperatives

The cooperatives served by SPS include Golden Spread Electric Cooperative (GSEC), and their 11 member cooperatives. There are also the New Mexico cooperatives – Lea County Electric Cooperative, Central Valley Electric Cooperative, Farmers Electric, and Roosevelt County Electric Cooperative. Their concerns are primarily resource adequacy, transmission import limitations, and SPP RTO and NERC Compliance processes. GSEC is approximately a 1410 MW load, and the New Mexico cooperatives are approximately 483 MW load.

b. Municipalities

SPS serves the West Texas Municipal Power Authority (WTMPA) as a full requirements customer. This is an association of City of Lubbock, Floydada, Brownfield, and Tulia. Their approximate load is 808 MW, in the studies for this year. Their issues are long-term resource adequacy, transmission import capacity, and SPP RTO and NERC Compliance processes. The City of Lubbock has purchased all SPS distribution facilities that served Lubbock in 2010. This will raise the WTMPA load by approximately 183 MW in the 2012 series of studies for a total load of 808 MW.

c. Neighboring Utilities

On July 13, 2010 Sharyland Utilities, L.P. ("Sharyland Utilities") and Hunt Transmission Services, L.L.C. ("HTS") jointly announced that the acquisition of Cap Rock Energy Corporation ("Cap Rock Energy") and its subsidiary NewCorp Resources Electric Cooperative, Inc. ("NewCorp") was complete. Sharyland Utilities now serves as the new electric utility for all customers previously served by Cap Rock Energy on a 138 kV transmission system that overlays the ERCOT system in the Midland, Odessa, and Big Springs area. Their load is in excess of 150 MW, however through a settlement agreement, the Sharyland load will be limited to 150 MW or less with all remaining load transferred back to the ERCOT system. Sharyland has adopted the timetable of Jan. 1, 2014 as the date that it will have the entire Caprock load transferred to the ERCOT system. This was based on the settlement agreement in PUCT Docket No. 37990 and the studies that were done by ERCOT and Sharyland’s consultants.

d. Independent Power Producers

There are a number of independent power producers in the SPS area. They are:

- Blackhawk – Borger Energy Associates, L.L.P
- Hobbs Plant – Lea Power Partners, L.L.P.
- Sid Richardson
- Engineered Carbons
- Mustang Plant- Yoakum County Electric Cooperative
- John Deere Wind – numerous facilities
- San Juan Mesa (Padoma) – Mission Wind
- Caprock Wind – Babcock and Brown
- Wildorado – Cielo Wind Power
- White Deer – Shell Wind
- Majestic - NextEra Energy Resources, LLC.
- Noble - Noble Great Plains Windpark, LLC.
- Sunray – Valero
- Mesalands Community College – Tucumcari
- Aeolus – Vestas Wind Systems
- Llano Estacado – Shell Wind Energy
- High Plains Wind Power – John Deere Renewables

The issues each producer faces are different since the fossil fuel units and San Juan, Wildorado, Caprock Wind, and White Deer are designated network resources with firm transmission service. John Deere Wind, Aeolus, High Plains Wind Power and Sunray are Qualifying Facilities are receiving non-firm transmission service. SPS also purchases the output of the Qualifying Facilities.

The developers that are considering marketing their power into the SPP EIS market are very concerned about the transmission deliverability for their plants. SPS is also concerned about how many developers want to build plants to provide energy to this market as long as any transmission upgrades to provide firm service are absent.

e. Industrial Customers

The industrial customers are varied and diverse. SPS has key account representatives that work with these retail customers. For example, SPS has the following major industrial customers:

Apache Corporation		Intrepid
Covenant Health System		Mosaic
Enterprise Products Operating L.P.		Bell Helicopter-Textron
White Energy - Hereford		Pioneer Natural Resources
White Energy - Plainview		Cannon AFB
X-Fab Texas Inc.		Leprino Foods
XTO Energy		National Enrichment Facility
Chevron		Navajo Refining Company
ConocoPhillips		Asarco
Hess		Baptist St Anthony's Hospital
Oxy Permian		BWXT-Pantex
Valero Energy		Panda Energy - Hereford
Cargill Meat Solutions		Sid Richardson
Degussa		Swift and Company - Cactus TX
Northwest Texas Hospital		Tyson
CRMWA (Canadian River Municipal Water Authority)		Owens Corning

Figure 6 Industrial Customers

These customers are concerned about transmission system development being made, but only the necessary development to provide the required service. They have not been supportive of speculative transmission facilities for future uses that are poorly defined today.

7. Load Forecast

The historic actual and current forecast for the SPS BA, or control area, is plotted below.

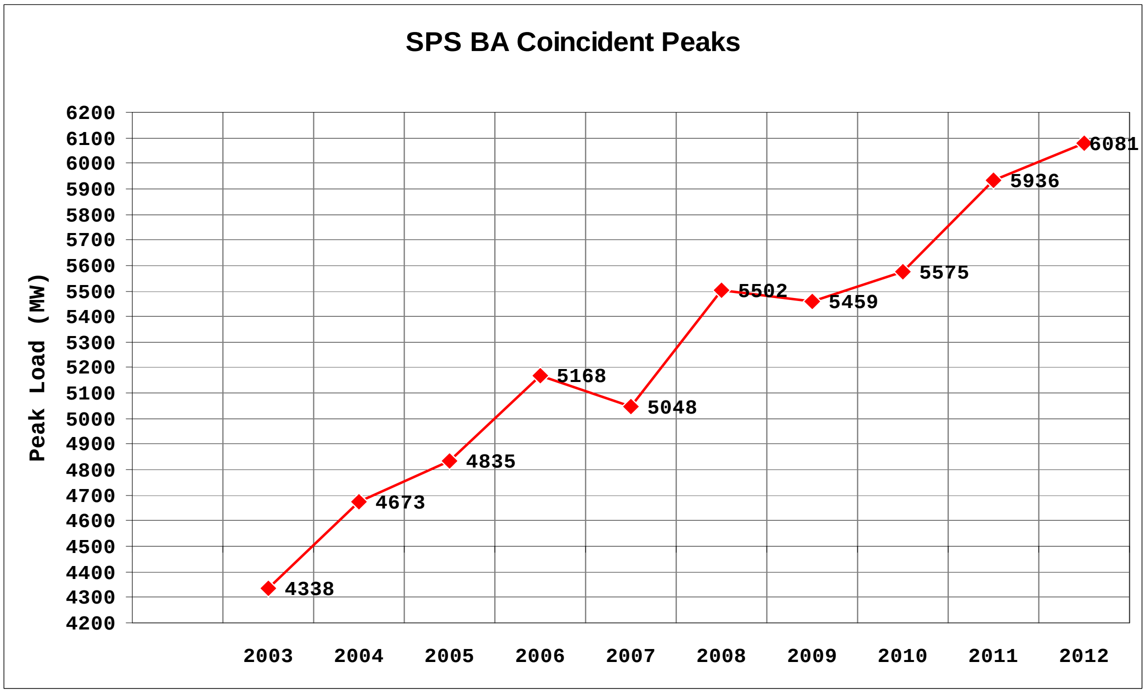


Figure 7 SPS BA Coincident Peaks

The current forecast is shown below.

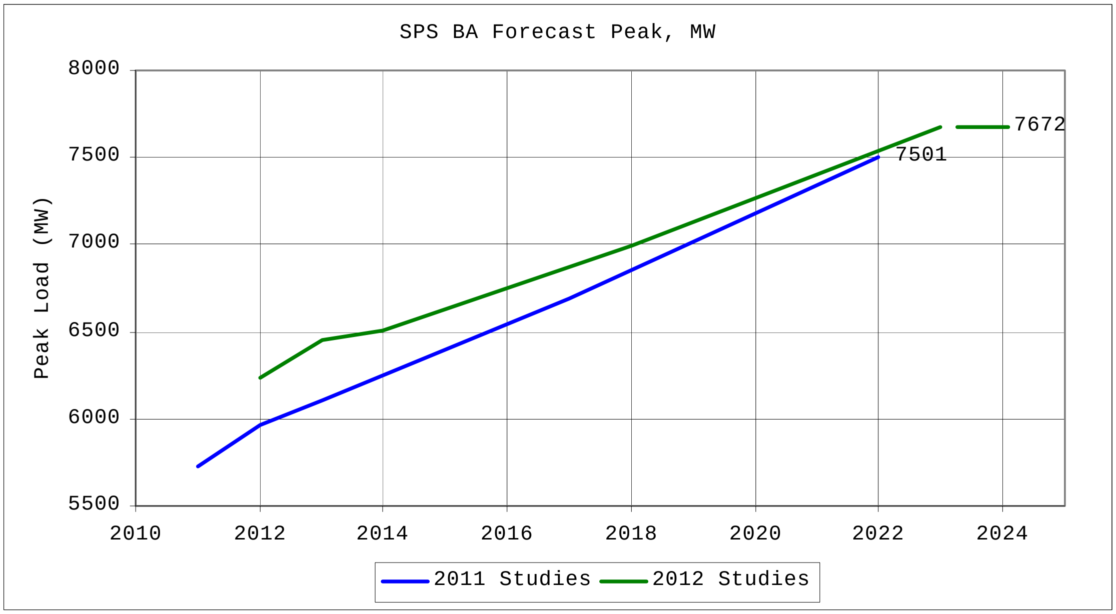


Figure 8 – SPS BA Forecast

8. Existing and New Generation Assumptions for Base Model Development

These are the assumptions for the SPP Model Development Group base models, which are used to build other models for specific studies in SPP.

a. Wind generation levels – assumed to be low (10%) in summer peak transmission planning model. The data used to represent the seasonal dispatch levels was taken from wind data obtained from the Alternative Energy Institute at West Texas A&M in Canyon, Texas. The dispatch levels for the non-summer peak models include the April Light (50%), Spring Peak (45%), Fall Peak (29%) and Winter Peak (30%). These values are based on average hourly values as a percent of the wind farm nameplate.

b. New Generation Locations –new generation locations are not modeled in the SPP ITP study unless they have met several criteria such as: a signed interconnection agreement, a power purchase agreement, environmental permits granted and major equipment on order. For the purpose of making the models through the SPP Model Development Working Group process, fictitious generation is shown at Tolk and Jones plant as needed to balance future load and generation requirements. This fictitious generation is removed in the SPP study processes.

c. New Generation Capacity – SPS has added a 168 MW gas combustion turbine generator at Jones Plant, Jones #3, and plans to add another 168 MW combustion turbine, Jones #4, with a planned in-service date of 6/1/2013. Jones #4 is in the base models for 2013.

d. Additionally, SPS Energy Markets has executed a Purchase Power Agreement (PPA) for two distribution-connected solar power plants that have a combined capacity of 40 MW.

e. New Generation Capacity – GSEC plans to add 165 MW CT generator at Mustang Interchange, with a planned in-service date of 6/1/2013. Mustang #6 is in the base models for 2013.

f. The new generation assumptions used for ITP 10 year-out and 20 year-out studies will start with what is in Section C above, but may be modified heavily based on the economic scenarios under study.

9. Planning Criteria

SPS subscribes to the Southwest Power Pool ("SPP") Reliability Criteria, which incorporates compliance with the appropriate North American Electric Reliability Corporation ("NERC") Planning Standards, which are enforced by the Regional Entity ("RE") function of SPP.

SPS's own specific criteria are applied in the development of the power flow data and conducting the studies. These should be considered in coordination with Attachment R-SPS to the Xcel Energy Operating Companies Joint OATT. Brief descriptions of those criteria follow.

Voltage Criteria

SPS allows a range of 0.95 per unit (p.u.) to 1.05 p.u. for the system voltage at a specific bus, for system intact conditions. SPS does not limit the maximum allowable voltage change during a contingency (voltage deviation criteria). The maximum allowable voltage change is dependent on the makeup of the customer load in the area of the contingency and the starting point for the voltage before the contingency. The +/- 0.05 p.u. base case voltage range is applied to all voltages, including sub-transmission networks.

During contingency studies SPS allows a range of 0.90 per unit (p.u.) to 1.05 per unit (p.u.) for the system voltage for most buses. The contingency range is dependent on the type of load at the bus under examination, the transmission equipment rating, and any regulating equipment which can be used to regulate the voltage delivered to the customer. Voltage deviations up to 1.10 per unit voltage may be permitted depending on the specific equipment ratings.

When evaluating available transfer capability, the TUCO 230 kV bus voltage is monitored and not allowed to go below 0.92 p.u. to minimize the risk of voltage collapse and system separation from the SPP. This requirement can be removed if the TUCO Static Var Controller is in service.

Transmission Element Rating Criteria

SPS has rated its transmission elements in accordance with the Xcel Energy Transmission Facility Rating Methodology, Version 5.0; July 1, 2010. The document requires the use of the most limiting element for each transmission branch and considers all elements of the transmission branch. Normal and emergency ratings are developed for both summer and winter periods and used in the power flow models.

Transformer Tap Ratios

Transformers with both fixed high side taps and low side tap changers are modeled to reflect the setting of the high side taps. The actual load tap changer adjustment range of the specific transformer is provided in the power flow data.

North-South Flow Criteria

SPS has three 230 kV north-south transmission lines and two 115 kV north-south transmission lines. The 230 kV lines are the Amarillo South Interchange-Swisher County Interchange line, the Bushland Interchange-Deaf Smith Interchange-Plant X line, and the Potter County Interchange-Plant X line. The 115 kV lines are the Randall County Interchange-Palo Duro-Happy Interchange line and Osage Switching Station-

Canyon-Hereford Interchange line. The stability limit is 800 MW flow south on these lines for an outage of a Tolk unit.

<u>Interconnected Reliability Criteria</u>

These criteria provide a framework for analyzing SPS's system in transfer analysis with other companies to which SPS is connected.

SPS's AC or synchronous interconnections have historically been built for system reliability. However, due to increases in load, these interconnections are presently required to meet demand during peak loading conditions. Additionally, these interconnections provide for emergency power if one of SPS's generators is suddenly taken off line. The largest SPS generators are the Tolk Plant units, both of which are rated 540 MW net. The existing synchronous interconnections are designed to allow the SPS system to sustain the loss of a Tolk unit without separating from the SPP.

The evaluation of power flows in or out of SPS's system should be based on SPS's reliability criteria to maintain synchronous connection with the SPP at all times. It is SPS's interconnected reliability criteria that any proposed transmission service will not reduce the ability of SPS to remain connected with the SPP in all contingencies under study. Thus, if any import of power is scheduled into the SPS system, this scheduled import cannot be so large that the loss of this import forces SPS to separate from the SPP. Similarly, the evaluation of an export of power from the SPS system should meet the same criteria. With the export or import of power occurring, there should not be cascading loss of interconnections with the SPP due to the single outage of a transmission or generation element.

<u>General Assessment Practices</u>

On an annual basis, SPS prepares power flow model data based on the previous year's annual peak and the current load forecast. Historical actual load point data is used in preparing the new power flow base cases.

SPS performs single contingency outage studies on the summer peak models by examining the loss of each transmission element. The transmission elements are defined to be all transmission lines between 345 kV and 115 kV and transformers with high side connections to these transmission voltage levels. Each single contingency outage case is reviewed to determine if system improvement is required to provide reliable service during this contingency. Single contingency studies may be performed on the winter peak and average load models, to determine the sensitivity of the network to outages with seasonal generation patterns. Studies on the 69 kV sub-transmission network are targeted every two years. SPS's 69 kV network is extensive and is for a large part operated radial. Studies on selected portions of the 69 kV network may be done on a much more frequent basis, depending on load growth in a specific area.

If a network addition is proposed in a specific region of the transmission system, single contingency studies will be made of that area with the proposed addition to determine its ability to provide service. The studies will be made in the model year that the transmission addition is proposed to go into service and also for the model year that is the farthest into the future. For example, if a new 230/115 kV interchange is to go into service in 2013, the addition of this interchange would be studied in 2013 power flow models, and would also be studied in the future models to determine the long-term performance of this network addition.

For SPS' study purposes, power flow simulations are done with area interchange control enabled with tie-lines and load, transformers with load tap changers regulating, and generator voltage regulation enabled. All SPS generators are assumed to be capable of regulating voltage between their minimum and maximum reactive power limits. Small non-utility generators, and wind farms do not provide significant voltage regulation. The HVDC interconnections are block loaded in power flow simulations. Studies can be done with a full Newton solution or a decoupled Newton solution.

Where new generation is needed but not yet known as to its exact location, fictitious generators will be placed on the system as needed to maintain a balance between load and generation. These are normally placed at the Tolk Plant bus first, and if needed the Jones Plant bus. These are internal busses in the power flow model.

Interconnected Reliability Assessment Practices

It is important that any proposed transfer of power or construction of facilities not degrade SPS's interconnected reliability. SPS does perform contingency studies on the loss of a Tolk unit, the largest generating unit in the control area, with all HVDC tie-lines in service as a baseline case. As stated above SPS conforms to the NERC Planning Standards and produces annual studies in response to specific standards requirements. The standards, which can affect transmission are significant and are not listed in this report.

10. Transmission Congestion

SPS has several flow gates which have caused concern in past years. The primary flow gates are the North-South flow gate and the import flow gate, SPPSPSTIES.

The North-South flow gate limits due to a stability limitation based on loss of south generation. With additional non-firm wind based resources north of the flow gate, it hits its limit much more frequently than in past years.

The other key flow gate is the import flow gate. It is based on the sum of all of SPS AC ties to the SPP. This flow gate, while not a significant limit for operation today, does potentially limit future transactions. However, if future firm transactions are requested, SPP will study the needed service and determine what upgrades are needed to increase the import capability. A map of those constraints is shown in Figure 9.

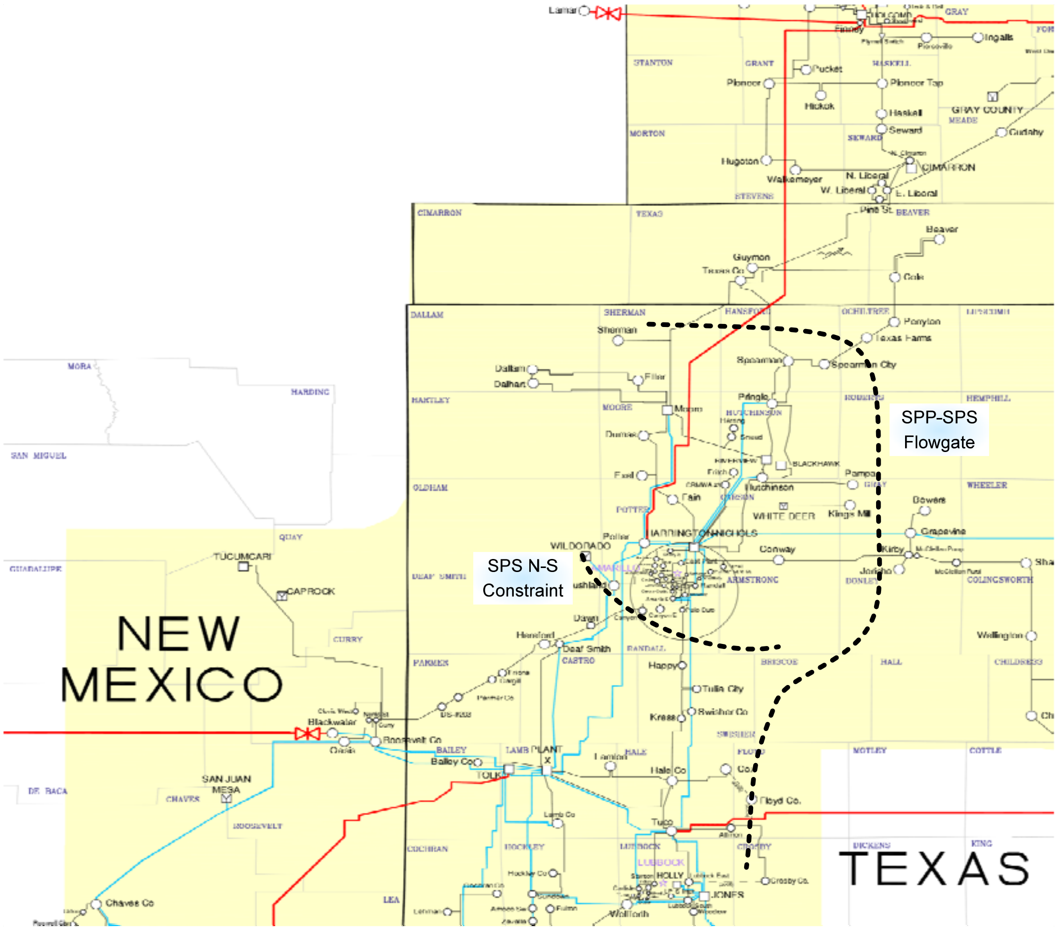


Figure 9 – Transmission Congestion Map

11. Economic Planning

SPS reviews studies by others and is actively involved in various regional economic planning efforts such as:

- Department of Energy (DOE) national transmission congestion studies
- SPP Integrated Transmission Plan (ITP) process
- Eastern Interconnection Planning Collaborative (EIPC)

The economic planning process involves various resource scenario evaluations, economic impact of market congestion on transmission elements, and energy and demand loss evaluation on transmission elements.

The benefits are frequently not large enough to justify stand alone transmission investment. Economic benefits, coupled with other benefits (reliability, local or regional policy, etc.), are factored into the transmission alternative evaluation.

II. System Plans

A. SPS Planning Zones has eight planning zones that it uses in its planning and these are based on operating historical data being available to analyze performance in these regions.

They are:

- Zone 1: Western Kansas, Oklahoma Panhandle, & Texas North Areas: Includes Garden City, Guymon, Dumas, Dalhart, Spearman, Borger, Pampa, and Wheeler.
- Zone 2: Amarillo Area: Adrian, Vega, Channing, Amarillo, Groom and McLean.
- Zone 3: Clovis, Hereford, Canyon Area: Includes Portales, Clovis, Muleshoe, Friona, Hereford, and Canyon.
- Zone 4: Central Plains and Lubbock Area: Includes Tulia, Plainview, Littlefield, Levelland, Brownfield, Post, Lubbock, and Floydada.
- Zone 5: Yoakum and Gaines Area: Includes Denver City, Seminole, and Seagraves.
- Zone 6: Pecos Valley Area: Includes Roswell, Artesia, and Carlsbad.
- Zone 7: Southeastern New Mexico Area: Includes Hobbs, Eunice, and Jal.
- Zone 8: Caprock Area: Includes Midland and Big Spring.

A map of the zones is shown below.

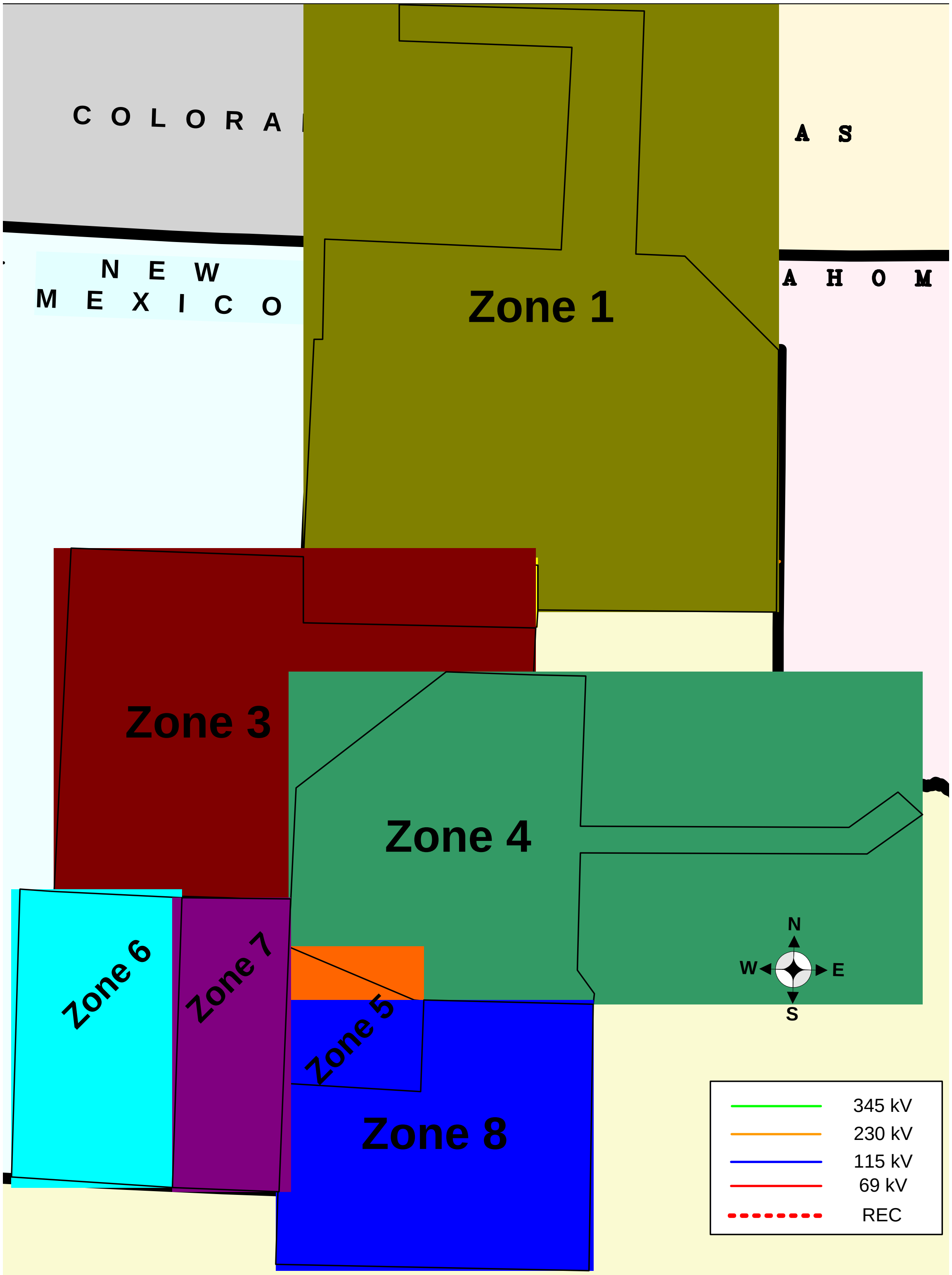


Figure 10 – SPS Planning Zone Map

B. Zone Descriptions

Zone 1 Description: Western Kansas, Oklahoma Panhandle, & Texas North Area

The Zone 1 region is one of the larger territorial regions in the Southwestern Public Service (SPS) system. It encompasses the transmission system from the northern end at Garden City, Kansas to the southeastern end near Shamrock, Texas. The eastern border for this region is on the Texas-Oklahoma state line and extends as far west as Lamar, Colorado but the service area typically extends westward to the New Mexico state line.

The summer peaking loads for this region consist mostly of industrial and agricultural with lesser levels of commercial and residential. The 2013 summer peak load is forecasted to be approximately 993 MW. SPS provides service to four cooperatives in this region, one in Oklahoma and three in Texas.

Most of the transmission lines in this region are operated at 115 and 69 kV, but there are also some 230 and 345 kV lines. There are two 345 kV tie lines and one major internal 345 kV line between Finney and Potter. There is a 230 kV tie line and two additional 115 kV tie lines in this region. One of the 115 kV tie lines is through a 115 kV 80 MVA phase shifting transformer. Most of the 230 and 115 kV lines are operated looped and the 69 kV lines are normally operated in a radial fashion to minimize outage risk. Switching can normally be performed on the 69 kV system to restore service from a different source.

The maximum generation in this region is approximately 1518 MW with 1213 MW being from wind generation, and the remaining from gas generators and cogen facilities. Much more wind generation is earmarked for this region.

Challenges:

- Huge amounts of additional wind generation are expected to be added to this region and will require significant transmission expansion.
- Load growth in the north Texas and Oklahoma panhandles is going to require significant transmission expansion, which has been addressed with the Texas North Improvements.
- By 2013 the 2nd Kingsmill Interchange 115/69 kV transformer will need to be in service.
- By 2013 the Spearman Interchange 115/69 kV transformer will need to be upgraded
- By 2014 the 2nd Hitchland Interchange 345/230 kV transformer will need to be placed in service.
- By 2015 the Potter-Channing-Dallam 115 to 230 kV conversion needs to be completed.

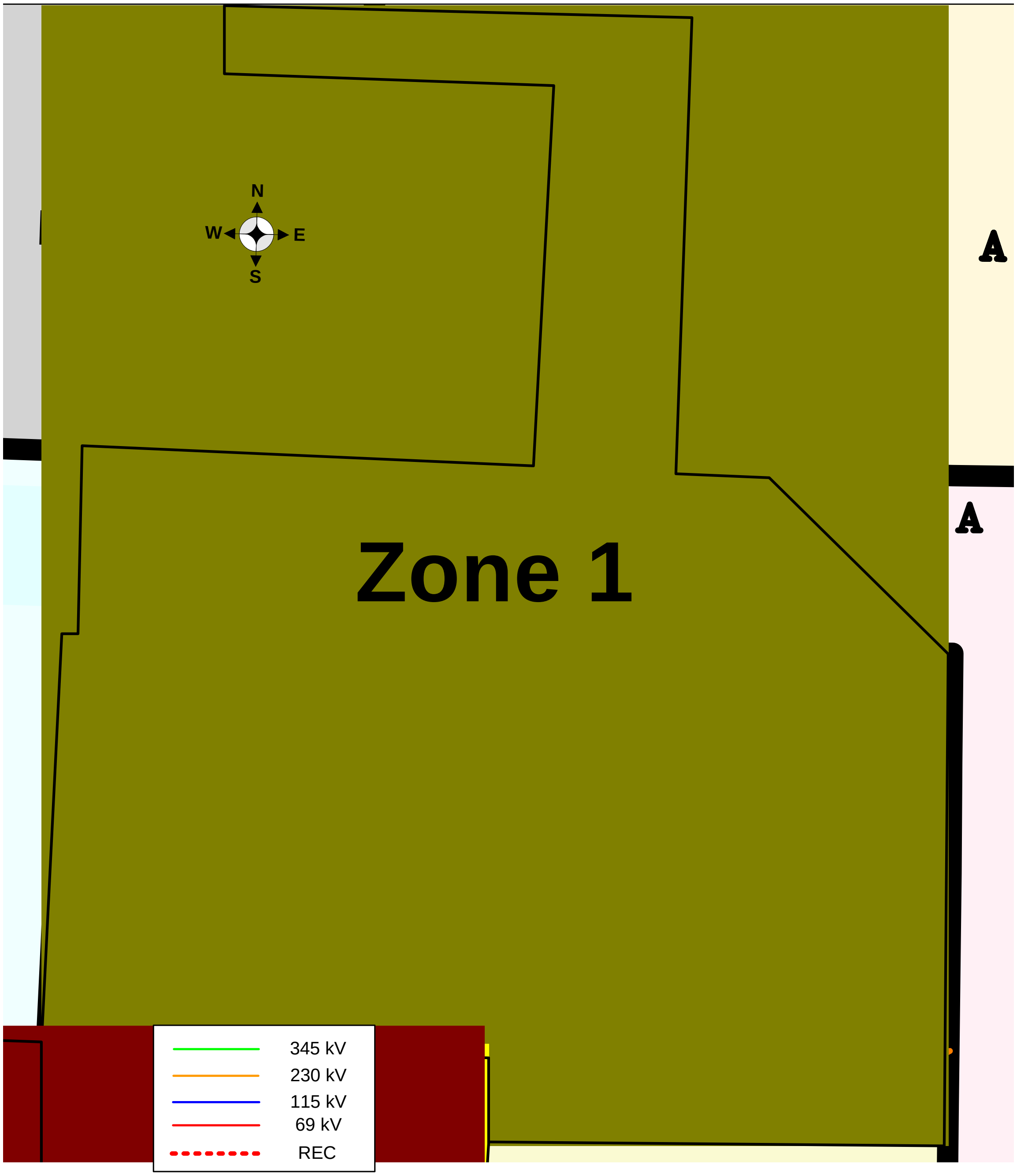


Figure 11 – Planning Zone 1 Map

Zone 2 Description: Amarillo Area: Adrian, Vega, Channing, Amarillo, Groom and McLean.

The Amarillo Metro area covers the entire city of Amarillo as well as areas to the west out to Adrian. The load for this area is a mix of residential, industrial, agricultural, oilfield and commercial loads.

The transmission lines in the Amarillo Area are operated at 345, 230, 115, and 69 kV levels. The 345 kV transmission line out of Hitchland Interchange is connected to the north (WECC) with nominal capacity of 210 MW. The 230 and 115 kV transmission lines out of Nichols Substation are connected to the East (SPP) via Grapevine and Kirby substations respectively.

In the Amarillo Metro area, SPS owns two generating stations at Nichols and Harrington plant with a generating net capacity of approximately 1,500 MW. There are also two independent power wind farm-generating facilities at Bushland and White Deer with a combined nominal capacity of 398 MW.

Challenges:

- By 2013 the Randall Interchange 2nd 230/115 kV transformer will need to be placed into service.
- By 2015 the Randall Co – South Georgia 115 kV line needs to be upgraded.
- By 2017 the Harrington – Randall County Interchange 115 kV line circuit #2 will need to be completed.

Figure 12 – Planning Zone 2 Map

Zone 3 Description: Clovis, Hereford, and Canyon Area

The Clovis, Hereford, and Canyon area covers the cities of Portales, Clovis, Tucumcari, Muleshoe, Friona, Hereford, and Canyon. The load for this area is a mix of residential, agricultural, industrial, and commercial loads.

The transmission lines in this area are operated at 230, 115, and 69 kV levels. SPS provides power to two electric cooperatives in the Hereford and Clovis area.

There are two independent power wind farm-generating facilities at Caprock in Tucumcari and San Juan in Elida both in New Mexico. They have a combined nominal capacity of 200 MW.

Challenges:

- By 2013 the Hereford Interchange – Northeast Hereford 69 kV line, both the Hereford Interchange 115/69 kV transformers, and the Northeast Hereford 115/69 kV transformer are predicted to surpass their ratings.
- By 2013 the Deaf Smith Interchange 230/115 kV transformers will need reinforcement for the predicted flows.
- By 2014 the NE-Hereford 2nd 115/69 kV transformer will be needed.
- By 2014 the Pleasant Hill 230 kV projects will need to be in service.
- By 2015, the Curry Co – Bailey Co 115 kV line will need to be in service

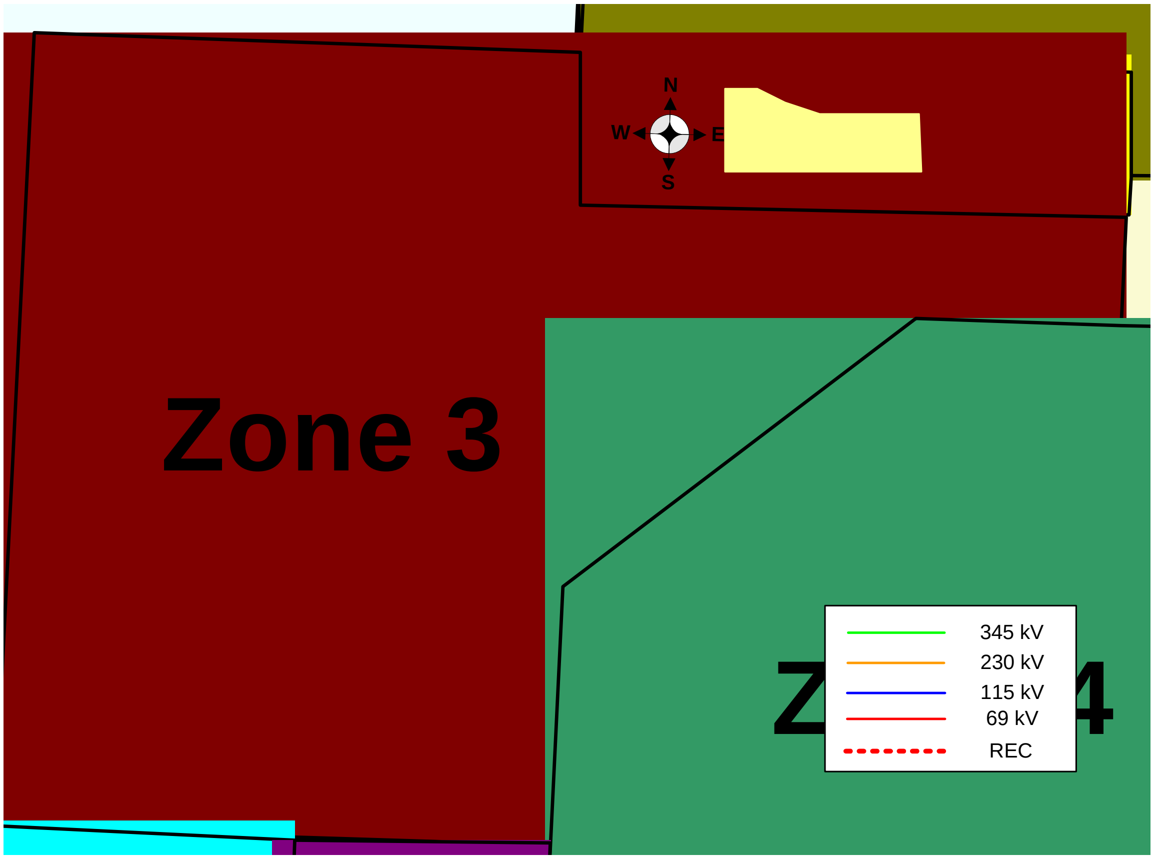


Figure 13 – Planning Zone 3 Map

Zone 4 Description: Central Plains and Lubbock Area

The Central Plains zone is a region in the West Texas Plains from Muleshoe to Brownfield and from Crosbyton to the Texas-New Mexico border. This area has approximately 1,457 MW of summer peaking load that is made up from a mix of residential, industrial, agricultural, and commercial loads. The load growth in this area is due to the increased farm irrigation, irrigation conversions from gas to electric, and the expanding oil and gas industry.

SPS provides power to six electrical cooperatives, all members of Golden Spread Electric Cooperative, that lie within the Central Plains area. SPS also serves Lubbock Power & Light (LP&L) at transmission level voltages. The transmission lines in the Central Plains area are operated at 230, 115, and 69 kV. Most of the 230 and 115 kV lines are operated looped or networked. The 69 kV lines are operated as radial feeders, with normally open line-switches to restore service to loads affected by an outage.

Within the Central Plains zone there is approximately 3,423 MW of Southwestern Public Service (SPS) generation within the Central Plains area from the facilities at Tolk, Plant-X, and Jones plants. Within the city of Lubbock, Texas on LP&L's system there is approximately 232 MW of generation. Figure 14 on the following page illustrates the area covered by Zone 4.

Challenges:

- By 2013 the Bailey County Interchange 115/69 kV transformers and the Lubbock South Interchange 230/115 kV transformer will need reinforcement.
- By 2013 the Bailey County – Plant-X Station 115 kV line, the Grassland Interchange 230/115 kV transformer, both of the Happy Interchange 115/69 kV transformers, the remaining transformer at Kress Interchange, both of the Tuco Interchange 115/69 kV will need reinforcement.
- By 2014 the Tuco Interchange 2ND 345/230 kV 560 MVA Transformer will be needed. The Happy sub upgrade project for the two 115/69 kV transformers to 84/96 MVA will be needed. The Newhart Interchange projects will be needed including the Newhart-Castro 115 kV line, the Newhart-Lampton 115 kV line, the 230 kV lines serving Newhart and 230/115 kV transformer.
- By 2018, if there are no system improvements, the Allen Sub – Lubbock South Interchange 115 kV line, the Canyon East Sub – Randall County 115 kV line, the Carlisle Interchange – Murphy 115 kV line, the Carlisle Interchange 230/115 kV transformer, the Graham Interchange 115/69 kV transformer, both of the Hockley County Interchange 115/69 kV transformers, the Jones Station Bus #2 – Lubbock South Interchange 230 kV line, both of the Lamb County Interchange 115/69 kV transformers, the Lynn County Interchange – South Plains Woodrow 115 kV line, the Planters Sub – SW_6786_S 69 kV line, the Stanton Sub – Tuco 115 kV line, and both of the Tuco Interchange 230/115 kV transformers will overload.

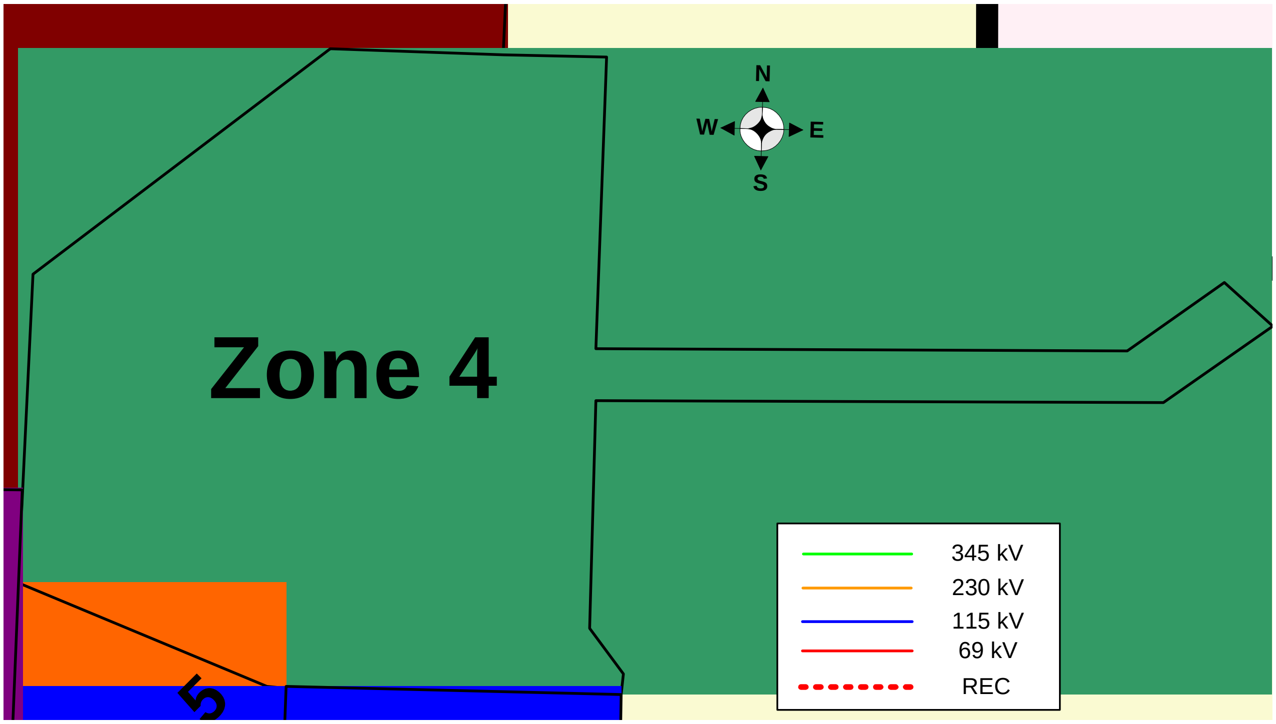


Figure 14 – Planning Zone 4 Map

Zone 5 Description: Yoakum and Gaines Area

The Yoakum and Gaines zone is a region in the West Texas Plains covering the Yoakum and Gaines Counties along the Texas-New Mexico border. This area has approximately 559 MW of summer peaking load that is made up from a mix of residential, industrial, agricultural, and commercial loads. The majority of the load growth in this area is due to the expanding oil and gas production. With sustained oil prices, this area is expected to experience large blocks of load additions. This area also experiences a very high load factor with very little year-round change.

SPS provides power to two electrical cooperatives that lie within the Yoakum and Gaines area. One of these cooperatives is a member of Golden Spread Electric Cooperatives, Inc., while the other cooperative is a total requirements wholesale customer.

The transmission lines in the Yoakum and Gaines area are operated at 230, 115, and 69 kV. Most of the 230 and 115 kV lines are operated looped or networked. The 69 kV lines are operated as radial feeders, with normally open line-switches to restore service to loads affected by an outage.

Within the Yoakum and Gaines zone there is approximately 925 MW of generation capacity from the facilities at Mustang Station. SPS does not own this generation and this generation may not be dispatchable in the off peak seasons. Figure 15 on the following page illustrates the area covered by Zone 5.

Challenges:
Currently both of the 115/69 kV transformers at Gaines County Interchange lack capacity for reliable service.

- By 2014 the 230 kV Yoakum Co substation bus needs to be rebuilt. The Sulphur Springs-Cedar Lake 115 kV line project needs to be completed.

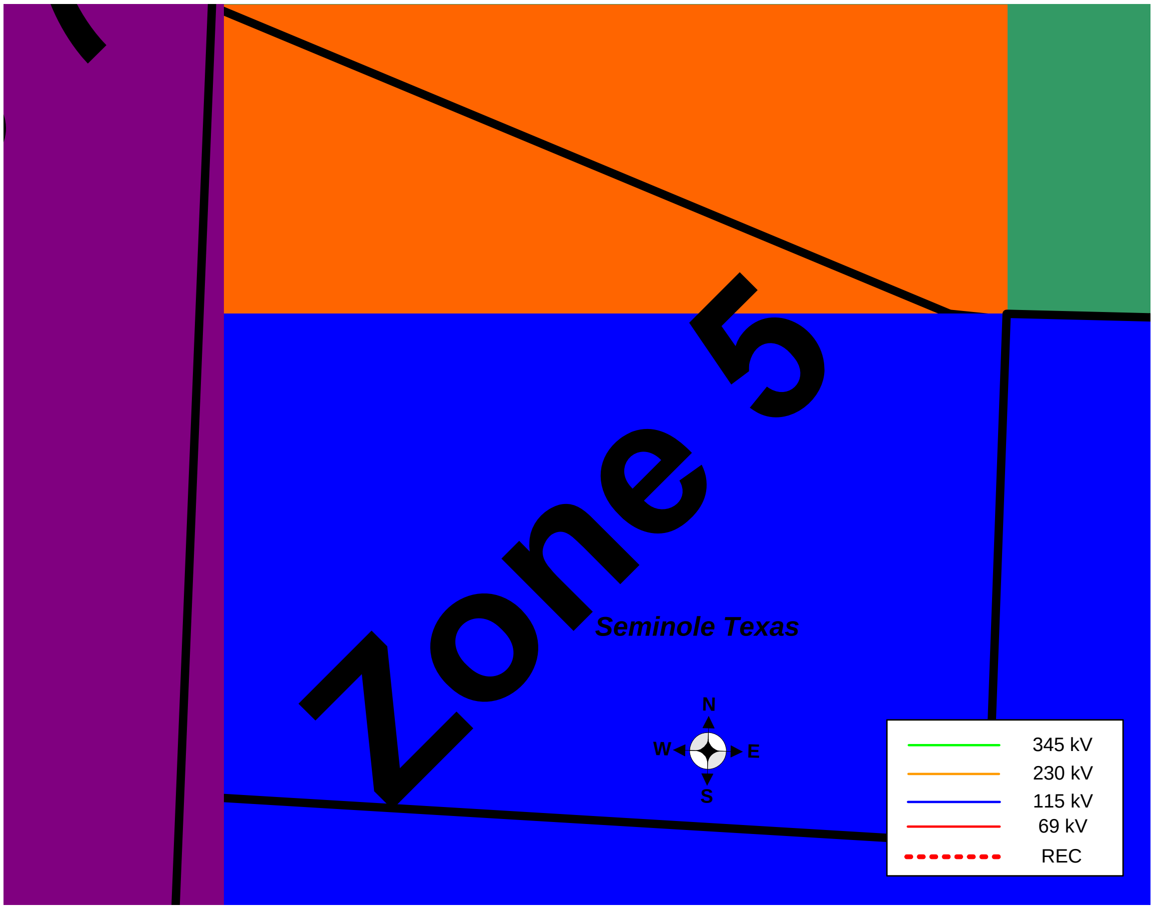


Figure 15 – Planning Zone 5 Map

Zone 6 Description: Pecos Valley

The Pecos Valley zone is a region in the eastern New Mexico from Roswell to White City that includes Chaves and Eddy Counties. This area has approximately 624 MW of summer peaking load that is made up from a mix of residential, industrial, agricultural, and commercial loads. The load growth in this area is due to the increased farm irrigation, irrigation conversions from gas to electric, and the expanding industrial base for the production of ethanol.

SPS provides power to the cities of Roswell, Artesia, and Carlsbad and several other rural communities. SPS also serves an area electrical cooperative that has a total requirements contract with SPS.

The transmission lines in the Pecos Valley area are operated at 230, 115, and 69 kV. Most of the 230 and 115 kV lines are operated looped or networked. The 69 kV lines are operated as radial feeders, with normally open line-switches to restore service to loads affected by an outage.

Within the Pecos Valley zone there is only 18 MW of generation at the Carlsbad Plant with all other resources outside the zone. The Eddy County HVDC interconnect with El Paso Electric (EPE) is at Eddy County Interchange. Figure 16 on the following page illustrates the area covered by Zone 6.

Challenges:

- By 2013 the Roswell Interchange 115/69 kV transformer will need to be relieved by swapping loads at Brasher and Capitan Substations onto the 115 kV system out of Roswell Interchange. Currently the 115/69 kV transformers at Roswell, Carlsbad, Artesia, and Chaves County Interchanges lack the capacity for reliable service. The load conversions in the Roswell area to 115 kV will relieve this capacity concerns at Roswell and Chaves County Interchanges.
- By 2016 the upgrade of the Eddy Co 230/115 kV transformer for circuit 1 is needed in order to relieve contingency overload of that transformer.
- By 2017 a new in series breaker on the 230 kV at Eddy Co is needed to relieve a stability problem.

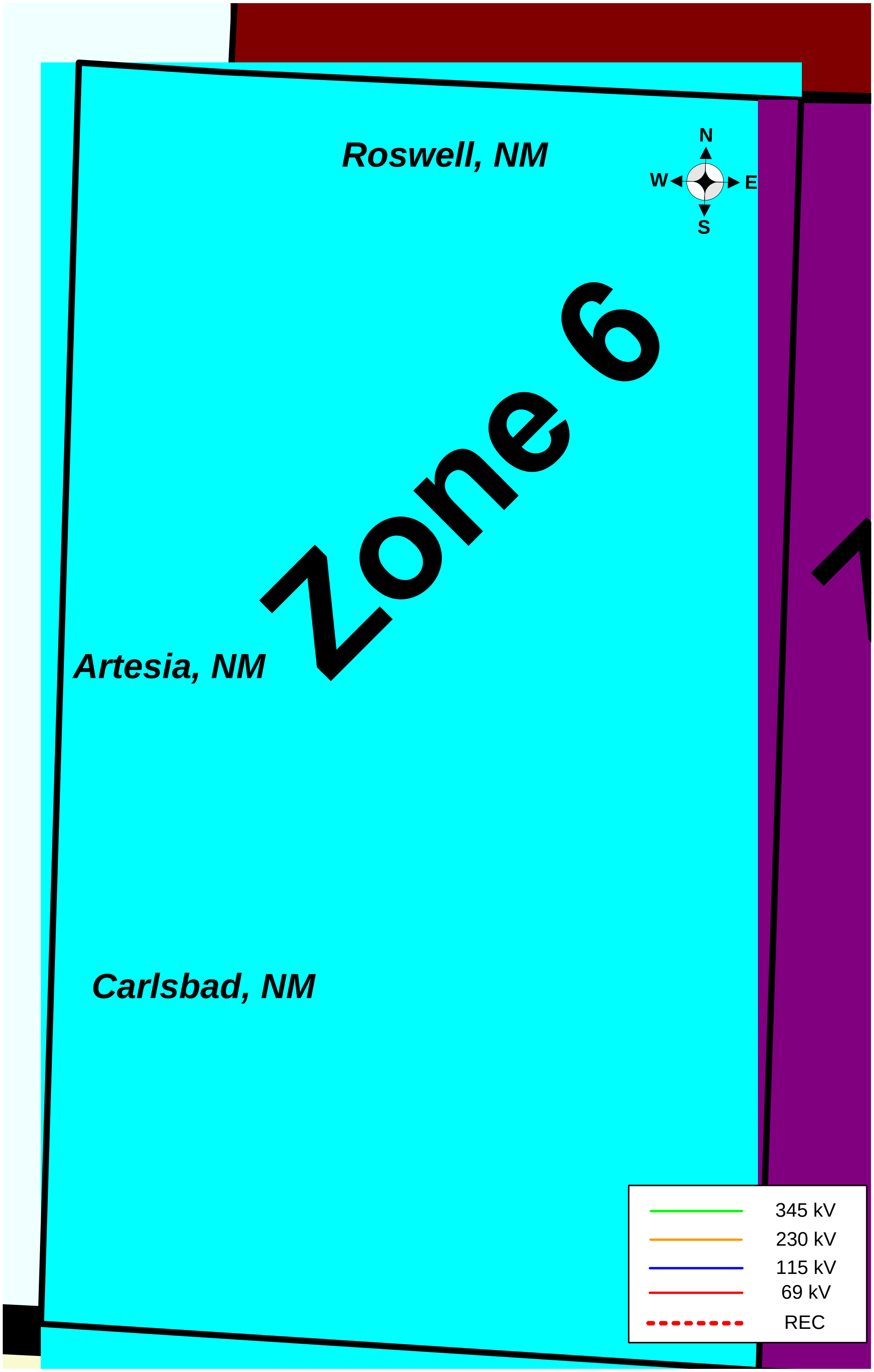


Figure 16 – Planning Zone 6 Map

Zone 7 Description: Hobbs/Jal Area

The Hobbs/Jal zone is a region in southeastern New Mexico covering Lea County along the Texas-New Mexico border. This area has approximately 321 MW of summer peaking load that is made up from a mix of residential, industrial, agricultural, and commercial loads. The majority of the load growth in this area is due to the expanding oil and gas production, and with the high oil prices, this area will experience large blocks of load additions.

SPS serves the communities of Hobbs, Jal, Eunice and several other rural communities. The transmission lines in the Hobbs/Jal area are operated at 230 and 115 kV. Most of the 230 and 115 kV lines are operated looped or networked.

Within the Hobbs/Jal zone there is approximately 1175 MW of generation capacity from the facilities at Cunningham, Maddox, and Hobbs Stations. SPS owns and operates the generation at Cunningham and Maddox, while SPS purchases the generation at the Hobbs Plant through long-term agreements. Figure 17 on the following page illustrates the area covered by Zone 7.

Challenges:

- By 2013 the capacity of the 115 kV line from Cunningham station to the Buckeye tap will be exceeded until the line is re-conductored to meet the anticipated loading.
- By 2017 the East Sanger Substation – Taylor Switching Station 115 kV line may need to be reinforced.

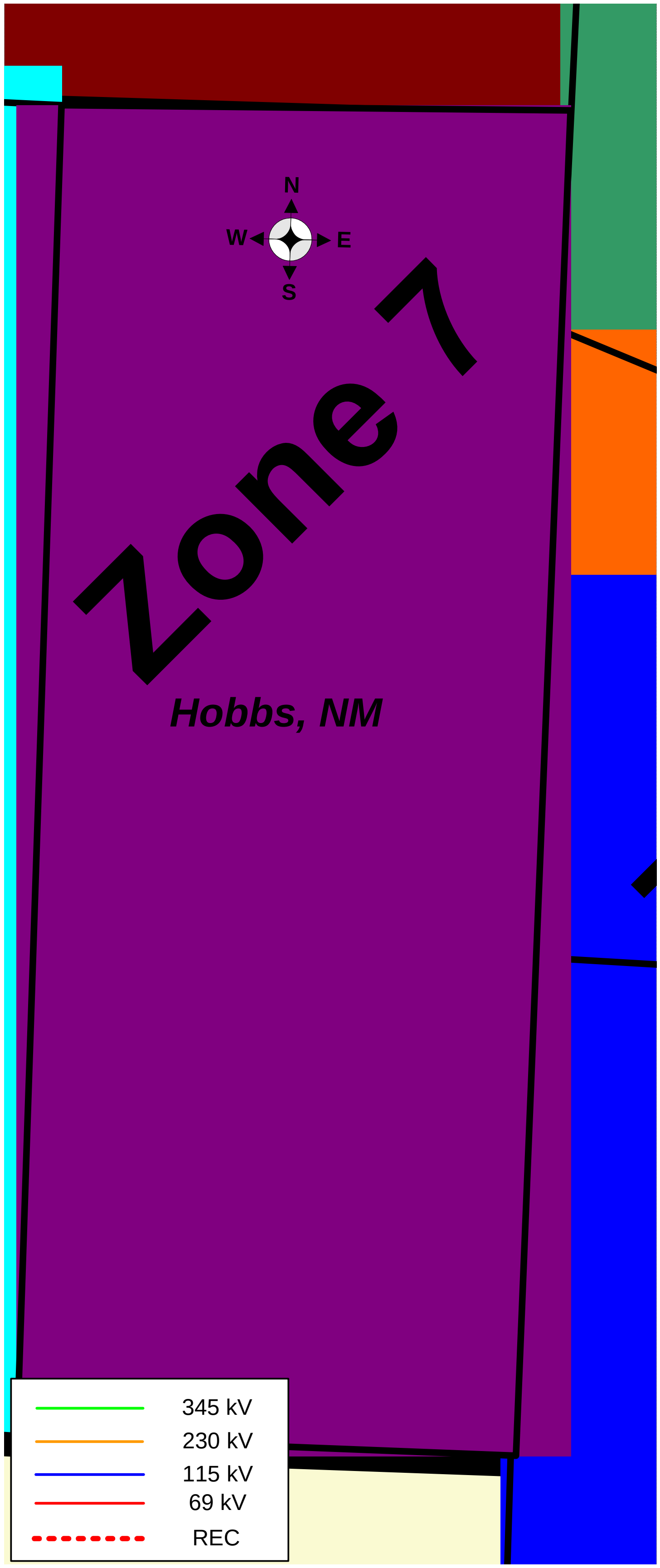


Figure 17 – Planning Zone 7 Map

Zone 8 Description: Caprock Area

The Caprock zone is the southern most region of the SPS service territory, covering an area between Midland, Texas to Big Springs, Texas and as far south as Reagan County, Texas. Sharyland Utilities is receiving service in this zone through two 230 kV transmission lines originating south of Lubbock, Texas, and at the new generating facilities near Hobbs, New Mexico. Currently there is no significant generation connected to the transmission within this zone.

The load in this area is summer peaking with a mix of residential, industrial, agricultural, and commercial loads. The majority of the load growth in this area will be to support the growth of the oil and gas industry. Sharyland Utilities is expected to control the load growth in this area by moving transmission service of some load to be served from the ERCOT[1] area. This action is expected to limit the load in the Caprock area to no more than 150 MVA. Sharyland has adopted the timetable of Jan. 1, 2014 as the date that it will have the entire Caprock load transferred to the ERCOT system.

Challenges:

- Currently the 230 kV tie-lines from Hobbs Station to Midland Interchange and from Grassland Interchange to Borden Interchange do not have the capacity to carry the Sharyland Utilities load from end to end when the load exceeds 150 MVA. The Sharyland Utilities system is operated at 138 kV, and is largely uncompensated for the loss of either 230 kV tie-line from SPS. Current load projections for Sharyland Utilities exceed the 150 MW contingency transformer limit. However, Sharyland agrees to limit the total load on the SPP system to 150 MW, by use of interruptible loads, new resources, moving one or more distribution feeders or substations to ERCOT, or other reasonable means to limit load growth in the Caprock area served from the SPP, so that such load shall not exceed the current capacity of the transmission facilities currently serving this area.

[1] ERCOT – Electric Reliability Council of Texas

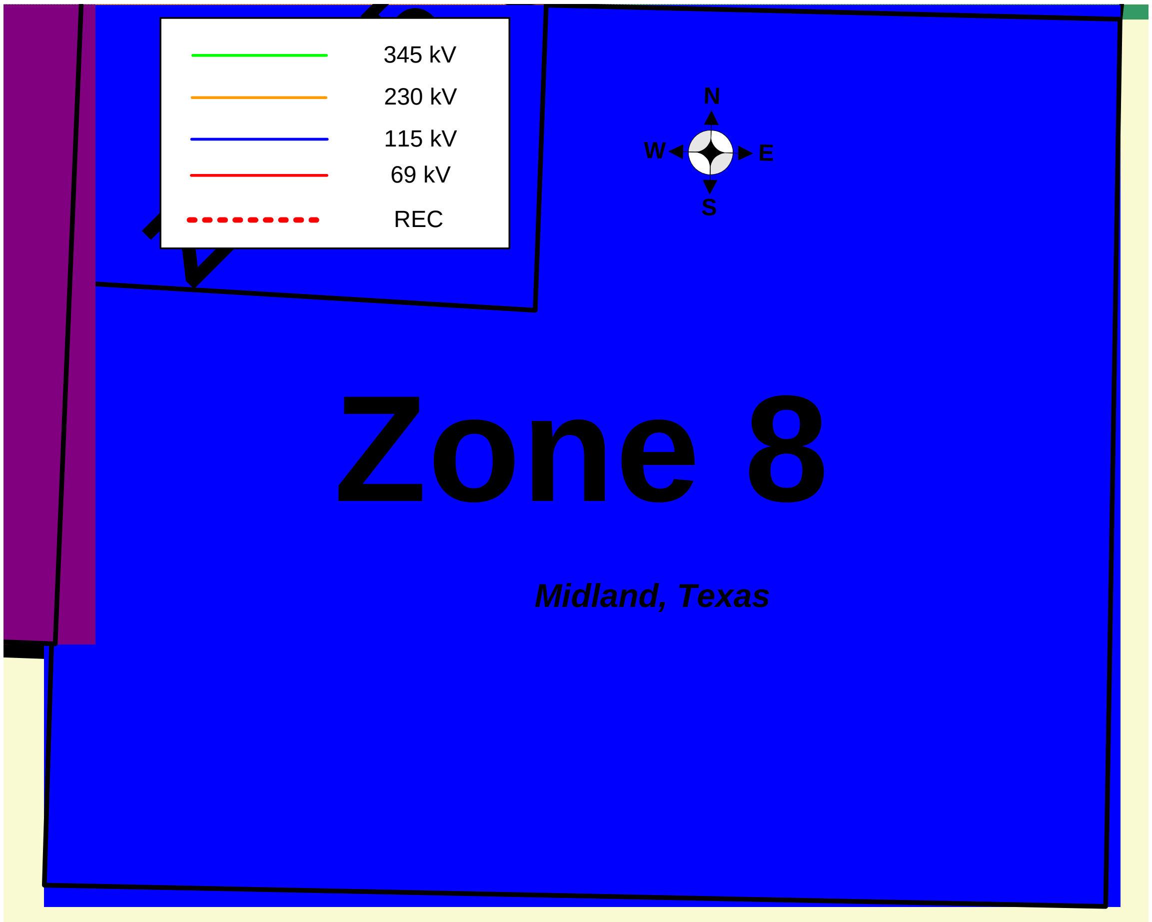


Figure 18 – Planning Zone 8 Map

C. Projects by Zone

Drawings are provided for most of the existing and new projects. SPP ITP drawings are used where applicable. SPP ITP Drawings show a desired in-service date based on the studies performed. Realistic dates are being determined based on completion of project scopes. In Status column of table, Current means project is under construction – Proposed means a new project.

Figure 19 - Zone 1 – Current and Proposed Projects

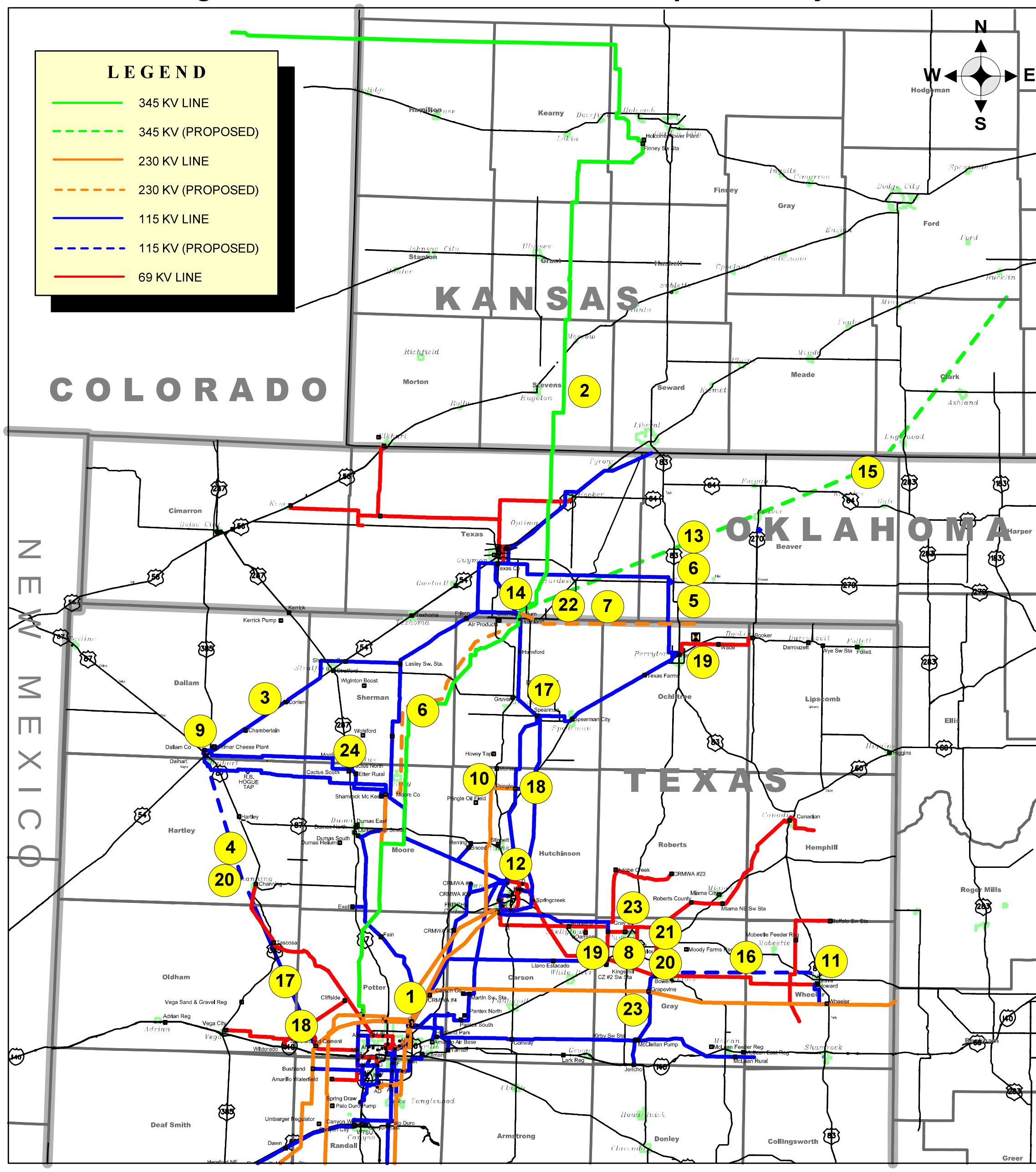


Figure 19 - Zone 1

Table 1: Current and Proposed Projects in Zone 1

No.	Project Name	Est. ISD	Status	Drivers
1	Potter County 230/115 kV 250 MVA TF	12/2011	Complete	Reliability
2	Novus II (250 MW)	12/2011	Current	IA
3	Etter Rural 2nd Stage 115 kV 14.4Mvar Capacitor	06/2012	Complete	Reliability
4	Potter Co- Channing to Dallam 115 kV line	06/2012	Complete	Reliability
5	Ochiltree 230/115 kV 172.5 MVA Autotransformer	03/2013	Current	Reliability
6	Ochiltree Co. 115 kV line terminations	03/2013	Current	Reliability
7	Hitchland- Ochiltree Co. 230 kV line	03/2013	Current	Reliability
8	Kingsmill 2nd 115/69 kV Autotransformer	05/2013	Current	Reliability
9	Install 230/115/13.2 kV Transformer at Dallam County Jr. (XIT) Sub	06/2013	Proposed	Reliability
10	Install the Backup protection system and Breaker Failure Relay on Breaker 1H45 at Pringle Intg.	06/2013	Proposed	Reliability
11	Howard 2nd 115/69 kV Autotransformer	06/2013	Proposed	Reliability
12	Install the Backup protection system and Breaker Failure Relay on Breaker 1956 at Hutchinson.	06/2013	Proposed	Reliability
13	Rebuild 16.9 miles Ochiltree-TRI-County RECs Cole 115 kV ckt 1	06/2013	Proposed	Reliability
14	Hitchland 2nd 345/230 kV 560 MVA Auto	02/2014	Proposed	Reliability
15	Hitchland– Woodward Dbl 345 kV Transmission Project	06/2014	Current	Reliability
16	Bowers– Howard 115 kV line	06/2014	Current	Reliability
17	Spearman 115/69 kV Autotransformer Upgrade	06/2014	Proposed	Reliability
18	Pringle Distribution	06/2015	Proposed	Reliability
19	Z66 Booker/Wade Conversion	12/2015	Current	Reliability
20	Potter- Channing-Dallam 115 to 230 kV Conversion	12/2015	Proposed	Reliability
21	Bowers 2nd 115/69 kV Autotransformer	06/2016	Current	Reliability
22	Hitchland II	06/2016	Proposed	Reliability
23	Replace 230/115 kV transformer at Grapevine substation with 250 MVA transformer	06/2017	Proposed	Reliability
24	N/A			

Figure 20 –
Table 1

Figure 21 - Zone 2 – Current and Proposed Projects

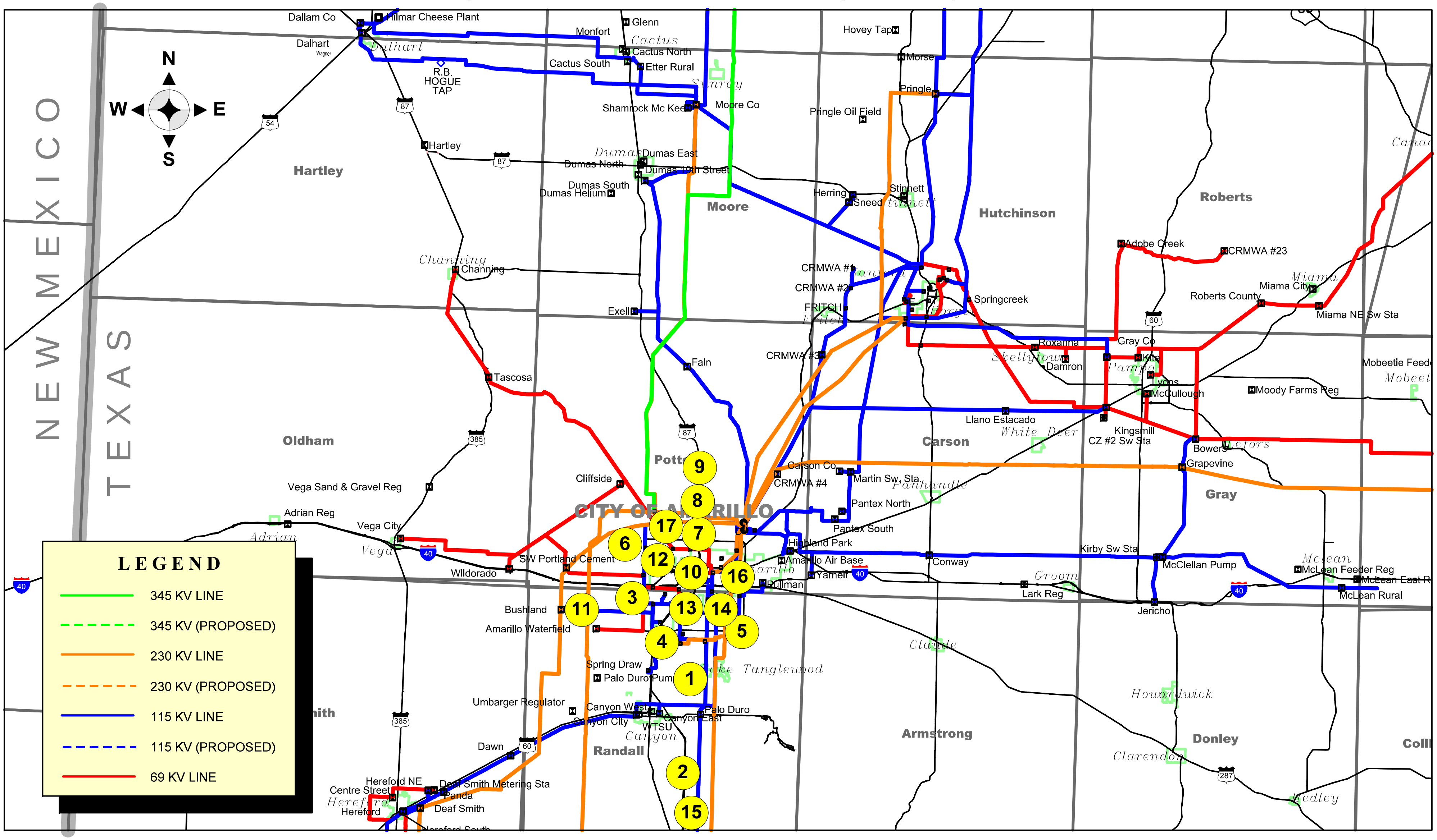


Figure 21 – Zone 2

Table 2: Current and Proposed Projects in Zone 2

#	Project Name	Est. ISD	Status	Drivers
1	Randall Co- Palo Duro Sub 115 kV Re-conductor line	05/2012	Complete	Zonal
2	Palo Duro Sub- Happy Interchange 115 kV Re-conductor Line	05/2012	Complete	Zonal
3	Hillside Substation	06/2012	Complete	Reliability
4	Randall 2nd 230/115 kV Autotransformer	04/2013	Current	Reliability
5	Randall- Amarillo South 230 kV line	04/2013	Current	Reliability
6	Install the Backup protection system and Breaker Failure Relay on Breaker 5910 at Northwest Intg.	06/2013	Proposed	Reliability
7	Cherry St.- Hastings New 115 kV line	06/2013	NTC	Reliability
8	Hastings Sub Convert to 115 kV	09/2013	Current	Reliability
9	Cherry St Interchange 230/115 kV 252 MVA TF	10/2013	Current	Reliability
10	East Plant- Hastings 115 kV line.	12/2013	Current	Reliability
11	Bushland Interchange 230 kV 100Mvar Capacitor	12/2013	Proposed	Reliability
12	Soncy Sub Convert to 115 kV	06/2015	Current	Reliability
13	Osage Station and 115 kV Line re-termination	06/2015	Current	Reliability
14	Randal Co. (Osage)- South Georgia 115kV Re-conductor Line	06/2015	Proposed	Reliability
15	Happy Interchange 115/69 kV Upgrade Autotransformers	06/2016	Current	Reliability
16	Harrington – Randall 230kV Circuit #2	06/2017	Proposed	Reliability
17	Re-conductor 115 kV NORTHWEST-ROLLHILLS line	06/2017	Proposed	Reliability

Figure 22 – Table 2

Figure 23 - Zone 3 – Current and Proposed Projects

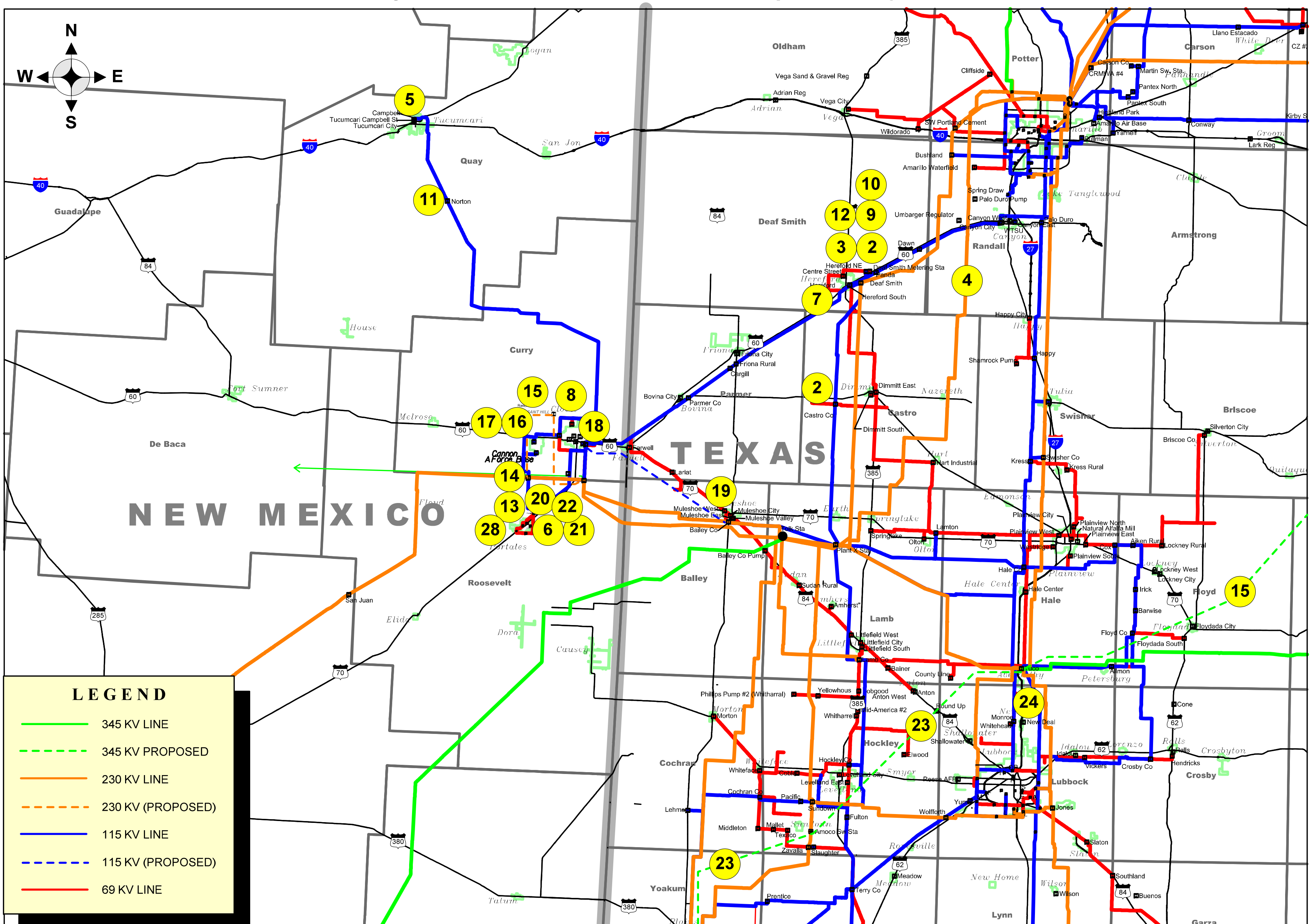


Figure 23 – Zone 3

Table 3: Current and Proposed Projects in Zone 3

	Project Name	Est. ISD	Status	Drivers
1	Parmer Co. Cap Bank	05/2012	Current	Reliability
2	Deaf Smith # 24 GSEC	06/2012	Complete	IA
3	Re-terminate T3 in & out of Deaf Smith Interchange (Re-conductor from Deaf Smith to Hereford 115 kV line)	06/2012	Current	Reliability
4	Clipper Wind (400 MW)	10/2012	Current	IA
5	Campbell St Modifications (Lopez)	03/2013	Current	Reliability
6	Zodiac Substation Convert to 115 kV	06/2013	Current	Reliability
7	Hereford – NE Hereford (Z72) re-insulate 69 kV line	06/2013	Current	Reliability
8	East Clovis Sub Convert to 115 kV	06/2013	Current	Reliability
9	Deaf Smith 230 kV Bus Rebuild	06/2013	Proposed	Reliability
10	Upgrade Deaf Smith County Interchange 230/115 kV Ckt 1 & 2 x'mer to 250 MVA	06/2013	Proposed	Reliability
11	Norton Reactor 115 kV	09/2013	Suspended	Zonal
12	NE-Hereford 2nd 115/69 kV 84 MVA Autotransformer	04/2014	Proposed	Reliability
13	Portales – Zodiac Convert to 115 kV	06/2014	Current	Reliability
14	Portales – Zodiac 115kV line	06/2014	Current	Reliability
15	Pleasant Hill- Oasis Interchange 230 kV line	09/2014	Current	Reliability
16	Pleasant Hill- Roosevelt Co. 230 kV line	09/2014	Current	Reliability
17	Pleasant Hill 230/115 kV interchange	12/2014	Current	Reliability
18	Curry Co – Bailey Co 115 kV line	06/2015	NTC Pending	Reliability
19	East Muleshoe & Valley Subs Convert to115 kV	11/2015	Proposed	Reliability
20	PORTALES 115/69 kV autotransformers upgrade	06/2017	Proposed	Reliability
21	Build 7 miles of 115 kV from Market St to Portales substation and install necessary terminal equipment	06/2018	Proposed	Reliability
22	Build 1.9 miles of 115 kV from S Portales to Market St 115 kV and install necessary terminal equipment	06/2018	Proposed	Reliability
23	TUCO-Amoco Switch-Hobbs	06/2020	Proposed	Reliability
24	East New Deal Interchange	06/2020	Proposed	Reliability
25	Install the Backup protection system and Breaker Failure Relay on Breaker 4K25 at Roosevelt Intg.	06/2013	Proposed	Reliability

Figure 24 – Table 3

Figure 25 - Zone 4 – Current and Proposed Projects

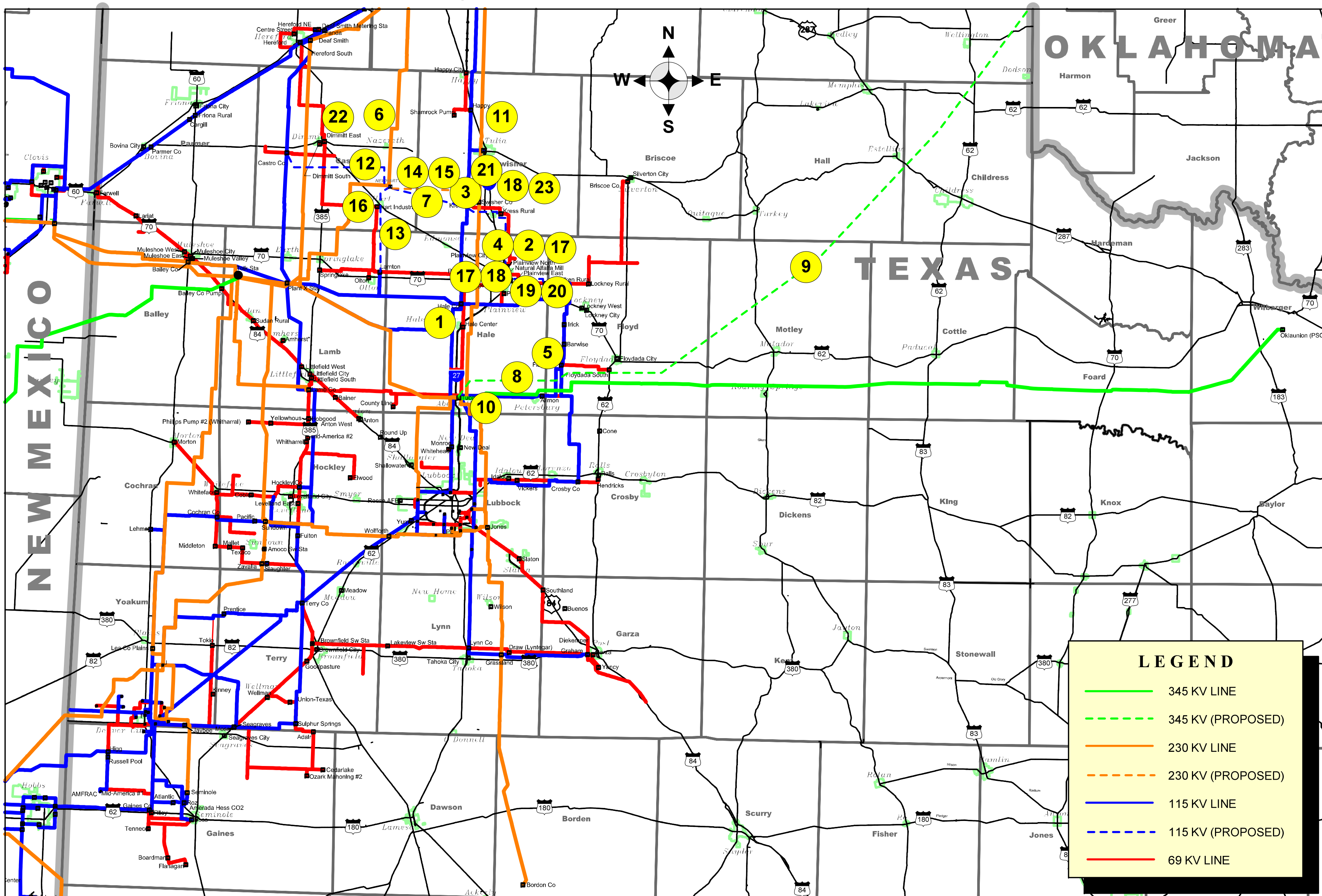


Figure 25 – Zone 4

Table 4: Current and Proposed Projects in Zone 4

#	Project Name	Est. ISD	Status	Drivers
1	Tulia Tap- Kress Interchange Re-conductor 115 kV line	04/2012	Complete	Zonal
2	Happy Interchange- Tulia Tap Re-conductor 115 kV line	04/2012	Complete	Zonal
3	Build new 22-mile Kress Interchange - Kiser 115 kV	06/2013	Proposed	Reliability
4	Build new 10-mile Cox - Kiser 115 kV line	06/2013	Proposed	Reliability
5	Install two 14.4 MVA 115 kV capacitors at Floyd Intg.	06/2013	Proposed	Reliability
6	Happy Whiteface Wind (240 MW)	10/2013	Current	IA
7	Newhart - Kress 115 kV line	03/2014	Current	Reliability
8	TUCO Interchange 2nd 345/230 kV 560 MVA TF	06/2014	Current	Balanced Portfolio
9	Tuco – Woodward 345 kV Project	06/2014	Current	Reliability
10	Tuco Interchange 3rd 115/69 kV Autotransformer	06/2014	NTC Pending	Reliability
11	Happy Sub Upgrade both 115/69 kV transformers to 84/96 MVA.	06/2014	NTC	Reliability
12	Newhart - Castro Co 115 kV line	06/2014	Current	Reliability
13	Newhart - Lamton 115 kV line (with Hart Ind. Tap)	11/2014	Current	Reliability
14	Kress - Plainview City New 115 kV line	11/2014	Current	Reliability
15	Plainview North Convert to 115 kV	11/2014	Current	Reliability
16	Plainview City Interchange 115/69 kV	11/2014	Current	Reliability
17	Newhart Interchange New 230 kV lines	12/2014	Current	Reliability
18	Newhart - Swisher Co. 230 kV line	12/2014	Current	Reliability
19	Plainview City - Cox Interchange New115 kV line	12/2014	Current	Reliability
20	Hart Industrial Sub Convert to 115 kV	06/2015	Current	Reliability
21	Dimmit Substation Convert to 115 kV	06/2016	Proposed	Reliability
22	Swisher Co. Upgrade 230/115 kV TF to 252 MVA	06/2017	Proposed	Reliability
23	Kress - Swisher Co. Upgrade the 115 kV line terminal equipment	06/2021	Proposed	Reliability

Figure 26 – Table 4

Figure 27 – Zone 4 – Current and Proposed Projects (Cont.)

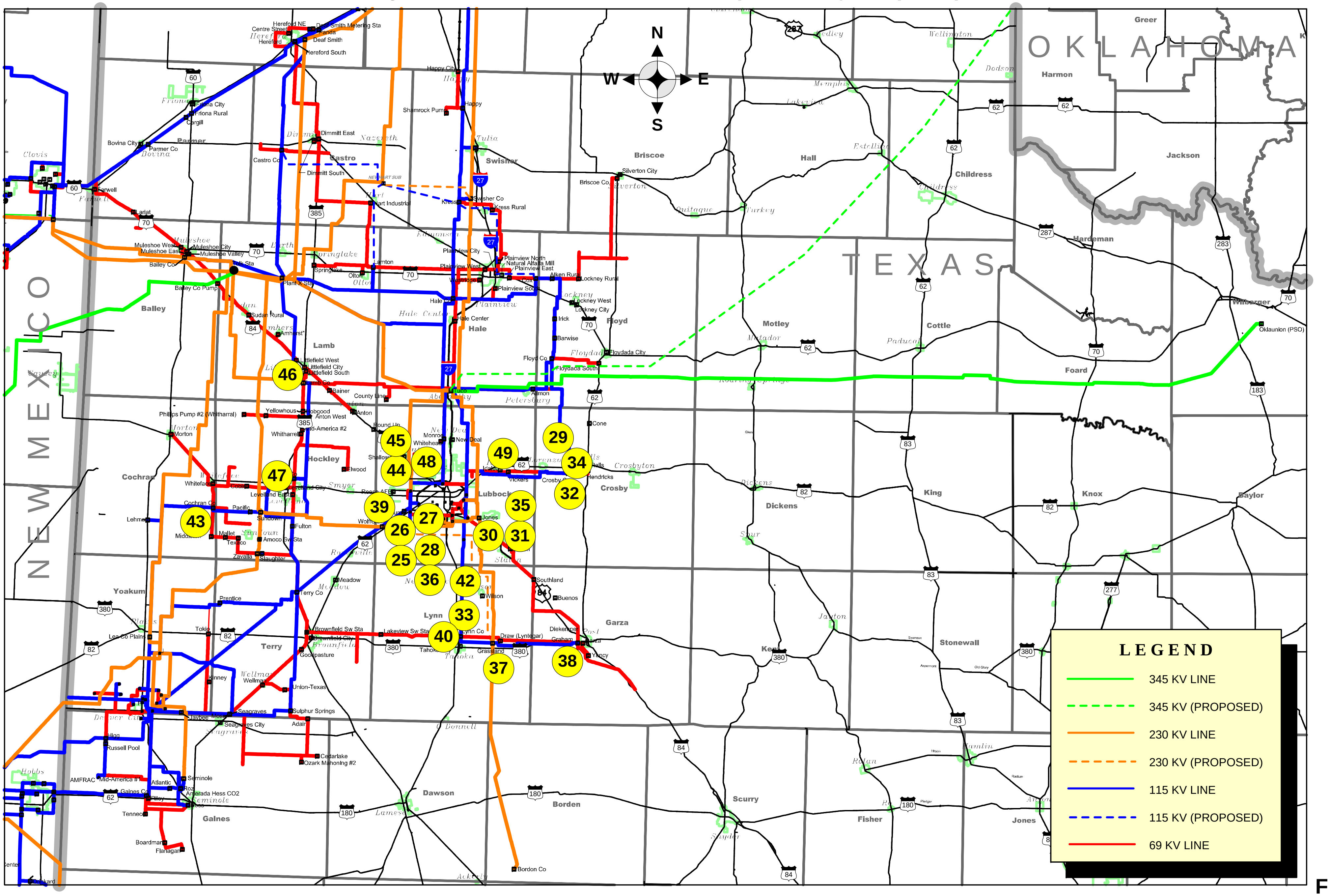


Figure 27 – Zone 4 (cont.)

Table 5: Current and Proposed Projects in Zone 4 (Cont.)

#	Project Name	Est. ISD	Status	Drivers
25	Wolfforth - Yuma terminal Upgrade 115 kV line terminal equipment	10/2012	NTC	Reliability
26	Wolfforth – Yuma T72 115 kV Upgrade line terminal equipment	12/2012	Current	Reliability
27	GSEC-SP Milwaukee Interconnection	03/2013	Current	IA
28	Install a second 230/115/13.2 kV transformer at Lubbock South	06/2013	Proposed	Reliability
29	Rebuild 28 miles 115 kV Crosby-Floyd ckt 1	06/2013	Proposed	Reliability
30	Jones 4	06/2013	Current	Reliability
31	Jones Plant Bus	06/2013	Current	Reliability
32	Crosby Co Upgrade Both 115/69 kV transformers to 84 MVA	06/2013	Proposed	Reliability
33	Lynn Co. Substation Convert load to 115 kV	11/2013	NTC	Reliability
34	Crosby Co 115 kV 14.4 MVAr Capacitor Project	03/2014	Proposed	Reliability
35	Jones Bus #2 -Lubbock S. Upgrade 230 kV line terminal equipment	06/2014	Proposed	Reliability
36	Allen – Lubbock South 115 kV rebuild line	06/2014	Proposed	Reliability
37	Grassland Interchange Upgrade 230/115 kV TF to 150 MVA	06/2015	Proposed	Reliability
38	Graham Upgrade 115/69 kV transformer to 84/96 MVA	06/2017	Proposed	Reliability
39	Build new 230kV line from Carlisle to Wolfforth So. and install terminal equipment	06/2017	Proposed	Reliability
40	LYNN_CNTY 115/69 kV autotransformers upgrade	06/2017	Proposed	Reliability
41	Wolfforth – Grassland 230/345 kV Project	03/2018	Proposed	Reliability
42	Wolfforth – Grassland 230 kV Line	06/2018	Proposed	Reliability
43	Install a 2 stage 28.8 115 kV capacitor bank each stage 14.4 MVA at Cochran Interchange	06/2018	Proposed	Reliability
44	GSEC-SP Alcove Interconnection	Unknown	Pending	IA
45	GSEC-SP Wolfforth Interconnection	Unknown	Pending	IA
46	LC-Littlefield 115 kV conversion	Unknown	Pending	Reliability
47	East Levelland 115 kV conversion	Unknown	Pending	Reliability
48	Carlisle Intg. 2nd 168 MVA 230/115 kV TF	Unknown	Pending	Reliability
49	Vickers Sub Convert to 115 kV	Unknown	Pending	Reliability

Figure 28 – Table 5

Figure 29 - Zone 5 – Current and Proposed Projects

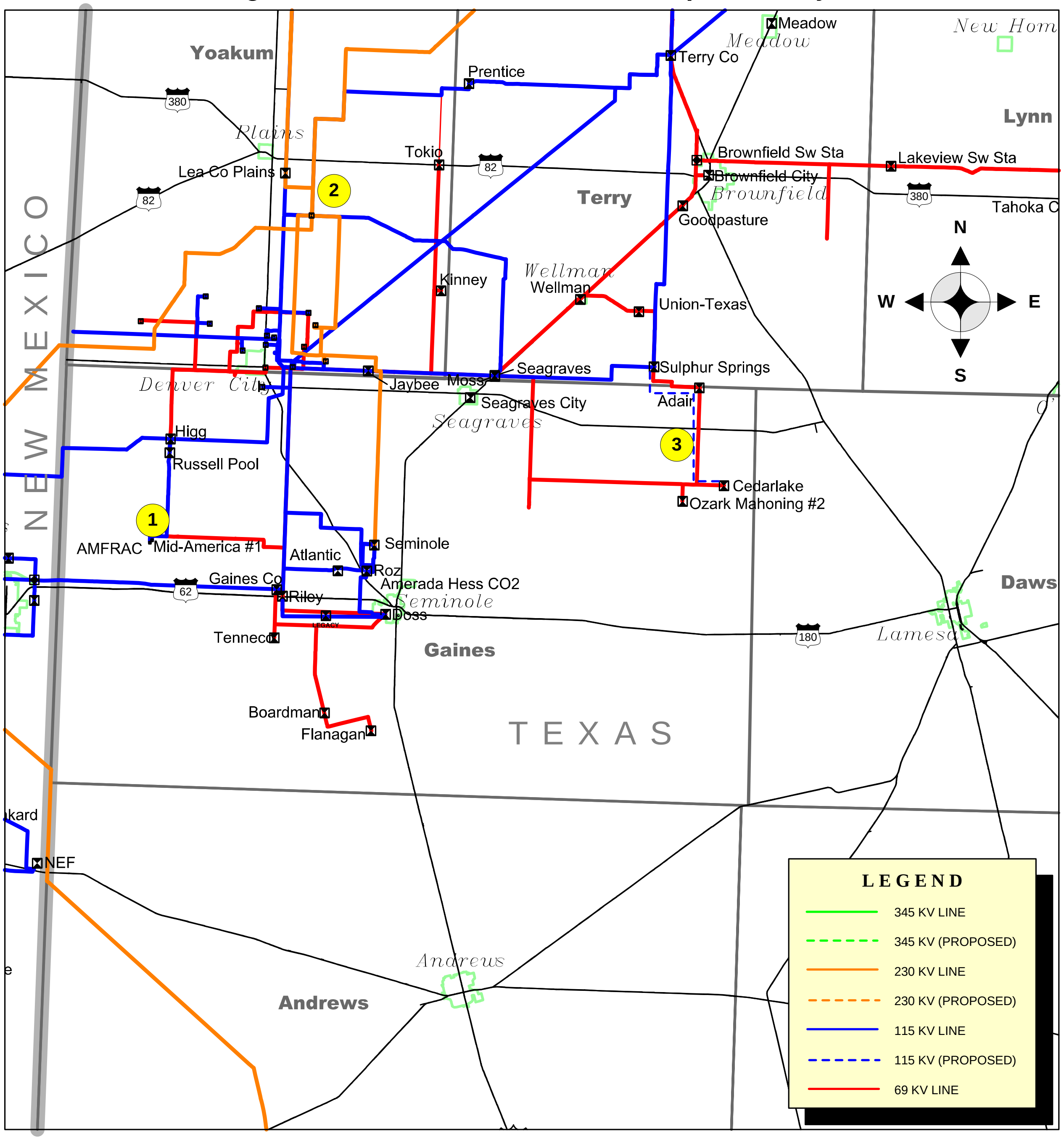


Figure 29 – Zone 5

Table 6: Current and Proposed Projects in Zone 5

#	Project Name	Est. ISD	Status	Drivers
1	Johnson Draw Project 115 kV	09/2012	Complete	Reliability
2	Yoakum Co. bus rebuild	06/2014	Current	Reliability
3	Sulphur Springs – Cedar Lake 115 kV line	06/2015	Proposed	Reliability

Figure 30 – Table 6

Figure 31 – Zone 6 – Current and Proposed Projects

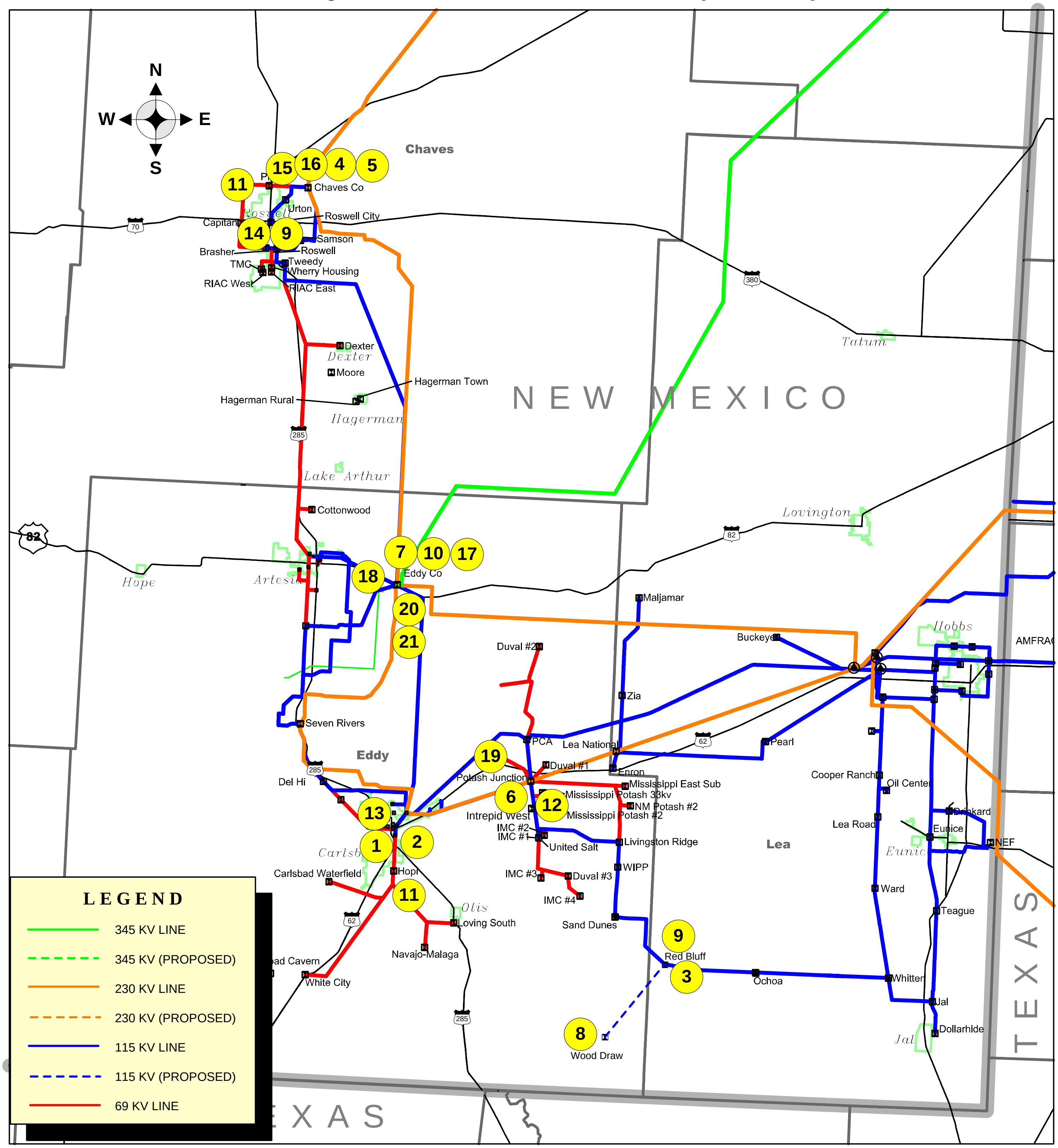


Figure 31 – Zone 6

Table 7: Current and Proposed Projects in Zone 6

#	Project Name	Est. ISD	Status	Drivers
1	Ocotillo Substation Convert to 115 kV	02/2012	Complete	Reliability
2	Ocotillo – Pecos 115 kV line	04/2012	Complete	Reliability
3	Red Bluff – Wood Draw 115 kV line Tap T41	07/2012	Complete	Reliability
4	Chaves 115 kV Bus Rebuild	12/2012	Current	Reliability
5	Chaves 230 kV Bus Rebuild	12/2012	Current	Reliability
6	POTASH_JCT 115/69 kV autotransformers upgrade	06/2013	Proposed	Reliability
7	Eddy County Breaker Failure Relaying	6/1/2013	Current	Reliability
8	Install the Backup protection system and Breaker Failure Relay on Breaker 4K25 at Roosevelt Intg.	06/2013	Proposed	Reliability
9	Install the Backup protection system and Breaker Failure Relay on Breaker 4K65 at Roosevelt Intg.	06/2013	Proposed	Reliability
10	Wood Draw 7.2 MVAr Capacitor	06/2013	Current	Reliability
11	Red Bluff 2-14.4 MVAr Capacitor	06/2013	Current	Reliability
12	Eddy Co 2nd 230/115 kV Autotransformer	06/2013	Current	Reliability
13	Hopi Conversion	10/2013	Proposed	Reliability
14	Intrepid West	12/2013	Proposed	Reliability
15	North Canal to Pecos	12/2013	Proposed	Reliability
16	Brasher Tap - Roswell Interchange Re-conductor 115 kV line	12/2013	Current	Reliability
17	Chaves Co. Interchange - Roswell Interchange Convert 69 kV line to 115 kV from (Convert Capitan & Price substations to 115 kV)	12/2013	Current	Reliability
18	Chaves Co 230/115 kV Transformer replacement	06/2014	Current	Reliability
19	Eddy Co SVC Controls Upgrade	12/2014	Current	Reliability
20	Build a new 115 kV line from Atoka-Eagle Creek and install terminal equipment	06/2015	Proposed	Reliability
21	Intercontinental Potash	12/2015	Proposed	Reliability
22	UPGRADE EDDY CO transformer 230-115 KV 250 MVA CKT 1	06/2016	Proposed	Reliability
23	Install a new 230 kV breaker in series with Breaker 4K70 at Eddy Co. Intg.	06/2017	Proposed	Reliability

Figure 32 – Table 7

Figure 33 - Zone 7 – Current and Proposed Projects

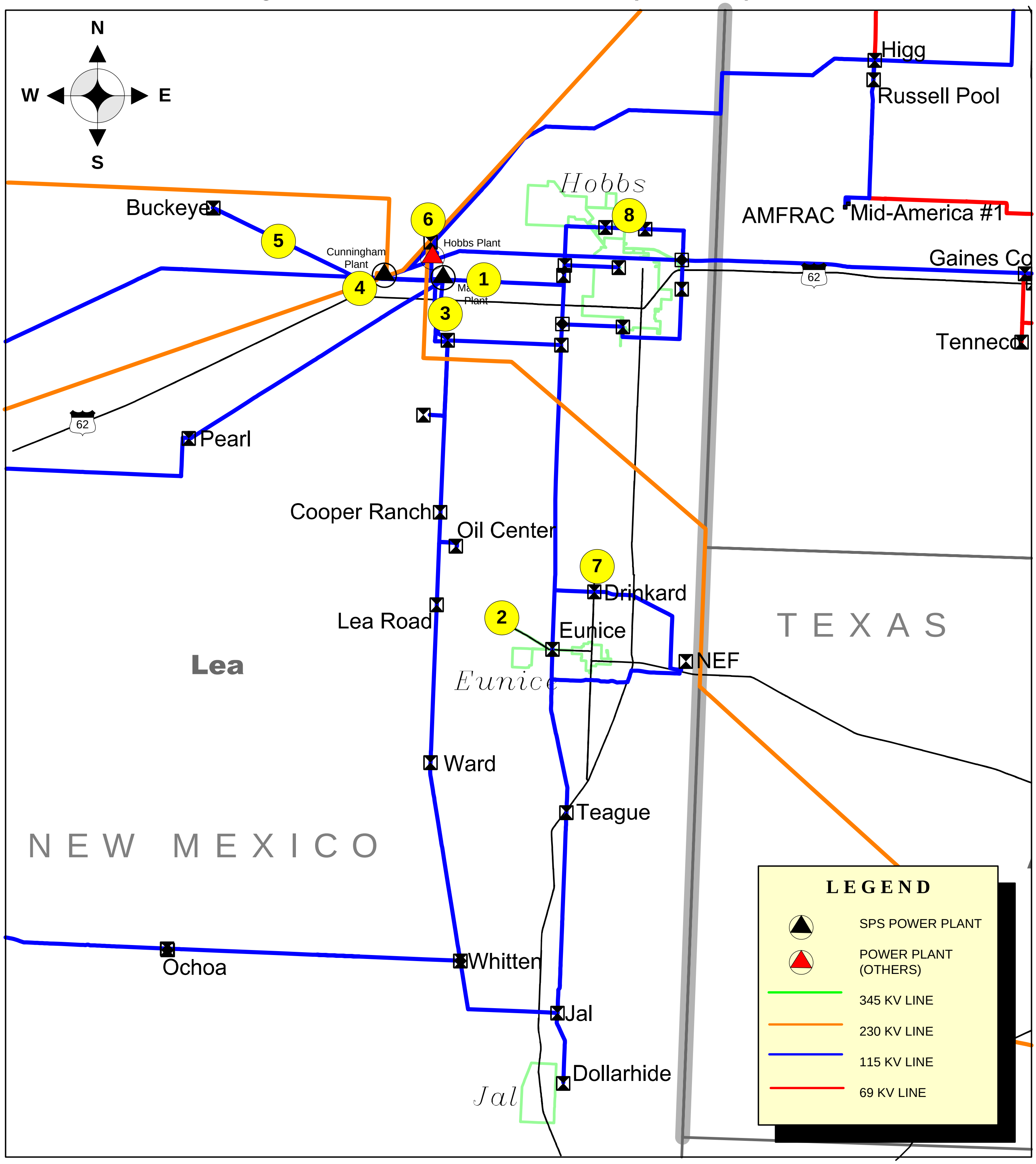


Figure 33 – Zone 7

Table 8: Current and Proposed Projects in Zone 7

#	Project Name	Est. ISD	Status	Drivers
1	Maddox Station - Sanger SW (T14) Re-conductor 115 kV line	05/2012	NTC	Reliability
2	Eunice Capacitor	06/2012	Complete	Reliability
3	Maddox Station - Monument (T42) Re-conductor 115 kV line	11/2012	Current	Reliability
4	Cunningham Station Breaker Failure Relaying	11/2012	Current	Reliability
5	Re-conductor 115 kV line from Cunningham Station to Buckeye Tap (V98)	10/2013	Current	Reliability
6	Lea County lines Re-terminate at Hobbs Interchange	12/2013	Current	Reliability
7	Drinkard 115 kV 14.4Mvar Capacitor	06/2015	Proposed	Reliability
8	Sanger SW - OXY Permian Sub (T14) Re-conductor 115 kV line	06/2017	Pending NTC	Reliability

Figure 34 – Table 8

Figure 35 – SPS-Ties– Current and Proposed Projects

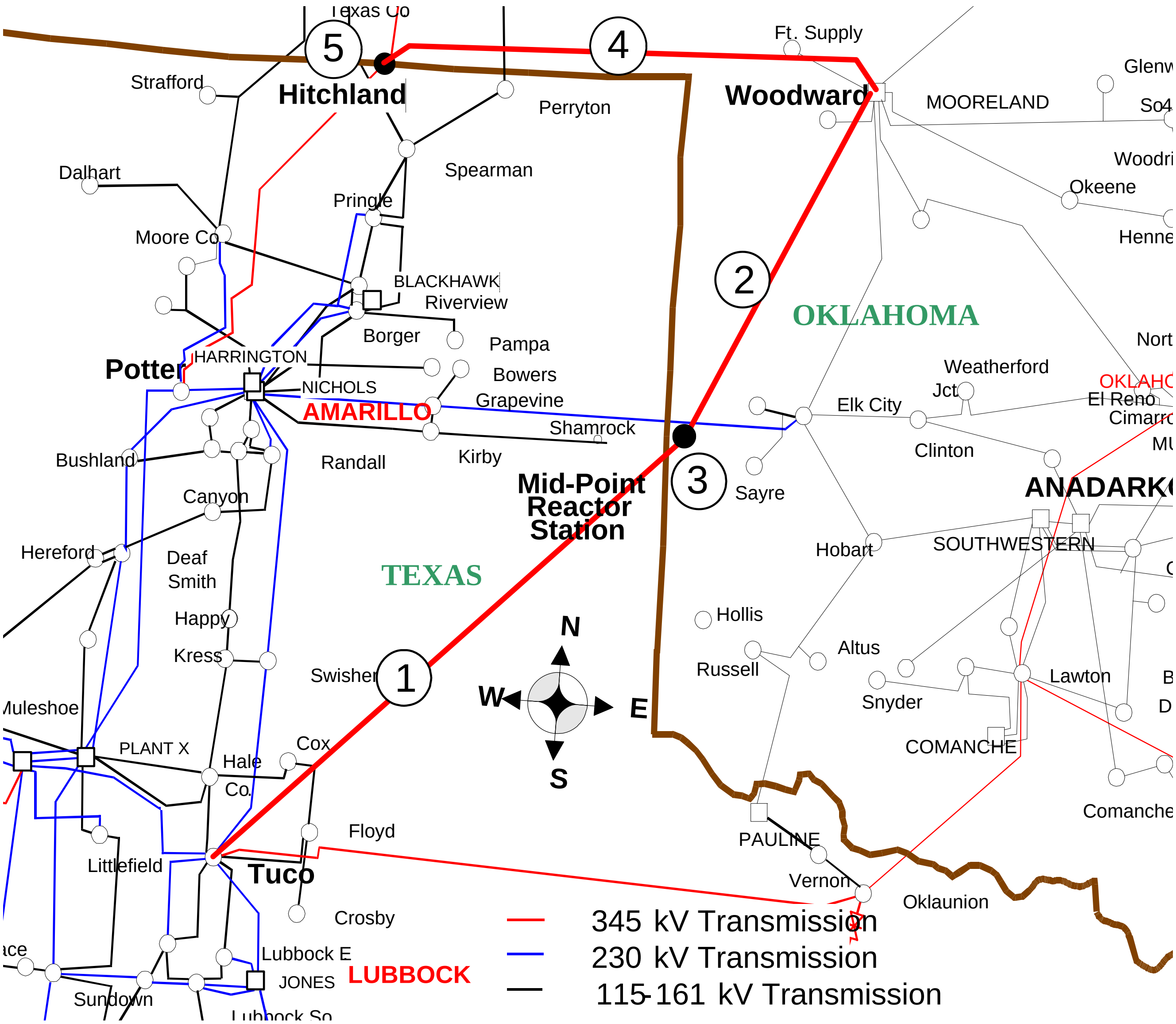


Figure 35 – SPS Ties

Table 9: Planned Tie-Line Projects

#	Project Name	Est. ISD	Status	Drivers
1	Tuco – Mid-Point Reactor Station 345 kV line	05/2014	Current	SPP-Bal-Port
2	Mid-Point Reactor Station - Woodward 345 kV line	05/2014	Current	SPP-Bal-Port
3	345 kV Mid-Point Reactor Station	05/2014	Current	SPP-Bal-Port
4	Hitchland to Woodward double-circuit 345 kV line	12/2015	Current	SPP EHV
5	XFR - Hitchland 345/230 kV ckt 2	06/2014	Current	Priority

Figure 36 – Table 9

D. Project Tracking Information

SPS provides to SPP project tracking information, such as in-service dates, updates cost estimates, key equipment delivery information on quarterly basis for the STEP projects. This information can be obtained by going to this link and downloading the records for SPS.

Link: http://www.spp.org/section.asp?pageID=114

III. Summary of the 10-Year Plan

A. Summary of Proposed Additions from 2012 – 2023

The transmission additions discussed in this report for the upcoming 10 year horizon are primarily for load serving purposes. They consist of numerous transformer upgrades, 230 and 115 kV transmission line construction, and installation of some transmission capacitor banks for improved voltage response in contingencies.

The sheer magnitude of the upgrades is due to heavy import into the SPS area and an increased load forecast for the SPS area through all years of the studies. SPS has added generation at Jones Plant and GSEC has added generation at TUCO Interchange. These plans have been included in this year's planning studies and therefore the timing of the SPP STEP upgrades has already considered the added generation to the SPS transmission system. SPS will continue to work with SPP to refine the list of upgrades as additional information becomes known.

The 2011 ITP process identified some locations where the conversion of the transmission service from 69 kV to 115 kV is needed to unload the overloaded 69 kV transmission system. Some of the locations identified for conversion were so identified because of their load amount. However some of these locations do not belong to SPS and careful coordination between customer and transmission service provider is warranted. The exact choice of which substation to convert to a higher voltage may change, but the trend for more 69 kV to 115 kV conversions will continue into the future.

B. Transmission Interface Expansion

SPS is aware of the interface issues which it faces. SPS is on the far western edge of the eastern electrical grid with AC interconnections available only to the north and east. Many SPP members have the potential for AC interconnection in all directions around their load service regions. As part of this report and the 2011 SPP ITP, no detailed study of the transmission interface capability (transfer capability) has been done. The study processes that are used in the SPP ITP do not assure that the proposed projects will be sufficient to import the required flows from resources external to SPS. As shown in section IV, the additions of the Tuco-Woodward 345 kV line plus the Hitchland to Woodward double circuit

345 kV lines are expected to raise export from SPS to SPP, but is not expected to improve import capability from SPP to SPS during the critical summer peak hours.

C. Challenges and Issues

SPS faces many upcoming challenges. They can be listed below.

a. Load growth – SPS continue to face significant new load additions, with SPS customers and wholesale customers that serve retail loads in the SPS system. Higher energy prices couple with strong demand have continued to mean new loads for the SPS area.

b. Transmission and substation construction level – availability of internal and external engineering and construction resources to support the transmission projects in this plan

c. Material deliveries – Industry pressure due to increased transmission development nationwide and higher focus on renewable energy. Challenge to make deliveries on needed dates.

d. NERC/FERC Compliance requirements – Additional compliance study requirements from the new TPL-001-2 standard may require additional transmission additions under short time frames. The ongoing FERC/NERC investigations of system disturbances may produce new planning requirements. Additional new standards looking at system protection and redundancy may require increased study efforts and more system modifications in response to the results obtained.