BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION

IN THE MATTER OF SOUTHWESTERN PUBLIC SERVICE COMPANY'S APPLICATION FOR REVISION OF ITS RETAIL RATES UNDER ADVICE NOTICE NO. 255,	)	**CASE NO. 15-00139-UT**
SOUTHWESTERN PUBLIC SERVICE COMPANY,	)	
APPLICANT.	)	

DIRECT TESTIMONY

of

JOHN S. FULTON

on behalf of

SOUTHWESTERN PUBLIC SERVICE COMPANY

TABLE OF CONTENTS

GLOSSARY OF ACRONYMS AND DEFINED TERMS

Acronym/Defined Term	Meaning
2009 Study	SPS Transmission and Distribution System Loss Evaluation Study for October 1, 2008 – September 30, 2009
2013 Study	SPS Transmission and Distribution System Loss Evaluation Study for July 1, 2012 – June 30, 2013
Base Period	Calendar year 2014
CCN	Certificate of Convenience and Necessity
Commission	New Mexico Public Regulation Commission
C1	Constructability I
Feeders	Primary Distribution Lines
FERC	Federal Energy Regulatory Commission
ISD	In-Service Date
kV	Kilovolt
Load Segments	Four time periods corresponding to monthly boundaries
MWh	Megawatt Hours
NERC	North America Electric Reliability Corporation
NTC	Notification to Construct
OATT	Open Access Transmission Tariff

Acronym/Defined Term	Meaning
PSCo	Public Service Company of Colorado, a Colorado corporation
PUCT	Public Utility Commission of Texas
Sales	Energy Deliveries
SPP	Southwest Power Pool
SPS	Southwestern Public Service Company, a New Mexico corporation
Study Period	July 1, 2012 – June 30, 2013
Test Year	Calendar year 2016
Transmission	Transmission and Operating Services Business Area
T&D	Transmission and Distribution
Xcel Energy	Xcel Energy Inc.
XES	Xcel Energy Services Inc.

LIST OF ATTACHMENTS

Attachment	Description
JSF-1	SPS Risk Assessment Categories (*Filename*: JSF-1.docx)
JSF-2	Electric Transmission Capital Additions – Transmission Plant for Period January 1, 2015 through December 31, 2016 (*Filename*: JSF-2.xlsx)
JSF-3	Electric Transmission Capital Additions – General Plant for Period January 1, 2015 through December 31, 2016 (*Filename*: JSF-3.xlsx)
JSF-4	Electric Transmission Capital Additions Intangible Plant for Period January 1, 2015 through December 31, 2016 (*Filename*: JSF-4.xlsx)
JSF-5	Cost Estimate Summary (*Filename*: JSF-5.docx)
JSF-6	Southwestern Public Service Company Loss Evaluation for 2013 Study Period (*Filenames*: JSF-6part1.docx and JSF-6part2.xlsx)

Case No. 15-00139-UT
Direct Testimony
of
John S. Fulton

I. WITNESS IDENTIFICATION AND QUALIFICATIONS

Q. Please state your name and business address.

A. My name is John S. Fulton. My business address is 600 S. Tyler Street, Amarillo, Texas 79101.

Q. On whose behalf are you testifying in this proceeding?

A. I am filing testimony on behalf of Southwestern Public Service Company, a New Mexico corporation ("SPS") and wholly-owned electric utility subsidiary of Xcel Energy Inc. ("Xcel Energy"). Xcel Energy is a registered holding company that owns several electric and natural gas utility operating companies.[1]

Q. By whom are you employed and in what position?

A. I am employed by Xcel Energy Services Inc. ("XES") as Manager, Transmission Planning South.

[1] Xcel Energy is the parent company of four wholly-owned electric utility operating companies: Northern States Power Company, a Minnesota corporation; Northern States Power Company, a Wisconsin corporation; Public Service Company of Colorado, a Colorado corporation ("PSCo"); and SPS. Xcel Energy's natural gas pipeline subsidiary is WestGas InterState, Inc. Xcel Energy also has two transmission-only operating companies, Xcel Energy Southwest Transmission Company, LLC and Xcel Energy Transmission Development Company, LLC, both of which are regulated by the Federal Energy Regulatory Commission ("FERC").

Q. Please briefly outline your responsibilities as Manager, Transmission Planning South.

A. I provide overall management direction for SPS's transmission planning staff in Amarillo. Their duties include planning new transmission facilities required for generation and customer additions. I also direct SPS's involvement with the Southwest Power Pool's ("SPP") transmission planning activities. In addition, I direct the preparation of the SPS transmission capital budget. Finally, I interact with retail and wholesale customers seeking new service, as well as wind developers working on interconnection with the SPS transmission system.

Q. Please describe your educational background.

A. I received my Bachelor of Science degree in Electric Engineering in 1974 from New Mexico State University. In 1977, I received a Master of Science degree in Electrical Engineering from New Mexico State University.

Q. Please describe your professional experience.

A. From 1974 to 1975, I was employed as an electrical distribution engineer with International Minerals and Chemical Corporation. In 1977, I joined West Texas Utilities Company as a planning engineer. I joined SPS as Supervisory Engineer, Electrical Operations, in 1979, and served in that capacity until 1982, when I

became System Operations Supervisor, Electrical Operations. In 1992, I became Principal Engineer, System Planning, and in 1997, I assumed my current position, supervising the transmission planning staffs for SPS and PSCo. In 2001, transmission planning for PSCo required a local manager and my position was changed to focus only on SPS.

Q. Do you hold a professional license?

A. Yes. I am a Registered Professional Engineer in New Mexico.

Q. Are you a member of any professional organizations?

A. Yes. I am a member of the Institute of Electrical and Electronics Engineers.

Q. Have you testified before any regulatory authorities?

A. Yes. I have filed testimony or testified before the New Mexico Public Regulation Commission ("Commission") in numerous cases, including base rate cases and certificate of convenience and necessity ("CCN") cases. Among other topics, I have testified on SPS's transmission planning activities, transmission capital additions, and SPP policies and activities that affect SPS's transmission operations, planning, capital expenditures, and other costs. I have testified on similar topics before the Public Utility Commission of Texas ("PUCT") and the FERC.

II. ASSIGNMENT AND SUMMARY OF TESTIMONY AND RECOMMENDATIONS

Q. What is your assignment in this proceeding?

A. My testimony will discuss the following three topics:

1. I explain how Transmission and Operating Services business area ("Transmission") capital projects are ranked and selected for funding.
2. I present the major Transmission capital additions that are included in SPS's Test Year.[2] As part of this discussion, I explain how the Transmission business area manages its capital expenditures.
3. I will discuss SPS's most recent Transmission and Distribution System Loss Evaluation Study ("2013 Study") conducted for the period of July 1, 2012 – June 30, 2013 ("Study Period"). SPS has requested approval of the 2013 Study in Case No. 14-00348-UT,[3]

[2] The Test Year in this case is calendar year 2016 ("Test Year"). The Base Period in this case is calendar year 2014 ("Base Period").

[3] *See* In the Matter of Southwestern Public Service Company's Application for Approval of: (1) Continued use of its Fuel and Purchased Power Cost Adjustment Clause ("FPPCAC") using a Monthly Adjustment Factor Under NMPRC Rule 550; and (2) the Report of Expenses Recognized and Revenues Collected or Refunded under the FPPCAC for the Period October 2012 through September 2014, Case No. 14-00348-UT, Application (filed November 21, 2014).

which is currently pending before the Commission, and requests that the Commission approve the 2013 Study in this case if approval has not been issued in Case No. 14-00348-UT.

In addition, I sponsor or co-sponsor Schedules M-3 and P-9 in the Rate Filing Package.

Q. Please summarize the conclusions and recommendations in your testimony.

A. The Transmission capital additions of $718,670,952 (total company) that SPS is requesting in this filing are reasonable and necessary, and support SPS's ability to provide safe and reliable electric service to its customers. With respect to SPS's loss factors, the 2013 Study results in a valid calculation of SPS's losses at several levels, which correspond to voltages on the transmission and distribution ("T&D") system at which customers are served.

III. TRANSMISSION CAPITAL ADDITIONS

Q. As part of this rate case, is SPS asking to include Transmission capital additions in its rate base?

A. Yes. SPS is asking to include in rate base Transmission capital additions it expects to close to plant-in-service during the period January 1, 2015 through December 31, 2016.

Q. Please describe these transmission capital additions.

A. The Transmission capital additions will expand the SPS transmission system infrastructure and upgrade the SPS transmission system to interconnect new generation resources, maintain reliability, and improve load-serving capability. Transmission capital projects may be generally separated into a few broad categories.

Q. Please describe the process SPS uses to determine which Transmission capital additions are included in its construction plans.

A. The Transmission Planning functional area develops the concept for transmission projects through technical studies that include new distribution load-serving substations; transmission upgrades based on the North America Electric Reliability Corporation ("NERC") reliability standards, new generation and transmission service requests, and discussions with SPP planning staff. SPP also

may issue to SPS a Notification to Construct ("NTC") for reliability projects, projects to provide transmission service under the SPP OATT, projects that have been determined by SPP to provide regional economic benefits, or projects required to provide service to new delivery points under the SPP OATT. All capital projects are ranked using a 10-point risk assessment metric, with 10 being the most urgent. The risk assessment categories are shown in Attachment JSF-1. Key drivers for the risk prioritization strategy include strategic, compliance, contractual agreements, reliability and regulatory mandated, economic, external, and other risk factors. The risk assessment process ranks projects on a scale of 1 through 10, with 5 through 10 being non-discretionary. Non-discretionary projects include outages, contractual agreement, regulatory mandated, projects that have received an NTC, interconnection agreement under FERC, and projects that have received a high ranking during the prioritization process.

Q. What is the dollar amount of the Transmission capital additions that SPS is requesting in this case?

A. The total dollar amount of Transmission capital additions to plant-in-service for the period beginning January 1, 2015 through December 31, 2016 is $718,670,952 (total company) for transmission infrastructure projects. This

amount consists of Transmission plant capital additions of $658,781,520, as well as general plant capital additions of $26,636,373, and intangible plant additions of $33,253,059. SPS witness Arthur P. Freitas will allocate the total company dollar amount among SPS's jurisdictions (New Mexico retail, Texas retail, and wholesale). Attachments JSF-2, JSF-3, and JSF-4 provide all of the Transmission capital additions to plant-in-service during this 24-month period.

Q. Please describe the information in Attachments JSF-2, JSF-3, and JSF-4, which provide details about the dollar amounts for the transmission capital additions.

A. Attachments JSF-2, JSF-3, and JSF-4 provide the following information:

Table JSF-1

Column A	Project Group Name	Provides the name for the project.
Column B	Parent Work Order Number	Provides the parent work order number for the project.
Column C	Parent Name	Provides name of parent work order.
Column D	Estimated ISD	Provides the estimated in-service date ("ISD") of the parent work order part of the project.
Column E	2015	Provides plant additions expected in calendar year 2015.

Column F	2016	Provides plant additions expected in calendar year 2016.
Column G	Total Period (Jan. 1, 2015 – Dec. 31, 2016)	Provides total plant additions expected in calendar years 2015 and 2016.
Column H	Project Description	Provides a short description of parent work order.
Column I	Cost Recovery Method	Specifies the method of cost recovery for the parent work order.
Column J	Project Type	Classifies the project into categories.

Q. Please describe the cost recovery methods listed in Attachments JSF-2, JSF-3, and JSF-4, column I.

A. The cost recovery method in column I of Attachment JSF-2, JSF-3, and JSF-4 explains how the capital costs are recovered. For example:

- Cust Funded – means that capital funds for the project are provided by the interconnection customer and there should be no revenue requirements in the SPS area.

- SPP Balanced Portfolio – means the revenue recovery follows the SPP Balanced Portfolio method of cost recovery as outlined in SPS witness William A. Grant's testimony.

- SPP Base Plan – means that, depending on the voltage of the project, if less than 300 kV and more than 100 kV, 2/3 of the revenue requirements will be rolled into zonal revenue requirements and 1/3 of the revenue requirements will be funded by the SPP region based on all SPP members' proportionate Load Ratio Shares. If less than 100 kV, then

100% of the revenue requirements are rolled into the SPS zonal transmission rates. If the project is more than 300 kV, then the revenue requirements are allocated by a load ratio share, which usually means approximately 12-15% of the revenue requirements are reflected in the SPS zonal transmission rates. These cost allocations may prospectively be modified by tariff changes over time. My description provided here describes the current tariff implementation.

- SPP Priority Project – means that 12-15% of the revenue recovery comes from customers in the SPS zone and the remaining revenue requirements are paid by other SPP members.

- SPS Zonal – means that 100% of the revenue requirements are rolled into SPS zonal transmission rates.

- SPS Directly Assigned – means that 100% of the revenue requirements are paid by SPS retail customers.

Some projects can have a combination of recovery methods as noted in Attachments JSF-2, JSF-3, and JSF-4. Mr. Grant discusses the SPP cost recovery methods in more detail in his testimony.

Q. Please describe the project types listed in Attachments JSF-2, JSF-3, and JSF-4, column J.

A. The project types listed in column J of Attachments JSF-2, JSF-3, and JSF-4 are as follows:

(1) *Transmission Service (TS)* – transmission system upgrades for new transmission lines and substations necessary to provide transmission service from generation to load inside the SPS area or through the SPS area under either the Xcel Energy Open Access Transmission Tariff ("OATT") or the SPP OATT. SPS is required

to make these upgrades under the OATTs. In addition, these capital additions provide a benefit to SPS's retail customers by enhancing the reliability of the transmission system and increasing SPS's access to generation resources.

(2) *Generation Interconnection (GI)* – transmission system upgrades necessary to connect new generation sources to the SPS transmission system as required by the SPP OATT. These capital additions may have the incidental benefit to SPS's retail customers of enhancing SPS's transmission system reliability.

(3) *Load Interconnection (LI)* – transmission system upgrades necessary to connect new load-serving substations for either SPS retail or wholesale customers, including cooperatives, municipal electric utilities, and other investor-owned utilities. The load interconnection request for the wholesale customers is made under the SPP OATT as their request constitutes a request for network transmission service. These capital additions provide a benefit to SPS's retail customers for the same reason the Transmission Service upgrades provide a benefit.

(4) *Reliability Projects (RE)* – transmission upgrades identified by SPS or the SPP that are necessary to maintain reliability on the SPS transmission system. Upgrades required from the SPP Transmission Expansion Planning process fall into this category as well. SPS's retail customers benefit from the maintenance and improvement in transmission system reliability by having a reduced risk with respect to both frequency and duration of outages, and reduced operational constraints.

(5) *System Refurbishment (SR)* – transmission upgrades to replace storm-damaged equipment and aged or failed equipment. SPS's retail customers benefit from these capital additions through a restoration of service, improved transmission reliability, the prevention of possible future outages, and avoiding higher maintenance costs associated with aging equipment.

(6) *Economic Projects (EC)* – transmission projects that were developed through SPP's Integrated Planning Process which provide economic benefits either to SPS or the SPP region.

(7) *Other (OT)* – transmission projects such as tools and equipment purchases, spare parts, and data acquisition including fault or disturbance recorders. These capital additions support the projects in the first five categories discussed above and enhance or improve transmission reliability by enabling SPS to conduct diagnostic testing to prevent outages.

Q. Are the Transmission capital additions to plant-in-service during the period of January 1, 2015 through December 31, 2016 reasonable and necessary?

A. Yes. The projects listed on Attachment JSF-2 are necessary to expand and sustain the transmission grid that serves as the path between generation and the distribution system. For example, SPS must construct new transmission lines and substations to interconnect new generation and/or deliver energy reliably through the transmission grid. SPS also must complete transmission system rehabilitation projects related to transmission line and substation improvements, replacement of obsolete and failed equipment, and replacement of systems damaged by storms. These new and reinforced transmission lines, substations, and protection and control systems are integral to providing reliable service to SPS customers.

Q. Why are the Transmission capital additions reasonable and necessary?

A. Attachment JSF-2 provides a description of each project. These projects were required to meet the obligations of SPS as a member of the SPP OATT, provide network transmission service under the Xcel Energy and SPP OATTs, provide infrastructure for new transmission and distribution load service, and provide a reliable network with improvements and refurbishments, where needed.

Q. Please identify the major Transmission capital projects that are planned to go into service during 2015 and that are estimated to be more than $5,000,000.

A. The major Transmission projects SPS plans to place in service in 2015 are listed in Table JSF-2 below. The project type abbreviations are discussed above and correspond with column J of Attachments JSF-2, JSF-3, and JSF-4.

Table JSF-2
2015 Major Transmission Projects

Project Title	Project Dollars	Necessity of Project	Project Type
OPIE 1 Road Runner (IntercPotash Conn)	*60,221,590*	This project provides a facility called Roadrunner Substation, to connect a new potash mine, Intercontinental Potash, to the 115 kV transmission system in SE New Mexico.	*RE*

Project Title	Project Dollars	Necessity of Project	Project Type
GSEC GB NP Howard-Miami	*27,092,614*	This project rebuilds the existing 69 kV line with a new line that is larger conductor and insulated for 115 kV in preparation for operation.	*RE*
STEP Pleasant Hill	*25,995,816*	This project constructs a new 230/115-kV interchange and substation with associated 230-kV and 115-kV transmission lines near the Clovis, New Mexico area and a 345-kV transmission line from Amarillo, Texas to Clovis. The project will provide additional support for the eastern New Mexico area.	*RE*
S&E - SPS Line	*14,047,013*	These projects involve storm and emergency blanket work orders for repair of facilities due to inclement weather or natural disasters.	*SR*
OPIE 2 Battle Axe 115kV	*13,098,562*	This project constructs a 115 kV line from Roadrunner to the new Battleaxe distribution substation.	*LI*
KC Substation	*12,401,080*	This project constructs the Diamondback Substation, a 115/69 kV substation southeast of Lubbock, Texas.	*RE*

Project Title	Project Dollars	Necessity of Project	Project Type
W28 Rebld/Recon Ochlitree-Cole	*12,073,255*	This project will rebuild the existing 115 kV line between Ochiltree Substation and Cole Interchange with larger conductor. This line is in the northeast Texas Panhandle.	*RE*
Potter-Channing-Dallam	*11,844,605*	This project converts the new Potter-Channing-Dallam 115 kV (built for 230 kV) to 230 kV operation and reconnects the substations to 230 kV facilities and installs the XIT 230/115 kV substation.	*RE*
OPIE 1 North Loving (Hopi to Capano)	*8,984,212*	This project constructs a 115-kV line from Hopi Substation, near Carlsbad, NM to new North Loving Substation, southeast of Carlsbad, NM to serve additional loads and provide increased network reliability. The Loving area is currently served at 69 kV.	*RE*
China Draw	*8,573,938*	This project creates a 115-kV and 345-kV substation south of Carlsbad, New Mexico to provide service and transmission support for developing loads in the southeast part of New Mexico.	*RE*

Project Title	Project Dollars	Necessity of Project	Project Type
SPS Line Capacity	*7,872,916*	This project surveyed and verified the line ratings of the SPS transmission system for lines above 100 kV. This project is a required response to a NERC initiative.	*SR*
OPIE 2 DCP Zia 2 Quahada Project	*7,766,791*	This project constructs a new 4-breaker 115-kV ring bus at the intersection of PC - Cunningham and Maljamar - Intrepid 115-kV lines. It also constructs the radial tap to the customer's new distribution substation.	*RE, LI*
Lynn Co. Dist. Load Conversion	*7,703,827*	This project converted a 69-kV distribution transformer to 115 kV to prevent overloading of the 115/69 kV transformers at Lynn County Substation, south of Lubbock, Texas.	*OT*
SPS Xfmr - Mobile/Spare	*6,428,755*	This project provides for replacement of the 115/69 kV mobile sub, purchase of two spare 115/69 kV transformers, and a spare 230/115 kV transformer.	*SR*
Nichols 115kV BFR	*6,390,043*	This project adds breaker failure relaying to the 115-kV bus at Nichols Plant, in Amarillo, Texas.	*RE*

Project Title	Project Dollars	Necessity of Project	Project Type
Zodiac Substation	*6,244,604*	This project converts the 69 kV Zodiac Sub to the 115 KV Kilgore substation and builds new 115 kV line from Portales Intg to serve it.	*RE*
Bowers-Howard 115kV	*5,734,179*	This project connected the Bowers Substation to the Howard Substation via a 115-kV transmission line at the existing Howard Substation.	*RE*

Q. Please identify the major Transmission capital projects that are planned to go into service during 2016 and that are estimated to be more than $5,000,000.

A. The major projects planned to go into service in 2016 are listed in Table JSF-3 below.

Table JSF-3
2016 Major Transmission Projects

Project Title	Project Dollars	Necessity of Project	Project Type
Curry to Bailey 115kV	*34,102,849*	This project constructs a new 115-kV line between Curry Interchange in Clovis, New Mexico to Bailey County Interchange in Texas.	*RE*

Project Title	Project Dollars	Necessity of Project	Project Type
OPIE 3 China Draw SVC	*28,977,278*	This project will install a 115 kV -70/+200 Mvar Static Var Controller (SVC) at the 115kV China Draw bus.	*RE*
OPIE 3 Road Runner SVC	*28,423,092*	This project will install a 115 kV -70/+200 Mvar Static Var Controller (SVC) at the 115-kV Roadrunner bus.	*RE*
Bowers-Howard 115kV	*27,690,441*	This project connected the Bowers Substation to the Howard Substation via a 115-kV transmission line at the existing Howard Substation.	*RE*
OPIE 2 Livingston Ridge-Cardinal 115kV_PID 30695	*26,187,108*	This project constructs a 115-kV line between Livingston Ridge and Cardinal substations in southeast New Mexico.	*RE*
Atoka-Eagle Creek	*21,764,632*	This project constructs a 115-kV line from Atoka Substation, south of Artesia, New Mexico to Eagle Creek Substation in Artesia.	*RE*
Osage Re-termination Project	*14,943,355*	This project re-terminates the lines around Osage Station near Amarillo to eliminate the station.	*RE*

Project Title	Project Dollars	Necessity of Project	Project Type
Z66 Booker/Wade Conversion	*13,679,825*	This project will remove the existing 69-kV line Z-66 (Perryton-Booker) and replace it with a new 115-kV transmission line. It will also convert the existing Wade and Booker to 115 kV. The source will be moved to the Ochiltree 115-kV bus, near Perryton, Texas.	*RE*
Andrews County Substation	*12,861,408*	This project constructs a new 230/115-kV substation southeast of Hobbs, New Mexico.	*RE*
Salt Creek	*10,466,004*	This project constructs a new 115-kV distribution substation east of Wheeler, Texas, called Salt (Coburn) Creek Substation. It also constructs a ~ 10 mile line from Wheeler Substation to Salt (Coburn) Creek to provide the source for the new distribution substation.	*LI*
Pringle 115 kV Breaker & One-Half	*8,965,171*	This project rebuilds the 115-kV bus at Pringle Substation to a breaker and a half design.	*RE*
SPS Major Line Refurbishment	*8,847,647*	This project refurbishes various 230-kV lines in the SPS system.	*SR*
SPS Sub Communication Network Group 1	*8,655,389*	These projects provide communications equipment for control and monitoring of the named substations.	*OT*

Project Title	Project Dollars	Necessity of Project	Project Type
NEWHART 230/115 kV Add Transformer #2	*8,105,409*	This project installs a 2nd 230/115 kV transformer at Newhart Substation, south of Amarillo, Texas.	*RE*
Carlisle to Wolfforth	*7,303,926*	This project constructs a 230-kV line between Carlisle Sub and Wolfforth Substation, near Lubbock, Texas.	*RE*

Q. Some of the costs listed in Table JSF-2 are noted as "SR" or System Refurbishment work orders (*e.g.*, "Relays ELR – SPS" Parent No. 10941117). What is a System Refurbishment work order?

A. A System Refurbishment or "blanket" work order involves multiple projects or improvements being constructed under the same work order with various in-service dates. There are several blanket work orders included in the January 1, 2015 through December 31, 2016 projects. Blanket work orders are generally set for a calendar year, but the projects may be completed beyond that year. These work orders allow upgrades to replace aged equipment, upgrades to avoid higher maintenance costs and future outages, and also provide for restoration of service when storms damage the transmission system. For example, work orders with the "ELR" in the name are targeting "end of life" replacement of poles, transmission

hardware, or transmission equipment, such as protective relays, or communications equipment. Replacing this equipment before it fails is important in maintaining the reliability of service to SPS customers. In Attachment JSF-2, a number of these types of blanket work orders have in-service dates beyond the end of the Test Year, but the capital costs shown are those expected to close to plant in service in the two periods represented (Columns E through G).

Q. In Attachments JSF-2 and JSF-3, some of the transmission capital additions have a cost recovery method of "SPP Base Plan." Please describe "SPP Base Plan" projects.

A. The SPP OATT defines Base Plan Upgrades as "those upgrades included in and constructed pursuant to the SPP Transmission Expansion Plan in order to ensure the reliability of the Transmission System." In effect, Base Plan Upgrades are transmission infrastructure projects approved by the SPP to enhance reliability of the transmission system. As discussed previously in my testimony, SPS will receive an NTC for these projects from the SPP. Projects that have this type of recovery are allocated 2/3 of the revenue recovery from the SPS area and 1/3 of the revenue recovery from customers across the SPP footprint, as required in the

SPP OATT. The testimony of SPS witness William A. Grant discusses Base Plan Upgrades and NTCs in more detail.

Q. Did any of the projects listed in Attachment JSF-2 require a CCN from the Commission?

A. Yes. A CCN was required for the 230-kilovolt ("kV") lines in the Pleasant Hill Project. The 230-kV lines will connect from Pleasant Hill to Roosevelt Substation and Pleasant Hill to Oasis Substation. The Pleasant Hill project is north of Clovis, New Mexico. The Commission granted the CCN on July 3, 2012 in Case No. 12-00027-UT.[4]

Q. Please explain the projects listed in Attachments JSF-3 and JSF-4.

A. These projects are part of the overall transmission capital construction effort and include general plant and intangible plant projects such as: communication projects, computer software and hardware projects, tools for transmission employees, and fleet purchases for transmission employees.

[4] *In the Matter of Southwestern Public Service Company's Application for: (1) Issuance of a Certificate of Public Convenience and Necessity Authorizing Construction and Operation of Two 230 KV Transmission Lines and Associated Substation Facilities in Curry and Roosevelt Counties, New Mexico; (2) Approval of the Location of the 230 KV Transmission Lines and Associated Facilities; and (3) Authorization to Accrue an Allowance for Funds Used During Construction for the Transmission Lines and Associated Facilities,* Case No. 12-00027-UT, Final Order (Jul. 3, 2012).

Q. Please describe how the Transmission and Operating Services Business Area develops cost estimates for proposed Transmission capital additions.

A. Please refer to Attachment JSF-5, which shows the general estimating steps and what project information is available as a project goes from creation to construction. When a project is prepared for the capital budget, a preliminary scope is developed by the Transmission Planning or other submitting organization and provided to the Project Management organization. Project Management then requests cost estimates from the Substation/Transmission Engineering & Design organization. Project Management and Substation/Transmission Engineering & Design are both part of the Portfolio Delivery organization. The Portfolio Delivery organization is responsible for the management of project design and construction and insuring projects are constructed within the desired scope requirements and the approved financial costs. The initiation of the project can come from an SPP proposed or issued NTC, a study done to add new load to the system under Attachment AQ of the SPP tariff, a request to perform capital maintenance work through the System Sustainability organization, the development of a generator interconnection agreement, SPS distribution, a

wholesale load serving entity, or through a combination of these paths and others as well.

Although projects can be initiated by different mechanisms, the estimating process is the same. An initial estimate is requested. If the project is an internally-developed budget item, the initial estimate is a scoping estimate and is intended to be within 30% of the total expected project cost. If the initial estimate is for a generator facilities study or a project proposed in response to an NTC, SPP's tariff includes additional cost estimation and oversight requirements.

Each project proceeds through various design review processes, called constructability processes, which review the scopes and estimates of a project at different stages in the project's development. The Constructability I ("C1") process evaluates the validity of the initial scope and looks for a fatal flaw in the proposed project. After the C1 process is complete, a Constructability 1.5 process is performed. This process involves a field visit to the area of the project to identify any issues which cannot be discovered through review of drawings. If changes are necessary due to issues discovered during a field visit, then the scope is modified. The project next proceeds through the Constructability II process, where a ±20% accuracy appropriation estimate is required. Following completion

of the project design, but prior to start of construction, a ±10% engineering estimate is developed. The engineering estimate is the most accurate estimate created for the project and is prepared after due consideration of the construction site and inclusion of known extenuating circumstances. In most cases, the engineering estimate includes actual material costs and may include construction bid pricing. This is the final estimate developed and is the final control point for project cost and schedule. During the constructability processes, input is sought from stakeholders such as engineering, operations, construction, siting and land rights, and regulatory, as needed. Other stakeholders may be involved depending on the nature of the project. At this project stage, information regarding the site and scope is known. Information regarding external influences such as final material delivery, outage windows, and contractor availability may be less certain.

At each stage in the constructability processes, estimates are refined with better knowledge and less uncertainty, which leads to a higher level of accuracy when the first construction actions are taken. The estimates account for material, labor (contract or internal), overheads, and contingency.

SPS uses the Hard Dollar estimating tool program to generate estimates. Hard Dollar contains a database of historical engineering and construction costs

that engineers can draw upon to prepare estimates. Engineers use templates from similar projects to ensure their estimates include all the necessary cost elements, and check their estimates against a benchmarking database to validate transmission costs using their cost per mile metrics or voltage and number of breakers for substations. Any engineering consultants hired to provide estimates use this same tool to ensure that their estimates are consistent with the methods used to prepare estimates that are generated internally.

Q. As an example, please explain how cost estimates were derived for the Curry to Bailey 115 kV Project (2016).

A. The Curry to Bailey 115-kV line project resulted from the SPP 2012 Integrated Transmission Planning Near Term study. The project was identified by SPP as an improvement needed for reliability in the western part of the SPS system. Since an NTC was issued and SPS had participated in the study process with SPP, SPS had provided an initial study estimate for SPP's use. This estimate was provided prior to the issuance of an NTC by SPP. After the SPP had issued the NTC, SPS provided a refined estimate, required by SPP's procedures, upon acceptance of the NTC. Because this project required a CCN in Texas, detailed routing information and cost estimates were prepared and submitted to the PUCT. Internally, the

project was moving through the project management and estimating processes described above. Thus, cost estimates for the project were subject to multiple levels of review and oversight.

Q. Please explain the process SPS follows to manage capital costs.

A. After capital projects are approved through the budgeting process, they are reviewed on a monthly basis to compare the monthly forecast to actual funds spent. Review is also performed to compare year-to-date actual performance with year-to-date and year-end forecasts. Deviations are identified and recommendations to meet financial targets are reviewed and approved. Changes are reported to the Financial Performance and Planning group, which monitors capital spending. If the project is an SPP NTC project, SPS must report the estimated completion cost of the NTC project quarterly to SPP. If the estimated cost of the project exceeds SPP's requirements, the estimate is sent for management review by the SPP Project Cost Working Group and other stakeholder groups. If the costs are significantly outside of the allowable range, the project may be canceled by SPP.

Q. How are contingencies encountered during the year handled in managing the capital budget?

A. The approved capital budget contains contingency funds identified for use on transmission, generation, and transmission to transmission interconnection agreements that may not have been executed when the budget was developed. Generation interconnection agreements, when executed, are mandatory under the SPP Generator Interconnection Procedures. Transmission interconnection projects are also mandatory under the SPP OATT. Projects that arise outside of the original budget planning cycle are funded using these contingency funds. If additional funding is needed, approval for the project is sought in the same manner as any new capital budget item with appropriate engineering, management, and financial reviews. The capital budget also includes routine blanket amounts for transmission line and substations to cover unexpected events that require capital expenditures. These funds are utilized for emergency outages that occur during the year. The capital blanket amounts included in the budget are developed based on historical requirements for the repair of failed equipment and/or storm-damaged equipment.

Q. Are the transmission plant additions included in Attachments JSF-2, JSF-3, and JSF-4 reflective of the transmission plant that SPS expects to place in service from the end of the Base Period through 2016?

A. Yes, for the reasons I have previously discussed in my testimony.

Q. Are the transmission plant additions included in Attachments JSF-2, JSF-3, and JSF-4 reasonable and necessary?

A. Yes, for the reasons discussed above in my testimony.

IV. 2013 LOSS FACTOR STUDY

Q. What topic will you address in this section of your testimony?

A. This section of my testimony describes SPS's most recent Transmission and Distribution System Loss Evaluation Study. The Commission last approved loss factors for SPS in Case No. 10-00395-UT based on a study SPS prepared in 2009, SPS's Transmission and Distribution System Loss Evaluation Study for October 1, 2008 – September 30, 2009 ("2009 Study").[5] SPS has prepared a new loss study, the 2013 Study, which was conducted employing the core methodology used to develop the loss factors currently being utilized in New Mexico, with a few changes that I discuss later. The 2013 Study results in a valid calculation of SPS's losses at several levels, which correspond to voltages on the T&D system at which customers are served. The 2013 Study is Attachment JSF-6 to my testimony.

[5] *In the Matter of Southwestern Public Service Company's Application for Revision of its Retail Rates Under Advice Notice No. 234,* Case No. 10-00395-UT, Final Order Adopting Amended Certification of Stipulation (Dec. 28, 2011); s*ee* Uncontested Comprehensive Stipulation at 8-9, (Sept. 12, 2011) and Amended Certification of Stipulation at 39-40 (Dec. 12, 2011).

A. SPS'S 2013 Loss Evaluation Study

Q. Why was it necessary for SPS to perform a new loss evaluation study?

A. During the Study Period, energy supplies (*i.e.*, resources) and energy deliveries ("Sales")[6] were higher in absolute terms than in the 2009 Study. As a percentage of SPS's total resources, however, actual losses were slightly less than in 2009. The losses calculated in the 2013 Study are 1,836,997 megawatt hours ("MWh"), which is only 0.83% more than actual losses (*i.e.*, calculated losses equal 100.83% of actual losses).

The following Table JSF-4 compares data from the 2009 and 2013 loss studies.

Table JSF-4

Comparison of 2009 and 2013 Loss Study Data[7]

Subject	2009 Study	2013 Study
Total Resources	29,707,136 MWh	32,964,320 MWh
Total Sales	27,867,115 MWh	31,142,401 MWh

[6] The sum of energy SPS sold to customers and delivered to interconnections with other utilities at the points the energy left the SPS transmission and distribution system, collectively "Sales."

[7] Data presented are rounded, which may result in calculations not totaling properly. Loss study spreadsheets frequently display rounded data, but use the unrounded data in the calculations.

Subject	2009 Study	2013 Study
Actual Losses	1,840,020 MWh	1,821,919 MWh
Overall Loss Percentage	6.19%	5.53%
Calculated Losses	1,829,126 MWh	1,836,997 MWh
Calculated Losses as % of Actual Losses	99.4%	100.83%
Undeterminable Losses	10,894 MWh	-15,079 MWh
Peak Load	5,456 MW	6,079 MW
Backbone Trans. Loss Factor	1.024427	1.025158
Sub-Trans. Loss Factor	1.032089	1.032914
Primary Dist. Loss Factor	1.112001	1.099263
Secondary Dist. Loss Factor	1.132439	1.120217

Q. Has SPS's 2013 Study been presented in any other jurisdiction?

A. Yes. The 2013 Study was presented to the PUCT in Docket No. 42004 and was approved on December 19, 2014.[8]

[8] *See* Application of Southwestern Public Service Company for Authority to Change Rates and to Reconcile Fuel and Purchased Power Costs for the Period July 1, 2012 through June 30, 2013, Docket No. 42004, Final Order at Finding of Facts 40 and 41, Conclusion of Law 7, and Ordering Paragraph 1 (December 19, 2014).

Q. Is SPS's request that the Commission approve the 2013 Study pending in any other case?

A. Yes. In Case No. 14-00348-UT (fuel continuation), which is currently pending before the Commission, SPS has requested that the Commission approve SPS's updated line loss factors as set out in the 2013 Study and SPS's use of those line loss factors in calculating its monthly fuel and purchased power cost adjustment clause.

Q. What are electrical "line losses"?

A. As electrical current flows from a generator to a customer using electricity (a "load"), it passes through wires and transformers that have inherent electrical resistance. Some amount of the power put into the utility's T&D system is converted to heat and thereby "lost" due to this inherent resistance. In addition, no-load losses are also incurred in serving customers. These losses are caused by the magnetizing current needed to energize the core of the transformer, and do not vary according to the loading on the transformer. They are constant and occur regardless of the load, hence the term no-load losses. Total line loss is the difference between the electrical energy put onto the T&D system and the electrical energy that was either sold to customers or delivered to exit points on

the utility's T&D system. For example, if a utility generates 1,000 MWh and experiences overall losses of six percent, it will only be able to deliver 940 of the 1,000 MWh generated. The 60 MWh difference between the amounts generated and delivered to customers is line loss. Line losses are a normal feature of a properly functioning electrical system and are unavoidable.

Q. In your example, would each customer cause the utility to lose six percent of the energy generated?

A. Not generally and not on SPS's system. In order for electricity to reach a typical residential customer, it must flow from the generator through generation unit main transformers, then through bulk transmission lines and related autotransformers, then through transformers at a distribution substation, then through primary distribution lines, then through a pole top transformer, then through a secondary distribution line from the pole top transformer to a pole behind the residence, and finally through a service line (*i.e.*, "a drop") from the pole to the meter on the side of the house. At each step described above, losses are incurred to serve the residential customer.

By contrast, to reach an industrial customer taking service at 230 kV, the electricity has to flow through only the generation unit main transformer, some

bulk transmission lines, and a 345/230 kV autotransformer. None of the losses incurred at distribution substations, primary distribution lines, distribution transformers, secondary lines, and drops are experienced in serving an industrial customer taking service at transmission voltage. Thus, in general, customers taking service at higher voltages cause fewer losses to be incurred than do customers taking service at lower voltages. On SPS's system, customers take service at multiple voltages ranging from 230,000 volts to 120 volts.

Q. Do utilities in general and SPS in particular have meters installed at each step in the electrical flow described above so that losses at each step can be measured?

A. No. In general and on SPS's system, meters exist at generators, at locations where SPS's transmission lines interconnect with transmission lines of other utilities, and at points of sale to customers. Thus, SPS can use meters to measure the total electrical energy placed on its T&D system, whether from generators located within or outside its system, and the total energy Sales. The difference between total resources and total Sales is the actual loss incurred.

Given that meters do not exist at each step at which losses are incurred, a loss evaluation study is performed to quantify, through engineering analysis and

calculations, the physical power and energy losses that occurred at various locations on the T&D system during the study period.

Q. What circuit elements of SPS's electrical system were analyzed in the 2013 Study?

A. The circuit elements analyzed were: (1) the transmission lines, (2) the autotransformers, (3) the distribution substation transformers, (4) the distribution primary feeder circuits, (5) the distribution line transformers, and (6) the distribution secondary lines and drops.

Q. You stated that the 2013 Study calculates losses at several levels. Please identify the loss levels and circuit elements contained in each loss level.

A. Loss levels 2 through 6 and the circuit elements in each loss level are identified below. Loss Level 1 is the generator and no losses are calculated at this level.

<u>Loss Level 2 – Backbone Transmission</u>

- Bulk transmission lines (345 kV, 230 kV, and 115 kV); and
- Autotransformers (345/230 kV and 230/115 kV).

<u>Loss Level 3 – Sub-Transmission</u>

- 69 kV transmission lines; and
- Autotransformers (115/69 kV).

Loss Level 4 – Distribution Primary

- Transformers located at distribution substations; and
- Primary Distribution Lines ("feeders") (33 kV – 2.4 kV).

Loss Level 5 – Distribution Secondary Transformers

- Transformers in the field.

Loss Level 6 – Distribution Secondary and Service Lines

- Secondary distribution lines running from Level 5 transformers to other poles or service points and service lines running to customers' premises.

In setting fuel factors, the losses at Levels 5 and 6 are combined to create a "Distribution Secondary" classification.

Q. Is it appropriate to perform a loss evaluation study over a period shorter than 12 months?

A. In general, no. The loss evaluation study must correlate energy generated and purchased for customers with sales to those customers. SPS bills customers each normal business day of each month. Customer billing is done mostly on a monthly basis; however, it does not always respect the calendar month boundary. The billing may cover part of a previous calendar month or may only cover part of the current month, with no overlap into a previous month. When all sales are

totaled and compared to that billing month's generation and power purchases, there will be a difference, which may be a positive or a negative number. This difference does not necessarily reflect the actual losses incurred on the T&D system during this billing month. This precludes doing a loss evaluation study for a short period of time.

Q. How does a longer time period aid in preparing a loss study?

A. By using a longer time period, such as one year, the effects of the customer billing cycles are minimized.

Q. Did the 2013 Study consider losses of customers operating their own T&D systems?

A. No. SPS evaluated losses up to the customers' meters, but not beyond because SPS does not incur the losses that occur beyond the customers' meters.

Q. Please describe the method used to evaluate the transmission system losses.

A. For peak demand losses, the 2013 summer peak was modeled with powerflow studies and the losses per circuit element were tabulated and grouped by voltage category. Any loss contribution due to no-load losses was also considered. For energy losses, the Study Period was divided into four time periods corresponding to monthly boundaries ("Load Segments") and average loads were computed for

each segment. Powerflow studies determined the losses for each circuit element during each of the four segments. The average loss per circuit element was determined and multiplied by the hours in the Load Segment to determine the energy losses. The months included in each Load Segment are identified in Appendix A of Attachment JSF-6.

Q. What are "no-load losses"?

A. Whenever a transformer is energized, a relatively small loss occurs even during hours when no current is passing through the transformer. These losses are referred to as "no-load losses." Since transformers are typically energized every hour of the year, no-load losses must be calculated for each transformer in order to accurately estimate losses incurred at each transformer location.

Q. In performing the 2013 Study, did SPS use the same core methodology and analytical tools used in the 2009 Study?

A. Yes. The powerflow studies were performed using the same computer program used in 2009. The 2013 Study Period was divided into four Load Segments. On SPS's system, it is not unusual to use four or five segments to analyze a study period. If the study period ends with September, as the 2009 Study did, then five load segments may be used because average loads in September are often very

different from average loads in July and August and, thus, September becomes its own segment. For this study, the final month in the study was June so a four segment structure was analyzed and found to be an acceptable model for the year under study.

Q. Where are transmission level losses discussed in the 2013 Study?

A. The circuit elements (*i.e.*, lines and transformers) of the transmission system are identified in Section 1.1 of Attachment JSF-5, and the process for calculating losses for each type of circuit element is discussed in Sections 2 through 5.

Appendix M of Attachment JSF-5 presents a summary of losses for each type of circuit element at both transmission and distribution levels.

Energy losses by level are stated in Appendix O in the column labeled "kWh Loss by Level" and Levels 2 and 3 are the transmission voltage levels.

Losses for individual transmission circuit elements are tabulated in Appendices E, F, and G.

The summary results of the powerflow studies are in Appendix N.

Q. Please describe the methodology used to determine distribution losses.

A. Peak demand and energy losses were calculated for the elements in the distribution system and accumulated based on a typical representation of SPS's

distribution system. Losses were calculated for the distribution substation transformer, the primary feeders, the secondary network (including pole top transformers), and the service drops to the customers. The annual energy loss was determined by calculating annual energy loss per distribution element and summing up the total energy loss. Similarly, demand losses were determined on each component of the distribution system and aggregated.

Q. Where are distribution level losses discussed in the 2013 Study?

A. The circuit elements (*i.e.*, lines and transformers) of the distribution system are identified in Section 1.1 of the Attachment JSF-6, and the process for calculating losses for each type of circuit element is discussed in Sections 6 through 9.

Appendix M of this attachment presents a summary of losses for each type of circuit element at both transmission and distribution levels.

Energy losses by level are stated in Appendix O in the column labeled "kWh Loss by Level" and Levels 4, 5 and 6 are the distribution voltage levels.

Losses for individual distribution circuit elements are tabulated in Appendices I, J, K, and L.

Q. What are the results of the 2013 Study?

A. Total losses for the Study Period were 1,821,919 MWh, and the losses determined through the 2013 Study's engineering analysis were 1,836,997 MWh. The undetermined losses are the difference, -15,079 MWh, which is 0.83% of the actual losses. *See* Attachment JSF-6, Appendix M, lines 44 (total losses), 42 (determined losses), and 43 (undeterminable losses).

Q. Can you determine the reason for the -15,079 MWh difference between the losses estimated in the 2013 Study and the actual losses incurred?

A. No. The -15,079 MWh of undeterminable losses cannot be assigned to any particular cause. A loss evaluation study is an engineering analysis of line losses attributable to particular components of the T&D system. There is always an unexplained difference, which can be negative or positive, between the results of such an analysis and the line losses actually experienced.

Q. Are undeterminable losses taken into account in determining loss factors?

A. Yes. The loss factors must be based on actual losses to ensure correct recovery of the cost of the losses. Thus, the undeterminable losses, whether positive or negative, are assigned to the circuit elements for which losses have been calculated in the study based on the ratio of each circuit element's calculated loss

to the total of all calculated losses. The results of this assignment process appear in Appendix M of Attachment JSF-6 in the "Adjusted Energy MWH" and "Factored KWH" columns. The totals for those columns tie to the total period losses on line 30 of Appendix A.

Q. How does the amount of undeterminable losses in the 2013 Study compare to that found in SPS's previous loss studies?

A. "Undeterminable Losses as a Percent of Total Losses" is slightly higher in the 2013 Study than it was in the 2009 Study, but within a reasonable bandwidth of the results in prior loss studies. The following table compares the undeterminable losses in the 2013 Study with the same data from the various loss studies prepared by SPS.

Table JSF-5

	2013 Study Period Losses (MWh)	**2008-2009 Study Period Losses (MWh)**	**2006 Study Period Losses (MWh)**	**1998-1999 Study Period Losses (MWh)**	**1995 Study Period Losses (MWh)**
Total Losses (App. M)	1,821,919	1,840,020	1,729,387	1,236,638	1,271,777
Determined Losses (App. M)	1,836,997	1,829,126	1,694,750	1,266,777	1,222,210
Undeterminable Losses (App. M)	-15,079	10,894	34,637	-30,139	49,567
Undeterminable Losses as percent of Total Losses	0.83%	0.59%	2.0%	-2.4%	3.9%

B. Changes in Study Methodology and Data

Q. Were there any changes in methods and data used to calculate losses in the appendices of the 2013 Study as compared to the 2009 Study?

A. Yes, there are always changes in data from one study to the next because the data is updated. Simply due to the change in the study period, much of the relevant data changes (*e.g.*, generation amounts, power purchases, peak load, powerflow case results, Sales data, miles of transmission lines, customer meter counts, etc.) The updated data is reflected in the appendices. In addition to the normal updating of data, there were a few changes in methodology or how data was obtained, which are discussed below.

Average System Load Value

Previously, the Average System Load Value in Appendix D of Attachment JSF-6, which forms the basis for a daily average load to be used to develop the load segment powerflow cases, had included the average SPP tie line flows. In the 2013 study, the SPP tie line flows were not included in the Average System Load Value because the powerflow cases were created simulating the SPP average tie line flows and including the average SPP tie line value in the average daily load would have created a doubling effect for that value.

Feeder Numbers and Lengths

New data was available to determine the actual feeder lengths and that data was used in lieu of the estimated feeder lengths based on a sampling of actual data that was used in the 2009 Study. A comparison of feeder lengths used in the 2009 Study and the 2013 Study is shown in Table JSF-6 below.

Table JSF-6

Feeder Voltage Class (kV)	2013 Study Lengths (miles)	2009 Study Lengths (miles)
33	13.1	21.27
22	12.89	18.11
13.2	9.32	6.85
12.5	8.6	7.69
4.16	4.34	2.46
2.4	7.18	2.2

The sale of the Lubbock distribution facilities in 2010 included approximately 41 feeders, which changed the average loading and average length of the remaining feeders in the SPS system. Also, with the completion of the distribution Graphic Information System database, more complete information was available related to feeder lengths and conductor sizes. Working from maps in the previous loss study, it was not always apparent where feeders ended and laterals began or what the actual conductor size was. For the 2013 Study, the feeder length was

determined by the distance from the substation out to the first control device. This gives a better representation of typical feeder length.

Feeders that were less than 0.05 miles in length were assumed to be bus connected loads and not counted as distribution feeders for this study.

Q. Was there any change in the treatment of wholesale transactions with entities outside of SPS's service area?

A. No, the same net metering approach used in SPS's Transmission and Distribution System Loss Evaluation Study for Calendar Year 2006 and in the 2009 Study was used in the 2013 Study. As was the case in the two prior studies, SPS has neither the data nor the software necessary to perform the calculations previously done in Appendix B of Attachment JSF-6.

Q. Was there any change in the treatment of generation obtained from Lubbock Power and Light or the sales to the West Texas Municipal Power Agency?

A. No, the generation and sales were handled in the same manner as in the 2006 Study and the 2009 Study. That is, the generation was included in total resources and the sales were included in total sales.

C. Calculation of Loss Factors

Q. What are "loss factors"?

A. A loss factor is simply a number, which when multiplied by a given amount of sales yields the amount of energy that must be generated to produce the sales amount. If, for example, losses at a specific service level are 10 percent, then 100 MWh have to be generated to yield 90 MWh of sales. Thus, the loss factor at that level is 1.1111 (90 MWh sold x 1.1111 loss factor = 100 MWh generated).

Q. Have you calculated loss factors based on the results of the 2013 Study?

A. Yes, the loss factors were calculated in the same manner as in prior loss studies. The Energy Loss Factor and the Demand Loss Factor for each SPS rate class are shown in Appendix Q of Attachment JSF-6. Loss factor derivation is discussed in Section 12.0 of Attachment JSF-6. The energy and demand loss factors are set forth in Table JSF-7 and JSF-8 below.

D. Comparison and Future Loss Studies

Q. How do the new line loss factors compare to the current factors?

A. That information is presented in the following table:

Table JSF-7
Energy Loss Factors

Voltage Level	2009 Study Loss Factors	2013 Study Loss Factors	Percent Change
Sales @ Generator	1.00000	1.000000	0.00000%
Backbone Trans.	1.024427	1.025158	0.0714%
Sub-Trans.	1.032089	1.032914	0.0799%
Primary Dist.	1.112001	1.099263	–1.1455%
Secondary Dist (level 5)	1.130411	1.118223	–1.0793%
Secondary Dist (level 6)	1.134348	1.121893	-1.0979%

Table JSF-8
Demand Loss Factors

Voltage Level	2009 Study Loss Factors	2013 Study Loss Factors	Percent Change
Sales @ Generator	1.00000	1.000000	0.0000%
Backbone Trans.	1.030610	1.026174	-0.4304%
Sub-Trans.	1.040605	1.035392	-0.5009%
Primary Dist.	1.156872	1.127359	-2.5511%
Secondary Dist (level 5)	1.188431	1.158647	33.4928%
Secondary Dist (level 6)	1.193903	1.164118	-2.4947%

Q. When does SPS intend to perform its next line loss study?

A. SPS will complete an updated line loss study to capture the full effects of the SPP Integrated Marketplace and all other relevant factors during a study period that will end no later than December 31, 2016.

V. CONCLUSION

Q. Were Attachments JSF-1 through JSF-6 prepared by you or under your direct supervision?

A. Yes.

Q. Were the Rate Filing Package Schedules M-3 and P-9 you are sponsoring or co-sponsoring prepared by you or under your supervision?

A. Yes.

Q. Do you incorporate the Rate Filing Package Schedules M-3 and P-9 that are sponsored or co-sponsored by you into your testimony?

A. Yes.

Q. Does this conclude your pre-filed direct testimony?

A. Yes.

VERIFICATION

STATE OF TEXAS)
) ss.
COUNTY OF POTTER)

JOHN S. FULTON, first being sworn on his oath, states:

I am the witness identified in the preceding direct testimony. I have read the testimony and the accompanying attachments and am familiar with their contents. Based upon my personal knowledge, the facts stated in the testimony are true. In addition, in my judgment and based upon my professional experience, the opinions and conclusions stated in the testimony are true, valid, and accurate.

JOHN S. FULTON

SUBSCRIBED AND SWORN TO before me this 20 day of May, 2015.

MARY C. JOHNSON
NOTARY PUBLIC,
STATE OF TEXAS
My Commission Expires 08-28-2016

Notary Public, State of Texas
My Commission Expires: 8-28-16

Southwestern Public Service Company

Risk Assessment Categories

Risk Assessment Categories

Category	*Risk Level	Non-Discretionary/Prioritized
DD - Distribution Driven projects low risk	1	Prioritized
RT- Reliability Transmission projects not involving load shed	2	Prioritized
RTE Phase 1 - Regional Transmission Expansion	2	Prioritized
LS - Reliability projects that require Load Shed	3	Prioritized
TRS - Transmission projects with high Regulatory Scrutiny	4	Prioritized
RC - Reliability projects that are over 60% Complete	5	Non-Discretionary
DDH - Distribution Driven projects Highly likely to be funded	6	Pending Contractual
IA Tariff Project Fund - Interconnection Agreement Tariff Funding	7	Pending Contractual
PL - Pending Legal Agreements (IA, T-T or T-D)	7	Pending Contractual
RTE Phase 2 - Regional Transmission Expansion	7	Pending Contractual
RM - Regulatory Mandated, legislative order, CON filed or Granted, ERO Compliance Requirements	8	Non-Discretionary
RTE Phase 3 - Regional Transmission Expansion	8	Non-Discretionary
NUGIA-Executed Non Utility Generator Interconnection Agreements	9	Non-Discretionary
LIA - Executed Load Interconnection Agreements	9	Non-Discretionary
TS - Executed Transmission Service requests	9	Non-Discretionary
Outage - Broken or imminent failure	10	Non-Discretionary

*Risk Level (1= minimal risk; 10= high risk)

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
1	Agrium Camex-Transpetco	11786765	Camex-TranspetcoSub69 kV Bus E	3/31/15	$ 554,969	-	$ 554,969			
2	Agrium Camex-Transpetco	11837878	Camex Agrium T-Line	10/31/14	679	-	679			
3	**Agrium Camex-Transpetco Total**				**$ 555,647**	**$ -**	**$ 555,647**	This project connects a new load in the Dumas, TX area.	SPS Zonal	LI
4	Andrews County Substation	11986343	Andrews County Substation	4/4/16	-	9,738,648	9,738,648			
5	Andrews County Substation	11986381	NEF Terminal Substation Portio	4/4/16	-	1,208,911	1,208,911			
6	Andrews County Substation	12006743	Whitten Remote End Relay Sub	4/4/16	-	219,711	219,711			
7	Andrews County Substation	12024682	K85 Retermination_Trans Portio	4/4/16	-	172,351	172,351			
8	Andrews County Substation	12035922	NEF ROW_115 KV ROW	2/15/15	26,680	-	26,680			
9	Andrews County Substation	12055176	NEF ROW_115KV TX Portion ROW	2/15/15	17,282	-	17,282			
10	Andrews County Substation	12055523	R04_TX Line - Andrews State Li	4/4/16	-	589,720	589,720			
11	Andrews County Substation	12055534	W83_115kV Line-Andrews TX Por	4/4/16	-	172,469	172,469			
12	Andrews County Substation	12055536	W83_115kV Line-Andrews NM Por	4/4/16	-	759,600	759,600			
13	**Andrews County Substation Total**				**$ 43,962**	**$ 12,861,408**	**$ 12,905,370**	This project constructs a new 230/115 kV substation southeast of Hobbs, NM.	SPP Base Plan	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
14	APT SPS	11487534	Texas Co. Interchange-Rpl APT, Sub	9/30/14	38,701	-	38,701			
15	APT SPS	11487537	Randall Co. Interchange-Rpl AP	3/31/14	(31)	-	(31)			
16	APT SPS	11500158	Gray Co - Replace APTs sub	1/30/14	(590)	-	(590)			
17	APT SPS	11500168	Industrial - Replace APTs sub	11/30/14	86,606	-	86,606			
18	APT SPS	11636088	Chaves Co-Replace APT s Sub	10/20/14	(65)	-	(65)			
19	APT SPS	11636098	Maddox - Replace APT s Sub	11/30/13	44	-	44			
20	APT SPS	12002856	Taylor - Replace 115kV PTs	2/28/15	64,782	-	64,782			
21	APT SPS	12002863	Roswell - Replace 115kV PTs	2/28/15	58,374	-	58,374			
22	**APT SPS Total**				**$ 247,822**	**$ -**	**$ 247,822**	This project provided funds to replace the Westinghouse APT potential transformers, which showed high failure rates.	SPS Zonal	SR
23	Atoka-Eagle Creek	11917567	Eagle Creek W-21 Reterm Line	10/15/16	-	270,594	270,594			
24	Atoka-Eagle Creek	11917572	Eagle Creek W-17 Reterm Line	10/15/16	-	505,116	505,116			
25	Atoka-Eagle Creek	11917574	Seven Rivers - Atoka Line Rero	10/15/16	-	207,436	207,436			
26	Atoka-Eagle Creek	11917578	Eddy Co - Atoka Line reroute L	10/16/16	-	286,127	286,127			
27	Atoka-Eagle Creek	12073109	Atoka to Eagle Creek 115kV ROW	7/31/15	1,491,119	-	1,491,119			
28	Atoka-Eagle Creek	11764393	Atoka-Eagle Creek 115 kV Line	10/15/16	-	11,157,144	11,157,144			

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
29	Atoka-Eagle Creek	11792776	Atoka Substation	10/15/16	-	5,630,015	5,630,015			
30	Atoka-Eagle Creek	11792780	Seven Rivers Relay Sub	10/15/16	-	402,769	402,769			
31	Atoka-Eagle Creek	11792783	Eddy Co. Relay Sub	10/15/16	-	475,349	475,349			
32	Atoka-Eagle Creek	11792789	Eagle Creek Substation	10/15/16	-	2,245,083	2,245,083			
33	Atoka-Eagle Creek	11792806	Eagle Creek-Atoka ROW	10/15/16	900,000	585,000	1,485,000			
34	**Atoka-Eagle Creek Total**				**$ 2,391,119**	**$ 21,764,632**	**$ 24,155,751**	This project constructs a 115 kV line from Atoka Substation, south of Artesia, NM to Eagle Creek Substation in Artesia.	SPP Base Plan	RE
35	Bailey Cty-New Amherst-Lamb Cty	11987493	K73 Reterm at Lamb 230kV Line	12/31/17	-	40,057	40,057			
36	Bailey Cty-New Amherst-Lamb Cty	11987494	Bailey Co-New Amherst ROW	6/1/18	-	250,000	250,000			
37	Bailey Cty-New Amherst-Lamb Cty	12019718	New Amherst - Lamb Co ROW	4/30/17	-	550,000	550,000			
38	**Bailey Cty-New Amherst-Lamb Cty Total**				**$ -**	**$ 840,057**	**$ 840,057**	This project constructs a new 115 kV line between Bailey Co. Sub and Lamb Co. Sub, also converts 69 kV SPS distribution subs to 115 kV, and constructs a new 115/69 kV substation for service to SGCE-Bailey Co Elec Cooperative.	SPP Base Plan	RE
							-			
39	Bopco Sub Switch/Tap Project	11885775	Bopco W39 Tap with Switch Inst	3/14/14	12,425	-	12,425			
40	**Bopco Sub Switch/Tap Project Total**				**$ 12,425**	**$ -**	**$ 12,425**	This project connects a new oil field load in the SE New Mexico load area.	SPS Zonal	LI

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
41	Bowers 2nd 115-69kV Auto	11628947	Bowers 2nd Auto Sub	2/28/15	2,271,993	-	2,271,993			
42	**Bowers 2nd 115-69kV Auto Total**				**$ 2,271,993**	**$ -**	**$ 2,271,993**	This project installs a 2nd 115/69 kV transformer at Bowers Substation east of Amarillo, TX.	SPP Base Plan	RE
43	Bowers-Howard 115kV	11495189	Bowers - Howard ROW	6/1/15	5,465,300	-	5,465,300			
44	Bowers-Howard 115kV	11495191	Bowers Substation sub	12/15/14	261,037	-	261,037			
45	Bowers-Howard 115kV	11495196	Howard Substation	1/30/16	7,892	18,233	26,125			
46	Bowers-Howard 115kV	11495206	Bowers-Howard 115 kV Line	1/31/16	-	23,350,677	23,350,677			
47	Bowers-Howard 115kV	11802656	Grapevine Relay Rpl Bowers Ter	4/28/16	-	189,909	189,909			
48	Bowers-Howard 115kV	11819484	Bowers T-51 Re-termination Lin	12/31/14	(50)	-	(50)			
49	Bowers-Howard 115kV	11825019	Wheeler Sub	2/28/16	-	143,434	143,434			
50	Bowers-Howard 115kV	11859844	Bowers-Howard Y-62Line	1/31/16	-	3,988,188	3,988,188			
51	**Bowers-Howard 115kV Total**				**$ 5,734,179**	**$ 27,690,441**	**$ 33,424,620**	This project connected the Bowers Substation to the Howard Substation via a 115-kV transmission line at the existing Howard Substation.	SPP Base Plan	RE
52	Bushland 230kV Cap Bank	11625164	Bushland 230kV Cap Bank Sub	12/30/13	22	-	22			
53	**Bushland 230kV Cap Bank Total**				**$ 22**	**$ -**	**$ 22**	This project added a 230 KV capacitor bank to the 230 kV bus at Bushland Substation, near Amarillo.	SPP Base Plan	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
54	Campbell St. Bus Modification	11495216	Campbell St. Bus Modification,Sub	7/15/13	18	-	18			
55	**Campbell St. Bus Modification Total**				**$ 18**	**$ -**	**$ 18**	This project relocates the gas turbine at Riverview Substation to Tucuimcari, NM . The 115 kV bus at Campbell Street substation will have to be modified from straight bus configuration to 3 ring terminal configuration to allow connection of 115 kV line from new Tucumcari generation station.	Cust Funded	GI
56	Carlisle to Wolfforth	11782613	Carlisle to Wofforth ROW	8/31/16	240,000	6,860,000	7,100,000			
57	Carlisle to Wolfforth	11869012	Carl-Wolf Wolfforth Land	5/31/16	-	316,253	316,253			
58	Carlisle to Wolfforth	11869015	Carl-Wolf Carisle Land	5/31/16	-	127,673	127,673			
59	Carlisle to Wolfforth	12051225	LP&L Line Relay Upgrade at Car	12/31/15	248,517	-	248,517			
60	**Carlisle to Wolfforth Total**				**$ 488,517**	**$ 7,303,926**	**$ 7,792,443**	This project constructs a 230 KV line between Carlisle Sub and Wolfforth Sub, near Lubbock, TX.	SPP Base Plan	RE
61	Chaves Auto Addtn	11350159	Chaves Ckt 2 Auto Sub	4/30/15	2,799,682	-	2,799,682			
62	**Chaves Auto Addtn Total**				**$ 2,799,682**	**$ -**	**$ 2,799,682**	This project upgrades the smaller 230/115 kV transformer with a larger unit. Chaves Sub is near Roswell, NM.	SPP Base Plan	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
63	Cherry Street Interchange	11350184	Cherry St 230/115kV Auto Sub	9/30/14	3,904	-	3,904			
64	Cherry Street Interchange	11350246	Cherry St Intg Hastings-E.Plt	6/1/15	3,446,317	-	3,446,317			
65	Cherry Street Interchange	11350475	Cherry St. Intg Convert Hastin	6/1/14	(42)	-	(42)			
66	Cherry Street Interchange	11350688	East Plant Conv. for Hastings	6/1/15	1,307,016	-	1,307,016			
67	Cherry Street Interchange	11650491	Cherry Street to Rolling Hills, Lin	4/1/14	12	-	12			
68	Cherry Street Interchange	11802357	Potter County to Rolling Hills	2/28/14	128	-	128			
69	Cherry Street Interchange	11802366	Harrington to Rolling Hills Re	4/25/14	(30)	-	(30)			
70	**Cherry Street Interchange Total**				**$ 4,757,305**	**$ -**	**$ 4,757,305**	This project constructed a new 230/115 KV interchange and substation in north Amarillo to increase the relibility of the transmission network.	SPP Base Plan	RE
71	China Draw	11899013	China Draw to North Loving Lin	6/15/15	6,979,138	-	6,979,138			
72	China Draw	11899018	China Draw ROW	5/30/15	431,714	-	431,714			
73	China Draw	11925759	China Draw High Side Substatio	8/31/15	1,163,085	-	1,163,085			
74	**China Draw Total**				**$ 8,573,938**	**$ -**	**$ 8,573,938**	This project creates a 115 kV and 345 kV substation south of Carlsbad, New Mexico to provide service and transmission support for developing loads in the SE part of New Mexico.	SPP Base Plan	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
75	Crobsy Co. 115 Cap Bank	11625275	Crobsy Co. 115kV Cap Bank Sub	5/31/15	1,174,231	-	1,174,231			
76	**Crobsy Co. 115 Cap Bank Total**				**$ 1,174,231**	**$ -**	**$ 1,174,231**	This project installs a 14.4 Mvar 115 kV cap bank in the Crosby County Interchange, east of Lubbock, TX.	SPP Base Plan	RE
77	Crosby Co.	11764431	Crosby Co. Upgrade 115/69 Xfmr	5/31/15	1,751,829	-	1,751,829			
78	**Crosby Co. Total**				**$ 1,751,829**	**$ -**	**$ 1,751,829**	This project calls for the replacement of the existing 115/69 kV, 40 MVA autotransformers at Crosby County Interchange, east of Lubbock, TX, with new transformers rated at 84 MVA.	SPP Base Plan	RE
79	Crosby County Transformer	11813898	Crosby County Transformer #1Su	5/1/15	2,004,553	-	2,004,553			
80	**Crosby County Transformer Total**				**$ 2,004,553**	**$ -**	**$ 2,004,553**	This project replaced the existing 115/69KV, 40 MVA autotransformers with new 84 MVA transformers.	SPP Base Plan	RE
81	Curry to Bailey 115kV	11625319	Curry to Bailey 115kV New Line	8/30/16	-	13,131,485	13,131,485			
82	Curry to Bailey 115kV	11625322	Curry to Bailey 115kV Bailey S	10/31/16	-	3,880,185	3,880,185			
83	Curry to Bailey 115kV	11625326	Curry to Bailey 115kV - Curry	9/28/16	-	7,990,033	7,990,033			
84	Curry to Bailey 115kV	11625330	Curry to Bailey 115kV ROW	8/30/16	1,079,378	300,000	1,379,378			
85	Curry to Bailey 115kV	11625334	Curry to Bailey 115kV, Land	8/30/14	43,934	-	43,934			
86	Curry to Bailey 115kV	11626185	Curry to Bailey 115kV NM ROW	9/28/17	48,607	665,000	713,607			

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
87	Curry to Bailey 115kV	11738750	Curry to Bailey TL, Pre Const, Line	7/1/14	292	-	292			
88	Curry to Bailey 115kV	11804658	Oasis to Curry Retermination S	3/31/15	213,508	-	213,508			
89	Curry to Bailey 115kV	11830010	Cargill Sub Relay Upgrade Sub	3/31/16	-	205,787	205,787			
90	Curry to Bailey 115kV	11830023	Plant X Relay Upgrade, Sub	6/1/15	24,796	-	24,796			
91	Curry to Bailey 115kV	11830896	Roosevelt Relay Upgrade Sub	9/30/16	-	243,388	243,388			
92	Curry to Bailey 115kV	11871164	Roosevelt Reterm V-78 Line	9/30/16	-	1,204,060	1,204,060			
93	Curry to Bailey 115kV	11871191	Oasis Reterm T-45 Line	8/30/16	-	175,479	175,479			
94	Curry to Bailey 115kV	11871202	Pleasant Hill #1 Reterm Line	3/31/16	-	235,408	235,408			
95	Curry to Bailey 115kV	11871214	Pleasant Hill #2 Reterm Line	3/31/16	-	269,960	269,960			
96	Curry to Bailey 115kV	11871238	Cargill Retermination T-59 Lin	3/31/16	-	319,911	319,911			
97	Curry to Bailey 115kV	11871253	K-30 Reroute Line	11/15/14	1,984	-	1,984			
98	Curry to Bailey 115kV	11871261	Y-97 Wreckout Line	12/31/14	5,174	-	5,174			
99	Curry to Bailey 115kV	11874877	Curry to Bailey 115kV NM Line	8/30/16	-	5,482,153	5,482,153			
100	**Curry to Bailey 115kV Total**				**$ 1,417,673**	**$ 34,102,849**	**$ 35,520,522**	This project constructs a new 115 kV line between Curry Intg in Clovis, NM to Bailey Co Intg, in Texas.	SPP Base Plan	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
101	Deaf Smith 230kV Breaker Add	11626067	Deaf Smith Reterm 115kV T04 Li	12/31/16	-	126,335	126,335			
102	Deaf Smith 230kV Breaker Add	11626105	Deaf Smith Reterm K21 Line	12/31/16	-	326,665	326,665			
103	Deaf Smith 230kV Breaker Add	11626200	Deaf Smith Reterm K11 230kV Li	12/1/16	-	554,657	554,657			
104	Deaf Smith 230kV Breaker Add	11627860	Deaf Smith 230kV Breaker ADD S	12/31/16	-	2,238,579	2,238,579			
105	Deaf Smith 230kV Breaker Add	11627862	Deaf Smith 230kV Breaker Add R	12/1/16	75,000	-	75,000			
106	Deaf Smith 230kV Breaker Add	12063250	Deaf Smith Reterm W40 Line	4/6/15	3,446	-	3,446			
107	**Deaf Smith 230kV Breaker Add Total**				**$ 78,446**	**$ 3,246,236**	**$ 3,324,682**	This project modifies the 230 kV bus structure to increase the reliability of the substation.	SPS Zonal	LI
108	Deaf Smith Xfmr	11764436	Deaf Smith Upgrade 230/115 Xfm	4/15/16	-	2,690,368	2,690,368			
109	Deaf Smith Xfmr	11811675	Deaf Smith Bank 1 Replacement	12/31/15	2,765,770	-	2,765,770			
110	**Deaf Smith Xfmr Total**				**$ 2,765,770**	**$ 2,690,368**	**$ 5,456,137**	This project replaces the existing 150 MVA 230/115 KV transformers with larger 250 MVA transfomers for increased reliability. Deaf Smith Substation is near Hereford, Texas.	SPP Base Plan	RE
111	Diamondback Lyntegar Terminal	11803442	Diamondback Lyntegar TerminalS	6/1/15	(28,600)	-	(28,600)			
112	**Diamondback Lyntegar Terminal Total**				**$ (28,600)**	**$ -**	**$ (28,600)**	This project installs a 115 kV terminal for Lyntegar Electric Cooperative to take service from Diamondback Substation, southeast of Lubbock TX.	SPS Zonal	LI

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
113	Drinkard 115 Cap Bank	11625339	Drinkard 115 Cap Bank Sub	6/1/15	1,322,310	-	1,322,310			
114	Drinkard 115 Cap Bank	12060206	T84.2-115kV Cap Bank@ Drinkard	6/1/15	32,722	-	32,722			
115	**Drinkard 115 Cap Bank Total**				**$ 1,355,031**	**$ -**	**$ 1,355,031**	This project installs a 14.4 Mvar cap bank at Drinkard Sub southeast of Hobbs, NM.	SPP Base Plan	RE
116	Eagle Creek	11227097	Eagle Creek Project(Artesia Tw	2/28/15	6,236	-	6,236			
117	Eagle Creek	11227111	Eagle Creek Prog(Artesia Twn 6	3/31/15	3,535,981	-	3,535,981			
118	**Eagle Creek Total**				**$ 3,542,218**	**$ -**	**$ 3,542,218**	This project constructed a new 115/69-kV substation and re-routing of 69-kV lines in the Navajo refinery area into the new Eagle Creek substation.	SPS Zonal, SPP Base Plan	RE
119	Eagle Creek 14.4 Mvar 115 Cap Bank	12048832	Eagle Creek 14.4 Mvar 115 Cap	10/15/16	-	1,349,287	1,349,287			
120	**Eagle Creek 14.4 Mvar 115 Cap Bank Total**				**$ -**	**$ 1,349,287**	**$ 1,349,287**	This project installs a 14.4 Mvar capacitor bank on the 115 kV bus at Eagle Creek substation, near Artesia, New Mexico.	SPP Base Plan	RE
121	East Clovis Conversion	11350670	East Clovis 69-115kV Conv Sub	6/30/13	11	-	11			
122	**East Clovis Conversion Total**				**$ 11**	**$ -**	**$ 11**	This project upgrades the existing 69 kV distribution substation to 115-kV and connects it to an adjacent 115-kV transmission line to relieve loading on the 115/69-kV transformers at Curry Co. Intg.	SPP Base Plan	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
123	Eddy Co Breakers	11803383	Eddy Cty 230 kV In-Line Breake	11/30/15	885,526	-	885,526			
124	**Eddy Co Breakers Total**				**$ 885,526**	**$ -**	**$ 885,526**	This project installs a 2nd 230 kV bus tie breaker in the Eddy Co Sub 230 kV bus, near Artesia, NM.	SPP Zonal	RE
125	Eddy Co. 230/115 Auto Addition	11495257	Eddy Co. 230/115 auto Sub	2/1/15	225,861	-	225,861			
126	**Eddy Co. 230/115 Auto Addition Total**				**$ 225,861**	**$ -**	**$ 225,861**	This project installs a 2nd 250 MVA 230/115-kV transformer at Eddy Co. Substation near Artesia, NM.	SPP Base Plan	RE
127	Eddy Co. Xfmr	11764447	Eddy Co. 230/115 Xfmr #1 Upgra	6/1/16	-	3,665,623	3,665,623			
128	**Eddy Co. Xfmr Total**				**$ -**	**$ 3,665,623**	**$ 3,665,623**	This project replaces the 168 MVA 230/115 kV transformer with a 288 MVA unit at Eddy Co. Sub near Artesia, NM.	SPP Base Plan	RE
129	Eddy County SVC Control Upgrade	11495266	Eddy County SVC ControlsSub	7/31/14	1,025,576	-	1,025,576			
130	**Eddy County SVC Control Upgrade Total**				**$ 1,025,576**	**$ -**	**$ 1,025,576**	This project replaced the Eddy County Substation Static Var Controller (SVC) device control system. The control system had become operationally limited due to failure of parts and not repairable. This project replaced the computer control system and other parts that were difficult to maintain. This facility is near Artesia, New Mexico.	SPS Zonal	SR

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
131	ELR - Breakers - SPS	11645465	SPS 2015 ELR Breakers Sub	12/31/15	74,471	-	74,471			
132	ELR - Breakers - SPS	11645466	SPS 2016 ELR Breakers Sub	12/31/16	-	1,443,561	1,443,561			
133	ELR - Breakers - SPS	11808118	Texas Co - Replace Breakers 08	9/30/16	-	378,068	378,068			
134	ELR - Breakers - SPS	11808120	Tolk-Repl Bkrs TK12TK39TK43TK5	10/31/16	-	1,043,445	1,043,445			
135	ELR - Breakers - SPS	12016556	Nichols-Rpl 115kV Breakers&Swi	12/31/15	1,575,139	-	1,575,139			
136	ELR - Breakers - SPS	12076270	Carlisle breaker 6880 replacem	11/15/15	162,096	-	162,096			
137	**ELR - Breakers - SPS Total**				**$ 1,811,705**	**$ 2,865,074**	**$ 4,676,779**	This project replaces these breakers due to age and condition.	SPS Zonal	SR
138	ELR - Relay - SPS	11645474	SPS 2016 ELR BreakersSub	12/31/16	-	3,958,154	3,958,154			
139	ELR - Relay - SPS	11705871	Carlisle V62 ELR Relays Sub	11/30/14	5,078	-	5,078			
140	ELR - Relay - SPS	11705882	Carlisle V40 ELR Relays Sub	10/23/14	239	-	239			
141	ELR - Relay - SPS	11705901	Denver City V80 ELR Relays Sub	3/1/15	250,245	-	250,245			
142	ELR - Relay - SPS	11705910	Murphy V40 ELR Relays, Sub	5/28/14	272,220	-	272,220			
143	ELR - Relay - SPS	11707079	Nichols Plant-ELR Relays, Sub	9/30/14	85,223	-	85,223			
144	**ELR - Relay - SPS Total**				**$ 613,005**	**$ 3,958,154**	**$ 4,571,159**	This project replaces protective relays that have reached their end of life.	SPS Zonal	SR
145	Floyd County	11764453	Floyd County 115 Cap Bank Sub	4/30/15	1,518,769	-	1,518,769			
146	**Floyd County Total**				**$ 1,518,769**	**$ -**	**$ 1,518,769**	This project installs a two stage 28.8 Mvar capacitor bank on the 115 kV bus at Floyd County substation, northeast of Lubbock, TX.	SPP Base Plan	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
147	GEN 2007 - 048 Higher power, 400 MW	11791962	Higher Power Sub	11/16/14	2,776	-	2,776			
148	**GEN 2007 - 048 Higher power, 400 MW Total**				**$ 2,776**	**$ -**	**$ 2,776**	Higher Power Energy, LLC (Palo Duro Wind) has requested the interconnection of a wind energy facility located in Randall County, Texas to the SPS transmission network. The wind facility has a net capacity of 400 MW and will connect to a new SPS 230 kV switching station located approximately 9 miles southeast of Canyon, Texas and located adjacent to SPS's 230 kV transmission line from Amarillo South Interchange to Swisher County Interchange.	Cust Funded	GI
149	GEN 2010-14 Novus Wind IV, 358.8 MW	11791971	Novus Wind IV - Hitchland Sub	12/31/16	-	(4,991)	(4,991)			
150	**GEN 2010-14 Novus Wind IV, 358.8 MW Total**				**$ -**	**$ (4,991)**	**$ (4,991)**	This project adds a new 345 kV terminal at Hitchland Substation, south of Guymon, OK, to connnect the generating project.	Cust Funded	GI
151	GEN 2012-020 Hale Co Wind, 478MW	12045115	Hale Co Wind 230kV Terminal at	3/31/16	-	(18,638)	(18,638)			
152	**GEN 2012-020 Hale Co Wind, 478MW Total**				**$ -**	**$ (18,638)**	**$ (18,638)**	This project will connect the wind resource to the 230 KV bus at TUCO Sub north of Lubbock, TX.	Cust Funded	GI
153	GEN-2011-025 Fiber Wind	11984017	GEN-2011-025 Fiber Wind Blanco	5/31/16	(613,168)	371,145	(242,023)			
154	GEN-2011-025 Fiber Wind	11987488	Crosby-Blanco Retermination-11	5/31/16	-	400,848	400,848			
155	GEN-2011-025 Fiber Wind	11987491	Floyd-Blanco Retermination-115	5/31/16	-	400,848	400,848			
156	**GEN-2011-025 Fiber Wind Total**				**$ (613,168)**	**$ 1,172,842**	**$ 559,674**	This project will construct a 3 breaker 115 kV ring bus on the Crosby-Floyd 115 kV line to connect the wind resource.	Cust Funded	GI

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
157	GEN-2013-016 GSEC Elk Sta Intercon-TUCO	11987405	Elk Station 2 Termination at T	12/1/16	-	3,478,682	3,478,682			
158	**GEN-2013-016 GSEC Elk Sta Intercon-TUCO Total**				**$ -**	**$ 3,478,682**	**$ 3,478,682**	This project will connect a 200 MW GT owned by GSEC to the TUCO 345 kV bus.	Cust Funded	GI
159	Goodwell Wind Gen-2007-046	11869062	Goodwell wIND gia-sa 2064(10-1	4/30/15	43,107	-	43,107			
160	**Goodwell Wind Gen-2007-046 Total**				**$ 43,107**	**$ -**	**$ 43,107**	This project will connect a wind energy resource to the system at Hitchland Substation, south of Guymon Oklahoma.	Cust Funded	GI
161	Graham Intg Xfmr	11764459	Graham Intg. 115/69 Xfmr Upgra	6/30/15	2,040,406	-	2,040,406			
162	**Graham Intg Xfmr Total**				**$ 2,040,406**	**$ -**	**$ 2,040,406**	This project will replace the existing 40 MVA 115/69 kV auto with an 84 MVA unit. Graham Sub is southeast of Lubbock, TX.	SPP Base Plan	RE
163	Graham Intg.Add 2nd115/69 Xmfr	11958405	Graham Intg-Add 115/69 Transfo	12/31/16	-	4,591,917	4,591,917			
164	**Graham Intg.Add 2nd115/69 Xmfr Total**				**$ -**	**$ 4,591,917**	**$ 4,591,917**	This project will add a 2nd 84 MVA 115/69 kV transformer at Graham Sub.	SPP Zonal	RE
165	Grassland Transformer Upgrade	11627866	Grassland XFMR Sub	8/31/15	3,680,540	-	3,680,540			
166	**Grassland Transformer Upgrade Total**				**$ 3,680,540**	**$ -**	**$ 3,680,540**	This project will replace the existing 230/115 KV auto with a higher rated unit. Grassland Sub is south of Lubbock, TX.	SPP Base Plan	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
167	GSEC - SEC Kress	11771397	GSEC - SEC KressSub	8/15/14	1,878	-	1,878			
168	**GSEC - SEC Kress Total**				**$ 1,878**	**$ -**	**$ 1,878**	This project replaced 69 kV breakers at kress Interchange, south of Amarillo, Texas	SPS Zonal, Cust Funded	RE
169	GSEC #2037 T51 Rebld/Recond	11786574	T51 Rebuild-Reconduct. ROW	1/30/15	27,137	-	27,137			
170	GSEC #2037 T51 Rebld/Recond	11786577	T51 Reconduct. Transmission 11	4/28/16	-	1,852,129	1,852,129			
171	**GSEC #2037 T51 Rebld/Recond Total**				**$ 27,137**	**$ 1,852,129**	**$ 1,879,266**	This project arebuilds the existing Bowers - Gravpevine 115 KV line with larger conductor to increase the capability of the line. This project is east of Amarillo, TX.	SPP Base Plan	RE
172	GSEC GB NP Howard-Miami	11771401	Miami Z-47 Rebuild Line	2/28/15	15,722,420	-	15,722,420			
173	GSEC GB NP Howard-Miami	11771406	Miami Z-70 Rebuild Line	6/30/15	9,548,394	-	9,548,394			
174	GSEC GB NP Howard-Miami	11799967	Z-69 Rebuild Line	6/1/15	1,691,940	-	1,691,940			
175	GSEC GB NP Howard-Miami	11800062	NE Miami Breaker Station Sub	4/30/15	129,860	-	129,860			
176	**GSEC GB NP Howard-Miami Total**				**$ 27,092,614**	**$ -**	**$ 27,092,614**	This project rebuilds the existing 69 kV line with a new line that is larger conductor and insulated for 115 kV in preparation for operation.	SPP Base Plan	RE
177	GSEC Mustang 6 Generator	11633522	GSEC Mustang 6 Generator	12/30/12	239,267	-	239,267			
178	**GSEC Mustang 6 Generator Total**				**$ 239,267**	**$ -**	**$ 239,267**			

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
179	GSEC-2012-037 GSEC Elk Station	11909901	GSEC-2012-037 GSEC Elk Station	2/13/15	(1,263,038)	-	(1,263,038)			
180	**GSEC-2012-037 GSEC Elk Station Total**				**$ (1,263,038)**	**$ -**	**$ (1,263,038)**	This project interconnect GSEC's 200 MW Elk Station 1 unit to The TUCO 345 kV bus.	Cust Funded	GI
181	Happy Interchange	11495283	Happy Intg. auto upgrades Sub	5/31/15	1,660,495	-	1,660,495			
182	Happy Interchange	11913060	Happy Intg. Auto Xfmr 2 Sub	11/30/15	1,351,768	-	1,351,768			
183	Happy Interchange	12068967	Happy Intg DTA Sub	2/28/15	(10,153)	-	(10,153)			
184	**Happy Interchange Total**				**$ 3,002,109**	**$ -**	**$ 3,002,109**	This project replaces the two 40 MVA 115/69 kV transformers with larger 84 MVA units. Happy Sub is south of Amarillo, TX.	SPP Base Plan	RE
185	Hereford Intg. Dist. Xfmr Conversion	11987334	Hereford High Side Sub	12/15/16	-	545,410	545,410			
186	**Hereford Intg. Dist. Xfmr Conversion Total**				**$ -**	**$ 545,410**	**$ 545,410**	This project expands the 115 kV bus at Hereford Intg., near Hereford, TX, and converts the 69 kV distribution transfomer to a 115 kV transformer.	SPP Base Plan	RE
187	Higg East XTO Russell	11869065	Higg East igh Side(Sub Portion	7/17/15	371,391	-	371,391			
188	Higg East XTO Russell	11869081	T89 115kV Line 3 Way Switch to	7/17/15	331,350	-	331,350			
189	**Higg East XTO Russell Total**				**$ 702,740**	**$ -**	**$ 702,740**	This project sets a 3 way 115 kV switch to serve the Higg East XTO distribution substation.	SPS Zonal	LI

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
190	Hitchland 2nd 250 MVA	11808899	Hitchland 2nd 250 MVA Sub	12/31/16	-	5,171,285	5,171,285			
191	**Hitchland 2nd 250 MVA Total**				**$ -**	**$ 5,171,285**	**$ 5,171,285**	This project adds a 2nd 230/115 kV transformer at Hitchland Sub, south of Guymon,OK.	SPP Base Plan	RE
192	Hitchland Add 345 kV, 60 Mvar Reactor	11987137	Hitchland Add 345 kV 60 Mvar R	12/31/15	2,127,125	-	2,127,125			
193	**Hitchland Add 345 kV, 60 Mvar Reactor Total**				**$ 2,127,125**	**$ -**	**$ 2,127,125**	This project adds a 60 Mvar 345 kV bus reactor to the Hitchland 345 kV bus.	SPS Zonal	RE
194	Hitchland to Woodward	11432299	Hitchland to Woodward 345KV, OK, Li	6/30/14	580	-	580			
195	Hitchland to Woodward	11432308	Hitchland to Woodward 345 kV S	5/1/14	615	-	615			
196	Hitchland to Woodward	11432309	Hitchland to Woodward 345 kV, TX Li	6/30/14	(1,074)	-	(1,074)			
197	Hitchland to Woodward	11432315	Hitchland to Woodward 345 kV O	7/15/14	1,129	-	1,129			
198	Hitchland to Woodward	11684933	Hicthland-Woodward J-13 Line	4/18/14	698	-	698			
199	Hitchland to Woodward	11684952	Hitchland to Woodward J-12 Lin	5/30/14	249	-	249			
200	**Hitchland to Woodward Total**				**$ 2,196**	**$ -**	**$ 2,196**	This project constructs a double circuit 345-kV line from the Hitchland area to Woodard, OK area. SPS will construct and own approx. 30 miles of this line. This is a SPP Priority Project.	SPP Priority Project	EC

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
201	Hopi 69-115 Conversion	11495316	Hopi Conversion 115 kV T-Line	12/31/13	1,346	-	1,346			
202	Hopi 69-115 Conversion	11678575	Carlsbad Substation Relay Sub	3/31/14	132	-	132			
203	**Hopi 69-115 Conversion Total**				**$ 1,478**	**$ -**	**$ 1,478**	This project converted a 69 kV distribution substation to 115 kV to alleviate loading on the 115/69 kV transformers at Carlsbad, New Mexico.	SPP Base Plan	RE
204	Howard Xfmr Rplmnt/Cap Add	11789314	Howard Xfmr Replacement Sub	12/31/14	119,570	-	119,570			
205	Howard Xfmr Rplmnt/Cap Add	11802036	Howard Capacitor Sub	6/1/14	2,276	-	2,276			
206	**Howard Xfmr Rplmnt/Cap Add Total**				**$ 121,846**	**$ -**	**$ 121,846**	This project replaced the 40 MVA 115/69 kV transfomrer at Howard Substaiton with an 84 MVA unit . A 28.8 Mvar capacitor bank was also added to the 115 kV bus at that location.	SPP Base Plan	RE
207	IA Tariff Fund	10615259	IA Tariff Fund SPS	12/31/19	558,617	935,458	1,494,075			
208	**IA Tariff Fund Total**				**$ 558,617**	**$ 935,458**	**$ 1,494,075**	This project funds the addition of new load delivery points that come up throughout the year.	SPP Zonal	LI
209	Intrepid West Load Interconnection	11628483	Intrepid West T38 Tap Line	9/30/13	(159)	-	(159)			
210	**Intrepid West Load Interconnection Total**				**$ (159)**	**$ -**	**$ (159)**	This project provides a tap for a new 115-kV distribution substation for the Intrepid Potash facility in SE NM.	SPS Zonal	LI

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
211	Jones 4 Mustang 6-Quay IA	11843188	Lubbock South-Rpl Switches Sub	11/6/14	(137)	-	(137)			
212	Jones 4 Mustang 6-Quay IA	11843191	Lubbock East-Rpl Wave Trap V34	2/9/15	35,916	-	35,916			
213	Jones 4 Mustang 6-Quay IA	11925745	Lubbock So-Repl Switches 6951&	7/1/14	(12)	-	(12)			
214	Jones 4 Mustang 6-Quay IA	11925753	Lubbock East -Rep Switche 6981	2/28/15	79,200	-	79,200			
215	**Jones 4 Mustang 6-Quay IA Total**				**$ 114,967**	**$ -**	**$ 114,967**	This project constructed various network upgrades for interconnection that were required in the respective interconnection agreements for these generators.	Cust Funded	GI
216	K11 Wavetrap Repl Bushland/Deaf Smith	11987101	K11 Wavetrap Replacement Deaf	6/1/16	-	209,464	209,464			
217	K11 Wavetrap Repl Bushland/Deaf Smith	11987106	K11 Wavetrap Replacement Bushl	12/31/15	0	-	0			
218	K11 Wavetrap Repl Bushland/Deaf Smith	11987111	K11 Wavetrap Replacement Bushl	6/1/16	-	209,847	209,847			
219	**K11 Wavetrap Repl Bushland/Deaf Smith Total**				**$ 0**	**$ 419,311**	**$ 419,311**	This project replaces a 230 kV wave trap with a higher rated unit.	SPP Base Plan	RE
220	KC Substation	11628674	KC Sub-Sulpher Springs 115kV T	3/31/15	1,279,221	-	1,279,221			
221	KC Substation	11628676	KC Substation Z21-69kV Line	3/31/15	574,026	-	574,026			
222	KC Substation	11628678	KC Substation 115kV Line	3/31/15	5,671,665	-	5,671,665			
223	KC Substation	11628681	KC Substation Sub	3/31/15	4,442,160	-	4,442,160			
224	KC Substation	11628689	KC Substation ROW	3/31/15	434,007	-	434,007			
225	**KC Substation Total**				**$ 12,401,080**	**$ -**	**$ 12,401,080**	This project constructs the Diamondback Substation, a 115/69 kV sub SE of Lubbock, TX.		

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
226	KC Substation - Diamondback	11848360	Terry Co. Relay Sub	6/1/15	305,023	-	305,023			
227	KC Substation - Diamondback	11955750	Diamondback Sub Ring Bus Sub	3/31/15	1,513,276	-	1,513,276			
228	**KC Substation - Diamondback Total**				**$ 1,818,298**	**$ -**	**$ 1,818,298**	This project constructs a ring bus expansion at Diamondback Substation, a 115/69 kV sub SE of Lubbock, TX.	SPS Zonal	RE
229	Kingsmill Capacitor	11802041	Kingsmill Capacitor Sub	11/14/14	69	-	69			
230	**Kingsmill Capacitor Total**				**$ 69**	**$ -**	**$ 69**	This project installs a 2nd 115/69-kV transformer for increased reliability in contingencies.	SPP Base Plan	RE
231	Kiser Distribution Addition	12050796	Kiser Distribution Addition Su	9/30/16	-	1,360,799	1,360,799			
232	**Kiser Distribution Addition Total**				**$ -**	**$ 1,360,799**	**$ 1,360,799**	This project relocates a 69 kV Plainview City dist sub to a new 115 kV Kiser distribution sub.	SPS Zonal	RE
233	Lea County Removal	11495334	Cunningham Relay Mod Sub	7/15/14	55	-	55			
234	Lea County Removal	11684456	Midland Relay Mod, Sub	5/1/14	86,149	-	86,149			
235	**Lea County Removal Total**				**$ 86,203**	**$ -**	**$ 86,203**	This project removes the 230-kV Lea County Interchange from service. This facility is located close to Hobbs Plant, near Hobbs, New Mexico. The transfer of the Caprock electrical system to the ERCOT grid, with the purchase of Caprock by Sharyland Utilities, will require the removal of the Lea County Interchange, 230-kV line construction, and relocation of the Lea County 230/115-kV transformer to Hobbs Plant to maintain system performance and reliability. All substation assets from Lea County Interchange will be removed.	SPP Base Plan	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
236	Line ELR SPS	11645477	SPS 2016 ELR Transformers Sub	12/31/16	-	3,539,054	3,539,054			
237	**Line ELR SPS Total**				**$ -**	**$ 3,539,054**	**$ 3,539,054**	This project funded capital transmission line improvement work.	SPS Zonal	SR
238	Lubbock Road Widening	12016564	Y50 Road Widening Lubbock Line	3/31/15	(412)	-	(412)			
239	Lubbock Road Widening	12016574	V40 Road Widening Lubbock Line	3/31/15	(4,959)	-	(4,959)			
240	**Lubbock Road Widening Total**				**$ (5,371)**	**$ -**	**$ (5,371)**	This project moves transmission lines for road widening projects in near Lubbock, TX.	Cust Funded	OT
241	Lubbock South Auto #2	11764468	Lubbock South 230/115 Auto #2S	2/28/15	4,240,896	-	4,240,896			
242	Lubbock South Auto #2	12064906	Lubbock South - Rock entire ya	12/31/14	76,567	-	76,567			
243	**Lubbock South Auto #2 Total**				**$ 4,317,463**	**$ -**	**$ 4,317,463**			
244	Lubbock South Auto #3	11764471	Lubbock South 230kV Terminal U	1/31/15	194,563	-	194,563			
245	**Lubbock South Auto #3 Total**				**$ 194,563**	**$ -**	**$ 194,563**	This project will replace six 230 kV switches at Lubbock South, which need to be upgraded. .	SPS Zonal	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
246	Lynn Co. Dist. Load Conversion	11495345	Lynn Co. Dist. Load Conversion	3/15/15	7,342,142	-	7,342,142			
247	Lynn Co. Dist. Load Conversion	11621182	Lynn Co. Dist Load Conversion	10/1/14	361,685	-	361,685			
248	**Lynn Co. Dist. Load Conversion Total**				**$ 7,703,827**	**$ -**	**$ 7,703,827**	This project converted a 69 kV distribution transformer to 115 kV to prevent overloading of the 115/69 kV transformers at Lynn Co. Substation, south of Lubbock, Texas.	SPP Base Plan	OT
249	Mescalero Ridge Wind GEN-2008-022	11614122	Mescalero Wind Sub	6/14/15	(1,100,889)	-	(1,100,889)			
250	Mescalero Ridge Wind GEN-2008-022	11814056	Tap to X-roads Sub J14-to Edd	6/19/15	(2,444,118)	-	(2,444,118)			
251	Mescalero Ridge Wind GEN-2008-022	11825081	J15 Crossroads Tap-X-Roads to	6/19/15	560,545	-	560,545			
252	**Mescalero Ridge Wind GEN-2008-022 Total**				**$ (2,984,462)**	**$ -**	**$ (2,984,462)**	This project connects a 200 MW wind resource to the Tolk-Eddy 345 kV line. Sub is Crossroads, but project is now Roosevelt Wind.	Cust Funded	GI
							-			
253	Mescalero Wind	11852733	Mescalero Wind New Mexico Land	11/30/14	69,149	-	69,149			
254	**Mescalero Wind Total**				**$ 69,149**	**$ -**	**$ 69,149**	This project connects a 200 MW wind resource to the Tolk-Eddy 345 kV line. Sub is Crossroads, but project is now Roosevelt Wind.	Cust Funded	GI
255	Moore County 115kV Capacitor	11735571	Moore County 115kV Capacitor B	4/30/14	44	-	44			
256	**Moore County 115kV Capacitor Total**				**$ 44**	**$ -**	**$ 44**	This project installed a 115 kV capacitor bank to provide reactive support for the 115 kV transmission system at Moore County when the #3 generator was retired at Moore County Plant, near Dumas, Texas.	SPS Zonal	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
257	Muleshoe East Conversion	11351189	Muleshoe East Line	11/28/15	1,054,657	-	1,054,657			
258	Muleshoe East Conversion	11351220	Muleshoe East Sub	11/28/15	161,248	-	161,248			
259	Muleshoe East Conversion	11859817	Muleshoe East Y-80 Line	11/28/15	299,277	-	299,277			
260	Muleshoe East Conversion	11859821	Muleshoe East K-30 Line	11/28/15	275,864	-	275,864			
261	**Muleshoe East Conversion Total**				**$ 1,791,046**	**$ -**	**$ 1,791,046**	This project converts the 69 kV Muleshoe East distribution substation to 115 kV. This substation is near Muleshoe, TX.	SPP Base Plan	RE
262	Muleshoe West Xfmr Upgrade	11955586	Muleshoe WestHighside Sub	6/1/15	242,776	-	242,776			
263	Muleshoe West Xfmr Upgrade	12031235	Muleshoe West Z-50 Re-terminat	3/31/15	48,053	-	48,053			
264	**Muleshoe West Xfmr Upgrade Total**				**$ 290,830**	**$ -**	**$ 290,830**	This project converts the 69 kV Muleshoe West distribution transformer to 115 kV. This substation is near Muleshoe, TX.	SPS Zonal	RE
265	Mustang-Schell CO2 115kV Line	12082040	115 ROW ROW Portion ROW	6/1/17	219,780	366,307	586,087			
266	**Mustang-Schell CO2 115kV Line Total**				**$ 219,780**	**$ 366,307**	**$ 586,087**	This project constructs a 115 kV line from Mustang Plant to Shell CO2 Sub, near Denver City, TX.	SPP base Plan	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
267	NE Hereford auto. addition	11495358	NE Hereford auto. addition Sub	4/1/14	1,154	-	1,154			
268	NE Hereford auto. addition	11646435	NE Hereford Auto-Deaf Smith Re	4/15/14	44	-	44			
269	NE Hereford auto. addition	11852450	NE Hereford Sub Phase 2 Sub	4/15/14	494	-	494			
270	**NE Hereford auto. addition Total**				**$ 1,692**	**$ -**	**$ 1,692**	This project installs a 2nd 8-MVA 115/69-kV auto at NE Hereford for improved contingency performance.	SPP Base Plan	RE
271	NE Hereford to New Center St. 115 kV Line	11987356	New Centre St Land	12/31/15	0	-	0			
272	NE Hereford to New Center St. 115 kV Line	11987361	NE Hereford- New Centre St 115	12/31/17	25,000	500,000	525,000			
273	NE Hereford to New Center St. 115 kV Line	12049412	NE Hereford to New Centre StPr	10/31/16	-	32,142	32,142			
274	**NE Hereford to New Center St. 115 kV Line Total**				**$ 25,000**	**$ 532,142**	**$ 557,142**	This project constructs a 115 kV line from North East Herford Sub to a new Center St. 115 kV to distribution sub in Hereford, TX.	SPP Base Plan	RE
275	NEWHART 230/115 kV Add Transformer #2	11987232	NEWHART 230/115 kV Add transfo	12/31/16	-	8,105,409	8,105,409			
276	**NEWHART 230/115 kV Add Transformer #2 Total**				**$ -**	**$ 8,105,409**	**$ 8,105,409**	This project installs a 2nd 230/115 kV transformer at Newhart Subb, south of Amarillo,, TX.	SPP Base Plan	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
277	Nichols 115kV BFR	11791676	Nichols 115kV BFR - Nichols Su	12/31/15	5,608,849	-	5,608,849			
278	Nichols 115kV BFR	11791677	Nichols 115kV BFR - Dumas 19th	12/31/15	166,343	-	166,343			
279	Nichols 115kV BFR	11791679	Nichols 115kV BFR - Kirby Sub	12/31/15	167,738	-	167,738			
280	Nichols 115kV BFR	11791682	Nichols 115kV BFR - Asarco Sub	12/31/15	19,490	-	19,490			
281	Nichols 115kV BFR	11791684	Nichols 115kV BFR - Pantex Sou	12/31/15	166,045	-	166,045			
282	Nichols 115kV BFR	11791952	Nichols 115kV BFR - East Plant	12/31/15	167,461	-	167,461			
283	Nichols 115kV BFR	11791953	Nichols 115kV BFR - Kingsmill	12/31/15	94,116	-	94,116			
284	**Nichols 115kV BFR Total**				**$ 6,390,043**	**$ -**	**$ 6,390,043**	This project adds breaker failure relaying to the 115 kV bus at Nichols Plant, in Amarillo, TX.	SPS Zonal	RE
285	North Canal-Pecos	11616546	Pecos Sub 115kV Breaker Additi	12/31/13	(128)	-	(128)			
286	**North Canal-Pecos Total**				**$ (128)**	**$ -**	**$ (128)**	This project reconnected the North Canal substation to a dedicated short 115 kV line sement to improve reliability. This substation is at Carlsbad, New Mexico.	SPS Zonal	OT
287	OPIE - Enterprise S Eddy Tap	12067839	W39 Inst Switch for Enterprise	10/31/15	465,218	-	465,218			
288	**OPIE - Enterprise S Eddy Tap Total**				**$ 465,218**	**$ -**	**$ 465,218**	This project installs a 115 KV switch for Enterprise to provide service to their substation, south east of Carlsbad, NM.	SPS Zonal	LI

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
289	OPIE 1 North Loving (Hopi to Capano)	11960111	N. Loving 115kV terminal -Chin	5/29/15	422,156	-	422,156			
290	OPIE 1 North Loving (Hopi to Capano)	11969178	N. Loving High Side Sub	6/15/15	2,083,071	-	2,083,071			
291	OPIE 1 North Loving (Hopi to Capano)	12080438	Z-05 Relocate at Hopi Line	5/30/15	47,803	-	47,803			
292	OPIE 1 North Loving (Hopi to Capano)	11783510	Hopi to Copano Line	5/31/15	4,897,951	-	4,897,951			
293	OPIE 1 North Loving (Hopi to Capano)	11783513	Hopi to Copano ROW	5/31/15	586,679	-	586,679			
294	OPIE 1 North Loving (Hopi to Capano)	11783570	Hopi to Copano Hopi Substation	5/29/15	946,553	-	946,553			
295	**OPIE 1 North Loving (Hopi to Capano) Total**				**$ 8,984,212**	**$ -**	**$ 8,984,212**	This project constructs a 115 KV line from Hopi Substation, near Carlsbad, NM to new North Loving Substation, southeast of Carlsbad, NM to serve additional loads and provide increased network reliability. The Loving area is currently served at 69 kV.	SPP Base Plan	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
296	OPIE 1 Road Runner (Interc Potash Conn)	11728653	T-41 In & Out(Whitten Line),Li	12/31/15	303,718	-	303,718			
297	OPIE 1 Road Runner (Interc Potash Conn)	11628411	115kV In & Out T-41 Line	4/30/15	7,755	-	7,755			
298	OPIE 1 Road Runner (Interc Potash Conn)	11628413	230kV Re Term at Potash Juncti	10/31/15	317,600	-	317,600			
299	OPIE 1 Road Runner (Interc Potash Conn)	11628414	Potash Junction terminal&bus e	10/31/15	1,867,449	-	1,867,449			
300	OPIE 1 Road Runner (Interc Potash Conn)	11628448	Intercont Potash Conn 230kV Li	10/31/15	45,928,874	-	45,928,874			
301	OPIE 1 Road Runner (Interc Potash Conn)	11628454	115kV Line to customers sub Li	10/31/15	927,876	-	927,876			
302	OPIE 1 Road Runner (Interc Potash Conn)	11628457	West Jal Sub	10/31/15	8,401,649	-	8,401,649			
303	OPIE 1 Road Runner (Interc Potash Conn)	11628460	West Jal Sub Land	6/30/14	238	-	238			
304	OPIE 1 Road Runner (Interc Potash Conn)	11628461	Potash to West Jal 230kV ROW	10/31/15	1,604,339	-	1,604,339			
305	OPIE 1 Road Runner (Interc Potash Conn)	11725274	K-52 Re-Term-Potash Juct 230kV	10/31/15	322,374	-	322,374			
306	OPIE 1 Road Runner (Interc Potash Conn)	11725298	Whitten Relay Modifications Su	12/31/15	28,119	-	28,119			
307	OPIE 1 Road Runner (Interc Potash Conn)	11725665	Pecos Sub Relay Modifications	10/31/15	191,325	-	191,325			
308	OPIE 1 Road Runner (Interc Potash Conn)	11725666	Cunningham Sub relay Modificat	10/31/15	292,730	-	292,730			
309	OPIE 1 Road Runner (Interc Potash Conn)	11725670	Red Bluff Relay Settings, Sub	6/15/15	27,543	-	27,543			
310	**OPIE 1 Road Runner (Interc Potash Conn) Total**				**$ 60,221,590**	**$ -**	**$ 60,221,590**	This project provides a facility called Roadrunner Substation, to connect a new potash mine, Intercontinental Potash, to the 115 kV transmission system in SE New Mexico.	SPP Base Plan	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
311	OPIE 2 Battle Axe 115kV	11959504	Battle Axe 115kV Sub NM Land	4/15/15	36,273	-	36,273			
312	OPIE 2 Battle Axe 115kV	11959513	Battle Axe 115kV NM Transmissi	12/4/15	1,093,208	-	1,093,208			
313	OPIE 2 Battle Axe 115kV	11959524	Battle Axe to Road Runner 115K	12/4/15	9,348,154	-	9,348,154			
314	OPIE 2 Battle Axe 115kV	11959531	Battle Axe 115KV NM_High Side	12/4/15	939,240	-	939,240			
315	OPIE 2 Battle Axe 115kV	11971609	115KV Road Runner to Battle Ax	12/4/15	1,681,688	-	1,681,688			
316	**OPIE 2 Battle Axe 115kV Total**				**$ 13,098,562**	**$ -**	**$ 13,098,562**	This project constructs a radial 115 kV line from Roadrunner Substation to the new Battleaxe distribution substation, in southeast New Mexico, and expands the 115 kV bus at Roadrunner Substation for the new line terminal.	SPS Directly Assigned	LI
317	OPIE 2 China Draw-Wood Draw 115kV_PID 30825	12016114	China Draw-Wood Draw 115kV ROW	9/1/17	159,853	120,000	279,853			
318	**OPIE 2 China Draw-Wood Draw 115kV_PID 30825 Total**				**$ 159,853**	**$ 120,000**	**$ 279,853**	This project constructs a 115 kV line from China Draw to Wood Draw.	SPP Base Plan	RE
319	OPIE 2 China Draw-Yeso Hills 115kV_PID 30675	12015808	China Draw-Yeso Hills 115kV RO	6/1/18	141,057	120,000	261,057			
320	**OPIE 2 China Draw-Yeso Hills 115kV_PID 30675 Total**				**$ 141,057**	**$ 120,000**	**$ 261,057**	This project constructs a 115 kV line from China Draw to Yeso Hills distribution substation.	SPS Directly Assigned	LI

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
321	OPIE 2 DCP Zia 2 Quahada Project	12019908	Lea National Switch_Wave TrapS	4/13/15	197,808	-	197,808			
322	OPIE 2 DCP Zia 2 Quahada Project	12034825	DCP Substation Upgrade_Substat	2/16/15	51,211	-	51,211			
323	OPIE 2 DCP Zia 2 Quahada Project	11878881	Quahada 4 Breaker Ring Switchi	7/16/15	3,980,247	-	3,980,247			
324	OPIE 2 DCP Zia 2 Quahada Project	11913204	V21 Term Cunningham to Quahada	7/16/15	852,547	-	852,547			
325	OPIE 2 DCP Zia 2 Quahada Project	11913299	V48 Term Lea National to Quaha	7/16/15	1,080,501	-	1,080,501			
326	OPIE 2 DCP Zia 2 Quahada Project	11913306	DCP Zia 2 115kV Switch Tap to	2/16/15	102,092	-	102,092			
327	OPIE 2 DCP Zia 2 Quahada Project	11913317	Maljmar Term Lea Natl Malj.-Qu	7/16/15	438,103	-	438,103			
328	OPIE 2 DCP Zia 2 Quahada Project	11913377	DCP Zia II Quahada Project Lin	7/16/15	450,631	-	450,631			
329	OPIE 2 DCP Zia 2 Quahada Project	11913396	Maddox Quahada Relay Sub	1/28/15	486,941	-	486,941			
330	OPIE 2 DCP Zia 2 Quahada Project	11913405	Quahada Substaion Land	11/28/14	110,975	-	110,975			
331	OPIE 2 DCP Zia 2 Quahada Project	11913408	DCP Zia 2 115kV Line & Tap ROW	2/28/15	15,735	-	15,735			
332	**OPIE 2 DCP Zia 2 Quahada Project Total**				**$ 7,766,791**	**$ -**	**$ 7,766,791**	This project constructs a new 4 breaker 115 kV ring bus at the intersection of PC - Cunningham and Maljamar - Intrepid 115 kV lines. It also constructs the radial tap line to the customer's new distribution substation.	SPP Base Plan, Cust Funded	RE, LI
333	OPIE 2 Kiowa-Eddy Co 345kV	12044108	Kiowa-Eddy Co 345kV ROW	9/1/20	150,000	40,475	190,475			
334	OPIE 2 Kiowa-Eddy Co 345kV	12044219	Kiowa-Eddy Co 345kV Line Pre C	2/28/15	457,402	-	457,402			
335	**OPIE 2 Kiowa-Eddy Co 345kV Total**				**$ 607,402**	**$ 40,475**	**$ 647,877**	This project constructs a 345 kV line betweek Eddy County Substation and Kiowa 345 kV substation in SE NM.	SPS Zonal	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
336	OPIE 2 Livingston Ridge-Cardinal 115kV_PID 30695	12016134	L Ridge-Sage Brush 115kV ROW_U	6/1/18	136,640	120,000	256,640			
337	OPIE 2 Livingston Ridge-Cardinal 115kV_PID 30695	12016140	S Brush-Cardinal 115kV L_UID 5	10/15/16	-	15,516,579	15,516,579			
338	OPIE 2 Livingston Ridge-Cardinal 115kV_PID 30695	12016150	S Brush-Cardinal 115 ROW_UID 5	6/1/16	1,417,808	30,000	1,447,808			
339	OPIE 2 Livingston Ridge-Cardinal 115kV_PID 30695	12016157	T85.5 Eunice Re-Term_UID 50951	7/31/16	-	385,998	385,998			
340	OPIE 2 Livingston Ridge-Cardinal 115kV_PID 30695	12016160	T85.0 NEF Re-Term_UID 50951	7/31/16	-	384,992	384,992			
341	OPIE 2 Livingston Ridge-Cardinal 115kV_PID 30695	12016163	T85.3 Teague Re-Term_UID 50951	7/31/16	-	385,998	385,998			
342	OPIE 2 Livingston Ridge-Cardinal 115kV_PID 30695	12016201	Sage Brush 115kV Sub Land_UID	1/31/16	-	80,000	80,000			
343	OPIE 2 Livingston Ridge-Cardinal 115kV_PID 30695	12016208	S Brush 115kV Sub Liv Cardinal	8/31/16	-	4,652,519	4,652,519			
344	OPIE 2 Livingston Ridge-Cardinal 115kV_PID 30695	12016223	Cardinal 115kV Sub Land_UID 50	1/31/16	-	97,056	97,056			
345	OPIE 2 Livingston Ridge-Cardinal 115kV_PID 30695	12016230	Cardinal 115kV Sub Sage Brush	12/15/16	-	3,716,056	3,716,056			
346	OPIE 2 Livingston Ridge-Cardinal 115kV_PID 30695	12016239	Hobbs W Sub Rmte Ends Cardinal	7/31/16	-	269,932	269,932			
347	OPIE 2 Livingston Ridge-Cardinal 115kV_PID 30695	12016245	Whitten Sub Rmte Ends Cardinal	7/31/16	-	280,475	280,475			
348	OPIE 2 Livingston Ridge-Cardinal 115kV_PID 30695	12016252	NEF Sub Remote Ends Cardinal_U	10/15/16	-	267,503	267,503			
349	**OPIE 2 Livingston Ridge-Cardinal 115kV_PID 30695 Total**				**$ 1,554,448**	**$ 26,187,108**	**$ 27,741,556**	This project constructs a 115 kV line between Livingston Ridge and Cardinal substations in SE NM.	SPP Base Plan	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
350	OPIE 2 Potash Junction 230/115 Auto Upgrade	12038514	Potash Junction 230/115 Auto U	4/30/16	-	3,162,434	3,162,434			
351	**OPIE 2 Potash Junction 230/115 Auto Upgrade Total**				**$ -**	**$ 3,162,434**	**$ 3,162,434**	This project will replace the 168 MVA 230/115 kV transformer with a 288 MVA unit at Potash Junction.	SPP Base Plan	RE
352	OPIE 3 China Draw SVC	12056610	China Draw Sub SVC Sub	4/1/16	-	28,977,278	28,977,278			
353	**OPIE 3 China Draw SVC Total**				**$ -**	**$ 28,977,278**	**$ 28,977,278**	This project will install a 115 kV -70/+200 Mvar Static Var Controller (SVC) at the 115 kV China Draw bus.	SPP Base Plan	RE
354	OPIE 3 Kiowa-China Draw 345kV_PID 30638	12015853	Kiowa-North Loving 345kV ROW_U	9/1/18	892,205	335,000	1,227,205			
355	OPIE 3 Kiowa-China Draw 345kV_PID 30638	12015865	N Loving-China Draw 345kV ROW_	9/1/18	803,442	630,000	1,433,442			
356	**OPIE 3 Kiowa-China Draw 345kV_PID 30638 Total**				**$ 1,695,647**	**$ 965,000**	**$ 2,660,647**	This project will construct a 345 kV line between Kiowa ot North Loving - China Draw 345 kV buses in SE NM.	SPP Base Plan	RE
357	OPIE 3 Ponderosa-Custer Mt 115kV_PID 30694	12016056	Ponderosa-Custer Mt 115kV ROW_	6/1/17	561,519	-	561,519			
358	OPIE 3 Ponderosa-Custer Mt 115kV_PID 30694	12016098	Custer Mt 115kV Sub Land_UID 5	1/31/15	74,968	-	74,968			
359	**OPIE 3 Ponderosa-Custer Mt 115kV_PID 30694 Total**				**$ 636,487**	**$ -**	**$ 636,487**	This project will construct a radial 115 kV line from a new Custer Mt Sub to a new Ponderosa Sub, a distribution substation, in SE NM.	SPS Directly Assigned	LI
360	OPIE 3 Road Runner SVC	12055606	Road Runner SVC Sub	4/1/16	-	28,423,092	28,423,092			
361	**OPIE 3 Road Runner SVC Total**				**$ -**	**$ 28,423,092**	**$ 28,423,092**	This project will install a 115 kV -70/+200 Mvar Static Var Controller (SVC) at the 115 kV Roadrunner bus.	SPP Base Plan	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
362	OPIE Hobbs-Kiowa 345kV_PID 30637	12015707	OPIE 3_Hobbs-Kiowa 345kV ROW_U	6/1/18	545,187	925,000	1,470,187			
363	OPIE Hobbs-Kiowa 345kV_PID 30637	12015807	Hobbs 345kV Sub Land_UID 50452	3/31/15	26,170	-	26,170			
364	**OPIE Hobbs-Kiowa 345kV_PID 30637 Total**				**$ 571,357**	**$ 925,000**	**$ 1,496,357**	This project will construct a 345 kV line between Hobbs Plant and Kiowa 345 kV substation in SE NM.	SPP Base Plan	RE
365	OPIE N Loving-S Loving 115kV	12058120	N Loving-S Loving 115 kVROW	12/1/15	650,000	-	650,000			
366	**OPIE N Loving-S Loving 115kV Total**				**$ 650,000**	**$ -**	**$ 650,000**	This project will convert the South Loving 69 kV sub to 115 kV.	SPS Zonal	LI
367	OPIE TUCO-Hobbs 345kV_PID 30376	12016028	TUCO-Yoakum 345kV ROW_UID 5044	6/1/20	27,002	24,000	51,002			
368	OPIE TUCO-Hobbs 345kV_PID 30376	12016046	Yoakum-TX/NM Border 345kV ROW_	1/15/19	25,000	60,000	85,000			
369	OPIE TUCO-Hobbs 345kV_PID 30376	12016057	TX/NM Border-Hobbs 345kV ROW_U	1/15/19	25,000	60,000	85,000			
370	**OPIE TUCO-Hobbs 345kV_PID 30376 Total**				**$ 77,003**	**$ 144,000**	**$ 221,003**	This project will construct a 345 kV line from Tuco Sub to Yoakum Sub to Hobbs Plt Sub in New Mexico.	SPP Base Plan	RE, EC
371	OPIE2-Pecos Dist Add 115kV	11945473	Pecos Dist Add/115kV Breaker a	11/30/15	3,347,258	-	3,347,258			
372	OPIE2-Pecos Dist Add 115kV	11945485	Eddy Co. Relay Sub	11/30/15	287,616	-	287,616			
373	OPIE2-Pecos Dist Add 115kV	11945489	Seven Rivers Relay Sub	3/31/15	187,735	-	187,735			
374	**OPIE2-Pecos Dist Add 115kV Total**				**$ 3,822,610**	**$ -**	**$ 3,822,610**	This project will add a 115 kV distribution substation in the Pecos Substation for additional load service to Carlsbad.	SPS Zonal	LI

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
375	Osage Re-termination Project	11495779	Osage Substation	6/1/16	-	383,304	383,304			
376	Osage Re-termination Project	11495780	Randall County Interchange Sub	6/1/16	-	6,850,670	6,850,670			
377	Osage Re-termination Project	11495785	South Georgia Substation	4/30/16	-	554,592	554,592			
378	Osage Re-termination Project	11500191	Osage Retermination 115 kV Lin	4/30/16	-	4,299,908	4,299,908			
379	Osage Re-termination Project	11781087	Canyon West Relay Sub	5/31/16	-	261,505	261,505			
380	Osage Re-termination Project	11781094	East Plant Relay Sub	5/1/16	-	251,101	251,101			
381	Osage Re-termination Project	11902959	South Georgia - Randall Line	6/1/15	56,905	-	56,905			
382	Osage Re-termination Project	11902968	T-66 Reterm Line	3/31/16	-	1,074,448	1,074,448			
383	Osage Re-termination Project	11918237	Manhatten Wave Trap Addition S	6/1/15	16,613	-	16,613			
384	Osage Re-termination Project	11983814	T-75 Structure	5/31/16	-	177,738	177,738			
385	Osage Re-termination Project	11983820	V-04 Circuit Removal	5/31/16	-	51,591	51,591			
386	Osage Re-termination Project	11983823	V-43 Structure Replacement	2/28/16	-	105,775	105,775			
387	Osage Re-termination Project	11983907	T-73 Rework Line	1/31/16	-	101,558	101,558			
388	Osage Re-termination Project	12076450	W-77 Randall Co.- Canyon WestLi	5/31/16	-	831,164	831,164			
389	**Osage Re-termination Project Total**				**$ 73,519**	**$ 14,943,355**	**$ 15,016,874**	This project re-terminates the lines around Osage Station near Amarillo to eliminate the station.	SPP Base Plan	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
390	Oxy S. Hobbs CO2	11786295	Oxy S Hobbs CO2 T-13 Tap Line	5/21/15	397,236	-	397,236			
391	Oxy S. Hobbs CO2	12076077	T13_115 KV ROW	2/28/15	2,011	-	2,011			
392	**Oxy S. Hobbs CO2 Total**				**$ 399,247**	**$ -**	**$ 399,247**	This Project installs a 115 kV switch and tap connecting to the Sanger Switch - Taylor 115 kV line for service to the new Oxy South Hobbs Substation, near Hobbs, NM.	SPP Base Plan	RE, LI
393	PCA Intg, 115/69 kV Transformer Upgrade	11987253	PCA Transformer Upgrade Sub	3/31/16	-	1,919,640	1,919,640			
394	**PCA Intg, 115/69 kV Transformer Upgrade Total**				**$ -**	**$ 1,919,640**	**$ 1,919,640**	This project replaces the 40 MVA 115/69 kV transformer with a 84 MVA unit at PCA substation.	SPP Base Plan	RE
395	PCA-Carlsbad V-61 Wavetrap Upg	12076284	PCA V-61 Wavetrap UpgradeSub	6/1/16	-	231,066	231,066			
396	PCA-Carlsbad V-61 Wavetrap Upg	12076285	Carlsbad V-61 Wavetrap Upgrade,Sub	6/1/16	-	127,890	127,890			
397	**PCA-Carlsbad V-61 Wavetrap Upg Total**				**$ -**	**$ 358,956**	**$ 358,956**			
398	Pearl Sub Rebuild	11987146	Pearl Substation Land_Sub Land	1/31/15	47,718	-	47,718			
399	Pearl Sub Rebuild	11987152	V83 Retermination_Line Portion	12/15/15	609,636	-	609,636			
400	Pearl Sub Rebuild	11987328	Pearl Sub Rebuild_High Side_Su	12/15/15	849,416	-	849,416			
401	**Pearl Sub Rebuild Total**				**$ 1,506,770**	**$ -**	**$ 1,506,770**	This project rebuilds the high and low side of the Pearl distribution substation and installs a larger transformer at that location.	SPS Zonal	LI

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
402	Portales	11801901	Kilgore-South Portales ROW	6/1/16	260,000	450,000	710,000			
403	Portales	11801967	Market St.-Portales ROW	12/1/16	460,000	1,450,000	1,910,000			
404	Portales	11802002	South Portales Sub Land	5/31/16	-	68,000	68,000			
405	Portales	11802009	Market St.-South Portales ROW	6/1/16	310,000	300,000	610,000			
406	**Portales Total**				**$ 1,030,000**	**$ 2,268,000**	**$ 3,298,000**	This project constructs new 115 kV lines from Kilgore - South Portales-Market Street-South Portales and provides high side transmisson facilities for these subs to be converted from 69 kV to 115 kV.	SPP Base Plan	RE
407	Potash Junction	11764477	Potash Junction 115/69 Xfmr Up	5/15/15	2,173,956	-	2,173,956			
408	Potash Junction	11805804	Potash Junction-Upgrade 115/69	7/24/14	299	-	299			
409	**Potash Junction Total**				**$ 2,174,255**	**$ -**	**$ 2,174,255**	This project replaces the 40 MVA 115/69 kV transformers at Potash Junction in SE NM with 84 MVA units.	SPP Base Plan	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
410	Potter-Channing-Dallam	11495857	Channing Sub	12/31/15	3,190,754	15,000	3,205,754			
411	Potter-Channing-Dallam	11495858	Dallam Co. 230/115 kV sub	12/31/15	6,194,031	15,000	6,209,031			
412	Potter-Channing-Dallam	11495864	Dallam Co. Sub	12/31/15	162,670	15,000	177,670			
413	Potter-Channing-Dallam	11495868	Potter-Sub	12/31/15	1,003,280	15,000	1,018,280			
414	Potter-Channing-Dallam	11495879	Transmisison 230 kV Line	12/31/15	426,016	15,000	441,016			
415	Potter-Channing-Dallam	11495880	Transmission Line 115kV Line	12/31/15	221,769	15,000	236,769			
416	Potter-Channing-Dallam	11969553	W03 Potter-Channing 230kV Line	12/31/15	446,266	15,000	461,266			
417	Potter-Channing-Dallam	11999450	Andrews Sub Land	2/15/15	199,819	-	199,819			
418	**Potter-Channing-Dallam Total**				**$ 11,844,605**	**$ 105,000**	**$ 11,949,605**	This project converts the new Potter-Channing-Dallam 115 kV (built for 230 kV) to 230 kV operation and reconnects the substations to 230 KV facilities. Installs the XIT 230/115 kV substation.	SPP Base Plan	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
419	Pringle 115 kV Breaker & One-Half	11987265	Pringle Substation Sub	12/30/16	-	6,426,919	6,426,919			
420	Pringle 115 kV Breaker & One-Half	11987270	Riverview Relay Upgrade Sub	12/30/16	-	486,578	486,578			
421	Pringle 115 kV Breaker & One-Half	11987271	Blackhawk Relay Upgrade_Sub	12/30/16	-	359,825	359,825			
422	Pringle 115 kV Breaker & One-Half	11987275	Spearman # 1 Relay Upgrade_Sub	12/30/16	-	509,408	509,408			
423	Pringle 115 kV Breaker & One-Half	11987281	T06_Pringle 115kV Re-Term Line	12/30/16	-	312,404	312,404			
424	Pringle 115 kV Breaker & One-Half	11987308	T07_Pringle 115kV Re-Term Line	12/30/16	-	313,009	313,009			
425	Pringle 115 kV Breaker & One-Half	11987312	T08_Pringle 115kV Re-Term Line	12/30/16	-	69,728	69,728			
426	Pringle 115 kV Breaker & One-Half	11987314	T49_Pringle 115kV Re-Term Line	12/30/16	-	71,556	71,556			
427	Pringle 115 kV Breaker & One-Half	11987320	Pringle 115KV ROW	12/30/16	25,201	27,492	52,693			
428	Pringle 115 kV Breaker & One-Half	12046133	Harrington Relay Upgrade_Sub P	12/30/16	-	388,250	388,250			
429	**Pringle 115 kV Breaker & One-Half Total**				**$ 25,201**	**$ 8,965,171**	**$ 8,990,372**	This project rebuilds the 115 kV bus at Pringle Substation, north of Amarillo, TX, to a breaker and a half design. Remote terminal relaying work is also included as part of the project.	SPS Zonal	RE
430	Pringle Dist Transformer	11628831	Pringle Dist Transformer Sub	2/16/15	1,404,719	-	1,404,719			
431	**Pringle Dist Transformer Total**				**$ 1,404,719**	**$ -**	**$ 1,404,719**	This project installs a 115 kV distribution transformer at the Pringle Substation.	SPS Zonal	LI

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
432	Puckett West Breaker Addition	11495943	Puckett West Tap Line	12/15/15	279,745	-	279,745			
433	Puckett West Breaker Addition	11805854	Puckett Sub	12/15/15	1,385,810	-	1,385,810			
434	Puckett West Breaker Addition	11805863	Couter Relay Mod Sub	12/8/15	281,167	-	281,167			
435	**Puckett West Breaker Addition Total**				**$ 1,946,722**	**$ -**	**$ 1,946,722**	This project installs 115 kV breakers at Puckett West to provide increased reliability in faults.	SPS Zonal	RE
436	Relays ELR - SPS	10941117	Tip-S SPS Relays	2/28/15	590,692	-	590,692			
437	Relays ELR - SPS	11133414	ELR-SPS Relays Sub NM	2/28/15	627,128	-	627,128			
438	**Relays ELR - SPS Total**				**$ 1,217,819**	**$ -**	**$ 1,217,819**	This project provided for replacement of protective relays that were no longer serviceable or spare parts were not obtainable.	SPS Zonal	SR
439	River Birch	11557297	River Birch Wind ROW	9/15/15	(44,956)	-	(44,956)			
440	River Birch	11566001	River Birch Wind Sub	3/15/16	-	(141,349)	(141,349)			
441	River Birch	11688730	River Birch Z-33Wreck Out Line	5/27/16	-	(206,700)	(206,700)			
442	**River Birch Total**				**$ (44,956)**	**$ (348,050)**	**$ (393,006)**	This project constructs an interconnection of a 50 MW connected wind farm on the 69 kV line near Vega, TX.	Cust Funded	GI
443	Roosevelt Cty 230 Brkr 1/2	11786350	Roosevelt County K-51 line	11/30/16	-	411,779	411,779			
444	Roosevelt Cty 230 Brkr 1/2	11786356	Roosevelt County Z-30 line	11/30/16	-	411,779	411,779			
445	**Roosevelt Cty 230 Brkr 1/2 Total**				**$ -**	**$ 823,557**	**$ 823,557**	This project converts the straight 230 kV bus to a double bus - double breaker bus design for increased reliability.	SPS Zonal	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
446	Roswell Loop	11786500	Chaves-Price-Capitan 115 kV Li	7/30/16	1,400,000	150,000	1,550,000			
447	Roswell Loop	11786502	Chaves-Price-Capitan 115 kV Li	5/31/15	5,000	-	5,000			
448	**Roswell Loop Total**				**$ 1,405,000**	**$ 150,000**	**$ 1,555,000**			
449	S&E - SPS Line	11330274	SPS 2014 S&E B 230kV Line	2/28/15	2,893,195	-	2,893,195			
450	S&E - SPS Line	11330276	SPS 2015 S&E B 230kV Line	12/31/15	2,312,315	-	2,312,315			
451	S&E - SPS Line	11495908	SPS 2016 S&E B 230kV Line	12/31/16	-	2,503,579	2,503,579			
452	S&E - SPS Line	11752691	TX 2013 S&E B 69kV Line	5/31/14	(1,348)	-	(1,348)			
453	S&E - SPS Line	11924050	SPS 2014 NM S&E B 69kV Line	1/31/15	43,736	-	43,736			
454	S&E - SPS Line	11924073	SPS 2014 TX S&E B 69kV Line	2/28/15	4,304,195	-	4,304,195			
455	S&E - SPS Line	11924077	SPS 2014 TX S&E B 115kV Line	2/28/15	4,480,526	-	4,480,526			
456	S&E - SPS Line	11924113	SPS 2014 KS S&E B 345kV Line	12/31/14	(220)	-	(220)			
457	S&E - SPS Line	12075915	SPS 2015 S&E NM B115kVLine	12/31/15	14,616	-	14,616			
458	**S&E - SPS Line Total**				**$ 14,047,013**	**$ 2,503,579**	**$ 16,550,592**	These projects are part of the storm and emergency blankets work orders for repair of facilities due to inclement weather or natural disasters.	SPS Zonal	SR

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
459	S&E - SPS Sub	11351984	SPS 2013 S&E Sub	5/30/14	50,845	-	50,845			
460	S&E - SPS Sub	11352015	SPS 2014 S&E Sub	4/15/15	782,003	-	782,003			
461	S&E - SPS Sub	11352019	SPS 2015 S&E Sub	12/31/15	583,664	-	583,664			
462	S&E - SPS Sub	11495918	SPS 2016 S&E Sub	12/31/16	-	698,499	698,499			
463	S&E - SPS Sub	11727122	SPS 2013 S&ENew MexicoSub	5/30/14	39	-	39			
464	S&E - SPS Sub	11925140	SPS 2014 NM S&E B Sub	12/31/14	148,263	-	148,263			
465	**S&E - SPS Sub Total**				**$ 1,564,814**	**$ 698,499**	**$ 2,263,312**	These projects are part of storm and emergency blanket work orders for repair of facilities due to inclement weather or natural disasters.	SPS Zonal	SR
466	Salt Creek	11802046	Salt Creek Substation	6/1/16	-	2,331,111	2,331,111			
467	Salt Creek	11802052	Wheeler-Salt Creek Line	6/1/16	-	5,935,358	5,935,358			
468	Salt Creek	11802054	Wheeler-Salt Creek ROW	6/1/16	1,737,354	120,000	1,857,354			
469	Salt Creek	11803450	Wheeler Substation	6/1/16	-	2,079,535	2,079,535			
470	**Salt Creek Total**				**$ 1,737,354**	**$ 10,466,004**	**$ 12,203,358**	This project constructs a new 115 kV distribution substation east of Wheeler, TX, called Salt Creek Substation. It also constructs a ~ 10 mile line from Wheeler Substation to Salt Crrek to provide the source for the new distribution substation.	SPS Zonal	LI

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
471	Soncy Dist. Transformer Conv.	11495945	Soncy Dist. Transformer Conv.	1/20/16	-	661,082	661,082			
472	Soncy Dist. Transformer Conv.	11779461	115kV Line Tap to Soncy, Line	2/29/16	-	1,364,035	1,364,035			
473	Soncy Dist. Transformer Conv.	11805835	Sunset Relay ModSub	11/30/15	168,883	-	168,883			
474	Soncy Dist. Transformer Conv.	11837599	69kV Line Tap to Soncy, Line	2/29/16	-	609,855	609,855			
475	Soncy Dist. Transformer Conv.	11899409	Soncy ROW	6/30/15	757,459	-	757,459			
476	**Soncy Dist. Transformer Conv. Total**				**$ 926,342**	**$ 2,634,972**	**$ 3,561,313**	This project converts the existing 69 kV Soncy Sub transformer to 115 kV. This substation is in the city of Amarillo, TX	SPP Base Plan	RE
477	Spearman 33 Kv Rebuild	11880827	Spearman 33kV Highside Sub	7/31/14	11	-	11			
478	**Spearman 33 Kv Rebuild Total**				**$ 11**	**$ -**	**$ 11**	This project supports the Spearman 33 kV distribution transformer upgrade which requires additional 115 kV upgrades because of the larger unit.	SPS Zonal	LI
479	SPS Asset Sales	12021341	Asset Sale to Oncor	10/15/15	(2,895,701)	-	(2,895,701)			
480	**SPS Asset Sales Total**				**$ (2,895,701)**	**$ -**	**$ (2,895,701)**	This project managed the sale of SPS assets to Sharyland Utilities and the sale of a 69 kV line to Lea County Electric Cooperative.	SPS Zonal	OT
481	SPS Bulk Tran Str	11986980	SPS Bulk Trans Emr Restor Str	9/30/16	-	2,001,088	2,001,088			
482	**SPS Bulk Tran Str Total**				**$ -**	**$ 2,001,088**	**$ 2,001,088**	This project will purchase emergency structure replacement kits for bulk system transmission lines. This kit will include foundations and structure parts.	SPS Zonal	SR

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
483	SPS Group 1 Switch Replacements	11219936	SPS Trans Switch Replmnt Line	12/31/19	29,752	1,506,312	1,536,064			
484	SPS Group 1 Switch Replacements	11361076	NM Trans Switch replacement Li	10/31/13	3,981	-	3,981			
485	**SPS Group 1 Switch Replacements Total**				**$ 33,733**	**$ 1,506,312**	**$ 1,540,045**	These projects provided for replacement of old high maintenance or broken switches with newer switches.	SPS Zonal	SR
486	SPS Line Capacity	11230659	SPS Line Capacity Line	12/31/15	6,978,775	-	6,978,775			
487	SPS Line Capacity	11352085	SPS Line Capacity Lidar Line	9/30/15	215,913	-	215,913			
488	SPS Line Capacity	11358991	Lidar Oklahoma SPS Line	9/30/15	160,060	-	160,060			
489	SPS Line Capacity	11646505	Lidar Kansas Transmission Line	9/30/15	43,998	-	43,998			
490	SPS Line Capacity	11684923	Cherry St k-85 Potter-Rolling	4/30/14	283	-	283			
491	SPS Line Capacity	11684947	Hitchland-Woodward J-12 Line	4/18/14	449	-	449			
492	SPS Line Capacity	12020402	SPS Geospatial Cost on Closed	6/30/15	473,438	-	473,438			
493	**SPS Line Capacity Total**				**$ 7,872,916**	**$ -**	**$ 7,872,916**	This project surveyed and verified the line ratings of the SPS transmission system for lines above 100-kV. This project is a required response to a NERC initiative.	SPS Zonal	SR
494	SPS Line Ratings Impmnt,Maddox	12058833	T42 Wave Trap Repl_Sub Portion	6/1/15	250,581	-	250,581			
495	**SPS Line Ratings Impmnt,Maddox Total**				**$ 250,581**	**$ -**	**$ 250,581**	The wave trap on the 115kV line to Monument (T42) will be upgraded from 800A to 1600A. Additionally, the 115kV CCVT, stand, foundation and line tuner will be upgraded. The 800A wave trap is currently the liming element on T42. The installation of the 1600A wave trap will allow the T42 transmission line to meet the required 249 MVA summer emergency rating.	SPP Base Plan	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
496	SPS Major Line Refurbishment	11765316	SPS Major Line Refurb230kVTX20	12/31/16	-	8,847,647	8,847,647			
497	**SPS Major Line Refurbishment Total**				**$ -**	**$ 8,847,647**	**$ 8,847,647**	This project refurbishes various 230 kV lines in the SPS system.	SPS Zonal	SR
498	SPS Physical Security	11987084	SPS Physical Security-2016	12/31/16	-	0	0			
499	SPS Physical Security	11987091	SPS Physical Security-2015	12/31/19	1,000,950	-	1,000,950			
500	**SPS Physical Security Total**				**$ 1,000,950**	**$ 0**	**$ 1,000,950**	This project provides for necessary security improvements per NERC Standard CIP-014.	SPS Zonal	OT
501	SPS Sub Communication Network Group 1	11986950	SPS Sub Comm Network Group 1 L	10/15/16	-	8,180,330	8,180,330			
502	SPS Sub Communication Network Group 1	11986953	SPS Sub Comm Network Group 1 S	10/31/16	-	475,058	475,058			
503	**SPS Sub Communication Network Group 1 Total**				**$ -**	**$ 8,655,389**	**$ 8,655,389**	These projects provide communications equipment for control and monitoring of the named substations.	SPS Zonal	OT
504	SPS Sub Communication Network Group 3	11986918	SPS Sub Comm Network Group 3 L	10/31/16	-	2,418,205	2,418,205			
505	SPS Sub Communication Network Group 3	11986926	SPS Sub Comm Network Group 3 S	10/31/16	-	172,603	172,603			
506	**SPS Sub Communication Network Group 3 Total**				**$ -**	**$ 2,590,808**	**$ 2,590,808**	These projects provide communications equipment for control and monitoring of the named substations.	SPS Zonal	OT

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
507	SPS Xfmr - Mobile/Spare	11887261	115/69 kV Mobile Sub, Sub	2/28/15	2,122,456	-	2,122,456			
508	SPS Xfmr - Mobile/Spare	11887266	115/69 kV 84 MVA Xfmr(spare)Su	4/30/15	1,201,726	-	1,201,726			
509	SPS Xfmr - Mobile/Spare	11944483	230/115kV 250MVA Xfmr CESSub	4/30/15	1,902,299	-	1,902,299			
510	SPS Xfmr - Mobile/Spare	12055520	115-69kV 84MVA CES-1Sub	5/15/15	1,202,274	-	1,202,274			
511	**SPS Xfmr - Mobile/Spare Total**				**$ 6,428,755**	**$ -**	**$ 6,428,755**	This project provides for replacement of the 115/69 kV mobile sub, purchase of two spare 115/69 kV transformers, and a spare 230/115 kV transformer.	SPS Zonal	SR
512	STEP Newhart Interchange	11351104	Kress Sub	5/31/14	638	-	638			
513	STEP Newhart Interchange	11351120	Lamton Sub	12/15/14	7,255	-	7,255			
514	STEP Newhart Interchange	11351221	Newhart 230/115kV Interchange,	10/1/14	12,066	-	12,066			
515	STEP Newhart Interchange	11351227	Newhart Intg Castro Co-Newhart	2/15/14	423	-	423			
516	STEP Newhart Interchange	11351234	Newhart Intg Hart Ind-Lamton11	11/30/14	40,166	-	40,166			
517	STEP Newhart Interchange	11351245	Newhart Intg Swisher-Newhart23	12/5/14	145,284	-	145,284			
518	STEP Newhart Interchange	11351252	Newhart to Castro, ROW	8/31/14	5	-	5			
519	STEP Newhart Interchange	11351268	Newhart to Lamton ROW	11/15/14	808	-	808			
520	STEP Newhart Interchange	11351271	Newhart to Kress,ROW	9/30/14	11	-	11			
521	STEP Newhart Interchange	11351274	Newhart to Swisher, ROW	11/30/14	6	-	6			

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
522	STEP Newhart Interchange	11352127	Swisher Sub Expansion, Land	4/30/14	564	-	564			
523	STEP Newhart Interchange	11352152	Swisher Sub Sub	12/15/14	176,934	-	176,934			
524	STEP Newhart Interchange	11352465	Z-62 remove Struct@Hart Ind.,	8/30/14	324	-	324			
525	STEP Newhart Interchange	11665679	Re-terminate V-72 Hale at Kres	4/30/14	(13)	-	(13)			
526	STEP Newhart Interchange	11673092	Amarillo South relay Mod-Swish	12/1/14	18,369	-	18,369			
527	STEP Newhart Interchange	11673100	TUCO Relay Mod - Swisher Sub	12/31/14	27,298	-	27,298			
528	STEP Newhart Interchange	11673114	Plant X re-termination-Lampton	12/15/14	546	-	546			
529	STEP Newhart Interchange	11673123	Plant X Relay Mod-Lampton Sub	11/1/14	5,453	-	5,453			
530	STEP Newhart Interchange	11673134	Hale Co. Relay Mod-Lampton Sub	11/1/14	14,238	-	14,238			
531	STEP Newhart Interchange	11673138	Hart Industrial Sub High Side,	11/15/14	5,187	-	5,187			
532	STEP Newhart Interchange	11673301	TUCO re-termination at Swisher	12/5/14	4,428	-	4,428			
533	STEP Newhart Interchange	11673566	Amarillo So. re-termination-Sw	12/15/14	2,297	-	2,297			
534	STEP Newhart Interchange	11928541	Z-63 Double Circuit, Line	3/15/15	1,550	-	1,550			
535	**STEP Newhart Interchange Total**				**$ 463,838**	**$ -**	**$ 463,838**	This project constructs a new 230/115-kV interchange and substation with associated 115-kV transmission lines near Hart, south of Amarillo, Texas. The project will upgrade the transmission system in this area and relieve high transmission loadings on the central part of the SPS transmission system in Castro, Parmer, Swisher, Bailey, Lamb and Hale counties.	SPP Base Plan	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
536	STEP Plainview City Expansion	11350485	Cox-Plainview City 115kV Line	3/28/14	6,387	-	6,387			
537	STEP Plainview City Expansion	11351117	Kress - Plainview City 115kV	11/21/14	98,707	-	98,707			
538	STEP Plainview City Expansion	11351290	Plainview City Exp Sub	11/21/14	7,181	-	7,181			
539	STEP Plainview City Expansion	11351299	Plainview City Exp Kress Sub	11/21/14	899	-	899			
540	STEP Plainview City Expansion	11351303	Plainview City Exp Kress Rura	1/30/15	12,110	-	12,110			
541	STEP Plainview City Expansion	11351309	Plainview City Exp N.Plainview	12/30/14	21,283	-	21,283			
542	STEP Plainview City Expansion	11351313	Plainview - Cox ROW	9/28/14	396	-	396			
543	STEP Plainview City Expansion	11351315	Plainview - Kress ROW	11/28/14	14,968	-	14,968			
544	STEP Plainview City Expansion	11352446	Y-76 Plv - Cox Line	11/30/14	423	-	423			
545	STEP Plainview City Expansion	11925333	Plv. Expansion K-01 Structure	1/31/15	(14)	-	(14)			
546	**STEP Plainview City Expansion Total**				**$ 162,339**	**$ -**	**$ 162,339**	This project constructs a new 115/69 kV substation near Plainview, TX and constructs several 115 kV lines and coverts 69 kV distribution subs to 115 KV from 69 kV. The purpose is to relieve loading of the 69 kV system in that area.	SPP Base Plan	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
547	STEP Pleasant Hill	11351287	Oasis Sub. Term for Pleasant H	12/31/14	4,250	-	4,250			
548	STEP Pleasant Hill	11351316	Pleasant Hill 345/230kV NM Sub	2/28/15	11,929,968	-	11,929,968			
549	STEP Pleasant Hill	11351358	Pleasant Hill to Clovis FEC RO	9/12/14	(2)	-	(2)			
550	STEP Pleasant Hill	11351362	Pleasant Hill to Oasis Sub NM	12/31/14	602	-	602			
551	STEP Pleasant Hill	11351365	Pleasant Hill to Oasis Sub NM	12/31/14	269	-	269			
552	STEP Pleasant Hill	11351366	Pleasant Hill to Roosevelt Co	2/28/15	11,519,469	-	11,519,469			
553	STEP Pleasant Hill	11351371	Pleasant Hill to Roosevelt Co.	12/31/14	132,065	-	132,065			
554	STEP Pleasant Hill	11351374	Pleasant Hill to T-76 in&out NM, Li	10/30/14	72,834	-	72,834			
555	STEP Pleasant Hill	11351693	Roosevelt Co. Term for Pleasan	2/28/15	1,308,747	-	1,308,747			
556	STEP Pleasant Hill	11815740	FEC to Pleasant Hill Term Sub	12/31/14	22,871	-	22,871			
557	STEP Pleasant Hill	11815744	Norton to Pleasant Hill Term S	12/31/14	220,929	-	220,929			
558	STEP Pleasant Hill	11902973	Pleasant Hill to Curry W-65Lin	2/28/15	497,027	-	497,027			
559	STEP Pleasant Hill	11902977	Pleasant Hill to FEC W-64 Line	2/28/15	2,312	-	2,312			
560	STEP Pleasant Hill	11907702	Pleasant Hill to Curry W-62 Li	2/28/15	284,346	-	284,346			
561	STEP Pleasant Hill	11907704	Pleasant Hill to(Norton)Curry	12/31/14	130	-	130			
562	**STEP Pleasant Hill Total**				**$ 25,995,816**	**$ -**	**$ 25,995,816**	This project constructs a new 230/115-kV interchange and substation with associated 230-kV and 115-kV transmission lines near the Clovis, New Mexico area and a 345-kV transmission line from Amarillo, Texas to Clovis. The project will provide additional support for the eastern New Mexico area.	SPP Base Plan	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
563	Sunset add 2nd 115/13.2 xfrmr	11352113	Sunset Transformer Add Sub	4/30/16	-	123,799	123,799			
564	**Sunset add 2nd 115/13.2 xfrmr Total**				**$ -**	**$ 123,799**	**$ 123,799**	This project will add a 2nd 115 kV distribution transformer to Sunset substation.	SPS Zonal	LI
565	Swisher Cty Intg 230/115kV Upgrade	11352115	Swisher Co Intg 230kV Sub	5/29/15	3,054,438	-	3,054,438			
566	**Swisher Cty Intg 230/115kV Upgrade Total**				**$ 3,054,438**	**$ -**	**$ 3,054,438**	This project replaces the existing 230/115 KV transformer with a larger unit.	SPP Base Plan	RE
567	Switch 2845 Conversion	11803464	Switch 2845 Conversion Line	6/1/15	253,583	-	253,583			
568	**Switch 2845 Conversion Total**				**$ 253,583**	**$ -**	**$ 253,583**	This project installs a normally open 69 kV motor operated line switch, replacing existing switch 2845 on circuit Z-69 (Gray County-Bowers), near the Lyons tap to allow the Lyons Substation load to be moved from Bowers Interchange to Gray County Interchange. Lyons Substation is northeast of Amarillo, TX.	SPS Zonal	RE
							-			
569	T01 Tap TCEC Unit Petroleum	11987338	T-01 Tri County Tap 115kV Line	12/31/14	507,762	-	507,762			
570	**T01 Tap TCEC Unit Petroleum Total**				**$ 507,762**	**$ -**	**$ 507,762**	This project connects a new distribution sub for Tri-County Electric Cooperative on the 115 kV line between Texas County Sub and Cole Sub in the Oklahoma Panhandle.	SPS Zonal	LI
571	T38 Taps-BOPCo Sub Capitan 9 & DI #9	11987410	T38 Bopco 3Way Sw Inst Str#41	3/31/15	82,274	-	82,274			
572	T38 Taps-BOPCo Sub Capitan 9 & DI #9	11987412	T38 Bopco 3 Way Sw Inst Capita	12/1/16	-	0	0			
573	**T38 Taps-BOPCo Sub Capitan 9 & DI #9 Total**				**$ 82,274**	**$ 0**	**$ 82,274**	This project connects a new distribution subs for BOPCO on various 115 kV lines in SE NM.	SPS Zonal	LI

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
574	T65 Rebld Recon Floyd-Crosby	11791637	T65 Rebuild Floyd-Crosby, ROW	11/12/14	18,238	-	18,238			
575	**T65 Rebld Recon Floyd-Crosby Total**				**$ 18,238**	**$ -**	**$ 18,238**	This project rebuilds the existing Crosby-Floyd 115 kV line with larger conductor to increase capacity. This line is east of Lubbock, TX.	SPP Base Plan	RE
576	T73 Loop335 Georgia Xing TXDOT	11889816	T73_Raise Strs at Loop 335_Tra	12/31/13	(97,883)	-	(97,883)			
577	**T73 Loop335 Georgia Xing TXDOT Total**				**$ (97,883)**	**$ -**	**$ (97,883)**	This project moves 115 kV line T73 to accommodate the widening of Loop 335 in Amarillo, TX.	Cust Funded	OT
578	TPL BFR V31 Hutchinson to Riverview	11791664	TPL BFR V31 Hutchinson Sub	12/31/15	573,331	-	573,331			
579	TPL BFR V31 Hutchinson to Riverview	11791668	TPL BFR V31 Riverview Sub	12/31/15	504,400	-	504,400			
580	**TPL BFR V31 Hutchinson to Riverview Total**				**$ 1,077,731**	**$ -**	**$ 1,077,731**	This project installs breaker failure relaying on the Hutchinson-Riverview 115 kV line at Hutchinson Sub.	SPS Zonal	RE
581	Trans E&S Accts	10695269	E&S Elec Trans Lines_SPS	Routine	29,463	-	29,463			
582	Trans E&S Accts	10695288	E&S Elec Trans Subs_SPS	Routine	57,952	-	57,952			
583	**Trans E&S Accts Total**				**$ 87,415**	**$ -**	**$ 87,415**	The E&S overhead is the method of allocating costs that are incurred in normal business but cannot be directly assigned to a particular function or activity without excessive cost for the benefit received for the five utility subsidiaries.	SPS Zonal	OT

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
584	Tres Amigas	11791986	Tres Amigas - Tolk Sub	12/31/15	(7,883)	-	(7,883)			
585	Tres Amigas	11791989	Tres Amigas - Reterminate J02	12/31/15	0	-	0			
586	**Tres Amigas Total**				**$ (7,883)**	**$ -**	**$ (7,883)**	This project will terminate a new 345 kV line from the tres Amigas HVDC project in New Mexico at Tolk Plant. A new 345 kV bus will be constructed, and a 2nd 345/230 kV auto will be installed.	Cust Funded	LI,GI
587	TUCO 3rd 115/69 autotransformer	11500198	Tuco Substation Sub	5/16/14	1,748	-	1,748			
588	TUCO 3rd 115/69 autotransformer	11852630	Y79 Retermination at TucoLine	6/17/14	423	-	423			
589	**TUCO 3rd 115/69 autotransformer Total**				**$ 2,172**	**$ -**	**$ 2,172**	This project adds a 3rd 115/69KV, 84 MVA transformer and relocates the termination point fo circuit Y79 to provide overloading relief on the existing 115/69 transformers.	SPP Base Plan	RE
590	TUCO Mooreland (Woodward)	10941122	TUCO-Mooreland 345kv (Woodward	11/15/14	110,981	-	110,981			
591	TUCO Mooreland (Woodward)	11313776	Tuco to Mooreland (Woodward) R	12/15/14	298,779	-	298,779			
592	TUCO Mooreland (Woodward)	11342429	Tuco-Woodward Midway Reactor,	10/15/14	6	-	6			
593	TUCO Mooreland (Woodward)	11602863	Border 345kV Reactor OK,Sub	10/15/14	(42)	-	(42)			
594	TUCO Mooreland (Woodward)	11646664	TUCO to Woodward-T-Line, OK, L	11/15/14	124	-	124			
595	**TUCO Mooreland (Woodward) Total**				**$ 409,849**	**$ -**	**$ 409,849**	This project constructs a single circuit 345-kV line between TUCO, near Lubbock, TX to Woodward Oklahoma. SPS will construct the line to just inside the TX-OK state line and OGE will construct from there to Oklahoma. Project was based on the Balanced Portfolio economic studies by SPP.	SPP Balanced Portfolio	EC

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
596	TXN Hitchland-Ochiltree County	11081129	Hitchland-Ochiltree County 230	12/31/13	(21)	-	(21)			
597	**TXN Hitchland-Ochiltree County Total**				**$ (21)**	**$ -**	**$ (21)**	This project constructed a 230-kV line from Hitchland Substation to Ochiltree substation (Perryton) and 230/115-kV interchange at Ochiltree Substation with connections from existing 115-kV lines into the new sub station.	SPP Base Plan	RE
598	UFR-Tripping, TX North	11827404	UFR Tripping, Tx North-Cole OK	8/31/13	33	-	33			
599	**UFR-Tripping, TX North Total**				**$ 33**	**$ -**	**$ 33**	This project added Under Frequency Relay at Cole Substation at the time the line relay packages were replaced at Cole due to the Ochiltree Interchange job.	SPS Zonal	OT
600	Unserviceable - Breakers - SPS	11989259	Potach Breaker Replacement Sub	4/15/15	361,163	-	361,163			
601	Unserviceable - Breakers - SPS	12019428	Sunset Breaker 5J60 Replacemen	4/15/15	162,119	-	162,119			
602	**Unserviceable - Breakers - SPS Total**				**$ 523,282**	**$ -**	**$ 523,282**	This project replaces circuit breakers that have failed tests and are not performing correctly. It also replaces breakers which have become under-rated due to transmission or generation additions.	SPS Zonal	SR
603	Unserviceable - Relays - SPS	11808129	TX - 2015 - Unserviceable Rela	12/31/15	279,265	-	279,265			
604	Unserviceable - Relays - SPS	11808136	TX - 2016 - Unserviceable Rela	12/31/16	-	465,666	465,666			
605	**Unserviceable - Relays - SPS Total**				**$ 279,265**	**$ 465,666**	**$ 744,931**	This project is to replace relays identified as unserviceable during maintenance or testing activities	SPS Zonal	SR

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
606	Unserviceable Brkr Rplmt Program	11219739	SPS Unserviceable Bkr ReplmntS	12/1/17	58,686	490,023	548,709			
607	**Unserviceable Brkr Rplmt Program Total**				**$ 58,686**	**$ 490,023**	**$ 548,709**	This project is to replace breakers identified as unserviceable during maintenance or testing activities	SPS Zonal	SR
608	Urenco, NEF HS Substation	11874880	Urenco NEF HS Cust Billing Por	3/31/15	(47,814)	-	(47,814)			
609	Urenco, NEF HS Substation	11874887	Urenco NEF High Side Substatio	3/31/15	12,220	-	12,220			
610	**Urenco, NEF HS Substation Total**				**$ (35,594)**	**$ -**	**$ (35,594)**	This project made additions to the 115 kV bus at NEF to accommodate another dist tranformer owned by URENCO. This is part of their load growth at the station.	SPS Zonal, Cust Funded	LI
611	V-05 Canyon West to Canyon East	12076286	Canyon West terminal upgrade,Sub	5/31/16	-	837,808	837,808			
612	V-05 Canyon West to Canyon East	12076287	V-05 Canyon West to Canyon East Reb	5/1/16	-	2,459,812	2,459,812			
613	**V-05 Canyon West to Canyon East Total**				**$ -**	**$ 3,297,621**	**$ 3,297,621**	This project rebuilds the existing 115 kV line between Canyon East and Canyon West substations with larger conductor. This line is near Canyon, TX.	SPP Base Plan	RE
614	V21 Tap-BOPCo Sub DI #14	11987416	V21 115kV Bopco Switch_Tap Ins	7/31/16	-	318,291	318,291			
615	**V21 Tap-BOPCo Sub DI #14 Total**				**$ -**	**$ 318,291**	**$ 318,291**	This project connects new oil field load in SE New Mexico for BOPCO. BOPCO will construct their own distribution substation and this project provides the high side facilities required to serve the new substation.	SPS Zonal	LI

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
616	V-37 Bailey County Switch	12016579	V-37 Bailey County Switch 115k	5/1/15	412,862	-	412,862			
617	**V-37 Bailey County Switch Total**				**$ 412,862**	**$ -**	**$ 412,862**	This project installs a new 115 KV switch to serve the new Bailey County Electric Cooperative's new Kelly Substation. This new sub is near Muleshoe, TX.	SPS Zonal	LI
618	W28 Rebld/Recon Ochiltree-Cole	11764507	W28 Rebuild/Recon Ochiltree-Co	12/31/15	4,972,086	-	4,972,086			
619	W28 Rebld/Recon Ochlitree-Cole	11786785	W28 Recond115 kV Ochiltree-Col	12/31/15	5,401,541	-	5,401,541			
620	W28 Rebld/Recon Ochlitree-Cole	11786800	W28 Recon115 kV Protect Ochil	12/31/15	28,118	-	28,118			
621	W28 Rebld/Recon Ochlitree-Cole	11786808	W28-Reconduct 115 kVProtection	12/31/15	28,118	-	28,118			
622	W28 Rebld/Recon Ochlitree-Cole	11786812	W28-Reconduct 115 Ochiltree-Co	12/31/15	273,422	-	273,422			
623	W28 Rebld/Recon Ochlitree-Cole	11786828	W28-Recond115 kV Ochiltree-Col	12/31/15	546,863	-	546,863			
624	W28 Rebld/Recon Ochlitree-Cole	11786848	W28-Reconduct 115kV Ochiltree-	12/31/15	823,105	-	823,105			
625	**W28 Rebld/Recon Ochlitree-Cole Total**				**$ 12,073,255**	**$ -**	**$ 12,073,255**	This project will rebuild the exisitng 115 kV line between Ochiltree Substation and Cole Interchange with larger conductor. This line is in the northeast Texas Panhandle.	SPP Base Plan	RE
626	Y-62 Switch Addition	11803473	Y-62 Switch Addition Line	6/1/16	-	120,193	120,193			
627	**Y-62 Switch Addition Total**				**$ -**	**$ 120,193**	**$ 120,193**	This project reconfigures the normal point on 69 kV line Y-62 from switch 2827 to switch 2843.	SPS Zonal	RE
628	Yoakum 230kv Bus Rebuild	11665760	Yoakum 230 kV K25 Tolk Line	4/30/14	(11)	-	(11)			
629	**Yoakum 230kv Bus Rebuild Total**				**$ (11)**	**$ -**	**$ (11)**	This project was to convert the 230KV bus from a straight configuration to a breaker and one-half configuration to satisfy NERC TPL standards.	SPS Zonal	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
630	Z2 Capacity Upgrade	12080428	Remove Carrier/Rpl CCVT at PCA	6/30/15	166,960	-	166,960			
631	Z2 Capacity Upgrade	12080434	Remove Carrier Rpl CCVT at Pot	6/30/15	185,803	-	185,803			
632	**Z2 Capacity Upgrade Total**				**$ 352,763**	**$ -**	**$ 352,763**	This project removes the wave traps at both PCA and Potash, which are no longer needed, in order to raise the rating of the transmission line.	SPS Zonal	RE
633	Z26 Bailey Co South Switch 69kV	12049195	Z26 Bailey Co South Switch 69k	8/1/15	449,139	-	449,139			
634	**Z26 Bailey Co South Switch 69kV Total**				**$ 449,139**	**$ -**	**$ 449,139**	This project installs a new 69 kV 3-Way Switch adjacent to Bailey County Electric Cooperative's South Bailey Metering Station to provide service as a delivery point. This delivery point location is near Muleshoe, TX.	SPS Zonal	LI
635	Z66 Booker/Wade Conversion	11494877	Wade SubstationSub	5/31/16	-	652,253	652,253			
636	Z66 Booker/Wade Conversion	11494884	Perryton Substation Sub	5/31/16	-	190,746	190,746			
637	Z66 Booker/Wade Conversion	11494885	Ochitree SubstationSub	12/15/15	1,027,100	-	1,027,100			
638	Z66 Booker/Wade Conversion	11494911	Ochiltree - BookerROW	12/15/15	767,916	-	767,916			
639	Z66 Booker/Wade Conversion	11494914	Ochiltree - Booker, Line	6/30/14	253	-	253			
640	Z66 Booker/Wade Conversion	11789289	Lipscomb Cty Sub High Side Sub	12/15/15	534,456	-	534,456			
641	Z66 Booker/Wade Conversion	11849149	Ochiltree-Lipscomb 115kVLine	7/1/16	-	10,460,555	10,460,555			
642	Z66 Booker/Wade Conversion	11849161	Z-66 Wreckout Perryton-BookerL	12/31/16	-	2,071,717	2,071,717			

Southwestern Public Service Company

Electric Transmission Capital Additions - Transmission Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
643	Z66 Booker/Wade Conversion	12048652	Lipscomb CtyExpand Yard for Xf	5/1/16	-	304,556	304,556			
644	**Z66 Booker/Wade Conversion Total**				**$ 2,329,724**	**$ 13,679,825**	**$ 16,009,549**	This project will remove the existing 69 kV line Z-66 (Perryton-Booker) and replace it with a new 115 kV transmission line. It will also convert the existing Wade and Booker to 115 kV. The source will be moved to the Ochiltree 115 kV bus, near Perryton, TX.	SPS Zonal	RE
645	Z66 Tap to NP Chapparal	12059193	Z66 Tap to NP Chapparal Line	2/6/15	(4,376)	-	(4,376)			
646	Z66 Tap to NP Chapparal	12060880	W24 Tap for RB-Elks Line	5/15/15	431,617	-	431,617			
647	**Z66 Tap to NP Chapparal Total**				**$ 427,241**	**$ -**	**$ 427,241**	This project would cosntruct a 115 kV tap to serve North Plains REC Chapparal Substation.	SPS Zonal	LI
648	Zodiac Substation	11351390	Portales 115kV Line Terminal	3/31/15	1,075,498	-	1,075,498			
649	Zodiac Substation	11352464	Z-44 Re-conductor Line	3/31/15	3,575	-	3,575			
650	Zodiac Substation	11352550	Zodiac Substation, Line	5/31/13	(87)	-	(87)			
651	Zodiac Substation	11352555	Zodiac Substation ROW	2/28/15	472,812	-	472,812			
652	Zodiac Substation	11352558	Zodiac Substation sub	6/1/13	751	-	751			
653	Zodiac Substation	11710955	Kilgore Sub Highside Sub	3/31/15	366,998	-	366,998			
654	Zodiac Substation	11827407	Zodiac Substation NM Line	6/28/15	4,325,057	-	4,325,057			
655	**Zodiac Substation Total**				**$ 6,244,604**	**$ -**	**$ 6,244,604**	This project converts the 69 kV Zodiac Sub to the 115 KV Kilgore substgation and builds new 115 kV line from Portales Intg to serve it.	SPP Base Plan	RE
656	**Grand Totals**				**$ 327,746,616.04**	**$ 331,034,904.15**	**$ 658,781,520.19**			

Southwestern Public Service Company

Electric Transmission Capital Additions - General Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
1	Andrews County Substation	11986358	Andrews Substation Communication	4-Apr-16	$ -	$ 348,484	$ 348,484			
2	**Andrews County Substation Total**				**$ -**	**$ 348,484**	**$ 348,484**	This project constructs a new 230/115 kV substation southeast of Hobbs, NM.	SPP Base Plan	RE
3	Atoka-Eagle Creek	12068725	Eagle Creek Sub Comm	15-Oct-16	-	414,980	414,980			
4	Atoka-Eagle Creek	12081550	Comm	31-Oct-16	-	385,181	385,181			
5	**Atoka-Eagle Creek Total**				**$ -**	**$ 800,161**	**$ 800,161**	This project constructs a 115 kV line from Atoka Substation, south of Artesia, NM to eagle Creek Substation in Artesia.	SPP Base Plan	RE
6	Bowers-Howard 115kV	11862009	Bowers Communication	28-Feb-15	142,775	-	142,775			
7	**Bowers-Howard 115kV Total**				**$ 142,775**	**$ -**	**$ 142,775**	This project connected the Bowers Substation to the Howard Substation via a 115-kV transmission line at the existing Howard Substation.	SPP Base Plan	RE
8	Crosby Co. 115 Cap Bank	11852742	Crosby County Cap Bank-Comm	31-May-15	95,999	-	95,999			
9	**Crosby Co. 115 Cap Bank Total**				**$ 95,999**	**$ -**	**$ 95,999**	This project installs a 14.4 Mvar 115 kV cap bank in the Crosby County Interchange, east of	SPP Base Plan	RE
10	Curry to Bailey 115kV	11843215	Communication	28-Sep-16	-	298,348	298,348			
11	Curry to Bailey 115kV	11843226	Communicatio	30-Oct-16	-	166,801	166,801			
12	**Curry to Bailey 115kV Total**				**$ -**	**$ 465,149**	**$ 465,149**	This project constructs a new 115 kV line between Curry Intg in Clovis, NM to Bailey Co	SPP Base Plan	RE
13	DCP Zia 2 Quahada Project	11913384	Quahada RTU & Comm Sub	16-Jul-15	188,216	-	188,216			
14	**DCP Zia 2 Quahada Project Total**				**$ 188,216**	**$ -**	**$ 188,216**	This project constructed a 115 kV substation to connect two 115 kV lines that cross into a station in SE NM. It was needed for additional load serving capability for the DCP Zia II Plant. The lines that would connect are the Cuningham-PCA and Maddox - Maljamar lines.	SPP Base Plan	RE
15	Eddy Co. Xfmr	12029135	Communication	1-Jun-16	-	34,588	34,588			
16	**Eddy Co. Xfmr Total**				**$ -**	**$ 34,588**	**$ 34,588**	This project replaces the 168 MVA 230/115 kV transformer with a 288 MVA unit at Eddy Co. Sub near Artesia, NM.	SPP Base Plan	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - General Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
17	Fault Recorder - SPS	11924226	Hutchinson Co-Rpl Fault RecCom	15-Apr-15	188,600	-	188,600			
18	Fault Recorder - SPS	11924235	Chaves Co-Inst Fault Recorder	31-Mar-15	406,420	-	406,420			
19	Fault Recorder - SPS	11924238	Yoakum-Inst 115kV Fault RecCom	28-Feb-15	213,978	-	213,978			
20	Fault Recorder - SPS	11924244	Com	15-Apr-15	363,607	-	363,607			
21	Fault Recorder - SPS	11941236	Cunningham DFR -Add continuous	15-Feb-15	2,002	-	2,002			
22	Fault Recorder - SPS	11941243	recor	15-Feb-15	2,002	-	2,002			
23	**Fault Recorder - SPS Total**				**$ 1,176,610**	**$ -**	**$ 1,176,610**	This project installs fault recorders for disturbance monitoring at substations.	SPS Zonal	OT
24	Fault Recorders - SPS	11711429	Roosevelt -Fault Recorder Comm	17-Dec-13	(223)	-	(223)			
25	**Fault Recorders - SPS Total**				**$ (223)**	**$ -**	**$ (223)**	This project installs fault recorders for disturbance monitoring at substations.	SPS Zonal	OT
26	General Tools and Equipment	11496149	2015 Tool Blanket TX Line	31-Dec-15	50,000	-	50,000			
27	General Tools and Equipment	11496152	2016 Tool Blanket TX Line	30-Jun-16	-	50,000	50,000			
28	General Tools and Equipment	11496164	SPS Sub COM 2015	30-Aug-15	550,000	-	550,000			
29	General Tools and Equipment	11496165	SPS Sub COM 2016	30-Sep-16	-	560,000	560,000			
30	**General Tools and Equipment Total**				**$ 600,000**	**$ 610,000**	**$ 1,210,000**	These projects install common communications equipment for control and monitoring of substation and transmission assets.	SPS Zonal	OT
31	General Transportation	11130623	S	31-Dec-22	10,314	1,690	12,004			
32	General Transportation	11302945	Fleet New Units 2011 El Tran, SPS	31-Aug-13	65	-	65			
33	General Transportation	11302950	Fleet New Units 2013 El Tran, SPS	30-Apr-14	96,259	-	96,259			
34	General Transportation	11302952	Fleet New Units 2014 El Trans	31-Jan-15	1,073,393	-	1,073,393			
35	General Transportation	11350761	T	31-Dec-15	5,581,977	-	5,581,977			
36	General Transportation	11496205	Fleet New Units 2015 El Trans	31-Dec-15	675,699	-	675,699			
37	General Transportation	11496210	Fleet New Units 2016 El Trans	31-Dec-16	-	600,000	600,000			
38	General Transportation	11496219	Fleet New Units 2016 El Trans	31-Dec-16	-	2,072,432	2,072,432			
39	**General Transportation Total**				**$ 7,437,707**	**$ 2,674,122**	**$ 10,111,829**	These projects provide fleet vehicles for operation in the SPS area.	SPS Zonal	OT

Southwestern Public Service Company

Electric Transmission Capital Additions - General Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
40	046	12022544	046	30-Apr-15	88,967	-	88,967			
41	**Goodwell Wind Gen-2007-046 Total**				**$ 88,967**	**$ -**	**$ 88,967**	This project will connect xxx MW wind resource to the	Cust Funded	GI
42	Graham Intg.Add 2nd115/69 Xmfr	11958375	Graham-Install 2nd 115-69kV Au	31-Dec-16	-	87,347	87,347			
43	**Graham Intg.Add 2nd115/69 Xmfr Total**				**$ -**	**$ 87,347**	**$ 87,347**	This project will add a 2nd 84 MVA 115/69 kV transformer at Graham Sub.	SPP Zonal	RE
44	Intercontinental Potash Connection	11848710	Roadrunner Communications, Sub	31-Dec-15	328,887	-	328,887			
45	**Intercontinental Potash Connection Total**				**$ 328,887**	**$ -**	**$ 328,887**	This project provides a facility called Roadrunner Substation, to connect a new potash mine, Intercontinental Potash, to the 115 kV transmission system in SE New Mexico.	SPS Base Plan	LI, RE
46	KC Substation - Diamondback	11856013	Communications	31-Mar-15	44,142	-	44,142			
47	KC Substation - Diamondback	11856015	Diamondback Sub Communications	31-Mar-15	93,078	-	93,078			
48	**KC Substation - Diamondback Total**				**$ 137,220**	**$ -**	**$ 137,220**	This project constructs a ring bus expansion at Diamondback Substation, a 115/69 kV sub SE of Lubbock, TX.	SPS Zonal	RE
49	Lubbock South Auto #2	12075833	Lubbock South-Replace RTU Com	30-Sep-15	309,119	-	309,119			
50	**Lubbock South Auto #2 Total**				**$ 309,119**	**$ -**	**$ 309,119**	This project installs a 2nd 250 MVA 230/115 kV auto transformer at Lubbock South Substation in Lubbock, Texas.	SPP Base Plan	RE
51	Conversion	11907289	Lynn County Communications	31-Oct-14	16,351	-	16,351			
52	**Lynn Co. Dist Load Conversion Total**				**$ 16,351**	**$ -**	**$ 16,351**	This project converted a 69 kV distribution transformer to 115 kV to prevent overloading of the 115/69 kV transformers at Lynn Co. Substation, south of Lubbock, Texas.	SPP Base Plan	OT

Southwestern Public Service Company

Electric Transmission Capital Additions - General Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
53	Lynn County RTU Replacement	12049205	Lynn Co RTU Replacement, Comm	15-Mar-15	35,522	-	35,522			
54	**Lynn County RTU Replacement Total**				**$ 35,522**	**$ -**	**$ 35,522**	This project provides for communications equipment for the named substation fro control and monitoring.	SPS Zonal	OT
55	Mescalero Ridge Wind GEN-2008-022	11819486	Mescalero Wind Comm for Crossr	19-Jun-15	129,085	-	129,085			
56	**Mescalero Ridge Wind GEN-2008-022 Total**				**$ 129,085**	**$ -**	**$ 129,085**	This project connects a 200 MW wind resource to the Tolk-Eddy 345 kV line. Sub is Crossroads, but project is now Roosevelt Wind.	Cust Funded	GI
57	NE Hereford auto. addition	11799065	Hereford Sub Communication	15-Nov-14	21,080	-	21,080			
58	**NE Hereford auto. addition Total**				**$ 21,080**	**$ -**	**$ 21,080**	This project installs a 2nd 8-MVA 115/69-kV auto at NE Hereford for improved contingency performance.	SPP Base Plan	RE
59	OPIE 1 North Loving (Hopi to Capano)	11960106	North Loving RTU - comm	15-Jun-15	260,142	-	260,142			
60	**OPIE 1 North Loving (Hopi to Capano) Total**				**$ 260,142**	**$ -**	**$ 260,142**	This project constructs a 115 KV line from Hopi Substation, near Carlsbad, NM to new North Loving Substation, southeast of Carlsbad, NM to serve additional loads and provide increased network reliability., The Loving area is currently	SPP Base Plan	RE
61	OPIE 1 Potash Junction	11951364	UpgrC	15-May-15	240,908	-	240,908			
62	**OPIE 1 Potash Junction Total**				**$ 240,908**	**$ -**	**$ 240,908**	This project provides for communications equipment for the named substation fro control	SPS Zonal	RE
63	OPIE 1 Road Runner (Interc Potash Conn)	12075490	Potash Communications NM Comm	31-Dec-15	6,511	-	6,511			
64	**OPIE 1 Road Runner (Interc Potash Conn) Total**				**$ 6,511**	**$ -**	**$ 6,511**	This project provides a facility called Roadrunner Substation, to connect a new potash mine, Intercontinental Potash, to the 115 kV transmission system in SE New Mexico.	SPP Base Plan	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - General Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
65	OPIE 2 DCP Zia 2 Quahada Project	12068711	Maddox RTU Substation Comm	16-Jul-15	246,521	-	246,521			
66	**OPIE 2 DCP Zia 2 Quahada Project Total**				**$ 246,521**	**$ -**	**$ 246,521**	This project constructs a new 4 breaker 115 kV ring bus at the intersection of PC - Cunningham and Maljamar - Intrepid 115 kV lines. It also constructs the radial tap line to the customer's new	SPP Base Plan, Cust Funded	RE, LI
67	OPIE 2 Livingston Ridge-Cardinal 115kV_PID 30695	12016218	Sage Brush 115kV Sub Comms_UID	31-Jul-16	-	508,978	508,978			
68	OPIE 2 Livingston Ridge-Cardinal 115kV_PID 30695	12016237	Cardinal 115kV Sub Comms_UID 5	1-Jun-16	-	275,806	275,806			
69	**OPIE 2 Livingston Ridge-Cardinal 115kV_PID 30695 Total**				**$ -**	**$ 784,784**	**$ 784,784**	This project constructs a 115 kV line between Livingston Ridge and Cardinal substations in SE NM.	SPP Base Plan	RE
70	OPIE 3 China Draw SVC	12075867	China Draw Sub Comm	1-Apr-16	-	2,047	2,047			
71	**OPIE 3 China Draw SVC Total**				**$ -**	**$ 2,047**	**$ 2,047**	This project will install a 115 kV -70/+200 Mvar Static Var Controller (SVC) at the 115 kV China Draw bus.	SPP Base Plan	RE
72	OPIE 3 Road Runner SVC	12075516	Road Runner Sub Comm	28-Feb-15	6,506	-	6,506			
73	**OPIE 3 Road Runner SVC Total**				**$ 6,506**	**$ -**	**$ 6,506**	This project will install a 115 kV -70/+200 Mvar Static Var Controller (SVC) at the 115 kV Roadrunner bus.	SPP Base Plan	RE
74	OPIE2-Pecos Dist Add 115kV	11945477	Pecos Comm	30-Nov-15	341,032	-	341,032			
75	**OPIE2-Pecos Dist Add 115kV Total**				**$ 341,032**	**$ -**	**$ 341,032**	This project will add a 115 kV distribution substation in the Pecos Substation for additional load service to Carlsbad.	SPS Zonal	LI
76	Pantex Metering	11968286	Pantex Metering	15-Apr-14	2,121	-	2,121			
77	**Pantex Metering Total**				**$ 2,121**	**$ -**	**$ 2,121**	properlyy capture output realted to wind energy facility.	SPS Zonal	OT
78	Potter-Channing-Dallam	11969545	XIT Communications	31-Dec-15	181,684	15,000	196,684			
79	**Potter-Channing-Dallam Total**				**$ 181,684**	**$ 15,000**	**$ 196,684**	This project converts the new Potter-Channing-Dallam 115 kV (built for 230 kV) to 230 kV operation and reconnects the substations to 230 KV faacilities. Installs the XIT 230/115 kV	SPP Base Plan	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - General Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
80	Pringle 115 kV Breaker & One-Half	11987268	Pringle Substation Comm	30-Dec-16	-	136,087	136,087			
81	**Pringle 115 kV Breaker & One-Half Total**				**$ -**	**$ 136,087**	**$ 136,087**	This project rebuilds the 115 kV bus at Pringle Substation, north of Amarillo, TX, to a breaker and a half design. Remote terminal relaying work is also included as part of the project.	SPS Zonal	RE
82	Pringle Dist Transformer	11936551	Pringle Dist Xfmr_Comm (RTU)_S	28-Feb-15	89,938	-	89,938			
83	**Pringle Dist Transformer Total**				**$ 89,938**	**$ -**	**$ 89,938**	This project installs a 115 kV distribution transformer at the Pringle Substation.	SPS Zonal	LI
84	RTU - EMS Upgrade - SPS	11495902	SPS RTU EMS Upgrade	30-Nov-14	186,894	-	186,894			
85	**RTU - EMS Upgrade - SPS Total**				**$ 186,894**	**$ -**	**$ 186,894**	This project provides for communications equipment for the named substation fro control	SPS Zonal	OT
86	S&E - SPS Sub	12017203	S&E Communications SPS	31-Dec-14	4,559	-	4,559			
87	**S&E - SPS Sub Total**				**$ 4,559**	**$ -**	**$ 4,559**	These projects are part of storm and emergency blanket work orders for repair of facilities due to inclement weather or natural disasters.	SPS Zonal	SR
88	Conv.	11848549	Sonvy Communications, Sub	29-Feb-16	-	138,724	138,724			
89	**Soncy Dist. Transformer Conv. Total**				**$ -**	**$ 138,724**	**$ 138,724**	This project converts the existing 69 kV Soncy Sub transformer to 115 kV. This substation is in the city of Amarillo, TX	SPP Base Plan	RE
90	SPS Communication	12074387	Communications	31-Dec-15	190,538	-	190,538			
91	**SPS Communication Total**				**$ 190,538**	**$ -**	**$ 190,538**	This project provides for communications equipment for the named substation fro control	SPS Zonal	OT
92	SPS Frame Relay	12076288	KS Frame Relay Comm	31-Jan-16	-	85,906	85,906			
93	SPS Frame Relay	12076289	NM Frame Relay Comm	15-May-16	-	1,604,676	1,604,676			
94	SPS Frame Relay	12076292	TX Frame Relay Comm	15-May-16	-	1,937,007	1,937,007			
95	**SPS Frame Relay Total**				**$ -**	**$ 3,627,588**	**$ 3,627,588**	This project provides for communications equipment for the named substation fro control	SPS Zonal	OT

Southwestern Public Service Company

Electric Transmission Capital Additions - General Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
96	SPS Sub Communication Network Group 1	11986956	SPS Sub Comm Network Group 1 C	31-Oct-16	-	327,760	327,760			
97	**SPS Sub Communication Network Group 1 Total**				**$ -**	**$ 327,760**	**$ 327,760**	These projects provide communications equipment for control and monitoring of the	SPS Zonal	OT
98	SPS Sub Communication Network Group 3	11986929	SPS Sub Comm Network Group 3 C	31-Oct-16	-	135,631	135,631			
99	**SPS Sub Communication Network Group 3 Total**				**$ -**	**$ 135,631**	**$ 135,631**	These projects provide communications equipment for control and monitoring of the	SPS Zonal	OT
100	SPS Sub Ofc Furn & Eq	11829320	SPS Ofc Furn & Eq TX 2013 Sub	31-May-14	4,373	-	4,373			
101	**SPS Sub Ofc Furn & Eq Total**				**$ 4,373**	**$ -**	**$ 4,373**	These projects provide office furniture and equipment for various locations.	SPS Zonal	OT
102	STEP Newhart Interchange	11776126	Step Newhart, Communication	14-Dec-13	574	-	574			
103	STEP Newhart Interchange	11925722	Lamton Communications	1-Mar-15	6,028	-	6,028			
104	STEP Newhart Interchange	11941671	Swisher Sub. Communications	31-Mar-15	65,221	-	65,221			
105	**STEP Newhart Interchange Total**				**$ 71,824**	**$ -**	**$ 71,824**	This project constructs a new 230/115-kV interchange and substation with associated 115-kV transmission lines near Hart, south of Amarillo, Texas. The project will upgrade the transmission system in this area and relieve high transmission loadings on the central part of the SPS transmission system in Castro, Parmer,	SPP Base Plan	RE
106	Expansion	11838567	Kiser Communications	31-Jan-15	7,998	-	7,998			
107	**STEP Plainview City Expansion Total**				**$ 7,998**	**$ -**	**$ 7,998**	This project constructs a new 115/69 kV substation near Plainview, TX and constructs several 115 kV lines and coverts 69 kV distribution subs to 115 KV from 69 kV. The purpose is to relieve loading of the 69 kV system in that area	SPP Base Plan	RE

Southwestern Public Service Company

Electric Transmission Capital Additions - General Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
108	STEP Pleasant Hill	11838815	Rosevelt RTU	28-Feb-15	5,255	-	5,255			
109	STEP Pleasant Hill	11846465	Pleasant Hill RTU Comm	28-Feb-15	90,031	-	90,031			
110	**STEP Pleasant Hill Total**				**$ 95,286**	**$ -**	**$ 95,286**	This project constructs a new 230/115-kV interchange and substation with associated 230-kV and 115-kV transmission lines near the Clovis, New Mexico area and a 345-kV transmission line from Amarillo, Texas to Clovis. The project will provide additional support for the	SPP Base Plan	RE
111	Tools COM Substation	11787171	2015	31-Dec-15	125,000	-	125,000			
112	Tools COM Substation	11787173	2016	31-Dec-16	-	125,000	125,000			
113	Tools COM Substation	11788579	SPS COM Tools 2015 (BU 8371)	31-Dec-15	18,750	-	18,750			
114	Tools COM Substation	11788580	SPS COM Tools 2016 (BU 8371)	31-Dec-16	-	18,750	18,750			
115	**Tools COM Substation Total**				**$ 143,750**	**$ 143,750**	**$ 287,500**	These projects purchase tools for construction and maintenance activities.	SPS Zonal	OT
116	Tools, Training Center	11782633	SPS	30-Jun-15	18,600	-	18,600			
117	Tools, Training Center	11782683	SPS	31-Dec-16	-	22,785	22,785			
118	Tools, Training Center	11960417	Equipment	31-Dec-15	50,908	-	50,908			
119	Tools, Training Center	11960438	Equipment	31-Dec-16	-	39,200	39,200			
120	**Tools, Training Center Total**				**$ 69,508**	**$ 61,985**	**$ 131,493**	These projects purchase tools for construction and maintenance activities.	SPS Zonal	OT
121	TPL BFR V31 Hutchinson to Riverview	11791672	TPL BFR V31 Riverview Comm	31-Dec-15	336,273	-	336,273			
122	TPL BFR V31 Hutchinson to Riverview	12076434	TPL BFR V31 Hutchinson Comm	15-Dec-15	448,358	-	448,358			
123	**TPL BFR V31 Hutchinson to Riverview Total**				**$ 784,631**	**$ -**	**$ 784,631**	This project installs breaker failure relaying on Hutchinson-Riverview 115 kV line.	SPS Zonal	RE
124	Transportation - SPS	11775181	SPS 2015 Fleet Trans Const - A	31-Dec-15	1,394,998	-	1,394,998			
125	**Transportation - SPS Total**				**$ 1,394,998**	**$ -**	**$ 1,394,998**	These projects provide fleet vehicles for operation in the SPS area.	SPS Zonal	OT

Southwestern Public Service Company

Electric Transmission Capital Additions - General Plant
January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
126	TUCO Mooreland (Woodward)	11900958	Hall Cty Fiber optic Repeater Sta,C	16-Aug-14	173,574	-	173,574			
127	TUCO Mooreland (Woodward)	11900984	Motley Cty Fiber Optic Repeater Sta	16-May-14	173,574	-	173,574			
128	(Woodward)	11914742	TUCO Communications	1-Dec-14	126,988	-	126,988			
129	**TUCO Mooreland (Woodward) Total**				**$ 474,136**	**$ -**	**$ 474,136**	This project constructs a single circuit 345-kV line between TUCO, near Lubbock, TX to Woodward Oklahoma. SPS will construct the line to just inside the TX-OK state line and OGE will construct from there to Oklahoma. Project was based on the Balanced Portfolio economic studies by SPP	SPP Balanced Portfolio	EC
130	TUCO Mooreland(Woodward)	11886468	Motley Cty Repeater Station,Comm	30-Sep-14	349,116	-	349,116			
131	Mooreland(Woodward)	11886474	Comm	30-Sep-14	350,312	-	350,312			
132	**TUCO Mooreland(Woodward) Total**				**$ 699,428**	**$ -**	**$ 699,428**	This project constructs a single circuit 345-kV line between TUCO, near Lubbock, TX to Woodward Oklahoma. SPS will construct the line to just inside the TX-OK state line and OGE will construct from there to Oklahoma. Project was based on the Balanced Portfolio economic studies by SPP	SPP Balanced Portfolio	EC
133	Z66 Booker/Wade Conversion	11889157	Ochiltree Communication	31-Dec-15	32,565	-	32,565			
134	**Z66 Booker/Wade Conversion Total**				**$ 32,565**	**$ -**	**$ 32,565**	This project will remove the existing 69 kV line Z-66 (Perryton-Booker) and replace it with a new 115 kV transmission line. It will also convert the existing Wade and Booker to 115 kV. The source will be moved to the Ohiltree 115 kV bus, near Perryton, TX.	SPS Zonal	RE
135	**Grand Total**				**$ 16,243,166**	**$ 10,393,207**	**$ 26,636,373**			

Southwestern Public Service Company

Electric Transmission Capital Additions - Intangible Plant
for Period January 1, 2015 through December 31, 2016

Line No.	Project Group Name (A)	Parent Number (B)	Parent Name (C)	Estimated ISD (D)	Year 2015 (E)	Year 2016 (F)	Total 2015-2016 (G)	Project Description (H)	Cost Recovery Method (I)	Project Type (J)
1	GIST-II Subs Computer Software	11435582	GIST-II Computer SoftwareSPS	30-Jun-15	5,717,527	-	5,717,527			
2	**GIST-II Subs Computer Software Total**				$ 5,717,526.97	$ -	$ 5,717,526.97	This project provides for the creation of a Graphics Information System for accessing engineering and operating data for substations on the SPS transmission system.	SPS Zonal	OT
3	GIST-III TLines Computer Software	11465744	GIST-III Computer Software	31-Dec-15	21,473,383	-	21,473,383			
4	**GIST-III TLines Computer Software Total**				$ 21,473,382.61	$ -	$ 21,473,382.61	This project provides for the creation of a Graphics Information System for accessing engineering and operating data for transmission lines on the SPS transmission system.	SPS Zonal	OT
5	GIST-IV TLine Computer Software	11808894	GIST-IV Computer Software SPS	31-Dec-16	-	6,062,149	6,062,149			
6	**GIST-IV TLine Computer Software Total**				$ -	$ 6,062,148.92	$ 6,062,148.92	This project provides for the creation of a Graphics Information System for accessing land and right of way data for the SPS transmission system.	SPS Zonal	OT
7	**Grand Total**				$ 27,190,909.58	$ 6,062,148.92	$ 33,253,058.50			

Southwestern Public Service Company

Cost Estimate Summary

Estimate Name	Scoping Estimate	Appropriation Estimate	Engineering Estimate	Cost at Completion
Accuracy Target	± 30%	± 20%	± 10%	± 0%
Permitting & Field Siting	0% to 5% complete	60% to 80% complete	80% to 100% complete	100% complete
Engineering	0% to 5% complete	5% to 25% complete	80% to 100% complete	100% complete
Land Acquisition	0% to 5% complete	5% to 25% complete	75% to 100% complete	100% complete
Remaining Unknowns	▪ *PUC final need / route permit order specifics* ▪ *Acquisition of land rights* ▪ *Project design specifications & scope* ▪ *Material costs & lead times* ▪ *Construction schedule & cost*	▪ *Acquisition of land rights cost* ▪ *Material costs & lead times* ▪ *Construction schedule & cost*	▪ *Construction cost (weather, access, field conditions, etc…)*	

Southwestern Public Service Company

Loss Evaluation Study

July 2012 – June 2013

SPS Transmission Planning

October 2013

Southwestern Public Service Company
Loss Evaluation Study for 2013 Study Period

TABLE OF CONTENTS

1.0 Overview

This report discusses an evaluation of transmission and distribution system losses for the 12 month period July 2012 – June 2013 (2013 Study Period). This evaluation was designed to be as introspective as technically possible and provide a significant level of confidence in determining the electrical losses on the Southwestern Public Service (SPS) transmission and distribution system. This evaluation determines actual losses and then uses engineering principles to calculate both demand and energy losses at specific voltage levels.

SPS operates an electrical system consisting of 345 kV, 230 kV, 115 kV and 69 kV transmission lines and a distribution system with lines operating at 33 kV to 2400 volts. The system spans a large 52,000 square mile area from the Oklahoma Panhandle through West Texas South Plains into Eastern and Southeastern New Mexico. SPS has generation on both 230 kV and 115 kV busses throughout this area. Since 2009 SPS and other power producers have installed significant wind and solar generation within the control area of SPS. Some of this generation is connected at transmission voltage and some at primary voltage. The scope of this study was to determine the demand and energy losses for the following components:

Transmission System Components:

- Generation Unit Main Transformers
- Transmission Lines
- Autotransformers

Distribution System Components:

- Distribution Substation Transformers
- Distribution System, including Primary, Secondary and Service Lines Transformers

The losses related to these elements of the power system are frequently seen in accounting reports as "Unaccounted For Energy." The purpose of this study is to determine actual losses and then specifically estimate losses by the components identified above for the 2013 Study Year.

Southwestern Public Service Company
Loss Evaluation Study for 2013 Study Period

The losses of customer operated transformers, transmission and distribution systems are not considered in this study. Any losses occurring in auxiliary busses at power plants are not considered in this study.[1] Also, losses related to the step-up transformers are not included since net generation is recorded at the high side of these transformers.

The analysis of losses requires consideration of both demand, or power, losses and energy losses. The demand losses are typically measured in megawatts (MW), kilowatts (kW), or watts. The energy losses are measured in megawatt-hours (MWh), kilowatt-hours (kWh), or watt-hours (Wh). The energy losses can be thought of as the sum of instantaneous demands over a specified period of time, such as an hour. Certain components of the energy losses are present even though there is very low electrical load passing through the device. An example of this is the magnetizing current and related losses of a transformer. After the transformer is energized, these losses will occur. Power flow through the transformer will increase the losses, but even in the absence of any power flow, the transformer will experience "no-load losses" simply because it is energized.

To provide a basis for the calculations in this study, data was gathered for the transmission and distribution system. This data and associated calculations are shown in the Appendices. Each Appendix corresponds to a section of the total loss calculation or provides data used in other appendices. Actual counts exist for the devices and miles of electric circuits that cause losses at the transmission level. Thus calculation of losses at the transmission level involves very little engineering judgment. Actual counts of devices and lines exist for some portions of the distribution system as well. In some cases, however, data does not exist for the distribution system and engineering approximations or judgments must be and were made to determine losses at specific voltage levels. These approximations are noted in the discussion.

[1] Auxiliary busses are distribution busses which provide internal power plant distribution service for internal power plant equipment (i.e. water wells, internal plan equipment, plant controls, pumps, etc.).

Southwestern Public Service Company
Loss Evaluation Study for 2013 Study Period

1.1 Loss Levels

The energy losses for each physical category (lines, transformers, etc) are grouped by the six Loss Levels. These Loss Levels, which were shown in Appendix H, are:

Loss Level 1 - Generation

Loss Level 2 – Backbone Transmission

Loss Level 3 - Sub. Transmission

Loss Level 4 - Primary Distribution

Loss Level 5 - Secondary Distribution Transformers

Loss Level 6 - Secondary Distribution Lines

Loss is not calculated at Level 1. The other levels are composed of the following physical loss categories:

Loss Level 2 – Backbone Transmission

- 345 kV, 230 kV and 115 kV Transmission Lines
- 345/230 kV, 230/115 kV Autotransformers

Loss Level 3 - Sub. Transmission

- 69 kV Lines
- 115/69 kV Autotransformers

Loss Level 4 - Primary Distribution

- Distribution Substation Transformers
- Distribution Primary Lines (33 kV to 2.4 kV lines)

Loss Level 5 - Secondary Distribution Transformer

- Distribution Line Transformers

Loss Level 6 - Secondary Distribution Lines

- Distribution Secondary and Service Lines

Transmission losses are those at Levels 2 and 3. Losses attributable to distribution facilities are those calculated for levels 4, 5 and 6. In setting loss factors for rate classes, the losses calculated at levels 5 and 6 are combined and a composite loss factor is determined.

The results of the Loss Evaluation Study are shown in Appendix M and the rate class loss factors derived from the study are in Appendix Q.

1.2 Determination of Actual Losses

Appendix A contains the determination of actual losses measured in MWh for the total transmission and distribution system based on 2013 Study Period operating data. The general definition of losses is the difference between the total resources and total deliveries. Specifically, the Total Resources, shown in Appendix A, are:

Net Generation (line 6) – metered output of SPS's generating plants

Net Metered In and Out (lines 7 & 8) – metered physical flows at all interchange tie points with the Southwest Power Pool (SPP) and the Western Electric Coordinating Council (WECC). Wherever SPS's transmission system interconnects with transmission systems of utilities in the SPP or WECC (*i.e.*, SPS's Balancing Authority), meters exist and data are captured to determine the energy either flowing into or out of SPS's system. The net flows into or out of the SPS system at these boundaries account for any purchases made from, or sales made to, entities outside the SPS control area boundary. In addition, if third parties enter into a sale and purchase transaction and SPS's transmission system is used to deliver power, the net metered flows at SPS's boundaries will reflect the use of the transmission system by recording the inflow and the corresponding outflow. This process of calculating the net flows into or out of SPS's system is referred to as "net metering."

Firm Purchased Power

BEA, LPP (line 11) – Energy purchased pursuant to contracts with Borger Energy Associates and Lea Power Partners, LLC.

LPL Generation (line 12) – SPS has a full requirements sales contract with West Texas Municipal Power Agency (WTMPA), an entity established by the cities of Lubbock,

Southwestern Public Service Company
Loss Evaluation Study for 2013 Study Period

Tulia, Brownfield, and Floydada. SPS also contracts with the City of Lubbock to purchase the output of three Lubbock generating plants that operate only when requested by SPS. This generation is located within the LP&L network and no SPS loss is attributable to this power. Line 12 is the total Lubbock generation during the 2013 Study Period.

Others (line 13) – SPS purchases relatively small amounts of energy from a number of other entities located within its system boundary pursuant to firm contracts. The collective purchases under these contracts are reported on this line.

Non-Firm Purchased Power

Purchases made from non-firm wind and solar energy suppliers within the SPS system boundary are reported on line 16.

Other Control Area Generation

Golden Spread Electric Cooperative (GSEC) owns the Mustang Plant near Denver City, Texas and Antelope Station located near Abernathy, Texas. Also, GSEC has purchased the output of the Panhandle Wind Ranch. Line 19 shows the GSEC total resource for the 2013 Study Period. Since the Mustang Plant and other generation is within SPS's control area, it's generation must be included in total area resources to prevent an under-statement of resources due to the net metering process described above.

Generation Sold Into Market (line 20) – Generators other than GSEC located within SPS's control area sell power over SPS's transmission lines to entities outside of the control area. Like GSEC's generation, this generation must be included in SPS's total resources to prevent an under-statement of resources.

The sum of these resources is the "Total Resources" (line 22) available on SPS's system for serving customer load within the system boundary.

From Total Resources, the Total Deliveries are subtracted. Total Deliveries (line 28) consists of all retail sales, all full requirements wholesale sales within the system boundary, and all deliveries to Golden Spread load points within the system boundary. The resulting value is the Total Losses (line 30), which are the actual losses experienced during the 2013 Study Period.

Line 31 is SPS's total system loss percentage during the 2013 Study Period, which is derived by dividing Total Losses (line 30) by Total Resources (line 22).

This value of Total Losses is the value that will be used to generate the loss factors by voltage level.

The "Net Output to Lines by Segment" data (lines 41-53) are simply the sums of monthly values for "Net Output to Lines" (line 38) for the months contained in each segment. The determination of segments is discussed in Section 3.1 and the Net Output to Lines by Segment data are used in determining transmission line losses in Section 4.3.

2.0 Generation Step-Up Transformer Losses

During the time since the last loss study, meters were installed or re-calibrated to measure the power flow at the high-side of the step-up transformers. Losses attributable to these transformers are included in station power and not part of this study.

3.0 System Load Analysis

To determine the transmission and autotransformer losses, it is necessary to perform powerflow studies at different load levels. The loading levels must be determined before these studies can be done. For the period under study, the system loads are obtained from the operations center. The load represented in these studies is a composite of SPS retail load, GSEC, and other wholesale loads within the system boundary.

Any other sale or purchase of energy that either started in or was received into the SPS control area, and including any through transactions from the east to west or west to east across the SPS

system between the eastern and western grids are included when the powerflow models are developed to capture any transmission losses due to those transactions.

The individual loads at SPS's daily minimum and maximum load are summed to produce a daily average load. Then the corresponding values for tie line flows are obtained and summed for the same hour. This produces a daily minimum and daily maximum load to be analyzed. The results of this procedure are shown in Appendix D, Daily Maximum/Minimum Loads graph.

3.1 Segment Derivation

The daily maximum and minimum loads are still too detailed for the powerflow analysis, since there are 365 values for each load. The next step is to produce a daily average load graph. This graph is shown in Appendix D as the Average Value Analysis. The average load is graphed for the study period. Then an average study value is fitted to the graph. The goal of this fit is to minimize the sum of the errors between the average load values to be used in the study and the actual daily average load. Once this has been determined, the year can be broken into load segments which will be modeled in the powerflow program by the values of average load determined here. The load segments will typically be January-May, June-August, and September-December, but there are frequently more than 3 load segments when the study period is not a calendar year. It is required that the segments correspond to monthly boundaries, since additional data is also calculated besides the loads for the powerflow studies. For the 2013 Study Period, the best fit to model the loads for the 12 months was a four segment model. The sum of the errors in the 2013 Study Period is 0.18%. *See* App. D, System Load Data, line 8, col. AC. The segment values used in this analysis were:

Segment 1:	July – August	4649 MW
Segment 2:	September - February	3437 MW
Segment 3:	March - April	3572 MW
Segment 4:	May - June	4019 MW

The average loads per segment, number of days in each segment and other values used in the analysis are shown on the Appendix D chart entitled "System Load Data."

3.2 Powerflow Loss Calculation

Once the segment loads have been determined, the powerflow analysis can be performed. The average study value determined above is used for the load in the powerflow studies. There are powerflow cases, representing each of the load segments under study. The generation patterns are varied between the segments to better represent the mix of generators actually on-line at that time of the year.

There is also a peak powerflow case prepared to analyze the system losses at the hour of the system peak.

The powerflow program used is Power Technologies Inc.'s PSS/E program. Once the powerflows have been created, the losses are summarized for SPS's system. The loss values for each transmission element and voltage class are tabulated for the peak hour case and for each segment. The summary tabulations are contained in Appendix N. These losses represent the loss for that element at that average segment load. These values are then used to determine the transmission and transformer losses.

Excluded from the loss tabulation are transmission systems that are not owned by SPS, but reside inside SPS's control area. These systems are Lea County Electric, Lubbock Power and Light, Sharyland Utilities, and Tri-County Electric Cooperative.

4.0 Transmission Line Losses

The losses for transmission lines consist of several parts. For demand loss at peak load, there is corona and insulator loss. For energy loss, there is the corona and insulator loss and the energy losses due to power flow through the lines. These losses are tabulated by transmission voltage level in Appendix E.

4.1 Transmission Line Corona and Insulator Losses

Transmission systems have losses due to corona and insulator leakage. Corona loss occurs when the voltage gradient near the conductor surface exceeds the breakdown strength of the surrounding air. The Transmission Line Reference Book published by Electric Power Research Institute contains information on determining the representative losses associated with corona and insulator leakage. Using that reference, losses per mile for each transmission voltage level were determined and entered in the "KW Loss/mile" column. Transmission line mileage was taken from FERC Form 1 data. The demand loss due to corona and insulator loss (App. E, "Demand Losses" column). is calculated by multiplying the kW loss per mile for a specific voltage level times the miles of transmission operating at that voltage and then dividing that product by 1,000 to yield a MW loss result. The energy loss is simply the demand loss times the number of hours per year. For 345 kV transmission lines, for example, the corona and insulator demand loss of 1.46 MW in App. E is the rounded value of this equation: (2.343 kW loss/mile x 623.00 miles) ÷ 1,000. The annual energy loss (12,787 MWH) for these same elements is the product of 1.459689 MW (the unrounded value from the previous equation) x 8,760 hours/year.

4.2 Transmission Line Demand Losses

The losses obtained for transmission lines are shown in Appendix E, labeled Transmission Line Demand Loss. The peak demand losses were determined by tabulating the megawatt losses per transmission line as shown in the 2013 Study Period peak powerflow study in Appendix N. These losses are tabulated by voltage class.

4.3 Transmission Line Energy Losses

The energy loss for the transmission lines at each voltage level is determined by using the losses developed in the powerflows for each load segment. The segment loads are listed in Appendix E along with the net output of power to the transmission system during the segment. This value was determined in Appendix A and labeled "Net Output to Lines By Segment." The Net Output to Lines is the amount of generated and purchased energy put onto the transmission system to serve load. The determination of the energy losses for transmission lines of a specific voltage in a specific segment is calculated using the following equations.

$$\text{Segment Loss Factor} = \frac{\text{Segment Loss for Transmission Element, MW}}{\text{Segment Load, MW}} \qquad (4.3.1)$$

$$\text{Segment Losses} = \text{Seg Loss Factor} \times \text{Net Output to Lines for Segment, MWH} \qquad (4.3.2)$$

Thus, the powerflows provide a determination of the energy loss as a single value. Dividing by the segment load produces a per MW loss factor which when multiplied by the Net Output to Lines for that segment produces the energy loss for that element in that load segment. The energy loss values for the year are simply the sum of the energy loss values for each element in each load segment and appear on App. E a lines 37-43 under the column heading "Total Segment Losses, MWH."

5.0 Autotransformer Demand Losses

SPS's transmission system autotransformers reduce voltage from one transmission level to a lower transmission level. The high side and low side autotransformer voltages are typically written as "345/230," "230/115" and "115/69." *See, e.g.*, App. G. lines 2, 11 and 41. Each autotransformer in SPS's transmission system is identified in Appendix G. The load losses related to autotransformers can be separated into demand and energy components.

The demand component was determined by two steps. The first step was to determine the demand loss from each autotransformer from the summer peak powerflow study, summarized in Appendix N. This provided the loss due to loading at the peak time of the year. These losses are stated for each of three types of autotransformers at lines 3, 5 and 7 of Appendix F.
The second component of the autotransformer demand loss was provided by summing the individual transformer no-load losses for those operating at a particular voltage class from the tabulation in Appendix G. This component represents the loss incurred by simply energizing the transformer, as described below.

5.1 Autotransformer Energy Losses

The energy losses related to autotransformers can also be separated into two parts. The first part is the energy loss associated with no-load operation. This is the energy loss that is due to energization of the transformer from the magnetizing currents. These values were determined by taking the no-load loss, as tabulated in Appendix G, and multiplying by the number of hours in the 2013 Study Period because these autotransformers are assumed to be energized throughout the study period.

The energy losses related to loading were determined by the same methodology as for transmission lines. For each powerflow study, a tabulation of the autotransformer losses by voltage level was done and these losses were also expressed as a percentage of the net load for that powerflow study. The autotransformer losses for each segment were determined by multiplying the percentage by the net generation occurring during that segment. This produces the average losses for each voltage level for each segment. The data needed to make these calculations and the results are shown in Appendix F. The equations used to obtain the energy losses for the autotransformers are the same as Equations 4.3.1 and 4.3.2.

All losses discussed to this point are transmission level losses. The losses discussed in the following sections 6 through 10 are losses at the distribution level.

6.0 Distribution Substation Transformer Losses

Distribution substation transformers are those transformers that reduce the transmission voltage, *e.g.*, 69 kV, to a distribution voltage, such as 33 kV, 22 kV or 12.5 kV. The data for each distribution substation transformer are in Appendix I. Manufacturers' data were used to determine losses. If manufacturers' data were not available for a specific transformer, data for a similar transformer manufactured by another company were used.

Column 9 has a code for verification of data. The codes used in this field mean:

R - ratings were verified from manufacturer's data

L - loss values were verified from manufacturer's data

E - loss values are an estimate

There are many transformers on SPS's system that are either owned by a specific customer or have metering or other arrangements to reflect the billing on the high side of the transformer, *i.e.*, before losses are incurred. These transformers are excluded from the loss calculations in Appendix I, and excluded from App. I's list of transformers, because SPS does not incur the losses associated with these transformers (the losses are borne by the customer leasing the transformer). In some situations, only a portion of a transformer is leased, and thus, only a portion of the losses associated with that transformer should be excluded. These transformers are identified by the letter "E" in column 10 of App. I, and the percentage of losses to be excluded is stated in column 15. The letter "I" in column 10 means that transformer is fully included in the loss calculations.

6.1 Distribution Substation Transformer Demand Losses

The demand losses associated with these transformers have two components. The first component is the magnetizing current losses that are present anytime the transformer is energized. The second component is the full load loss value for the transformer. Manufacturers' test report data was used to determine the no-load loss and the loss when the distribution transformers were loaded to their nominal MVA ratings (App. I, Col. 4). Loading of transformers at their nominal MVA rating is referred to in App. I as "full load" but this label does not mean that the transformers have no additional capacity. The maximum MVA loading for each transformer is listed in App. I, Column 5. As evidenced by the differences between the values in columns 4 and 5 of App. I, many transformers can handle loads in excess of their nominal "full load." The no-load losses and nominal "full load" losses for each transformer are tabulated in Appendix I, columns 6 and 7, and totaled for the entire system at the bottoms of Columns 6, 7, and 8.

It was assumed for the purposes of this study that the distribution transformers were operating at "full load" (their nominal MVA ratings) at the time of the system peak. This assumption was reasonable, conservative, and necessary. The transmission and distribution system is designed to handle the system's peak load and have additional capacity available in case peak load is greater than forecasted. And, of course, system load has grown since most of these transformers were originally sized and installed. Thus, at the time of system peak, it is likely that many transformers operated somewhere between their nominal and maximum MVA ratings. Thus, basing losses upon only the nominal MVA loading, as SPS has done, is conservative. Using this assumption was necessary since manufacturers typically provide test data only for losses at the nominal MVA rating.

6.2 Distribution Substation Transformer Energy Losses

The energy loss has two components. The first is the no-load loss, which occurs during every hour of the Study Period. Referring to Appendix I, this value was calculated by multiplying the no-load losses derived from manufacturers' test data, column 6, by the number of hours in the Study Period, which results in the energy loss during the Study Period, as shown in column 12.

The full load loss required the determination of the load characteristic of the load being served by a particular transformer. The load factor assigned to each transformer is shown in App. I, column 11.

The load factor for a study period is defined as:

$$\text{Load Factor} = \frac{\text{Total Study Period Energy}}{\text{Max. Demand} \times \text{Hours in Study Period}} \qquad (6.2.1)$$

For the purpose of determining the study period energy losses, the following equation was used:

$$\text{Losses} = \text{Full Load Loss} \times \text{Hours in Period} \times \text{Load Factor} \qquad (6.2.2)$$

The results of this calculation are shown in Appendix I, column 14.

The "Sum of demands adjusted for Primary Generation: is the estimated load at primary and shown on line 290. The 54.139 MW adjustment shown on line 289 are the coincident wind and solar primary generation at system peak hour and reduce the total load on the primary feeders. Generation at primary may be used at the primary voltage level and never get transformed to the transmission voltage level.

6.3 Calculation of Load at Each Feeder Voltage Level

The load at each feeder voltage level is calculated at lines 298-304 of Appendix I. The loading on 33 kV feeders, for example, is calculated by determining the ratio of the nominal MVA of transformers connected to 33 kV feeders (108.90 MVA on line 299) to the adjusted nominal MVA of all distribution substation transformers (2,702.78 on line 299) and then multiplying that ratio by total loading on all distribution feeders (line 290). Thus, for 33 kV feeders, the calculated loading is: (108.90/2702.78) x 2213.90 MW = 89.20 MW. This value appears at line 300 of Appendix I in the "33" column. From this value, the load on transformers with no feeders (line 301) is subtracted to yield the load on 33 kV feeders, which appears on line 304. Line 302 presents data on total numbers of feeders at each voltage level and (line 303) the number of feeders after excluding the portions of transformers that are shared with customers.

7.0 Load Factor Derivation

The load factors used to calculate the study period energy losses reflected in Appendix I, column 13, provide representative load factors for substation loads. However, the load factors are not a pure load factor, such as might be found for a rate class. Rather they represent the composite mix of customer load which occurs on the power system.

The data used in Appendix H comes from rate analysis of each customer class on SPS's system for the Study Period. Using this data, monthly demand peaks and monthly energy deliveries, a

composite load is developed which represents the desired substation class load. With the summed energy and demands, a load factor can be calculated. The load factor for distribution connected load, Loss Level 4 through 6 is shown in Appendix H, line 78.

8.0 Distribution Primary Feeder Losses

The primary distribution network (Level 4 in the loss study) consists of the distribution lines (feeders) that transport power from the distribution substation to the distribution line transformers near each customer. The losses associated with these primary distribution feeders are calculated on Appendix J. At the top of Appendix J, the distribution loads and energy are summarized for the Study Period. They are broken into loss levels and they represent the demand and energy for each level of the distribution system. These values shown are derived from Appendix H and they will be used throughout the distribution loss calculations.

Losses are calculated for 521.92 feeders operating at 6 nominal voltage levels (33 kV, 22 kV, 13.2 kV, 12.5 kV, 4.16 kV and 2.4 kV). There are 536 feeders connected to the transformers (App. I, line 302), but some feeders are connected to transformers that are shared with customers. Thus, the number of feeders at each voltage level has been reduced in proportion to the nominal MVA of substation transformers at each voltage level leased by customers. The percentage of each transformer's capacity leased to a customer is shown in column 15 of Appendix I. This process produces fractional feeders that are used to calculate primary distribution feeder losses.

8.1 Distribution Primary Feeder Demand Losses

The load and number of feeders at each voltage level are derived from lines 304 and 303, respectively, of Appendix I.

The Feeder Current, in amps, is:

$$\text{Feeder Current} = \frac{\text{Feeder Load}}{(\sqrt{3}) \times \text{ Feeder Voltage}} \qquad (8.1.1)$$

The Feeder Loss, in watts, for a given voltage level is :

$$\text{Feeder Loss} = 3 \times (\text{Current})^2 \text{ x Resistance} \times \text{Avg. Length} \qquad (8.1.2)$$

The length of each feeder varies considerably as do the wire sizes (conductors) used in the construction, which affects resistance. The distribution system database consists of 567 feeders ranging in length from zero to 60.5 miles and many different wire sizes and materials. The typical conductor size was determined by summing the feeder lengths by voltage by conductor type and size and selecting the most common conductor based on length and conductor material and size. The results of this investigation appear in the "Typical Conductor" column on Appendix J.

The average feeder length was determined by sorting the feeders by voltage and dividing the sum of the lengths by the number of feeders in each voltage. A feeder was counted if the length was greater than 0.05 miles. There were 515 feeders that fit this criteria. The results of this investigation appear in the "Avg. Feeder Length, Miles" column on Appendix J.

The total loss for a given voltage level is obtained by multiplying the loss determined above by the number of feeders in the given voltage level.

8.2 Distribution Primary Energy Losses

These losses were calculated by multiplying the demand energy loss for the entire load served via primary distribution line by the hours in the study year and by the loss factor for the entire distribution load. The load factor is determined in Appendix J from the Total Primary Demand and the Total Energy. The Loss Factor is determined from equation 2.2.2. Thus, the losses over the year are determined by the following equation.

$$\text{Loss} = \text{Demand Loss} \times 8760 \text{ hours} \times \text{Loss Factor} \qquad (8.2.1)$$

9.0 Distribution Line Transformer Losses

Appendix K contains the loss calculations for distribution line transformers, which corresponds to loss level 5. The number of meters and transformers are actual counts derived from SPS's records. The meters per transformer data is derived by dividing the adjusted meter count by the number of transformers, *e.g.*, 331,250 single phase meters/93,753 transformers equals 3.53322 meters/transformer.

In calculating losses, it is necessary to distinguish between single phase transformers, which serve primarily residential customers, and three phase transformers, which serve primarily commercial customers. The "Adjusted Meters" column on Appendix K performs this function by assigning the single phase commercial meters to the "Residential" category, *i.e.*, Residential Adjusted Meters equals actual residential meters (293,839) plus the difference between all commercial meters and three phase commercial meters (38,871).

It was assumed that one residential customer took service directly from each distribution line transformer and that all other residential customers were served from secondary distribution lines. Secondary lines are the lines that typically run from a pole top transformer to another pole that has no transformer. From that second pole, a service line (a drop) runs to the customer's premises. Losses on secondary lines and drops are addressed in Appendix L. For three phase commercial customers, the number of transformers essentially equals the number of meters, and thus, each such customer is assumed to be served directly from the transformer.

9.1 Distribution Line Transformer Demand Losses

Based on consultation with distribution system engineers, typical transformer sizes were chosen as 25 KVA (residential) and 100 KVA (commercial). The transformer loss data at no load and "full load" for each size are listed in Appendix K at lines 26 and 27. The average load per customer is developed by taking the demand served and dividing by the number of customers.

Then the loss per transformer is developed by taking the load per customer and calculating the losses proportionally to the load served by the transformer and its full load rating. The total demand loss is determined by multiplying the number of transformers by each no-load and full load loss component. The no-load and loaded losses are shown at App. K, lines 35 and 37, and totaled at lines 39 and 41.

9.2 Distribution Line Transformer Energy Losses

These losses were calculated by using the demand energy loss for the distribution line transformers and multiplying by the loss factor of the load served through the distribution transformers and by the number of hours in the Study Period. The load factor is determined from data in Appendix K using the Total Secondary Dist. Transformer Demand and the Total Secondary Dist. Transformer Energy. The Loss Factor is determined from equation 2.2.2. Thus, the losses over the year are determined by the following equation.

$$\text{Loss} = \text{Demand Loss} \times 8760 \text{ hours} \times \text{Loss Factor} \qquad (9.2.1)$$

10.0 Distribution Secondary Losses

The distribution secondary losses are determined in Appendix L. To determine the secondary losses, it was estimated that the secondary conductor was 1/0 MCM ACSR conductor and that there was 60 feet of conductor serving each residential meter not served directly from the transformer. The resistance of this secondary was 0.0127 ohms. The typical residential load and current and commercial load and current were determined in Appendix K. There is no consideration of commercial load on secondary lines, as these customers are usually served directly from transformers.

10.1 Distribution Secondary Demand Losses

There was assumed to be 2 meters per 60 foot of secondary line. The loss, in watts, on the secondary was determined by the following equation:

$$\text{Loss} = \left(2 \times I^2 \times R\right) \qquad (10.1.1)$$

Multiplying by the number of meters (Appendix K) produces the total loss for the distribution secondary.

10.2 Distribution Service Line Demand Losses

It was estimated that residential service line consisted of 65 feet of #2 Triplex and commercial service line consisted of 30 feet of #1/0 Quadriplex service wire. The resistance for these service lines are 0.02028 ohms and 0.00636 ohms, respectively. The current for each type of customer is calculated and the losses are calculated by the following equations:

$$\text{Loss} = 2 \times I^2 \times R \text{ , for residential customers and} \qquad (10.2.1)$$

$$\text{Loss} = 3 \times I^2 \times R \text{ , for commercial customers.} \qquad (10.2.2)$$

The total loss for each group was determined by multiplying the loss per meter by the number of meters, which are found on Appendix K.

10.3 Distribution Secondary and Service Lines Energy Losses

These losses were calculated by adding the demand loss of both the Secondary and Services and multiplying by the number of hours in the test year and also multiplying by the loss factor of the load that is served by Secondary and Services. The load factor is determined from data in Appendix L using the Total Secondary Dist. Transformer Demand and Total Sec. Distribution Lines demand and their associated energy. The Loss Factor is determined from equation 2.2.2. Thus, the losses over the year are determined by the following equation.

$$\text{Loss} = \text{Demand Loss} \times 8760 \text{ hours} \times \text{Loss Factor} \qquad (10.3.1)$$

The results of this calculation are shown in Appendix L.

11.0 Summary of Transmission Loss Study

Southwestern Public Service Company
Loss Evaluation Study for 2013 Study Period

Appendix M contains the results of all of the calculations discussed previously. The power system elements for which losses are determined are:

Transmission Lines
Autotransformers
Distribution Substation Transformers
Distribution Primary Lines
Distribution Line Transformers
Distribution Secondary and Service Lines

Line 42 lists the total of the value obtained by the study, labeled as "Total Determined Losses". Line 44, labeled "Losses," is the actual losses determined in Section 1.2 of this report. The difference between the results of this study and the actual losses is shown on line 43 as "Undeterminable Losses". Typically, the results from a loss study will be within a few percent, plus or minus, of the actual losses**.** For the 2013 Study Period, the Total Determined Losses are over estimated by 0.83% of actual losses. ***It should be noted that nowhere in this study is the actual loss value used to force the loss study to produce a final answer equal to the actual loss value.***

The results of this study are used to determine loss factors for rate classes. To do this, all actual losses must be accounted for, and thus, the Undeterminable Losses (line 43) have to be allocated to loss levels. Each category of energy losses is allocated a portion of the Undeterminable Losses equal to the ratio of that category's calculated losses to Total Determined Losses in MWh. For example, the "Adjusted Energy MWh" value for Transmission Lines – 345 kV (line 14), which is 38,389 MWh, is determined by: 38,707 MWh (line 14 determined energy loss) x (1,821,919 MWH Total Losses /1,836,997 MWH Total Determined Losses).

The values of factored energy loss, at the far right side of Appendix M, are used in the development of the rate class loss factors.

12.0 Loss Factor Derivation

Appendices O and P contain the derivation of the rate class loss factors from summary data derived in various sections of the report. The rate class loss factors are determined for the loss levels shown in Appendix O and P.

The method to determine the loss factors is based on starting with the total resource input to the system at Generation Level, Level 1. This value is the starting point for the worksheet. Using Appendix O as an example, from this value, the deliveries for that level and the losses for that level are subtracted, leaving the 'Net KWH into each Loss Level'. This calculation is done for each loss level, with the result that all losses and deliveries have been subtracted from the Total Resources, with a result of zero. This means that all deliveries and losses have been assigned to a loss level and there is no error. Loss factors are calculated at each level as the subtraction progresses to the right through the loss levels. The calculation is shown in the appendices along with the loss factors by rate classification.

The process of calculating the Demand Loss Factor in Appendix O is the same as described for the energy factor calculation. However, rather than redistributing any "Undeterminable Losses" among the different loss levels, the "Total Determined Losses" from Appendix M is used.

Appendix Q contains the Demand and Energy Loss Factors by rate class in summarized form, without their respective derivations. The composite loss factors are shown for rate classes in loss levels 5 and 6.

APPENDIX A
DERIVATION OF ACTUAL LOSSES
Jul. 2012 - Jun 2013
(MWh)

Line No.		Jul 2012	Aug 2012	Sep 2012	Oct 2012	Nov 2012	Dec 2012	Jan 2013	Feb 2013	Mar 2013	Apr 2013	May 2013	Jun 2013	TOTAL PERIOD
1														
2														
3	**Loss Derivation**													
4														
5	**Total Resources**													
6	Net Generation (+)	2,167,351	2,069,788	1,729,710	1,676,791	1,408,083	1,539,986	1,442,496	1,336,681	1,643,047	1,454,927	1,494,678	1,661,314	19,624,852
7	Net Metered in(+)	237,268	271,618	203,765	217,077	206,128	165,746	238,636	210,109	150,163	228,959	355,063	272,171	2,756,703
8	Net Metered Out (-)	134,779	107,671	152,432	171,479	116,136	120,584	93,546	72,078	86,500	92,363	67,760	108,069	1,323,397
9														
10	Firm Purchased Power													
11	BEA, LPP	463,733	453,105	345,147	255,435	321,328	361,583	343,159	342,418	310,231	395,912	414,989	382,698	4,389,738
12	LPL Generation	73,219	85,028	45,161	28,212	4,177	24,797	43,191	33,367	66,593	73,080	75,462	75,902	628,187
13	Others(Orion,Sid)	11,738	12,621	11,307	10,981	6,688	4,218	8,247	8,222	9,198	10,477	6,232	8,782	108,713
14														
15	Non-firm Purchased Power													
16	Wind and Solar	148,004	113,723	129,552	170,950	176,796	246,103	217,592	231,134	265,443	253,278	262,701	268,620	2,483,897
17														
18	Other Control Area Generation													
19	GSEC's Mustang, Antelope and Wind Total Gen	403,651	447,114	251,058	94,895	264,718	191,455	209,586	55,660	49,526	214,232	171,591	286,609	2,640,094
20	Generation sold into market	108,543	95,917	107,384	142,274	142,891	161,337	141,764	137,916	144,054	153,476	157,013	162,964	1,655,533
21														
22	**Total Resources**	**3,478,729**	**3,441,242**	**2,670,652**	**2,425,137**	**2,414,673**	**2,574,642**	**2,551,124**	**2,283,428**	**2,551,755**	**2,691,979**	**2,869,968**	**3,010,992**	**32,964,320**
23														
24	**Total Deliveries**													
25	Retail/Wholesale Deliveries	3,308,001	3,250,884	2,534,978	2,273,384	2,264,767	2,419,675	2,402,834	2,141,512	2,436,348	2,558,010	2,726,176	2,825,832	31,142,401
26														
27	WTMPA Sales (FYI -In Total Sales above)	-	-	-	-	-	-	-	-	-	-	-	-	-
28	**Total Deliveries**	3,308,001	3,250,884	2,534,978	2,273,384	2,264,767	2,419,675	2,402,834	2,141,512	2,436,348	2,558,010	2,726,176	2,825,832	31,142,401
29														
30	**Total Losses**	**170,727**	**190,359**	**135,674**	**151,752**	**149,906**	**154,967**	**148,290**	**141,916**	**115,407**	**133,969**	**143,792**	**185,159**	**1,821,919**
31														**5.5269%**
32														
33														
34	**Net Output To Lines Derivation**													
35	Total Resources	3,478,729	3,441,242	2,670,652	2,425,137	2,414,673	2,574,642	2,551,124	2,283,428	2,551,755	2,691,979	2,869,968	3,010,992	32,964,320
36														
37														
38	**Net Output To Lines**	**3,478,729**	**3,441,242**	**2,670,652**	**2,425,137**	**2,414,673**	**2,574,642**	**2,551,124**	**2,283,428**	**2,551,755**	**2,691,979**	**2,869,968**	**3,010,992**	**32,964,320**
39														
40														
41	**Net Output to Lines By Load Segmen**													
42														
43	**Load Segment Period 1: Jul. - Aug**	**6,919,971**												
44														
45	**Load Segment Period 2: Sep.- Feb**	**14,919,655**												
46														
47	**Load Segment Period 3: Mar - Apr.**	**5,243,734**												
48														
49	**Load Segment period 4: May. - Jun.**	**5,880,959**												
50														
51														
52														
53	**Total Region**	**32,964,320**												

Appendix B

Not used in this loss evaluation study

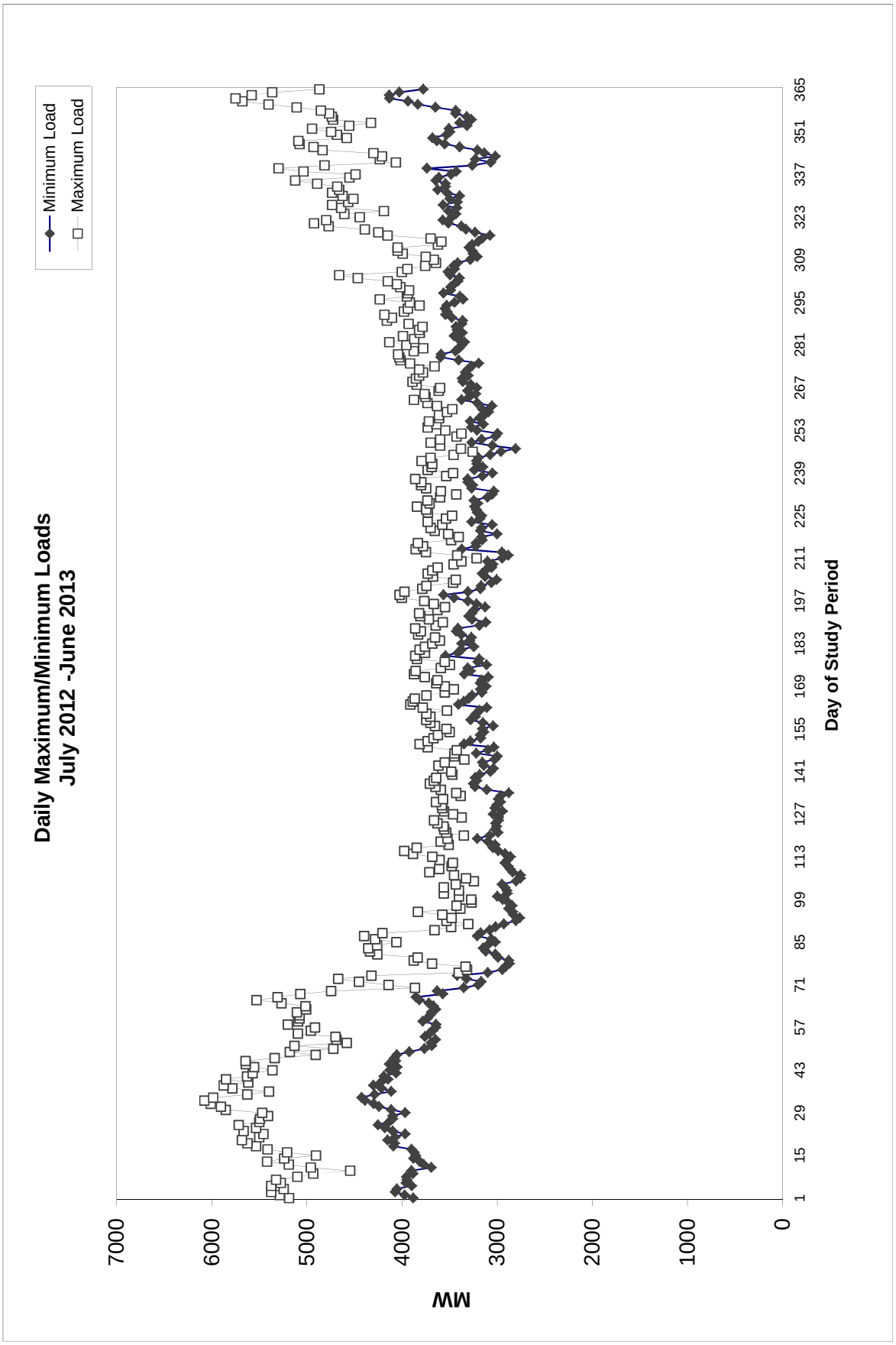
Appendix C

Not used in this loss evaluation study

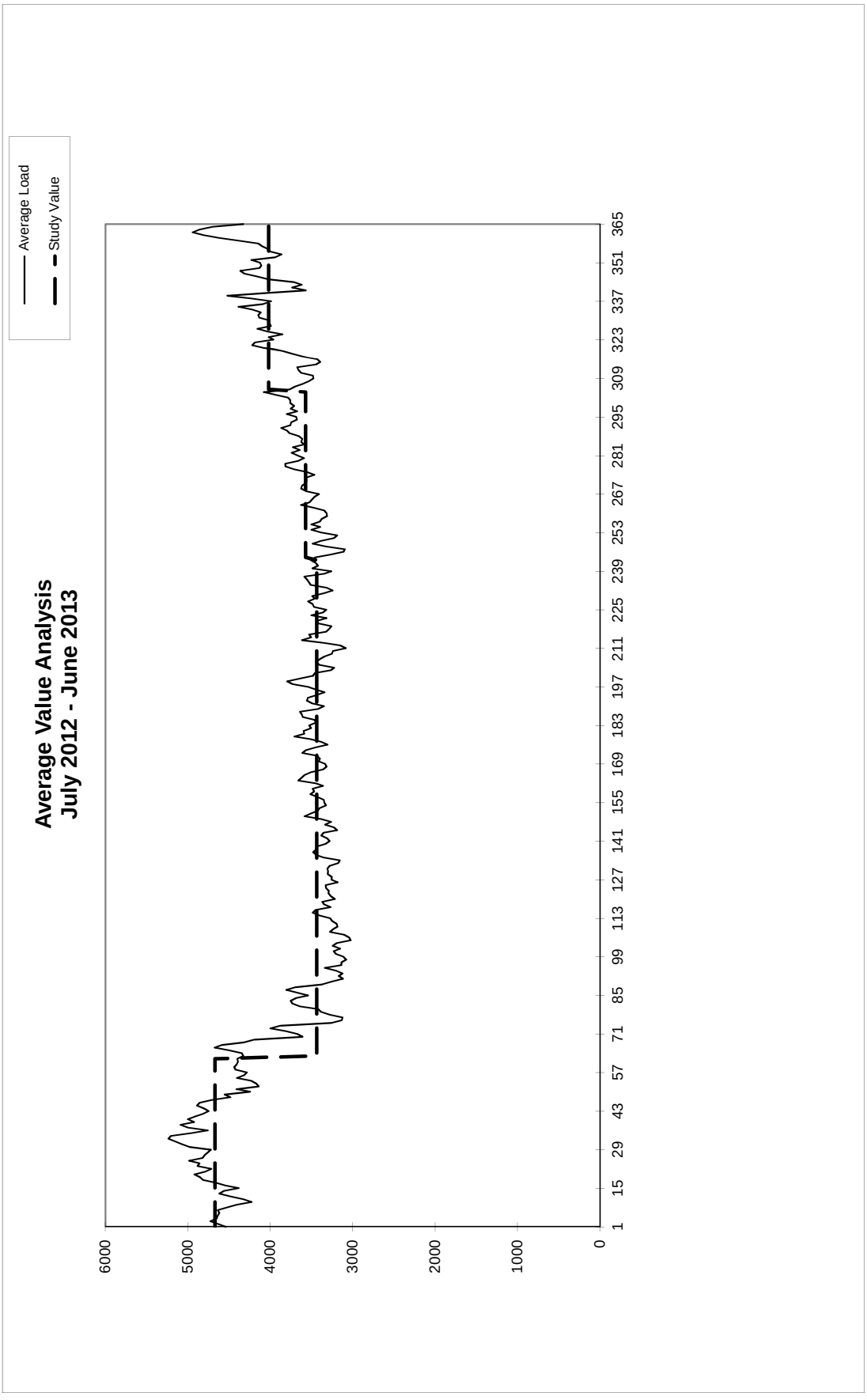
App. D - System Load Data

	Y	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM
1						**Month**		**TNP/EPE**	**PNM**	**LAMAR**	**LPL FLOW**	**SWPP**	**WIND**
2		**Avg Load**	**%Error**	**Start Day**	**End Day**	**Entry**		**Avg**	**Avg**	**Avg**	**Avg**	**Avg**	**Avg**
3		4669.20	-0.04%	1	62	62	1	61.32	-25.24	26.67	163.12	-187.58	306.94
4		3436.90	0.25%	63	243	181	2	12.52	-6.34	-2.39	154.54	-131.15	472.69
5		3572.40	-0.03%	244	304	61	3	-0.12	-18.58	-1.50	82.90	-101.74	605.70
6		4019.25	0.00%	305	365	61	4	-0.13	-8.50	1.92	130.18	-264.98	627.63
7													
8		**Total Error**	**0.18%**			365							

App. D - System Load Data 6



App. D - System Load Data 6



Appendix E
Transmission Losses

Corona & Insulator Leakage Demand and Energy Losses

	Miles	KW Loss/mile	Energy Losses MWH	Demand Losses MW
345 kV Line	623.00	2.343	**12,787**	**1.46**
230 kV Line	1,732.68	1.185	**17,986**	**2.05**
115 Kv Line	2,953.27	0.403	**10,426**	**1.19**
69 kV LIne	1,595.49	0.197	**2,753**	**0.31**
	6,904.44	**Annual Losses**	**43,952 MWH**	**5.02 MW**

Transmission Line Demand Loss

		MW
345 kV Line	This data comes from the peak hour powerflow Case. App. N.	**7.81**
230 kV Line		**40.28**
115 Kv Line		**85.22**
69 kV LIne		**25.16**

Transmission Line Energy Loss

Segment Name	**Segment 1**	**Segment 2**	**Segment 3**	**Segment 4**
Segment Load, MW	4669.2	3436.9	3572.4	4019.3
Segment Output to Lines, MWH	6,919,971	14,919,655	5,243,734	5,880,959

	Segment 1			**Segment 2**			**Segment 3**			**Segment 4**			**Total Segment**
	MW Loss	**Factor**	**MWH Loss**	**MW Loss**	**Factor**	**MWH Loss**	**MW Loss**	**Factor**	**MWH Loss**	**MW Loss**	**Factor**	**MWH Loss**	**Losses, MWH**
345 kV Line	4.340	0.0009	6,433	3.466	0.0010	15,046	2.419	0.0007	3,550	9.348	0.0023	13,678	**38,707**
230 kV Line	27.612	0.0059	40,922	33.419	0.0097	145,074	35.853	0.0100	52,627	37.551	0.0093	54,944	**293,567**
115 Kv Line	49.591	0.0106	73,496	33.878	0.0099	147,066	40.249	0.0113	59,079	44.145	0.0110	64,593	**344,234**
69 kV LIne	15.606	0.0033	23,128	9.380	0.0027	40,718	9.070	0.0025	13,313	11.297	0.0028	16,529	**93,689**

Appendix F
Autotransformer Losses
Under Load

Line No.			
1	**Autotransformer Line Demand Loss**		
2			**MW**
3	**345/230 kV Autos**	This data comes from the peak hour powerflow.	**0.67**
5	**230/115 kV Autos**		**9.00**
7	**115/69 Kv Autos**		**5.90**
10	**Autotransformer Energy Loss**		

	Segment Name	**Segment 1**	**Segment 2**	**Segment 3**	**Segment 4**
14	**Segment Load, MW**	4669.2	3436.9	3572.4	4019.3
16	**Segment Output to Lines, MWH**	6,919,971	14,919,655	5,243,734	5,880,959

		Segment 1			**Segment 2**			**Segment 3**			**Segment 4**			**Total Segment**
19		**MW Loss**	**Factor**	**MWH Loss**	**MW Loss**	**Factor**	**MWH Loss**	**MW Loss**	**Factor**	**MWH Loss**	**MW Loss**	**Factor**	**MWH Loss**	**Losses, MWH**
20	**345/230 kV Autos**	0.605	0.0001	897	0.698	0.0002	3,028	0.662	0.0002	972	0.886	0.0002	1,297	**6,193**
22	**230/115 kV Autos**	6.539	0.0014	9,691	5.180	0.0015	22,485	5.031	0.0014	7,385	5.476	0.0014	8,012	**47,573**
24	**115/69 Kv Autos**	4.086	0.0009	6,056	2.958	0.0009	12,841	2.946	0.0008	4,324	3.282	0.0008	4,803	**28,024**

Appendix G
Autotransformer
No-Load Losses

Line No.	Location	Voltage	Nominal Rating MVA	Max Rating MVA	No Load Loss, Watts	Energy Losses, MWH 345 Kv	230 kV	115 kV	Demand Losses, KW 345 Kv	230 kV	115 kV
1	AMARILLO SOUTH	230/120	135	225	55,440		485.65			55.44	
2	ARTESIA INT	115/69	23.77	39.62	15,268			133.75			15.27
3	ARTESIA INT	115/69	23.77	39.62	17,600			154.18			17.60
4	ATOKA INT	115/69	23.77	39.62	21,060			184.49			21.06
5	BAILEY CO	115/69	84	84	17,540			153.65			17.54
6	BAILEY CO	115/69	84	84	18,460			161.71			18.46
7	BLACKHAWK	115/69	45	84	14,335			125.57			14.34
8	BLACKHAWK	115/69	45	84	14,249			124.82			14.25
9	BORDEN CO.	230/131	90	150	30,906		270.74			30.91	
10	BOWERS	120/69	45	84	69,440			608.29			69.44
11	BUSHLAND	230/115	90	150	86,001		753.37			86.00	
12	CARLISLE	230/115	90	150	57,968		507.80			57.97	
13	CARLISLE	115/69	23.77	39.6	18,380			161.01			18.38
14	CARLSBAD INT E	115/69	23.77	39.6	16,900			148.04			16.90
15	CARLSBAD INT W	115/69	23.77	39.5	22,450			196.66			22.45
16	CASTRO N	115/69	45	75	14,901			130.53			14.90
17	CASTRO S	115/69	45	75	14,917			130.67			14.92
18	CHAVES CO INT E	230/115	90	150	60,700		531.73			60.70	
19	CHAVES CO INT W	230/120	135	225	61,380		537.69			61.38	
20	CHAVES INT	115/69	23.77	39.6	18,700			163.81			18.70
21	COCHRAN	115/69	23.77	39.6	17,600			154.18			17.60
22	COCHRAN	115/69	23.77	39.6	16,150			141.47			16.15
23	COULTER	115/69	45	75	25,659			224.77			25.66
24	COX	120/69	45	84	17,400			152.42			17.40
25	CROSBY #T1	115/69	23.77	39.6	17,300			151.55			17.30
26	CROSBY #T2	115/69	23.77	39.6	21,930			192.11			21.93
27	CUNNINGHAM	230/115	90	150	84,128		736.96			84.13	
28	CURRY	115/69	23.77	39.62	20,110			176.16			20.11
29	CURRY	115/69	45	75	26,000			227.76			26.00
30	DALHART	115/69	23.77	39.6	20,200			176.95			20.20
31	DALLAM	115/69	23.77	39.6	17,840			156.28			17.84
32	DEAF SMITH #1	230/115	90	150	59,030		517.10			59.03	
33	DEAF SMITH #2	230/115	90	150	35,300		309.23			35.30	
34	DENVER CITY INTCH	115/69	50	84	18,860			165.21			18.86
35	DENVER CITY INTCH	115/69	50	84	18,660			163.46			18.66
36	DOSS INTCHG.	115/69	50	84	17,000			148.92			17.00
37	EAST PLANT	230/120	135	225	71,492		626.27			71.49	
38	EAST PLANT	115/69	50	84	18,200			159.43			18.20
39	EAST PLANT	115/69	50	84	17,340			151.90			17.34
40	EDDY CO INT (T1)	230/115	90	150	55,794		488.76			55.79	
41	EDDY CO INT	345/230	300	560	75,788	663.90			75.79		
42	EDDY CO INT (T2)	230/115	150	250	37,500		328.50			37.50	
43	EAGLE CREEK	115/69	23.77	39.6	18,205			159.48			18.21
44	FLOYD CO	115/69	23.77	39.6	20,640			180.81			20.64
45	FLOYD CO INTCHG.	120/69	45	84	22,270			195.09			22.27
46	GAINES #1	115/69	23.77	44	10,900			95.48			10.90
47	GAINES #2	115/69	23.77	39.6	22,000			192.72			22.00
48	GRAHAM CO	115/69	23.77	39.6	16,670			146.03			16.67
49	GRAPEVINE INTG	230/115	60	100	47,450		415.66			47.45	
50	GRASSLAND	230/115	60	100	51,300		449.39			51.30	
51	GRAY CO	115/69	45	75	24,519			214.79			24.52
52	HALE CO	115/69	23.77	39.6	16,720			146.47			16.72
53	HALE CO	115/69	23.77	39.6	17,328			151.79			17.33
54	HAPPY INTG E	115/69	23.77	39.617	19,700			172.57			19.70
55	HAPPY INTG W	115/69	23.77	39.617	19,700			172.57			19.70
56	HEREFORD	115/66	23.77	39.62	21,000			183.96			21.00
57	HEREFORD	115/69	23.77	39.62	23,340			204.46			23.34
58	HITCHLAND	345/230	336	560	86,954			761.72	86.95		
59	HITCHLAND	230/115	150	250	62,938		551.34			62.94	
60	HOCKLEY	115/69	50	84	25,100			219.88			25.10
61	HOCKLEY	115/69	50	84	23,700			207.61			23.70
62	HOWARD	115/69	45	75	33,190			290.74			
63	HUTCHINSON	115/69	45	75	28,199			247.02			28.20
64	HUTCHINSON	230/115	90	150	84,172		737.35			84.17	
65	HUTCHINSON	230/115	90	150	90,549		793.21			90.55	
66	KINGSMILL (T1)	115/69	45	75	33,190			290.74			33.19
67	KINGSMILL (T2)	115/69	50	84	18,560			162.59			18.56
68	KRESS INTCHG	115/69	50	84	24,100			211.12			24.10
69	LAMB CO	230/120	135	225	69,698		610.55			69.70	
70	LAMB CO	120/69	45	84	23,000			201.48			23.00
71	LAMB CO	120/69	45	84	23,000			201.48			23.00
72	LAMBTON INTG.	115/69	45	75	14,230			124.65			14.23
73	LEA CO INTG.	230/115	90	150	83,572		732.09			83.57	
74	LEGACY	115/69	50	84	25,140			220.23			25.14
75	LUBBOCK EAST	230/115	90	150	70,680		619.16			70.68	
76	LUBBOCK-EAST (N)	115/69	50	84	26,330			230.65			26.33
77	LUBBOCK-EAST (S)	115/69	50	84	25,300			221.63			25.30
78	LUBBOCK-SOUTH	115/69	23.77	39.6	20,200			176.95			20.20
79	LUBBOCK-SOUTH	230/115	135	225	60,232		527.63			60.23	
80	LYNN CO	115/69	23.8	39.6	18,730			164.07			18.73
81	LYNN CO #2	115/69	27	45	10,100			88.48			10.10

Appendix G
Autotransformer
No-Load Losses

Line No.	Location	Voltage	Nominal Rating MVA	Max Rating MVA	No Load Loss, Watts	Energy Losses, MWH 345 Kv	230 kV	115 kV	Demand Losses, KW 345 Kv	230 kV	115 kV
82	MIDLAND CO.	230/131	90	150	30,906		270.74			30.91	
83	MOORE CO	230/115	150	250	67,370		590.16			67.37	
84	MUSTANG	230/115	90	150	69,850		611.89			69.85	
85	NE HEREFORD	120/69	45	84	15,038			131.73			15.04
86	NICHOLS-N	230/115	90	150	63,300		554.51			63.30	
87	NICHOLS-S	230/115	90	150	58,700		514.21			58.70	
88	NORTHWEST INTCH	120/69	45	84	14,390			126.06			14.39
89	OASIS INTG	230/115	135	225	53,021		464.46			53.02	
90	OCHILTREE	230/115	100	168	51,800		453.77			51.80	
91	PCA #2 INT	115/69	23.77	39.62	17,920			156.98			17.92
92	PERRYTON INTG	115/66	15	18.75	19,800			173.45			19.80
93	PECOS	230/115	90	150	50,428		441.75			50.43	
94	PLANT X	230/120	135	225	71,721		628.28			71.72	
95	PORTALES	115/69	45	84	14,894			130.47			14.89
96	PORTALES	115/69	45	84	14,604			127.93			14.60
97	POTASH JCT	230/115	90	150	72,380		634.05			72.38	
98	POTASH JCT	115/69	23.77	39.5	25,320			221.80			25.32
99	POTASH JCT	115/69	23.77	39.5	25,360			222.15			25.36
100	POTTER CO.	345/230	300	560	56,760	497.22			56.76		
101	POTTER CO.	230/115	150	250	65,980		577.98			65.98	
102	PRINGLE INTG.	230/120	135	225	78,433		687.07			78.43	
103	RANDALL CO (T1)	230/115	135	225	99,620		872.67			99.62	
104	RANDALL CO (T2)	230/115	150	250	37,900		332.00			37.90	
105	RIVERVIEW	115/69	23.77	39.5	24,770			216.99			24.77
106	ROOSEVELT	230/115	135	225	52,272		457.90			52.27	
107	ROSWELL INT (T1)	115/69	23.77	39.62	18,740			164.16			18.74
108	ROSWELL INT (T2)	115/69	23.77	39.62	17,400			152.42			17.40
109	SEAGRAVES	120/69	45	75	14,103			123.54			14.10
110	SEMINOLE E	230/115	90	150	63,300		554.51			63.30	
111	SEVEN RIVERS	115/69	23.77	39.62	15,520			135.96			15.52
112	SEVEN RIVERS	115/69	23.77	39.62	15,520			135.96			15.52
113	SEVEN RIVERS	230/115	90	150	58,220		510.01			58.22	
114	SOUTH GEORGIA	115/69	45	75	20,602			180.47			20.60
115	SPEARMAN	115/69	18.75	25	38,940			341.11			38.94
116	SULPHUR SPNG	120/69	24	44.8	6,280			55.01			6.28
117	SULPHUR SPNG	120/69	24	44.8	8,900			77.96			8.90
118	SUNDOWN	230/118	100	166.667	60,604		530.89			60.60	
119	SWISHER	230/115	90	150	57,000		499.32			57.00	
120	TERRY CO E	115/69	50	84	24,500			214.62			24.50
121	TERRY CO W	115/69	50	84	24,100			211.12			24.10
122	TOLK	345/230	300	560	77,592	679.71			77.59		
123	TUCO N	120/69	45	84	14,950			130.96			14.95

APPENDIX H
USE BY LOSS LEVEL

SOUTHWESTERN PUBLIC SERVICE COMPANY
SCHEDULE: ADJUSTED TEST YEAR DATA BY RATE CLASS

TOTAL SYSTEM

FOR THE YEAR ENDED: JUNE 30, 2013

KWH ENERGY DELIVERED AT THE METER (1)

	Total Loss Level 6	Total Loss Level 5	Total Loss Level 4	Total Loss Level 3	Total Loss Level 2	Total Retail	Wholesale 4	Wholesale 3	Wholesale 2	Wholesale "@generator	Total Wholesale	Total System Energy
JULY 12	472,016,390	375,861,793	306,966,482	108,305,873	545,775,593	1,808,926,131	42,446,368	640,935,337	742,440,639	73,253,001	1,499,075,345	3,308,001,476
AUGUST	439,012,783	367,508,548	306,683,060	109,255,301	543,191,943	1,765,651,635	41,241,490	635,906,337	723,025,509	85,058,606	1,485,231,942	3,250,883,577
SEPTEMBER	315,051,182	292,348,905	294,020,749	106,347,344	527,216,807	1,534,984,987	35,395,456	351,486,278	567,910,095	45,201,285	999,993,114	2,534,978,101
OCTOBER	258,416,274	271,261,298	301,273,574	91,008,167	526,004,028	1,447,963,341	34,582,486	268,936,342	493,626,155	28,276,131	825,421,114	2,273,384,455
NOVEMBER	273,800,014	261,372,858	287,801,762	80,499,270	510,982,654	1,414,456,558	32,377,867	284,135,060	529,580,245	4,217,011	850,310,183	2,264,766,741
DECEMBER	370,852,908	251,612,398	290,529,250	103,985,085	533,157,983	1,550,137,624	32,924,420	271,750,852	539,980,349	24,881,821	869,537,442	2,419,675,066
JANUARY 13	385,621,075	243,194,999	285,050,856	106,347,494	529,191,219	1,549,405,643	33,345,849	252,670,215	524,158,992	43,253,231	853,428,287	2,402,833,930
FEBRUARY	309,514,189	219,931,950	258,267,797	99,491,060	478,896,236	1,366,101,232	30,079,519	236,328,884	475,562,495	33,439,620	775,410,518	2,141,511,750
MARCH	302,563,782	256,073,460	290,513,956	112,103,837	541,108,124	1,502,363,159	34,148,128	326,078,993	507,086,032	66,671,563	933,984,716	2,436,347,875
APRIL	265,714,920	272,450,863	287,196,628	113,881,531	512,662,377	1,451,906,319	34,839,560	455,177,179	542,915,040	73,171,582	1,106,103,361	2,558,009,680
MAY	316,555,730	307,960,423	294,669,597	120,564,746	529,405,347	1,569,155,843	39,304,040	469,498,155	572,665,449	75,552,887	1,157,020,531	2,726,176,374
JUNE	393,120,570	327,723,712	291,269,513	117,689,464	530,258,274	1,660,061,533	39,266,264	445,028,249	605,485,188	75,990,897	1,165,770,598	2,825,832,131
TOTAL YEAR	4,102,239,817	3,447,301,207	3,494,243,224	1,269,479,172	6,307,850,585	18,621,114,005	429,951,447	4,637,931,881	6,824,436,188	628,967,635	12,521,287,151	31,142,401,156
							3,924,194,671	5,907,411,053	13,132,286,773			

SOUTHWESTERN PUBLIC SERVICE COMPANY
SCHEDULE: ADJUSTED TEST YEAR DATA BY RATE CLASS

TOTAL SYSTEM

ADJUSTED CLASS COINCIDENT PEAK DEMAND
FOR THE YEAR ENDED: JUNE 30, 2013

ADJUSTED COINCIDENT PEAK DEMAND AT THE METER USING EXISTING LOSS FACTORS

	Total Loss Level 6	Total Loss Level 5	Total Loss Level 4	Total Loss Level 3	Total Loss Level 2	Total Retail	Total Wholesale 4	Total Wholesale 3	Total Wholesale 2	Total Wholesale "@generator	Total Wholesale	Total System Demand
JULY 12	1,032,275	627,615	435,824	147,719	772,276	3,015,710	78,591	1,035,666	1,221,425	182,777	2,518,459	5,534,169
AUGUST	1,084,021	664,745	439,649	149,991	761,307	3,099,713	77,342	1,051,185	1,307,682	157,316	2,593,525	5,693,238
SEPTEMBER	988,087	601,924	440,684	152,742	765,099	2,948,536	75,685	823,108	1,152,828	174,414	2,226,035	5,174,571
OCTOBER	537,291	499,558	422,033	117,121	707,307	2,283,311	60,651	465,980	843,915	69,255	1,439,801	3,723,112
NOVEMBER	561,170	395,535	420,778	136,790	722,100	2,236,374	56,155	424,367	858,743	45	1,339,310	3,575,684
DECEMBER	618,596	433,950	402,696	148,878	737,781	2,341,903	56,655	388,696	827,662	48,417	1,321,430	3,663,333
JANUARY 13	744,927	386,291	378,689	143,849	743,715	2,397,471	57,881	382,565	859,441	69,748	1,369,635	3,767,106
FEBRUARY	658,450	356,997	388,659	155,577	735,081	2,294,764	54,798	379,236	840,051	48,110	1,322,195	3,616,959
MARCH	593,903	407,466	404,431	149,467	710,531	2,265,797	57,419	448,811	760,897	114,559	1,381,686	3,647,483
APRIL	638,516	529,017	390,792	160,193	765,579	2,484,097	65,426	736,472	979,893	113,251	1,895,042	4,379,139
MAY	893,849	476,623	411,389	166,253	775,716	2,723,830	71,333	778,820	1,119,387	112,036	2,081,576	4,805,406
JUNE	1,056,222	623,690	436,906	163,154	778,740	3,058,713	74,152	873,727	1,262,826	109,557	2,320,262	5,378,975
AT Peak Hour	1,084,021	664,745	439,649	149,991	761,307	3,099,713	77,342	1,051,185	1,307,682	157,316	2,593,525	5,693,238
MAX PEAK	1,084,021	664,745	440,684	166,253	778,740	3,099,713	78,591	1,051,185	1,307,682	182,777	2,593,525	5,693,238
		1,748,766										

SOUTHWESTERN PUBLIC SERVICE COMPANY
SCHEDULE: ADJUSTED TEST YEAR DATA BY RATE CLASS

TOTAL SYSTEM

LOAD FACTOR USING KWH DELIVERED AND MAX KW AT THE METER
FOR THE YEAR ENDED: JUNE 30, 2013

LOAD FACTOR AT THE LOSS LEVEL

	Total Loss Level 6	Total Loss Level 5	Total Loss Level 4	Total Loss Level 3	Total Loss Level 2	Total Loss Level 1	Total System Demand	HOURS
JULY 12	0.614594	0.686564	0.740127	0.779198	0.812458	0.803416	0.803416	744
AUGUST	0.544336	0.619885	0.684837	0.736454	0.768642	0.767484	0.767484	744
SEPTEMBER	0.442847	0.530569	0.617711	0.628445	0.691583	0.680405	0.680405	720
OCTOBER	0.646454	0.686630	0.765598	0.783373	0.825872	0.820718	0.820718	744
NOVEMBER	0.677651	0.776933	0.828653	0.849423	0.878068	0.879694	0.879694	720
DECEMBER	0.805789	0.794879	0.840928	0.866768	0.890424	0.887785	0.887785	744
JANUARY 13	0.695784	0.747144	0.812058	0.838356	0.857769	0.857320	0.857320	744
FEBRUARY	0.699502	0.775882	0.834157	0.861048	0.878998	0.881064	0.881064	672
MARCH	0.684745	0.749830	0.811383	0.861600	0.901533	0.897787	0.897787	744
APRIL	0.577978	0.640198	0.735781	0.787602	0.809014	0.811299	0.811299	720
MAY	0.476007	0.612492	0.695174	0.743813	0.759085	0.762519	0.762519	744
JUNE	0.516937	0.595967	0.666485	0.694518	0.724790	0.729650	0.729650	720
ANNUAL LF	0.431996	0.492816	0.577497	0.569262	0.625149	0.624437	0.624437	8760

APPENDIX H
USE BY LOSS LEVEL

SOUTHWESTERN PUBLIC SERVICE COMPANY
SCHEDULE: ADJUSTED TEST YEAR DATA BY RATE CLASS

TOTAL SYSTEM

FOR THE YEAR ENDED: JUNE 30, 2013

KWH ENERGY DELIVERED AT THE METER

	Residential - NM Water Heating	Residential RTX & RLNM	Residential RHTX & RHNM	Total Residential	NM & TX Small General Service	NM & TX Street Lighting	NM & TX Area Lighting	NM & TX Small Muni and School Service	TX Large Municipal Service	Total Loss Level 6
JULY 12	-	283,435,635	130,610,044	414,045,679	29,624,268	3,537,725	3,790,326	2,096,385	18,922,008	472,016,390
AUGUST	-	262,094,075	121,852,069	383,946,145	28,001,369	3,537,725	3,790,326	2,105,644	17,631,575	439,012,783
SEPTEMBER	-	181,956,823	88,375,894	270,332,717	21,719,621	3,537,725	3,790,326	1,770,290	13,900,503	315,051,182
OCTOBER	-	141,783,910	76,720,085	218,503,994	18,938,569	3,537,725	3,790,326	1,714,865	11,930,795	258,416,274
NOVEMBER	-	144,163,868	90,574,437	234,738,305	18,913,214	3,537,725	3,790,326	1,793,304	11,027,140	273,800,014
DECEMBER	-	187,891,516	139,010,996	326,902,512	23,288,372	3,537,725	3,790,326	2,219,232	11,114,742	370,852,908
JANUARY 13	-	193,365,712	146,622,363	339,988,074	24,698,003	3,537,725	3,790,326	2,344,993	11,261,954	385,621,075
FEBRUARY	-	155,452,402	113,976,503	269,428,905	20,686,097	3,537,725	3,790,326	1,942,837	10,128,300	309,514,189
MARCH	-	155,689,156	104,811,777	260,500,933	21,471,530	3,537,725	3,790,326	1,828,528	11,434,741	302,563,782
APRIL	-	140,297,879	84,291,770	224,589,649	19,614,163	3,537,725	3,790,326	1,399,798	12,783,259	265,714,920
MAY	-	179,176,215	91,415,744	270,591,959	22,163,353	3,537,725	3,790,326	1,475,266	14,997,101	316,555,730
JUNE	-	233,426,856	109,655,781	343,082,637	25,429,282	3,537,725	3,790,326	1,549,460	15,731,141	393,120,570
TOTAL YEAR	-	2,258,734,047	1,297,917,463	3,556,651,510	274,547,842	42,452,700	45,483,906	22,240,602	160,863,258	4,102,239,818

SOUTHWESTERN PUBLIC SERVICE COMPANY
SCHEDULE: ADJUSTED TEST YEAR DATA BY RATE CLASS

TOTAL SYSTEM

ADJUSTED CLASS COINCIDENT PEAK DEMAND
FOR THE YEAR ENDED: JUNE 30, 2013

ADJUSTED COINCIDENT PEAK DEMAND AT THE METER USING EXISTING LOSS FACTORS

	Residential - NM Water Heating	Residential RTX & RLNM	Residential RHTX & RHNM	Total Residential		NM & TX Small General Service	NM & TX Street Lighting	NM & TX Area Lighting	TX Small Muni and School Service	TX Large Municipal Service	Total Loss Level 6
JULY 12	-	634,290	310,093	944,384		58,231	-	-	3,225	26,436	1,032,275
AUGUST	-	678,218	315,672	993,889		56,792	-	-	3,274	30,065	1,084,021
SEPTEMBER	-	606,752	296,758	903,510		57,244	-	-	3,435	23,898	988,087
OCTOBER	-	311,615	168,661	480,275		36,766	-	-	2,930	17,320	537,291
NOVEMBER	-	290,308	219,830	510,138		30,722	-	-	3,451	16,860	561,170
DECEMBER	-	261,354	295,293	556,647		41,135	-	-	3,562	17,252	618,596
JANUARY 13	-	348,207	335,615	683,822		38,768	-	-	3,778	18,559	744,927
FEBRUARY	-	323,763	280,453	604,217		34,243	-	-	3,552	16,438	658,450
MARCH	-	264,705	272,753	537,458		39,533	-	-	2,794	14,118	593,903
APRIL	-	415,726	150,304	566,030		48,311	-	-	1,666	22,509	638,516
MAY	-	561,840	258,292	820,133		46,006	-	-	2,084	25,627	893,849
JUNE	-	635,207	326,120	961,327		63,227	-	-	2,666	29,002	1,056,222
AT Peak Hour	-	678,218	315,672	993,889	#	56,792	-	-	3,274	30,065	1,084,021
MAX PEAK	-	678,218	335,615	993,889		63,227	-	-	3,778	30,065	1,084,021

APPENDIX H
USE BY LOSS LEVEL

SOUTHWESTERN PUBLIC SERVICE COMPANY
SCHEDULE: ADJUSTED TEST YEAR DATA BY RATE CLASS

TOTAL SYSTEM

FOR THE YEAR ENDED: JUNE 30, 2013

KWH ENERGY DELIVERED AT THE METER

	NM Irrigation Service	NM Municipal and Schoo Service	NM & TX Sec General Service	TX LSSTX Large School	Total Loss Level 5	CRMWA TX Interruptible SAS-4	TX LMSTX - Pri Large Municipal	TX LSSTX - Pri Large School	TX Primary LGS SAS-8	TX Primary QF Stand by	Primary Generation (Neg)	NM & TX Primary General Service	Total Loss Level 4
JULY 12	15,101,639	12,657,629	334,839,002	13,263,523	375,861,793	14,246,689	4,956,717	244,218	2,852,616	77,838	-	284,588,404	306,966,482
AUGUST	13,980,029	13,901,924	322,662,978	16,963,618	367,508,548	13,915,435	4,678,183	275,652	2,745,018	91,926	-	284,976,846	306,683,060
SEPTEMBER	9,318,016	12,154,515	253,605,415	17,270,959	292,348,905	12,932,766	3,172,417	255,989	3,114,496	104,470	-	274,440,611	294,020,749
OCTOBER	5,696,015	10,456,084	239,984,263	15,124,936	271,261,298	12,799,502	2,564,987	221,698	3,662,543	79,896	-	281,944,948	301,273,574
NOVEMBER	3,367,155	9,065,307	235,226,279	13,714,118	261,372,858	11,683,406	2,113,805	189,331	3,434,235	88,304	-	270,292,681	287,801,762
DECEMBER	1,998,201	9,107,761	226,643,716	13,862,720	251,612,398	9,987,453	1,989,148	185,819	2,504,805	87,266	-	275,774,759	290,529,250
JANUARY 13	1,806,921	9,425,530	217,134,523	14,828,024	243,194,999	10,658,538	1,652,811	193,618	2,624,641	99,473	-	269,821,775	285,050,856
FEBRUARY	3,732,703	8,733,108	193,952,190	13,513,948	219,931,950	8,360,154	1,418,554	181,822	2,303,086	79,043	-	245,925,139	258,267,797
MARCH	8,415,070	9,843,295	224,298,720	13,516,375	256,073,460	11,281,132	1,762,016	190,073	2,444,233	92,430	-	274,744,072	290,513,956
APRIL	10,758,558	10,395,933	237,473,913	13,822,460	272,450,863	12,077,287	2,444,184	190,756	2,697,706	81,879	-	269,704,817	287,196,628
MAY	11,280,999	12,147,289	268,897,988	15,634,147	307,960,423	13,296,803	3,201,953	235,324	2,495,173	74,041	-	275,366,303	294,669,597
JUNE	11,992,826	12,045,204	290,209,870	13,475,811	327,723,712	13,163,437	3,253,385	247,853	2,996,564	71,539	-	271,536,736	291,269,513
TOTAL YEAR	97,448,133	129,933,578	3,044,928,857	174,990,638	3,447,301,207	144,402,602	33,208,159	2,612,153	33,875,116	1,028,105	-	3,279,117,091	3,494,243,225

SOUTHWESTERN PUBLIC SERVICE COMPANY
SCHEDULE: ADJUSTED TEST YEAR DATA BY RATE CLASS

TOTAL SYSTEM

ADJUSTED CLASS COINCIDENT PEAK DEMAND
FOR THE YEAR ENDED: JUNE 30, 2013

ADJUSTED COINCIDENT PEAK DEMAND AT THE METER USING EXISTING LOSS FACTORS

	NM Irrigation Service	NM Municipal and Schoo Service	NM & TX Sec General Service	TX LSSTX Large School	Total Loss Level 5	CRMWA TX Interruptible SAS-4	TX LMSTX - Pri Large Municipal	TX LSSTX - Pri Large School	TX Primary LGS SAS-8	TX Primary QF Stand by	Primary Generation (NEG)	NM & TX Primary General Service	Total Loss Level 4
JULY 12	27,285	26,621	544,774	28,934	627,615	14,653	6,925	533	3,243	321	-	410,149	435,824
AUGUST	34,551	26,268	575,274	28,651	664,745	19,036	7,977	466	3,634	251	-	408,284	439,649
SEPTEMBER	22,794	34,028	502,092	43,011	601,924	19,103	5,454	638	3,767	226	-	411,497	440,684
OCTOBER	17,125	24,422	426,120	31,892	499,558	18,801	3,724	467	4,961	-	-	394,080	422,033
NOVEMBER	2,579	15,927	341,807	35,223	395,535	18,064	3,232	486	5,670	100	-	393,227	420,778
DECEMBER	835	19,535	371,629	41,951	433,950	16,535	3,087	562	3,436	-	-	379,075	402,696
JANUARY 13	670	14,253	335,676	35,693	386,291	14,207	2,724	466	4,110	666	-	356,517	378,689
FEBRUARY	3,973	14,924	301,708	36,391	356,997	14,137	2,302	490	3,046	257	-	368,427	388,659
MARCH	3,682	17,045	348,530	38,209	407,466	16,454	2,175	537	2,122	0	-	383,141	404,431
APRIL	23,066	25,870	450,902	29,179	529,017	18,855	4,304	403	2,697	91	-	364,442	390,792
MAY	17,897	18,867	418,888	20,972	476,623	18,977	5,471	316	3,440	64	-	383,121	411,389
JUNE	24,092	28,098	542,056	29,445	623,690	19,019	5,998	542	5,007	75	-	406,266	436,906
AT Peak Hour	34,551	26,268	575,274	28,651	664,745	19,036	7,977	466	3,634	251		408,284	439,649
MAX PEAK	34,551	34,028	575,274	43,011	664,745	19,103	7,977	638	5,670	666		411,497	440,684
												388,186	

APPENDIX H
USE BY LOSS LEVEL

SOUTHWESTERN PUBLIC SERVICE COMPANY
SCHEDULE: ADJUSTED TEST YEAR DATA BY RATE CLASS

TOTAL SYSTEM

FOR THE YEAR ENDED: JUNE 30, 2013

KWH ENERGY DELIVERED AT THE METER

	Sub-Trans. LGS Standard	Sub-Trans. Standby 739	Total Loss Level 3	Transmission LGS Standard	Transmission QF	Transmission LGS Generation	Total Loss Level 2
JULY 12	108,299,679	6,194	108,305,873	533,344,107	12,431,486	-	545,775,593
AUGUST	109,252,243	3,058	109,255,301	530,703,129	12,488,814	-	543,191,943
SEPTEMBER	106,260,985	86,359	106,347,344	513,542,696	13,674,111	-	527,216,807
OCTOBER	90,951,426	56,741	91,008,167	513,762,856	12,241,172	-	526,004,028
NOVEMBER	80,376,848	122,422	80,499,270	500,692,365	10,290,289	-	510,982,654
DECEMBER	103,513,374	471,711	103,985,085	520,548,816	12,609,167	-	533,157,983
JANUARY 13	106,075,724	271,770	106,347,494	516,496,986	12,694,233	-	529,191,219
FEBRUARY	99,398,346	92,714	99,491,060	467,783,115	11,113,121	-	478,896,236
MARCH	112,031,502	72,335	112,103,837	528,846,781	12,261,343	-	541,108,124
APRIL	112,953,831	927,700	113,881,531	502,151,390	10,510,987	-	512,662,377
MAY	118,588,826	1,975,920	120,564,746	517,266,009	12,139,338	-	529,405,347
JUNE	113,548,301	4,141,163	117,689,464	517,771,635	12,486,639	-	530,258,274
TOTAL YEAR	1,261,251,085	8,228,087	1,269,479,172	6,162,909,885	144,940,700	-	6,307,850,585

SOUTHWESTERN PUBLIC SERVICE COMPANY
SCHEDULE: ADJUSTED TEST YEAR DATA BY RATE CLASS

TOTAL SYSTEM

ADJUSTED CLASS COINCIDENT PEAK DEMAND
FOR THE YEAR ENDED: JUNE 30, 2013

ADJUSTED COINCIDENT PEAK DEMAND AT THE METER USING EXISTING LOSS FACTORS

	Sub-Trans. LGS Standard	Sub-Trans. Generation QF	Total Loss Level 3	Transmission LGS Standard	Transmission Standby QF	Transmission LGS Generation	Total Loss Level 2
JULY 12	147,719	-	147,719	770,932	1,345	-	772,276
AUGUST	149,991	-	149,991	759,873	1,434	-	761,307
SEPTEMBER	152,742	-	152,742	764,342	756	-	765,099
OCTOBER	116,673	448	117,121	707,307	-	-	707,307
NOVEMBER	136,693	97	136,790	721,868	232	-	722,100
DECEMBER	141,892	6,987	148,878	737,781	-	-	737,781
JANUARY 13	143,849	-	143,849	740,454	3,262	-	743,715
FEBRUARY	154,114	1,464	155,577	733,113	1,968	-	735,081
MARCH	149,467	-	149,467	710,531	-	-	710,531
APRIL	157,798	2,395	160,193	765,554	25	-	765,579
MAY	159,005	7,247	166,253	775,045	671	-	775,716
JUNE	156,409	6,745	163,154	778,709	31	-	778,740
AT Peak Hour	149,991	-	149,991	759,873	1,434	-	761,307
MAX PEAK	159,006	7,247	166,253	778,709	3,262	-	778,740

APPENDIX H
USE BY LOSS LEVEL

SOUTHWESTERN PUBLIC SERVICE COMPANY
SCHEDULE: ADJUSTED TEST YEAR DATA BY RATE CLASS

TOTAL SYSTEM

FOR THE YEAR ENDED: JUNE 30, 2013

KWH ENERGY DELIVERED AT THE METER

	Wholesale Full Requirements LL 4	Wholesale Partial Requirement LL 4	Total LL4	Wholesale Full Requirements LL 3	Wholesale Partial Requirement LL 3	Total Wholesale LL 3	Wholesale Partial Requiremen LL 2	Wholesale Full Requirements LL2	Total Wholesale LL2	@ Generation Wholesale LL1	Total Wholesale
JULY 12	10,399,516	32,046,852	42,446,368	147,612,093	493,323,244	640,935,337	499,133,104	243,307,534	742,440,639	73,253,001	1,499,075,346
AUGUST	9,543,371	31,698,119	41,241,490	146,199,056	489,707,281	635,906,337	493,916,743	229,108,767	723,025,509	85,058,606	1,485,231,942
SEPTEMBER	7,704,076	27,691,380	35,395,456	119,338,142	232,148,136	351,486,278	430,660,165	137,249,930	567,910,095	45,201,285	999,993,114
OCTOBER	7,213,640	27,368,846	34,582,486	107,135,924	161,800,418	268,936,342	399,083,464	94,542,692	493,626,155	28,276,131	825,421,115
NOVEMBER	6,737,697	25,640,169	32,377,867	106,149,917	177,985,143	284,135,060	413,742,251	115,837,994	529,580,245	4,217,011	850,310,182
DECEMBER	6,614,529	26,309,891	32,924,420	114,968,724	156,782,128	271,750,852	427,619,026	112,361,323	539,980,349	24,881,821	869,537,443
JANUARY 13	6,541,034	26,804,814	33,345,849	117,766,868	134,903,347	252,670,215	415,067,742	109,091,250	524,158,992	43,253,231	853,428,286
FEBRUARY	5,581,720	24,497,799	30,079,519	103,488,698	132,840,186	236,328,884	376,835,089	98,727,406	475,562,495	33,439,620	775,410,517
MARCH	5,730,585	28,417,543	34,148,128	114,767,287	211,311,706	326,078,993	383,036,291	124,049,741	507,086,032	66,671,563	933,984,717
APRIL	5,697,811	29,141,749	34,839,560	115,814,858	339,362,321	455,177,179	382,371,508	160,543,532	542,915,040	73,171,582	1,106,103,361
MAY	6,186,787	33,117,253	39,304,040	122,026,525	347,471,630	469,498,155	397,057,286	175,608,164	572,665,449	75,552,887	1,157,020,531
JUNE	7,178,141	32,088,123	39,266,264	132,834,196	312,194,053	445,028,249	426,370,092	179,115,096	605,485,188	75,990,897	1,165,770,598
TOTAL YEAR	147,312,062	344,822,539	492,134,601	1,448,102,288	3,189,829,594	4,637,931,882	5,044,892,759	1,779,543,428	6,824,436,188	628,967,634	12,521,287,152

SOUTHWESTERN PUBLIC SERVICE COMPANY
SCHEDULE: ADJUSTED TEST YEAR DATA BY RATE CLASS

TOTAL SYSTEM

ADJUSTED CLASS COINCIDENT PEAK DEMAND
FOR THE YEAR ENDED: JUNE 30, 2013

ADJUSTED COINCIDENT PEAK DEMAND AT THE METER USING EXISTING LOSS FACTORS

	Wholesale Full Requirements LL 4	Wholesale Partial Requirement LL 4	Total LL4	Wholesale Partial Requirement LL 3	Wholesale Full Requirements LL 3	Total Wholesale LL 3	Wholesale Partial Requiremen LL 2	Wholesale Full Requirements LL2	Total Wholesale LL2	@ Generation Wholesale LL1	Total Wholesale
JULY 12	32,017	46,573	78,591	254,330	781,336	1,035,666	828,827	392,598	1,221,425	182,777	2,518,458
AUGUST	30,306	47,036	77,342	257,020	794,166	1,051,185	898,513	409,168	1,307,682	157,316	2,593,525
SEPTEMBER	26,262	49,422	75,685	240,722	582,386	823,108	826,367	326,461	1,152,828	174,414	2,226,034
OCTOBER	20,478	40,173	60,651	174,172	291,809	465,980	656,577	187,338	843,915	69,255	1,439,802
NOVEMBER	20,040	36,115	56,155	171,105	253,262	424,367	669,010	189,733	858,743	45	1,339,310
DECEMBER	19,419	37,236	56,655	177,920	210,776	388,696	646,764	180,898	827,662	48,417	1,321,429
JANUARY 13	19,429	38,452	57,881	185,060	197,505	382,565	671,451	187,990	859,441	69,748	1,369,635
FEBRUARY	17,068	37,730	54,798	173,772	205,464	379,236	661,957	178,094	840,051	48,110	1,322,195
MARCH	19,313	38,106	57,419	172,306	276,505	448,811	581,825	179,072	760,897	114,559	1,381,686
APRIL	20,303	45,123	65,426	194,075	542,397	736,472	688,928	290,965	979,893	113,251	1,895,043
MAY	21,237	50,096	71,333	222,585	556,235	778,820	783,906	335,481	1,119,387	112,036	2,081,576
JUNE	28,329	45,823	74,152	251,286	622,442	873,727	891,234	371,592	1,262,826	109,557	2,320,262
AT Peak Hour	30,306	47,036	77,342	257,020	794,166	1,051,185	898,513	409,168	1,307,682	157,316	2,593,525
MAX PEAK	32,017	50,096	78,591	257,020	794,166	1,051,186	898,514	409,168	1,307,682	182,777	2,593,525

Appendix I
Distribution Substation Transformer Loss

Line No.	1	Voltage High Side, kV 2	Voltage Low Side, kV 3	Ratings Nominal MVA 4	Max MVA 5	No Load Losses WATTS 6	Full Load Losses WATTS 7	Low Side Class 8	Verify Flag R,L,E 9	Exclude Flag 10	Primary Load Factor 11	No Load Losses MWH 12	Full Load Losses MWH 13	Number of Feeder Circuits 14	Percent Transf. Excluded 15
											0.577497				
1	34TH STREET	115	13.2	22.4	37.3	19,005	64,617	13.2	R,L	I	0.57750	166.48	326.89	4	
2	ADAIR	68.8	13.09	10	14	12,573	25,896	12.5	R,E	I	0.57750	110.14	131.00	1	
3	AIKEN RURAL	67	12.5	2.5	2.5	4,608	13,940	12.5	R,E	I	0.57750	40.37	70.52	1	
4	ALLMON	67	12.5	7.5	9.38	10,895	43,006	12.5	R,L	I	0.57750	95.44	217.56	1	
5	ALLRED	115	12.5	12	20	19,630	57,040	12.5	R,L	E	0.57750	0.00	106.77	2	63
6	AM-FRAC	115	2.4	5.6	7	5,677	24,595	2.4	R,L	I	0.57750	49.73	124.42	0	
7	AMHERST	67	2.4	3.75	4.687	7,840	28,640	2.4	R,L	I	0.57750	68.68	144.89	2	
8	ARROWHEAD	115	13.2	15	25	12,450	55,570	13.2	R,L	I	0.57750	109.06	281.12	2	
9	ARTESIA COUNTRY CLUB	67	12.5	7.5	9.38	12,000	40,000	12.5	R,E	I	0.57750	105.12	202.36	2	
10	ARTESIA S RURAL	69	13.2	11.2	14	8,663	46,721	13.2	R,L	I	0.57750	75.89	236.36	2	
11	ARTESIA TOWN	66	4.16	5	5	10,526	32,485	4.16	R,E	I	0.57750	92.21	164.34	3	
12	ARTESIA WEST 13th St.	67	4.16	7.5	11.26	9,800	55,797	4.16	R,L	I	0.57750	85.85	282.27	2	
13	BAILEY PUMP	67	12.5	5	5.6	11,000	35,000	12.5	R,E	I	0.57750	96.36	177.06	1	
14	BAINER	66	4.16	5	5	10,526	32,485	4.16	R,E	I	0.57750	92.21	164.34	1	
15	BARWISE	68.8	13.09	3.75	4.2	7,760	27,560	12.5	R,L	I	0.57750	67.98	139.42	2	
16	BENNETT	115	13.2	16.8	28	11,770	55,780	12.5	R,L	I	0.57750	103.11	282.18	3	
17	BOARDMAN	69	13.2	12	20	9,410	45,960	12.5	R,L	E	0.57750	0.00	190.65	2	18
18	BOOKER 35 KV	66	34.5	6	8.4	4,693	23,320	33	R,E	I	0.57750	41.11	117.97	1	
19	BOOKER 4.16 KV	69	4.2	3.75	3.75	7,900	24,500	4.16	R,E	I	0.57750	69.20	123.94	3	
20	BOWERS	67	13.8	7.5	10	19,800	56,515	13.2	R,L	I	0.57750	173.45	285.90	3	
21	BRASHER	115	13.2	15	25	13,500	57,700	13.2	R,L	I	0.57750	118.26	291.90	3	
22	BRISCOE	66	22	3	3.92	5,697	15,131	22	R,E	I	0.57750	49.91	76.54	2	
23	BROWNFIELD SWITCH STATION	67	22.9	5	5	13,410	31,360	22	R,L	I	0.57750	117.47	158.65	1	
24	BUCKEYE	115	12.5	10	12.5	15,780	55,475	12.5	R,L	I	0.57750	138.23	280.64	3	
25	BUFFALO	69	13.2	5	6.25	4,595	22,296	13.2	R,L	I	0.57750	40.25	112.79	2	
26	BURNETT	69	13.2	11.2	14	8,110	45,840	13.2	R,L	I	0.57750	71.04	231.90	2	
27	BUSH	115	13.8	15	25	24,880	60,701	13.2	R,L	I	0.57750	217.95	307.08	3	
28	BYRD	115	4.2	13.5	22.4	10,602	52,896	4.16	R, L	I	0.57750	92.87	267.59	0	
29	CAMEX	67	2.4	5	7	13,000	30,000	2.4	R,L	I	0.57750	113.88	151.77	0	
30	CAMPBELL STREET	115	12.5	15	25	18,192	65,727	12.5	R,L	I	0.57750	159.36	332.50	2	
31	CANADIAN	67	2.4	10	10	15,350	55,490	2.4	R,L	I	0.57750	134.47	280.72	4	
32	CANYON EAST	115	13.2	15	25	12,700	58,300	13.2	R,L	I	0.57750	111.25	294.93	2	
33	CANYON WEST	115	13.2	15	25	13,340	50,960	13.2	R,L	I	0.57750	116.86	257.80	3	
34	CAPITAN	69	13.2	15	25	10,610	57,270	13.2	R,L	I	0.57750	92.94	289.72	3	
35	CARLSBAD WATER	67	12.5	3.75	3.75	6,912	20,909	12.5	R,E	I	0.57750	60.55	105.78	2	
36	CARSON CO	115	13.8	10	12.5	16,667	56,431	13.2	R,L	I	0.57750	146.00	285.48	2	
37	CEDAR LAKE EAST	66	12.5	2	2	4,000	25,000	12.5	R,E	I	0.57750	35.04	126.47	1	
38	CENTRE ST	67	13.8	12	22.4	20,560	43,351	13.2	R,E	I	0.57750	180.11	219.31	2	
39	CHALA	115	13.8	25	25	49,050	90,080	13.2	R,E	I	0.57750	429.68	455.70	1	
40	CHANNING	115	34.5	16.8	28	12,537	53,269	33	R,L	I	0.57750	109.82	269.48	3	
41	CHERRY	115	13.2	15	25	18,449	67,706	13.2	R,L	I	0.57750	161.61	342.52	2	
42	CLIFFSIDE	68.8	4.36	7.5	10.5	12,678	44,698	4.16	R,L	I	0.57750	111.06	226.12	0	
43	COBLE	67	12.5	10	11	16,500	55,000	12.5	R,E	E	0.57750	0.00	158.60	2	43
44	CONWAY	115	13.8	12	20	21,840	48,390	13.2	R,L	I	0.57750	191.32	244.80	2	
45	COOPER RANCH	115	13.2	12	22.4	17,615	56,447	12.5	R,E	I	0.57750	154.31	285.56	2	
46	CORTEZ	115	4.2	5	6.25	10,530	27,280	4.16	R,L	I	0.57750	92.24	138.01	0	
47	COTTONWOOD #1	66	12.5	1.5	1.88	3,158	9,745	12.5	R,E	I	0.57750	27.66	49.30	2	
48	COULTER	115	13.8	15	25	25,000	75,000	13.2	R,L	I	0.57750	219.00	379.42	3	
49	COUNTY LINE	69	12.47	18.75	25	36,600	89,810	12.5	R,L	E	0.57750	0.00	113.58	1	75
50	CRMWA #1	115	4.16	7.5	9.37	20,493	50,307	4.16	R,L	I	0.57750	179.52	254.50	0	
51	CRMWA #2	115	4.16	5	6.25	16,255	36,145	4.16	R,L	I	0.57750	142.39	182.85	0	
52	CRMWA #3	115	4.16	5	6.25	14,481	35,758	4.16	R,L	I	0.57750	126.85	180.90	0	
53	CRMWA #4	115	4.16	5	6.25	15,785	35,824	4.16	R,L	I	0.57750	138.28	181.23	0	
54	CRMWA 21 (Adobe Creek) 4	67	4.2	7.5	8.4	10,000	32,000	4.16	R,E	I	0.57750	87.60	161.88	0	
55	CRMWA 21 (Adobe Creek) 13	67	13.2	10	14	23,000	80,000	13.2	R,E	I	0.57750	201.48	404.71	1	
56	CRMWA 22	69	4.2	3.75	4.687	7,900	24,500	4.16	R,E	I	0.57750	69.20	123.94	0	
57	CRMWA 23	67	13.8	15	28	24,060	66,861	13.2	R,L	I	0.57750	210.77	338.24	0	
58	CROUSE HINDS	115	13.8	12	20	19,600	63,100	13.2	R,L	I	0.57750	171.70	319.22	0	
59	CURRY CO	67	24	12	20	18,465	52,230	22	R,L	I	0.57750	161.75	264.23	4	
60	DALHART 2.4 KV	67	2.4	3.75	4.68	11,960	38,450	2.4	R,E	I	0.57750	104.77	194.51	4	
61	DALHART 12.5 KV	67	12.5	12	22.4	15,855	50,503	12.5	R,L	I	0.57750	138.89	255.49	2	
62	DALHART 35 KV	67	34.5	7.5	7.5	17,590	42,475	33	R,L	I	0.57750	154.09	214.88	2	
63	DAMRON	69	13.2	7.5	10	17,250	55,850	13.2	R,L	I	0.57750	151.11	282.54	1	
64	DAWN	115	13.2	7.5	9.375	7,870	23,170	13.2	R,L	I	0.57750	68.94	117.21	2	
65	DEXTER 34.5 KV	69	34.5	5.6	7	7,047	32,076	33	R,L	I	0.57750	61.73	162.27	1	
66	DEXTER 4.16 KV	66	4.2	3.75	3.75	7,894	24,364	4.16	R,E	I	0.57750	69.16	123.25	2	
67	DIEKEMPER	66	4.2	1.5	1.5	2,105	6,497	4.16	R,E	I	0.57750	18.44	32.87	1	
68	DIMMITT E	67	13.8	15	25	21,980	69,170	12.5	R,L	I	0.57750	192.54	349.92	2	
69	DIMMITT S	67	12.5	10	12.5	9,216	27,879	12.5	R,E	I	0.57750	80.74	141.04	2	
70	DOLLARHIDE	115	13.2	12	22.4	11,100	46,800	12.5	R,E	I	0.57750	97.24	236.76	3	
71	DOSS 13.2 KV	69	13.2	16.8	28	9,851	71,031	12.5	R,L	I	0.57750	86.29	359.34	3	
72	DOSS 22 KV	67	24.9	12	20	18,330	62,470	22	R,L	I	0.57750	160.57	316.03	2	
73	DRINKARD	115	13.2	12	22.4	11,190	38,840	13.2	R,L	I	0.57750	98.02	196.49	3	
74	DUMAS 19TH 35 KV	115	34.5	12	20	20,700	51,675	33	R,L	I	0.57750	181.33	261.42	2	
75	DUMAS 19TH 12.5 KV	115	12.5	12	20	19,400	63,400	12.5	R,L	I	0.57750	169.94	320.73	3	
76	DUVAL #3	67	4.2	5	7	10,526	32,485	4.16	R,L	I	0.57750	92.21	164.34	1	
77	EAST CLOVIS	118	13.2	16.8	28	8,768	67,351	12.5	R,L	I	0.57750	76.81	340.72	3	
78	EAST DENVER CITY	67	12.5	10	12.5	16,500	55,000	12.5	R,E	I	0.57750	144.54	278.24	3	
79	EAST LEVELLAND	69	13.2	12	22.4	9,400	42,300	12.5	R,E	I	0.57750	82.34	213.99	2	
80	EAST PLAINVIEW	68.8	13.09	15	16.8	19,370	71,767	12.5	R,L	I	0.57750	169.68	363.06	3	
81	EAST SANGER	115	12.5	12	20	19,859	64,143	12.5	R,L	I	0.57750	173.96	324.49	2	
82	EAST PLANT	115	13.2	15	28	11,415	59,261	13.2	R,L	I	0.57750	100.00	299.79	4	
83	ELWOOD	67	12.5	10	12.5	16,500	55,000	12.5	R,E	I	0.57750	144.54	278.24	1	
84	ESTACADO #1	115	13.2	15	28	11,680	52,670	13.2	R,L	I	0.57750	102.32	266.45	3	
85	ESTACADO #2	115	13.2	15	28	15,000	55,700	13.2	R,L	I	0.57750	131.40	281.78	3	
86	ETTER RURAL E.	115	34.5	12	20	23,520	49,700	33	R,L	E	0.57750	0.00	168.46	2	33
87	ETTER RURAL W	115	34.5	15	25	15,250	64,030	33	R,L	E	0.57750	0.00	217.03	0	33
88	EUNICE	115	13.2	15	25	11,750	52,460	12.5	R,L	I	0.57750	102.93	265.39	4	
89	EXELL	115	12.5	10	12.5	29,500	65,000	12.5	R,E	I	0.57750	258.42	328.83	2	
90	FAIN	115	12.5	7.5	9.375	11,480	45,380	12.5	R,L	I	0.57750	100.56	229.57	1	
91	FARMERS	115	13.2	15	25	18,239	65,335	13.2	R,L	I	0.57750	159.77	330.52	3	
92	FARWELL	67	2.4	2.5	2.5	6,334	19,792	2.4	R,E	I	0.57750	55.48	100.12	2	
93	FIESTA	115	13.2	15	28	15,523	65,978	12.5	R,L	I	0.57750	135.98	333.77	3	
94	FLANNAGAN	69	13.2	11.2	14	10,800	37,984	12.5	R,L	E	0.57750	0.00	103.76	1	46
95	FRIONA RURAL	115	22.9	12	20	21,350	49,200	22	R,L	I	0.57750	187.03	248.90	2	
96	FRITCH	115	13.2	7.5	9.38	13,825	41,819	13.2	R,E	I	0.57750	121.10	211.56	2	
97	GARZA N	72	25	11.2	14	6,497	45,517	22	R,L	I	0.57750	56.91	230.26	1	

Appendix I
Distribution Substation Transformer Loss

Line No.	1	Voltage High Side, kV 2	Voltage Low Side, kV 3	Ratings Nominal MVA 4	Max MVA 5	No Load Losses WATTS 6	Full Load Losses WATTS 7	Low Side Class 8	Verify Flag R,L,E 9	Exclude Flag 10	Primary Load Factor 11	No Load Losses MWH 12	Full Load Losses MWH 13	Number of Feeder Circuits 14	Percent Transf. Excluded 15
98	GARZA S	72	25	11.2	14	9,304	47,534	22	R,L	I	0.57750	81.50	240.47	1	
99	GOODPASTURE	69	12.5	2	2	6,300	18,000	12.5	R,E	I	0.57750	55.19	91.06	1	
100	HALE CENTER	67	12.5	5	5	10,000	35,000	12.5	R,E	I	0.57750	87.60	177.06	2	
101	HAPPY CITY	66	12.5	6	7	11,100	36,880	12.5	R,L	I	0.57750	97.24	186.57	2	
102	HART INDUSTRIAL	67	12.5	5	6.25	12,425	31,575	12.5	R,L	I	0.57750	108.84	159.73	2	
103	HASTINGS	67	13.2	15	25	27,190	77,050	13.2	R,L	I	0.57750	238.18	389.79	4	
104	HENDRICKS	66	22	10	13.33	16,500	50,000	22	R,L	I	0.57750	144.54	252.94	3	
105	HEREFORD	67	13.8	12	20	20,000	45,000	13.2	R,E	I	0.57750	175.20	227.65	2	
106	HERRING	115	34.5	12	20	25,140	51,450	33	R,L	I	0.57750	220.23	260.28	2	
107	HIGHLAND PARK	115	13.8	25	41.6	30,680	101,010	13.2	R,E	E	0.57750	0.00	260.61	2	49
108	HILLSIDE	118	13.2	16.8	28	8,807	67,624	13.2	R,L	I	0.57750	77.15	342.10	3	
109	HOBGOOD	69	4.2	0.23	0.23	1,096	3,150	4.16	R,E	I	0.57750	9.60	15.94	1	
110	HOPI	69	13.2	16.8	28	9,927	70,540	12.5	R,L	I	0.57750	86.96	356.85	3	
111	HOWARD	118	13.2	11.2	14	7,531	41,570	13.2	R,L	I	0.57750	65.97	210.30	2	
112	IMC #3 Strata	69	12.5	5	6.25	12,000	48,000	12.5	R,L	I	0.57750	105.12	242.83	1	
113	IMC #4	69	13.2	5	5	7,789	20,101	13.2	R,L	I	0.57750	68.23	101.69	0	
114	INDUSTRIAL	67	13.8	12	20	19,700	57,300	13.2	R,L	I	0.57750	172.57	289.87	3	
115	IRICK	66	12.5	6	7.26	11,450	36,845	12.5	R,L	I	0.57750	100.30	186.39	2	
116	JAL	115	13.8	12	20	18,800	63,000	12.5	R,L	I	0.57750	164.69	318.71	3	
117	JAYBEE	69	12.5	2.5	3.125	4,608	13,940	12.5	R,E	I	0.57750	40.37	70.52	1	
118	KINGSMILL	69	13.2	16.8	28	16,300	67,300	13.2	R,L	I	0.57750	142.79	340.46	5	
119	KINNEY	69	2.4	1	1.5	3,800	11,875	2.4	R,E	I	0.57750	33.29	60.07	0	
120	KITE	67	13.2	12	20	17,800	55,630	13.2	R,L	I	0.57750	155.93	281.43	3	
121	KRESS RURAL	69	12.5	6	6	10,515	10,922	12.5	R,L	I	0.57750	92.11	55.25	3	
122	LARIAT	67	12.5	7.5	9.375	10,895	43,006	12.5	R,E	I	0.57750	95.44	217.56	1	
123	LAKE MEREDITH	118	13.2	11.2	14	8,004	40,923	13.2	R,L	I	0.57750	70.12	207.02	3	
124	LAWRENCE PK E #1	67	13.8	15	25	23,899	60,360	13.2	R,L	I	0.57750	209.36	305.35	3	
125	LAWRENCE PK W #2	67	13.8	15	25	24,200	71,126	13.2	R,L	I	0.57750	211.99	359.82	3	
126	LEA NATIONAL	115	13.2	11.2	14	7,806	43,297	13.2	R,L	I	0.57750	68.38	219.03	2	
127	LEA ROAD	115	12.5	10	12.5	17,615	56,447	12.5	R,L	E	0.57750	0.00	91.38	2	68
128	LEHMAN	115	12.5	12	20	19,400	63,000	12.5	R,L	I	0.57750	169.94	318.71	2	
129	LEVELLAND CITY	69	13.2	12	22.4	9,800	49,600	12.5	R,L	I	0.57750	85.85	250.92	2	
130	LEVELLAND (EAST XFMR)	66	2.4	1.5	1.5	3,800	11,875	2.4	R,E	I	0.57750	33.29	60.07	2	
131	LITTLEFIELD CITY	67	4.2	5	6.25	10,000	30,000	4.16	R,E	I	0.57750	87.60	151.77	4	
132	LITTLEFIELD SOUTH	67	12.5	7.5	9.375	10,000	35,000	12.5	R,E	I	0.57750	87.60	177.06	2	
133	LIVINGSTON RIDGE	69	13.2	11.2	14	6,396	44,866	12.5	R,L	I	0.57750	56.03	226.97	3	
134	LOCKNEY RURAL	69	12.5	2.5	2.5	4,608	13,940	12.5	R,E	I	0.57750	40.37	70.52	2	
135	LOCKNEY RURAL 23	69	22.86	10	10	12,004	35,123	22	R,L	I	0.57750	105.16	177.68	2	
136	LYNN	69	22.9	10	10	12,233	37,682	22	R,L	I	0.57750	107.16	190.63	3	
137	LYONS	67	13.8	12	20	21,550	52,560	13.2	R,L	I	0.57750	188.78	265.89	2	
138	MALJAMAR	115	12.5	10	12.5	17,450	58,016	12.5	R,L	E	0.57750	0.00	58.70	0	80
139	MALJAMAR #2	115	4.2	7	12.4	6,316	29,319	4.16	R,L	I	0.57750	55.33	148.32	0	
140	MALLET	67	13.8	5	5	10,641	39,077	12.5	R,L	I	0.57750	93.22	197.69	2	
141	MANHATTAN	115	13.8	15	25	24,640	63,513	13.2	R,L	I	0.57750	215.85	321.30	3	
142	MARKET STREET	66	12.5	10	10	23,320	58,600	12.5	R,L	I	0.57750	204.28	296.45	1	
143	McCLELLAN (GROOM PUMP STAT	115	13.2	5	5	9,216	27,879	13.2	R,E	I	0.57750	80.74	141.04	1	
144	MCCULLOGH	67	13.2	15	25	23,044	65,351	13.2	R,L	I	0.57750	201.87	330.60	3	
145	MCLEAN RURAL	115	13.2	7.5	9.375	17,700	58,000	13.2	R,L	E	0.57750	0.00	126.17	2	57
146	MID-AM #2	67	2.4	3.75	3.75	8,800	23,950	2.4	R,L	I	0.57750	77.09	121.16	0	
147	MID AM #3 -in Swisher area	67	2.4	5	5.6	14,150	42,000	2.4	R,E	I	0.57750	123.95	212.47	0	
148	MIDDLETON	67	12.5	10	12.5	14,400	54,818	12.5	R,L	I	0.57750	126.14	277.32	2	
149	MILLEN	115	12.5	12	20	19,889	63,525	12.5	R,L	I	0.57750	174.23	321.37	3	
150	MISS CHEM #2	67	12.5	3.75	4.69	7,851	27,329	12.5	R,E	I	0.57750	68.77	138.25	0	
151	MONROE	66	22	10	13.3	20,680	47,900	22	R,E	I	0.57750	181.16	242.32	1	
152	MONUMENT	118	13.2	16.8	28	10,781	65,108	12.5	R,L	I	0.57750	94.44	329.37	3	
153	MOORE CO	115	13.2	15	28	12,650	52,720	13.2	R,L	I	0.57750	110.81	266.70	3	
154	MORTON	67	2.4	5	6.25	10,526	32,485	2.4	R,E	I	0.57750	92.21	164.34	2	
155	MOSS	67	24.9	10	10	17,985	47,480	22	R,L	I	0.57750	157.55	240.20	2	
156	MULESHOE CITY	67	2.4	3.75	3.75	9,501	29,687	2.4	R,E	I	0.57750	83.23	150.18	2	
157	MULESHOE EAST	67	2.4	3.75	4.69	9,501	29,687	2.4	R,E	I	0.57750	83.23	150.18	2	
158	MULESHOE VALLEY	69	12	5	6.25	7,440	21,250	12.5	R,E	I	0.57750	65.17	107.50	1	
159	MULESHOE WATERIELD @ Bailey (	66	12.5	1.5	1.5	2,765	8,364	12.5	R,E	I	0.57750	24.22	42.31	1	
160	N CLOVIS	118	13.2	16.8	28	11,544	61,309	13.2	R,L	I	0.57750	101.13	310.15	2	
161	N E HOBBS	115	13.2	15	28	11,232	59,268	12.5	R,L	I	0.57750	98.39	299.83	4	
162	N HOBBS #1	115	12.5	12	20	21,320	41,510	12.5	R,E	I	0.57750	186.76	209.99	3	
163	N HOBBS #2	115	12.5	12	20	20,830	57,290	12.5	R,L	I	0.57750	182.47	289.82	2	
164	N PLAINVIEW	67	12.5	10	10	16,500	55,000	12.5	R,E	I	0.57750	144.54	278.24	2	
165	NAVAJO MALAGA	66	4.16	3	3	6,316	19,491	4.16	R,E	I	0.57750	55.32	98.60	0	
166	NM POTASH	69	13.8	7.5	10.5	16,680	44,960	12.5	R,E	I	0.57750	146.12	227.45	0	
167	NORRIS ST	115	13.2	12	20	13,396	37,753	12.5	R,L	I	0.57750	117.35	190.99	2	
168	NORTH CANAL	115	13.2	15	25	15,291	56,220	12.5	R,L	I	0.57750	133.95	284.41	3	
169	OCHOA	118	13.2	16.8	28	10,000	69,000	12.5	R,L	I	0.57750	87.60	349.06	2	
170	OCOTILLO	118	13.2	16.8	28	9,851	64,252	12.5	R,L	I	0.57750	86.29	325.04	3	
171	OLTON	67	12.5	7.5	7.5	13,825	41,819	12.5	R,E	I	0.57750	121.10	211.56	2	
172	OSAGE	118	13.2	16.8	28	11,789	60,542	12.5	R,L	I	0.57750	103.27	306.27	4	
173	OZARK MAHONING #2	67	2.4	5	5.6	9,501	29,687	2.4	R,L	I	0.57750	83.23	150.18	0	
174	PACIFIC	115	12.5	12	20	19,300	65,500	12.5	R,L	E	0.57750	0.00	212.07	2	36
175	PALO DURO	115	13.2	7.5	10.5	8,520	23,570	13.2	R,L	I	0.57750	74.64	119.24	1	
176	PARMER CO	115	22	7.5	7.5	17,800	40,490	22	R,E	I	0.57750	155.93	204.83	2	
177	PCA #2	67	13.2	16	22.4	13,825	95,121	13.2	R,L	I	0.57750	121.11	481.21	2	
178	PEARL	115	12.5	5	6.25	9,216	27,879	12.5	R,E	I	0.57750	80.74	141.04	2	
179	PERIMETER	118	13.2	16.8	28	10,330	65,333	13.2	R,L	I	0.57750	90.49	330.51	0	
180	PERRYTON N	115	12.5	7.5	11.72	9,800	36,700	12.5	R,L	I	0.57750	85.85	185.66	2	
181	PERRYTON S	115	12.5	7.5	10.5	15,500	58,000	12.5	R,L	I	0.57750	135.78	293.41	2	
182	PHILLIP PUMP	69	2.4	2.5	2.8	5,109	21,081	2.4	R,L	I	0.57750	44.75	106.65	0	
183	PHILLIPS PUMP 2	69	2.4	2.5	2.8	4,837	21,307	2.4	R,L	I	0.57750	42.37	107.79	0	
184	PIERCE	115	13.8	15	25	23,053	68,991	13.2	R,L	I	0.57750	201.94	349.02	3	
185	PLAINVIEW CITY E Transformer	65	2.4	7.5	7.5	9,501	29,687	2.4	R,E	I	0.57750	83.23	150.18	3	
186	PLAINVIEW CITY W Transformer	66	2.4	3.75	3.75	9,501	29,687	2.4	R,E	I	0.57750	83.23	150.18	3	
187	PLANT X RURAL	115	12.5	5	5	11,720	28,660	12.5	R,L	I	0.57750	102.67	144.99	2	
188	PORTALES #1	67	4.2	7.5	9.375	12,000	48,000	4.16	R,E	I	0.57750	105.12	242.83	3	
189	PORTALES #2 A	67	12.47	10	14	6,316	19,491	4.16	R,L	I	0.57750	55.32	98.60	1	
190	PORTALES #2 B	67	4.2	5	5	8,777	40,107	4.16	R,L	I	0.57750	76.89	202.90	2	
191	PORTALES SOUTH	67	4.16	7.5	9.375	12,000	44,565	4.16	R,L	I	0.57750	105.12	225.45	2	
192	PORTALES WATER FIELD	115	12.5	10	14	11,700	33,600	13.2	R,L	I	0.57750	102.49	169.98	2	
193	POST CITY	67	4.2	5	5	10,304	34,922	4.16	R,L	I	0.57750	90.26	176.67	2	
194	POTASH JUNCTION	67	12.5	10	12.5	14,470	58,190	12.5	R,L	I	0.57750	126.76	294.38	1	
195	PRENTICE W	115	13.2	15	28	12,281	52,074	13.2	R, L	E	0.57750	0.00	18.44	1	93

Appendix I
Distribution Substation Transformer Loss

Line No.	1	Voltage High Side, kV 2	Voltage Low Side, kV 3	Ratings Nominal MVA 4	Max MVA 5	No Load Losses WATTS 6	Full Load Losses WATTS 7	Low Side Class 8	Verify Flag R,L,E 9	Exclude Flag 10	Primary Load Factor 11	No Load Losses MWH 12	Full Load Losses MWH 13	Number of Feeder Circuits 14	Percent Transf. Excluded 15
196	PRICE	67	13.2	15	25	26,720	80,450	12.5	R, L	I	0.57750	234.07	406.99	3	
197	PUCKETT WEST	115	13.2	15	25	15,460	58,647	13.2	R,L	I	0.57750	135.43	296.69	3	
198	PULLMAN	115	13.2	15	25	11,990	52,620	13.2	R, L	I	0.57750	105.03	266.20	3	
199	RIAC EAST	67	4.2	5	5.25	10,526	32,485	4.16	R,L	I	0.57750	92.21	164.34	3	
200	RIAC WEST	69	4.2	7.5	9.375	11,800	44,605	4.16	R,L	I	0.57750	103.37	225.65	2	
201	RILEY	67	12.5	3.75	5	6,912	20,909	12.5	R,E	I	0.57750	60.55	105.78	2	
202	RIVERVIEW	115	13.2	15	25	16,074	56,237	13.2	R,L	I	0.57750	140.81	284.50	3	
203	ROBERTS CO	67	4.16	5	6.25	6,851	19,040	13.2	R,E	I	0.57750	60.01	96.32	2	
204	ROSWELL CITY N	115	12.5	15	25	17,636	65,206	12.5	R,E	I	0.57750	154.49	329.87	2	
205	ROSWELL CITY S	115	12.5	15	25	17,600	65,000	12.5	R,E	I	0.57750	154.18	328.83	2	
206	ROXANA	69	13.8	10	14	10,742	23,613	13.2	R,E	I	0.57750	94.10	119.46	2	
207	RUSSELL SUB E TRANSFORMER	115	12.5	12	20	20,200	63,100	12.5	R,L	E	0.57750	0.00	114.92	0	64
208	RUSSELL SUB W TRANSFORMER	115	13.2	15	28	12,369	51,686	13.2	R,L	E	0.57750	0.00	94.13	2	64
209	S FLOYDADA	66	22	5	5	10,100	32,392	22	R,L	I	0.57750	88.48	163.87	2	
210	S HOBBS E	115	13.2	12	20	14,677	40,275	12.5	R,L	I	0.57750	128.57	203.75	2	
211	S HOBBS W	115	12.5	12	20	18,500	57,000	12.5	R,L	E	0.57750	0.00	63.44	2	78
212	S LOVING	69	13.2	11.2	17.5	7,835	43,091	13.2	R,L	I	0.57750	68.63	217.99	2	
213	S PLAINVIEW	67	12.5	10	14	16,500	55,000	12.5	R,E	I	0.57750	144.54	278.24	3	
214	SAMSON	115	13.2	12	20	18,820	46,500	12.5	R,L	I	0.57750	164.86	235.24	2	
215	SAND DUNES	67	12.5	7.5	8.4	9,500	30,000	12.5	R,E	I	0.57750	83.22	151.77	3	
216	SEMINOLE INTG	115	22.86	16.8	28	12,592	58,368	22	R,L	I	0.57750	110.31	295.28	3	
217	SHAMROCK PUMP	66	2.4	1	1	2,534	7,917	2.4	R,E	I	0.57750	22.19	40.05	0	
218	SHELL C3	115	4.16	10	14	12,852	31,876	4.16	R,L	E	0.57750	0.00	114.49	0	29
219	SHERMAN CO	115	34.5	12	12	27,100	53,900	33	R,L	I	0.57750	237.40	272.67	3	
220	SLATON	69	22.9	10	10	13,067	35,044	22	R,L	I	0.57750	114.47	177.28	2	
221	SLATON CITY	67	4.2	3.75	3.75	7,894	24,364	4.16	R,E	I	0.57750	69.16	123.25	2	
222	SLAUGHTER	67	2.4	3.75	4.2	6,960	22,330	2.4	R,L	I	0.57750	60.97	112.96	1	
223	SMITH	67	4.2	3.75	3.75	7,894	24,364	4.16	R,E	I	0.57750	69.16	123.25	2	
224	SONCY	67	13.8	20	20	24,981	94,630	13.2	R,L	I	0.57750	218.83	478.72	4	
225	SOUTHEAST	115	13.2	15	25	18,480	50,440	13.2	R,L	I	0.57750	161.88	255.17	2	
226	SOUTH GEORGIA EAST	115	13.8	15	25	21,120	56,040	13.2	R,L	I	0.57750	185.01	283.50	3	
227	SOUTH GEORGIA WEST	115	13.8	15	25	22,320	54,660	13.2	R,L	I	0.57750	195.52	276.52	3	
228	SOUTHLAND	69	2.4	1.5	1.5	3,158	9,745	2.4	R,E	I	0.57750	27.66	49.30	1	
229	SOUTH LOVING	69	13.2	11.2	17.5	7,835	43,091	13.2	R,L	I	0.57750	68.63	217.99	3	
230	SPEARMAN SUB EAST XFMR	115	4.16	7.5	10.5	12,416	40,872	4.16	R,L	I	0.57750	108.76	206.77	2	
231	SPEARMAN SUB WEST XFMR	115	4.16	7.5	10.5	13,440	41,855	4.16	R,L	I	0.57750	117.73	211.74	2	
232	SPEARMAN INTERCHANGE	67	34.4	10	10	14,320	61,030	33	R,L	I	0.57750	125.44	308.74	1	
233	SPRINGCREEK	67	13.2	7.5	9.375	15,760	41,150	13.2	R,E	I	0.57750	138.06	208.17	2	
234	SPRING DRAW	118	13.2	16.8	28	11,713	67,783	13.2	R,L	I	0.57750	102.61	342.91	3	
235	SPRINGLAKE	67	13.2	7.5	7.5	11,060	52,193	13.2	R,L	I	0.57750	96.89	264.04	2	
236	SUDAN RURAL	66	12.5	2.5	2.5	4,608	13,940	12.5	R,E	I	0.57750	40.37	70.52	2	
237	SUNSET	115	13.2	15	28	15,300	46,900	13.2	R,L	I	0.57750	134.03	237.26	3	
238	TEAGUE	115	12.5	10	14	13,610	30,300	12.5	R,E	I	0.57750	119.22	153.28	2	
239	TENNECO	69	13.2	15	25	11,170	57,590	13.2	R,L	I	0.57750	97.85	291.34	1	
240	TEXACO	67	12.5	12	20	20,146	52,610	12.5	R,L	E	0.57750	0.00	31.94	2	88
241	TEXAS FARMS	115	13.2	7.5	9.375	7,670	23,270	13.2	R,L	I	0.57750	67.19	117.72	1	
242	TMC	67	4.2	10	12.5	15,600	54,420	4.16	R,L	I	0.57750	136.66	275.30	0	
243	TOKIO	67	12.5	5	6.25	9,216	27,879	12.5	R,E	I	0.57750	80.74	141.04	1	
244	TRANSPETCO	67	4.2	7.5	7.5	11,657	37,611	4.16	R,L	I	0.57750	102.12	190.27	2	
245	TUCO	67	12.5	10	13.3	16,050	58,110	12.5	R,L	I	0.57750	140.60	293.97	2	
246	UNITED SALT	69	12.4	0.75	0.75	1,382	4,182	12.5	R,E	I	0.57750	12.11	21.16	1	
247	URTON	115	12.5	12	12	21,940	63,559	12.5	R,L	I	0.57750	192.19	321.54	2	
248	VAN BUREN #1	67	13.2	15	25	29,725	70,460	13.2	R,L	I	0.57750	260.39	356.45	3	
249	VAN BUREN #2	67	13.8	15	25	23,760	62,700	13.2	R,L	I	0.57750	208.14	317.19	3	
250	VEGA	69	13.2	11.2	14	10,575	43,151	13.2	R,L	I	0.57750	92.64	218.30	2	
251	VICKERS	69	23.9	10	14	23,600	50,236	22	R,L	I	0.57750	206.74	254.14	1	
252	W ANTON	66	22	6	6	11,394	30,261	22	R,E	I	0.57750	99.82	153.09	1	
253	W BENDER	115	13.2	12	22.4	11,190	38,840	13.2	R,L	I	0.57750	98.02	196.49	2	
254	W BORGER	115	13.2	15	25	14,838	55,493	13.2	R,L	I	0.57750	129.98	280.73	3	
255	W CLOVIS 23 KV	67	24	12	22.4	10,800	47,800	22	R,L	I	0.57750	94.61	241.81	1	
256	W CLOVIS 13.2 KV	115	13.2	15	25	12,160	55,680	13.2	R,L	I	0.57750	106.52	281.68	2	
257	W LITTLEFIELD	69	12.5	1.5	1.5	2,765	8,364	12.5	R,E	I	0.57750	24.22	42.31	1	
258	W MULESHOE	67	12.5	5	5	9,216	27,879	12.5	R,E	I	0.57750	80.74	141.04	2	
259	W PLAINVIEW	67	12.5	12.5	20	16,500	55,000	12.5	R,E	I	0.57750	144.54	278.24	4	
260	WADE	69	12.5	3.75	4.68	11,000	33,000	12.5	R,E	I	0.57750	96.36	166.94	1	
261	WARD	115	12.5	4	4	13,610	30,300	12.5	R,L	I	0.57750	119.22	153.28	1	
262	WASSON	67	2.4	2	2	5,160	15,661	2.4	R,L	I	0.57750	45.20	79.23	0	
263	WATERFIELD	67	13.8	10	12.5	13,670	68,760	13.2	R,L	I	0.57750	119.75	347.85	3	
264	WEATHERLY	67	13.8	10	11.2	15,760	41,150	13.2	R,E	I	0.57750	138.06	208.17	2	
265	WELLMAN	67	12.5	5	6.25	5,000	15,000	12.5	R,E	I	0.57750	43.80	75.88	1	
266	WESTRIDGE	69	13.2	12	20	9,020	45,460	13.2	R,L	I	0.57750	79.02	229.98	2	
267	WHERRY HOUSING	67	12.5	3	3.65	5,530	16,728	12.5	R,E	I	0.57750	48.44	84.62	2	
268	WHITAKER	115	13.8	15	25	22,520	72,200	13.2	R,L	I	0.57750	197.28	365.25	3	
269	WHITE CITY	67	12.5	2.5	2.5	4,608	13,940	12.5	R,E	I	0.57750	40.37	70.52	2	
270	WHITEFACE	67	12.5	10	10	14,695	57,235	12.5	R,L	I	0.57750	128.73	289.54	2	
271	WHITEHEAD AMOCO	67	2.4	3.75	4.69	7,120	27,771	2.4	R,E	I	0.57750	62.37	140.49	1	
272	WHITHARRAL	67	4.16	2.5	3.125	6,560	16,503	4.16	R,L	I	0.57750	57.47	83.49	1	
273	WHITTEN	115	12.5	10	12.5	21,360	64,570	12.5	R,L	I	0.57750	187.11	326.65	2	
274	WILDORADO	67	12.5	10	10	15,984	59,797	13.2	R,L	I	0.57750	140.02	302.51	2	
275	WILLS OIL	67	12.5	1.5	1.5	2,730	7,800	12.5	R,E	I	0.57750	23.91	39.46	1	
276	WOOD DRAW	118	13.2	16.8	28	8,989	67,373	13.2	R,L	I	0.57750	78.74	340.83	3	
277	YANCY	67	4.16	2	2	5,160	15,536	4.16	R,L	I	0.57750	45.20	78.59	0	
278	YELLOW HOUSE	66	12.5	3.75	5	10,992	32,937	12.5	R,E	I	0.57750	96.29	166.62	1	
279	ZAVALLA	67	12.5	10	12.5	18,680	51,100	12.5	R,L	I	0.57750	163.64	258.51	2	
280	ZIA	115	13.2	10	14	22,080	39,216	12.5	R,E	I	0.57750	193.42	198.39	1	
281	ZODIAC	67	4.16	10	11.2	19,282	64,592	4.16	R,L	I	0.57750	168.91	326.76	2	
282															
283						No Load Losses MW	Full Load Losses MW	Total Losses MW				No Load Losses MWH	Load Losses MWH	Total Losses MWH	
284															
285															
286															
287	Total nominal ratings			2,702.780 MVA		3.58	11.97	15.54				30,107	60,542	90,649	
288	Sum of demands at Primary and below from "H"			2,268.041 MW											
289	System at peak Hr Primary Generation			54.139 MW											
290	Sum of demands adjusted for Primary Generatior			2,213.902 MW											
291															
292	Hours in Period			8760											
293															

Appendix I
Distribution Substation Transformer Loss

Line No.	1	Voltage High Side, kV 2	Voltage Low Side, kV 3	Ratings Nominal MVA 4	Max MVA 5	No Load Losses WATTS 6	Full Load Losses WATTS 7	Low Side Class 8	Verify Flag R,L,E 9	Exclude Flag 10	Primary Load Factor 11	No Load Losses MWH 12	Full Load Losses MWH 13	Number of Feeder Circuits 14	Percent Transf. Excluded 15
294															
295															
296	**Summary Information**														
297															
298	**KV Level**	**33**	**22**	**13.2**	**12.5**	**4.16**	**2.4**	**Total**							
299	Total Nominal MVA by Voltage	108.90	183.70	1,101.30	1,002.80	218.48	87.60	2,702.78		MVA					
300	Load by Voltage	89.20	150.47	902.10	821.41	178.96	71.76	2,213.90		MW Load					
301	Load on transformers without feeders	0.00	0.00	40.95	9.44	68.60	27.99	146.98		MW Load At the transformer					
302	Total Feeders	17.00	36.00	197.00	211.00	46.00	29.00	536.00		Number of Feeders					
303	**Feeders excluding partial feeders**	**16.34**	**36.00**	**192.67**	**201.91**	**46.00**	**29.00**	**521.92**		All feeders less % of transformer not included					
304	**Load on Feeders**	**89.20**	**150.47**	**861.15**	**811.97**	**110.36**	**43.77**	**2,066.92**		MW Load on feeders					

Appendix J
Distribution Primary Loss

Line No.			
	Demand at Primary Level		
1	Level 4 - Primary Distribution	519,275	Kw
2	Level 5 - Sec. Distribution Transformers	664,745	Kw
3	Level 6 - Sec. Distribution Lines	1,084,021	Kw
4	**Total Demand**	**2,268,041**	**Kw**
5			
6			
7	**Energy at Primary Level**		
8	Level 4 - Primary Distribution	3,924,194,671	Kwh
9	Level 5 - Sec. Distribution Transformers	3,447,301,207	Kwh
10	Level 6 - Sec. Distribution Lines	4,102,239,817	Kwh
11	**Total Energy**	**11,473,735,695**	**Kwh**

Demand Losses

Low Side Voltage	Load MW	No. of Feeders	@ CP MW Per Feeder	Current Amps	Typical Conductor	Ohms/Mile	Avg. Feeder Length, Miles	Resistance, Ohms	Power Loss per Feeder, Watts	Total Feeder Loss, KW
33.00	89.2	16.34	5.46	95.51	4/0	0.592	13.11	7.76	212,406.15	3,470.72
22.00	150.5	36.00	4.18	109.69	1/0	1.12	12.89	14.44	521,143.64	18,761.17
13.20	861.1	192.67	4.47	195.50	336	0.306	9.32	2.85	326,994.74	63,002.08
12.50	812.0	201.91	4.02	185.75	336	0.306	8.60	2.63	272,391.43	54,998.55
4.16	110.4	46.00	2.40	332.98	336	0.306	4.34	1.33	441,734.05	20,319.77
2.40	43.8	29.00	1.51	363.09	336	0.306	7.18	2.20	868,945.10	25,199.41
	2066.9	521.92							**2,643,615.11**	**185,751.69**

Total Primary Loss(MW) **185.75**

Energy Losses

Total Sales	11,473,735,695	KWH	
Load Factor - Based on Total Primary Demand and Energy Above	0.5775		
Loss Factor	0.4067		
Primary Energy Losses	**661,778**	**MWH**	

Appendix K
Distribution Line Transformer Loss

Demand Losses

Commercial customers may come only off the transformer or larger service drops

			Adjusted Meters				
Residential	293,839	meters	331,250	93,753	trans.	3.53322	mtr/trans.
Commercial	76,282	meters	38,871	42,807	trans.	0.90805	mtr/trans.
3 Ph Commercial	38,871	meters					

Residential and small commercial	1,084,021	KW	4,102,239,817	KWH (Level 6)
Commercial Load	664,745	KW	3,447,301,207	KWH (Level 5)
Total Load	**1,748,766**	**KW**	**7,549,541,024**	**KWH**

Load/Residential Customer	3.27	KW	Load/transformer	11.56 KW
Load/Commercial Customer	17.10	KW	Load/transformer	15.53 KW

Typical Transformer Losses	76	NL watts	323	FL watts	25	KVA Transformer
	207	NL watts	892	FL watts	100	KVA Transformer

Residential Transformer Losses(Watts)	190.24
Commercial Transformer Losses(Watts)	313.37

	Residential	Commercial
No Load Losses(KW)	7,125.23	8,861.05
Load Losses(KW)	17,835.35	13,414.54
Total Losses(KW)	24,960.58	22,275.59

Total Line Transformer Losses (KW) **47,236**

Energy Losses

Total Sales	7,549,541,024	KWH
Load Factor - Based on Total Secondary Demand and Energy Above	0.4928	
Loss Factor	0.3179	
Total Dist. Line Transformer Losses	**131,524**	**MWH**

Appendix L
Secondary and Service Loss

Secondary Demand Losses

Line No.			
1	**Demand Served at Secondary Level**		
2	Level 5 - Sec. Distribution Transformers	664,745	KW
3	Level 6 - Sec. Distribution Lines	1,084,021	KW
4	**Total Demand**	**1,748,766**	**KW**
5			
6	**Energy Served at Secondary Level**		
7	Level 5 - Sec. Distribution Transformers	3,447,301,207	KWH
8	Level 6 - Sec. Distribution Lines	4,102,239,817	KWH
9	**Total Energy**	**7,549,541,024**	**KWH**
10			
11	Secondary Conductor - 60 ' of 1/0 Conductor		
12			
13	Resistance 0.0127 ohms		
14			
15	Load /Residential Customer	3.27 KW	(From Appendix K)
16			
17	Load /Commercial Customer	17.10 KW	(From Appendix K)
18			
19			
20	Losses for secondary run	13.64 amps	4.72 watts loss
21			
22			
23	Number of Residential Customers Served at Secondary	237,497	Customers
24	Assumes that 1 meter was served at transformer		
25			
26	**Total Secondary Loss**	**1,122**	**KW**
27			
28			
29			
30			
31			
32	**Service Demand Loss**		
33			
34	Resistance Values		
35			
36	Residential Service	0.02028 ohms	
37	65' of #2 Triplex		
38			
39	Commercial Service	0.00636 ohms	
40	30' of #1/0 Quad		
41			
42	Residential	331,250 meters	13.64 amps/mtr
43			
44	Commercial	38,871 meters	41.14 amps/mtr
45			
46			
47	Residential Loss/Meter	7.54 watts	2,498 kw
48			
49	Commercial Loss/meter	32.29 watts	1,255 kw
50			
51			
52	**Total Service Losses**	**3,753**	**kw**
53			
54			
55	**Secondary and Service Energy Losses**		
56			
57			
58	**Total Sales**	7,549,541,024	KWH
59			
60	Load Factor - Based on Total Secondary	0.4928	
61	Demand and Energy Above		
62	Loss Factor	0.3179	
63			
64	**Total Secondary and Service Demand Loss**	**4,875**	**KW**
65			
66	**Total Secondary and Service Energy Loss**	**13,574**	**MWH**

Appendix M
Loss Summary

SOUTHWESTERN PUBLIC SERVICE COMPANY
SUMMARY OF LOSS EVALUATION

JULY 2012 - JUNE 2013

Line No.	System Component	Demand MW	Energy MWH	Adjusted Energy MWH	Percent of Total Losses: Demand Percent	Percent of Total Losses: Energy Percent	Factored KWH
13	Transmission Lines						
14	345 kV	7.81	38,707	38,389	1.79	2.11	38,389,231
15	230 kV	40.28	293,567	291,157	9.21	15.98	291,157,173
16	115 kV	85.22	344,234	341,409	19.48	18.74	341,408,804
17	69 kV	25.16	93,689	92,920	5.75	5.10	92,919,805
19	Corona and Insulator Loss						
20	345 kV	1.46	12,787	12,682	0.33	0.70	12,681,918
21	230 kV	2.05	17,986	17,839	0.47	0.98	17,838,623
22	115 kV	1.19	10,426	10,340	0.27	0.57	10,340,292
23	69 kV	0.31	2,753	2,731	0.07	0.15	2,730,769
25	Autotransformers - Load						
26	345/230 kV	0.67	6,193	6,143	0.15	0.34	6,142,577
27	230/115 kV	9.00	47,573	47,182	2.06	2.59	47,182,174
28	115/69 kV	5.90	28,024	27,794	1.35	1.53	27,793,894
30	Autotransformers - No Load						
31	345/230 kV	0.43	3,019	2,994	0.10	0.16	2,994,344
32	230/115 kV	2.92	25,595	25,385	0.67	1.39	25,385,113
33	115/69 kV	1.58	14,919	14,797	0.36	0.81	14,796,653
35	Distribution Sub. Transformers	15.54	90,649	89,905	3.55	4.93	89,905,104
37	Distribution						
38	Primary	185.75	661,778	656,346	42.47	36.02	656,346,172
39	Line Transformers	47.24	131,524	130,444	10.80	7.16	130,444,111
40	Secondary & Services	4.87	13,574	13,462	1.11	0.74	13,462,156
42	Total Determined Losses	437.40	1,836,997				
43	Undeterminable Losses		-15,079				
44	Total Losses		1,821,919	1,821,919			1,821,918,912

Appendix N

Powerflow Study Loss Results

CASE NAME: 2012MDWGB2FINAL-12S_ SUMMER PEAK.sav

TITLE LINE 1: MDWG 2012 B2 FINAL WITH 2011 MMWG
TITLE LINE 2: MDWG 2012S WITH MMWG 2012S [6079 - SUMMER PEAK]

BUS RANGE: 522800 -- 528799

********** LOSSES BY ELEMENT CLASS **********

---------- TRANSFORMER LOSSES (MW) ----------

[345/230 kV]	[345/115 kV]	[230/115 kV]	[230/69 kV]	[115/69 kV]	[TOTAL]
0.672775	0.0	9.002553	0.0	5.895226	15.57055

MIDLAND & BORDEN 230/138kV LOSSES IN 230/115kV LOSSES ABOVE: [0.154961, 0.104294]

---------- TRANSMISSION LINE LOSSES (MW) ----------

[345 kV]	[230 kV]	[115 kV]	[69 kV]	[TOTAL]
7.808521	40.27761	85.22276	25.16303	158.4719

---------- CASE TOTALS ----------

TOTAL LOSSES: 174.0425MW

TOTAL 345kV LINES:	6	TOTAL 345/230kV TRANSFORMERS:	5
TOTAL 230kV LINES:	70	TOTAL 345/115kV TRANSFORMERS:	0
TOTAL 115kV LINES:	340	TOTAL 230/115(138)kV TRANSFORMERS:	45
TOTAL 69kV LINES:	293	TOTAL 230/69kV TRANSFORMERS:	0
		TOTAL 115/69kV TRANSFORMERS:	79

CASE NAME: 2012MDWGB2FINAL-12S_4669.sav

TITLE LINE 1: MDWG 2012 B2 FINAL WITH 2011 MMWG
TITLE LINE 2: MDWG 2012S WITH MMWG 2012S [4669.2 - SEGMENT 1]

BUS RANGE: 522800 -- 528799

* * * * * * * * * * L O S S E S B Y E L E M E N T C L A S S * * * * * * * * * *

---------- TRANSFORMER LOSSES (MW) ----------

[345/230 kV]	[345/115 kV]	[230/115 kV]	[230/69 kV]	[115/69 kV]	[TOTAL]
0.605217	0.0	6.538837	0.0	4.086288	11.23034

MIDLAND & BORDEN 230/138kV LOSSES IN 230/115kV LOSSES ABOVE: [0.0766945, 0.0942993]

---------- TRANSMISSION LINE LOSSES (MW) ----------

[345 kV]	[230 kV]	[115 kV]	[69 kV]	[TOTAL]
4.340492	27.61203	49.59095	15.60572	97.14919

---------- CASE TOTALS ----------

TOTAL LOSSES: 108.3795MW

TOTAL 345kV LINES:	6	TOTAL 345/230kV TRANSFORMERS:	5
TOTAL 230kV LINES:	70	TOTAL 345/115kV TRANSFORMERS:	0
TOTAL 115kV LINES:	340	TOTAL 230/115(138)kV TRANSFORMERS:	45
TOTAL 69kV LINES:	293	TOTAL 230/69kV TRANSFORMERS:	0
		TOTAL 115/69kV TRANSFORMERS:	79

CASE NAME: 2012MDWGB2FINAL-12S_3436.sav

TITLE LINE 1: MDWG 2012 B2 FINAL WITH 2011 MMWG
TITLE LINE 2: MDWG 2012S WITH MMWG 2012S [3436.9 - SEGMENT 2]

BUS RANGE: 522800 -- 528799

* * * * * * * * * * L O S S E S B Y E L E M E N T C L A S S * * * * * * * * * *

---------- TRANSFORMER LOSSES (MW) ----------

[345/230 kV]	[345/115 kV]	[230/115 kV]	[230/69 kV]	[115/69 kV]	[TOTAL]
0.69762	0.0	5.179602	0.0	2.958105	8.835327

MIDLAND & BORDEN 230/138kV LOSSES IN 230/115kV LOSSES ABOVE: [0.048811, 0.0661545]

---------- TRANSMISSION LINE LOSSES (MW) ----------

[345 kV]	[230 kV]	[115 kV]	[69 kV]	[TOTAL]
3.465938	33.41922	33.87829	9.379807	80.14325

---------- CASE TOTALS ----------

TOTAL LOSSES: 88.97858MW

TOTAL 345kV LINES:	6	TOTAL 345/230kV TRANSFORMERS:	5
TOTAL 230kV LINES:	70	TOTAL 345/115kV TRANSFORMERS:	0
TOTAL 115kV LINES:	340	TOTAL 230/115(138)kV TRANSFORMERS:	45
TOTAL 69kV LINES:	293	TOTAL 230/69kV TRANSFORMERS:	0
		TOTAL 115/69kV TRANSFORMERS:	79

CASE NAME: 2013MDWG_FINAL_13G_3572.sav

TITLE LINE 1: MDWG 2013 FINAL WITH 2012 MMWG
TITLE LINE 2: MDWG 2013G WITH MMWG 2013G [3572.4 -SEGMENT 3]

BUS RANGE: 522800 -- 528799

* * * * * * * * * * L O S S E S B Y E L E M E N T C L A S S * * * * * * * * * *

---------- TRANSFORMER LOSSES (MW) ----------

[345/230 kV]	[345/115 kV]	[230/115 kV]	[230/69 kV]	[115/69 kV]	[TOTAL]
0.66189	0.0	5.030991	0.0	2.945627	8.638508

MIDLAND & BORDEN 230/138kV LOSSES IN 230/115kV LOSSES ABOVE: [0.0649834, 0.108719]

---------- TRANSMISSION LINE LOSSES (MW) ----------

[345 kV]	[230 kV]	[115 kV]	[69 kV]	[TOTAL]
2.418805	35.85329	40.24855	9.070039	87.59068

---------- CASE TOTALS ----------

TOTAL LOSSES: 96.22919MW

TOTAL 345kV LINES:	6	TOTAL 345/230kV TRANSFORMERS:	6
TOTAL 230kV LINES:	72	TOTAL 345/115kV TRANSFORMERS:	0
TOTAL 115kV LINES:	350	TOTAL 230/115(138)kV TRANSFORMERS:	48
TOTAL 69kV LINES:	291	TOTAL 230/69kV TRANSFORMERS:	0
		TOTAL 115/69kV TRANSFORMERS:	77

CASE NAME: 2013MDWG_FINAL_13G_4019.sav

TITLE LINE 1: MDWG 2013 FINAL WITH 2012 MMWG
TITLE LINE 2: MDWG 2013G WITH MMWG 2013G [4019.25 -SEGMENT 4]

BUS RANGE: 522800 -- 528799

* * * * * * * * * * L O S S E S B Y E L E M E N T C L A S S * * * * * * * * * *

---------- TRANSFORMER LOSSES (MW) ----------

[345/230 kV]	[345/115 kV]	[230/115 kV]	[230/69 kV]	[115/69 kV]	[TOTAL]
0.886086	0.0	5.4759	0.0	3.28249	9.644475

MIDLAND & BORDEN 230/138kV LOSSES IN 230/115kV LOSSES ABOVE: [0.0799561, 0.121674]

---------- TRANSMISSION LINE LOSSES (MW) ----------

[345 kV]	[230 kV]	[115 kV]	[69 kV]	[TOTAL]
9.34802	37.55057	44.14527	11.29654	102.3404

---------- CASE TOTALS ----------

TOTAL LOSSES: 111.9849MW

TOTAL 345kV LINES:	6	TOTAL 345/230kV TRANSFORMERS:	6
TOTAL 230kV LINES:	72	TOTAL 345/115kV TRANSFORMERS:	0
TOTAL 115kV LINES:	350	TOTAL 230/115(138)kV TRANSFORMERS:	48
TOTAL 69kV LINES:	291	TOTAL 230/69kV TRANSFORMERS:	0
		TOTAL 115/69kV TRANSFORMERS:	77

Appendix O
Energy Loss Factors

SOUTHWESTERN PUBLIC SERVICE COMPANY
ENERGY LOSS FACTOR CALCULATION
12 MONTHS ENDING JUNE 2013

Loss Factor Calculation

Total Generation Inputs = 32,964,320,068 kWh

Line No.		Loss Factor to Gross up to Gen	Loss factor to gross up 1 level 1/(1-loss %)	% loss by level	KWH Flow into each level		KWH Loss by Level		KWH Sales by loss level	Loss Check Loss fac X sales
11	Sales at the Generator @ Generation	**1.000000**	1.000000	0.000000%	32,964,320,068		0		628,967,635	628,967,635
14	Sales @ 115, 230 & 345 KV Level 2	**1.025158**	1.025158	2.454033%	32,335,352,433		793,520,248		13,132,286,773	13,462,668,844
17	Sales @ 69 KV Level 3	**1.032914**	1.007566	0.750921%	18,409,545,411		138,241,120		5,907,411,053	6,101,847,580
20	Sales @ Primary (33kv - 2.4kv) Level 4	**1.099263**	1.064234	6.035731%	12,363,893,238		746,251,276		3,924,194,671	4,313,722,007
23	Secondary Sales @ the Transf. Level 5	**1.118223**	1.017248	1.695522%	7,693,447,290		130,444,111		3,447,301,207	3,854,851,498
26	Sales served by secondary lines Level 6	**1.121893**	1.003282	0.327093%	4,115,701,973		13,462,156		4,102,239,817	4,602,274,135
29	Total		1.058503	5.526942%	32,964,320,068	=	1,821,918,912	+	31,142,401,156	32,964,331,698
31								Check using rounded factors		11,631
34	Composite Factors 5 & 6 to Gen.	**1.120217**	1.019062	1.870504%	7,693,447,290		143,906,266		7,549,541,024	

36 Loss factor calculation for gross up to a target level equals the product of loss factors for each level up through the target level.

Appendix P
Demand Loss Factors

SOUTHWESTERN PUBLIC SERVICE COMPANY
DEMAND LOSS FACTOR CALCULATION
12 MONTHS ENDING JUNE 2013

Loss Factor Calculation

Total Generation Inputs = 6,079,000 Kw
System Peak Hr. 6,079,000 Kw

Line No.		Loss Factor to Gross up to Gen	Loss factor to gross up 1 level 1/(1-loss %)	% loss by level	KW Flow into each level		KW Loss by Level		KW Demand by loss level	Loss Check Loss fac X sales
11	Sales at the Generator @ Generation	**1.000000**	1.000000	0.000000%	6,079,000		0		157,316	157,316
14	Sales @ 115, 230 & 345 KV Level 2	**1.026174**	1.026174	2.550638%	5,921,684		151,041		2,068,989	2,123,142
17	Sales @ 69 KV Level 3	**1.035392**	1.008983	0.890292%	3,701,654		32,956		1,201,176	1,243,688
20	Sales @ Primary (33kv - 2.4kv) Level 4	**1.127359**	1.088824	8.157751%	2,467,523		201,294		516,991	582,834
23	Secondary Sales @ the Transf. Level 5	**1.158647**	1.027753	2.700387%	1,749,237		47,236		664,745	770,205
26	Sales served by secondary lines Level 6	**1.164118**	1.004722	0.469979%	1,037,256		4,875		1,084,021	1,261,928
29	Total		1.077532	7.195289%	6,130,639	=	437,402	+	5,693,238	6,139,114
31	Composite Factor Levels 5 and 6	**1.161975**	1.030705	2.979073%	1,749,237		52,111		1,748,766	

Appendix Q

Demand and Energy Factors

July 2012- June 2013

Rate Class Loss Factors by Loss Level

Line No.		Loss Level	Demand Loss factors	Energy Loss Factors
1				
2				
3				
4	Residential Lighting	6	1.161975	1.120217
5	Residential Space Heating	6	1.161975	1.120217
6	Small General Service	6	1.161975	1.120217
7	General Service - Secondary	5	1.161975	1.120217
8	General Service - Primary	4	1.127359	1.099263
9	Large General Service			
10	Transmission Backbone	2	1.026174	1.025158
11	Sub-Transmission	3	1.035392	1.032914
12	Street Lighting	6	1.161975	1.120217
13	Area Lighting	6	1.161975	1.120217
14	Small Municipal and School	6	1.161975	1.120217
15	Large Municipal	6	1.161975	1.120217
16	Large Municipal - Primary	4	1.127359	1.099263
17	Large Schools	5	1.161975	1.120217
18	Interruptible Service -SAS 4	4	1.127359	1.099263
19	Wholesale - Service -115 kV	2	1.026174	1.025158
20	Wholesale - Service -69 kV	3	1.035392	1.032914

* For Levels 5 & 6, the Composite Factors used in billing applicatons are stated.