BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION

IN THE MATTER OF SOUTHWESTERN PUBLIC SERVICE COMPANY'S APPLICATION FOR: (1) REVISION OF ITS RETAIL RATES UNDER ADVICE NOTICE NO. 312; (2) AUTHORITY TO ABANDON THE PLANT X UNIT 1, PLANT X UNIT 2, AND CUNNINGHAM UNIT 1 GENERATING STATIONS AND AMEND THE ABANDONMENT DATE OF THE TOLK GENERATING STATION; AND (3) OTHER ASSOCIATED RELIEF, **SOUTHWESTERN PUBLIC SERVICE COMPANY,** **APPLICANT.**	)	**CASE NO. 22-00286-UT**

DIRECT TESTIMONY

of

DAVID A. LOW

on behalf of

SOUTHWESTERN PUBLIC SERVICE COMPANY

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GLOSSARY OF ACRONYMS AND DEFINED TERMS

Acronym/Defined Term	**Meaning**
Base Period	July 1, 2021 through June 30, 2022
Btu	British thermal unit
Commission	New Mexico Public Regulation Commission
Cunningham	Cunningham Generating Station
FERC	Federal Energy Regulatory Commission
Hale	Hale Wind Generation Station
Harrington	Harrington Generating Station
Jones	Jones Generating Station
Linkage Period	July 1, 2022 through June 30, 2023
Maddox	Maddox Generating Station
M&D	Monitoring and Diagnostic
MW	megawatt
Nichols	Nichols Generating Station
O&M	Operation and maintenance
OEM	Original Equipment Manufacturer
Plant X	Plant X Generating Station
PRB	Powder River Basin
RFP	Rate Filing Package

Acronym/Defined Term	Meaning
Sagamore	Sagamore Wind Generation Station
SPS	Southwestern Public Service Company, a New Mexico corporation
Future Test Year Period	July 1, 2023 through June 30, 2024
Tolk	Tolk Generating Station
TCR	Transient Climate Response
Xcel Energy	Xcel Energy Inc.
XES	Xcel Energy Services Inc.

LIST OF ATTACHMENTS

Case No. 22-00286-UT
Direct Testimony
of
David A. Low

I. WITNESS IDENTIFICATION AND QUALIFICATIONS

Q. Please state your name and business address.

A. My name is David A. Low. My business address is 790 South Buchanan 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"). SPS is a wholly owned electric utility subsidiary of Xcel Energy Inc. ("Xcel Energy").

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

A. I am employed by SPS, as General Manager, SPS Generation.

Q. Please briefly outline your responsibilities as General Manager, SPS Generation.

A. I manage the SPS Generation business area within the Energy Supply organization, which provides leadership, strategic direction, and management of the power generation group within Xcel Energy.

Q. Please describe your educational background.

A. I received a Bachelor of Science in Mechanical Engineering Technology from Texas Tech University in 1983. I also completed course work toward an MBA at West Texas A&M University from 1998 to 2001.

Q. Please describe your professional experience.

A. I have significant professional experience in power generation across multiple Xcel Energy operating companies and service territories, including at some of SPS's largest generation facilities. I also have been directly involved in the transition of the energy landscape from a regional markets perspective and have facilitated flexible operations of SPS's generation fleet as regional expansion occurred and as generation technologies have evolved. Xcel Energy has been a national leader in renewable energy integration, particularly wind generation, for over a decade. Over the past decade, I've managed the integration of the SPS generation fleet into the Southwest Power Pool, which has grown to a 14-state footprint.

I began my career with SPS in 1983 as a Plant Engineer at Tolk Generating Station ("Tolk") after serving an intership at Jones Generating Station ("Jones"), and was quickly immersed into assisting the construction and start-up of Tolk Unit 2. I was promoted to Supervisory Plant/Project Engineer at Tolk Station in 1987. In 1992, I was promoted to Senior Project Engineer at Tolk. Then in 1995, I became the Maintenance Manager for SPS's Harrington Generating Station ("Harrington"). In 2003, I was promoted to Plant Director for Public Service Company of Colorado's Pawnee Station, which is a coal unit in Northeast Colorado with a much different boiler design and water source. In 2007, I was promoted to

Plant Director of SPS's Tolk and Plant X Generating Station ("Plant X") Complex. In 2011, I was promoted to my current position as General Manager, SPS Generation, a role in which I manage and oversee the operations of SPS's generation fleet. Those units, which represent 5,307 megawatts ("MW") net maximum (including wind) generating capacity, have earned national recognition as the Climate Registry (Transient Climate Response ("TCR")) Climate Leadership award twice, and have been inducted into the TCR Hall of Fame. These distinguished accomplishments acknowledge Xcel Energy's industry-leading carbon efforts as well as support for customers and communities achieving their clean energy goals. We have also been granted all-star status through TCR for carbon reporting. While I was the Tolk/Plant X Director, Tolk was awarded the Powder River Basin ("PRB") Plant of the Year in 2010, and Harrington was awarded the same recognition in 2015. The PRB Coal Users Group gave this recognition for innovation and best practices in safety, coal handling, plant operations, and environmental performance.

Q. Have you attended or taken any special courses or seminars relating to public utilities?

A. Yes. Over my career, I have taken various courses and seminars related specifically to the public utility industry.

Q. Have you testified before any regulatory authorities?

A. Yes. I have submitted pre-filed testimony and testified before the New Mexico Public Regulation Commission ("Commission") in several cases, including SPS's most recent base rate cases, Case Nos. 20-00238-UT, 19-00170-UT, and 17-00255-UT, among others. I have also filed testimony and testified in cases before the Public Utility Commission of Texas. My testimony in all those cases has addressed the topics of SPS's generation and its power plant operation, maintenance, and cost control practices.

II. ASSIGNMENT AND SUMMARY OF TESTIMONY AND RECOMMENDATIONS

Q. What is your assignment in this proceeding?

A. My testimony supports the Operation and Maintenance ("O&M") expenses for the Energy Supply business area in the Base Period, Linkage Period, and Future Test Year Period.[1] I demonstrate that those expenses are reasonable and necessary to support the electric service that SPS provides to its New Mexico retail customers. I also discuss SPS's generation by operating plant and unit, and I discuss the changes in service lives of generating facilities that SPS proposes in this case. In addition, I describe SPS's power plant operation, maintenance, and cost control practices. Finally, I sponsor Schedule P-7 in SPS's Rate Filing Package ("RFP").

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

A. I recommend that the Commission approve SPS's requested Energy Supply business area O&M expenses. SPS's Energy Supply business area O&M expenses are reasonable and necessary to support the electric service SPS provides to its New Mexico retail customers, and those expenses are representative of SPS's future

[1] I define the terms "Base Period," "Linkage Period," and "Future Test Year Period" in the next section of my direct testimony.

costs. SPS operates its units in a prudent and efficient manner that ensures the safe and reliable operations of its units, with continued environmental compliance. SPS's practices also include efforts to minimize related O&M expenses.

I also recommend that the Commission approve SPS's request to abandon and retire Plant X Unit 1, Plant X Unit 2, and Cunningham Generating Station ("Cunningham") Unit 1 in 2023. In addition, I recommend that the Commission approve SPS's request for authority to cease coal operations at Tolk in 2028. Finally, I recommend that the Commission approve SPS's request to extend the service life of Nichols Generating Station ("Nichols") Unit 1 from 2022 to 2028, and to extend the service life of Nichols Unit 2 from 2023 to 2027.

Q. Does SPS quantify the Energy Supply O&M expenses on a New Mexico retail jurisdictional basis?

A. I quantify the Energy Supply O&M expense amounts on a total company basis. SPS witness Stephanie N. Niemi develops the New Mexico jurisdictional amounts in her Attachment SNN-6. If the percentages used to allocate amounts to the New Mexico retail jurisdiction change, those new allocation percentages will need to be applied to the total SPS numbers to derive updated New Mexico retail amounts.

Q. Was Attachment DAL-1 prepared by you or under your direct supervision and control?

A. Attachment DAL-1 was prepared under the supervision of Ms. Niemi. It represents a portion of the jurisdictional cost of service provided in Ms. Niemi's direct testimony (Attachment SNN-10), as well as a listing of O&M services provided by the Energy Supply group. I have reviewed the attachment and believe it to be accurate.

Q. Was RFP Schedule P-7, which you sponsor, prepared by you or under your direct supervision and control?

A. Yes. In RFP Schedule P-7, SPS provides the following information:

- total maintenance by operating unit for four years prior to the Test Year;
- scheduled maintenance for the Test Year; and
- projected scheduled maintenance for five years beyond the Test Year.

Q. Do you incorporate RFP Schedule P-7 that you sponsor into your testimony?

A. Yes.

III. SPS GENERATING FACILITIES

Q. Please describe SPS's generating facilities.

A. During the Base Period, SPS fleet of generating units included the units listed in Table DAL-1. Table DAL-1 also shows the in-service dates, the currently approved service lives, and the currently approved retirement dates for the SPS generating units. The last column of Table DAL-1 shows the expected retirement date as of 1984 for each unit that had been placed in service by that time:[2]

Table DAL-1

Unit Name	In-Service Date	Currently Approved Service Life	Currently Approved Retirement Date	Expected Retirement Date as of 1984
Jones 1	1971	60	2031	2011
Jones 2	1974	60	2034	2014
Plant X 1	1952	67	2019	1992
Plant X 2	1953	66	2019	1994
Plant X 3	1955	69	2022[3]	1995
Plant X 4	1964	63	2027	2004
Cunningham 1	1957	62	2019	1997
Cunningham 2	1965	60	2025	2005

[2] SPS has listed the expected retirement date as of 1984 because a depreciation study from that year is the oldest depreciation study that SPS was able to find.

[3] Plant X Unit 3 will retire in 2022. The Commission approved the 2022 retirement of Plant X Unit 3 in Case No. 20-00238-UT.

Unit Name	In-Service Date	Currently Approved Service Life	Currently Approved Retirement Date	Expected Retirement Date as of 1984
Harrington 1	1976	60	2036	2011
Harrington 2	1978	60	2038	2013
Harrington 3	1980	60	2040	2015
Maddox 1	1967	61	2028	2007
Nichols 1	1960	62	2022	2000
Nichols 2	1962	61	2023	2000
Nichols 3	1968	62	2030	2000
Tolk 1	1982	55	2032	2017
Tolk 2	1985	52	2032	
Blackhawk	1999	35	2034	
Cunningham 3	1997	43	2040	
Cunningham 4	1997	43	2040	
Jones 3	2011	45	2056	
Jones 4	2013	45	2058	
Maddox 2	1975	50	2025	
Maddox 3	1963	62	2025	
Quay County	2013	21	2034	
Hale	2019	25	2044	
Sagamore	2020	25	2045	

As this table shows, SPS's older units have remained operational far beyond their originally contemplated service lives. That demonstrates that SPS has operated and maintained the units well to the benefit of SPS customers.

Q. Are any of the SPS generating units dedicated for peaking service?

A. Yes. The combustion turbines at Jones Units 3 and 4, Cunningham Units 3 and 4, and Maddox Generating Station ("Maddox") Unit 2 are peaking units.

Q. Are any units used primarily for emergency situations?

A. Yes. SPS uses Quay County Unit 1 and Maddox Unit 3 primarily for emergency use.

Q. Will any of the existing units be operated differently in the future?

A. Yes. As more and more renewable resources such as wind and solar generating facilities go into service, SPS must cycle the fossil-fuel units in its generation fleet more often. Harrington units will convert its main fuel source from coal to gas operation in 2025. In addition, SPS is proposing to abandon and retire Plant X Units 1 and 2, as well as Cunningham Unit 1, in 2023. SPS is also proposing to cease coal operations at Tolk in 2028 and convert full time to a synchronous condenser and serve as a transmission asset. I discuss those proposed changes later in my direct testimony.

Q. Does SPS obtain energy or capacity from units other than those listed in Table DAL-1?

A. Yes. SPS has purchased power agreements to acquire power from other facilities, including wind facilities, located in SPS's service area.

IV. <u>ENERGY SUPPLY O&M EXPENSES</u>

Q. What topics do you cover in this section of your testimony?

A. In this section, I will discuss O&M expenses associated with the Energy Supply business area and explain that these expenses are reasonable and necessary for the provision of utility service. Consistent with the Future Test Year Period Rule,[4] for each of the (1) Base Period[5] and Adjusted Base Period,[6] (2) Linkage Period,[7] and (3) Future Test Year Period,[8] I break down the Energy Supply costs by Federal Energy Regulatory Commission ("FERC") account or FERC account subcategory, as appropriate, detail the associated elements of cost, and fully explain, support, and justify this Energy Supply data. I also identify Energy Supply's contribution to the material variances between the Adjusted Base Period and Future Test Year Period costs identified by Ms. Niemi, and I describe the Energy Supply cost drivers expected to contribute to these material variances.

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[4] 17.1.3.1 NMAC et seq.

[5] SPS's base period in this proceeding begins July 1, 2021 and ends June 30, 2022 (the "Base Period").

[6] SPS's adjusted base period in this proceeding is the Base Period adjusted as described by SPS witness Stephanie Niemi (the "Adjusted Base Period").

[7] SPS's "Linkage Period" in this proceeding begins July 1, 2022 and ends June 30, 2023. Per the Future Test Year Period Rule, it covers the period of time between the end of the Base Period and the beginning of the Future Test Year Period and includes the required "Linkage Data" as that term is defined in 17.1.3.7(H) NMAC.

[8] SPS's future test year period in this proceeding begins July 1, 2023 and ends June 30, 2024 (the "Future Test Year Period").

A. Overview of Energy Supply Services and Associated Expenses

Q. Describe generally the services associated with Energy Supply costs.

A. SPS's Energy Supply business area is responsible for the oversight, planning, siting, design, construction, operation, and maintenance of SPS's generation facilities. In terms of organization, the Energy Supply is composed of the following groups and subgroups:

- Performance Optimization
  - Fleet Engineering
  - Analytics and Practices
  - Reliability Engineering
- Energy Supply Projects
  - Renewable Project Development
  - Regional Capital Projects
  - Engineering Design and Document Services
  - Construction and Project Services
- Environmental Services
  - Auditing and Corporate Reporting
  - Air, Water and Waste Compliance

  - Chemistry Service
  - Water Resources
- Business Operations
  - Strategic Asset Management
  - Business Planning and Performance Reporting
  - Work Management Process and Performance
  - Continuous Improvement
  - North American Electric Reliability Corporation Standards Compliance

Q. What are native SPS costs?

A. Native SPS costs are those costs incurred directly by SPS associated with the provision of electric service to customers.

Q. Do the Energy Supply O&M expenses include native SPS costs?

A. Yes. These costs include labor, materials, and other non-fuel O&M costs. For example, the O&M portion of the salaries of SPS employees working at the Harrington Generating Station ("Harrington") are native costs.

Q. What are affiliate costs?

A. Affiliate charges are primarily those costs associated with services provided to SPS by Xcel Energy Services Inc ("XES"), which is Xcel Energy's service company.

Q. Do the Energy Supply O&M expenses include affiliate charges?

A. Yes. These services are in addition to, and not duplicative of, the services that SPS employees provide. The affiliate O&M expenses are primarily associated with labor costs, such as the O&M portion of labor costs charged to SPS by XES employees related to engineering and environmental services.

Q: How are the affiliate charges assigned or allocated to SPS?

A: As explained in detail in SPS witness Nicole L. Doyle's direct testimony, affiliate costs are directly charged or allocated to SPS "at cost" pursuant to Appendix A to the Service Agreement between XES, SPS and the other Operating Companies.

Q. Are any of the Energy Supply affiliate services provided to SPS duplicated elsewhere in XES or in any other Xcel Energy subsidiary, such as SPS itself?

A. No. None of the services provided by the Energy Supply group are duplicated elsewhere. No other Xcel Energy subsidiary performs these services for the SPS, and SPS does not perform these services for itself.

Q. Are the O&M costs related to the Energy Supply business area necessary for SPS's operations?

A. Yes. All of the O&M costs—including both labor and non-labor O&M costs—are necessary to ensure that SPS's generation fleet, which is essential to providing electric service to SPS's customers, is safely and reliably operated and maintained.

For example, these costs are incurred to ensure that SPS's generation facilities comply with environmental regulations and receive sufficient technical support. Without the services provided by the Energy Supply business area, SPS would not be able to provide safe and reliable electric service to its customers.

Q. Do SPS's New Mexico retail customers benefit from the services provided by the Energy Supply business area?

A. Yes. The services of the Energy Supply business area benefit SPS's New Mexico retail customers by supporting the safe and reliable production of generation capacity needed to serve the electric needs of those customers.

B. Presentation of Energy Supply O&M Expense Data

Q. At a high level, how does SPS present O&M expenses in this proceeding?

A. To comply with the Commission's Future Test Year Rule, SPS presents its O&M data in several separate views. In Attachment SNN-10, Tab 2, Ms. Niemi presents SPS's total company O&M expenses by FERC account and subaccount[9] for the following periods: (1) the Base Period and Adjusted Base Period, (2) the Linkage

[9] Consistent with 17.1.3.16(B)(1) NMAC, each FERC account has been subdivided where necessary to a level that is sufficient to identify cost drivers and demonstrate where variations between the Adjusted Base Period and Future Test Year Period occur.

Period, and (3) the Future Test Year Period.[10] This attachment also identifies the variance between the Adjusted Base Period[11] expenses and Future Test Year Period expenses by FERC account or subaccount and highlights where material variances exist.[12]

Separately, in Attachment SNN-10, Tab 3, Ms. Niemi presents a more granular view of the general O&M data. There, the general O&M expenses included in each FERC account or subaccount are further divided into elements of

[10] *See* 17.1.3.12 NMAC; 17.1.3.15 NMAC; 17.1.3.16(B) NMAC.

[11] SPS notes that 17.1.3.6 NMAC states that the objective of the Rule is to "provide for a complete and comprehensive rate case filing that, by including full explanations and justifications of changes in items between the *adjusted base period*, linkage data and future test year period as required by this rule should minimize the amount of discovery needed by commission staff…and intervenors to analyze a filing." 17.1.3.6 NMAC (emphasis added). 17.1.3.7 NMAC defines "material change" or "material variance" as "a change or variance in cost between the *adjusted base period* and the future test year period." 17.1.3.7(J) NMAC (emphasis added). Later, however, 17.1.3.17(A) NMAC states that "[f]or any material changes between *base period* and future test year period, cost drivers shall be separately identified, explained and justified as well as linked to the historical base period and any linkage data." 17.1.3.17(A) NMAC (emphasis added). And 17.1.3.18(B) NMAC directs an applicant to include a side-by-side comparison with "a column showing actual expenditures during the *base period*; a column showing the estimated expenditures during the future test year period; a column showing the variance between the two; and a column providing an explanation (or a reference to the written testimony requirement under Subsection D of this section) for the differences between the *base period* data and the future test year period estimates, including occurrences which took place in the linkage data." 17.1.3.18(B) NMAC (emphasis added). Consistent with the Future Test Year Period Rule's objective and the material variance definition and to ensure an apples-to-apples comparison throughout all relevant data, SPS focuses on Adjusted Base Period amounts, rather than Base Period amounts, when presenting variation data in testimony. Nonetheless, to ensure compliance with the NMPRC Future Test Year Period Rule, SPS has included the variance between the Base Period expenses and Future Test Year expenses in Ms. Niemi's Attachment SNN-10, tab 2.

[12] *See* 17.1.3.16(B) NMAC; 17.1.3.18(B) NMAC.

cost, including labor-related cost elements.[13] This view of the O&M data is presented on both a total company and New Mexico Retail basis.[14]

In Attachment SNN-10, Tab 4, Ms. Niemi separates out the labor-related cost elements from the general O&M data for the Base Period. In conjunction with the Business Area witnesses, SPS witness Michael P. Deselich supports the Base Period labor amounts reflected in this tab. Mr. Deselich also identifies, fully explains, and justifies any labor-related cost drivers that contributed to material variances between the Adjusted Base Period and the Future Test Year Period identified by Ms. Niemi.

Finally, in Attachment SNN-10, Tab 5, Ms. Niemi presents the non-labor cost elements of general O&M expenses for the Base Period and Adjusted Base Period, the Linkage Period, and the Future Test Year Period by Business Area. Each Business Area's general O&M (non-labor) expenses are presented by FERC account or subaccount, as appropriate.[15] Next, the expenses in each FERC account or FERC subaccount are further divided by non-labor cost element.[16] Generally,

[13] *See* 17.1.3.16(B) NMAC.

[14] *See* 17.1.3.16(B) NMAC.

[15] *See* 17.1.3.16(B) NMAC; 17.1.3.16(B)(1)-(2) NMAC.

[16] *See* 17.1.3.16(B) NMAC; 17.1.3.16(B)(1)-(2) NMAC.

SPS's Business Area witnesses fully explain, justify, and support the O&M data presented by Ms. Niemi for their applicable Business Area in Attachment SNN-10, Tab 5, including variances from period to period.[17] However, as noted throughout my testimony, Ms. Niemi sponsors many of the adjustments made to Base Period amounts to arrive at the Adjusted Base Period amounts. Business Area witnesses also identify, fully explain, and justify any non-labor Business Area cost drivers that contributed to material variances between the Adjusted Base Period and the Future Test Year Period identified by Ms. Niemi.[18]

Q. Which Business Area O&M expenses do you sponsor?

A. I sponsor the Energy Supply O&M expenses. This includes (1) the labor-related expenses associated with Energy Supply services that were incurred during the Base Period (in conjunction with Mr. Deselich), (2) the non-labor expenses associated with Energy Supply services that were incurred during the Base Period, and (3) the non-labor known and measurable adjustments made to Adjusted Base Period data associated with Energy Supply services to reach the Future Test Year Period data. Attachment DAL-1 to my direct testimony is an excerpt from Ms. Niemi's Attachment SNN-10, Tabs 4 and 5.

[17] *See* 17.1.3.6 NMAC; 17.1.3.14 NMAC; 17.1.3.17 NMAC; 17.1.3.18 NMAC.

[18] *See* 17.1.3.17(A) NMAC; 17.1.3.17(D) NMAC.

Q. What FERC accounts and FERC subaccounts are captured within the Energy Supply O&M expenses?

A. Table DAL-2 identifies the FERC accounts and FERC subaccounts included within the Energy Supply O&M expenses. A more detailed description of these FERC accounts can be found at 18 C.F.R. § 101 (2022).

Table DAL-2
FERC Accounts and FERC Subaccounts for Energy Supply O&M Costs

FERC Account or FERC Subaccount	Account Description
500	Operation Supervision and Engineering
502	Steam Expenses
505	Electric Expenses
506	Miscellaneous Steam Power Expenses
507	Rents
510	Maintenance Supervisions and Engineering
511	Maintenance of Structures
512	Maintenance of Boiler Plant
513	Maintenance of Electric Plant
514	Maintenance of Miscellaneous Steam Plant
546	Operation Supervision and Engineering
548	Generation Expenses
549	Miscellaneous Other Power Generation Expense
550	Rents
551	Maintenance Supervision and Engineering
552	Maintenance of Structures
553	Maintenance of Generating and Electric Plant
554	Maintenance of Miscellaneous Other Power Generation Plant
560	Operation Supervision and Engineering
562	Station Expenses

FERC Account or FERC Subaccount	Account Description
556	Miscellaneous Transmission Expenses
575.1	Operation Supervision
583	Overhead Line Expenses
586	Meter Expenses
588	Miscellaneous Distribution Expenses
590	Maintenance Supervision and Engineering
593	Maintenance of Overhead Lines
902	Meter Reading Expenses
903	Customer Records and Collection Expenses
905	Miscellaneous Customer Accounts Expenses
910	Miscellaneous Customer Service and Informational Expenses
916	Miscellaneous Sales Expense
920	Administrative and General Salaries
921	Office Supplies and Expenses
923	Outside Services Employed
925	Injuries and Damages
926	Employee Pensions and Benefits
930.1	General Advertising Expenses
930.2	Miscellaneous General Expenses

Q. Do you detail the elements of cost included in each FERC accounts and subaccounts assigned to Energy Supply?

A. Yes. In Attachment DAL-1, Tab 1, column E, I identify the labor-related elements of cost for each FERC account and FERC subaccount for the Base Period. In Attachment DAL-1, Tab 2, column E, I identify the non-labor elements of cost for the Base Period and Adjusted Base Period, Linkage Period, and Future Test Year Period.

Q. Please explain what you mean when you use the term "elements of cost."

A. The Future Test Year Rule defines the phrase "elements of cost" to mean types of cost such as labor, materials, outside services, contract costs, important clearings, and all other types of cost combined as one category.[19] I use the term in this manner throughout my testimony.

Q. How did SPS arrive at the Linkage Period and Future Test Year O&M data generally?

A. SPS did not use budgeting to identify expected Linkage Period and Future Test Year Period O&M expenses, including Energy Supply expenses. Instead, SPS made specific and discrete known and measurable adjustments to the Adjusted Base Period O&M expenses to reflect changes SPS expects to occur during these future periods. So SPS adjusted the per book Base Period expenses first to ensure that the starting point for the discrete known and measurable adjustments in the Linkage Period and Future Test Year Period was appropriate.

[19] *See* 17.1.3.7(F) NMAC.

C. <u>Full Explanations, Justifications, and Support for Energy Supply Data</u>

Q. Does your testimony explain and justify quantities, assumptions, expectations, activity changes and the like associated with the Energy Supply data presented herein?

A. Yes. In this section of my testimony I fully explain, justify, and support the Energy Supply O&M data presented for the Base Period and Adjusted Base Period, the Linkage Period, and the Future Test Year Period.

Q. Does your testimony include full explanations and justifications of changes in Energy Supply O&M costs between the Adjusted Base Period, the Linkage Period, and the Future Test Year Period?

A. Yes. In this section of my testimony, I fully explain and justify changes between Energy Supply O&M costs for the Adjusted Base Period, the Linkage Period, and the Future Test Year Period.

1. Base Period and Adjusted Base Period

Q. What is the Base Period in this proceeding?

A. SPS's Base Period in this proceeding is the historical 12-month period beginning July 1, 2021 and ending June 30, 2022.

Q. Please summarize the expenses reflected in the FERC accounts, FERC subaccounts and elements of cost encompassed within the Base Period data sponsored by you.

A. The Energy Supply O&M expenses reflected in the FERC accounts, FERC subaccounts, and elements of cost identified on Attachment DAL-1 consist primarily of the costs associated with labor, incentive compensation, consulting, contract labor, miscellaneous other, and overhead. Attachment DAL-1, Tab 1 identifies all of the applicable FERC accounts, FERC subaccounts and associated labor-related elements of cost and expense amounts, while Attachment DAL-1, Tab 2 identifies all of the applicable FERC accounts, FERC subaccounts, and associated non-labor elements of cost and expense amounts.

Q. What were the actual labor-related expenses incurred by the Energy Supply group during the Base Period?

A. During the Base Period, the Energy Supply group incurred $41,379,949 of labor-related expenses on a total company basis, as reflected on Attachment DAL-1, Tab 1. Mr. Deselich presents labor-related expenses on a New Mexico Retail basis by FERC account or FERC subaccount.

Q. Did SPS adjust the Base Period labor-related O&M expenses to arrive at Adjusted Base Period amounts?

A. Yes. Mr. Deselich and Ms. Niemi discuss these adjustments in detail in their testimony.

Q. Were the Energy Supply labor-related expenses incurred during the Base Period reasonable and necessary?

A. Yes. The services provided by SPS and XES employees for the Energy Supply group are necessary to provide safe and reliable service to New Mexico retail customers. These employees were compensated during the Base Period at appropriate market levels, as discussed in detail by Mr. Deselich.

Q. What amount of Energy Supply non-labor O&M expenses did SPS incur during the Base Period?

A. During the Base Period, the Energy Supply group incurred $41,097,382 in non-labor O&M expenses on a total company basis. Ms. Niemi presents non-labor O&M expenses on a New Mexico Retail basis by FERC account and subaccount.

Q. Please summarize the expenses reflected in the FERC accounts or FERC account subcategories and the elements of cost encompassed within the Base Period data sponsored by you.

A. The FERC accounts and FERC subaccounts with recorded expenses in the Base Period are the ones I identified earlier in Table DAL-2. The non-labor O&M elements of cost are primarily materials and supplies, outside contractor costs, overhead costs, and other miscellaneous costs. Attachment DAL-1, Tab 2, Column E lists the element of cost associated with each expense recorded in the Base Period.

Q. Did SPS adjust the Base Period non-labor O&M expenses to arrive at Adjusted Base Period amounts?

A. Yes. SPS adjusted the Base Period non-labor O&M expenses in several FERC accounts. Those adjustments are reflected in Attachment DAL-1, Tab 2, Column G.

Q. Did SPS make any annualizations to the Base Period non-labor O&M expenses to arrive at the Adjusted Base Period amounts?

A. No.

Q. Did SPS make any normalizations to the Base Period non-labor O&M expenses to arrive at the Adjusted Base Period amounts?

A. Yes. SPS made several normalizations to the Base Period Energy Supply non-labor O&M expenses. First, SPS adjusted the generation overhaul expense in accordance with the stipulation in Case No. 19-00170-UT, in which the signatories agreed that "SPS's generation overhaul expense will be determined based on a four-year average."[20] SPS has accordingly calculated its generation overhaul expense in this case based on a four-year average, which is $8,041,896 on a total company basis, as shown in Table DAL-3:

[20] Case No. 19-00170-UT, Uncontested Comprehensive Stipulation at 7 (Jan. 13, 2020).

Table DAL-3
SPS Generation Overhaul Expense

Period	Generation Overhaul Expense Total Company
Jul 2018 – Jun 2019	$13,069,636
Jul 2019 – Jun 2020	$5,618,327
Jul 2020 – Jun 2021	$6,123,037
Jul 2021 – Jun 2022 (Base Period)	$7,356,582
Average	**$8,041,896**

SPS recorded the difference between the four-year average and the Base Period amount, which is $685,263, in the FERC accounts listed in Table DAL-4:

Table DAL-4

FERC Account	Amount of Generation Overhaul Expense Adjustment
502	$(48,972)
505	$5,706
506	$(18,960)
511	$33,661
512	$486,421
513	$304,010
514	$(95,868)
548	$(1,962)
553	$21,277
Total	**$685,263**

Q. Did SPS make any other normalization adjustments to develop the Adjusted Base Period non-labor O&M expense?

A. Yes. SPS normalized O&M expense to remove the liquidated damage payments that SPS received during the Base Period from its Original Equipment Manufacturer ("OEM") wind service provider, Vestas. The O&M service agreement between SPS and Vestas contains an "availability covenant" that provides a Projected Average Availability for a given production period. If the contractual Measured Average Availability is less than the Projected Average Availability for a given production period, Vestas owes availability damages to Xcel Energy.[21] Within the Base Period O&M, Vestas paid SPS approximately $12.5 million in liquidated damages because the Measured Average Availability was less than the Projected Average Availability. SPS witness Brooke A. Trammell explains in her direct testimony that these payments, which were recorded as a credit to Energy Supply O&M costs, are non-recurring payments and therefore must be eliminated from the cost of service. SPS has reversed the credit by adding $6,248,457 to FERC Account 549 and by adding $6,248,457 to FERC Account 554.

[21] Average availability is reflected in percentage of actual energy produced out of the sum of actual energy produced and energy deficit from downtime.

Q. Was it necessary to make any other normalization adjustments to arrive at the Adjusted Base Period amount of non-labor O&M expense?

A. Yes, although the third normalization adjustment had no effect on the Adjusted Base Period amount. During the Base Period, SPS received a Vestas invoice that classified all of the invoiced cost to FERC Account 549, Operations. SPS subsequently received an updated invoice outside of the Base Period that correctly allocated this cost between both FERC Account 549, Operations, and FERC Account 554, Maintenance. SPS has adjusted the Base Period amount in FERC Account 549 by $(975,216), and it has adjusted the Base Period amount in FERC Account 554 by $975,216.

Q. Did SPS make any known and measurable changes to the Base Period O&M expenses to arrive at the Adjusted Base Period amounts?

A. Yes. SPS made certain adjustments to eliminate or correct amounts incorrectly billed to a certain FERC account. Ms. Niemi discusses those business area adjustments in her direct testimony.

Q. Are there any other non-labor O&M expenses that would otherwise fall within the Energy Supply of which SPS is not seeking recovery or which the Commission's rules/orders exclude from recovery?

A. Yes. SPS eliminated brand and general advertising expense from FERC Account 930.1.

Q. Have you prepared an attachment showing the adjustments to arrive at the Adjusted Base Period amounts?

A. Yes. Attachment DAL-1, Tab 1, Column G identifies all of the adjustments made to the Energy Supply Base Period non-labor O&M amounts. As shown in that column, after all of the adjustments to the Base Period per book amounts, the Adjusted Base Period amount is $54,740,190 on a total company basis.

Q. Are the Energy Supply non-labor O&M expenses incurred during the Base Period as adjusted in the Adjusted Base Period and identified on Attachment DAL-1 reasonable and necessary?

A. Yes. The O&M services and associated costs are necessary to ensure that SPS's generation fleet, which is essential to providing electric service to SPS's customers, is safely and reliably operated and maintained. For example, these services are necessary to ensure that SPS's generation facilities comply with environmental regulations and receive sufficient technical support. Without the services provided by the Energy Supply business area, SPS would not be able to provide safe and reliable electric service to its customers.

2. Linkage Period

Q. What is the Linkage Period in this proceeding?

A. SPS's Linkage Period in this proceeding begins July 1, 2022 and ends June 30, 2023.

Q. What is "Linkage Data"?

A. The term "linkage data" refers to a specific and detailed description of all line items for the period of time between the end of the Base Period and the beginning of the Future Test Year Period required by the rule to create a "verifiable link" between Future Test Year Period data and Base Period data.[22] The rule states that linkage data does not constitute a test period, but instead is provided for the purpose of validating the information contained in the Future Test Year Period.[23]

Q. What are the estimated Energy Supply non-labor O&M expenses SPS expects to incur during the Linkage Period?

A. During the Linkage Period, Energy Supply expects to incur $51,946,292 on a total company basis.

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[22] 17.1.3.7(H) NMAC.

[23] *Id.*

Q. How were these amounts derived?

A. SPS used the Adjusted Base Period amounts for all FERC accounts and subaccounts except FERC Accounts 549 and 554. For those two FERC accounts, SPS adjusted the Adjusted Base Period amounts to account for reductions that I discuss below.

Q. Please summarize the expenses reflected in the FERC accounts, FERC subaccounts, and elements of cost encompassed within the Linkage Period data sponsored by you.

A. The FERC accounts, FERC subaccounts, and elements of cost in the Linkage period are largely the same as those identified in the Base Period. Further, the expenses reflected in these accounts are largely the same. Attachment DAL-1, Tab 2 identifies all of the applicable FERC accounts, FERC subaccounts, elements of cost, and expense amounts.

Q. Please explain the changes between the Adjusted Base Period and Linkage Period for Energy Supply non-labor O&M expenses.

A. As I discussed earlier, SPS has entered into contracts with Vestas for the operation and maintenance of SPS's wind facilities. Those contracts contain either increases or reductions in the agreed-upon cost, depending on how long the plant has been in service, and the scope of work within the service contract for the specified year of operation. For the Linkage Period, the amount paid to Vestas will decline by approximately $2.76 million. SPS has adjusted the Adjusted Base Period amount in FERC Account 549 by ($1,379,893) and has adjusted the amount in FERC Account 554 by ($1,379,893). Please see Attachment DAL-1, Tab 2, Column I.

Q. Have you provided a specific and detailed description of all line items for the Linkage Period data sponsored by you?

A. Yes. Please see Attachment DAL-1, Tab 2.

Q. Are the Energy Supply non-labor O&M expenses SPS expects to incur during the Linkage Period as identified on Attachment DAL-1 reasonable and necessary?

A. Yes. The O&M services and associated costs are necessary to ensure that SPS's generation fleet, which is essential to providing electric service to SPS's customers, is safely and reliably operated and maintained. For example, these services are necessary to ensure that SPS's generation facilities comply with environmental regulations and receive sufficient technical support. Without the services provided by the Energy Supply business area, SPS would not be able to provide safe and reliable electric service to its customers.

Q. Is the Linkage Period data presented in a way that provides a reasonable approximation of jurisdictional amounts for Future Test Year Period comparison purposes?

A. Yes. As explained by Ms. Niemi, the Future Test Year Period jurisdictional allocators were applied to the Linkage Period data presented in Attachment DAL-1.

Q. Does the Linkage Period provide verifiable information that allows Commission Staff and Intervenors to assess the validity of the information contained in the Future Test Year Period discussed in the next section of your testimony?

A. Yes. The linkage data presented provides the necessary support to link the Future Test Year Period amounts to the Adjusted Base Period amounts.

3. Future Test Year Period Data

Q. What is the Future Test Year Period?

A. SPS's Future Test Year Period in this proceeding is the 12-month period beginning July 1, 2023 and ending June 30, 2024.

Q. What are the expected Energy Supply non-labor O&M expenses included in the Future Test Year Period that SPS is requesting recovery of in this case?

A. During the Future Test Year Period, Energy Supply expects to incur $50,902,798 on a total company basis.

Q. How were these amounts derived?

A. For the most part, SPS used the Adjusted Base Period amounts of non-labor O&M expenses. SPS made certain adjustments to account for changes in costs paid to Vestas and to reflect changes in service lives of generating facilities.

Q. Was the method used in developing the Future Test Year Period non-labor O&M expenses based on Energy Supply's most recently available data?

A. Yes. As explained in the previous answer, most of the Future Test Year Period non-labor O&M amounts are based on the actual Adjusted Base Period amounts.

Q. How, if at all, do the non-labor O&M amounts used in the Future Test Year Period relate to the Linkage Period non-labor O&M amounts?

A. The amounts for the Future Test Year Period are the same as the Linkage Period, except for the reductions necessary to reflect accurate generation overhaul expense and the reductions in wind services provider costs.

Q. Please explain the changes between the Linkage Period Energy Supply O&M expenses and the Future Test Year Period expenses.

A. Similar to the adjustment made in the Linkage Period, SPS reduced the cost by $1.02 million to reflect the changes in amounts to be paid to Vestas for the operation and maintenance of Sagamore Wind Generation Facility ("Sagamore") and Hale

Wind Generation Facility ("Hale"). SPS has adjusted the Linkage Period amount in FERC Account 549 by ($511,020) and in FERC Account 554 by ($511,020).

Q. How, if at all, do the amounts used in the Future Test Year Period relate to the Adjusted Base Period amounts?

A. As explained earlier, the Future Test Year Period amounts are similar to, but lower than, the Adjusted Base Period amounts.

Q. Are the FERC accounts, FERC subaccounts, and elements of cost used for the Future Test Year Period the same or similar to those appearing in the Base Period and Linkage Period?

A. Yes.

Q. Please summarize the expenses reflected in the FERC accounts and FERC account subcategories and elements of cost encompassed within the Future Test Year Period data sponsored by you.

A. Attachment DAL-1 identifies all of the applicable FERC accounts, FERC subaccounts, elements of cost and expense amounts.

Q. Were any expenses that would have otherwise fallen within the Energy Supply O&M expenses in the Future Test Year Period excluded from SPS's request for recovery?

A. No.

Q. Has SPS calculated the differences by FERC account or subaccount between the Adjusted Base Period and the Future Test Year Period?

A. Yes. My Attachment DAL-1 shows the differences by FERC account or subaccount between the Adjusted Base Period and the Future Test Year Period. That attachment contains:

1. a column showing expenditures during the Adjusted Base Period;[24]
2. a column showing the estimated expenditures during the Future Test Year Period;
3. a column showing the variance between the two; and
4. a column providing an explanation or reference to the written testimony that explains the differences between the Adjusted Base Period data and the Future Test Year Period estimates.

Q. What does the Future Test Year Period Rule deem a material variance in cost between the Adjusted Base Period and Future Test Year Period?

A. The Future Test Year Period Rule defines "material change" or "material variance" as a change or variance in cost between the Adjusted Base Period and Future Test Year Period for a FERC account that exceeds 6% and $100,000 Total Company.[25]

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[24] As described in Note 9 above, SPS has focused on Adjusted Base Period amounts here, rather than Base Period amounts, to ensure an apples-to-apples comparison.

[25] *See* 17.1.3.7(J)(1) NMAC.

Q. Did the Energy Supply non-labor O&M costs contribute to any material changes between the Adjusted Base Period and Future Test Year Period?

A. Yes. The Energy Supply group's non-labor O&M costs in FERC Accounts 549 and 554 fell approximately 22% between the Adjusted Base Period and Future Test Year Period.

Q. Please separately identify, explain, and justify the cost driver(s) for each material change and link it to the Adjusted Base Period and Future Test Year Period data.

A. As I explained earlier, the contracts under which Vestas operates and maintains SPS's wind facilities have incremental step-down provisions. The cost reductions resulting from the step-down provisions in the Vestas contracts are the cost drivers of the decrease in non-labor O&M expense between the Adjusted Base Period and Future Test Year Period.

Q. Are these Energy Supply O&M expenses reasonable and necessary?

A. Yes. As shown in Attachment DAL-1, SPS forecasts that its Energy Supply non-labor O&M expenses will be less in the Linkage Period than in the Adjusted Base Period, and the costs will be even lower in the Future Test Year Period. This trend is dependent on the actual flexible dispatch of the Tolk units in response largely to gas prices, which are variable and outside of SPS's direct control. I discuss this more in the next section of my testimony.

V. CHANGES IN PLANT LIVES

Q. Is SPS seeking approval to change the service lives of any of its generating facilities?

A. Yes. SPS is seeking Commission approval:

- to abandon and retire Plant X Units 1 and 2 and Cunningham Unit 1 in 2023;
- for authority to abandon and retire coal operations at Tolk by December 31, 2028; and
- to extend the service lives of Nichols Units 1 and 2 by six years and four years, respectively.

Q. Why is SPS seeking approval to abandon Plant X Units 1 and 2 in 2023?

A. Plant X Units 1 and 2 have been in service since 1952 and 1953, respectively, and they have reached the end of their approved, and greatly extended, service lives. It is no longer economic to operate those units because of their age, high heat rates, and operational condition. In addition, both Plant X Units 1 and 2 have equipment conditions that have caused SPS to place them into forced outages, and it is uneconomic to return the units to safe operation.

Q. What effect, if any, will retiring Plant X Units 1 and 2 in 2023 have on the Energy Supply fixed O&M costs?

A. It will have little or no effect on fixed O&M costs because Plant X Units 1 and 2 operated very little during the Base Period. Moreover, Plant X Unit 4 will continue to operate, so SPS cannot reduce the operations personnel at the plant. Currently, at any given time, SPS has one Control Room A Operator in the control room and one Control Room B Operator for outside plant operations. That very low staffing is the result of SPS's long-term plan to reduce the work force in preparation for the retirement of those units. In addition, the infrastructure of the facility has many common systems that will need to be maintained, such as auxiliary boilers, building heating and air equipment, house lighting, potable water system equipment, reverse osmosis equipment, the chemistry lab, the circulating water system on the cooling tower for fire protection, a common turbine deck for all four units, the compressed air systems, and the shop and building maintenance.

Q. Why is SPS seeking approval to abandon and retire Cunningham Unit 1 in 2023?

A. Cunningham Unit 1 has been in service since 1957 and has reached the end of its approved, and greatly extended, service life. Like the Plant X Units, Cunningham Unit 1 is no longer economic to operate because of its age, high heat rates, and operational condition. Cunningham Unit 1 has equipment conditions that caused SPS to place it in forced outage, and it is uneconomic to return to safe operation.

Q. What effect, if any, will retiring Cunningham Unit 1 in 2023 have on the Energy Supply fixed O&M costs?

A. Like Plant X Units 1 and 2, Cunningham Unit 1 operated very little during the Base Period. The operators currently employed at the plant will be needed to continue operating Cunningham Units 2, 3 and 4. Similar to the Plant X facility, at any given time, SPS has only one Control Room A Operator in the control room and one Control Room B Operator for outside plant operations at Cunningham, which also is a result of the long-term plan to reduce the work force in preparation for the retirement of those units. Finally, the same types of common systems that I discussed earlier in connection with Plant X Units 1 and 2 must be operated and maintained at the Cunningham station.

Q. Please describe SPS's proposal to extend the service lives at Nichols Units 1 and 2.

A. SPS proposes to extend the service life of Nichols Unit 1 from 2022 to 2028, and it proposes to extend the service life of Nichols Unit 2 from 2023 to 2027.

Q. Why is SPS proposing to extend the service lives of the Nichols units?

A. The sharp increase in renewable resources over the past decade has increased the need for dispatchable gas units in the Southwest Power Pool footprint. The growth in renewables has resulted in a significant increase in cycling at both Nichols Units 1 and 2, particularly since the start of the Southwest Power Pool Integrated Marketplace. In addition, as discussed in the testimony of SPS witnesses Jarred J. Cooley and Ben R. Elsey, the Southwest Power Pool has increased the required minimum planning reserve margin that utilities must achieve from 12% to 15% beginning in 2023, creating an immediate increase in SPS's planning reserve requirement by an additional 123 MWs in 2023. Although increased cycling adds more wear and tear to Nichols Units 1 and 2, those units have enabled SPS to provide customers with more wind and other low-cost generation. Extending the retirement dates is a low-cost option to provide continued support to the SPS system and to help address the increased planning reserve requirement imposed by the Southwest Power Pool.

Q. If the Commission approves SPS's proposal to extend the service lives of the Nichols units, will that affect the Energy Supply fixed O&M expense?

A. The plant personnel will remain about the same regardless of these service life extensions because Nichols 3 and the water treatment facility that serves Nichols and Harrington Station common plant will need to continue operating. However, overhaul inspections will continue until retirement, and some capital work will be required to keep those units in good operating condition. As I explained earlier in connection with retirements of units at Plant X and Cunningham, the retirement of fewer than all units at a generating station does not result in material fixed O&M savings because the remaining units and common areas must be operated and maintained. Conversely, extending the lives of units does not materially affect fixed O&M costs because SPS would be operating and maintaining the remaining units and common areas anyway.

Q. Why is SPS seeking Commission approval to cease coal operations at Tolk in 2028?

A. As discussed by SPS witness Richard L. Belt, SPS forecasts that it will not have adequate groundwater from the Tolk wellfield to continue operating the Tolk facility as a coal-fired generating facility after 2028, especially given the increased cycling that Tolk has experienced as gas prices have risen.[26] In addition, SPS anticipates that other forms of generation will become more economical in light of new federal laws that provide tax incentives for renewable resources. Accordingly, SPS will manage the retirement of coal generation at Tolk in a safe and reliable

[26] SPS does plan to continue operating the synchronous condenser facilities at Tolk after 2028 to provide voltage stability in the region.

manner. Ms. Trammell, Mr. Belt, and Mr. Elsey discuss SPS's proposal to cease coal operations at Tolk in more detail, including the intention to run as much as 4,000 gigawatt-hours per year, which would be an increase over recent output.

Q. If Tolk operates at higher output levels going forward, will that affect the variable O&M expense at Tolk?

A. Yes. SPS expects that higher output will result in higher variable O&M expense for a number of reasons:

- The water needed to operate the facility is pumped from a wide area around the facility, and the additional cost to procure that water could exceed $500,000 per year.
- With the additional water required to operate the plant, the water treatment necessary would generate lime and would require additional pond clean out every other year, which would cost approximately $200,000 every two years.
- Increased operation of the units would require additional short outages to conduct an air preheater wash to remove ash pluggage, to grit blast the final superheater from excessive ash buildup, to utilize vacuum trucks to remove excessive ash from the baghouse, and to conduct a bag inspection and possible heat exchanger cleaning.
- Increased output would cause outside service and material cost to increase along with chemical usage.
- Coal mill maintenance costs would increase to produce the coal fineness necessary to achieve good environmental and heat rate performance.

In total, to maximize Tolk generation for higher levels of output, SPS expects approximately $4 million (Total Company) in additional variable O&M expense annually.

Q. Is any of that incremental $4 million (Total Company) of variable O&M expense included in the cost of service in this case?

A. No, it is not. The incremental cost will vary in accordance with the output of Tolk, which will be dependent upon natural gas prices and to some extent dispatch instructions from Southwest Power Pool, so it is hard to predict. Ms. Trammell describes SPS's proposal to recover the incremental variable O&M costs associated with Tolk.

VI. SPS POWER PLANT O&M PROGRAMS

Q. Please describe SPS's O&M programs for the Energy Supply group.

A. SPS employs a number of O&M programs to maintain reliability, control costs and ensure generation efficiency, including:

- scheduled routine maintenance practices;
- predictive maintenance practices;
- performance assurance programs; and
- training of maintenance personnel and plant operators.

These activities, which are consistent with industry practices, reduce O&M expenditures while maximizing unit availability This allows SPS to optimize generation through increased use of the most cost-effective units, which results in reliable service to SPS customers with an efficient use of financial resources.

A. Scheduled Maintenance Practices

Q. Please describe SPS's power plant maintenance program.

A. SPS uses a computerized maintenance information system software program to manage its power plant maintenance activities. This system integrates: (1) maintenance requests submitted by power plant personnel; (2) maintenance progress tracking; (3) man-hour time reporting; (4) parts inventory management; (5) scheduled maintenance; and (6) maintenance history. It also enables operators, maintenance personnel, engineers and other technical staff to identify, prioritize, plan, coordinate, and schedule maintenance activities for power plants. This system allows SPS operators and maintenance personnel to work together as a team toward the common goals of minimizing operating costs, maximizing unit availability, and complying with environmental regulations. Additionally, SPS uses project management software programs such as PLEXOS, Microsoft Project, and Primavera P6 to ensure efficient maintenance scheduling.

Q. Please describe SPS's scheduled maintenance practice.

A. SPS uses an equivalent nine-year cycle on its major component inspections unless specific circumstances warrant more or less frequent inspections. Under this practice, SPS inspects all components in a turbine within a nine-year cycle of equivalent operating time. Actual durations vary, and SPS may inspect more or less often if component history, industry information, component assessment, projected retirements, and unit operations warrant an extension or reduction in the duration.

SPS maintains its turbine generators on a component basis. Instead of a less frequent complete unit major overhaul (which involves disassembly, inspection, and repair of all major components of the turbine-generator at once), SPS overhauls individual sub-components of the turbine generator on a more frequent basis, which allows for more stable maintenance costs from year to year and provides a higher average level of unit availability. Additionally, SPS inspects and overhauls boilers on a three-year cycle. When a unit must be shut down for boiler maintenance, SPS may take advantage of that outage to perform component turbine or generator maintenance as well.

Q. Is the overhaul frequency the same for all units?

A. No. SPS generally follows manufacturers' recommendations for both steam and combustion turbines, but some units are scheduled for maintenance on a more frequent basis due to operational concerns or the nature of the unit design specifications. SPS has a combustion turbine maintenance system that tracks the hours of operation and number of starts and trips, and the system correlates that information with total hours of operation. When a unit reaches the OEM's recommended hours of operation, SPS performs maintenance inspection and repairs. SPS uses a similar method of tracking maintenance requirements for steam turbines. Additional hours of operation are added to the total hours when the units are cycled.

Q. You testified earlier that SPS overhauls individual sub-components of a turbine generator more frequently than it performs a general overhaul, which provides a higher level of unit availability. Can you provide examples?

A. Yes. One example of a change to SPS's overhaul frequency due to the nature of a unit's design specifications occurred with respect to the Harrington Unit 1 throttle valves during the February 2022 overhaul. Based on the OEM's recommendation, SPS modified the valves with improved internal parts that will prevent the valves from malfunctioning when they are required to close. With the new internal parts installation, the inspection time will be extended from 39 to 60 operating months. The new design materials eliminate deposits forming on the valves and improved positive sealing, which allows for safer operation of the high pressure/intermediate pressure turbine.

Another recent example occurred on the Maddox 1 overhaul, which had an original throttle valve design. During a Unit 1 overhaul in 2022, SPS installed a new stem and bushing material upgrade, which will extend the life of the throttle valve operation and reduce the likelihood of seizing up the parts from blue blushing.

Q. How does SPS's scheduled maintenance practice affect system operations?

A. Scheduling outages on a component basis rather than incurring a complete unit outage results in higher availability because problems that occur due to normal degradation can be identified and corrected much sooner and with less disruption to the plant as a whole. In addition, the manpower needs for a component outage are less than for a major outage. This reduces the need for outside contractors or higher internal staffing levels for scheduled outages. The ability to minimize the scheduled outage time of units provides more options to minimize costs to SPS's customers by increasing efficiency and maintaining the availability of these units. Minimizing outage times also provides SPS with more options to meet load and increases system reliability.

B. Predictive Maintenance Practices

Q. What is predictive maintenance?

A. Predictive maintenance refers to the process of analyzing equipment operations for degradation and performing maintenance at a cost-effective time, prior to failures that could be more costly. If SPS performs maintenance too frequently, reliability remains very high, but maintenance costs can be higher than required for that level of reliability. If SPS performs maintenance too infrequently, problems can go undetected and unaddressed – resulting in decreased reliability and increased repair costs once the problem emerges. SPS is a strong proponent of taking a proactive approach with our predictive maintenance programs, rather than simply reacting to failures.

Q. Please describe the tools SPS uses in its predictive maintenance program.

A. SPS uses numerous programs and tools to help identify problems before forced outages occur:

- Performance Assurance Program – Under this program, SPS evaluates the steam turbine and the parameters of the steam turbine cycle to detect problems that may require maintenance. This program, which is designed to prevent problems that may result in a forced outage, allows the maintenance department to gather data from the performance test and act on that data by, for example, ordering parts and materials in preparation for an anticipated outage. I discuss the Performance Assurance Programs in more detail later in my testimony.
- Valve Wide Open Test – As part of the performance assurance program, SPS performs a Valve Wide Open Test with the unit on-line. The information obtained from this test allows the Analytics & Practices organization or power plant personnel to quantify the amount of degradation that has occurred since previous tests. If the level of degradation is large, then plant personnel can spend the needed time during the outage to identify and resolve any problems. With the valve wide open test results plant personnel can preplan repairs for the next outage. Heat balance tests have historically been scheduled every two to

three years depending on the outage schedules for the major units (i.e., those greater than 200 megawatts ("MW")). SPS implemented online thermal performance monitoring on these units to provide near real-time monitoring of thermal performance and equipment degradation, as well as predictive analytics to highlight deviations from expected performance. In the absence of online thermal performance monitoring, alternative methods of heat rate and efficiency evaluation will still be employed on three-year intervals. This ensures that the units with the greatest effect on fuel costs are tested frequently. Minor units that have high-capacity factors are scheduled for heat rate evaluation approximately every five years depending on need and resource availability. Peaking and low-capacity factor units are not routinely tested because their use is based on the need for capacity and not on economical generation.

- Steam Path Analysis – SPS uses this tool for corrective and predictive maintenance purposes. During a scheduled turbine outage SPS thoroughly inspects the steam-path areas of the turbine. By taking precise measurements and conducting a detailed inspection, SPS evaluates the components evaluated for wear, deposit buildup, foreign object damage, and steam leakage. This helps identify components that should be replaced to prevent a forced outage or improve the efficiency of the unit. The Steam Path Analysis is also used to justify the cost of repairs of the unit.

- Vibration Monitoring – SPS uses vibration monitoring as another predictive maintenance tool. Because vibration is recognized as an early indicator of problems in rotating machinery, SPS has installed continuous vibration detection and protection on critical equipment, such as large turbine generators, large boiler feed pumps and cooling tower fans. SPS collects computerized periodic vibration data to monitor and trend vibration problems.
- Magnetic Particle Nondestructive Examination – SPS has invested in nondestructive examination capabilities by training and qualifying employees in magnetic particle nondestructive examination. This enables SPS to determine the condition of components in a power plant without damage to the component being inspected. SPS has the capability to use several qualified nondestructive examination techniques, such as magnetic particle, dye penetrant, ultrasonic, eddy current, and x-ray. Each technique has a special application to identify components that could cause failure.

- Generator Tagging – Generator tagging is another useful predictive tool that can provide early information of localized overheating in the generator. When used on the gas-cooled generators at Jones, Tolk, and Harrington, generator tagging involves painting or tagging different locations in the generator with various tagging compounds. If localized overheating occurs while the unit is on-line, a generator condition monitor senses the condition and gives an alarm to the operator. SPS can then take a gas sample from the generator containing molecules of the burned tagging compound and determine the location of the overheating before entering the generator. This advanced warning system not only minimizes generator damage in the event of overheating, but also assists maintenance personnel in determining the location of the overheating and the steps to correct the overheating before disassembly of the generator.
- Dissolved Gas and Oil Testing – This predictive maintenance tool, which is used for transformer condition assessment, enables SPS to identify localized overheating and insulation defects in oil-cooled transformers at the incipient stage so that repairs can be planned in conjunction with a scheduled outage of the unit. Early awareness of potential localized burning in the transformer can

help prevent catastrophic forced outages of generating units. This testing involves taking oil samples from the transformer for evaluation by SPS's analytical chemistry lab for the presence of several gases, as well as degradation of insulation materials. SPS uses information about how the different gaseous compounds are formed and trending analyses to interpret the data and to detect problems before failure. Another tool that is being installed on several of the large transformers is the Dissolved Gas Analyzers which gives real time operational information to the operator. The analyzer helps determine the types of abnormal events that may be occurring within the main tank. Monitoring for key gas provides an early indication of most abnormal operating conditions that may occur in the main tank.

- Lubrication Oil Testing – In addition to testing transformer oil, SPS samples and tests lubrication oils for the plants once per year for indication of oil degradation and unusual machine wear. Analyses include measuring oxidation resistance and identifying the presence of wear metals. In addition to yearly testing, SPS tests major rotating equipment at least every six months at all facilities for indication of corrosion or contamination.

- Plant Water Chemistry – SPS analyzes water samples to predict areas for corrective action. Automatic analyzers constantly measure the quality of the boiler feedwater, boiler water, and steam, and they detect small amounts of impurities that, when immediately addressed, prevent costly long-term damage to the boiler and turbine equipment. SPS takes water samples from every water source in each plant for indication of operational and maintenance problems, as well as unusual corrosion conditions.
- Insulation Resistance Testing – Another predictive maintenance tool SPS uses is insulation resistance testing of motors, which is performed by applying a high voltage (at least twice the rated voltage) direct current to the motor windings. SPS conducts the test on motors during a scheduled outage, and the data obtained provides three alternative courses of action. If the data shows the insulation to be in good condition, then no action is necessary, and repeat testing can be done at the next scheduled outage. If the data shows marginal results, SPS disassembles, cleans, and retests the motor. Finally, if the data indicates an imminent failure, SPS repairs or replaces the motor. The advantage of this predictive tool is that SPS can perform repairs during a scheduled outage, which avoids a forced outage.

C. Performance Assurance Programs

Q. Please explain SPS's performance assurance programs.

A. SPS undertakes performance assurance programs to achieve optimum operating efficiency of power generating facilities.

Q. Please summarize SPS's policy relating to efficient operation of its plants.

A. SPS maintains an ongoing policy of monitoring its power plant performance, improving unit efficiency, and determining cost-effective ways to save on fuel and base rate costs for its customers. The Performance Optimization department monitors performance and recommends changes to enhance the operational performance of SPS's power plants. This group evaluates unit operational conditions and identifies opportunities to improve availability and reduce process emissions based upon design and/or best achievable conditions. Over the years, SPS has developed performance assurance practices to maximize efficiencies by studying and evaluating the latest technologies in plant maintenance and/or operations. These technologies are then adapted to the unique power plant designs in SPS's system if technically and economically feasible.

The application of performance assurance practices to optimize power plant efficiency, availability, and reliability is not new to SPS. Since the early 1950s, SPS has had performance assurance practices in place to ensure that it can generate electricity reliably at the lowest reasonable cost. These practices have resulted in an increasingly sophisticated testing program to monitor and improve power plant efficiency. The following is a list of the various testing and analytical services that SPS's performance testing staff currently provides:

- Power Plant Thermal Performance – Unit Cycle Testing;
- Development of Dispatch Performance Curves;
- Component Testing;
- Environmental Emissions Testing; and
- Independent Power Producing Facilities Capacity Testing.

Q. What indicators are available to monitor plant equipment and process performance?

A. Heat rates, unit availability, and process emissions are the primary indicators of unit performance. Equipment performance and reliability is monitored through online condition monitoring (vibration, temperatures, pressures, etc.) and route-based condition monitoring (vibration data collection, motor testing, thermography, etc.). I discuss some of those indicators, which SPS uses in assessing the performance of its generation fleet, in a later section of my testimony.

Q. Please describe what you mean when you refer to heat rates.

A. Heat rate is a measure of the efficiency of a unit. There are two types of heat rates. One is the Average Load Operational Net Heat Rate, which is defined as the fuel consumption in British thermal units ("Btu") divided by the net generation in kilowatt hours. Both the fuel consumption and the net generation are totals for the applicable time period. The Average Net Heat Rate calculation is affected by several factors such as unit loading, measured generation, measured fuel consumption, measured fuel heating value, and overall process degradation.[27]

The second type of heat rate is the Average Load Adjusted Design Net Heat Rate, which is the heat rate at the average load adjusted for major equipment performance degradation and/or deviation from the manufacturers' design when the equipment was placed in service. This value approximates a unit's best achievable heat rate at the present time. To calculate the Adjusted Design Net Heat Rate, SPS first determines the monthly average loads for each unit and then compares them against original design heat rate curves for the units. SPS then applies adjustments to correct for degradations to boiler and turbine efficiencies. The degradation

[27] The heat rate determination is subject to measurement errors due to several factors including: type of instruments used, number of test points collected, and condition of the equipment being tested. SPS works to minimize uncertainties associated with power and fuel measurement through frequent calibration of measurement devices and installation of more accurate measurement devices.

factors are time-based factors related to unit age and time between overhauls. Adjusted design fuel usage is calculated on a monthly basis and then totaled for all months. The total adjusted design fuel usage is then used along with the total MW-hours to calculate the overall adjusted design heat rate values for the Base Period.

Q. Does the heat rate of a generating unit deteriorate over time?

A. Yes.

Q. Why does that deterioration occur?

A. There are many factors that cause the efficiency of a generating unit to deteriorate, causing plant performance to become less optimal over time:

- Deposits, erosion, and foreign object damage to turbine rotating and stationary blading;
- Excessive seal clearances on the turbine blading, which allow steam to bypass the blading;
- Buildup of deposits on and between boiler tubing, which reduces heat transfer and increases fan horsepower requirements;
- Oxidation inside boiler tubes, which also reduces heat transfer through the tubes;
- Plugging and oxidation of air preheaters, which reduce heat transfer from flue gas to incoming air and also increase required fan horsepower;
- Oxidation and deposits on (and/or in) feedwater heater tubes, which reduce heat transfer from the extraction steam to the feedwater;

- Erosion or holes, or both, on the partition plates in feedwater heaters, which allows feedwater to bypass the heaters;
- Pump performance degradation due to increased seal clearances and/or impeller erosion;
- Corrosion of inner surfaces of piping, which increases friction loss;
- Steam or high-energy water leaking through valves and/or steam traps, which develop leaks over time;
- Oxidation and deposit buildups on condenser tubes, which reduce heat transfer through the tubes; and
- Deterioration of cooling tower due to ice damage, algae growth, and other issues, which reduces heat transfer between air and water.

Q. Is it possible to take steps to restore some of the lost efficiency?

A. Yes. For example, boiler tubes can be cleaned, turbine blade damage can be repaired, new turbine seals can be installed, and leaking valves and steam traps can be repaired or replaced. SPS currently has programs specifically designed to implement these tasks. Moreover, as described in this section, SPS works to maintain and improve the efficiency of its generating units.

Q. Are there any other programs SPS uses for performance assurance?

A. Yes. SPS uses a turbine steam-path analysis program and other performance test methods in its performance assurance program.

Q. Please describe the turbine steam-path analysis program.

A. The purpose of this ongoing program is to economically optimize the performance of steam turbines through sound maintenance practices. The analysis consists of two phases: (1) SPS collects and analyzes pre-inspection test data for indications of turbine performance degradation; and (2) during the overhaul, SPS makes numerous measurements and observations to further evaluate the condition of the turbine. After appropriate engineering and economic analyses are completed, SPS makes the repairs that are economically justified.

During the pre-inspection analysis, SPS analyzes the performance test data for the following steam-path problems: solid particle erosion, foreign object damage, deposits, and steam-path leakage. As problems are identified, SPS evaluates the extent of the damage and the probability of the component's failure, and SPS also determines the projected effect of these problems on fuel costs. Armed with this knowledge, SPS decides which to replace and which repair procedures to undertake. The pre-inspection information is then furnished to the plant maintenance department for scheduling repairs, ordering parts, and preparing repair procedures. During planned overhauls, SPS makes further inspections to determine the extent of damage and repairs required to bring the equipment back to design condition.

When the turbine is disassembled for inspection, SPS performs the following evaluations:

- Assessments of turbine nozzle and blade erosion and damage, with measurements taken for throat and pitch dimension, and establishment of the effect of these problems on the heat rate;
- Measurements to determine deposit thickness and the degree of coverage on nozzles and blades, along with the resulting effect of excessive deposits on heat rate; and
- Measurement of steam seal and steam packing clearances, and evaluation of the alignment of rotating and stationary components, along with the effect on the heat rate.

These measurements and calculated values are used to cost justify the repair and replacement of worn or damaged components.

Q. Please describe the other performance test methods SPS uses in its performance assurance program.

A. SPS also uses the following test methods in its performance assurance program:

- <u>The Unit Heat Rate Test.</u> SPS currently uses two different test methods to determine the net unit heat rates for its units – the input-output method and the heat balance method. As indicated previously, heat rate is a measure of unit efficiency.
- <u>The Variable Throttle Pressure Operation Test.</u> This test determines the operational mode that results in the optimum heat rate throughout the load

range. This testing helps define how boiler pressure can be reduced at lower loads to improve unit heat rate. Heat rate improves because: (i) there is less pressure drop across the turbine steam admission valves; and (ii) less power is required to pump the feedwater into the boiler drum.

- The Unit Equipment Condition and Efficiency Test. These tests measure energy in and energy out, and the results are compared with previous test results and/or design efficiency. For major plant equipment within the steam cycle, SPS periodically conducts efficiency tests to determine if there has been any degradation in the performance of the components, such as a boiler feed pump, condensate pump, compressor, cycle heat exchanger, or cooling tower. From the results of this test, SPS evaluates the costs and benefits associated with replacing or reconditioning equipment parts, which enables SPS to make informed decisions.

Q. What other technology does SPS use to monitor generating fleet performance?

A. The Energy Supply business area's Monitoring & Diagnostic ("M&D") Center was established in 2014 to monitor the performance and health of SPS's generating fleet. SPS uses monitoring and diagnostic technology to help detect plant abnormalities before they result in equipment failures and lost generation. The M&D Center offers the potential to improve plant reliability, optimize performance, and minimize repair costs. Tolk and Harrington have been monitored by the M&D Center since January 2014, and Jones Unit 1 and Unit 2 have been monitored by the M&D Center since September 2016. In addition, the M&D Center will be used to monitor wind turbines at Hale and Sagamore. The system monitors approximately 235 points of data for each turbine that will alert operations of any operational or mechanical issues. Hale is actively being monitored and Sagamore is in the process of getting into the system.

D. Training of Plant Operators and Maintenance Personnel

Q. Do SPS plant operators receive training in efficient operating practices?

A. Yes. Every Plant Operator receives training to operate the plant equipment reliably, efficiently, and safely. No operator is allowed to perform operating duties or is promoted to a higher level until successfully completing the required training and passing the appropriate tests. Each test consists of a written and demonstration portion.

Q. Briefly describe SPS's power plant training programs.

A. Power plant employees are required to complete an apprentice program that lasts three or four years, depending on the individual's progress. That program includes classroom, computer-based, programmed text, video, and on-the-job training. Apprenticeships are available in the areas of Operations, Maintenance, Electrical, Instrument, Technician, and Chemist Technician programs. Following apprentice training, power plant employees are provided ongoing training in their area of operations. SPS also provides operator refresher and scenario training on an on-going basis. Scenario training is conducted about once a month with a simulator to go through "what if" scenarios in the plant.

The Power Plant Engineer training program is designed to guide the new engineer through a six-year development plan with a goal to have a well-rounded power plant engineer ready to be considered for the full performance level Engineer "C" role by the end of the six-year period. The program is designed to take a relatively inexperienced engineer and expose that employee to all facets of power plant operations. It includes role-specific formal power plant training classes such as Power Plant Fundamentals, Heat Rate Analysis, Predictive Maintenance, and Equipment and Plant Balancing. This is followed by numerous training modules specific to the systems in the employee's assigned power plant. SPS also provides formalized rotational on-the-job training assignments in Operations, Maintenance, Environmental, and Chemistry. Additionally, SPS requires rotations outside the department, including at other power plants, and other engineering departments. To maximize the engineer's ability to work within the Xcel Energy accounting and budgeting environment, the training also covers the use of financial software systems. Other topics include numerous safety-related modules, time management, and project management. For professional development, the program includes a completion requirement of an Engineer-in-Training program. As components of the program are completed, participants become eligible for promotional consideration to Engineer "B" and "C" positions in the Plant Engineering and Technical Support organization. To assist in identifying and coordinating training, SPS has formed a Regional Training Activity Committee that includes at least one member from each power plant and from each of the following disciplines: Safety, Environmental, Engineering, Management, and Human Resources. This committee meets quarterly to discuss the training needs for each SPS plant.

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

A. Yes.

BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION

IN THE MATTER OF SOUTHWESTERN PUBLIC SERVICE COMPANY'S APPLICATION FOR: (1) REVISION OF ITS RETAIL RATES UNDER ADVICE NOTICE NO. 312; (2) AUTHORITY TO ABANDON THE PLANT X UNIT 1, PLANT X UNIT 2, AND CUNNINGHAM UNIT 1 GENERATING STATIONS AND AMEND THE ABANDONMENT DATE OF THE TOLK GENERATING STATION; AND (3) OTHER ASSOCIATED RELIEF, **SOUTHWESTERN PUBLIC SERVICE COMPANY,** **APPLICANT.**	)	**CASE NO. 22-00286-UT**

VERIFICATION

On this day, November 18, 2022, I, David A. Low, swear and affirm under penalty of perjury under the law of the State of New Mexico, that my testimony contained in Direct Testimony of David A. Low is true and correct.

/s/ David A. Low
DAVID A. LOW

Southwestern Public Service Company

Energy Supply O Expenses

General O&M Labor

Witness	Business Area	FERC Account	Account Description	Cost Element	Total Company Base Period July 1, 2021 - June 30, 2022
Low	Energy Supply	500000	Operation supervision and engineering	INCENTIVE	229,483
				LABOR	3,285,565
		500000 Total			**3,515,047**
		502000	Steam expenses	INCENTIVE	161,817
				LABOR	6,722,549
		502000 Total			**6,884,366**
		505000	Electric expenses	INCENTIVE	123,301
				LABOR	5,094,387
		505000 Total			**5,217,688**
		506000	Miscellaneous steam power expenses	INCENTIVE	459,093
				LABOR	8,304,247
		506000 Total			**8,763,340**
		510000	Maintenance supervision and engineering	INCENTIVE	24,742
				LABOR	551,474
		510000 Total			**576,216**
		511000	Maintenance of structures	INCENTIVE	32,450
				LABOR	1,099,486
		511000 Total			**1,131,936**
		512000	Maintenance of boiler plant	INCENTIVE	189,697
				LABOR	5,213,786
		512000 Total			**5,403,483**
		513000	Maintenance of electric plant	INCENTIVE	88,141
				LABOR	2,709,242
		513000 Total			**2,797,383**
		514000	Maintenance of miscellaneous steam plant	INCENTIVE	101,698
				LABOR	3,501,698
		514000 Total			**3,603,396**
		546000	Operation supervision and engineering	INCENTIVE	67,404
				LABOR	583,818
		546000 Total			**651,222**
		548000	Generation expenses	INCENTIVE	14,870
				LABOR	314,646

Southwestern Public Service Company

Energy Supply O Expenses

General O&M Labor

Witness	Business Area	FERC Account	Account Description	Cost Element	Total Company Base Period July 1, 2021 - June 30, 2022
		548000 Total			**329,515**
		549000	Miscellaneous other power generation expenses	INCENTIVE	11,070
				LABOR	121,637
		549000 Total			**132,708**
		551000	Maintenance supervision and engineering	INCENTIVE	74,674
				LABOR	603,509
		551000 Total			**678,183**
		552000	Maintenance of structures	INCENTIVE	2,895
				LABOR	98,012
		552000 Total			**100,907**
		553000	Maintenance of generating and electric plant	INCENTIVE	64,067
				LABOR	876,479
		553000 Total			**940,546**
		554000	Maint of misc other power generation plant	INCENTIVE	133
				LABOR	2,628
		554000 Total			**2,761**
		560000	Operation supervision and engineering	INCENTIVE	937
				LABOR	30,700
		560000 Total			**31,637**
		562000	Station expenses	LABOR	439
		562000 Total			**439**
		566000	Miscellaneous transmission expenses	LABOR	4
		566000 Total			**4**
		575100	Operation Supervision	LABOR	0
		575100 Total			**0**
		583000	Overhead line expenses	LABOR	1,120
		583000 Total			**1,120**
		586000	Meter expenses	LABOR	3,960
		586000 Total			**3,960**
		588000	Miscellaneous distribution expenses	LABOR	19
		588000 Total			**19**
		590000	Maintenance supervision and engineering	INCENTIVE	1,331

Southwestern Public Service Company

Energy Supply O Expenses

General O&M Labor

Witness	**Business Area**	**FERC Account**	**Account Description**	**Cost Element**	**Total Company Base Period July 1, 2021 - June 30, 2022**
				LABOR	12,398
		590000 Total			**13,729**
		593000	Maintenance of overhead lines	LABOR	1,881
		593000 Total			**1,881**
		902000	Meter reading expenses	LABOR	529
		902000 Total			**529**
		903000	Customer records and collection expenses	LABOR	583
		903000 Total			**583**
		905000	Miscellaneous customer accounts expenses	LABOR	3
		905000 Total			**3**
		910000	Miscell customer service and informational expense	LABOR	0
		910000 Total			**0**
		916000	Miscellaneous Sales Expense	LABOR	0
		916000 Total			**0**
		920000	Administrative and general salaries	INCENTIVE	51,761
				LABOR	470,147
		920000 Total			**521,908**
	Energy Supply Total				**41,304,512**
	Gas Systems	506000	Miscellaneous steam power expenses	LABOR	10
		506000 Total			**10**
		512000	Maintenance of boiler plant	LABOR	139
		512000 Total			**139**
		513000	Maintenance of electric plant	LABOR	1,096
		513000 Total			**1,096**
		549000	Miscellaneous other power generation expenses	LABOR	2
		549000 Total			**2**
		566000	Miscellaneous transmission expenses	LABOR	6
		566000 Total			**6**
		570000	Maintenance of station equipment	LABOR	585
		570000 Total			**585**
		575100	Operation Supervision	LABOR	0
		575100 Total			**0**

Southwestern Public Service Company

Energy Supply O Expenses

General O&M Labor

Witness	Business Area	FERC Account	Account Description	Cost Element	Total Company Base Period July 1, 2021 - June 30, 2022
		580000	Operation supervision and engineering	INCENTIVE	7,100
				LABOR	60,139
		580000 Total			**67,238**
		582000	Station expenses	LABOR	240
		582000 Total			**240**
		586000	Meter expenses	LABOR	3,351
		586000 Total			**3,351**
		587000	Customer installations expenses	LABOR	138
		587000 Total			**138**
		588000	Miscellaneous distribution expenses	LABOR	7
		588000 Total			**7**
		593000	Maintenance of overhead lines	LABOR	1,231
		593000 Total			**1,231**
		903000	Customer records and collection expenses	LABOR	365
		903000 Total			**365**
		905000	Miscellaneous customer accounts expenses	LABOR	3
		905000 Total			**3**
		910000	Miscell customer service and informational expense	LABOR	1
		910000 Total			**1**
		916000	Miscellaneous Sales Expense	LABOR	0
		916000 Total			**0**
		920000	Administrative and general salaries	LABOR	925
		920000 Total			**925**
	Gas Systems Total				**75,337**
Low Total					**41,379,849**

Southwestern Public Service Company

Energy Supply O Expenses

General O&M Non-Labor

Witness	Business Area	FERC Account	Account Description	Cost Element	Total Company: Base Period July 1, 2021 - June 30, 2022	Base Period Adjustments	Adjusted Base Period	Linkage Period Adjustments	Linkage Period July 1, 2022 - June 30, 2023	Future Test Year Period Adjustments	Future Test Year Period July 1, 2023 - June 30, 2024
Low	Energy Supply	500000	Operation supervision and engineering	CONSULTING	34,148						
				CONTR_LABR	15						
				CONTR_VEND	6,225						
				EMPLOY_EXP	99,409						
				MATERIALS	41,257						
				MISC_OTHER	19,801						
				OVERHEAD	1,076						
		500000 Total			**201,932**	**(327)**	**201,605**		**201,605**	**(32)**	**201,573**
		502000	Steam expenses	CONTR_LABR	26,497						
				CONTR_VEND	53,853						
				EMPLOY_EXP	196,097						
				MATERIALS	1,517,686						
				MISC_OTHER	3,199,333						
				OVERHEAD	22,074						
		502000 Total			**5,015,539**	**11,286**	**5,026,825**		**5,026,825**	**(12,886)**	**5,013,939**
		505000	Electric expenses	CONTR_LABR	(0)						
			$54,	CONTR_VEND	24,939						
				EMPLOY_EXP	50,779						
				MATERIALS	1,720,522						
				MISC_OTHER	1,396,735						
				OVERHEAD	21,255						
		505000 Total			**3,214,230**	**5,373**	**3,219,603**		**3,219,603**		**3,219,603**
		506000	Miscellaneous steam power expenses	CONSULTING	29,973						
				CONTR_LABR	133,240						
				CONTR_VEND	394,703						
				EMPLOY_EXP	537,479						
				MATERIALS	602,114						
				MISC_OTHER	1,049,106						
				OVERHEAD	20,398						
				TRANSPORT	409,256						
		506000 Total			**3,176,268**	**(951)**	**3,175,317**		**3,175,317**	**(4,625)**	**3,170,693**
		507000	Rents	MISC_OTHER	310						
		507000 Total			**310**		**310**		**310**		**310**
		510000	Maintenance supervision and engineering	CONTR_LABR	1,662						
				CONTR_VEND	5,428						
				EMPLOY_EXP	39,101						
				MATERIALS	158,128						
				MISC_OTHER	6,731						
				OVERHEAD	5,687						
		510000 Total			**216,738**	**(260)**	**216,478**		**216,478**		**216,478**
		511000	Maintenance of structures	CONTR_LABR	909,322						
				CONTR_VEND	593,817						
				EMPLOY_EXP	22,753						
				MATERIALS	948,054						
				MISC_OTHER	235,656						
				OVERHEAD	49,420						
		511000 Total			**2,759,021**	**26,186**	**2,785,208**		**2,785,208**	**(16,222)**	**2,768,986**
		512000	Maintenance of boiler plant	CONSULTING	7,986						
				CONTR_LABR	2,331,680						

Southwestern Public Service Company

Energy Supply O Expenses

General O&M Non-Labor

Witness	Business Area	FERC Account	Account Description	Cost Element	Linkage Period v. Adjusted Base Period ($)	Linkage Period v. Adjusted Base Period (%)	Material Variance? (by FERC Account)	Future Test Year v. Base Period ($)	Future Test Year v. Adjusted Base Period ($)	Future Test Year v. Adjusted Base Period (%)	Material Variance? (by FERC Account)
Low	Energy Supply	500000	Operation supervision and engineering	CONSULTING							
				CONTR_LABR							
				CONTR_VEND							
				EMPLOY_EXP							
				MATERIALS							
				MISC_OTHER							
				OVERHEAD							
		500000 Total			-	0%	FALSE	(358)	(32)	0%	FALSE
		502000	Steam expenses	CONTR_LABR							
				CONTR_VEND							
				EMPLOY_EXP							
				MATERIALS							
				MISC_OTHER							
				OVERHEAD							
		502000 Total			-	0%	FALSE	(1,600)	(12,886)	0%	FALSE
		505000	Electric expenses	CONTR_LABR							
			$54,	CONTR_VEND							
				EMPLOY_EXP							
				MATERIALS							
				MISC_OTHER							
				OVERHEAD							
		505000 Total			-	0%	FALSE	5,373	-	0%	FALSE
		506000	Miscellaneous steam power expenses	CONSULTING							
				CONTR_LABR							
				CONTR_VEND							
				EMPLOY_EXP							
				MATERIALS							
				MISC_OTHER							
				OVERHEAD							
				TRANSPORT							
		506000 Total			-	0%	FALSE	(5,575)	(4,625)	0%	FALSE
		507000	Rents	MISC_OTHER							
		507000 Total			-	0%	FALSE	-	-	0%	FALSE
		510000	Maintenance supervision and engineering	CONTR_LABR							
				CONTR_VEND							
				EMPLOY_EXP							
				MATERIALS							
				MISC_OTHER							
				OVERHEAD							
		510000 Total			-	0%	FALSE	(260)	-	0%	FALSE
		511000	Maintenance of structures	CONTR_LABR							
				CONTR_VEND							
				EMPLOY_EXP							
				MATERIALS							
				MISC_OTHER							
				OVERHEAD							
		511000 Total			-	0%	FALSE	9,964	(16,222)	-1%	FALSE
		512000	Maintenance of boiler plant	CONSULTING							
				CONTR_LABR							

Southwestern Public Service Company

Energy Supply O Expenses

General O&M Non-Labor

Witness	Business Area	FERC Account	Account Description	Cost Element	Total Company: Base Period July 1, 2021 - June 30, 2022	Base Period Adjustments	Adjusted Base Period	Linkage Period Adjustments	Linkage Period July 1, 2022 - June 30, 2023	Future Test Year Period Adjustments	Future Test Year Period July 1, 2023 - June 30, 2024
				CONTR_VEND	1,341,112						
				EMPLOY_EXP	78,182						
				MATERIALS	2,622,730						
				MISC_OTHER	27,431						
				OVERHEAD	152,363						
				REV_ELECT	200						
				TRANSPORT	1,829						
		512000 Total			**6,563,513**	**669,303**	**7,232,816**		**7,232,816**	**(168)**	**7,232,648**
		513000	Maintenance of electric plant	CONTR_LABR	1,187,384						
				CONTR_VEND	1,753,136						
				EMPLOY_EXP	57,968						
				MATERIALS	1,922,522						
				MISC_OTHER	65,631						
				OVERHEAD	99,514						
		513000 Total			**5,086,155**	**454,770**	**5,540,925**		**5,540,925**	**(12,527)**	**5,528,397**
		514000	Maintenance of miscellaneous steam plant	CONSULTING	222,034						
				CONTR_LABR	838,885						
				CONTR_VEND	755,286						
				EMPLOY_EXP	173,100						
				MATERIALS	1,488,814						
				MISC_OTHER	560,051						
				OVERHEAD	82,080						
				TRANSPORT	40,266						
		514000 Total			**4,160,516**	**(47,160)**	**4,113,356**		**4,113,356**	**(9,286)**	**4,104,070**
		546000	Operation supervision and engineering	CONSULTING	11,954						
				CONTR_LABR	39,929						
				CONTR_VEND	950						
				EMPLOY_EXP	43,618						
				MATERIALS	558						
				MISC_OTHER	10,813						
				OVERHEAD	736						
		546000 Total			**108,558**	**(4)**	**108,554**		**108,554**		**108,554**
		548000	Generation expenses	CONTR_LABR	24,707						
				EMPLOY_EXP	153						
				MATERIALS	112,611						
				OVERHEAD	4,868						
		548000 Total			**142,339**	**(1,962)**	**140,377**		**140,377**		**140,377**
		549000	Miscellaneous other power generation expenses	CONSULTING	3,238						
				CONTR_VEND	3,021,143						
				EMPLOY_EXP	26,573						
				MATERIALS	15,925						
				MISC_OTHER	179,563						
				OVERHEAD	113,854						
				TRANSPORT	28,392						
		549000 Total			**3,388,687**	**5,273,089**	**8,661,776**	**(1,379,803)**	**7,281,973**	**(511,020)**	**6,770,953**
		550000	Rents	MISC_OTHER	4,480,390						
		550000 Total			**4,480,390**		**4,480,390**		**4,480,390**		**4,480,390**
		551000	Maintenance supervision and engineering	CONTR_LABR	75,469						
				CONTR_VEND	1,712						

Southwestern Public Service Company

Energy Supply O Expenses

General O&M Non-Labor

Witness	Business Area	FERC Account	Account Description	Cost Element	Linkage Period v. Adjusted Base Period ($)	Linkage Period v. Adjusted Base Period (%)	Material Variance? (by FERC Account)	Future Test Year v. Base Period ($)	Future Test Year v. Adjusted Base Period ($)	Future Test Year v. Adjusted Base Period (%)	Material Variance? (by FERC Account)
				CONTR_VEND							
				EMPLOY_EXP							
				MATERIALS							
				MISC_OTHER							
				OVERHEAD							
				REV_ELECT							
				TRANSPORT							
		512000 Total			-	0%	FALSE	669,136	(168)	0%	FALSE
		513000	Maintenance of electric plant	CONTR_LABR							
				CONTR_VEND							
				EMPLOY_EXP							
				MATERIALS							
				MISC_OTHER							
				OVERHEAD							
		513000 Total			-	0%	FALSE	442,242	(12,527)	0%	FALSE
		514000	Maintenance of miscellaneous steam plant	CONSULTING							
				CONTR_LABR							
				CONTR_VEND							
				EMPLOY_EXP							
				MATERIALS							
				MISC_OTHER							
				OVERHEAD							
				TRANSPORT							
		514000 Total			-	0%	FALSE	(56,446)	(9,286)	0%	FALSE
		546000	Operation supervision and engineering	CONSULTING							
				CONTR_LABR							
				CONTR_VEND							
				EMPLOY_EXP							
				MATERIALS							
				MISC_OTHER							
				OVERHEAD							
		546000 Total			-	0%	FALSE	(4)	-	0%	FALSE
		548000	Generation expenses	CONTR_LABR							
				EMPLOY_EXP							
				MATERIALS							
				OVERHEAD							
		548000 Total			-	0%	FALSE	(1,962)	-	0%	FALSE
		549000	Miscellaneous other power generation expenses	CONSULTING							
				CONTR_VEND							
				EMPLOY_EXP							
				MATERIALS							
				MISC_OTHER							
				OVERHEAD							
				TRANSPORT							
		549000 Total			(1,379,803)	-16%	FALSE	3,382,265	(1,890,823)	-22%	FALSE
		550000	Rents	MISC_OTHER							
		550000 Total			-	0%	FALSE	-	-	0%	FALSE
		551000	Maintenance supervision and engineering	CONTR_LABR							
				CONTR_VEND							

Southwestern Public Service Company

Energy Supply O Expenses

General O&M Non-Labor

Witness	Business Area	FERC Account	Account Description	Cost Element	Total Company						
					Base Period July 1, 2021 - June 30, 2022	**Base Period Adjustments**	**Adjusted Base Period**	**Linkage Period Adjustments**	**Linkage Period July 1, 2022 - June 30, 2023**	**Future Test Year Period Adjustments**	**Future Test Year Period July 1, 2023 - June 30, 2024**
				EMPLOY_EXP	51,124						
				MATERIALS	20,901						
				MISC_OTHER	17,022						
				OVERHEAD	1,301						
		551000 Total			**167,528**	**(124)**	**167,404**		**167,404**		**167,404**
		552000	Maintenance of structures	CONTR_LABR	23,748						
				CONTR_VEND	375,586						
				EMPLOY_EXP	32						
				MATERIALS	40,573						
				MISC_OTHER	306						
				OVERHEAD	5,855						
		552000 Total			**446,101**	**(1)**	**446,100**		**446,100**		**446,100**
		553000	Maintenance of generating and electric plant	CIAC	1,601						
				CONTR_LABR	81,893						
				CONTR_VEND	252,527						
				EMPLOY_EXP	31,048						
				MATERIALS	187,640						
				MISC_OTHER	11,804						
				OVERHEAD	13,413						
		553000 Total			**579,927**	**34,939**	**614,866**		**614,866**		**614,866**
		554000	Maint of misc other power generation plant	CONSULTING	6,671						
				CONTR_LABR	79,505						
				CONTR_VEND	797,304						
				EMPLOY_EXP	34						
				MATERIALS	6,079						
				MISC_OTHER	377						
				OVERHEAD	65,645						
		554000 Total			**955,616**	**7,223,669**	**8,179,285**	**(1,379,803)**	**6,799,482**	**(511,020)**	**6,288,462**
		560000	Operation supervision and engineering	EMPLOY_EXP	404						
		560000 Total			**404**		**404**		**404**		**404**
		590000	Maintenance supervision and engineering	EMPLOY_EXP	404						
		590000 Total			**404**		**404**		**404**		**404**
		921000	Office supplies and expenses	EMPLOY_EXP	32,411						
				MATERIALS	1,586						
				MISC_OTHER	21,810						
				OVERHEAD	1,189						
				TRANSPORT	9,202						
		921000 Total			**66,198**		**66,198**		**66,198**		**66,198**
		923000	Outside services employed	CONSULTING	72,043						
				CONTR_VEND	15,745						
		923000 Total			**87,788**		**87,788**		**87,788**		**87,788**
		925000	Injuries and damages	MISC_OTHER	70						
		925000 Total			**70**		**70**		**70**		**70**
		930100	General advertising expenses	MISC_OTHER	5,019						
		930100 Total			**5,019**	**(5,019)**	**-**		**-**		**-**
		930200	Miscellaneous general expenses	MISC_OTHER	239,840						
		930200 Total			**239,840**		**239,840**		**239,840**		**239,840**
	Energy Supply Total				**41,063,091**	**13,642,808**	**54,705,899**	**(2,759,606)**	**51,946,292**	**(1,077,786)**	**50,868,507**
	Gas Systems	580000	Operation supervision and engineering	CONSULTING	28,042						

Southwestern Public Service Company

Energy Supply O Expenses

General O&M Non-Labor

Witness	Business Area	FERC Account	Account Description	Cost Element	Linkage Period v. Adjusted Base Period ($)	Linkage Period v. Adjusted Base Period (%)	Material Variance? (by FERC Account)	Future Test Year v. Base Period ($)	Future Test Year v. Adjusted Base Period ($)	Future Test Year v. Adjusted Base Period (%)	Material Variance? (by FERC Account)
				EMPLOY_EXP							
				MATERIALS							
				MISC_OTHER							
				OVERHEAD							
		551000 Total			-	0%	FALSE	(124)	-	0%	FALSE
		552000	Maintenance of structures	CONTR_LABR							
				CONTR_VEND							
				EMPLOY_EXP							
				MATERIALS							
				MISC_OTHER							
				OVERHEAD							
		552000 Total			-	0%	FALSE	(1)	-	0%	FALSE
		553000	Maintenance of generating and electric plant	CIAC							
				CONTR_LABR							
				CONTR_VEND							
				EMPLOY_EXP							
				MATERIALS							
				MISC_OTHER							
				OVERHEAD							
		553000 Total			-	0%	FALSE	34,939	-	0%	FALSE
		554000	Maint of misc other power generation plant	CONSULTING							
				CONTR_LABR							
				CONTR_VEND							
				EMPLOY_EXP							
				MATERIALS							
				MISC_OTHER							
				OVERHEAD							
		554000 Total			(1,379,803)	-17%	FALSE	5,332,846	(1,890,823)	-23%	FALSE
		560000	Operation supervision and engineering	EMPLOY_EXP							
		560000 Total			-	0%	FALSE	-	-	0%	FALSE
		590000	Maintenance supervision and engineering	EMPLOY_EXP							
		590000 Total			-	0%	FALSE	-	-	0%	FALSE
		921000	Office supplies and expenses	EMPLOY_EXP							
				MATERIALS							
				MISC_OTHER							
				OVERHEAD							
				TRANSPORT							
		921000 Total			-	0%	FALSE	-	-	0%	FALSE
		923000	Outside services employed	CONSULTING							
				CONTR_VEND							
		923000 Total			-	0%	FALSE	-	-	0%	FALSE
		925000	Injuries and damages	MISC_OTHER							
		925000 Total			-	0%	FALSE	-	-	0%	FALSE
		930100	General advertising expenses	MISC_OTHER							
		930100 Total			-	0%	FALSE	(5,019)	-	0%	FALSE
		930200	Miscellaneous general expenses	MISC_OTHER							
		930200 Total			-	0%	FALSE	-	-	0%	FALSE
	Energy Supply Total										
	Gas Systems	580000	Operation supervision and engineering	CONSULTING							

Southwestern Public Service Company

Energy Supply O Expenses

General O&M Non-Labor

Witness	Business Area	FERC Account	Account Description	Cost Element	Total Company Base Period July 1, 2021 - June 30, 2022	Base Period Adjustments	Adjusted Base Period	Linkage Period Adjustments	Linkage Period July 1, 2022 - June 30, 2023	Future Test Year Period Adjustments	Future Test Year Period July 1, 2023 - June 30, 2024
				CONTR_LABR	1,518						
				EMPLOY_EXP	3,995						
				MATERIALS	224						
				MISC_OTHER	181						
				OVERHEAD	330						
		580000 Total			**34,291**		**34,291**		**34,291**		**34,291**
	Gas Systems Total				**34,291**	**-**	**34,291**	**-**	**34,291**	**-**	**34,291**
Low Total					**41,097,382**	**13,642,808**	**54,740,190**	**(2,759,606)**	**51,980,584**	**(1,077,786)**	**50,902,798**

Southwestern Public Service Company

Energy Supply O Expenses

General O&M Non-Labor

Witness	Business Area	FERC Account	Account Description	Cost Element	Linkage Period v. Adjusted Base Period ($)	Linkage Period v. Adjusted Base Period (%)	Material Variance? (by FERC Account)	Future Test Year v. Base Period ($)	Future Test Year v. Adjusted Base Period ($)	Future Test Year v. Adjusted Base Period (%)	Material Variance? (by FERC Account)
				CONTR_LABR							
				EMPLOY_EXP							
				MATERIALS							
				MISC_OTHER							
				OVERHEAD							
		580000 Total			-	0%	FALSE	-	-	0%	FALSE
	Gas Systems Total										
Low Total											