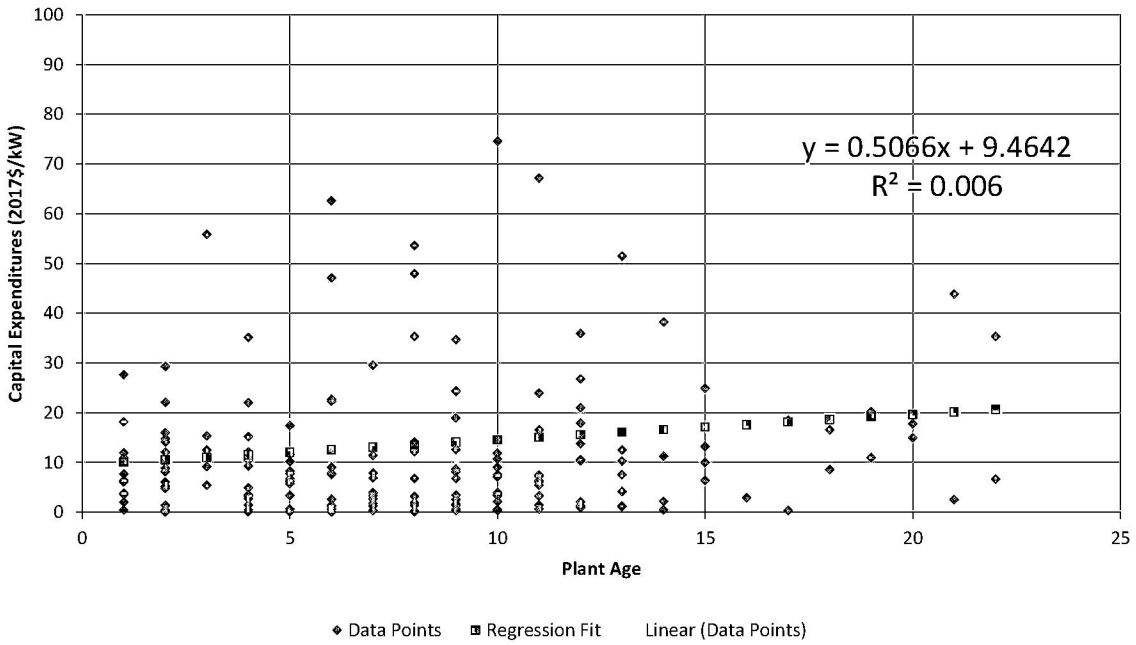
CAPITAL EXPENDITURES – GREATER THAN 1,000 MW

The results of the regression analysis of CAPEX spending for gas/oil CC plants greater than 1,000 MW are summarized in the table below and plotted in the figure below. Since the p-value for the age coefficient ("slope") is 0.30, which is greater than 0.05, age is not a statistically significant predictor of CAPEX spending.

Table C-7 — Regression Statistics – CC CAPEX > 1,000 MW

		t statistic	*p-value*
Observations	177		
Simple Average ($/kW)	13.566		
Intercept	9.464	2.0308	4.38E-02
Slope	0.507	1.0309	3.04E-01
R^2	0.00604		

Figure C-7 — Gas/Oil CC Dataset – CAPEX for Greater than 1,000-MW Plant Size



Note: Age coefficient in above regression equation is not statistically significant.

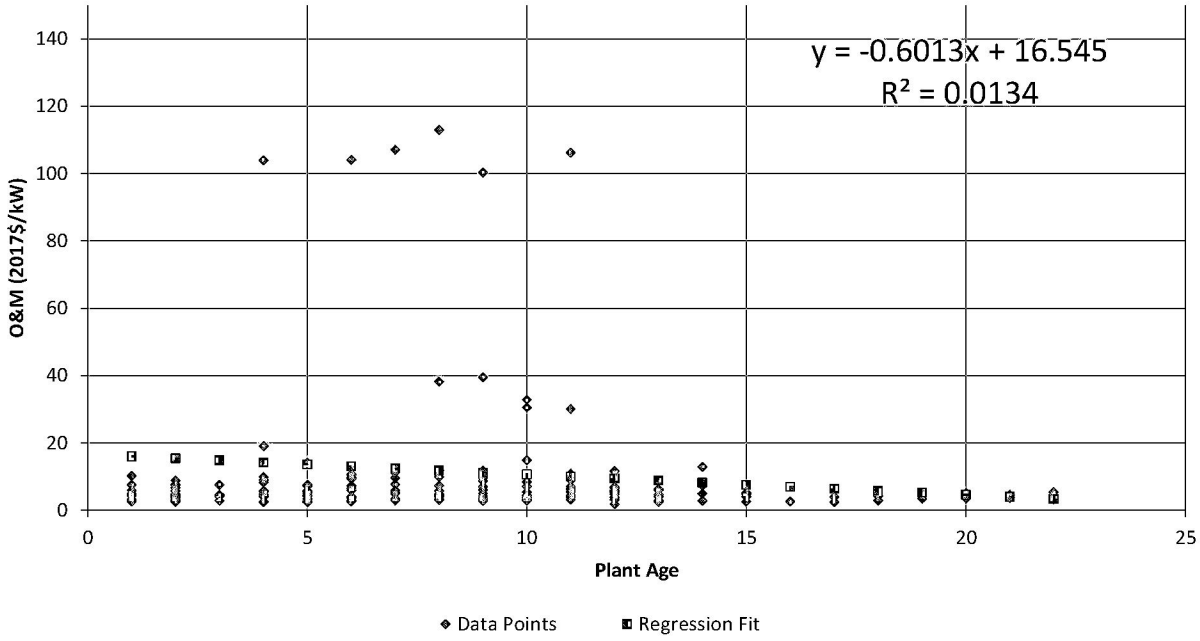
OPERATIONS & MAINTENANCE EXPENDITURES – GREATER THAN 1,000 MW

The results of the regression analysis of O&M spending for gas/oil CC plants greater than 1,000 MW are summarized in the table below and plotted in the figure below. Since the p-value for the age coefficient ("slope") is 0.13, which is greater than 0.05, age is not a statistically significant predictor of O&M spending.

Table C-8 — Regression Statistics – CC O&M > 1,000 MW

		t statistic	*p-value*
Observations	177		
Simple Average ($/kW)	11.676		
Intercept	16.545	4.4651	1.43E-05
Slope	-0.601	-1.5389	1.26E-01
R^2	0.01335		

Figure C-8 — Gas/Oil CC Dataset – O&M for Greater than 1,000 MW Plant Size



Note: Age coefficient in above regression equation is not statistically significant.

The simple average O&M and CAPEX values for each 20-year age band, expressed in constant 2017 $/kW-year, are summarized in the table below.

	Average $/kW (years 1 - 20) =	Average $/kW (years 21 - 40) =	Average $/kW (years 41 - 80) =	**Average $/kW (all years) =**	Data Points (years 1 - 20) =	Data Points (years 21 - 40) =	Data Points (years 41 - 80) =	**Data Points (all years) =**
> 1000 MW, All Capacity Factors								
Net Total O&M- 2017 $/kW	11.85	4.14	-	**11.68**	173	4	0	**177**
Net Total Capex - 2017 $/kW	13.37	22.06	-	**13.57**	173	4	0	**177**
Net Total O&M and Capex - 2017 $/kW	25.22	26.20	-	**25.24**	173	4	0	**177**

Starting with the initial analysis of CAPEX and O&M raw data, as presented above, Sargent & Lundy developed recommended changes to the existing values used in the EMM. The recommended changes for existing gas/oil CC plants are described in Section 5.

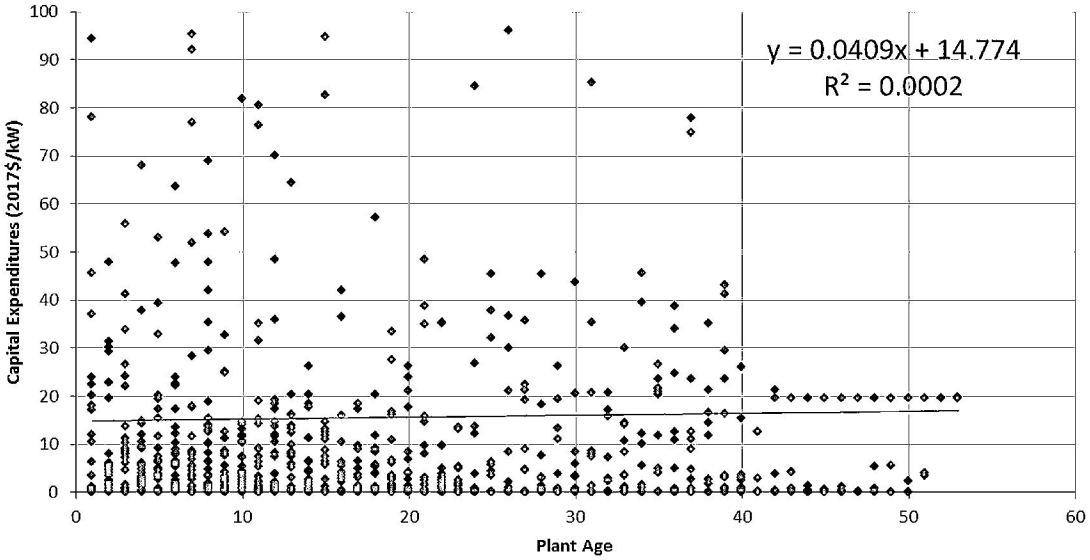
CAPITAL EXPENDITURES – CAPACITY FACTOR LESS THAN 50%

The results of the regression analysis of CAPEX spending for gas/oil CC plants of all MW sizes (full dataset) with capacity factors under 50% are summarized in the table below and plotted in the figure below. Since the p-value for the age coefficient ("slope") is 0.71, which is greater than 0.05, age is not a statistically significant predictor of CAPEX spending.

Table C-9 — Regression Statistics – CC CAPEX for Capacity Factor < 50%

		t statistic	*p-value*
Observations	844		
Simple Average ($/kW)	15.554		
Intercept	14.774	5.7075	1.59E-08
Slope	0.041	0.3659	7.15E-01
R^2	0.00016		

Figure C-9 — CC Dataset – CAPEX for All Plant Sizes and Avg. Net Capacity Factor < 50%



Notes: Age coefficient in above regression equation is not statistically significant.
Sequential data points with identical values are forecasted values for the same plant.

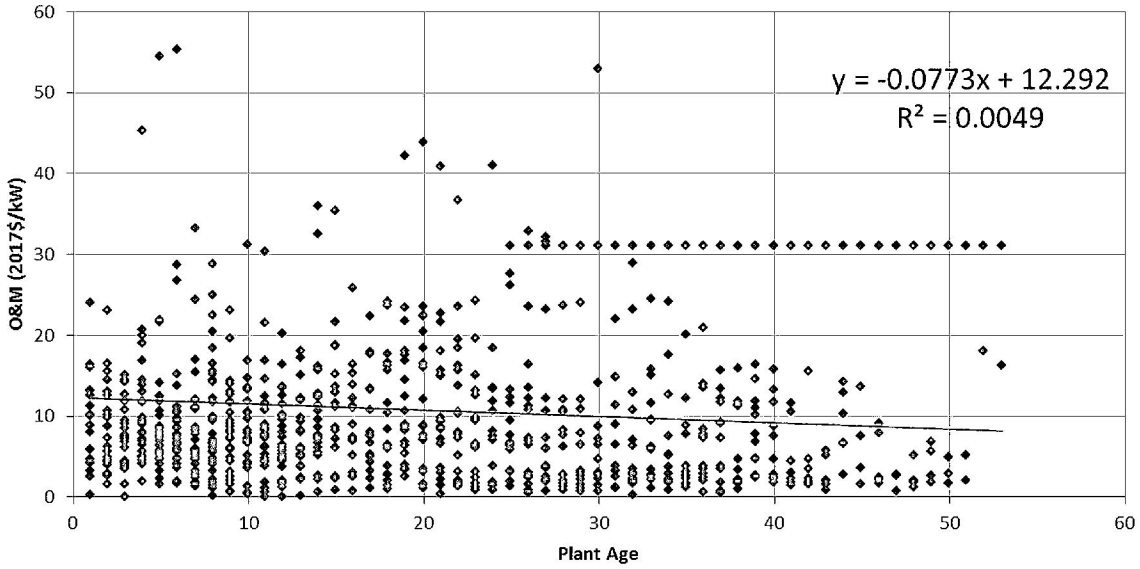
OPERATIONS & MAINTENANCE EXPENDITURES – CAPACITY FACTOR LESS THAN 50%

The results of the regression analysis of O&M spending for gas/oil CC plants of all MW sizes (full dataset) with capacity factors under 50% are summarized in the table below and plotted in the figure below. Since the p-value for the age coefficient ("slope") is less than 0.05, age is a statistically significant predictor of O&M spending (on a linear trend across all plant ages). However, the outliers before year 20 and relatively low number of data points after year 40 may distort the regression analysis.

Table C-10 — Regression Statistics – CC O&M for Capacity Factor < 50%

		t statistic	*p-value*
Observations	864		
Simple Average ($/kW)	10.791		
Intercept	12.292	13.9850	3.33E-40
Slope	-0.077	-2.0625	3.95E-02
R^2	0.00491		

Figure C-10 — CC Dataset – O&M for All Plant Sizes and Avg. Net Capacity Factor < 50%



Note: Sequential data points with identical values are forecasted values for the same plant.

The simple average O&M and CAPEX values for each 20-year age band, expressed in constant 2017 $/kW-year, are summarized in the table below.

	Average $/kW (years 1 - 20) =	Average $/kW (years 21 - 40) =	Average $/kW (years 41 - 80) =	**Average $/kW (all years) =**	Data Points (years 1 - 20) =	Data Points (years 21 - 40) =	Data Points (years 41 - 80) =	**Data Points (all years) =**
All MW, Capacity Factors 0 - 50%								
Net Total O&M- 2017 $/kW	11.54	9.65	10.26	**10.79**	500	298	66	**864**
Net Total Capex - 2017 $/kW	15.35	15.46	17.56	**15.55**	501	280	63	**844**
Net Total O&M and Capex - 2017 $/kW	26.95	25.41	28.19	**26.53**	499	280	63	**842**

Starting with the initial analysis of CAPEX and O&M raw data, as presented above, Sargent & Lundy developed recommended changes to the existing values used in the EMM. The recommended changes for existing gas/oil CC plants are described in Section 5.

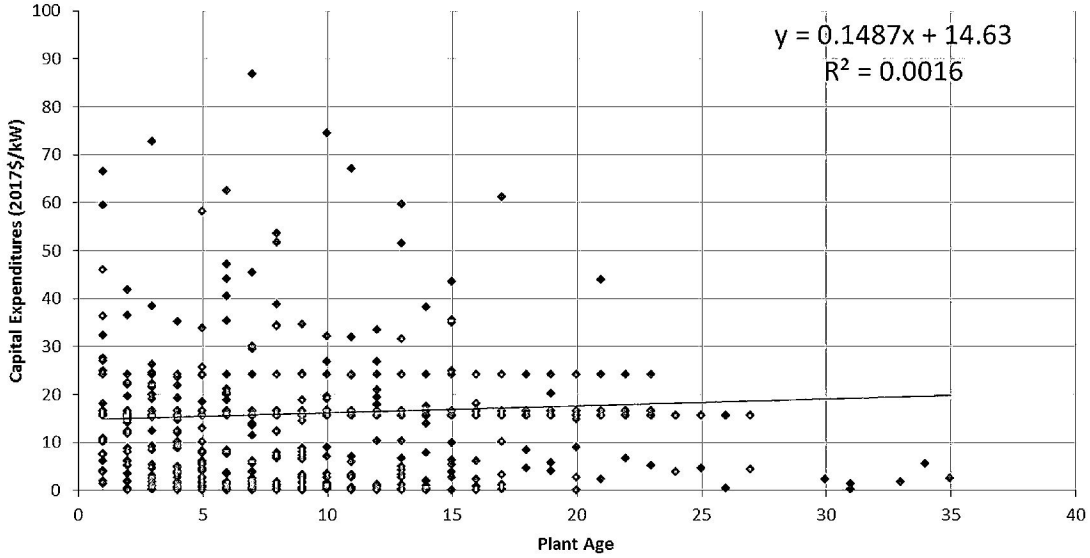
CAPITAL EXPENDITURES – CAPACITY FACTOR GREATER THAN 50%

The results of the regression analysis of CAPEX spending for gas/oil CC plants of all MW sizes (full dataset) with capacity factors greater than 50% are summarized in the table below and plotted in the figure below. Since the p-value for the age coefficient ("slope") is 0.37, which is greater than 0.05, age is not a statistically significant predictor of CAPEX spending.

Table C-11 — Regression Statistics – CC CAPEX for Capacity Factor > 50%

		t statistic	*p-value*
Observations	524		
Simple Average ($/kW)	16.104		
Intercept	14.630	7.3893	5.90E-13
Slope	0.149	0.9054	3.66E-01
R^2	0.00157		

Figure C-11 — CC Dataset – CAPEX for All Plant Sizes and Avg. Net Capacity Factor > 50%



Notes: Age coefficient in above regression equation is not statistically significant.
Sequential data points with identical values are forecasted values for the same plant.

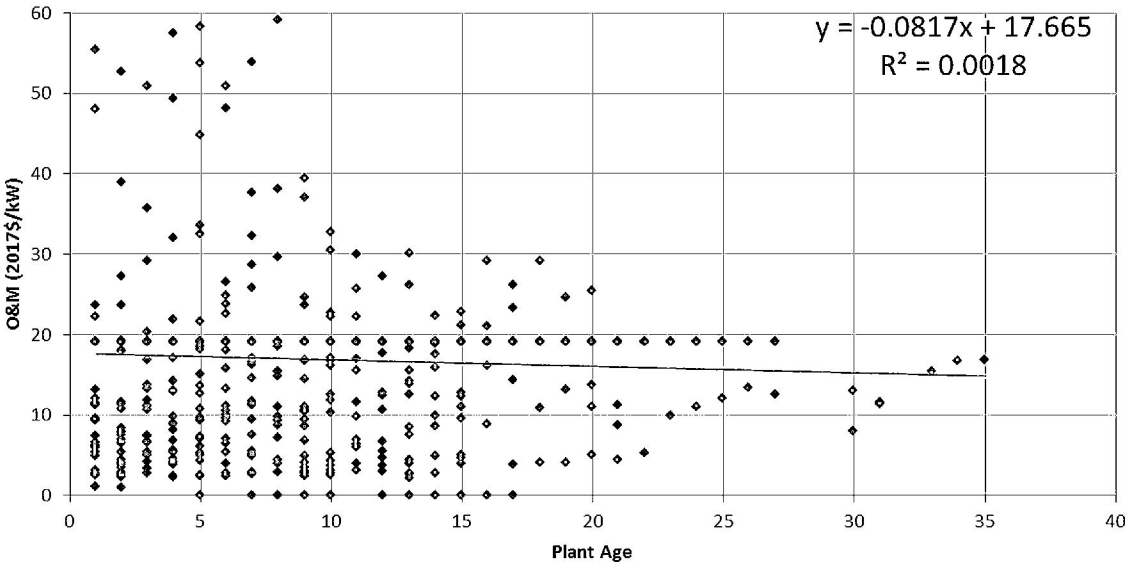
OPERATIONS & MAINTENANCE EXPENDITURES – CAPACITY FACTOR GREATER THAN 50%

The results of the linear regression analysis of O&M spending for gas/oil CC plants of all MW sizes (full dataset) with capacity factors greater than 50% are summarized in the table below. Since the p-value for the age coefficient ("slope") is 0.33, which is greater than 0.05, age is not a statistically significant predictor of CAPEX spending (on a linear trend across all plant ages).

Table C-12 — Regression Statistics – CC O&M for Capacity Factor > 50%

		t statistic	*p-value*
Observations	524		
Simple Average ($/kW)	16.855		
Intercept	17.665	17.5298	1.93E-54
Slope	-0.082	-0.9777	3.29E-01
R^2	0.00183		

Figure C-12 — CC Dataset – O&M for All Plant Sizes and Avg. Net Capacity Factor > 50%



Notes: Age coefficient in above regression equation is not statistically significant.
Sequential data points with identical values are forecasted values for the same plant.

The simple average O&M and CAPEX values for each 20-year age band, expressed in constant 2017 $/kW-year, are summarized in the table below.

	Average $/kW (years 1 - 20) =	Average $/kW (years 21 - 40) =	Average $/kW (years 41 - 80) =	**Average $/kW (all years) =**	Data Points (years 1 - 20) =	Data Points (years 21 - 40) =	Data Points (years 41 - 80) =	**Data Points (all years) =**
All MW, Capacity Factors 50% - 100%								
Net Total O&M- 2017 $/kW	16.90	16.44	-	**16.85**	478	46	0	**524**
Net Total Capex - 2017 $/kW	15.55	21.89	-	**16.10**	478	46	0	**524**
Net Total O&M and Capex - 2017 $/kW	32.46	38.32	-	**32.98**	477	46	0	**523**

Starting with the initial analysis of CAPEX and O&M raw data, as presented above, Sargent & Lundy developed recommended changes to the existing values used in the EMM. The recommended changes for existing gas/oil CC plants are described in Section 5.

Sargent & Lundy
Consulting

Appendix D. Regression Analysis – Gas/Oil Combustion Turbine

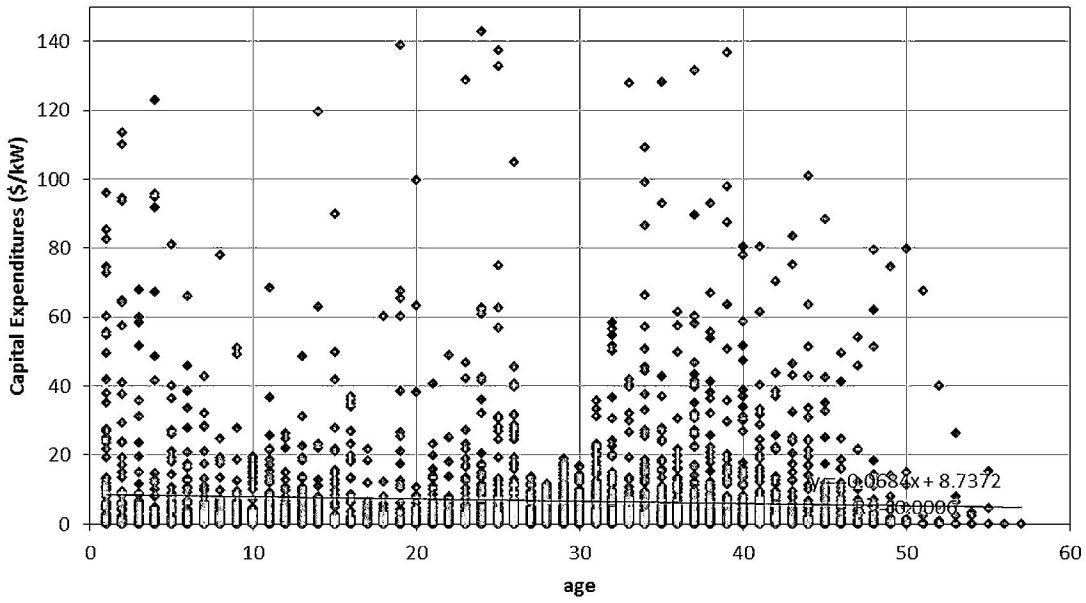
CAPITAL EXPENDITURES – ALL PLANT SIZES

The results of the regression analysis of CAPEX spending for gas/oil CT plants of all MW sizes (full dataset) are summarized in the table below and plotted in the figure below. Since the p-value for the age coefficient ("slope") is 0.09, which is greater than 0.05, dataset does not support age as a statistically significant predictor of CAPEX spending (on a linear trend across all plant ages).

Table D-1 — Regression Statistics – CT CAPEX for All MW

		t statistic	*p-value*
Observations	5065		
Simple Average ($/kW)	6.897		
Intercept	8.737	7.3087	3.12E-13
Slope	-0.068	-1.6948	9.02E-02
R^2	0.00057		

Figure D-1 — Gas/Oil CT Dataset – CAPEX for All Plant MW Sizes



Note: Age coefficient in above regression equation is not statistically significant.

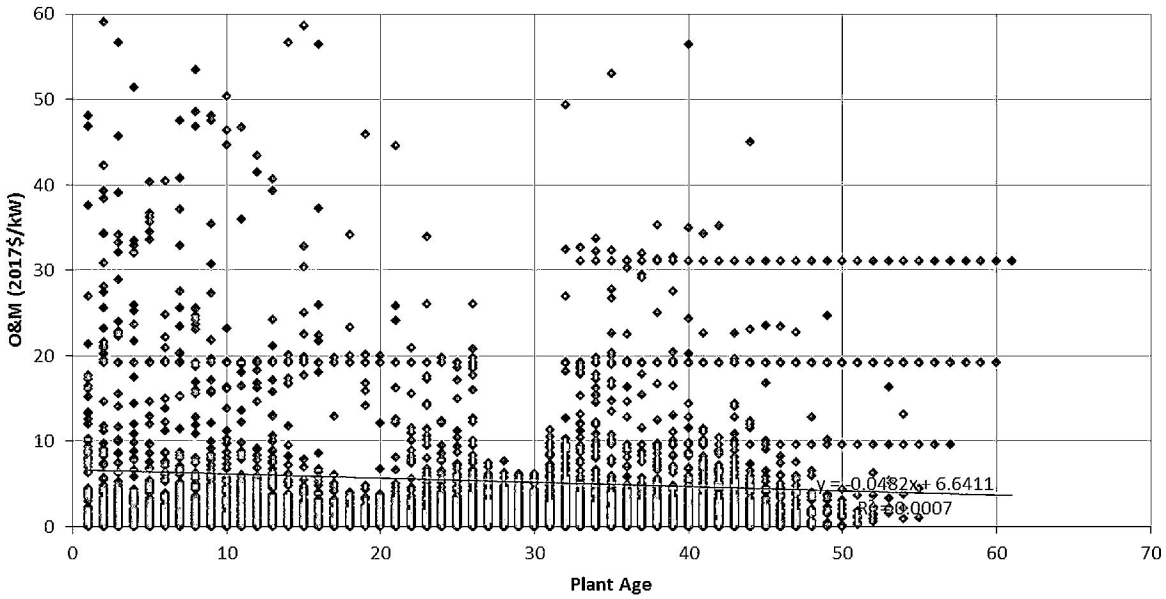
OPERATIONS & MAINTENANCE EXPENDITURES – ALL PLANT SIZES

The results of the regression analysis of O&M spending for gas/oil CT plants of all MW sizes (full dataset) are summarized in the table below and plotted in the figure below. Since the p-value for the age coefficient ("slope") is 0.062, which is greater than 0.05, the dataset does not support age as a statistically significant predictor of O&M spending (on a linear trend across all plant ages).

Table D-2 — Regression Statistics – CT O&M for All MW

		t statistic	*p-value*
Observations	5283		
Simple Average ($/kW)	5.331		
Intercept	6.641	8.5764	1.27E-17
Slope	-0.048	-1.8683	6.18E-02
R^2	0.00066		

Figure D-2 — Gas/Oil CT Dataset – O&M for All Plant MW Sizes



Notes: Age coefficient in above regression equation is not statistically significant.
Sequential data points with identical values are forecasted values for the same plant.

The simple average O&M and CAPEX values for each 20-year age band, expressed in constant 2017 $/kW-year, are summarized in the table below.

	Average $/kW (years 1 - 20) =	Average $/kW (years 21 - 40) =	Average $/kW (years 41 - 80) =	**Average $/kW (all years) =**	Data Points (years 1 - 20) =	Data Points (years 21 - 40) =	Data Points (years 41 - 80) =	**Data Points (all years) =**
All MW, All Capacity Factors								
Net Total O&M- 2017 $/kW	7.86	3.99	6.11	**5.33**	1,418	3,118	747	**5,283**
Net Total Capex - 2017 $/kW	9.17	5.78	7.40	**6.90**	1,360	3,054	651	**5,065**
Net Total O&M and Capex - 2017 $/kW	16.43	9.43	10.92	**11.49**	1,341	3,040	640	**5,021**

Starting with the initial analysis of CAPEX and O&M raw data, as presented above, Sargent & Lundy developed recommended changes to the existing values used in the EMM. The recommended changes for existing gas/oil CT plants are described in Section 6.

CAPITAL EXPENDITURES – LESS THAN 100 MW

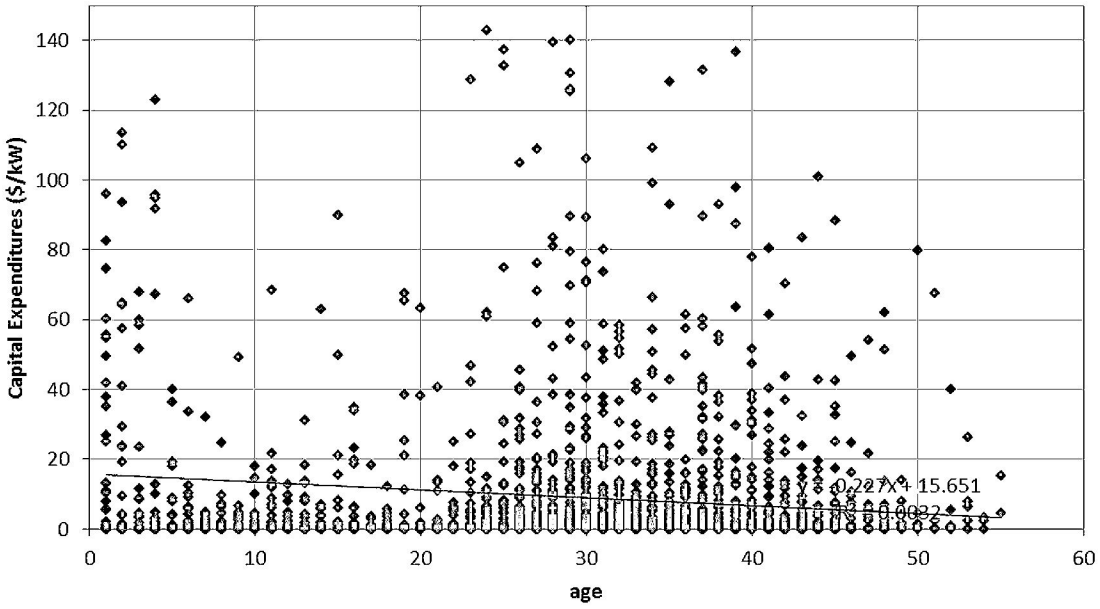
The results of the regression analysis of CAPEX spending for gas/oil CT plants less than 100 MW are summarized in the table below and plotted in the figure below. Since the p-value for the age coefficient ("slope") is 0.002, which is less than 0.05, age is a statistically significant predictor of CAPEX spending (on a linear trend across all plant ages). Therefore, CAPEX spending for this dataset may be estimated by the regression equation:

Annual CAPEX spending in 2017 $/kW-year = 15.651 + (-0.227 × age)

Table D-3 — Regression Statistics – CT CAPEX < 100 MW

		t statistic	*p-value*
Observations	2,911		
Simple Average ($/kW)	9.003		
Intercept	15.651	6.6753	2.94E-11
Slope	-0.227	-3.0345	2.43E-03
R^2	0.00316		

Figure D-3 — Gas/Oil CT Dataset – CAPEX for Less than 100-MW Plant Size



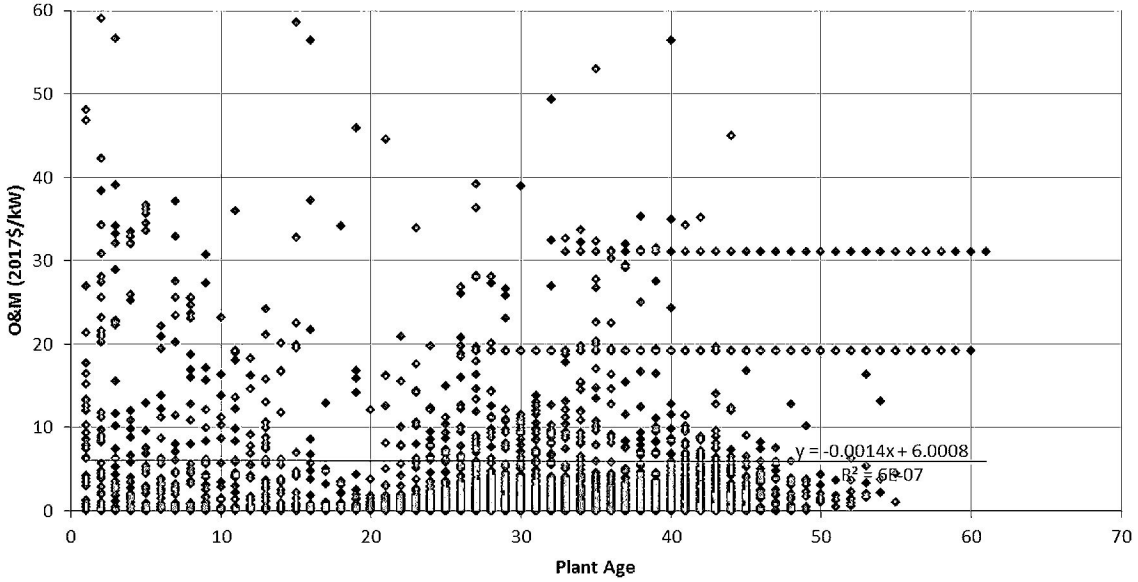
OPERATIONS & MAINTENANCE EXPENDITURES – LESS THAN 100 MW

The results of the regression analysis of O&M spending for gas/oil CT plants less than 100 MW are summarized in the table below and plotted in the figure below. Since the p-value for the age coefficient ("slope") is 0.966, which is greater than 0.05, the dataset does not support age as a statistically significant predictor of O&M spending (on a linear trend across all plant ages).

Table D-4 — Regression Statistics – CT O&M < 100 MW

		t statistic	*p-value*
Observations	3,062		
Simple Average ($/kW)	5.958		
Intercept	6.001	5.5008	4.09E-08
Slope	-0.001	-0.0423	9.66E-01
R^2	0.00000		

Figure D-4 — Gas/Oil CT Dataset – O&M for Less than 100-MW Plant Size



Notes: Age coefficient in above regression equation is not statistically significant.
Sequential data points with identical values are forecasted values for the same plant.

The simple average O&M and CAPEX values for each 20-year age band, expressed in constant 2017 $/kW-year, are summarized in the table below.

	Average $/kW (years 1 - 20) =	Average $/kW (years 21 - 40) =	Average $/kW (years 41 - 80) =	**Average $/kW (all years) =**	Data Points (years 1 - 20) =	Data Points (years 21 - 40) =	Data Points (years 41 - 80) =	**Data Points (all years) =**
< 100 MW, All Capacity Factors								
Net Total O&M- 2017 $/kW	8.76	4.93	7.40	**5.96**	489	2,060	513	**3,062**
Net Total Capex - 2017 $/kW	15.08	7.98	6.64	**9.00**	497	1,999	415	**2,911**
Net Total O&M and Capex - 2017 $/kW	24.04	12.31	10.26	**14.02**	489	1,978	406	**2,873**

Starting with the initial analysis of CAPEX and O&M raw data, as presented above, Sargent & Lundy developed recommended changes to the existing values used in the EMM. The recommended changes for existing gas/oil CT plants are described in Section 6.

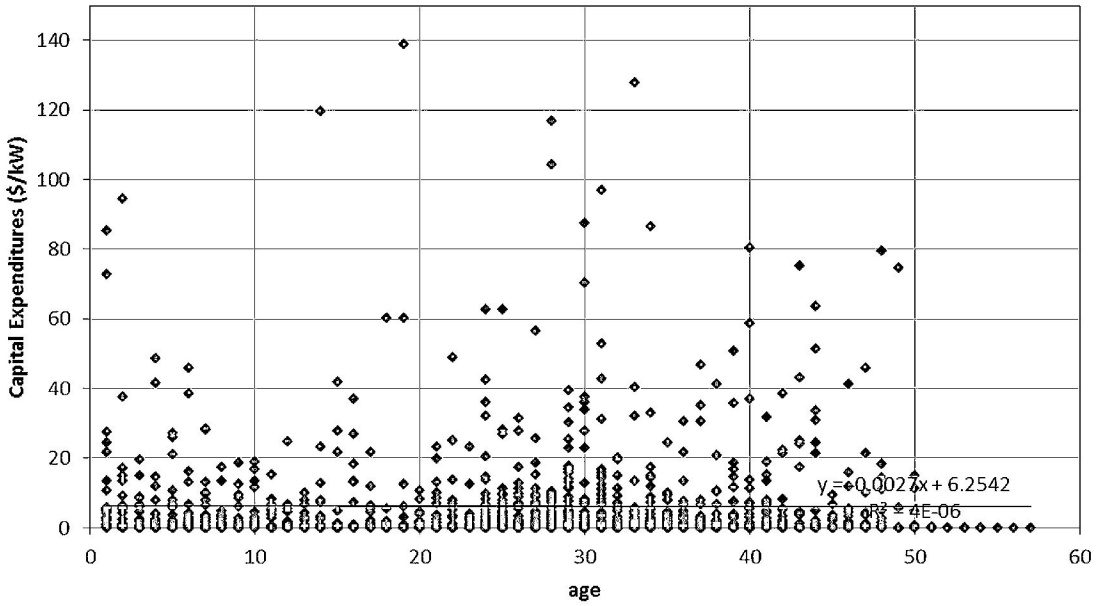
CAPITAL EXPENDITURES – BETWEEN 100 MW AND 300 MW

The results of the regression analysis of CAPEX spending for CT plants between 100 MW and 300 MW are summarized in the table below and plotted in the figure below. Since the p-value for the age coefficient ("slope") is 0.939, which is greater than 0.05, age is not a statistically significant predictor of CAPEX spending.

Table D-5 — Regression Statistics – CT CAPEX 100 MW to 300 MW

		t statistic	*p-value*
Observations	1,350		
Simple Average ($/kW)	6.183		
Intercept	6.254	6.0376	2.02E-09
Slope	-0.003	-0.0768	9.39E-01
R^2	0.00000		

Figure D-5 — Gas/Oil CT Dataset – CAPEX for Between 100-MW and 300-MW Plant Size



Note: Age coefficient in above regression equation is not statistically significant.

OPERATIONS & MAINTENANCE EXPENDITURES – BETWEEN 100 MW AND 300 MW

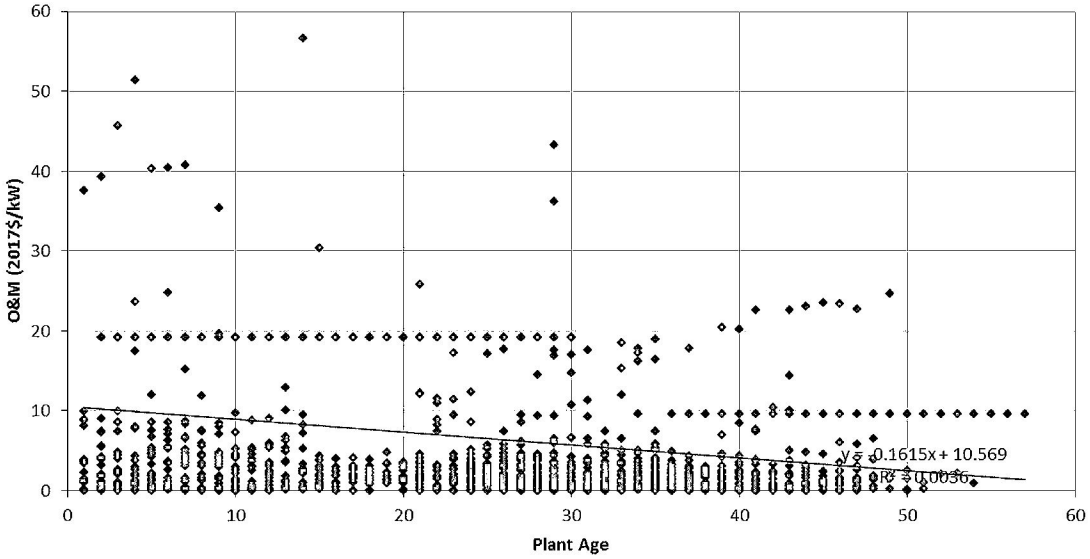
The results of the regression analysis of O&M spending for gas/oil CT plants between 100 MW and 300 MW are summarized in the table below and plotted in the figure below. Since the p-value for the age coefficient ("slope") is 0.023, which is less than 0.05, age is a statistically significant predictor of O&M spending (on a linear trend across all plant ages). Therefore, O&M spending for this dataset may be estimated by the regression equation:

Annual O&M spending in 2017 $/kW-year = 10.569 + (-0.162 × age)

Table D-6 — Regression Statistics – CT O&M 100 MW to 300 MW

		t statistic	*p-value*
Observations	1,416		
Simple Average ($/kW)	6.430		
Intercept	10.569	5.1759	2.59E-07
Slope	-0.162	-2.2723	2.32E-02
R^2	0.00364		

Figure D-6 — Gas/Oil CT Dataset – O&M for Between 100-MW and 300-MW Plant Size



Note: Sequential data points with identical values are forecasted values for the same plant.

The simple average O&M and CAPEX values for each 20-year age band, expressed in constant 2017 $/kW-year, are summarized in the table below.

	Average $/kW (years 1 - 20) =	Average $/kW (years 21 - 40) =	Average $/kW (years 41 - 80) =	**Average $/kW (all years) =**	Data Points (years 1 - 20) =	Data Points (years 21 - 40) =	Data Points (years 41 - 80) =	**Data Points (all years) =**
100 MW - 300 MW, All Capacity Factors								
Net Total O&M- 2017 $/kW	9.97	5.18	3.24	**6.43**	442	794	180	**1,416**
Net Total Capex - 2017 $/kW	6.32	6.07	6.38	**6.18**	407	762	181	**1,350**
Net Total O&M and Capex - 2017 $/kW	15.14	9.09	9.66	**10.98**	402	759	180	**1,341**

Starting with the initial analysis of CAPEX and O&M raw data, as presented above, Sargent & Lundy developed recommended changes to the existing values used in the EMM. The recommended changes for existing gas/oil CT plants are described in Section 6.

CAPITAL EXPENDITURES – GREATER THAN 300 MW

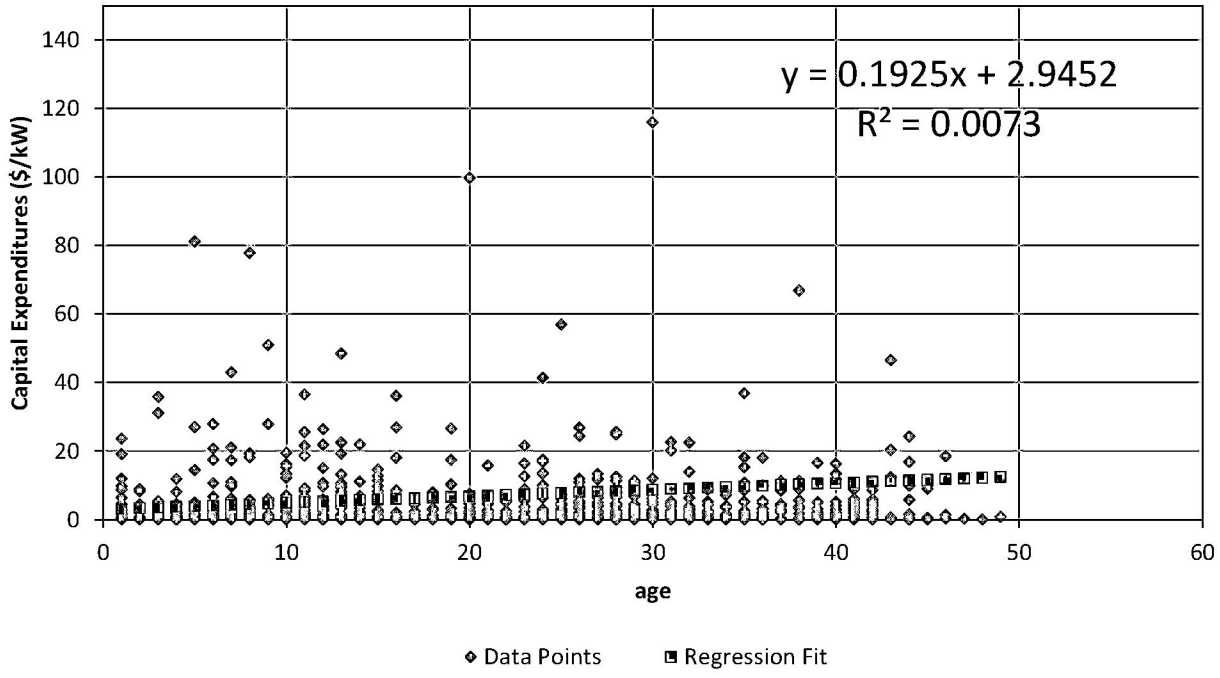
The results of the regression analysis of CAPEX spending for gas/oil CT plants greater than 300 MW are summarized in the table below and plotted in the figure below. Since the p-value for the age coefficient ("slope") is 0.010, which is less than 0.05, age is a statistically significant predictor of CAPEX spending (on a linear trend across all plant ages). Therefore, CAPEX spending for this dataset may be estimated by the regression equation:

Annual CAPEX spending in 2017 $/kW-year = 2.945 + (0.193 × age)

Table D-7 — Regression Statistics – CT CAPEX > 300 MW

		t statistic	*p-value*
Observations	909		
Simple Average ($/kW)	6.952		
Intercept	2.945	1.6382	1.017E-01
Slope	0.193	2.5842	0.010
R^2	0.00731		

Figure D-7 — Gas/Oil CT Dataset – CAPEX for Greater than 300-MW Plant Size



OPERATIONS & MAINTENANCE EXPENDITURES – GREATER THAN 300 MW

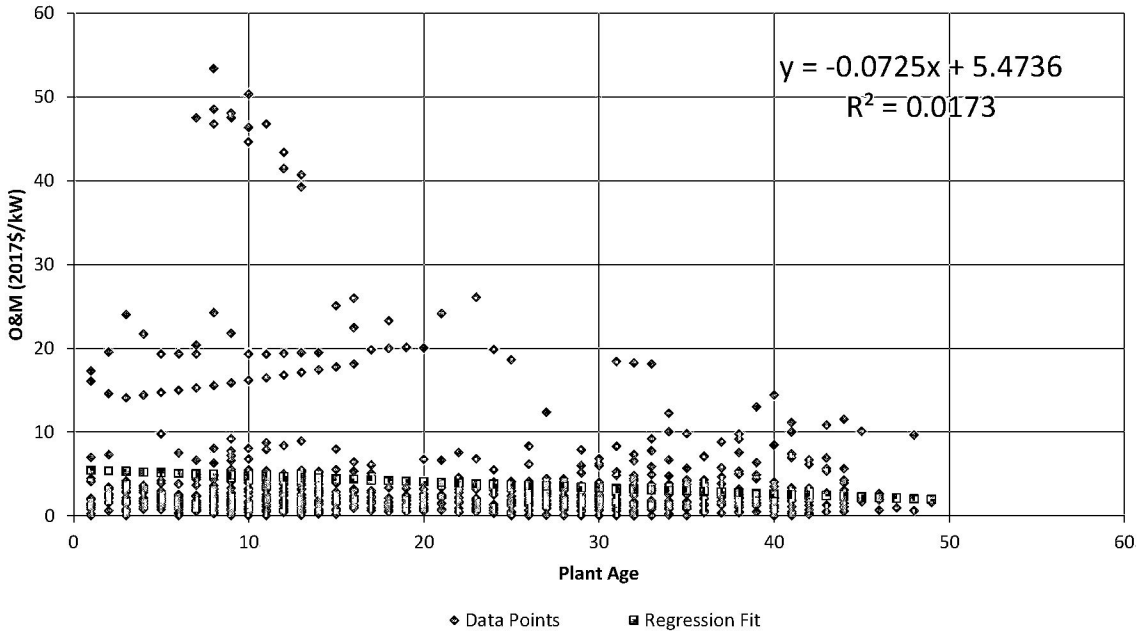
The results of the regression analysis of O&M spending for CT plants greater than 300 MW are summarized in the table below and plotted in the figure below. Since the p-value for the age coefficient ("slope") is significantly less than 0.05, age is a statistically significant predictor of O&M spending (on a linear trend across all plant ages). Therefore, O&M spending for this dataset may be estimated by the regression equation:

Annual O&M spending in 2017 $/kW-year = 5.474 + (-0.072 × age)

Table D-8 — Regression Statistics – CT O&M > 300 MW

		t Statistic	*p-value*
Observations	938		
Simple Average ($/kW)	3.994		
Intercept	5.474	12.8980	3.75E-35
Slope	-0.072	-4.0612	5.29E-05
R^2	0.01732		

Figure D-8 — Gas/Oil CT Dataset – O&M for Greater than 300-MW Plant Size



The simple average O&M and CAPEX values for each 20-year age band, expressed in constant 2017 $/kW-year, are summarized in the table below.

	Average $/kW (years 1 - 20) =	Average $/kW (years 21 - 40) =	Average $/kW (years 41 - 80) =	**Average $/kW (all years) =**	Data Points (years 1 - 20) =	Data Points (years 21 - 40) =	Data Points (years 41 - 80) =	**Data Points (all years) =**
> 300 MW, All Capacity Factors								
Net Total O&M- 2017 $/kW	5.03	2.78	3.46	**3.99**	488	396	54	**938**
Net Total Capex - 2017 $/kW	5.26	7.58	16.50	**6.95**	457	397	55	**909**
Net Total O&M and Capex - 2017 $/kW	9.30	10.38	20.11	**10.42**	451	396	54	**901**

Starting with the initial analysis of CAPEX and O&M raw data, as presented above, Sargent & Lundy developed recommended changes to the existing values used in the EMM. The recommended changes for existing gas/oil CT plants are described in Section 6.

Sargent & Lundy
Consulting

Appendix E. Regression Analysis – Conventional Hydroelectric

CAPITAL EXPENDITURES – ALL PLANT SIZES

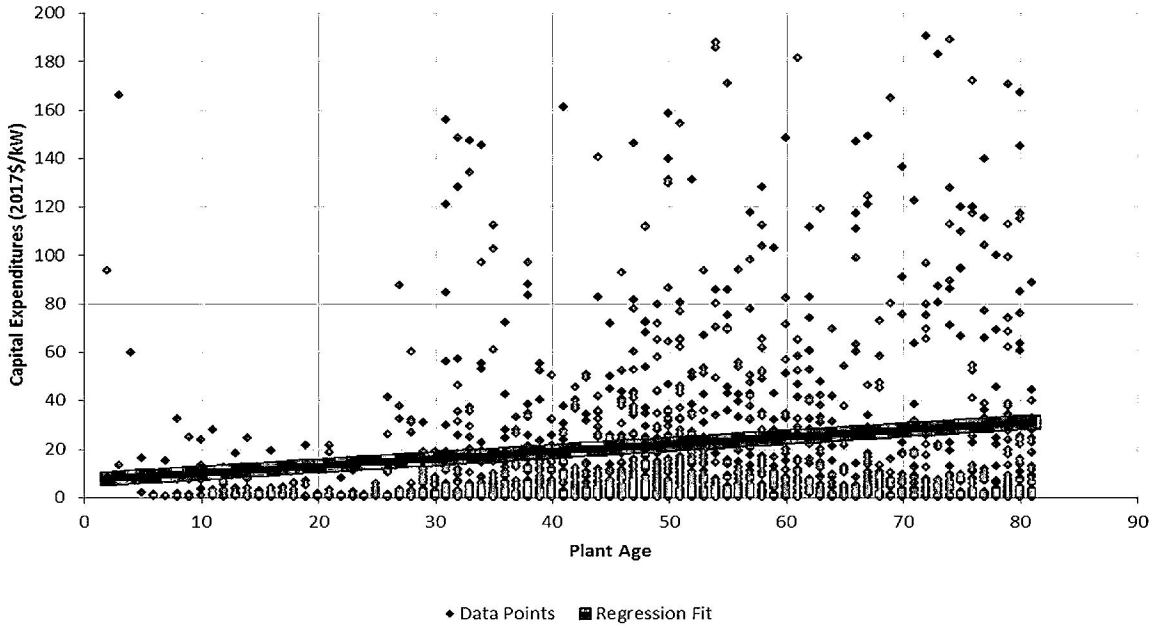
The results of the linear regression analysis of CAPEX spending for conventional hydroelectric plants of all MW sizes (full dataset) are summarized in the table below and plotted in the figure below. Since the p-value for the age coefficient ("slope") is significantly less than 0.05, age is a statistically significant predictor of CAPEX spending (on a linear trend across all plant ages). Therefore, CAPEX spending for this dataset may be estimated by the regression equation:

Annual CAPEX spending in 2017 $/kW-year = 7.269 + (0.296 × age)

Table E-1 — Regression Statistics – Hydroelectric CAPEX for All MW

		t statistic	*p-value*
Observations	2180		
Simple Average ($/kW)	21.999		
Intercept	7.269	1.4681	1.42E-01
Slope	0.296	3.1441	1.69E-03
R^2	0.00452		

Figure E-1 — Conventional Hydroelectric Dataset – CAPEX for All MW Plant Sizes



OPERATIONS & MAINTENANCE EXPENDITURES – ALL PLANT SIZES

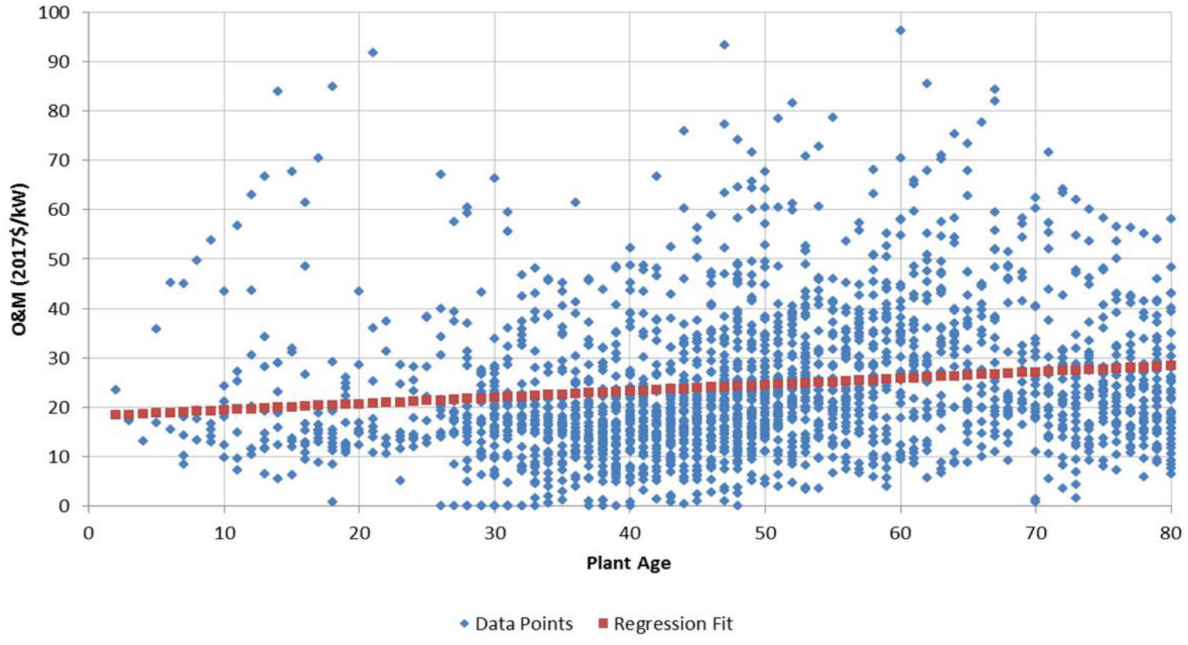
The results of the linear regression analysis of O&M spending for conventional hydroelectric plants of all MW sizes (full dataset) are summarized in the table below and plotted in the figure below. Since the p-value for the age coefficient ("slope") is significantly less than 0.05, age is a statistically significant predictor of O&M spending (on a linear trend across all plant ages). Therefore, O&M spending for this dataset may be estimated by the regression equation:

Annual O&M spending in 2017 $/kW-year = 22.360 + (0.073 × age)

Table E-2 — Regression Statistics – Hydroelectric O&M for All MW

		t statistic	*p-value*
Observations	1,272		
Simple Average ($/kW)	24.473		
Intercept	22.360	13.7360	3.92E-40
Slope	0.073	2.5053	1.24E-02
R^2	0.00492		

Figure E-2 — Conventional Hydroelectric – O&M for All MW Plant Sizes



Sargent & Lundy
Consulting

Appendix F. Regression Analysis – Pumped Hydroelectric Storage

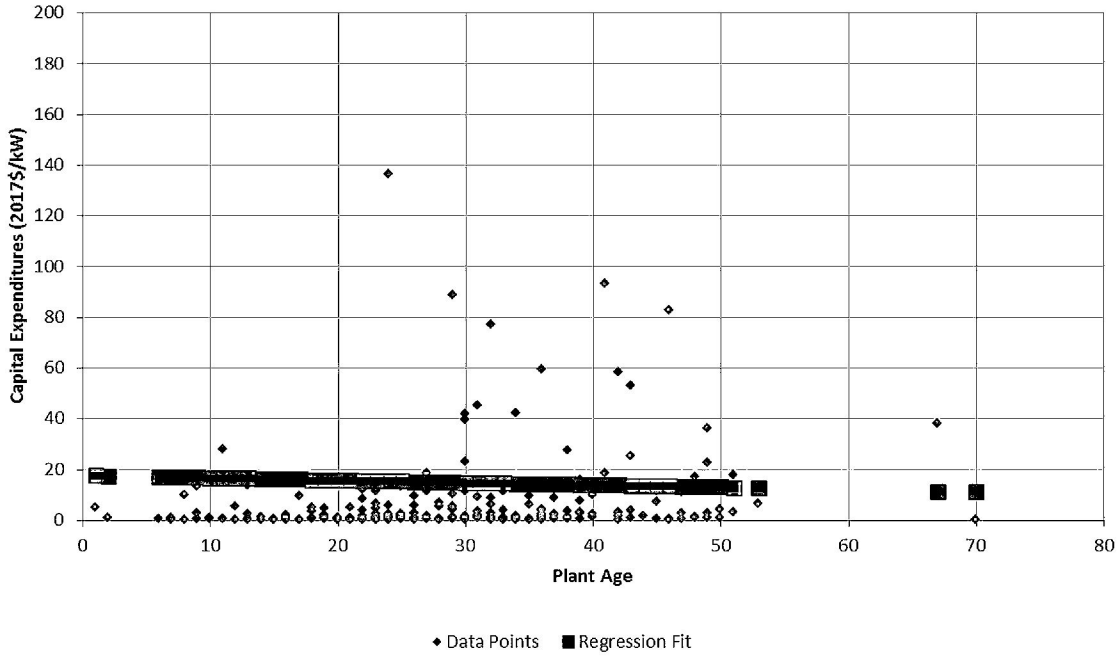
CAPITAL EXPENDITURES – ALL PLANT SIZES

The results of the linear regression analysis of CAPEX spending for pumped hydroelectric storage plants of all MW sizes (full dataset) are summarized in the table below and plotted in the figure below. Since the p-value for the age coefficient ("slope") is greater than 0.05, the dataset does not support age as a statistically significant predictor of CAPEX spending (on a linear trend across all plant ages). The dataset was not divided by unit capacity due to the limited number of data points.

Table F-1 — Regression Statistics – Pumped Hydroelectric CAPEX for All MW

		t statistic	*p-value*
Observations	227		
Simple Average ($/kW)	11.398		
Intercept	-6.907	-0.4501	6.53E-01
Slope	0.743	1.2723	2.06E-01
R^2	0.01278		

Figure F-1 — Pumped Hydroelectric Dataset – CAPEX for All MW Plant Sizes



Note: Age coefficient in above regression equation is not statistically significant.

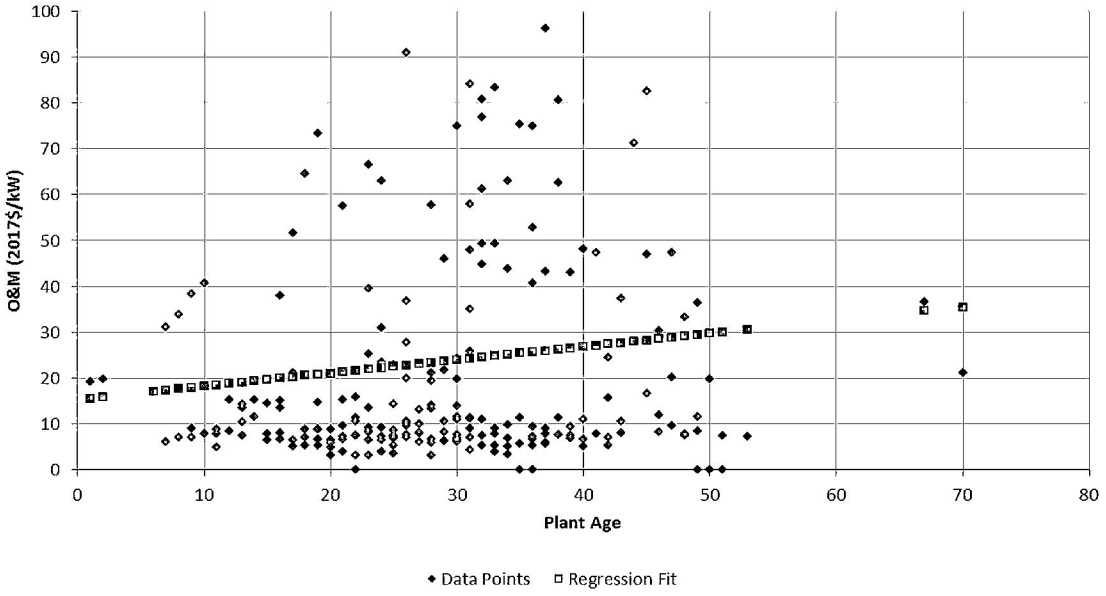
OPERATIONS & MAINTENANCE EXPENDITURES – ALL PLANT SIZES

The results of the linear regression analysis of O&M spending for pumped hydroelectric storage plants of all MW sizes (full dataset) are summarized in the table below and plotted in the figure below. Since the p-value for the age coefficient ("slope") is greater than 0.05, the dataset does not support age as a statistically significant predictor of O&M spending (on a linear trend across all plant ages). The dataset was not divided by unit capacity due to the limited number of data points.

Table F-2 — Regression Statistics – Pumped Hydroelectric O&M for All MW

		t statistic	*p-value*
Observations	226		
Simple Average ($/kW)	23.634		
Intercept	15.296	2.9021	4.08E-03
Slope	0.288	1.7010	9.03E-02
R^2	0.01275		

Figure F-2 — Pumped Hydroelectric – O&M for All Plant MW Sizes



Note: Age coefficient in above regression equation is not statistically significant.

The simple average O&M and CAPEX values for each 20-year age band, expressed in constant 2017 $/kW-year, are summarized in the table below.

	Average $/kW (years 1 - 20) =	Average $/kW (years 21 - 40) =	Average $/kW (years 41 - 80) =	**Average $/kW (all years) =**	Data Points (years 1 - 20) =	Data Points (years 21 - 40) =	Data Points (years 41 - 80) =	**Data Points (all years) =**
All MW, All Capacity Factors								
Net Total O&M- 2017 $/kW	18.97	23.41	31.00	**23.63**	50	140	36	**226**
Net Total Capex - 2017 $/kW	22.94	11.93	14.92	**14.83**	50	141	36	**227**
Net Total O&M and Capex - 2017 $/kW	41.91	35.34	45.92	**38.46**	--	--	--	--

Starting with the initial analysis of CAPEX and O&M raw data, as presented above, Sargent & Lundy developed recommended changes to the existing values used in the EMM. The recommended changes for existing pumped hydroelectric storage plants are described in Section 8.

Sargent & Lundy
Consulting

Appendix G. Regression Analysis – Solar Photovoltaic

CAPITAL EXPENDITURES

Annual CAPEX, labeled in FERC Form 1 as TCP, are broken down into subcategories, including:

- Land & Land Rights
- Structures & Improvements
- Reservoirs, Dams & Waterways
- Water Wheels
- Turbines & Generators
- Accessory Electric Equipment
- Equipment
- Asset Retirement Costs
- Roads, and Railroads & Bridges

These subcategories are based on traditional power generation technologies and have minimal applicability to solar PV. Expected CAPEX for solar PV, such as inverter replacement and repair or module replacement, are clearly not applicable to any of the categories listed in FERC Form 1.

In the FERC Form 1 data, only 10 of the solar PV sites had a breakdown of TCP into the above subcategories, with even fewer providing such a breakdown for more than one year. As discussed in Section 9, the year-over-year change in TCP is the sole source of annual CAPEX information in FERC Form 1. Of this data, Sargent & Lundy determined that a significant portion of it needed to be filtered out due to the following reasons:

- A negative change in the TCP between two consecutive years
- A change in the capacity of the plant greater than 20%
- A significant increase in TCP without a capacity increase
- Large unexplained fluctuations (e.g., negative to positive) in TCP from year to year
- Large gaps in annual data

After filtering out clearly suspect data, about one-third of the remaining data was for plants having only three years of data or less. In addition, many of the plants reported no changes in TCP, suggesting that most annual expenditures at those sites were being reported as O&M rather than being capitalized.

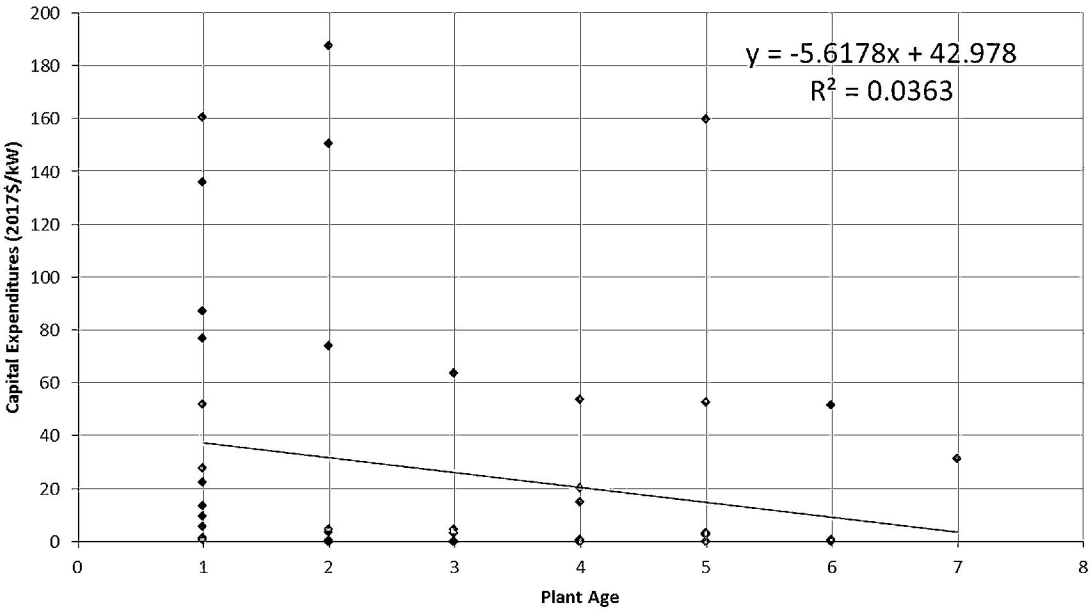
Thus, Sargent & Lundy had to rely on a limited dataset for solar PV consisting of 15 sites. The average change in TCP for these sites was approximately $26/kW-year. Based on the available FERC Form 1 information, it cannot be determined whether this change in TCP was due to typical CAPEX for solar PV, such as inverter or module replacement, or other factors.

The results of the linear regression analysis of CAPEX spending for solar PV plants of all MW sizes (full dataset) are summarized in the table below and plotted in the figure below. Since the p-value for the age coefficient ("slope") is 0.16, which is greater than 0.05, the dataset does not support age as a statistically significant predictor of CAPEX spending (on a linear trend across all plant ages). In addition, as indicated in the table below, there are a relatively small number of data points for CAPEX (less than 60 points). The average CAPEX across all years is approximately $26/kW-year (2017 dollars).

Table G-1 — Regression Statistics – Solar PV CAPEX for All MW

		t statistic	*p-value*
Observations	57		
Simple Average ($/kW)	26.026		
Intercept	42.978	3.2248	2.12E-03
Slope	-5.618	-1.4387	1.56E-01
R^2	0.03627		

Figure G-1 — Solar PV Dataset – CAPEX for All MW Plant Sizes



Note: Age coefficient in above regression equation is not statistically significant.

OPERATIONS & MAINTENANCE EXPENDITURES

Solar PV O&M activities include a variety of work scopes, including administrative work, monitoring, cleaning, preventative maintenance, and corrective maintenance. Some specific examples of O&M activities may include cleaning modules, monitoring system voltage and current, inspecting and cleaning electrical equipment, inspecting modules for damage, inspecting mounting systems, and checking invertor settings. The cost of O&M is dependent on several factors, including the number of components, the type of system (e.g., roof, tracking, ground mount, fixed, etc.), warranty coverage, and location. Environmental conditions, such as hail, sand/dust, snow, salt in air, high winds, etc., also play a significant role in O&M costs. For these reasons, a higher level of variation is expected when compared to traditional generating technologies.

The total production cost, which is the sum of the total operating expense and total maintenance expense, was reported for slightly over half of the sites. Of the sites reporting, several sites only reported this data in certain years, leaving gaps in the data. Subcategories for operating costs and maintenance cost were provided in the FERC Form 1 data, but rarely was the reported data broken into subcategories.

Sargent & Lundy organized the FERC Form 1 data into two presentation formats. In the first format, the annual O&M cost was averaged across all years of the reported data to obtain the average annual O&M cost per plant. This resulted in approximately 60 data points. In the second format, the annual O&M cost was averaged across each year of operation. This resulted in approximately 200 data points. The average O&M cost results are not equal between the two presentation formats. Table G-2 provides a simple example of these differing results, using FERC Form 1 O&M data from three plants.

Table G-2 — Example of Calculation Method Differences

	O&M Cost ($/kW-year)															
Age (Years)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Plant Average
Example Plant 1	127.8	0.0	0.1	0.0	-	-	-	-	-	-	-	-	-	-	-	32.0
Example Plant 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Example Plant 3	32.2	15.3	24.8	-	-	-	-	-	-	-	-	-	-	-	-	24.1

Example Average (All Data Points)	9.1
Example Average (of Plant Averages)	18.7

In the example above, a single plant with more data points is able to sway the average O&M cost across the three plants. The values calculated below are based on averaged data points (i.e., a data point is the average annual O&M cost across the reported data for a given plant).

Figure G-2 and Figure G-3 show the average site O&M cost, expressed in $/MWh, for sites with a capacity less than 5 MW and greater than 5 MW, respectively. In general, these figures show a high level of variability across sites, with smaller sites having a higher O&M cost per MWh produced. Several data points were for sites having very low capacity factors (less than 5%), which also results in higher O&M costs per MWh. For the sites greater than 5 MW, the average O&M cost was $8.5/MWh. When expressed on the basis of cost per kW of capacity (see Figure G-4 and Figure G-5), the average O&M for sites greater than 5 MW was $15/kW-year.

Figure G-2 — Average Site O&M Cost per MWh Generated vs. Project Nameplate Capacity (< 5 MW)

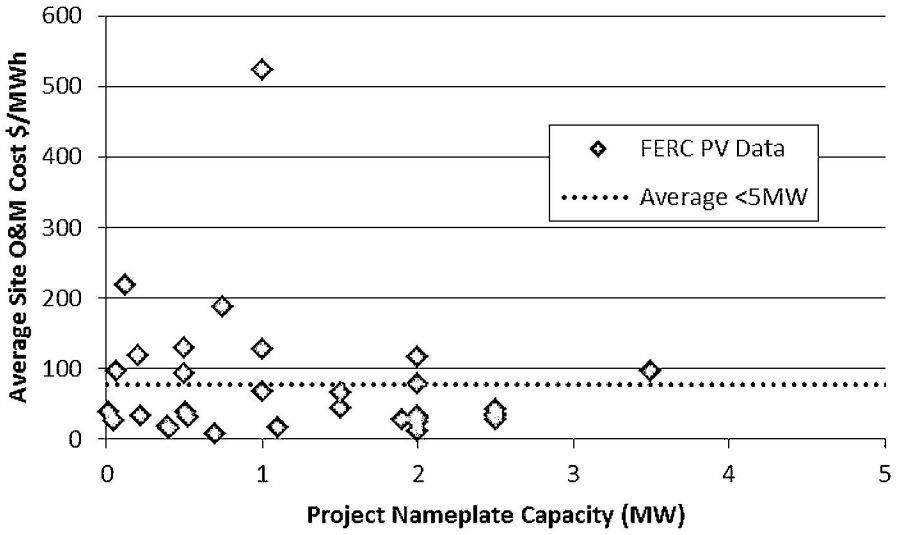


Figure G-3 — Average Site O&M Cost per MWh Generated vs. Project Nameplate Capacity (> 5 MW)

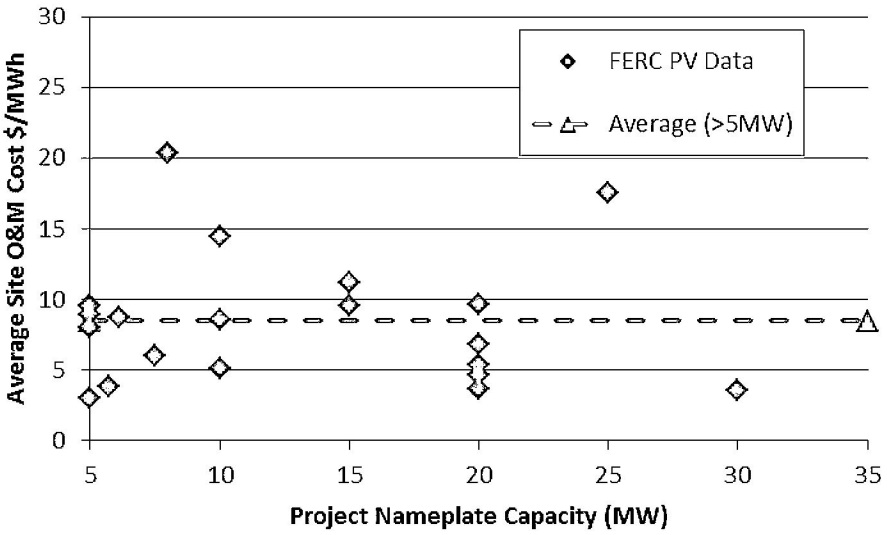


Figure G-4 — Average Site O&M Cost per kW-Year Capacity vs. Project Nameplate Capacity (< 5 MW)

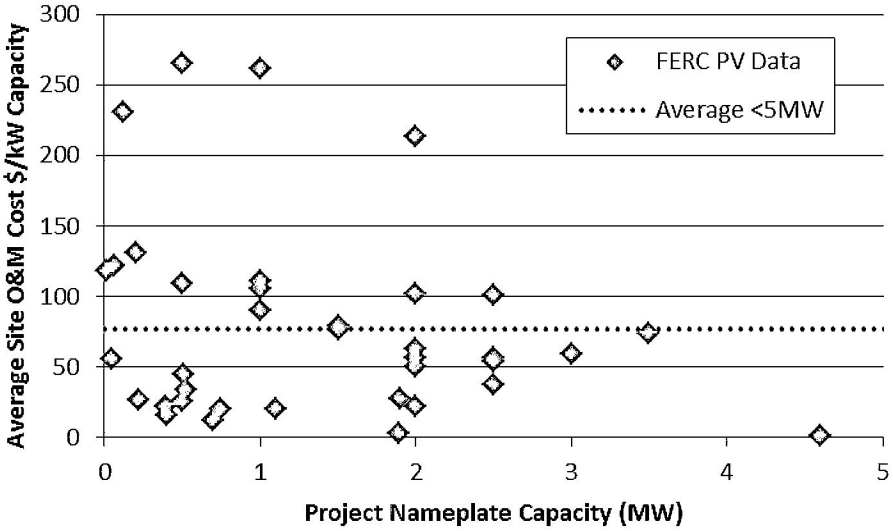
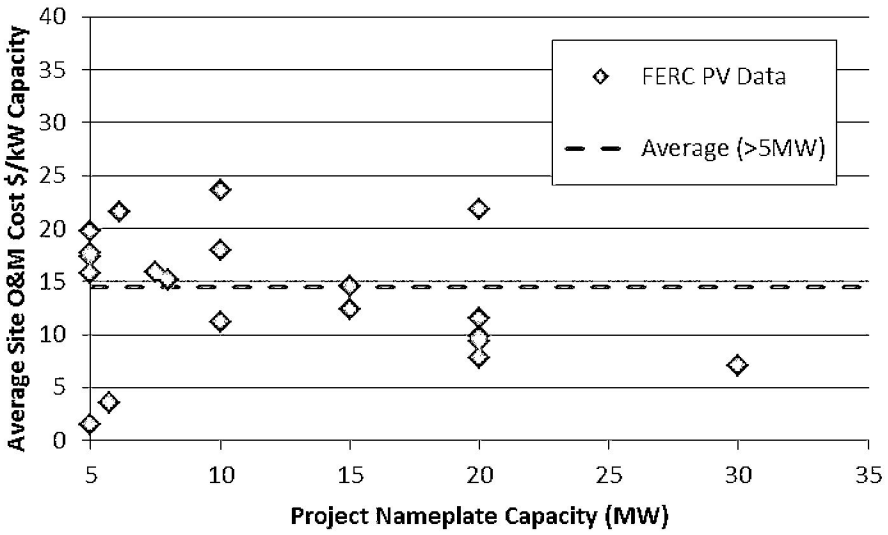


Figure G-5 — Average Site O&M Cost per kW-Year Capacity vs. Project Nameplate Capacity (> 5 MW)



The figures below show the annual site O&M cost (in $/MWh and $/kW-year) versus the age of the project. In general, little correlation can be seen between age and O&M cost.

Figure G-6 — Annual Site O&M Cost per MWh vs. Age of Project

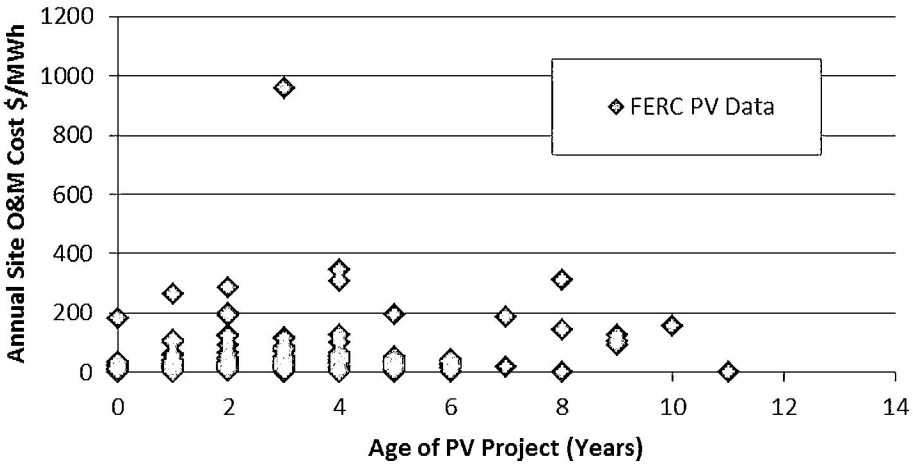
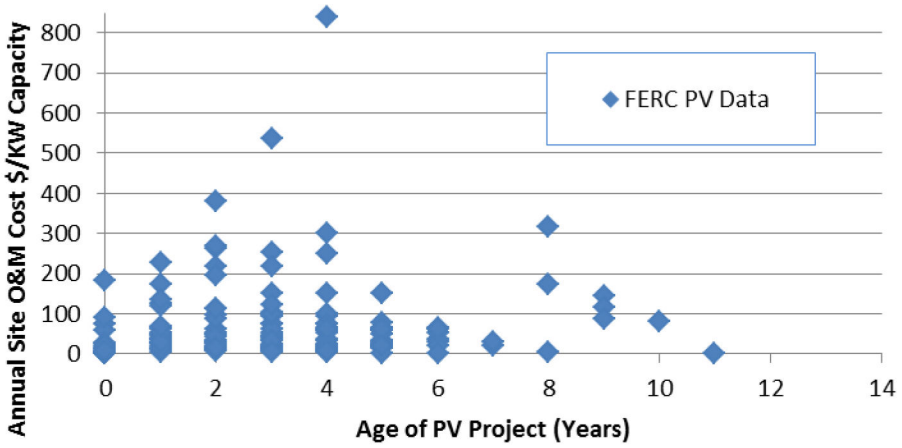


Figure G-7 — Annual Site O&M Cost per kW-Year Capacity vs. Age of Project



Sargent & Lundy compiled O&M data from other sources in Table G-3 below for comparison against the FERC data. In general, the O&M costs in $/kW-year capacity are in the same range as the FERC data for sites over 5-MW capacity.

Table G-3 — Summary of Industry O&M Cost Data for Solar PV

O&M Cost Sources	O&M Cost $/kW-yr	Notes	Report Source Data Year
NREL & Sunshot	15	Fixed	2015
NREL & Sunshot	18	Single-Axis Tracking	2015
Sunshot + NREL	20.5	Good O&M	2016
Sunshot + NREL	25.0	Optimal O&M	2016
IRENA Power to Change	10	Minimum	2015
IRENA Power to Change	18	Maximum	2015
Utility Scale Solar	17	Overall	2014
Utility Scale Solar 2016	7	Minimum	2016
Utility Scale Solar 2016	27	Maximum	2016
Utility Scale Solar 2016	18	Mean	2016
NREL U.S. Solar Photovoltaic System Cost Benchmark: Q1 2017	15.4	Fixed LCOE Assumption	2017
NREL U.S. Solar Photovoltaic System Cost Benchmark: Q1 2018	18.5	SAT LCOE Assumption	2017

Starting with the initial analysis of CAPEX and O&M raw data, as presented above, Sargent & Lundy developed recommended changes to the existing values used in the EMM. The recommended changes for existing solar PV plants are described in Section 9.

Sargent & Lundy
Consulting

Appendix H. Regression Analysis – Solar Thermal

There are no solar thermal power plants that report operating data in FERC Form 1. Industry-wide, there are a limited number of solar thermal projects; a majority of which have been constructed within the last 10 years—the exception being small test facilities and the Solar Energy Generating Systems (SEGS) plants built in the 1980s.

Sargent & Lundy
Consulting

Appendix I. Regression Analysis – Geothermal

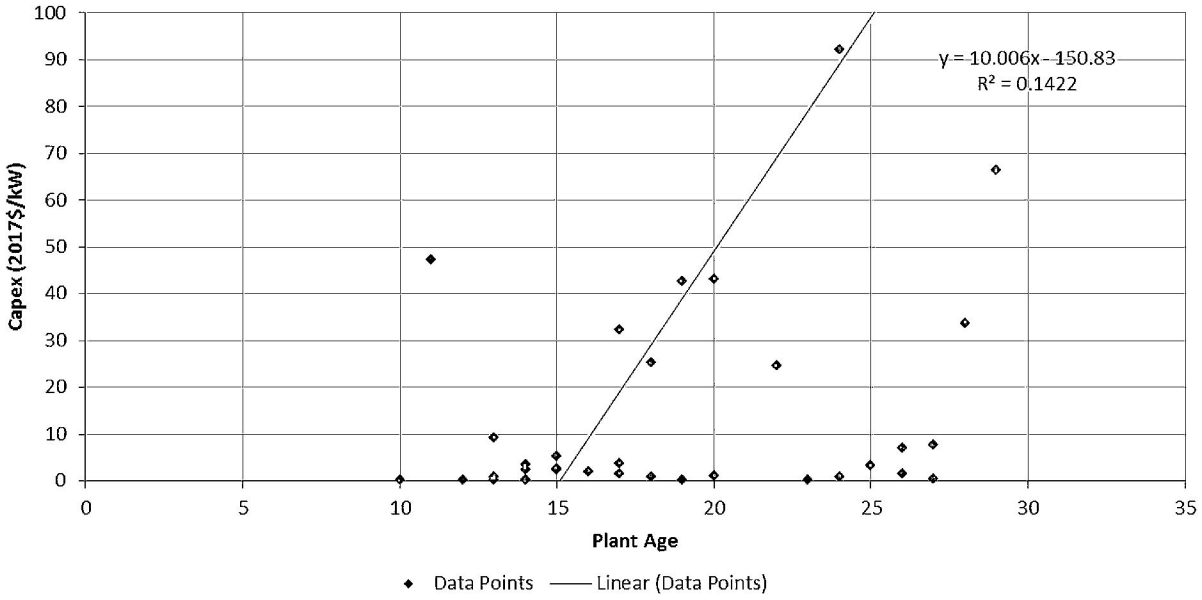
CAPITAL EXPENDITURES

The results of the linear regression analysis of CAPEX spending for geothermal plants of all MW sizes (full dataset) are summarized in the table below and plotted in the figure below. Although the p-value is less than 0.05, the dataset is inconclusive because the intercept is negative due to no plants reporting data between ages and 0 and 10.

Table I-1 — Regression Statistics – Geothermal CAPEX for All MW

		t statistic	*p-value*
Observations	36		
Simple Average ($/kW)	40.948		
Intercept	-150.830	-1.7907	8.23E-02
Slope	10.006	2.3736	2.34E-02
R^2	0.14215		

Figure I-1 — Geothermal Dataset – CAPEX for All MW Plant Sizes



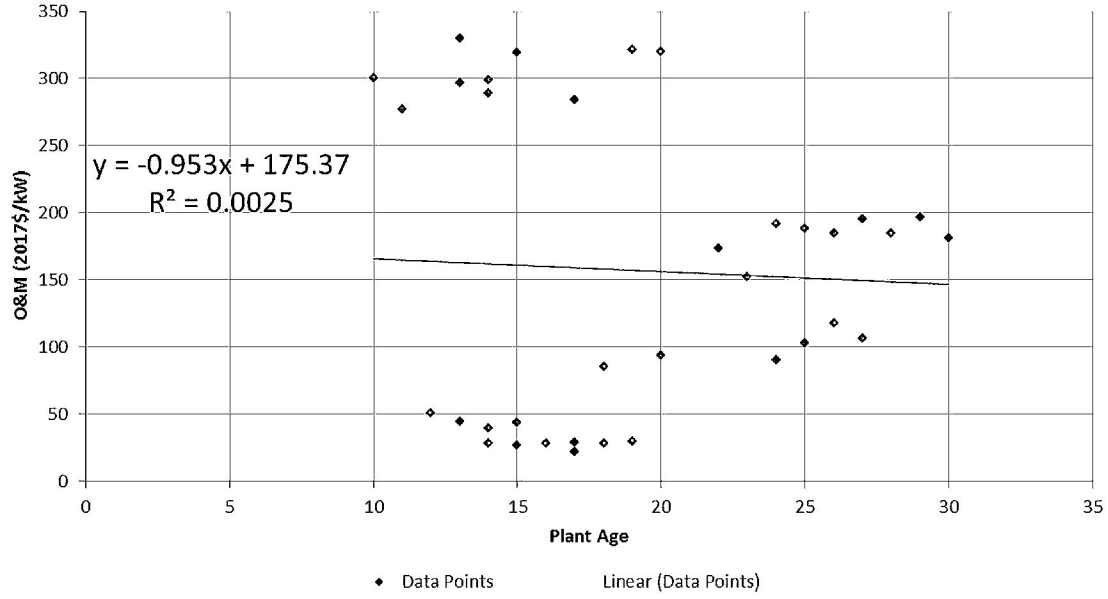
OPERATIONS & MAINTENANCE EXPENDITURES

The results of the linear regression analysis of O&M spending for geothermal plants of all MW sizes (full dataset) are summarized in the table below and plotted in the figure below. Since the p-value for the age coefficient is 0.071, which is greater than 0.05, the dataset does not support age as a statistically significant predictor of O&M spending (on a linear trend across all plant ages).

Table I-2 — Regression Statistics – Geothermal O&M for All MW

		t Statistic	*p-value*
Observations	36		
Simple Average ($/kW)	157.103		
Intercept	175.369	2.6984	1.08E-02
Slope	-0.953	-0.2930	7.71E-01
R^2	0.00252		

Figure I-2 — Geothermal Dataset – O&M for All MW Plant Sizes



Note: Age coefficient in above regression equation is not statistically significant.

The simple average O&M and CAPEX values for each five-year age band, expressed in constant 2017 $/kW-year, are summarized in the table below.

Table I-3 — Geothermal All MW Summary of Results

	Average $/kW-yr (Years 1-5)	Average $/kW-yr (Years 6-10)	Average $/kW-yr (Years 11-15)	Average $/kW-yr (Years 16-20)	Average $/kW-yr (Years 21-25)	Average $/kW-yr (Years 26-30)	Average $/kW-yr (All Years)	Data Points (Years 1-5)	Data Points (Years 6-10)	Data Points (Years 11-15)	Data Points (Years 16-20)	Data Points (Years 21-25)	Data Points (Years 26-30)	Data Points (All Years)
All MW, All Capacity Factors														
Net Total O&M – 2017 $/kW-yr	--	300.62	170.44	124.24	149.97	166.77	**157.10**	--	1	12	10	6	7	**36**
Net Total CAPEX – 2017 $/kW-yr	--	--	72.05	30.16	27.64	114.45	**40.94**	--	1	12	10	6	7	**36**

Starting with the initial analysis of CAPEX and O&M raw data, as presented above, Sargent & Lundy developed recommended changes to the existing values used in the EMM. The recommended changes for existing geothermal plants are described in Section 11.

Appendix J. Regression Analysis – Wind

CAPITAL EXPENDITURES

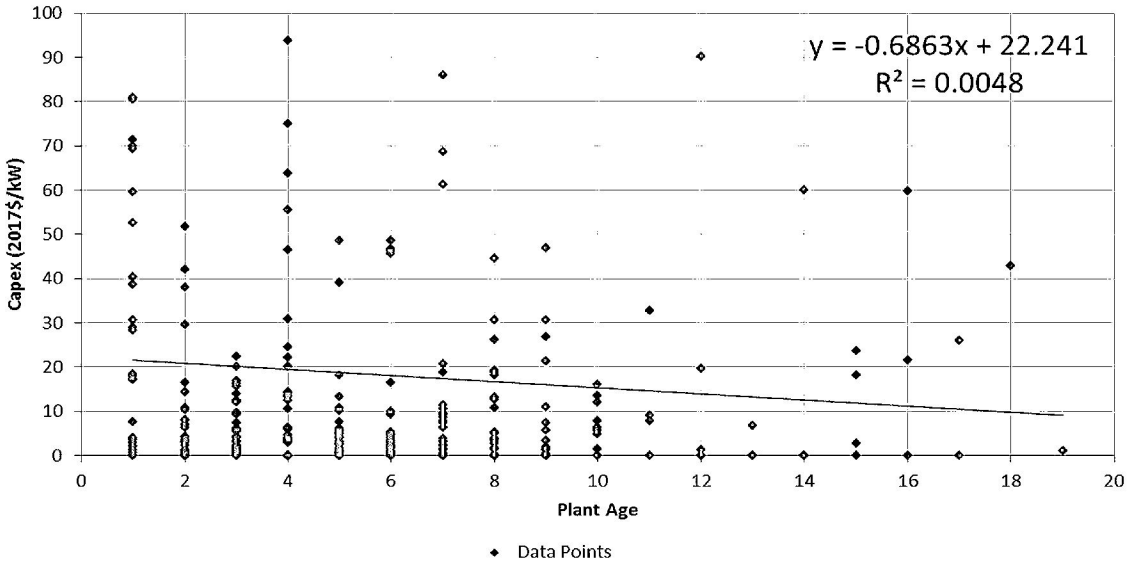
Full Dataset

The results of the linear regression analysis of CAPEX spending for wind plants of all MW sizes (full dataset) are summarized in the table below and plotted in the figure below. Since the p-value for the age coefficient is 0.224, which is greater than 0.05, the dataset does not support age as a statistically significant predictor of CAPEX spending (on a linear trend across all plant ages).

Table J-1 — Regression Statistics – Wind CAPEX for All MW

		t Statistic	*p-value*
Observations	310		
Simple Average ($/kW)	18.285		
Intercept	22.241	5.7807	1.82E-08
Slope	-0.686	-1.2194	2.24E-01
R^2	0.00480		

Figure J-1 — Wind Dataset – CAPEX for All MW Plant Sizes



Note: Age coefficient in above regression equation is not statistically significant.

The simple average O&M and CAPEX values for each five-year age band, expressed in constant 2017 $/kW-year, are summarized in the table below.

Table J-2 — Wind All MW Summary of Results

	Average $/kW-yr (Years 1-5)	Average $/kW-yr (Years 6-10)	Average $/kW-yr (Years 11-15)	Average $/kW-yr (Years 16-20)	Average $/kW-yr (All Years)	Data Points (Years 1-5)	Data Points (Years 6-10)	Data Points (Years 11-15)	Data Points (Years 16-20)	Data Points (All Years)
All MW, All Capacity Factors										
Net Total CAPEX – 2017 $/kW-yr	21.06	10.97	32.62	21.60	**18.29**	168	112	23	7	**310**

Starting with the initial analysis of CAPEX raw data, as presented above, Sargent & Lundy developed recommended changes to the existing values used in the EMM. The recommended changes for existing wind plants are described in Section 12.

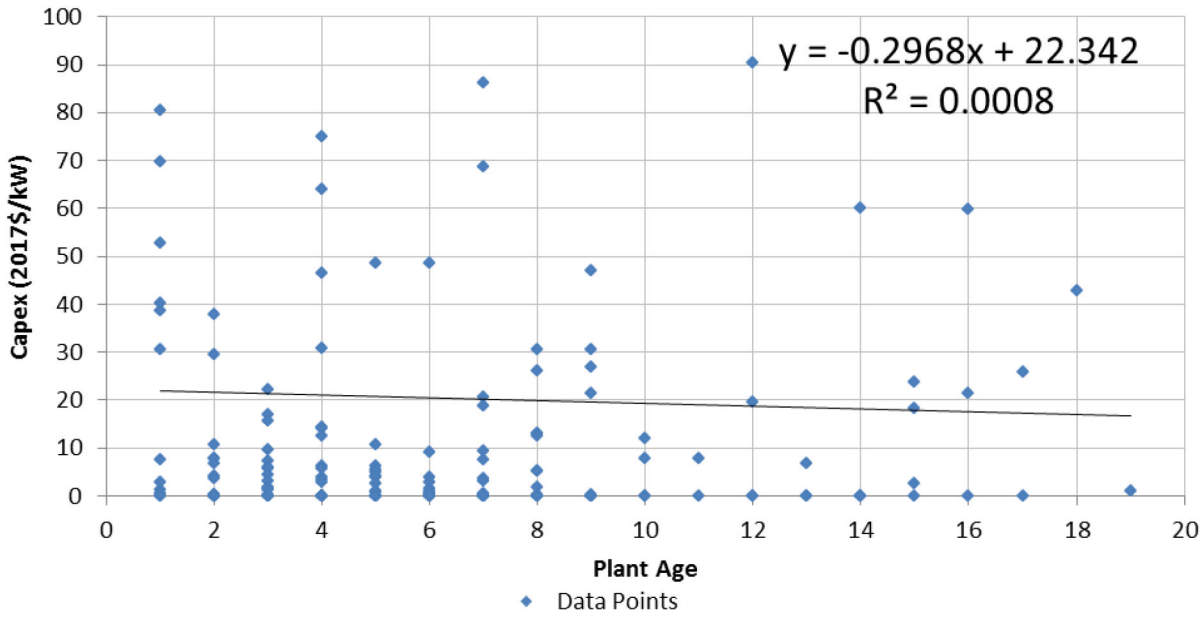
0-100 MW

The results of the linear regression analysis of CAPEX spending for wind plants between 0 MW and 100 MW are summarized in the table below and plotted in the figure below. Since the p-value for the age coefficient is 0.706, which is greater than 0.05, the dataset does not support age as a statistically significant predictor of CAPEX spending (on a linear trend across all plant ages). Therefore, a more appropriate predictor of CAPEX spending for this dataset is a simple average by plant age band, as discussed in Section 12.

Table J-3 — Regression Statistics – Wind CAPEX for 0-100 MW

		t Statistic	*p-value*
Observations	174		
Simple Average ($/kW)	20.483		
Intercept	22.342	3.7750	2.20E-04
Slope	-0.297	-0.3779	7.06E-01
R^2	0.00083		

Figure J-2 — Wind Dataset – CAPEX for 0-100-MW Plant Sizes



Note: Age coefficient in above regression equation is not statistically significant.

The simple average CAPEX values for each five-year age band, expressed in constant 2017 $/kW-year, are summarized in the table below.

Table J-4 — Wind < 100-MW Summary of Results

	Average $/kW-yr (Years 1-5)	Average $/kW-yr (Years 6-10)	Average $/kW-yr (Years 11-15)	Average $/kW-yr (Years 16-20)	Average $/kW-yr (All Years)	Data Points (Years 1-5)	Data Points (Years 6-10)	Data Points (Years 11-15)	Data Points (Years 16-20)	Data Points (All Years)
< 100 MW, All Capacity Factors										
Net Total CAPEX – 2017 $/kW-yr	22.83	11.62	35.35	21.60	**20.48**	89	58	20	7	**174**

Starting with the initial analysis of CAPEX raw data, as presented above, Sargent & Lundy developed recommended changes to the existing values used in the EMM. The recommended changes for existing wind plants are described in Section 12.

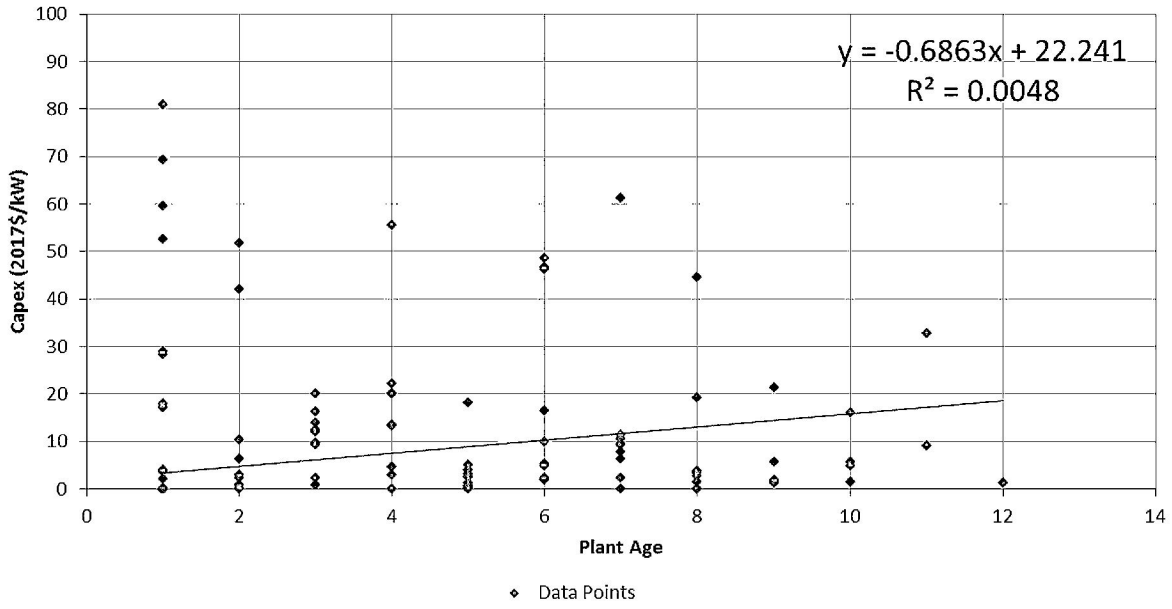
100-200 MW

The results of the linear regression analysis of CAPEX spending for wind plants between 100 MW and 200 MW are summarized in the table below. Since the p-value for the age coefficient is 0.224, which is greater than 0.05, the dataset does not support age as a statistically significant predictor of CAPEX spending (on a linear trend across all plant ages).

Table J-5 — Regression Statistics – Wind CAPEX for 100-200 MW

		t Statistic	*p-value*
Observations	310		
Simple Average ($/kW)	16.935		
Intercept	22.241	5.7807	1.82E-08
Slope	-0.686	-1.2194	2.24E-01
R^2	0.00480		

Figure J-3 — Wind Dataset – CAPEX for 100-200-MW Plant Sizes



Note: Age coefficient in above regression equation is not statistically significant.

The simple average CAPEX values for each five-year age band, expressed in constant 2017 $/kW-year, are summarized in the table below.

Table J-6 — Wind 100-200-MW Summary of Results

	Average $/kW-yr (Years 1-5)	Average $/kW-yr (Years 6-10)	Average $/kW-yr (Years 11-15)	Average $/kW-yr (Years 16-20)	Average $/kW-yr (All Years)	Data Points (Years 1-5)	Data Points (Years 6-10)	Data Points (Years 11-15)	Data Points (Years 16-20)	Data Points (All Years)
100 - 200 MW, All Capacity Factors										
Net Total CAPEX – 2017 $/kW-yr	20.36	12.20	14.41	--	**16.93**	52	36	3	--	**91**

Starting with the initial analysis of CAPEX raw data, as presented above, Sargent & Lundy developed recommended changes to the existing values used in the EMM. The recommended changes for existing wind plants are described in Section 12.

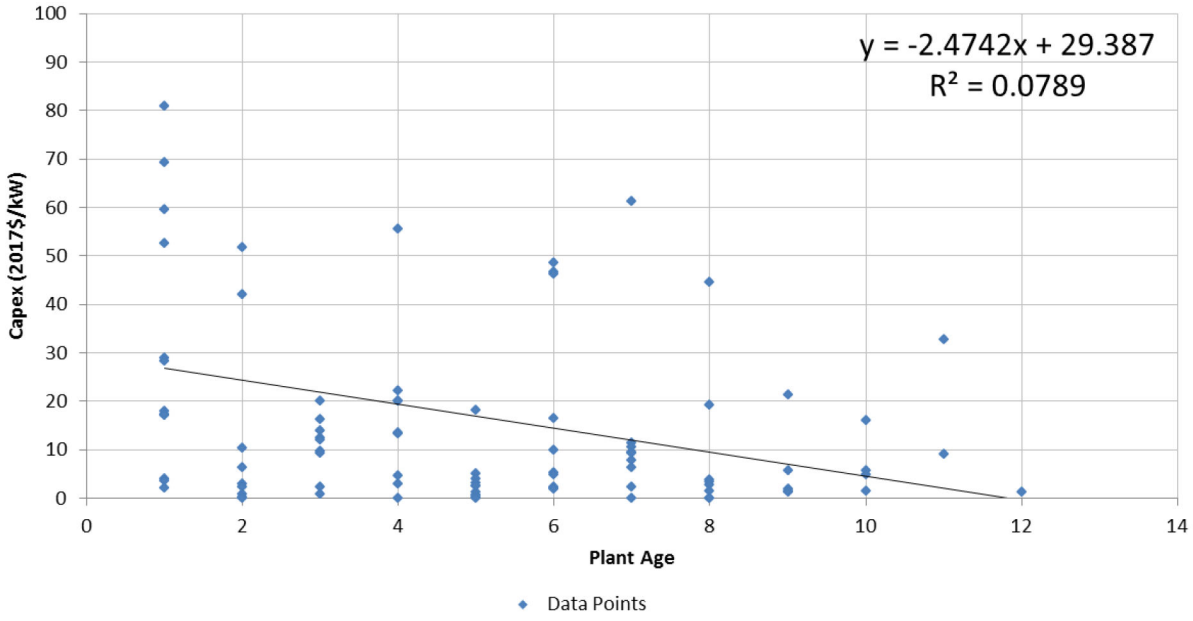
Greater than 200 MW

The results of the linear regression analysis of CAPEX spending for wind plants greater than 200 MW are summarized in the table below and plotted in the figure below. Since the p-value for the age coefficient is 0.006, which is less than 0.05, the dataset does support age as a statistically significant predictor of CAPEX spending (on a linear trend across all plant ages). However, a visual inspection of the data in the graph below shows that there are a limited number of data points over 10 years, which may be skewing the regression.

Table J-7 — Regression Statistics – Wind CAPEX for Greater than 200 MW

		t Statistic	*p-value*
Observations	91		
Simple Average ($/kW)	16.935		
Intercept	29.387	5.6538	1.87E-07
Slope	-2.474	-2.7612	6.99E-03
R^2	0.07891		

Figure J-4 — Wind Dataset – CAPEX for Greater than 200-MW Plant Sizes



The simple average CAPEX values for each five-year age band, expressed in constant 2017 $/kW-year, are summarized in the table below.

Table J-8 — Wind Greater than 200-MW Summary of Results

	Average $/kW-yr (Years 1-5)	Average $/kW-yr (Years 6-10)	Average $/kW-yr (All Years)	Data Points (Years 1-5)	Data Points (Years 6-10)	Data Points (All Years)
> 200 MW, All Capacity Factors						
Net Total CAPEX – 2017 $/kW-yr	**16.61**	**8.65**	**13.48**	31	20	**51**

Starting with the initial analysis of CAPEX raw data, as presented above, Sargent & Lundy developed recommended changes to the existing values used in the EMM. The recommended changes for existing wind plants are described in Section 12.

OPERATIONS & MAINTENANCE EXPENDITURES

Full Dataset

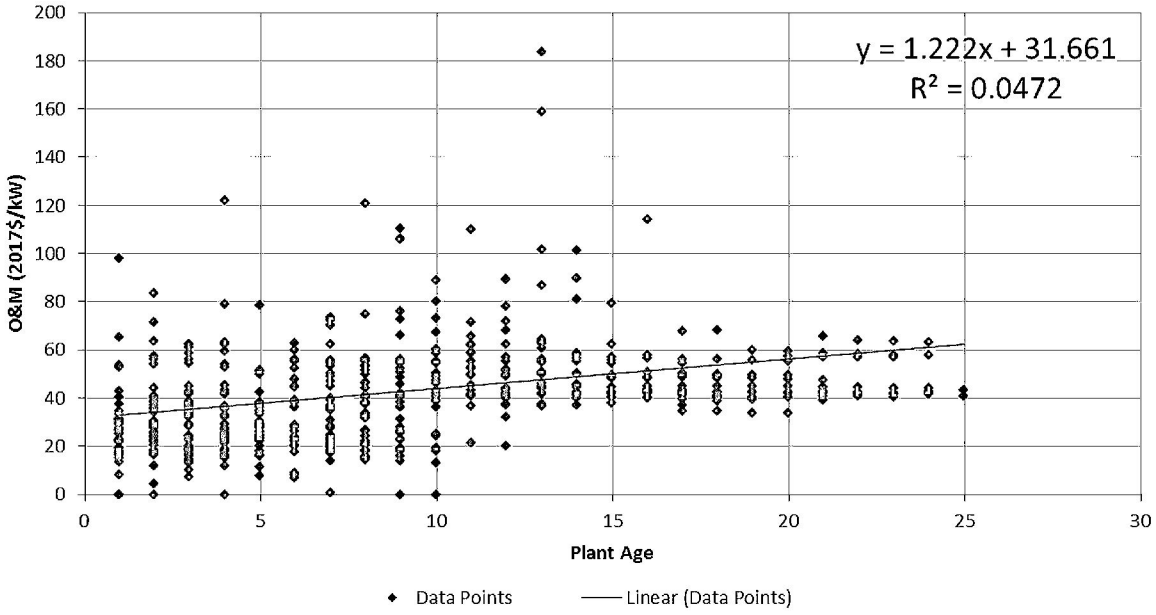
The results of the linear regression analysis of O&M spending for wind plants of all MW sizes (full dataset) are summarized in the table below and plotted in the figure below. Since the p-value for the age coefficient is significantly less than 0.05, age is a statistically significant predictor of O&M spending (on a linear trend across all plant ages). Therefore, O&M spending for the dataset may be estimated by the regression equation:

Annual O&M spending in 2017 $/kW-year = 31.661 + (1.222 × age)

Table J-9 — Regression Statistics – Wind O&M for All MW

		t statistic	*p-value*
Observations	580		
Simple Average ($/kW)	42.680		
Intercept	31.661	12.7763	4.24E-33
Slope	1.222	5.3515	1.26E-07
R^2	0.04721		

Figure J-5 — Wind Dataset – O&M for All MW Plant Sizes



0-100 MW

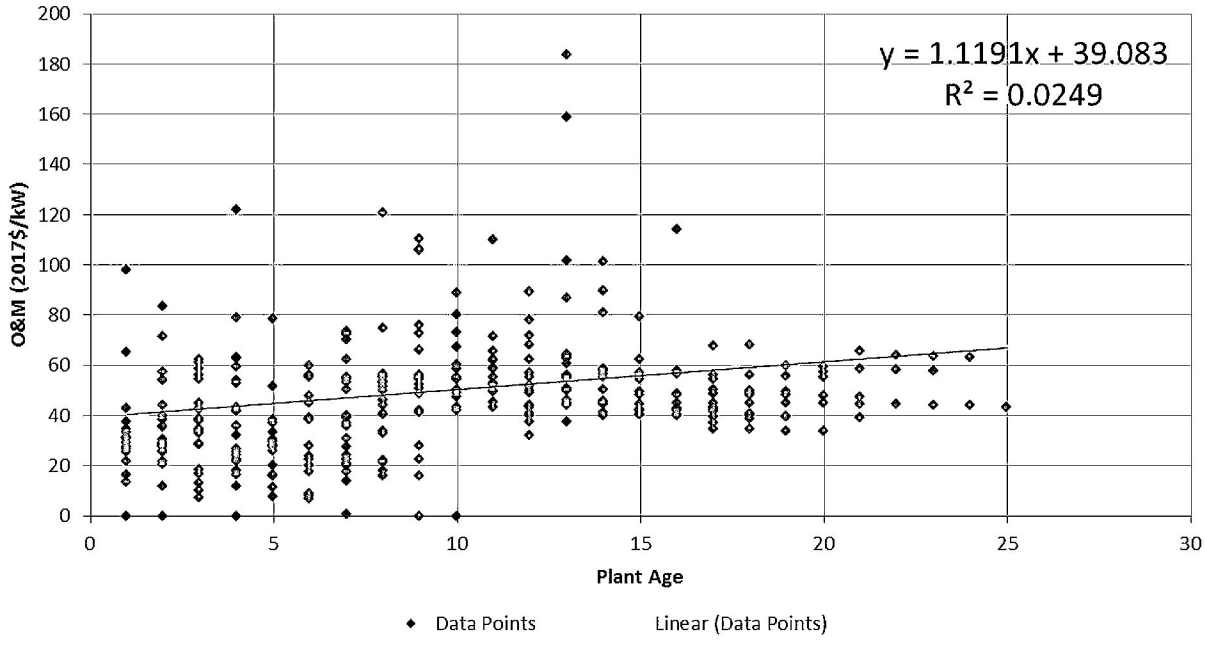
The results of the linear regression analysis of O&M spending for wind plants between 0 MW and 100 MW are summarized in the table below and plotted in the figure below. Since the p-value for the age coefficient is 0.003, which is less than 0.05, the dataset age is a statistically significant predictor of O&M spending (on a linear trend across all plant ages). Therefore, O&M spending for the dataset may be estimated by the regression equation:

Annual O&M spending in 2017 $/kW-year = 39.083 + (1.119 × age)

Table J-10 — Regression Statistics – Wind O&M for 0-100 MW

		t Statistic	*p-value*
Observations	339		
Simple Average ($/kW)	49.888		
Intercept	39.083	9.0574	1.10E-17
Slope	1.119	2.9310	3.61E-03
R^2	0.02486		

Figure J-6 — Wind Dataset – O&M for 0-100-MW Plant Sizes



100-200 MW

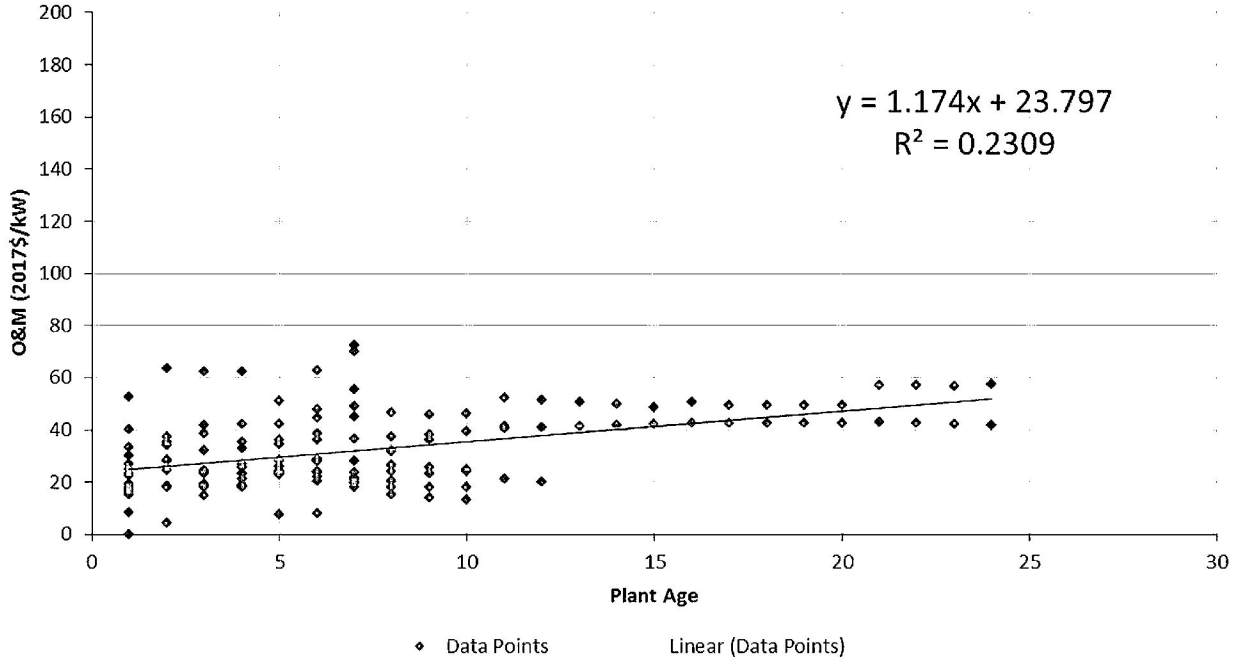
The results of the linear regression analysis of O&M spending for wind plants between 100 MW and 200 MW are summarized in the table below and plotted in the figure below. Since the p-value for the age coefficient is significantly less than 0.05, age is a statistically significant predictor of O&M spending (on a linear trend across all plant ages). Therefore, O&M spending for the dataset may be estimated by the regression equation:

Annual O&M spending in 2017 $/kW-year = 23.797 + (1.174 × age)

Table J-11 — Regression Statistics – Wind O&M for 100-200 MW

		t Statistic	*p-value*
Observations	147		
Simple Average ($/kW)	35.645		
Intercept	23.797	14.1919	3.27E-29
Slope	1.174	6.5971	7.33E-10
R^2	0.23086		

Figure J-7 — Wind Dataset – O&M for 100-200-MW Plant Sizes



Greater than 200 MW

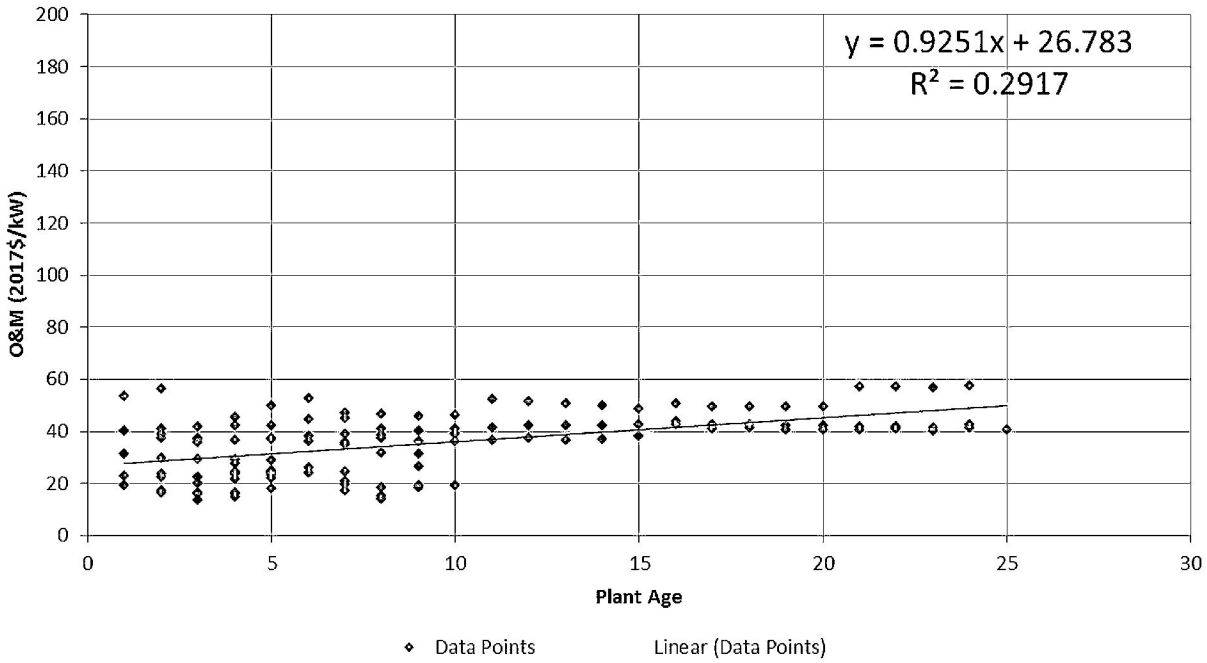
The results of the linear regression analysis of O&M spending for wind plants greater than 200 MW are summarized in the table below and plotted in the figure below. Since the p-value for the age coefficient is significantly less than 0.05, age is a statistically significant predictor of O&M spending (on a linear trend across all plant ages). Therefore, O&M spending for the dataset may be estimated by the regression equation:

Annual O&M spending in 2017 $/kW-year = 26.783 + (0.925 × age)

Table J-12 — Regression Statistics – Wind O&M Greater than 200 MW

		t statistic	*p-value*
Observations	124		
Simple Average ($/kW)	35.645		
Intercept	26.783	17.5334	3.90E-35
Slope	0.925	7.0885	9.55E-11
R^2	0.29171		

Figure J-8 — Wind Dataset – O&M for Plant Sizes Greater than 200 MW



Southwestern Public Service Company
Capital Additions
April 1, 2018 through March 31, 2019

Asset Class	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) Total Company	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) NM Retail
Steam Production	$ 39,843,569	$ 11,029,215
Other Production	1,210,856	335,181
Electric Transmission	256,772,854	52,507,979
Electric Distribution	100,309,251	35,534,299
Electric General	42,013,242	11,663,475
Electric Intangible	18,371,298	5,101,149
Grand Total	**$ 458,521,070**	**$ 116,171,298**

Witness	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) Total Company	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) NM Retail
Harkness	$ 27,021,325	$ 7,502,520
Bick	8,221,359	2,282,366
Lytal	42,028,513	11,634,816
Meeks	111,597,408	38,668,052
Cooley	269,652,466	56,083,543
Grand Total	**$ 458,521,070**	**$ 116,171,298**

Production Assets allocated using 12CP-PROD (27.68%).
Transmission Assets primarily allocated using 12CP-TRAN (20.45%). Radial Line assets direct assigned.
Distribution Assets direct assigned according to location.
General Plant allocated using LABXAG (27.76%).
Intangible Plant primarily allocated using LABXAG (27.76%) with one project allocated by CUST-RET (31.08%).

Southwestern Public Service Company
Capital Additions
April 1, 2018 through March 31, 2019

	(A)	(B)	(C)	(D)	(E)	(F)	(G)
Line No.	Asset Class	Witness	Project Category	WBS Level 2	Project Description (WBS Level 2 Description)	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) Total Company	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) NM Retail
1	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.500	TOL1C-Rpl MDBFP DischargeVlv	$ 178,334	$ 49,365
2	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.500	TOL1C-Rpl Boiler Frt Elevator	3,175	879
3	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.500	TOL1C-Rpl BlrDrm E Center Sfty	25,208	6,978
4	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.500	TOL1C- Rpl West Main Stm Sfty	(9,986)	(2,764)
5	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.500	TOL0C-HydrogenGen Power Sys	49,176	13,613
6	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.500	TOL1C-Rwd W Blr Circ Pmp Mtr	100,489	27,817
7	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.500	TOL1C-Rpl CT Partition Walls	238,005	65,883
8	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.500	TOL0C-Rpl Reactor 1 Inlet Pipe	23,986	6,640
9	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.500	TOL2C- Rewind Generator Rotor	2,175,648	602,248
10	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.500	TOL1C-Rpl MillF MainVrt Shaft	1,374,614	380,511
11	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.500	TOL2C-Gen Stator Rewedge	271,793	75,236
12	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.500	TOL2C-Inst RealTmXfmr DisGasAnly	46,282	12,811
13	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.500	TOL2C-Rpl Bull Ring Assmbly	23,363	6,467
14	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.500	TOL0C-Inst Rectifier RMU	2,666	738
15	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.500	TOL1C-Rewind CT Cell #6 Motor	7,820	2,165
16	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.500	TOL1C-Rewind CT Cell #14 Motor	7,418	2,053
17	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.500	TOL1C-Rewind CT Cell #18 Motor	7,558	2,092
18	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.500	TOL0C-Inst SwingGates&LadderProt	208,917	57,831
19	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.500	TOL0C-Rpl SSBAC Oil Cooler	8,864	2,454
20	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.500	TOL2C-Rpl Center AuxCirc Dis Vlv	16,949	4,692
21	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.500	TOL2C-Rpl Bull Ring Assmby 2C	20,245	5,604
22	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.500	TOL0C-Rpl Horz Well 99E Pump	83,440	23,097
23	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.500	TOL0C-S SBAC OVH 2017-22573	(881)	(244)
24	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.500	TOL1C-W Rev Gas Mtr Rwnd	(294)	(81)
25	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.035	HAR3C-Rpl Boiler Economizer	4,189,538	1,159,718
26	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR2C-Rpl S Cond Pump Element	80,736	22,349
27	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR3C-Rpl CT Cell #2 Mechanicals	6,004	1,662
28	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR1C-Rpl W #2 O2 Probe	226	63
29	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR1C-W Circ Pmp Wire Replaced	73,552	20,360
30	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR3C-Install Eye Wash Station	23,337	6,460
31	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR3C-CT N Circ Pump Mtr Rewind	136,535	37,795
32	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR2C-Rpl O2 Probes	21,631	5,988
33	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR1C-CTMU Pump Rpl Rotating Assy	19,678	5,447
34	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR2C-Rpl W FD Fn Oil Clr Tubes	22,246	6,158
35	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR0C-Rpl Pond 7 Floating Pump	14,866	4,115
36	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR0C-Rpl ACI Diverter Valves	12,891	3,568
37	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR1C-SUBFP Motor Rewind	211,706	58,603
38	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR0C-CESP BFP Element	168,304	46,589
39	Steam Production	Lytal	Environmental Compliance	A.0001550.500	HAR3C-Rpl Bghse Inlet Duct Exp Jnts	131,949	36,525
40	Steam Production	Lytal	Environmental Compliance	A.0001550.500	HAR2C-Rpl Deflation Fan Motors	17,716	4,904
41	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR3C-Rpl #2 FWH 2B Valve	40,365	11,174
42	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR3C-3D SBAC Motor Rewind	170,101	47,086
43	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR3C-Rpl N CT Circ Pump cable	56,955	15,766
44	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR0C-Swing gates and ladder	118,168	32,710

Southwestern Public Service Company
Capital Additions
April 1, 2018 through March 31, 2019

	(A)	(B)	(C)	(D)	(E)	(F)	(G)
Line No.	Asset Class	Witness	Project Category	WBS Level 2	Project Description (WBS Level 2 Description)	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) Total Company	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) NM Retail
45	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR2C-Inst CT Cable tray	59,589	16,495
46	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR3C-Aux Clg Wtr Pmp Mtr Rwd	60,012	16,612
47	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR0C-Inst Vlv on BD Recovery	80,571	22,303
48	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR3C-Rpl FWH3 Steam Separator	10,673	2,954
49	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR3C-Rpl W#4 O2 Probe	11,002	3,046
50	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR3C-N ACW Pump Mtr Rwnd	17,393	4,815
51	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR3C-C BCP Mtr Rwnd	46,210	12,791
52	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR3C-Rpl N Cond Bstr Pump Cable	20,253	5,606
53	Steam Production	Lytal	Environmental Compliance	A.0001550.500	HAR1C-Rpl Dust Spprssn Pump Cable	25,697	7,113
54	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR3C-Rpl FWH3 Shell relief vlv	8,758	2,424
55	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR2C-W Seal Trough Wtr Pump Rpl	5,485	1,518
56	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR1C-Rpl #2 Corner Tilt Drives	48,276	13,363
57	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.500	HAR3C-Rpl FWH2 Steam Separator	10,058	2,784
58	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.283	HAR3C-Rpl APH Baskets	1,623,841	449,500
59	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.296	TOL2C-Rpl Main Pwr Transformer	1,603,155	443,774
60	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.475	HAR3C-Rpl CT Bottom Structure	1,227,170	339,696
61	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.226	TOL2C-Rpl Mill E Gearbx & Jour	1,175,533	325,403
62	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.113	TOL0C-Rpl RR Ties PH 3 of 5	1,123,730	311,063
63	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.257	TOL1C-UpgDCSOprStn& CntrlProc	1,105,121	305,912
64	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.093	TOL0C-Rpl RR Ties PH 4 of 5	1,036,417	286,894
65	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.223	TOL1C-Rpr MillC GearBx & Jrnls	856,916	237,206
66	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.309	HAR3C-H3 Upgrd DCS Opr stn	776,877	215,050
67	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.597	TOL1C-Rpl Coal Pipe & Elbows	776,483	214,941
68	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001545.500	CHC0C-Waste Water Pond Pump	203	56
69	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001545.500	CHC2C-Sprht Spray Blck Vlv	26,817	7,423
70	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001545.500	CHC0C-Rpl Gas Sys SRV	37,149	10,283
71	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001545.500	CHC2C-Anodamine CF System	1,139	315
72	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001545.500	CHC0C-MaxiVolt Equipment	12,058	3,338
73	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001545.500	CHC2C-HRH Piping Abate&Reins	530,070	146,730
74	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001545.500	CHC2C-Rpl Firing Valve	13,138	3,637
75	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001545.500	CHC2C-Rpl Elevator Gearbox	63,842	17,672
76	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001545.500	CHC0C-inst Ladder Swing Gates	53,990	14,945
77	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.500	JON0C-Fire System Iso Vlvs	502	139
78	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.500	JON0C-Rpl UF Modules	40,559	11,227
79	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.500	JON0C-Rpl Diesel Fire Pmp Vlv	13,540	3,748
80	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.500	JON0C-Install Rectifier RMU	3,774	1,045
81	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.500	JON0C-Smart Pig Test	472,480	130,788
82	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.500	JON1C-Rpl HP FWH #1 & #2	27,941	7,734
83	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.500	JON2C-Rpl HP FWH #2	27,485	7,608
84	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.500	JON2C-Rpl CT Motor Cell #3	12,939	3,582
85	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.500	JON2C-Rpl CT Motors	23,786	6,584
86	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.500	JON0C-Inst Ladder Swing Gates	34,174	9,460
87	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.500	JON2C-Rpl Aux Blr Wtr Vlv	11,187	3,097
88	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.500	JON0C-Rpl Fire Sys Chk Vlv	10,658	2,950

Southwestern Public Service Company
Capital Additions
April 1, 2018 through March 31, 2019

	(A)	(B)	(C)	(D)	(E)	(F)	(G)
Line No.	Asset Class	Witness	Project Category	WBS Level 2	Project Description (WBS Level 2 Description)	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) Total Company	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) NM Retail
89	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.500	JON2C-Rpl Gas Density Anlyzr	5,394	1,493
90	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.500	JON2C-E Rpl CT Bypass Vlv	139	39
91	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.500	JON2C-Rpl Economizer Exp Jnts	(731)	(202)
92	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001529.500	MAD1C-Rpl Main Stm SealReg Vlv	26,341	7,291
93	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001529.500	MAD2C-Rwnd DC Lube Oil Motor	(255)	(71)
94	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001529.500	MAD1C-Rpl Basement Heater	839	232
95	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001529.500	MAD0C-Rpl Main Pinnacle Gas Vlv	27,802	7,696
96	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001529.500	MAD0C-Inst Ladder Swing Gates	24,324	6,733
97	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001529.500	MAD1C-Rpl HRH Terminal Tubes	601,878	166,608
98	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001534.157	PLX0C-Rpl 50T-5T Turb Crane-20816	668,393	185,020
99	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.043	TOL1C-Rpl Burner Assemblies	581,360	160,928
100	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.006	HAR2C-H2 Install Ash Silo Elev	565,909	156,651
101	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001529.067	MAD1C-Rpl #1 HP FWH-20820	529,643	146,612
102	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001560.117	NIC0C-Rpl Roof-Turb High	523,645	144,952
103	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.244	HAR0C-Rpl SBAC Controls	486,622	134,703
104	Steam Production	Lytal	Environmental Compliance	A.0001555.089	TOL2C-Rpl Baghouse Bags 2018	475,735	131,690
105	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.446	HAR1C- CT Fan Stacks	468,675	129,735
106	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.450	HAR2C- Rpl CT Fan Stacks	464,132	128,478
107	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001560.123	NIC3C-CT Mechanicals Phase 1	461,611	127,780
108	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001545.122	CHC2C-Upg DCS Hardware	427,632	118,374
109	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001529.024	MAD1C-Rpl CS APH Basket&Seals	397,843	110,128
110	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.250	HAR1C-Rpl CT Mechanicals Ph2	387,719	107,326
111	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001529.032	MAD1C-Rpl M1 Elevator	381,966	105,733
112	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001560.118	NIC0C-Rpl Roof-Turb Low	364,669	100,945
113	Steam Production	Lytal	Environmental Compliance	A.0001550.458	HAR3C- Rpl Bghse Doors	364,027	100,767
114	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.253	JON1C-BFP Elem Comp Rpl-21019	343,739	95,152
115	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001545.035	CHC2C-Rpl BFP Discharge vlvs	342,703	94,865
116	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.287	JON2C-Rpl CT Makeup Piping	332,687	92,092
117	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.366	TOL1C-T1 #1FWH valves	317,076	87,771
118	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001560.500	NIC2C-BFP Element Refurb	1,553	430
119	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001560.500	NIC0C-Inst #6 Slaker RR Supply	2,447	677
120	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001560.500	NIC3C-Rpl SJAE Throttle Valve	(817)	(226)
121	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001560.500	NIC2C-Rpl Boiler Sump Pipe	656	182
122	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001560.500	NIC3C-Rpl SSR Bypass Actuator	21,990	6,087
123	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001560.500	NIC3C-Rpl Reverse Power Relays RP1-	14,204	3,932
124	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001560.500	NIC1C-Rewind N FD Motor *Corrected*	46,343	12,828
125	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001560.500	NIC2C-Rpl Hogging Jet Valves	16,788	4,647
126	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001560.500	NIC0C-Swing gates and ladders	76,463	21,166
127	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001560.500	NIC0C-Rpl Demin Sump Drain Line	21,059	5,829
128	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001560.500	NIC0C-Pond 18 Motor Rpl	15,300	4,235
129	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001560.500	NIC0C-House Air Comp Mtr	6,169	1,708
130	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001560.500	NIC1C-Rpl CT Makeup Cntrl Vlv	(35)	(10)
131	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001560.500	NIC0C-Rpl System Lab HVAC	9,398	2,602
132	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001560.500	NIC0C-Rpl Aux Boiler Feed Pump	58,501	16,194

Southwestern Public Service Company
Capital Additions
April 1, 2018 through March 31, 2019

Line No.	(A) Asset Class	(B) Witness	(C) Project Category	(D) WBS Level 2	(E) Project Description (WBS Level 2 Description)	(F) Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) Total Company	(G) Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) NM Retail
133	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001534.500	PLX1C-Rpl DA Pressure Rel Vlv	(0)	(0)
134	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001534.500	PLX2C-Rpl Yarway DrumLvl Xmtr	24,922	6,899
135	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001534.500	PLX2C-Rpl West Blowdown Vlv	10,031	2,777
136	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001534.500	PLX3C-Rpl SH/RH Spray block Vlv	5,791	1,603
137	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001534.500	PLX4C-Rpl Bldn Throttling Vlv	6,491	1,797
138	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001534.500	PLX4C-Rpl Inst Air Comp	81,211	22,480
139	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001534.500	PLX0C-Inst SwingGates&LadderProt	23,690	6,558
140	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001534.500	PLX4C-Rpl SH/RH SpayAuto BlkVLV	29,904	8,278
141	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001534.500	PLX4C-Rpl HP Heater Safeties	14,537	4,024
142	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001534.500	PLX0C-Replace Water Wells	30,780	8,520
143	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001534.500	PLX3C-E FD Fan Motor Rwd	51,768	14,330
144	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.252	TOL0C-Rpl Receiving WH Roof	273,849	75,805
145	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001545.031	CHC2C-Rpl BFP Fluid Drives	270,951	75,003
146	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.479	HAR3C-Rpl EHC Pump Sys	261,741	72,453
147	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001560.115	NIC0C-Install Demin Wtr Supply	260,255	72,042
148	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.021	HAR0C-Rpl Paving Phase 5/6	252,260	69,829
149	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001529.057	MAD1C-Rpl Air Prehtr Exp Joint	243,217	67,326
150	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.455	HAR3C- ACW Heat Exchangers	234,268	64,848
151	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.120	TOL0C-Inst Perimet FencePonds	232,148	64,262
152	Steam Production	Lytal	Environmental Compliance	A.0001586.265	JON2C-CEM's Upgrade-19975	216,486	59,926
153	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.028	HAR2C-Rpl CT Acid Tank	210,340	58,225
154	Steam Production	Lytal	Environmental Compliance	A.0001586.264	JON1C-CEM's Upgrade-19976	208,087	57,601
155	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.370	TOL2C-RPL Boiler Sump Line T2	203,910	56,445
156	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.073	JON0C-Inst Backflow Prvt on HT	193,923	53,680
157	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.034	HAR0C-Rpl Paving Phase 6/6	180,040	49,837
158	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.595	TOL1C-Cooling Tower Bypass	173,448	48,013
159	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.285	JON2C-Rpl Circ Pump Suc Hood	170,659	47,241
160	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.254	TOL1C-Rpl SSC Chain 2018	165,793	45,894
161	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.083	HAR3C-H3 Rpl Lab Analyzers 201	151,767	42,011
162	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001534.172	PLX0C-Rpl Lab Analyzers	140,631	38,929
163	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.594	TOL1C-Int Online Vib Mntr Sys	140,414	38,868
164	Steam Production	Lytal	Environmental Compliance	A.0001550.151	HAR3C-H3 Rebag Partial 2018	132,478	36,672
165	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.599	TOL2C-Inst Online Vib Mntr Sys	120,957	33,483
166	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.060	TOL0C-Rpl Water Well Pmp 2018	118,257	32,735
167	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001560.079	NIC3C-Rpl Lab Analyzers	111,612	30,896
168	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.358	TOL1C-RPL Boiler Sump Line	107,985	29,892
169	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001545.254	CHC2C-Rpl Burner Titls-21235	104,421	28,905
170	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001545.255	CHC2C-Rpl CT Suction Screens-21237	100,689	27,872
171	Steam Production	Lytal	Environmental Compliance	A.0001550.443	HAR1C- ESP Re-build TR-sets PH2	91,868	25,430
172	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.473	HAR3C-Inst Online Vib Mntr Sys	88,416	24,475
173	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001560.116	NIC0C-Rpl Roof-Maint Shop	82,782	22,915
174	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001545.073	CHC0C-Rpl Waterwell Pmp Mtr	80,176	22,194
175	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001545.300	CHC0C-Rpl Lab Analyzers	73,779	20,423
176	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001534.171	PLX0C-Roof Drains Header	73,699	20,401

Southwestern Public Service Company
Capital Additions
April 1, 2018 through March 31, 2019

	(A)	(B)	(C)	(D)	(E)	(F)	(G)
Line No.	Asset Class	Witness	Project Category	WBS Level 2	Project Description (WBS Level 2 Description)	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) Total Company	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) NM Retail
177	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.082	HAR3C-H3 Rpl Drag Chain 2018	71,344	19,749
178	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001545.083	CHC0C-Rpr Water Well Mtr 2017	71,264	19,727
179	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.363	TOL1C- Rpl rev gas expansion joints	69,636	19,276
180	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001545.305	CHC2C-Rpl Lab Analyzers	65,132	18,029
181	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001545.046	CHC0C-Refurb Plant Bathroom	60,166	16,655
182	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001545.257	CHC0C-Rpl TUCO Roof-21291	56,709	15,698
183	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001534.185	PLX3C-Condensate Suction Pipe	53,483	14,805
184	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001534.190	PLX4C-Rpl Feedwater Analyzers	51,241	14,184
185	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001529.036	MAD1C-Rpl Turbine Oil Centrifu	46,676	12,920
186	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.481	HAR0C-Tmg Cntr Fire Detection	42,399	11,737
187	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001534.184	PLX3C-Rpl Feedwater Analyzers	40,505	11,212
188	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001545.304	CHC2C-Inst Onln Vib Mntr Sys	37,599	10,408
189	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.072	JON2C-Rpl Gas Firing Valve	37,199	10,297
190	Steam Production	Lytal	Environmental Compliance	A.0001550.461	HAR0C-Inst Above Grade Fuel Tanks	31,468	8,711
191	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001529.052	MAD0C-Tornado Shelter	28,874	7,993
192	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.260	JON1C-CT Sec pH Probe-21239	27,971	7,743
193	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.278	TOL0C-Drill Horizontal WaterWell	27,463	7,602
194	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001534.170	PLX0C-Rpl Relay & ComptrRmFloors	26,704	7,392
195	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.259	JON2C-CT Sec pH Probe-21238	26,343	7,292
196	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.364	TOL1C-Rpl east rev gas fan damper	23,338	6,460
197	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.262	HAR1C-SBAC 1B Mjr Rebld 2017	18,120	5,016
198	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001545.303	CHC1C-Rpl Lab Analyzers	13,664	3,782
199	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.194	HAR2C-Rpl H2 Mill E Exhauster	11,862	3,283
200	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001534.174	PLX1C-Rpl Boiler PH Analyzers	11,589	3,208
201	Steam Production	Lytal	Environmental Compliance	A.0001555.090	TOL1C-Rpl Baghouse Bags 2017	9,754	2,700
202	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001534.178	PLX2C-Rpl Boiler pH Analyzers	8,442	2,337
203	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.596	TOL1C-Rpl Lab Sample System	8,000	2,215
204	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.212	TOL0C-Rpl Water Well Pmp 2019	7,085	1,961
205	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.142	JON1C-Rpl Oil Circ Brkr JK00	4,923	1,363
206	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.055	JON1C-Abate & Reinsulate DA	2,288	633
207	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.057	TOL0C-Rpl Water Well Pmp 2017	1,492	413
208	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.262	JON1C-Circ Water Struct Liner-19992	1,025	284
209	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001529.065	MAD1C-Rpl Lab Analyzers-21292	508	141
210	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.261	JON1C-Replace CP's-19974	485	134
211	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.129	JON1C-Rpl Rosemount 1151 XMTRS	210	58
212	Steam Production	Lytal	Environmental Compliance	A.0001550.462	HAR0C-Remove UG Fuel Tanks	186	51
213	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.030	TOL0C-TolkX Water Well Ph 7	176	49
214	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.283	JON1C-Rpl CT Bypass Vlv	160	44
215	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.275	HAR2C-Rpl SH Spray Valves	37	10
216	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.014	JON2C-E Rpl Mech Draft 3&8	28	8
217	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.137	HAR2C-H2 Rpl Lab Analyzers 201	10	3
218	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.142	HAR1C-Cooling Tower Structure	(1)	(0)
219	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001555.219	TOL1C-Rpr MillB GearBx & Jrnl	(210)	(58)
220	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.141	JON1C-Rpl IPs with DVC	(314)	(87)

Southwestern Public Service Company
Capital Additions
April 1, 2018 through March 31, 2019

Line No.	(A) Asset Class	(B) Witness	(C) Project Category	(D) WBS Level 2	(E) Project Description (WBS Level 2 Description)	(F) Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) Total Company	(G) Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) NM Retail
221	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001550.109	HAR1C-H1 Rpl Condenser Circ Pi	(327)	(91)
222	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.295	JON0C-Portable Vibration DAS	(7,958)	(2,203)
223	Steam Production	Lytal	Reliability & Performance Enhancement	A.0001586.081	JON1C-Rpl Seamed HRH Piping	(123,637)	(34,224)
224	Steam Production	Lytal	Environmental Compliance	A.0001555.088	TOL1C-Rpl Baghouse Bags 2018	(137,462)	(38,051)
225	**Steam Production Total**					**$ 39,843,569**	**$ 11,029,215**
226	Other Production	Lytal	Reliability & Performance Enhancement	A.0001586.291	JON3C-Rpl Exh Expansion Joint	$ 230,300	$ 63,750
227	Other Production	Lytal	Reliability & Performance Enhancement	A.0001545.501	CHC3C-Rpl GT Inlet Air Filters	76,209	21,096
228	Other Production	Lytal	Reliability & Performance Enhancement	A.0001545.501	CHC4C-Rpl GT Inlet Air Filters	76,406	21,150
229	Other Production	Lytal	Reliability & Performance Enhancement	A.0001545.501	CHC3C-Rpl Submersible Pump	9,320	2,580
230	Other Production	Lytal	Reliability & Performance Enhancement	A.0001545.501	CHC3C-Rpl Generator Prot Relays	25,357	7,019
231	Other Production	Lytal	Reliability & Performance Enhancement	A.0001545.501	CHC4C-Rpl Generator Prot Relays	26,138	7,235
232	Other Production	Lytal	Reliability & Performance Enhancement	A.0001586.294	JON4C-Rpl Exh Expansion Joint	209,394	57,963
233	Other Production	Lytal	Reliability & Performance Enhancement	A.0001529.501	MAD2C-Xfrmr Rewind and Wire	82,853	22,935
234	Other Production	Lytal	Reliability & Performance Enhancement	A.0001529.501	MAD2C-Rpl Fuel Cntrl Vlv	48,541	13,437
235	Other Production	Lytal	Reliability & Performance Enhancement	A.0001529.501	MAD2C-Rpl Crane Pwr Supply	19,101	5,287
236	Other Production	Lytal	Reliability & Performance Enhancement	A.0001529.501	MAD2C-Rpl AC Units Elec Pkg	9,834	2,722
237	Other Production	Lytal	Reliability & Performance Enhancement	A.0001529.080	MAD3C-Rpl Exhaust Stack	152,634	42,251
238	Other Production	Lytal	Reliability & Performance Enhancement	A.0001586.501	JON4C-Rpl Turning Gear Gearbox	142,393	39,416
239	Other Production	Lytal	Reliability & Performance Enhancement	A.0001586.501	JON3C-Rpl Gen Cooler Bypass Act	9,973	2,761
240	Other Production	Lytal	New Generation	A.0001577.002	Hale-Land & Land Rights	55,028	15,233
241	Other Production	Lytal	Reliability & Performance Enhancement	A.0001554.501	QUA1C-Rpl Starting Diesel Rad	22,987	6,363
242	Other Production	Lytal	Reliability & Performance Enhancement	A.0001554.003	QUA2C-Rpl Emergency Diesel Generato	14,249	3,944
243	Other Production	Lytal	Reliability & Performance Enhancement	A.0001621.001	GMS0C-Gaines Cty Gen Project	139	39
244	**Other Production Total**					**$ 1,210,856**	**$ 335,181**
245	Electric Transmission	Cooley	RE	A.0000424.085	Kiowa-North Loving 345kV Line_	$ 22,495,220	$ 4,600,091
246	Electric Transmission	Cooley	RE	A.0000424.087	N Loving-China Draw 345kV Line	18,636,556	3,811,025
247	Electric Transmission	Cooley	RE	A.0000540.001	Atoka-Eagle Creek 115 kV Line	14,045,213	2,872,133
248	Electric Transmission	Cooley	RE	A.0001310.003	Walkemeyer 345/115 Sub	11,791,330	2,411,232
249	Electric Transmission	Cooley	SR	A.0000499.013	SPS ELR 115kV TX 2016	10,999,197	2,249,247
250	Electric Transmission	Cooley	RE	A.0000519.001	Roosevelt County Substation	9,502,265	1,943,137
251	Electric Transmission	Cooley	RE	A.0000511.003	Carlisle to Wofforth Carlisle	8,172,345	1,671,179
252	Electric Transmission	Cooley	RE	A.0000424.165	N Loving Sub Xfmr 345kV/115kV_	6,809,314	1,392,450
253	Electric Transmission	Cooley	RE	A.0000424.095	Road Runner Sub Xfmr 345kV_UID	6,793,459	1,389,208
254	Electric Transmission	Cooley	RE	A.0000424.167	C Draw 345kV Sub N Loving Term	6,154,882	1,258,624
255	Electric Transmission	Cooley	RE	A.0000424.091	Kiowa Sub Xfmr Bus/Potash Ter	6,133,566	1,254,265
256	Electric Transmission	Cooley	RE	A.0000673.022	TUCO-Yoakum 345kV ROW_UID 5044	5,720,536	1,169,803
257	Electric Transmission	Cooley	RE	A.0000424.169	C Draw Sub Xmfr 345kV/115kV_UI	5,434,106	1,111,231
258	Electric Transmission	Cooley	SR	A.0000499.011	SPS ELR 115kV NM 2016	5,430,058	1,110,403
259	Electric Transmission	Cooley	RE	A.0000424.163	N Loving Sub Kiowa/C Draw Term	5,426,930	1,109,763
260	Electric Transmission	Cooley	RE	A.0000296.005	NE Hereford to New Center St.	4,541,034	928,605
261	Electric Transmission	Cooley	LI	A.0001008.002	Inst 230kV Sw Station XcelPortion	4,112,432	840,959
262	Electric Transmission	Cooley	RE	A.0000424.144	OPIE Potash-Livingston Ridge	3,869,519	791,286

Southwestern Public Service Company
Capital Additions
April 1, 2018 through March 31, 2019

	(A)	(B)	(C)	(D)	(E)	(F)	(G)
Line No.	Asset Class	Witness	Project Category	WBS Level 2	Project Description (WBS Level 2 Description)	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) Total Company	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) NM Retail
263	Electric Transmission	Cooley	RE	A.0000199.001	Custer Mountain-Ochoa Reconductor	3,761,552	769,207
264	Electric Transmission	Cooley	SR	A.0000303.007	SPS 2016 S&E B 230kV Line	3,660,266	748,495
265	Electric Transmission	Cooley	RE	A.0000296.008	NE Hereford Sub	3,649,792	746,353
266	Electric Transmission	Cooley	SR	A.0000303.045	SPS S&E 115kV Line TX 2016	3,609,270	738,067
267	Electric Transmission	Cooley	RE	A.0000463.008	South Portales-Market Street L	3,333,790	681,733
268	Electric Transmission	Cooley	SR	A.0001267.001	345/115kV 448MVA XfmrspareSub	3,252,815	665,174
269	Electric Transmission	Cooley	RE	A.0001319.006	W40 Rebuild Dawn to Panda Tap	3,135,356	641,155
270	Electric Transmission	Cooley	RE	A.0000494.001	Seminole Xfmr 1	3,024,673	618,521
271	Electric Transmission	Cooley	OT	A.0000710.003	SPS Physical Security Sub Infrastru	2,880,609	589,061
272	Electric Transmission	Cooley	RE	A.0000860.003	Curry Co Dist Xfmr Conversion	2,819,976	576,662
273	Electric Transmission	Cooley	RE	A.0000194.001	Cochran 115 Cap Bank	2,631,416	538,103
274	Electric Transmission	Cooley	RE	A.0000424.093	Road Runner Sub 345kV Conv_UID	2,611,864	534,105
275	Electric Transmission	Cooley	RE	A.0000424.143	IMC1-Intrepid West 115kv Recd	2,467,078	504,498
276	Electric Transmission	Cooley	RE	A.0000424.136	Monument-Byrd 115kvRecond Line	2,442,386	499,448
277	Electric Transmission	Cooley	RE	A.0001326.001	Yoakum 230/115 Xfmr 1 Upgrade	2,325,506	475,547
278	Electric Transmission	Cooley	RE	A.0002049.001	Potash Sub 115 kV Terminal Sub	2,173,554	444,474
279	Electric Transmission	Cooley	RE	A.0001300.014	Wreckout Rebuild 115KV LineT24	2,064,695	422,214
280	Electric Transmission	Cooley	SR	A.0000640.023	AMOCO Breaker Rplmnt	2,049,755	419,158
281	Electric Transmission	Cooley	RE	A.0000424.160	Kiowa 345kV Sub N Loving Term_	1,916,371	391,882
282	Electric Transmission	Cooley	RE	A.0000481.012	New 230/115kV Transformer	1,910,284	390,638
283	Electric Transmission	Cooley	SR	A.0000499.015	SPS 230kV ELR TX 2016	1,848,868	378,079
284	Electric Transmission	Cooley	RE	A.0000424.037	OPIE 3_Hobbs-Kiowa 345kV Line_	1,826,818	373,570
285	Electric Transmission	Cooley	RE	A.0001272.001	Cargill 14.4 Mvar Cap Bank	1,784,111	364,836
286	Electric Transmission	Cooley	RE	A.0001319.005	W40 Rebld Panda Tap Deaf Smith	1,758,973	359,696
287	Electric Transmission	Cooley	RE	A.0000424.089	Kiowa 345kVSub Road Runner Ter	1,737,417	355,288
288	Electric Transmission	Cooley	SR	A.0000469.015	SPS Major Line Refurb 69kV TX 2016	1,692,109	346,023
289	Electric Transmission	Cooley	RE	A.0001283.001	Lea Co. Plains Sw. Cap Bank	1,683,000	344,160
290	Electric Transmission	Cooley	RE	A.0000194.008	Cochran Whiteface Z26 Rebuild	1,628,544	333,024
291	Electric Transmission	Cooley	RE	A.0000846.001	Denver City 115 kV Breaker Add	1,609,843	329,200
292	Electric Transmission	Cooley	SR	A.0000220.006	SPS 2016 S&E Sub	1,585,100	324,140
293	Electric Transmission	Cooley	RE	A.0000424.145	Potash-Intrepid West 115kvRecd	1,572,678	321,600
294	Electric Transmission	Cooley	SR	A.0000303.044	SPS S&E 69kV Line TX 2016	1,458,291	298,209
295	Electric Transmission	Cooley	RE	A.0000781.012	Outpost Highside	1,436,966	293,848
296	Electric Transmission	Cooley	SR	A.0000640.020	Texas Co Rpl Breakers 800, 804	1,382,769	282,765
297	Electric Transmission	Cooley	RE	A.0001300.013	Roswell Intg 115KVBkr One Half	1,309,966	267,877
298	Electric Transmission	Cooley	RE	A.0000424.040	Kiowa 345kV Sub H Term/Reactor	1,255,718	256,784
299	Electric Transmission	Cooley	RE	A.0000616.001	Soncy Dist. Transformer Conv.	1,143,366	233,809
300	Electric Transmission	Cooley	RE	A.0000424.137	Monument-Byrd ROW	976,827	199,753
301	Electric Transmission	Cooley	RE	A.0001285.001	NEF-Targa Reconductor	968,907	198,134
302	Electric Transmission	Cooley	RE	A.0000616.002	115kV Line Tap to Soncy Line	962,879	196,901
303	Electric Transmission	Cooley	SR	A.0000303.050	SPS S&E 345kV Line KS 2016	962,702	196,865
304	Electric Transmission	Cooley	RE	A.0000296.006	New Centre St 115kV Sub	890,170	182,033
305	Electric Transmission	Cooley	RE	A.0000522.009	Z09 69kV Line Removal Trans	861,651	176,201
306	Electric Transmission	Cooley	SR	A.0000893.001	Finney Holcomb Relay Upgrade	840,491	171,874

Southwestern Public Service Company
Capital Additions
April 1, 2018 through March 31, 2019

	(A)	(B)	(C)	(D)	(E)	(F)	(G)
Line No.	Asset Class	Witness	Project Category	WBS Level 2	Project Description (WBS Level 2 Description)	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) Total Company	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) NM Retail
307	Electric Transmission	Cooley	RE	A.0001310.002	Reterm 345KV Line Old J7	747,384	152,834
308	Electric Transmission	Cooley	RE	A.0001310.001	Reterm 345KV Line J7	746,883	152,732
309	Electric Transmission	Cooley	SR	A.0001273.020	Roosevelt Breaker 4K65 Replacement	740,745	151,476
310	Electric Transmission	Cooley	RE	A.0000290.005	Cunningham Intg, Upgrade Eddy 230kV	735,193	150,341
311	Electric Transmission	Cooley	GI	A.0000736.005	Tolk Needmore Retermination	690,440	141,189
312	Electric Transmission	Cooley	RE	A.0002049.002	Potash Kiowa 115kV Line	651,515	133,230
313	Electric Transmission	Cooley	RE	A.0000424.120	N Loving-S Loving 115 kVROW	647,472	132,403
314	Electric Transmission	Cooley	OT	A.0000795.001	SPS Sub Comm Network Group 1 L	629,734	128,775
315	Electric Transmission	Cooley	GI	A.0000105.007	Plant X Terminal Upgrades TX	629,421	128,711
316	Electric Transmission	Cooley	RE	A.0000424.088	Kiowa-Road Runner 345kV Line_U	617,448	126,263
317	Electric Transmission	Cooley	SR	A.0000499.018	Line ELR SPS OK 115kV	601,494	123,001
318	Electric Transmission	Cooley	SR	A.0000286.005	Horz Cap and Pin Replacement TX	593,242	121,313
319	Electric Transmission	Cooley	RE	A.0000513.005	Denver City Breaker W900 Replacemen	567,130	115,973
320	Electric Transmission	Cooley	OT	A.0000710.001	NM Physical Security Sub Infrastruc	554,950	113,483
321	Electric Transmission	Cooley	GI	A.0001183.006	RO6 NEEDMORE TO YOAKUM 230KV LINE	549,752	112,420
322	Electric Transmission	Cooley	RE	A.0001319.007	W40 Recond Canyon WDeaf Smith	509,341	104,156
323	Electric Transmission	Cooley	RE	A.0000511.021	Carl-Wolf Sundown Relay at Wo	502,881	102,835
324	Electric Transmission	Cooley	RE	A.0000916.010	Plant X 230kV LRU to Deaf Smith	496,684	101,568
325	Electric Transmission	Cooley	RE	A.0000513.004	Denver City Breaker W970 Replacemen	484,085	98,991
326	Electric Transmission	Cooley	RE	A.0000916.007	Remote End Upgrade for ring bus add	471,351	96,388
327	Electric Transmission	Cooley	SR	A.0000499.012	SPS ELR 69kV TX 2016	431,058	88,148
328	Electric Transmission	Cooley	RE	A.0000519.004	Oasis Relay Upgrade Sub	418,996	85,681
329	Electric Transmission	Cooley	RE	A.0000424.055	Custer Mt 115kV Sub Ponderosa	403,189	82,449
330	Electric Transmission	Cooley	LI	A.0001008.009	R11 230kV BRU Mahoney TLINE	400,415	81,882
331	Electric Transmission	Cooley	SR	A.0001067.001	Lubbock East K57 Relay Upgrade	382,017	78,119
332	Electric Transmission	Cooley	RE	A.0000511.001	Carlisle to Wolfforth 230 kVLi	364,982	74,636
333	Electric Transmission	Cooley	RE	A.0000463.002	Portales Interchange Sub	359,947	73,606
334	Electric Transmission	Cooley	GI	A.0000736.006	Yoakum Needmore Retermination	359,027	73,418
335	Electric Transmission	Cooley	RE	A.0000126.004	Artesia Cty Club Switch	350,231	71,619
336	Electric Transmission	Cooley	GI	A.0000736.001	Needmore Substation TOIF	349,078	71,384
337	Electric Transmission	Cooley	SR	A.0000220.018	SPS 2016 NM S&E Sub	344,910	70,531
338	Electric Transmission	Cooley	LI	A.0001008.010	R12 230kV AWOR Mahoney TLINE	343,735	70,291
339	Electric Transmission	Cooley	RE	A.0001319.011	Deaf Smith W40 Term Upgr	338,211	69,161
340	Electric Transmission	Cooley	RE	A.0000658.001	Yoakum	335,589	68,625
341	Electric Transmission	Cooley	RE	A.0000511.004	Carlisle to Wofforth Wolfforth	333,755	68,250
342	Electric Transmission	Cooley	RE	A.0000513.002	Castro Co Breaker 8829 Replacement	333,142	68,125
343	Electric Transmission	Cooley	RE	A.0000424.150	OPIE PTJU Intrepid Term Sub	333,124	68,121
344	Electric Transmission	Cooley	SR	A.0000153.006	V02 Switch 2915 Replacement	313,476	64,103
345	Electric Transmission	Cooley	SR	A.0000153.008	V77 Switch 4963 Replacement NM	304,985	62,367
346	Electric Transmission	Cooley	SR	A.0001067.004	Lubbock South K64 Relay Upgrade	304,349	62,237
347	Electric Transmission	Cooley	RE	A.0000290.006	Seven Rivers Intg, Upgrade Eddy 230	301,696	61,694
348	Electric Transmission	Cooley	RE	A.0000540.016	Atoka to Eagle Creek 115kV ROW	299,680	61,282
349	Electric Transmission	Cooley	SR	A.0000427.016	W14 Y98 Clearance Violations	296,067	60,543
350	Electric Transmission	Cooley	SR	A.0000153.005	NM Trans Switch Replace Line 69kV	290,042	59,311

Southwestern Public Service Company
Capital Additions
April 1, 2018 through March 31, 2019

	(A)	(B)	(C)	(D)	(E)	(F)	(G)
Line No.	Asset Class	Witness	Project Category	WBS Level 2	Project Description (WBS Level 2 Description)	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) Total Company	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) NM Retail
351	Electric Transmission	Cooley	RE	A.0000488.009	Ochoa Terminal Work	271,959	55,613
352	Electric Transmission	Cooley	RE	A.0001300.022	Relay Upgr Roswell City Rosw Intg	266,550	54,507
353	Electric Transmission	Cooley	GI	A.0000350.005	Lost Draw to Cochran Retermination	263,538	53,891
354	Electric Transmission	Cooley	LI	A.0001126.002	Inst 3 1 Way 115kV Switch	252,239	51,581
355	Electric Transmission	Cooley	RE	A.0000424.099	China Draw-Wood Draw 115kV Lin	250,317	51,188
356	Electric Transmission	Cooley	SR	A.0000640.021	W07 Tx Cty SS Fr DCB to DCUB Rpl SE	249,194	50,958
357	Electric Transmission	Cooley	RE	A.0000658.003	Terry Co	246,342	50,375
358	Electric Transmission	Cooley	RE	A.0000663.001	Sundown Sub, Amoco Terminal	245,645	50,232
359	Electric Transmission	Cooley	GI	A.0000350.006	Lost Draw to Lea Co Plains Retermin	242,304	49,549
360	Electric Transmission	Cooley	SR	A.0000427.014	K21 Clearance Violations	236,935	48,451
361	Electric Transmission	Cooley	RE	A.0001310.013	Hitchland J26 Terminal UPLC	235,592	48,177
362	Electric Transmission	Cooley	RE	A.0001319.010	Dawn Sub Terminal Upgrades	231,429	47,325
363	Electric Transmission	Cooley	RE	A.0000424.044	Hobbs Sub Xfmr 345kV/230kV_UID	223,515	45,707
364	Electric Transmission	Cooley	LI	A.0001008.001	Inst 230kV Sw Station TOIFPortion	210,708	43,088
365	Electric Transmission	Cooley	RE	A.0000658.002	Seagraves	207,192	42,369
366	Electric Transmission	Cooley	RE	A.0000194.005	Cochran Z26 Terminal	205,865	42,098
367	Electric Transmission	Cooley	SR	A.0001273.015	Deaf Smith Breaker 2K20 Replacement	203,986	41,713
368	Electric Transmission	Cooley	RE	A.0000767.003	Osage Substation	203,983	41,713
369	Electric Transmission	Cooley	SR	A.0000220.007	SPS 2017 S&E Sub	191,951	39,253
370	Electric Transmission	Cooley	RE	A.0001310.012	Finney J25 Terminal UPLC	184,926	37,816
371	Electric Transmission	Cooley	RE	A.0000463.015	Market St.-South Portales ROW	182,693	37,359
372	Electric Transmission	Cooley	RE	A.0000979.004	115 ROW ROW Portion ROW	180,749	36,962
373	Electric Transmission	Cooley	RE	A.0001300.009	Reterm 115KV Roswell City	177,640	36,326
374	Electric Transmission	Cooley	LI	A.0001008.005	AWOR Relay Upgrade Sub	176,958	36,186
375	Electric Transmission	Cooley	RE	A.0000979.011	K56 Structure Raise	174,471	35,678
376	Electric Transmission	Cooley	RE	A.0000489.003	Install Capacitor Bank at Kiser Sub	173,970	35,575
377	Electric Transmission	Cooley	SR	A.0001078.001	Yoakum UPLC Upgrade	165,180	33,778
378	Electric Transmission	Cooley	RE	A.0000290.003	K23 Retermination, Eddy Co Sub	163,239	33,381
379	Electric Transmission	Cooley	GI	A.0001183.001	Cochran Terminal Upgrade Sub	156,433	31,989
380	Electric Transmission	Cooley	RE	A.0000663.002	Amoco Sub, Sundown Terminal	151,731	31,028
381	Electric Transmission	Cooley	SR	A.0000640.034	COCO 115kV Brkr 9910 Replacement	149,864	30,646
382	Electric Transmission	Cooley	RE	A.0001271.004	Cardinal-Teague Recond 115kV	144,758	29,602
383	Electric Transmission	Cooley	GI	A.0001183.004	U19 Plains to LTDW Line Side	139,621	28,551
384	Electric Transmission	Cooley	RE	A.0000488.004	RDRN 115kV Line Terminal Upgrade	133,258	27,250
385	Electric Transmission	Cooley	RE	A.0001300.025	Wreckout Rebuild Z09 Dble Ckt	127,913	26,157
386	Electric Transmission	Cooley	RE	A.0001300.023	T24 ROW	123,925	25,342
387	Electric Transmission	Cooley	LI	A.0001008.006	BRU Relay Upgrade Sub	122,515	25,053
388	Electric Transmission	Cooley	SR	A.0001000.001	Hutchinson LTC Replacement	121,866	24,921
389	Electric Transmission	Cooley	RE	A.0001319.008	W40 Rebuild ROW	109,876	22,469
390	Electric Transmission	Cooley	SR	A.0000286.014	LNCO Rplc 69kV Bypass Switches	107,435	21,970
391	Electric Transmission	Cooley	SR	A.0001273.017	Jones Transformer Pad	101,886	20,835
392	Electric Transmission	Cooley	RE	A.0001188.002	Amoco Oxy UF Relay	93,599	19,140
393	Electric Transmission	Cooley	SR	A.0001078.002	Tolk UPLC Upgrade	88,685	18,135
394	Electric Transmission	Cooley	RE	A.0000126.003	Artesia Cty Club Line ROW	83,836	17,144

Southwestern Public Service Company
Capital Additions
April 1, 2018 through March 31, 2019

	(A)	(B)	(C)	(D)	(E)	(F)	(G)
Line No.	Asset Class	Witness	Project Category	WBS Level 2	Project Description (WBS Level 2 Description)	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) Total Company	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) NM Retail
395	Electric Transmission	Cooley	GI	A.0001183.005	U20 LTDW to Cochran Line Side	80,559	16,474
396	Electric Transmission	Cooley	SR	A.0000401.049	Seven Rivers BPRO Upgrade	79,161	16,188
397	Electric Transmission	Cooley	SR	A.0000303.041	SPS S&E 115kV Line NM 2016	78,777	16,109
398	Electric Transmission	Cooley	RE	A.0000663.005	K03 Structure Upgrade	78,006	15,952
399	Electric Transmission	Cooley	RE	A.0000511.020	Carl-Wolf Lubbock S Relay at	77,986	15,948
400	Electric Transmission	Cooley	SR	A.0000303.040	SPS S&E 69kV Line NM 2016	77,767	15,903
401	Electric Transmission	Cooley	RE	A.0000781.016	U16 Bushland to Outpost	75,471	15,433
402	Electric Transmission	Cooley	RE	A.0000781.017	U17 Coulter to Outpost	74,085	15,150
403	Electric Transmission	Cooley	SR	A.0000303.047	SPS S&E 115kV Line OK 2016	71,040	14,527
404	Electric Transmission	Cooley	RE	A.0000424.068	L Ridge Sub 115kV Conv/S Brush	65,806	13,457
405	Electric Transmission	Cooley	SR	A.0000401.025	Carlsbad 115kV (C900)Sub	64,126	13,113
406	Electric Transmission	Cooley	SR	A.0000153.004	SPS Trans Switch Rplmnt 115kV	63,304	12,945
407	Electric Transmission	Cooley	GI	A.0000105.008	K45 Reconductor Transmission Portio	62,682	12,818
408	Electric Transmission	Cooley	SR	A.0000220.024	SPS 2015 KS SE Sub	61,270	12,529
409	Electric Transmission	Cooley	RE	A.0000424.157	Whitten Sub Terminal Upgrades	60,690	12,411
410	Electric Transmission	Cooley	SR	A.0001273.012	Amoco Switch Replacement	60,116	12,293
411	Electric Transmission	Cooley	OT	10695269	E&S Elec Trans Lines_SPS	59,099	12,085
412	Electric Transmission	Cooley	RE	A.0000424.155	Custer Mt-Whitten Rebuild Line	56,590	11,572
413	Electric Transmission	Cooley	RE	A.0000673.041	Yoakum 345 kV Land	53,024	10,843
414	Electric Transmission	Cooley	RE	A.0001051.001	Hale V72 Treminal Upgrade	50,372	10,301
415	Electric Transmission	Cooley	RE	A.0000424.045	Hobbs 345kV Sub Reactor/Kiowa_	47,419	9,697
416	Electric Transmission	Cooley	RE	A.0002033.002	Market St Sub Greyhound 50565	47,290	9,670
417	Electric Transmission	Cooley	GI	A.0000706.001	Hitchland-New 345kV Terminal -	46,918	9,594
418	Electric Transmission	Cooley	RE	A.0000511.022	Carl-Wolf Tuco Relay at Carl	46,285	9,465
419	Electric Transmission	Cooley	SR	A.0000220.026	SPS 2015 OK SE Sub	45,306	9,265
420	Electric Transmission	Cooley	RE	A.0001325.004	ROW W77/T75	45,183	9,240
421	Electric Transmission	Cooley	OT	A.0001003.001	Lighthouse Switch Install Transmiss	42,247	8,639
422	Electric Transmission	Cooley	GI	A.0000902.001	Hale Co Wind 230kV Terminal at	41,968	8,582
423	Electric Transmission	Cooley	SR	A.0000401.024	Bushland 230kV (2K05)Sub	41,285	8,443
424	Electric Transmission	Cooley	SR	A.0001273.005	Facil UpgSub Ancillary Eq2016	39,461	8,069
425	Electric Transmission	Cooley	TI	A.0000974.012	Optima Land	32,699	6,687
426	Electric Transmission	Cooley	RE	A.0000522.005	Chaves-Price-Capitan 115 kV C	31,178	6,376
427	Electric Transmission	Cooley	GI	A.0000768.006	Floyd Relay Upgrade for Blanco	31,096	6,359
428	Electric Transmission	Cooley	RE	A.0000463.010	Market St.-Portales Line	30,360	6,208
429	Electric Transmission	Cooley	RE	A.0000511.015	Carl-Wolf K-24 Reterm at Carl	29,536	6,040
430	Electric Transmission	Cooley	RE	A.0001283.004	Lea Plains Metering	27,459	5,615
431	Electric Transmission	Cooley	SR	A.0001078.003	Needmore UPLC Upgrade	26,428	5,404
432	Electric Transmission	Cooley	GI	A.0000350.007	Cochran 115kV Sub Term Upg	26,371	5,393
433	Electric Transmission	Cooley	RE	A.0000424.060	L Ridge-Sage Brush 115kV Line_	26,369	5,392
434	Electric Transmission	Cooley	SR	A.0000401.039	Wipp Cap Bank Volt Diff NM	25,931	5,303
435	Electric Transmission	Cooley	RE	A.0000424.070	Potash Sub Rly Mods Livingston	25,125	5,138
436	Electric Transmission	Cooley	GI	A.0000350.002	Lost Draw TOIF	24,251	4,959
437	Electric Transmission	Cooley	RE	A.0000511.026	K39 LPL Line Reterm at Carlisle	23,636	4,833
438	Electric Transmission	Cooley	RE	A.0000424.104	China Draw-Wood Draw 115kV ROW	21,947	4,488

Southwestern Public Service Company
Capital Additions
April 1, 2018 through March 31, 2019

	(A)	(B)	(C)	(D)	(E)	(F)	(G)
Line No.	Asset Class	Witness	Project Category	WBS Level 2	Project Description (WBS Level 2 Description)	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) Total Company	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) NM Retail
439	Electric Transmission	Cooley	RE	A.0000424.232	S Brush 115kV Sub Liv Line Terminal	20,315	4,154
440	Electric Transmission	Cooley	RE	A.0000463.009	Kilgore-Portales Reterm Line	19,918	4,073
441	Electric Transmission	Cooley	RE	A.0000673.026	TX/NM Border-Hobbs 345kV ROW_U	19,836	4,056
442	Electric Transmission	Cooley	RE	A.0000424.071	WIPP Sub Relay Mods Livingston	14,481	2,961
443	Electric Transmission	Cooley	SR	A.0001068.001	T97 Structure Relocate	14,155	2,895
444	Electric Transmission	Cooley	RE	A.0000463.006	Oasis T-32 Relay Upgrade Sub	13,685	2,799
445	Electric Transmission	Cooley	EC/TI	A.0000665.005	TUCO Mooreland Woodward TX RO	13,267	2,713
446	Electric Transmission	Cooley	RE	A.0000424.102	W Draw 115kV Sub /C Draw Term_	12,952	2,649
447	Electric Transmission	Cooley	RE	A.0001319.009	Canyon West Sub W40 Term Upgr	12,863	2,630
448	Electric Transmission	Cooley	RE	A.0000424.226	OPIE Potash Livingston Ridge ROW	11,346	2,320
449	Electric Transmission	Cooley	RE	A.0000463.007	Oasis-Portales T-32 Reterm Lin	10,285	2,103
450	Electric Transmission	Cooley	RE	A.0000424.063	S Brush-Cardinal 115 ROW_UID 5	10,277	2,102
451	Electric Transmission	Cooley	GI	A.0000768.005	Crosby Relay Upgrade for Blanc	10,271	2,100
452	Electric Transmission	Cooley	SR	A.0001273.013	Mustang Switch Repalcement	10,219	2,090
453	Electric Transmission	Cooley	RE	A.0000424.058	T38 Potash Re-Term_UID 50924	10,116	2,069
454	Electric Transmission	Cooley	RE	A.0000767.005	South Georgia Substation	10,108	2,067
455	Electric Transmission	Cooley	RE	A.0001312.003	Targa Cardinal Sub	8,753	1,790
456	Electric Transmission	Cooley	SR	A.0000220.005	SPS 2015 S&E Sub	7,825	1,600
457	Electric Transmission	Cooley	RE	A.0000522.013	Roswell Interchange W49 Relay	7,442	1,522
458	Electric Transmission	Cooley	RE	A.0000767.004	Randall County Interchange Sub	6,699	1,370
459	Electric Transmission	Cooley	RE	A.0000223.001	Carlisle 230/115kV Xfmr Upgrade	6,135	1,254
460	Electric Transmission	Cooley	RE	A.0000511.016	Carl-Wolf K-02 Reterm at Wolf	5,803	1,187
461	Electric Transmission	Cooley	RE	A.0001310.004	Walkemeyer 345/115 Sub Land	5,428	1,110
462	Electric Transmission	Cooley	LI	A.0001270.001	Bensing 115/12.47KV Dist(TAM)	5,183	1,060
463	Electric Transmission	Cooley	RE	A.0000424.062	S Brush-Cardinal 115kV L_UID 5	4,851	992
464	Electric Transmission	Cooley	SR	A.0000427.007	W20_Line Capacity Work	4,849	992
465	Electric Transmission	Cooley	RE	A.0000224.005	Zodiac Substation sub	4,814	984
466	Electric Transmission	Cooley	RE	A.0000424.105	W-39 Reterm at Wood Draw_UID 5	4,765	974
467	Electric Transmission	Cooley	RE	A.0000087.001	Roosevelt T33 Terminal Upgrade	4,601	941
468	Electric Transmission	Cooley	RE	A.0000424.049	Ponderosa-Custer Mt 115kV Line	4,438	907
469	Electric Transmission	Cooley	SR	A.0000220.031	SPS OK S&E Sub	4,376	895
470	Electric Transmission	Cooley	RE	A.0000866.033	Lamb County Land	4,076	834
471	Electric Transmission	Cooley	RE	A.0000424.183	Intercont Potash Conn 230kV Li	3,894	796
472	Electric Transmission	Cooley	RE	A.0000540.018	W-92 ROW	3,692	755
473	Electric Transmission	Cooley	RE	A.0000157.003	Eagle Creek Project(Artesia Tw	3,501	716
474	Electric Transmission	Cooley	RE	A.0000616.006	69kV Line Tap to Soncy Line	3,343	684
475	Electric Transmission	Cooley	RE	A.0000511.008	Carlisle to Wofforth ROW	3,239	662
476	Electric Transmission	Cooley	RE	A.0000296.013	NE Hereford- New Centre St 115	2,372	485
477	Electric Transmission	Cooley	RE	A.0000424.107	Potash Junction 230/115 Auto U	2,069	423
478	Electric Transmission	Cooley	RE	A.0000421.013	Newhart to Lamton ROW	1,690	346
479	Electric Transmission	Cooley	GI	A.0000105.005	Tolk Terminal Upgrades	1,656	339
480	Electric Transmission	Cooley	RE	A.0000463.005	Roosevelt T-33 Relay Upgrade S	1,584	324
481	Electric Transmission	Cooley	RE	A.0000424.086	Kiowa-North Loving 345kV ROW_U	1,420	290
482	Electric Transmission	Cooley	SR	A.0000401.034	Potter 230kV K59 Sub	1,285	263

Southwestern Public Service Company
Capital Additions
April 1, 2018 through March 31, 2019

	(A)	(B)	(C)	(D)	(E)	(F)	(G)
Line No.	Asset Class	Witness	Project Category	WBS Level 2	Project Description (WBS Level 2 Description)	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) Total Company	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) NM Retail
483	Electric Transmission	Cooley	RE	A.0000424.225	Roadrunner Kiowa J23 ROW	1,263	258
484	Electric Transmission	Cooley	RE	A.0000511.009	Carl-Wolf K-10 Reterm at Wolf	1,187	243
485	Electric Transmission	Cooley	RE	A.0000424.219	Hopi to Copano Hopi Substation	1,162	238
486	Electric Transmission	Cooley	RE	A.0000916.002	Deaf Smith Reterm K21 Line	690	141
487	Electric Transmission	Cooley	RE	A.0000424.032	China Draw-Yeso Hills 115kV RO	670	137
488	Electric Transmission	Cooley	LI	A.0000062.002	Z86 New Tap to Oxy Cedar Lake ROW	476	97
489	Electric Transmission	Cooley	RE	A.0000673.024	Yoakum-TX/NM Border 345kV ROW_	458	94
490	Electric Transmission	Cooley	RE	A.0000463.013	Market St.-Portales ROW	412	84
491	Electric Transmission	Cooley	SR	A.0000258.049	Plant X Rpl SPW 111 PT	357	73
492	Electric Transmission	Cooley	RE	A.0000616.008	Soncy ROW	266	54
493	Electric Transmission	Cooley	RE	A.0000424.185	West Jal Sub	257	53
494	Electric Transmission	Cooley	RE	A.0000610.004	Curry to Bailey 115kV - Curry	253	52
495	Electric Transmission	Cooley	RE	A.0000424.131	N. Loving 115kV terminal -Chin	185	38
496	Electric Transmission	Cooley	RE	A.0000646.001	Wade SubstationSub	177	36
497	Electric Transmission	Cooley	LI	A.0000675.001	Pringle Dist Transformer Sub	177	36
498	Electric Transmission	Cooley	SR	A.0000499.004	Line ELR SPS 2016 Line	156	32
499	Electric Transmission	Cooley	RE	A.0000767.011	T-66 Reterm Line	89	18
500	Electric Transmission	Cooley	SR	A.0000303.028	SPS 2015 S&E TX B 69kV Line	78	16
501	Electric Transmission	Cooley	OT	A.0000820.006	SPS Physical Security	75	15
502	Electric Transmission	Cooley	SR	A.0000514.003	Rocky Point Switch Replmnt	69	14
503	Electric Transmission	Cooley	RE	A.0000424.100	China Draw 115kV Sub WDraw Ter	50	10
504	Electric Transmission	Cooley	RE	A.0000424.010	Potash Junction 115/69 Xfmr Up	25	5
505	Electric Transmission	Cooley	RE	A.0000424.187	Potash to West Jal 230kV ROW	25	5
506	Electric Transmission	Cooley	SR	A.0000427.003	Lidar Oklahoma SPS Line	20	4
507	Electric Transmission	Cooley	RE	A.0000481.011	New Ink Basin 230/115kV Substation	19	4
508	Electric Transmission	Cooley	RE	A.0000853.001	Hereford High Side Sub	18	4
509	Electric Transmission	Cooley	GI	11495216	Campbell St. Bus Modification,Sub	18	4
510	Electric Transmission	Cooley	RE	A.0000224.006	Kilgore Sub Highside Sub	11	2
511	Electric Transmission	Cooley	RE	A.0000424.076	Cardinal 115kV Sub Sage Brush	(2)	(0)
512	Electric Transmission	Cooley	LI	A.0000936.003	South Springlake-T28 Tap&Switc	(5)	(1)
513	Electric Transmission	Cooley	RE	A.0001310.006	Finney Relay Settings	(6)	(1)
514	Electric Transmission	Cooley	RE	A.0000424.016	Wreckout of Z22.2 Structures	(10)	(2)
515	Electric Transmission	Cooley	RE	A.0001310.007	Hitchland Relay Settings Texas	(10)	(2)
516	Electric Transmission	Cooley	RE	A.0000540.004	Seven Rivers Relay Sub	(27)	(5)
517	Electric Transmission	Cooley	RE	A.0000574.005	Inst Arms at Puckett W TapT37	(40)	(8)
518	Electric Transmission	Cooley	SR	A.0000427.001	SPS Line Capacity Line	(213)	(44)
519	Electric Transmission	Cooley	RE	A.0000224.007	Zodiac Substation NM Line	(254)	(52)
520	Electric Transmission	Cooley	SR	A.0000298.001	Eddy County SVC ControlsSub	(274)	(56)
521	Electric Transmission	Cooley	RE	A.0000540.003	Atoka Substation	(301)	(61)
522	Electric Transmission	Cooley	RE	A.0000610.007	Curry to Bailey 115kV NM ROW	(390)	(80)
523	Electric Transmission	Cooley	RE	A.0000773.001	Andrews County Substation	(613)	(125)
524	Electric Transmission	Cooley	RE	A.0000463.016	Roosevelt-Portales T-33 Reterm	(1,300)	(266)
525	Electric Transmission	Cooley	RE/SR	A.0000080.001	Oasis T32 Terminal Upgrade	(1,672)	(342)
526	Electric Transmission	Cooley	RE	A.0000488.008	Opie Roadrunner Agave Ochoa Pre Con	(1,700)	(348)

Southwestern Public Service Company
Capital Additions
April 1, 2018 through March 31, 2019

	(A)	(B)	(C)	(D)	(E)	(F)	(G)
Line No.	Asset Class	Witness	Project Category	WBS Level 2	Project Description (WBS Level 2 Description)	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) Total Company	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) NM Retail
527	Electric Transmission	Cooley	RE	A.0000522.002	Price-Chaves 115 kV Line Line	(2,137)	(437)
528	Electric Transmission	Cooley	RE	A.0000707.002	Graham Intg-Add 115/69 Transfo	(2,595)	(531)
529	Electric Transmission	Cooley	LI	A.0000858.001	T38 Bopco 3Way Sw Inst Str#41	(3,021)	(618)
530	Electric Transmission	Cooley	GI	A.0000537.001	Novus Wind IV - Hitchland Sub	(4,044)	(827)
531	Electric Transmission	Cooley	RE	A.0000610.002	Curry to Bailey 115kV New Line	(4,536)	(928)
532	Electric Transmission	Cooley	RE	A.0000610.027	Curry to Bailey 115kV NM Line	(4,545)	(929)
533	Electric Transmission	Cooley	RE	A.0000463.003	Market St. Substation	(5,055)	(1,034)
534	Electric Transmission	Cooley	RE	A.0000767.014	V-04 Circuit Removal	(5,549)	(1,135)
535	Electric Transmission	Cooley	SR	A.0000287.035	Potash 4920 Breaker Rplmnt	(6,108)	(1,249)
536	Electric Transmission	Cooley	RE	A.0000533.002	Nichols 115kV BFR - Dumas 19th	(7,652)	(1,565)
537	Electric Transmission	Cooley	GI	A.0000768.003	Floyd-Blanco Retermination-115	(7,789)	(1,593)
538	Electric Transmission	Cooley	RE	A.0000424.059	T38 WIPP Re-Term_UID 50924	(7,884)	(1,612)
539	Electric Transmission	Cooley	SR	A.0000287.036	Carlsbad C900 Breaker Rplmnt	(9,276)	(1,897)
540	Electric Transmission	Cooley	LI	A.0001076.001	Xcel Install 3 Way Switch	(9,390)	(1,920)
541	Electric Transmission	Cooley	RE	A.0000424.073	S Brush 115kV Sub Liv Cardinal	(9,857)	(2,016)
542	Electric Transmission	Cooley	RE	A.0000463.001	Portales 115kV Loop Line	(17,463)	(3,571)
543	Electric Transmission	Cooley	RE	A.0000533.006	Nichols 115kV BFR - East Plant	(18,145)	(3,711)
544	Electric Transmission	Cooley	RE	A.0000919.001	Happy Intg. auto upgrades Sub	(19,053)	(3,896)
545	Electric Transmission	Cooley	OT	10695288	E&S Elec Trans Subs_SPS	(25,595)	(5,234)
546	Electric Transmission	Cooley	SR/LI	A.0000851.001	Pringle Substation Sub	(26,327)	(5,384)
547	Electric Transmission	Cooley	LI	A.0001156.001	Int 1 Way 115kV Switch Tap	(26,443)	(5,407)
548	Electric Transmission	Cooley	LI	A.0001097.002	Inst Z77 60kV Switch Reimb TOIF	(26,467)	(5,412)
549	Electric Transmission	Cooley	RE	A.0001312.004	TargaCardinal Recond115kV Line	(29,330)	(5,998)
550	Electric Transmission	Cooley	SR	A.0000220.017	SPS 2015 NM S&E Sub	(31,196)	(6,379)
551	Electric Transmission	Cooley	RE	A.0000354.001	Crobsy Co. 115kV Cap Bank Sub	(33,106)	(6,770)
552	Electric Transmission	Cooley	LI	A.0000711.002	LOA U06 Slack Spans Cust Portion	(39,132)	(8,002)
553	Electric Transmission	Cooley	RE	A.0000767.008	East Plant Relay Sub	(39,483)	(8,074)
554	Electric Transmission	Cooley	RE	A.0000215.012	Pleasant Hill to Roosevelt Co.	(45,306)	(9,265)
555	Electric Transmission	Cooley	LI	A.0000424.194	Pecos Dist Add/115kV Breaker a	(48,546)	(9,927)
556	Electric Transmission	Cooley	LI	A.0000553.001	Diamondback Lyntegar TerminalS	(50,429)	(10,312)
557	Electric Transmission	Cooley	RE	A.0000367.002	Bowers 2nd Auto Sub	(51,121)	(10,454)
558	Electric Transmission	Cooley	RE	A.0000361.004	KC Substation Sub	(52,037)	(10,641)
559	Electric Transmission	Cooley	RE	A.0000603.001	Crosby County Transformer #1Su	(58,784)	(12,021)
560	Electric Transmission	Cooley	RE	A.0000424.177	Hopi Breaker Install Pecos Ter	(59,865)	(12,242)
561	Electric Transmission	Cooley	RE	A.0000463.011	Kilgore-South Portales ROW	(60,765)	(12,426)
562	Electric Transmission	Cooley	RE	A.0000361.001	KC Sub-Sulpher Springs 115kV T	(62,647)	(12,811)
563	Electric Transmission	Cooley	RE	A.0000407.004	Howard Substation	(70,153)	(14,346)
564	Electric Transmission	Cooley	LI	A.0001002.002	115kV N loving Sub Ter Upg Xcel Por	(72,600)	(14,846)
565	Electric Transmission	Cooley	OT	A.0001106.001	WIPP W38 Structure Relocate	(72,878)	(14,903)
566	Electric Transmission	Cooley	RE	A.0000407.002	Bowers Substation sub	(76,302)	(15,603)
567	Electric Transmission	Cooley	LI	A.0000634.001	Higg East igh Side(Sub Portion	(80,057)	(16,371)
568	Electric Transmission	Cooley	RE	A.0000424.174	North Loving 115kV Bkr Ring Su	(82,511)	(16,873)
569	Electric Transmission	Cooley	SR	A.0000401.033	Potash Junction 115kV 4920	(87,662)	(17,926)
570	Electric Transmission	Cooley	RE	A.0000522.004	Chaves-Price-Capitan 115 kV Ca	(87,971)	(17,989)

Southwestern Public Service Company
Capital Additions
April 1, 2018 through March 31, 2019

Line No.	(A) Asset Class	(B) Witness	(C) Project Category	(D) WBS Level 2	(E) Project Description (WBS Level 2 Description)	(F) Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) Total Company	(G) Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) NM Retail
571	Electric Transmission	Cooley	RE	A.0000522.001	Capitan-Price 115 kV Line, Li	(91,059)	(18,621)
572	Electric Transmission	Cooley	RE	A.0000424.028	PCA Terminal Upgrade_Sub	(103,247)	(21,113)
573	Electric Transmission	Cooley	RE	A.0000215.002	Pleasant Hill 345/230kV NM Sub	(111,148)	(22,729)
574	Electric Transmission	Cooley	RE	A.0000357.001	Grassland XFMR Sub	(118,701)	(24,273)
575	Electric Transmission	Cooley	RE	A.0000409.004	Cherry St Intg Hastings-E.Plt	(124,356)	(25,430)
576	Electric Transmission	Cooley	RE	A.0000424.015	China Draw High Side Substatio	(125,536)	(25,671)
577	Electric Transmission	Cooley	SR	A.0000645.001	115/69 kV Mobile Sub, Sub	(144,380)	(29,525)
578	Electric Transmission	Cooley	RE	A.0000646.004	Ochiltree - BookerROW	(149,002)	(30,470)
579	Electric Transmission	Cooley	RE	A.0000426.004	Plainview City Exp, Cox, Sub	(171,541)	(35,079)
580	Electric Transmission	Cooley	RE	A.0000302.002	Dallam Co. 230/115 kV sub	(176,484)	(36,090)
581	Electric Transmission	Cooley	RE	A.0000914.001	Drinkard 115 Cap Bank Sub	(179,497)	(36,706)
582	Electric Transmission	Cooley	SR	A.0000153.001	SPS Trans Switch Replmnt Line	(197,508)	(40,389)
583	Electric Transmission	Cooley	EC/TI	A.0000417.003	Tuco to Mooreland (Woodward) R	(209,175)	(42,775)
584	Electric Transmission	Cooley	EC/TI	A.0000417.015	TUCO-Mooreland Woodward TX ROW 2017	(229,301)	(46,890)
585	Electric Transmission	Cooley	RE	A.0000407.001	Bowers - Howard ROW	(230,393)	(47,114)
586	Electric Transmission	Cooley	RE	A.0000301.002	Lynn Co. Dist. Load Conversion	(231,421)	(47,324)
587	Electric Transmission	Cooley	EC/TI	A.0000244.002	Hitchland to Woodward 345 kV S	(268,840)	(54,976)
588	Electric Transmission	Cooley	RE	A.0000421.006	Newhart Intg Hart Ind-Lamton11	(285,397)	(58,361)
589	Electric Transmission	Cooley	LI	A.0001126.001	Inst Temp Switch Reimb TOIF	(320,517)	(65,543)
590	Electric Transmission	Cooley	GI	A.0000768.002	Crosby-Blanco Retermination-11	(330,204)	(67,524)
591	Electric Transmission	Cooley	LI	A.0001002.001	115kV N loving Sub TOIF Lucid Porti	(471,792)	(96,478)
592	Electric Transmission	Cooley	SR	A.0000303.046	SPS S&E 345kV Line TX 2016	(552,009)	(112,881)
593	Electric Transmission	Cooley	GI	A.0000768.001	GEN-2011-025 Fiber Wind Blanco	(704,828)	(144,132)
594	Electric Transmission	Cooley	GI	A.0000105.001	R27 Reconductor	(991,467)	(202,747)
595	Electric Transmission	Cooley	RE	A.0000424.029	V21_Quahada 115kV Reconductor	(1,046,782)	(214,059)
596	Electric Transmission	Cooley	RE	A.0000890.001	Eddy Co. 230/115 Xfmr #1 Upgra	(1,064,791)	(217,741)
597	Electric Transmission	Cooley	SR	A.0000427.011	K83_Line Capacity Work	(1,092,475)	(223,402)
598	Electric Transmission	Cooley	GI	A.0000350.001	Lost Draw Substation	(1,606,213)	(328,458)
599	Electric Transmission	Cooley	SR	A.0000776.002	Security Resilience Spare TR	(1,786,008)	(365,224)
600	Electric Transmission	Cooley	GI	A.0000564.002	Tuco 345 Trsf Rplmnt Sub Portion	(2,203,625)	(450,624)
601	Electric Transmission	Cooley	GI	A.0000736.002	Needmore Substation	(2,282,270)	(466,706)
602	**Electric Transmission Total**					**$ 256,772,854**	**$ 52,507,979**
603	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0010017.001	TX - OH Rebuild Blanket	$ 9,759,736	$ -
604	Electric Distribution	Meeks	New Business	A.0010002.001	NM - OH Extension Blanket	9,050,623	9,050,623
605	Electric Distribution	Meeks	Purchases	D.0005014.009	TX Electric Distribution Transforme	7,325,623	-
606	Electric Distribution	Meeks	New Business	A.0010001.001	TX - OH Extension Blanket	5,043,139	-
607	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005522.130	Convert Soncy to 115/13.2kV 50	4,996,621	-
608	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005583.001	TEXAS MAJOR STORM RECOVERY	4,169,374	-
609	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0010017.007	TX - Pole Blanket	4,128,697	-
610	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005522.370	Install 115/12.47kV 14MVA substatio	3,798,784	3,798,784
611	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0010018.001	NM - OH Rebuild Blanket	3,358,925	3,358,925
612	Electric Distribution	Meeks	Purchases	D.0005014.011	NM Electric Distribution Transforme	3,204,394	3,204,394
613	Electric Distribution	Meeks	New Business	A.0010001.002	TX - UG Extension Blanket	2,954,609	-

Southwestern Public Service Company
Capital Additions
April 1, 2018 through March 31, 2019

	(A)	(B)	(C)	(D)	(E)	(F)	(G)
Line No.	Asset Class	Witness	Project Category	WBS Level 2	Project Description (WBS Level 2 Description)	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) Total Company	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) NM Retail
614	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005522.015	Outpost Substation 115-13.2kV 28MVA	2,945,627	-
615	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005522.259	Convert Centre Street Replace	2,840,066	-
616	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005522.258	Install New 34.5kV Source book	2,722,944	-
617	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005522.211	Convert Curry Co. Interchange	2,439,579	2,439,579
618	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005521.004	Tx N-Dist Substation Equip Rep	2,339,009	-
619	Electric Distribution	Meeks	Outdoor/Area Lighting	A.0010017.005	TX - OH Street Light Rebuild Blanke	1,999,307	-
620	Electric Distribution	Meeks	Purchases	D.0005014.028	TX-Electric Meter Blanket	1,970,023	-
621	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0010156.001	Install Preston West Substation - L	1,726,698	-
622	Electric Distribution	Meeks	New Business	A.0010002.002	NM - UG Extension Blanket	1,605,710	1,605,710
623	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005584.001	Convert 4kV Load out of RIAC East a	1,490,201	1,490,201
624	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0000781.020	Install Outpost Substation 115-13.2	1,445,465	-
625	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0010018.007	NM - Pole Blanket	1,433,712	1,433,712
626	Electric Distribution	Meeks	New Business	A.0005500.051	Cnturion Jal Orig Pmp Stn PME/Oxy M	1,095,058	1,095,058
627	Electric Distribution	Meeks	New Business	A.0010001.004	TX - UG New Services Blanket	1,068,676	-
628	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0010033.001	TX - OH Reinforcement Blanket	1,033,451	-
629	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005521.200	NM - Subs Equipment Replace	873,726	873,726
630	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0010138.001	Land purchase for Western St Sub	831,102	-
631	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0010017.002	TX - UG Conversion/Rebuild Blanket	775,292	-
632	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005517.024	Substation Land - New Mexico	674,045	674,045
633	Electric Distribution	Meeks	New Business	A.0010059.001	SEM/RING ENERGY/5.7 MILE RECONDUCTO	662,233	-
634	Electric Distribution	Meeks	New Business	A.0010060.002	EUNICE/SAGE BRUSH 556 EXT	606,001	606,001
635	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005521.085	Feeder breaker degradation - S	599,725	-
636	Electric Distribution	Meeks	New Business	A.0010060.005	JAL/ GWS DEEP POSEIDON SWD/ RECON &	581,119	581,119
637	Electric Distribution	Meeks	Purchases	A.0005517.013	NM-Elec-Easement	570,765	570,765
638	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0010092.004	Reconductor Intrepid Potash Pond	565,257	565,257
639	Electric Distribution	Meeks	New Business	A.0010060.003	CIMAREX WHITE CITY PME	536,443	536,443
640	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005584.002	NEW MEXICO MAJOR STORM RECOVERY	523,036	523,036
641	Electric Distribution	Meeks	New Business	A.0010002.004	NM - UG New Services Blanket	482,572	482,572
642	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0010076.001	JAL/ JAL ORIGINATION PUMP/3PH RCND	476,927	476,927
643	Electric Distribution	Meeks	Purchases	D.0005014.030	NM-Electric Meter Blanket	438,814	438,814
644	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005583.005	TX Mixed Work Adjustment	422,109	-
645	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0010123.004	Damron Transformer Replacement	411,441	-
646	Electric Distribution	Meeks	New Business	A.0010060.006	Mesquite Services, LLC- Cypress SWD	391,721	391,721
647	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0010123.002	Repl Failed Kite Transfrmr 69/13.2	387,573	-
648	Electric Distribution	Meeks	New Business	A.0005500.047	JAL/SE SEC6T24R31/ OXY MESA VER/ RE	384,087	384,087
649	Electric Distribution	Meeks	Outdoor/Area Lighting	A.0010018.005	NM - OH Street Light Rebuild Blanke	364,543	364,543
650	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0000296.002	Replace existing Hereford 69/1	353,737	-
651	Electric Distribution	Meeks	New Business	A.0010060.001	SUMMIT MIDSTREAM PARTNERS	334,871	334,871
652	Electric Distribution	Meeks	New Business	A.0010001.003	TX - OH New Services Blanket	332,463	-
653	Electric Distribution	Meeks	New Business	A.0010002.003	NM - OH New Services Blanket	318,684	318,684
654	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005583.002	TEXAS POLE INSPECTIONS	245,252	-
655	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005502.052	Install Market St 12.5kV Feede	243,496	243,496
656	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0010017.003	TX - OH Services Renewal Blanket	228,205	-
657	Electric Distribution	Meeks	Purchases	A.0005517.015	TxN-Elec Easement	211,270	-

Southwestern Public Service Company
Capital Additions
April 1, 2018 through March 31, 2019

	(A)	(B)	(C)	(D)	(E)	(F)	(G)
Line No.	Asset Class	Witness	Project Category	WBS Level 2	Project Description (WBS Level 2 Description)	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) Total Company	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) NM Retail
658	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005517.025	Substation Land - TX	198,094	-
659	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0010010.001	NM - OH Relocation Blanket	190,629	190,629
660	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005522.006	Replace Existing Substation Breaker	173,392	173,392
661	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005521.086	ELR - Substation Relays - SPS	168,354	-
662	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005508.186	Rebuild Planview City 69/2.4kV	163,638	-
663	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0010018.003	NM - OH Services Renewal Blanket	161,682	161,682
664	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0010034.001	NM - OH Reinforcement Blanket	148,047	148,047
665	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0010009.001	TX - OH Relocation Blanket	147,804	-
666	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0010018.002	NM - UG Conversion/Rebuild Blanket	140,471	140,471
667	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005584.006	NM Mixed Work Adjustment	138,150	138,150
668	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0010124.005	Replace Failed Urton XFR	136,684	136,684
669	Electric Distribution	Meeks	Outdoor/Area Lighting	A.0010017.006	TX - UG Street Light Rebuild Blanke	131,369	-
670	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0000646.019	Convert Town of Booker to 34.5	116,413	-
671	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005522.183	Conv Portales So to 115/4.2kV	109,620	109,620
672	Electric Distribution	Meeks	Purchases	A.0005517.017	TxS-Elec Easement	98,050	-
673	Electric Distribution	Meeks	Outdoor/Area Lighting	A.0010002.006	NM - UG New Street Light Blanket	96,395	96,395
674	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005522.184	Conv Market St to 115/12.5kV 2	90,453	90,453
675	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0001300.053	Install 2 12.47kV OH lines from Sie	85,671	85,671
676	Electric Distribution	Meeks	Outdoor/Area Lighting	A.0010001.006	TX - UG New Street Light Blanket	68,800	-
677	Electric Distribution	Meeks	Outdoor/Area Lighting	A.0010001.005	TX - OH New Street Light Blanket	67,137	-
678	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005508.153	SPS-TX Convert Obsolete Vltg D	65,298	-
679	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005521.087	ELR - Substation Regulators -	63,109	-
680	Electric Distribution	Meeks	Outdoor/Area Lighting	A.0010002.005	NM - OH New Street Light Blanket	62,606	62,606
681	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0000860.005	Convert Curry Co. Interchange 69kV	61,151	61,151
682	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0010009.002	TX - UG Relocation Blanket	58,730	-
683	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0010018.004	NM - UG Services Renewal Blanket	55,062	55,062
684	Electric Distribution	Meeks	New Business	A.0005505.009	Txn-(0025) Ug Services	53,048	-
685	Electric Distribution	Meeks	Purchases	A.0005584.004	SPS-NM CAPITALIZED ELECTRIC LOCATES	50,873	50,873
686	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0010017.004	TX - UG Services Renewal Blanket	46,841	-
687	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0010026.002	NM - FPIP Blanket	37,862	37,862
688	Electric Distribution	Meeks	Purchases	A.0005583.003	SPS-TX CAPITALIZED ELECTRIC LOCATES	36,209	-
689	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005584.003	NEW MEXICO POLE INSPECTIONS	34,207	34,207
690	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0010025.001	TX - REMS Blanket	31,413	-
691	Electric Distribution	Meeks	Outdoor/Area Lighting	A.0005506.009	TXOH Street Lights-TX	28,906	-
692	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005502.225	SENM	26,407	26,407
693	Electric Distribution	Meeks	Outdoor/Area Lighting	A.0010018.006	NM - UG Street Light Rebuild Blanke	18,391	18,391
694	Electric Distribution	Meeks	New Business	A.0005501.116	AMARILLO/TIMES SQUARE VILLAGE 1/BAC	18,298	-
695	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005502.223	Convert Hereford 69/13.2kV to	18,248	-
696	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005522.106	Conver Wade to 115/12.5KV &MVA	18,204	-
697	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005508.179	Convert Town of Booker to 34.5	17,159	-
698	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005522.218	Convert Livingston Ridge #1 69	13,916	13,916
699	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005521.182	Convert Centre Street - Remova	13,854	-
700	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005518.095	Sps-Poor Perf Fdr Replace Blkt	12,188	-
701	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0010025.002	TX - FPIP Blanket	10,363	-

Southwestern Public Service Company
Capital Additions
April 1, 2018 through March 31, 2019

	(A)	(B)	(C)	(D)	(E)	(F)	(G)
Line No.	Asset Class	Witness	Project Category	WBS Level 2	Project Description (WBS Level 2 Description)	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) Total Company	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) NM Retail
702	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005509.011	TXUG ConvrsnsRebuilds-TX	9,769	-
703	Electric Distribution	Meeks	New Business	A.0005505.007	NMUG Services-NM	9,137	9,137
704	Electric Distribution	Meeks	New Business	A.0005504.008	TXOH Services-TX	8,273	-
705	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005502.232	Inst Muleshoe East 12.5/2.4 3-	7,147	-
706	Electric Distribution	Meeks	Outdoor/Area Lighting	A.0005506.008	NMOH Street Lights-NM	6,761	6,761
707	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005510.007	NMOH Relocations-NM	6,687	6,687
708	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0010033.002	TX - UG Reinforcement Blanket	6,261	-
709	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0010009.003	TX - UG Service Conversion Blanket	5,499	-
710	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005521.202	Replace Substation Relays-NM	4,573	4,573
711	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005511.011	NMUG Relocations-NM	3,353	3,353
712	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005521.140	Potash #2 Replace Failed XFMR	2,964	2,964
713	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005522.073	Reinf Price T1 69 to 115 kV 2	2,917	2,917
714	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0000860.004	Convert Curry Co. Interchange	2,677	2,677
715	Electric Distribution	Meeks	New Business	A.0005504.007	NMOH Services-NM	2,344	2,344
716	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0010010.002	NM - UG Relocation Blanket	2,044	2,044
717	Electric Distribution	Meeks	New Business	A.0005501.011	TXUG Extension-TX	1,825	-
718	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005503.008	TXUG Reinforcements-TX	1,642	-
719	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005511.012	TXUG Relocations-TX	1,530	-
720	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005522.260	Reinforce Pringle Oil Field 10	1,493	-
721	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005509.010	NMUG ConvrsnsRebuilds-NM	1,341	1,341
722	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005510.021	Txn Blanket-Oh Relocations	1,246	-
723	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005502.247	Install Sunset 13.2kV Feeders	1,157	-
724	Electric Distribution	Meeks	New Business	A.0005500.009	NMOH Extension-NM	894	894
725	Electric Distribution	Meeks	Distribution Line and Substation Capacity	11789422	Purch Land for Higg East Sub	542	-
726	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005522.357	Install Ponderosa #1 115/25KV	324	324
727	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005521.188	Order new system spare 115/12k	252	-
728	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005508.031	Txn-(022) Oh Rebuilds	159	-
729	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005518.013	Reliability Monitoring System	159	-
730	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005508.101	Inspect/Replace Poles_Texas	3	-
731	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005518.087	Reliability Monioring System	3	3
732	Electric Distribution	Meeks	New Business	A.0005504.009	Txs-(023) Oh Services	(1)	-
733	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005519.023	TX North-UG Service Conv	(119)	-
734	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005584.005	SPS NM Targeted OH Rebuild - A	(129)	(129)
735	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005510.008	TXOH Relocations-TX	(144)	-
736	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005510.072	TX Pole Transfers	(168)	-
737	Electric Distribution	Meeks	New Business	A.0005505.011	0025 Blanket - New Mexico Ug S	(191)	(191)
738	Electric Distribution	Meeks	Purchases	A.0005516.033	Scrap Sale Credits-SPS	(218)	-
739	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005521.011	Purchase 115/25KV 50 MVA reserve tr	(511)	(511)
740	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005521.012	Replace North Hobbs T2 - 28MVA	(664)	(664)
741	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005522.175	Construct Kilgore115/4.2kV 14M	(710)	(710)
742	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005522.263	Install New 115/12.5kV Bensing	(883)	(883)
743	Electric Distribution	Meeks	New Business	A.0005500.024	Txs Blanket-Oh Extension	(1,270)	-
744	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005508.007	NMOH Rebuilds-NM	(1,670)	(1,670)
745	Electric Distribution	Meeks	New Business	A.0005505.008	TXUG Services-TX	(2,277)	-

Southwestern Public Service Company
Capital Additions
April 1, 2018 through March 31, 2019

	(A)	(B)	(C)	(D)	(E)	(F)	(G)
Line No.	Asset Class	Witness	Project Category	WBS Level 2	Project Description (WBS Level 2 Description)	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) Total Company	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) NM Retail
746	Electric Distribution	Meeks	Purchases	A.0005511.048	Capitalized Locating Costs-Ele	(3,838)	-
747	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005509.037	Nm Blanket-Ug Conv/Rebuilds	(6,945)	(6,945)
748	Electric Distribution	Meeks	New Business	A.0005500.025	NM Blanket-Oh Extension	(9,031)	(9,031)
749	Electric Distribution	Meeks	New Business	A.0005500.023	Tx Blnkt-Overhead Extensions	(12,170)	-
750	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005502.009	TXOH Reinforcements-TX	(17,433)	-
751	Electric Distribution	Meeks	New Business	A.0005500.007	TXOH Extension-TX	(17,735)	-
752	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005522.007	Wood Draw Pad Expansion	(21,958)	(21,958)
753	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005522.105	Inst China Draw 69/12.5kV 28MV	(23,296)	(23,296)
754	Electric Distribution	Meeks	Outdoor/Area Lighting	A.0005507.006	NMUG Street Lights-NM	(42,601)	(42,601)
755	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005522.177	Inst Camex 115/13.2kV 28MVA T3	(44,813)	-
756	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005522.077	Convert Zodiac T1 69 to 115 kV	(61,323)	(61,323)
757	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005522.178	Inst Higg East 115/12.5kV 28MV	(80,931)	-
758	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0000302.016	Conv Channing to 230/35kV 2-28	(96,646)	-
759	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005522.127	Inst Battle Axe115/12.5kV 28MV	(107,731)	(107,731)
760	Electric Distribution	Meeks	New Business	A.0006062.010	Distribution CIAC TX Elec	(119,885)	-
761	Electric Distribution	Meeks	New Business	A.0005500.043	BUSHLAND/ 26511 N US HIGHWAY 287/ N	(175,186)	-
762	Electric Distribution	Meeks	Distribution Line and Substation Capacity	A.0005502.231	Install Battle Axe 12.5kV Feed	(239,996)	(239,996)
763	Electric Distribution	Meeks	Distribution Line and Substation Reconstruction	A.0005508.008	TXOH Rebuilds-TX	(280,170)	-
764	Electric Distribution	Meeks	New Business	A.0006062.011	Distribution CIAC NM Elec	(1,668,842)	(1,668,842)
765	**Electric Distribution Total**					**$ 100,309,251**	**$ 35,534,299**
766	Electric General	Bick	Building & Infrastructure	D.0001813.061	Canyon Service Center - New	$ 7,485,131	$ 2,077,979
767	Electric General	Meeks	Purchases	A.0006056.213	TX-DIST Fleet New Unit Purchases	4,441,545	1,233,036
768	Electric General	Cooley	OT	A.0006056.224	Fleet New Unit El Trans TX	2,556,508	709,723
769	Electric General	Meeks	Purchases	A.0006059.006	TX-Dist Electric Tools and Equip	2,514,101	697,950
770	Electric General	Harkness	Aging Technology	D.0001839.827	Purch Eddy County MW Equip NM	2,323,748	645,106
771	Electric General	Cooley	OT	A.0001118.006	Lock and Key System TX	1,418,821	393,885
772	Electric General	Meeks	Purchases	A.0006059.016	TX-Dist Subs Tools and Equip	1,340,173	372,051
773	Electric General	Meeks	Purchases	A.0006056.214	NM-DIST Fleet New Unit Purchase El	1,101,616	305,824
774	Electric General	Harkness	Aging Technology	D.0001821.290	2018 Unplanned PC SPS	1,045,629	290,281
775	Electric General	Meeks	Purchases	A.0005549.009	SPS-Dist Sub Communication Equ	985,469	273,580
776	Electric General	Cooley	OT	A.0000710.008	SPS Physical Security Comm	951,084	264,035
777	Electric General	Harkness	Cyber Security	D.0002000.008	Purch CIP Appl SPS	819,010	227,369
778	Electric General	Harkness	Aging Technology	D.0001821.311	2018 Planned PC SPS	775,703	215,346
779	Electric General	Cooley	OT	A.0000588.011	Moore Co 115kV RTU Rplmnt	766,987	212,927
780	Electric General	Cooley	RE	A.0000424.164	N Loving 345kV Sub Comms_UID 5	567,117	157,440
781	Electric General	Cooley	OT	A.0001118.007	Lock and Key System NM	481,955	133,797
782	Electric General	Cooley	SR	A.0000220.030	Amoco RTU Replacement	456,110	126,623
783	Electric General	Harkness	Aging Technology	D.0002016.017	Purch T&D MPLS - Unplanned (2017) N	450,721	125,127
784	Electric General	Harkness	Aging Technology	D.0002021.004	Purch Facility IT Investments HW SP	445,784	123,756
785	Electric General	Cooley	RE	A.0000424.168	China Draw 345kV Sub Comms_UID	381,692	105,963
786	Electric General	Cooley	OT	A.0006059.063	SPS Sub Comm Tool Blanket	377,140	104,700
787	Electric General	Meeks	Purchases	A.0005549.010	NM-Dist Sub Communication Equi	374,135	103,865
788	Electric General	Cooley	RE	A.0000511.017	Carl-Wolf Carisle Comm	366,956	101,872

Southwestern Public Service Company
Capital Additions
April 1, 2018 through March 31, 2019

	(A)	(B)	(C)	(D)	(E)	(F)	(G)
Line No.	Asset Class	Witness	Project Category	WBS Level 2	Project Description (WBS Level 2 Description)	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) Total Company	Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) NM Retail
789	Electric General	Meeks	Purchases	A.0006059.007	NM-Dist Electric Tools and Equip	347,200	96,388
790	Electric General	Harkness	Aging Technology	D.0001783.021	Purch LMR Radio HW TX	321,210	89,172
791	Electric General	Cooley	RE	A.0000296.009	NE Hereford Comm	312,659	86,799
792	Electric General	Cooley	OT	A.0000948.004	TX Frame Relay Comm	302,571	83,998
793	Electric General	Cooley	OT	A.0000948.003	NM Frame Relay Comm	297,380	82,557
794	Electric General	Harkness	Aging Technology	D.0001821.307	2018 EMS Infra Refresh SPS	289,475	80,362
795	Electric General	Bick	Security - Controls & Monitoring	D.0001781.049	790 Buchannan Security System	277,391	77,008
796	Electric General	Bick	Building & Infrastructure	D.0001834.039	Carlsbad Roof Seal-Safety System	272,224	75,573
797	Electric General	Harkness	Aging Technology	D.0001821.278	2018 IT INFS Network Refresh S	257,063	71,364
798	Electric General	Cooley	RE	A.0001300.020	Roswell Intg New 115kV Terminal Com	252,009	69,961
799	Electric General	Cooley	GI	A.0000736.003	Needmore Communication	244,912	67,991
800	Electric General	Harkness	Enhance Capabilities	D.0001804.397	Purch Wireless HW SPS	239,605	66,518
801	Electric General	Cooley	RE	A.0000194.006	Cochran RTU, Comm	228,136	63,334
802	Electric General	Cooley	RE	A.0001310.008	Walkemeyer 345/115 Sub Comm	217,960	60,509
803	Electric General	Lytal	Reliability & Performance Enhancement	A.0003000.689	GMS0C-TX Lab Instruments	217,876	60,486
804	Electric General	Cooley	RE	A.0000296.007	New Centre St Comm	212,859	59,093
805	Electric General	Harkness	Aging Technology	D.0001839.148	2018 Storage Annual Refresh SP	207,751	57,675
806	Electric General	Harkness	Aging Technology	D.0002016.004	Purch T&D MPLS - Unplanned (2017) S	197,841	54,923
807	Electric General	Harkness	Aging Technology	D.0002014.001	Purch WAN HW SPS-BSPRJ0001170	197,774	54,905
808	Electric General	Cooley	OT	A.0006059.500	EPZ Mats NM	190,062	52,764
809	Electric General	Cooley	OT	A.0006059.499	EPZ Mats TX	185,713	51,557
810	Electric General	Cooley	RE	A.0000540.017	Atoka Comm Sub Portion Comm	181,320	50,337
811	Electric General	Harkness	Enhance Capabilities	D.0001804.396	Purch Wireless HW NM	175,180	48,632
812	Electric General	Lytal	Reliability & Performance Enhancement	A.0006056.227	GSMOC Purchase Vehicles	173,296	48,109
813	Electric General	Cooley	SR	A.0000499.017	PS ELR 115kV NM Comm	169,242	46,984
814	Electric General	Harkness	Enhance Capabilities	D.0001804.327	Purch Wireless HW SPS	167,034	46,371
815	Electric General	Harkness	Aging Technology	D.0001840.004	2017 Network Refresh SPS	164,421	45,646
816	Electric General	Cooley	OT	A.0000795.003	SPS Sub Comm Network Group 1 C	163,179	45,301
817	Electric General	Cooley	GI	A.0001351.003	Roswell Comm	160,460	44,546
818	Electric General	Cooley	RE	A.0000658.007	Seagraves Comm	147,339	40,904
819	Electric General	Harkness	Aging Technology	D.0002014.002	Purch WAN HW NM	146,254	40,602
820	Electric General	Cooley	GI	A.0000350.004	Lost Draw Comm	143,270	39,774
821	Electric General	Cooley	RE	A.0001353.001	Roosevelt Comm	140,839	39,099
822	Electric General	Cooley	GI	A.0000902.002	TUCO RTU Addition Comm	135,542	37,629
823	Electric General	Cooley	OT	A.0000710.007	NM Physical Security Comm	132,175	36,694
824	Electric General	Harkness	Cyber Security	D.0001840.114	Purch Sec Camera HW TX	114,721	31,848
825	Electric General	Cooley	RE	A.0000658.006	Terry Co Comm	114,109	31,678
826	Electric General	Cooley	LI	A.0001008.004	Inst 230kV Sw Station Comm	111,870	31,057
827	Electric General	Meeks	Purchases	A.0005549.034	TX Frame Relay Replacement	111,566	30,972
828	Electric General	Cooley	OT	A.0006059.432	Tool Blanket TX Line	108,292	30,063
829	Electric General	Cooley	SR	A.0001067.002	Lubbock South Communication	103,192	28,647
830	Electric General	Lytal	Reliability & Performance Enhancement	A.0003000.684	TOL0C - Purch Misc Tools	98,438	27,328
831	Electric General	Cooley	SR	A.0001067.003	Lubbock East Communication	97,429	27,048
832	Electric General	Lytal	Reliability & Performance Enhancement	A.0003000.668	HAR0C-Purch Plant Tools	95,600	26,540

Southwestern Public Service Company
Capital Additions
April 1, 2018 through March 31, 2019

Line No.	(A) Asset Class	(B) Witness	(C) Project Category	(D) WBS Level 2	(E) Project Description (WBS Level 2 Description)	(F) Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) Total Company	(G) Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) NM Retail
833	Electric General	Harkness	Aging Technology	D.0001821.538	Purch Mobile Handheld HW SPS	93,656	26,000
834	Electric General	Cooley	RE	A.0000488.005	OCHOA Comm	92,896	25,789
835	Electric General	Cooley	SR	A.0000499.016	Line ELR SPS 2016 Comm	91,691	25,455
836	Electric General	Cooley	SR	A.0000153.003	SPS Trans Switch Comm	83,308	23,127
837	Electric General	Cooley	LI	A.0000854.003	Install Switch and Tap Comm	80,896	22,458
838	Electric General	Cooley	RE	A.0000494.003	Seminole Xfmr East Comm	79,541	22,082
839	Electric General	Cooley	LI	A.0000424.173	W39 Inst Switch for Enterprise	71,768	19,924
840	Electric General	Bick	Building & Infrastructure	D.0001823.084	Misc Bldg - Electric - Dumas - Rout	65,419	18,161
841	Electric General	Cooley	RE	A.0001283.003	Business System Equip for Eng Acces	65,343	18,140
842	Electric General	Harkness	Aging Technology	D.0001821.537	2018 IT INFS Network Ref HW NM	64,721	17,968
843	Electric General	Cooley	RE	A.0001272.002	Cargill 14.4 Mvar Cap Bank Comm	63,180	17,540
844	Electric General	Cooley	RE	A.0000424.043	OPIE 3_Hobbs 345kV Sub Comms_U	62,076	17,233
845	Electric General	Cooley	OT	A.0006059.436	SPS Ops Engineering Tools	59,245	16,447
846	Electric General	Lytal	Reliability & Performance Enhancement	A.0003000.692	GMS0C-MMR Instruments	56,118	15,579
847	Electric General	Cooley	RE	A.0000511.018	Carl-Wolf Wolfforth Comm	54,102	15,020
848	Electric General	Cooley	OT	A.0000588.001	SPS RTU EMS Upgrade	53,949	14,977
849	Electric General	Cooley	RE	A.0000290.008	Cunningham Intg Upgr Eddy Term Comm	53,801	14,936
850	Electric General	Bick	Building & Infrastructure	D.0001813.022	Amarillo Tower New Lease	51,606	14,327
851	Electric General	Harkness	Enhance Capabilities	D.0001804.325	Purch Wireless Hobbs NM SPS	51,522	14,303
852	Electric General	Lytal	Reliability & Performance Enhancement	A.0003000.691	GMS0C-TRaC Tools	49,357	13,702
853	Electric General	Cooley	RE	A.0000194.007	Cochran Comm Equiup	49,254	13,674
854	Electric General	Lytal	Reliability & Performance Enhancement	A.0003000.429	JON0C-Rpl Milling Machine	48,276	13,402
855	Electric General	Cooley	RE	A.0000424.222	Quahada Communication	45,354	12,591
856	Electric General	Lytal	Reliability & Performance Enhancement	A.0001550.460	HAR0C-Purchase PMI Analyzer	39,628	11,001
857	Electric General	Lytal	Reliability & Performance Enhancement	A.0003000.673	JON0C-Capital Tools	37,899	10,521
858	Electric General	Cooley	OT	A.0006056.223	Fleet New Units El Trans NM	36,470	10,125
859	Electric General	Lytal	Reliability & Performance Enhancement	A.0003000.677	PLX0C-Purch Misc Plant Tool	35,068	9,735
860	Electric General	Harkness	Aging Technology	D.0001839.406	Microwave Crossroads/Towers SP	34,563	9,595
861	Electric General	Cooley	OT	A.0006059.437	SPS COM Tools (BU 8371)	34,545	9,590
862	Electric General	Lytal	Reliability & Performance Enhancement	A.0003000.674	MAD0C-Purchase Cap Tools	34,414	9,554
863	Electric General	Cooley	RE	A.0000424.221	PCA Communication	33,396	9,271
864	Electric General	Bick	Tools & Equipment	A.0006059.489	Tools & Equipment - Electric - NM	32,469	9,014
865	Electric General	Harkness	Aging Technology	D.0001839.621	Purch Avaya Server HW SPS	32,451	9,009
866	Electric General	Lytal	Reliability & Performance Enhancement	A.0003000.693	GMS0C-PMO Equipment	28,270	7,848
867	Electric General	Cooley	SR/LI	A.0000851.002	Pringle Substation Comm	25,223	7,002
868	Electric General	Lytal	Reliability & Performance Enhancement	A.0003000.690	GMS0C-E&C Tools	23,823	6,614
869	Electric General	Cooley	LI	A.0000905.002	Install Switch and Tap Comm	22,101	6,136
870	Electric General	Cooley	RE	A.0002033.001	Portales Interchange Sub Comm	21,825	6,059
871	Electric General	Lytal	Reliability & Performance Enhancement	A.0003000.675	NIC0C-Purch Plant Tools	21,541	5,980
872	Electric General	Cooley	OT	A.0000924.011	SPS CIP 5 RooseveltCo NM Comm	21,412	5,944
873	Electric General	Cooley	RE	A.0000424.233	Hopi Bkr Inst pecos Term Sub Comm	21,368	5,932
874	Electric General	Bick	Building & Infrastructure	D.0001810.057	Amarillo NESC Evidence Storage Faci	21,098	5,857
875	Electric General	Cooley	OT	A.0006059.434	SPS Training Center Tools	18,804	5,220
876	Electric General	Harkness	Aging Technology	D.0001800.939	Purch Verint Server HW SPS	17,848	4,955

Southwestern Public Service Company
Capital Additions
April 1, 2018 through March 31, 2019

Line No.	(A) Asset Class	(B) Witness	(C) Project Category	(D) WBS Level 2	(E) Project Description (WBS Level 2 Description)	(F) Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) Total Company	(G) Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) NM Retail
877	Electric General	Harkness	Aging Technology	D.0002016.018	Purch T&D MPLS - Unplanned (2017) O	17,683	4,909
878	Electric General	Meeks	Purchases	A.0005549.028	NM-Elec Dist Communication Equip	17,563	4,876
879	Electric General	Cooley	OT	A.0001118.009	Lock and Key System OK	17,284	4,798
880	Electric General	Meeks	Purchases	A.0005014.110	Remodel SPS Lubbock Dist Control Ce	16,427	4,560
881	Electric General	Cooley	RE	A.0000424.069	L Ridge 115kV Sub Comms_UID 50	13,979	3,881
882	Electric General	Cooley	OT	A.0000924.010	SPS CIP 5 Potter Co Comm	13,796	3,830
883	Electric General	Harkness	Aging Technology	D.0001839.370	Purch SPS Gold Elite Console H	13,782	3,826
884	Electric General	Cooley	OT	A.0000924.009	SPS CIP 5 Plant X Sta Comm	13,595	3,774
885	Electric General	Lytal	Reliability & Performance Enhancement	A.0003000.688	GMS0C-Training Tools	13,165	3,655
886	Electric General	Harkness	Enhance Capabilities	D.0002007.008	Purch Digital Signage HW SPS	12,390	3,440
887	Electric General	Meeks	Purchases	A.0006056.019	NM-DIST Fleet New Unit Purchase El	12,286	3,411
888	Electric General	Cooley	OT	A.0000588.010	Grassland RTU Replacement	11,139	3,092
889	Electric General	Meeks	Purchases	A.0005555.002	NM - Frame Relay Replacement	10,356	2,875
890	Electric General	Cooley	OT	A.0006059.081	Tools Sys Protection Comm Eng	9,332	2,591
891	Electric General	Harkness	Aging Technology	D.0001822.010	Purch Sub Frame Relay Equip SP	9,182	2,549
892	Electric General	Meeks	Purchases	A.0005014.076	SPS-Subs Furniture Blanket	8,831	2,452
893	Electric General	Harkness	Aging Technology	D.0001822.057	Purch Sub Frame BAU Sites TX SPS	8,784	2,439
894	Electric General	Cooley	OT	A.0005014.109	Gen Plt Ofc Furn TX	7,594	2,108
895	Electric General	Bick	Building & Infrastructure	D.0001806.086	Mechanical - Dumas - Routine	7,465	2,072
896	Electric General	Bick	Security - Controls & Monitoring	D.0001781.041	Security Projects - Electric -	6,739	1,871
897	Electric General	Cooley	SR	A.0000589.009	Tuco 115 House RTU Replacement Comm	6,509	1,807
898	Electric General	Cooley	RE	A.0000890.002	Eddy Co. Xfmr #1 Communication	5,939	1,649
899	Electric General	Harkness	Aging Technology	D.0001822.008	Purch Sub Frame Relay Equip NM	5,850	1,624
900	Electric General	Meeks	Purchases	A.0006059.105	NM-Transportation Tools & Equi	5,480	1,521
901	Electric General	Cooley	RE	A.0000846.002	Denver City RTU Comm	5,171	1,436
902	Electric General	Harkness	Cyber Security	D.0001804.126	Purch Network Appl Camera Upgr SPS	4,412	1,225
903	Electric General	Cooley	OT	A.0005014.084	New Mexico Substation Furnitur	4,364	1,211
904	Electric General	Harkness	Aging Technology	D.0001821.232	2017 Unplanned PC Refresh SPS	4,179	1,160
905	Electric General	Cooley	LI	A.0000907.002	Kiser Distribution Add Comm	3,605	1,001
906	Electric General	Harkness	Aging Technology	D.0001797.009	Purch Sub Frame Relay OK SPS	3,395	942
907	Electric General	Cooley	GI	A.0000768.004	Blanco Comm	2,316	643
908	Electric General	Harkness	Aging Technology	D.0001783.010	Purch LMR HW SPS	2,278	633
909	Electric General	Harkness	Aging Technology	D.0001822.058	Purch Sub Frame BAU Sites NM SPS	2,142	595
910	Electric General	Cooley	RE	A.0000424.229	OPIE POTASH LIVINGSTON RIDGE RECOND	2,055	571
911	Electric General	Bick	Building & Infrastructure	D.0001810.035	Amarillo Tower - Structual	1,742	484
912	Electric General	Cooley	SR	A.0000220.029	SPS NM SE Comm	1,731	481
913	Electric General	Cooley	OT	A.0000924.014	SPS CIP 5 Yoakum Co Comm	1,646	457
914	Electric General	Meeks	Purchases	A.0006056.010	TX-DIST Fleet New Unit Purchases	1,408	391
915	Electric General	Harkness	Aging Technology	D.0001840.019	2017 Network Ref NM	1,320	366
916	Electric General	Lytal	Reliability & Performance Enhancement	A.0003000.663	CHC0C-Cunningham Tools	1,318	366
917	Electric General	Harkness	Aging Technology	D.0001804.022	Purch Corp Network Core HW SP	1,314	365
918	Electric General	Cooley	RE	A.0000424.223	Hopi Comm	1,312	364
919	Electric General	Harkness	Aging Technology	D.0001839.675	Purch Roosevelt MW NM SPS	1,265	351
920	Electric General	Harkness	Aging Technology	D.0001828.004	Purch NS T&D Network Equip SPS	1,122	311

Southwestern Public Service Company
Capital Additions
April 1, 2018 through March 31, 2019

Line No.	(A) Asset Class	(B) Witness	(C) Project Category	(D) WBS Level 2	(E) Project Description (WBS Level 2 Description)	(F) Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) Total Company	(G) Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) NM Retail
921	Electric General	Cooley	OT	A.0002048.003	Higg Inst New SCADA Radio Comm	969	269
922	Electric General	Cooley	RE	A.0000574.007	Coulter Relay Mod, Sub, COMM	923	256
923	Electric General	Cooley	RE	A.0000906.001	Lynn Co RTU Replacement Comm	815	226
924	Electric General	Cooley	RE	A.0000424.129	China Draw Sub Comm	737	205
925	Electric General	Cooley	RE	A.0000424.074	Sage Brush 115kV Sub Comms_UID	600	167
926	Electric General	Harkness	Aging Technology	D.0001703.009	Purch EMS DEMS Ph2 HW SPS	508	141
927	Electric General	Harkness	Aging Technology	D.0001839.055	2016 IT INFS Network Refresh S	334	93
928	Electric General	Harkness	Aging Technology	D.0001821.401	2015 IT INFS Refresh Communica	264	73
929	Electric General	Cooley	RE	A.0000532.003	TPL BFR V31 Riverview Comm	119	33
930	Electric General	Cooley	RE	A.0000424.018	Potash Junct 115/69 Xfmr UpgrC	76	21
931	Electric General	Cooley	RE	A.0000424.130	North Loving RTU - comm	76	21
932	Electric General	Bick	Building & Infrastructure	D.0001814.046	Electrical - Borger - Routine	71	20
933	Electric General	Cooley	OT	11302945	Fleet New Units 2011 El Tran, SPS	65	18
934	Electric General	Harkness	Aging Technology	D.0001822.001	Purch Corp Frame Relay HW SPS	25	7
935	Electric General	Bick	Building & Infrastructure	D.0001806.080	Mechanical - Lubbock - Routine	3	1
936	Electric General	Bick	Building & Infrastructure	D.0001806.001	Mechanical	1	0
937	Electric General	Harkness	Aging Technology	D.0001839.679	Purch Net Core Rte Amarillo SPS	(5)	(1)
938	Electric General	Cooley	OT	A.0005014.069	AC Unit 2015 for Subs	(24)	(7)
939	Electric General	Harkness	Aging Technology	D.0001839.063	2015 IT INFS Network Refresh S	(56)	(15)
940	Electric General	Harkness	Aging Technology	D.0001797.010	Purch Sub Frame Relay KS SPS	(293)	(81)
941	Electric General	Harkness	Aging Technology	D.0001821.185	2016 Unplanned PC Refresh SPS	(478)	(133)
942	Electric General	Cooley	GI	A.0000706.002	Hitchland Firewheel Comm	(6,987)	(1,940)
943	Electric General	Harkness	Aging Technology	D.0001821.208	2017 Planned PC SPS	(15,724)	(4,365)
944	Electric General	Cooley	RE	A.0000421.052	Swisher Sub. Communications	(22,846)	(6,342)
945	Electric General	Harkness	Cyber Security	D.0001839.832	Purch Net Sec HW SPS	(57,274)	(15,900)
946	Electric General	Cooley	RE	A.0000352.016	Yoakum 230 kV Bus Rebld, Commu	(313,944)	(87,155)
947	Electric General	Cooley	RE	A.0000424.041	OPIE 2 Kiowa 345kV Sub Comms U	(820,831)	(227,875)
948	**Electric General Total**					**$ 42,013,242**	**$ 11,663,475**
949	Electric Intangible	Harkness	Aging Technology	D.0001805.004	Next Gen MSFT LIC SW SPS-10692	$ 3,401,180	$ 944,216
950	Electric Intangible	Harkness	PTT	D.0001787.009	Customer Mgmt SPS	2,932,094	813,991
951	Electric Intangible	Harkness	Aging Technology	D.0001826.191	Demand Response Manage SW SPS	1,041,852	289,233
952	Electric Intangible	Harkness	PTT	D.0001787.004	SAP Financial Mgmt SPS	966,479	268,308
953	Electric Intangible	Harkness	Enhance Capabilities	D.0001839.391	Sharepoint 2013 Ph2 SW SPS	949,163	263,501
954	Electric Intangible	Harkness	Aging Technology	D.0002002.007	NMS 1.12 Upgrade SW SPS-10669	759,942	210,971
955	Electric Intangible	Harkness	Aging Technology	D.0001804.151	Interval Complex Billing SW SP	668,146	185,487
956	Electric Intangible	Harkness	Enhance Capabilities	D.0001826.247	2015 RPAM Phase 3 Amort SW SPS	610,205	169,402
957	Electric Intangible	Harkness	Aging Technology	D.0001796.018	Netwrk Tools Telecom Exp SW TX -106	560,993	155,740
958	Electric Intangible	Harkness	Aging Technology	D.0001744.019	IrthNet Damage Prevent SW SPS	506,452	140,598
959	Electric Intangible	Harkness	Aging Technology	D.0002090.013	Microfocus SW SPS-10721	450,595	125,091
960	Electric Intangible	Harkness	Aging Technology	D.0002003.010	2018 Oracle SW SPS-10701	409,078	113,566
961	Electric Intangible	Harkness	Aging Technology	D.0002003.014	2019 Oracle SW SPS-10748	404,749	112,364
962	Electric Intangible	Harkness	Aging Technology	D.0002097.007	UAST Ph1 SW SPS-10689	353,544	98,149
963	Electric Intangible	Harkness	Cyber Security	D.0002099.007	Firewall Rule Mgmt SW SPS-10707	345,214	95,836

Southwestern Public Service Company
Capital Additions
April 1, 2018 through March 31, 2019

Line No.	(A) Asset Class	(B) Witness	(C) Project Category	(D) WBS Level 2	(E) Project Description (WBS Level 2 Description)	(F) Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) Total Company	(G) Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) NM Retail
964	Electric Intangible	Harkness	Cyber Security	D.0001771.007	Certificate Key Mgmt SW SPS	336,074	93,299
965	Electric Intangible	Harkness	Cyber Security	D.0001825.098	Advanced Endpoint SW SPS-10685	330,844	91,847
966	Electric Intangible	Harkness	Aging Technology	D.0002067.004	OSI Ent Agree SW SPS-10726	276,433	76,742
967	Electric Intangible	Harkness	PTT	D.0002020.014	SAP Cont Improve R18 SW SPS-10706	265,485	73,702
968	Electric Intangible	Harkness	Aging Technology	D.0001826.161	Verint Workforce SW SPS	259,315	71,990
969	Electric Intangible	Harkness	Enhance Capabilities	D.0002090.004	IT Service Request SW SPS-10699	246,023	68,300
970	Electric Intangible	Harkness	PTT	D.0001726.058	Work and Asset Phase 1 SW SPS	245,902	68,266
971	Electric Intangible	Harkness	Aging Technology	D.0002162.004	Microsoft Core Server SW SPS-10727	241,869	67,146
972	Electric Intangible	Harkness	Aging Technology	D.0001839.379	RedSky e911 SW SPS	221,184	61,404
973	Electric Intangible	Harkness	Cyber Security	D.0002098.004	CyberArk PAM SW SPS-10694	217,277	60,319
974	Electric Intangible	Harkness	Cyber Security	D.0002001.014	Sailpoint Ph3 SW SPS-10717	211,607	58,745
975	Electric Intangible	Harkness	Aging Technology	D.0002004.014	SAP Data Mart Ph2 SW SPS-10690	195,305	54,219
976	Electric Intangible	Harkness	Aging Technology	D.0002066.004	Bus Obj Ref SW SPS-10698	170,644	47,373
977	Electric Intangible	Harkness	Cyber Security	D.0002008.004	Ent DataBase Security Ph2 SW SPS-10	147,637	40,986
978	Electric Intangible	Harkness	Enhance Capabilities	D.0001796.025	Netwrk Tools Mgmt SW SPS-10700	141,841	39,377
979	Electric Intangible	Harkness	Enhance Capabilities	D.0001792.176	Rational SW SPS-10715	123,015	34,151
980	Electric Intangible	Harkness	Cyber Security	D.0001818.108	Emergency Mass SW SPS-10709	118,012	32,762
981	Electric Intangible	Harkness	Aging Technology	D.0001839.851	RedSky Ph2 SW SPS Direct	74,307	20,629
982	Electric Intangible	Harkness	Cyber Security	D.0002101.006	eGRC Ph3 SW SPS-10719	71,328	19,802
983	Electric Intangible	Harkness	Aging Technology	D.0001839.613	CRS CM SW SPS-10644	30,556	9,497
984	Electric Intangible	Harkness	Aging Technology	D.0001826.381	Mobile App Ph2 SW SPS-10695	25,338	7,034

Southwestern Public Service Company
Capital Additions
April 1, 2018 through March 31, 2019

Line No.	(A) Asset Class	(B) Witness	(C) Project Category	(D) WBS Level 2	(E) Project Description (WBS Level 2 Description)	(F) Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) Total Company	(G) Additions to Plant-in-Service (April 1, 2018 - March 31, 2019) NM Retail
985	Electric Intangible	Harkness	Cyber Security	D.0001747.008	Data Loss Ph2 SW SPS	21,882	6,075
986	Electric Intangible	Harkness	Aging Technology	D.0001792.008	Data Warehouse Env Ref SW SPS	21,105	5,859
987	Electric Intangible	Harkness	Aging Technology	D.0001770.020	Sec File Ph3 SW SPS-10716	21,023	5,836
988	Electric Intangible	Harkness	Aging Technology	D.0002034.004	CEC-TCPA Do Not Call SW SPS-10703	20,746	5,759
989	Electric Intangible	Harkness	Enhance Capabilities	D.0002182.004	Sharepoint RFP SW SPS-10739	17,090	4,744
990	Electric Intangible	Harkness	Cyber Security	D.0001818.090	SIEM Extension SW SPS-10679	10,188	2,828
991	Electric Intangible	Harkness	Aging Technology	D.0001770.014	Secure File&Transfer Ph 2 SW SPS-10	8,826	2,450
992	Electric Intangible	Harkness	Cyber Security	D.0001804.365	eGRC Security SW SPS -10660	4,399	1,221
993	Electric Intangible	Harkness	Cyber Security	D.0001804.376	EGRC Security Ph2 SW SPS-10668	3,635	1,009
994	Electric Intangible	Harkness	Aging Technology	D.0001792.162	Informatica New Ver-10673 SW SPS	2,354	654
995	Electric Intangible	Harkness	Aging Technology	D.0001744.027	ITSM Ph4 SW SPS	1,282	356
996	Electric Intangible	Harkness	Aging Technology	D.0002004.004	SAP Data Mart SW SPS-10675	1,123	312
997	Electric Intangible	Harkness	Cyber Security	D.0001755.007	Identity & Access Mgmt Sailpoi	987	274
998	Electric Intangible	Harkness	Aging Technology	D.0001839.821	DMZ Airwatch SW SPS-10664	701	195
999	Electric Intangible	Harkness	Enhance Capabilities	D.0001804.369	Integrated Talent Ph4 SWSPS-10637	352	98
1000	Electric Intangible	Harkness	Aging Technology	D.0001792.152	XE.COM Optimization Ph2 SW SPS-1066	315	88
1001	Electric Intangible	Harkness	Cyber Security	D.0001761.007	Database Security SW SPS	233	65
1002	Electric Intangible	Harkness	Cyber Security	D.0001839.642	Network Security Protect SW SPS-106	194	54
1003	Electric Intangible	Harkness	Enhance Capabilities	D.0001792.141	10634-eGERC NERC SW SPS	156	43
1004	Electric Intangible	Harkness	Cyber Security	D.0001818.077	Vulnerability NexPose SW SPS-10665	114	32
1005	Electric Intangible	Cooley	OT	A.0002062.001	GIST-IV Computer Software SPS	56	16
1006	Electric Intangible	Harkness	Aging Technology	D.0001744.044	Teradata HW SW SPS	26	7
1007	Electric Intangible	Harkness	Enhance Capabilities	D.0001826.233	Solar Energy Grid SW SPS	4	1
1008	Electric Intangible	Harkness	Aging Technology	D.0001822.036	TD Ciena Network SW SPS-10642	3	1
1009	Electric Intangible	Harkness	Enhance Capabilities	D.0001763.014	ITSM Secure Ticket SW SPS-10676	1	0
1010	Electric Intangible	Harkness	Cyber Security	D.0001783.017	WebSense SW SPS-10670	(10)	(3)
1011	Electric Intangible	Harkness	Enhance Capabilities	D.0001738.014	GeoSpatial Integration SW SPS-10653	(43)	(12)
1012	Electric Intangible	Harkness	Aging Technology	D.0001743.007	Upgrade IEE 5.3 to IEE 8.1 SW	(59)	(16)
1013	Electric Intangible	Harkness	Aging Technology	D.0001759.007	Fleet Focus SW SPS	(140)	(39)
1014	Electric Intangible	Harkness	Enhance Capabilities	D.0001839.635	VMware Private Cloud SW SPS -10647	(209)	(58)
1015	Electric Intangible	Harkness	Enhance Capabilities	D.0001804.306	Federated Records SW SPS-10640	(267)	(74)
1016	Electric Intangible	Harkness	Cyber Security	D.0001818.084	Vulnerability AppSpider SW SPS-1066	(442)	(123)
1017	Electric Intangible	Harkness	Aging Technology	D.0001826.064	Mobile Application Customer SW	(548)	(152)
1018	Electric Intangible	Harkness	Enhance Capabilities	D.0001815.043	Renewable Energy SW SPS-10649	(617)	(171)
1019	Electric Intangible	Harkness	Enhance Capabilities	D.0001826.241	SAP BI Suite SW SPS	(786)	(218)
1020	Electric Intangible	Harkness	Enhance Capabilities	D.0001741.007	Data Quality Tool SW SPS	(1,623)	(451)
1021	Electric Intangible	Harkness	Aging Technology	D.0002007.004	Digital Signage SW SPS-10671	(2,161)	(600)
1022	Electric Intangible	Harkness	Aging Technology	D.0001767.007	Self Service and PAF SW SPS	(2,483)	(689)
1023	Electric Intangible	Harkness	Enhance Capabilities	D.0001826.211	ITSA Pole Ph3 SW SPS	(2,570)	(713)
1024	Electric Intangible	Harkness	Cyber Security	D.0001754.007	Identity & Access Mgmt QAS SW	(2,738)	(760)
1025	Electric Intangible	Harkness	Cyber Security	D.0002001.007	SailPoint Extension SW SPS-10667	(60,483)	(16,791)
1026	**Electric Intangible Total**					**$ 18,371,298**	**$ 5,101,149**
1027	**Grand Total**					**$ 458,521,070**	**$ 116,171,298**

BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION

IN THE MATTER OF SOUTHWESTERN PUBLIC SERVICE COMPANY'S APPLICATION 1) TO AMEND ITS CERTIFICATES OF PUBLIC CONVENIENCE AND NECESSITY TO CONVERT HARRINGTON GENERATION STATION FROM COAL TO NATURAL GAS, 2) FOR AUTHORIZATION TO ACCRUE ALLOWANCE FOR FUNDS USED IN CONSTRUCTION, AND 3) FOR OTHER ASSOCIATED RELIEF	)	**CASE NO. 21-00200-UT**
SOUTHWESTERN PUBLIC SERVICE COMPANY,		
APPLICANT.		

SOUTHWESTERN PUBLIC SERVICE COMPANY'S RESPONSE TO SIERRA CLUB'S FIRST SET OF INTERROGATORIES AND REQUESTS FOR PRODUCTION OF DOCUMENTS

Southwestern Public Service Company ("SPS") hereby responds to and answers the Sierra Club ("SC") First Set of Interrogatories and Requests for Production as set forth below.

PRELIMINARY MATTERS-GENERAL OBJECTION

SPS objects to the instructions and directions in SC's First Set of Interrogatories and Requests for Production to the extent that SC improperly seeks to: (1) expand or establish more burdensome requirements for discovery than the requirements of the New Mexico Public Regulation Commission's Rules and Procedures (i.e., 1.2.2.25 NMAC) and the New Mexico Rules of Civil Procedure for the District Courts (i.e., NMRA Rules 1-026 through 1-037); and (2) require disclosure of privileged communications and information pursuant to the attorney-client privilege

or disclosure of communications and information protected from discovery under the attorney work product doctrine. Subject to this general objection, SPS responds to SC's First Set of Interrogatories and expressly reserves all evidentiary objections concerning any of SPS's answers or related documents that SC may seek to offer into evidence at the hearing in this case. Relating to SC's discovery requests that seek disclosure of confidential/proprietary information, SPS will provide a copy of confidential/proprietary information to SC and other parties who sign the approved confidentiality agreement. Confidential/proprietary documents responsive to specific discovery requests have been identified with the designation "(CONF)."

QUESTION NO. SC 1-5:

For the Harrington units:

a. Please produce any unit replacement studies done by the Company.

b. Identify any transmission grid updates or changes that would be needed to allow for the retirement of any of the units.

c. Produce any analysis or assessment of the need for the continued operations of each unit.

d. Provide the remaining book value (plant balance) at the start of 2021.

e. Identify the current undepreciated book value, and the expected undepreciated book value for each year of the remaining operation life of the unit.

f. Produce any analysis or assessment of the impact that retirement of each unit would have on capacity adequacy, transmission grid stability, transmission grid support, voltage support, or transmission system reliability.

RESPONSE:

a. Please refer to Exhibit SPS-SC 1-3(i)(CONF) and Exhibit SPS-SC 1-3(ii) for the unit replacement studies SPS conducted in 2021 and 2019, respectively.

b. Transmission grid updates or changes will be studied and identified by the Southwest Power Pool, pursuant to Attachment AB "Generator Retirement Process" of the Open Access Tariff. During this process, Southwest Power Pool will perform a study to identify any updates or changes, if required, within a year of filing the retirement request. Retirement requests are required to be filed with Southwest Power Pool no less than one year from the expected retirement date. SPS does not conduct this process.

c. **Please refer to SPS's responses to subpart (a) and subpart (f).**

d. Please refer to Exhibit SPS-SC 1-5(d).

e. **Please refer to SPS's re**sponse to subpart (d).

f. Please refer to subpart (a) and Exhibit SPS-SC 1-5(f)(CONF).

Preparers: Ben R. Elsey, Jarred Cooley, Sean Young
Sponsors: Ben R. Elsey, William A. Grant

Harrington Station
Fuel Repowering System Impact Study

SPS Study #190311

Potter County, Texas

Xcel Energy Services, Inc.
Transmission Planning, South

July 19, 2019

Executive Summary

Transmission Planning has completed a study to assess reliability based impacts to the Southwestern Public Service Company (SPS) transmission system, as a result of the Harrington Station fuel repowering from coal to natural gas. The work completed was for both transient stability analysis and post transient stability, steady state power flow analysis. Contingencies assessed were taken from the list of events studied during the yearly North American Electric Reliability Corporation (NERC) TPL-001-4 analysis. These events were chosen due to the compliance obligations that SPS is required to meet during its yearly assessment.

The results of this study have determined several key factors that could result as concerns once the Harrington units are converted to natural gas fuel. Prior to outlining these concerns, it should be noted that the generation dispatch for the different model scenarios were developed based on an economic dispatch using the software tool PROMOD to reflect a market based dispatch. As such, new generation was added to these scenario models as part of the PROMOD dispatch without the required transmission system upgrades needed for interconnection, since the interconnection is being studied by the Southwest Power Pool (SPP). Therefore the validity of many of the impacts had to be carefully scrutinized.

Key notable concerns for this study include the dispatch of Harrington. It is concerning that the Harrington units did not make it into the economic dispatch used in the models for this study, leading us to believe that these units may not be dispatched when converted. As for impacts associated with outages, some of the key outages include those related to tie-line outages, which impact power imports into the SPS system. The outage of tie-lines was also identified as concern. Most impactful are the Category P3 outages for the EHV[1] transmission system. The outages of generators coupled with EHV outages of 345kV tie-lines, produced a large number of non-convergent results alluding to transmission system collapse due to the insufficiency of generation in the SPS area and import limitations caused by the outage of tie-lines. These types of violations mandate a Corrective Action Plan, per the requirements of the NERC TPL-001-4 reliability standard. Similar outages producing concerns are the combination of tie-line outages. During the outage of two EHV tie-lines (Category P6) and lines across the North-South interface and a tie-line, also produces a large number of non-convergent results. The violations produced by these types of outages will only become worse by the additional oil and gas growth in the southeast New Mexico as additional generation is retired.

As a result of the wide range of NERC TPL-001-4 disturbances assessed as part of the study, this study recommends the conversion of the Harrington units to synchronous condensers, in lieu of retiring the units. In addition, the MW capacity from the Harrington generation should be replaced and relocated to the south

1 Extra High Voltage (>300kV)

west part of the SPS transmission system to serve the growing load pocket in the area. Equally important is the construction of a new 345kV transmission path from Potter County to Tolk Station, to alleviate flow-through across the Amarillo Metro HV[2] network and the North-South interface. This will provide an EHV transmission path from the Texas Panhandle during the outage of tie-lines south of the North-South interface. There is also a need for the addition of a second Potter 345/230kV transformer, due to high power-flows from the Texas Panhandle.

2 High Voltage (<300kV)

Table of Contents

Introduction

The objective of this study is to assess impacts to the transmission system of Southwestern Public Service Company (SPS), for both system-intact and during contingency events consistent with the NERC TPL-001-4 reliability standard. The study is required to determine if the repowering of the Harrington Station from its present fuel source, coal, to its proposed fuel source, natural gas, will cause additional impacts to the transmission system of SPS.

It is Transmission Planning's understanding that the main driver for this fuel repowering is the Clean Air Act[3], which was last amended in 1990, requires EPA to set National Ambient Air Quality Standards (40 CFR part 50) for pollutants considered harmful to public health and the environment. The Clean Air Act identifies two types of national ambient air quality standards. Primary standards provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

The study considered options for the coal fired generators at Harrington station, as a result of a mandate from the Clean Air Act calling for the reduction of SO2 emission required by the National Ambient Air Quality Requirement (NAAQS4). The scenario models developed for this study were developed with guidance from the Resource Planning group at Xcel Energy, in addition to assistance from the Reginal Reliability Planning group, which provided the market based economic generation dispatches for the different scenario models. Details specific to the different scenario models used for this study are noted in the Modeling Assumptions section of this report.

Study Methodology

The study analysis was performed using the Power Technologies, Inc. (PTI) Power System Simulator for Engineering (PSS™E) program and contains a steady-state analysis using the AC Contingency Calculation (ACCC) with a Fixed Slope Decoupled Newton-Raphson (FDNS) solution. The study was conducted ensuring that current SPS/SPP/NERC criteria are fulfilled for voltage and thermal performance of the transmission system elements. As applicable, the criteria used for system intact conditions mandates that bus voltages must be maintained between 0.95 - 1.05 per-unit of their nominal voltage value and thermal system-intact conditions must not exceed their designated normal rating, or A-rating. During transmission system contingencies, bus voltages on the SPS transmission system are allowed to deviate between 0.90 - 1.05 per-

3 https://www.epa.gov/clean-air-act-overview
4 https://www.epa.gov/criteria-air-pollutants/naaqs-table

unit of their nominal voltage values and thermal loading on transmission system equipment cannot exceed 100% of the emergency B-rating.

Additionally as part of this study, the events specific to Table 1 of the NERC TPL-001-4 reliability standard are evaluated, and impacts associated with this standard are discussed and called-out in this report. Impacts specific to the fuel repowering of the generators are also discussed, along with concerns from Transmission Planning.

Modeling Assumptions

The models used for this analysis were derived from the SPP 2019 ITPNT[5] Lubbock Power and Light (LPL) sensitivity models, where a portion of the LPL load is no longer in SPP. The transmission projects initially not added by SPP in the development of these ITP models were also added to these models. The transmission projects added were the Eddy – Kiowa 345kV line and China Draw – Phantom – Roadrunner 345kV lines, along with the 350 MW in southeast New Mexico. The significant differences considered as impacting to the various scenario models, is the generation dispatch specific to the season. The generator dispatch in each of the seasonal models comes from an economic dispatch, using PROMOD[6]. The PROMOD dispatch applied to each of the scenarios was provided by the Regional Planning Analytics group. The seasonal models created are the 2024 Light Load, 2024 Summer Peak and a 2024/25 Winter Peak.

The modeling assumptions for the Harrington generators in this study include fuel-repowering, generator conversion to synchronous condensers, and the addition of new gas fired generation to the SPS transmission system. The differences in the scenarios considered as part of this study are discussed below.

1. Retirement of all Harrington generation, without replacement of the MW capacity.
2. Harrington generators at the present location are repowered from coal to direct firing of the boiler with natural gas.
3. Repowering of two Harrington units to natural gas and replacing MW capacity at the Gaines Plant location in Andrews County, Texas.
4. Conversion of all three existing Harrington generators to synchronous condensers.
5. Retirement of all three Harrington Station generators by converting them to synchronous condensers and adding MW capacity at the Gaines Plant in Andrews County, Texas.

Contingency Events

Power Flow contingency events considered as important for this study were chosen from Table 1 of the NERC reliability standard TPL-001-4. These events were selected for this study due the compliance obligations SPS

5 Integrated Transmission Plan, Near Term
6 ABB software

must meet for this reliability standard, and include a wide range of events from simple single-element type events, to those having a lower probability of occurring yet a much higher impact to the transmission system.

The events chosen include NERC TPL-001-4 Category P1 events consisting of single element outages. These events although only evaluate the outage of a single element, do not allow for the curtailment of non-sequential load for events taking place on the EHV and HV transmission elements. Category P2 events result in bus faults utilizing normal bus-differential clearing times to isolate the fault. Category P3 events are faults where the initial event is the outage of a generator, followed by an additional generator outage, or the outage of some other transmission system element. These other elements could include transformers, shunt devices, bus sections or transmission lines, including tie-lines to entities outside of the SPS legacy BA[7]. These events, similar to Category P1 events, do not allow for the curtailment of non-sequential load for events taking place on both the EHV and HV transmission system. The mechanical failures of breakers resulting in the inability of the breaker to isolate faults are evaluated under Category P4 events. These events are impactful since not all breakers on the SPS transmission system have breaker failure relaying, which can trigger a much larger system outage as a result of the time it takes for the remaining relays, local to the event, to recognize and isolate the fault. The Category P5 events analyze the failure of primary relaying on those transmission elements that do not have secondary or redundancy in the relaying. In the absence of secondary relaying fault isolation is left to the remaining uncoordinated relays, which at times cannot isolate the fault quickly enough, triggering a much larger than expected outage, and in some instances these faults are not isolated with the remaining relaying. Category P6 events, similar to the P3 events, are meant to consider the impact of outages on the transmission system due to the outage of two transmission elements, with the first event allowing for system adjustments prior to the second event. These Category P6 events were studied as an N-2 event (double contingency), disavowing system adjustments that are permitted for the first event and concentrating on a Corrective Action Plan (CAP) for the final state of the system following the outage of both elements. Finally Category P7 events consider the effects to the transmission system during the outage of two adjacent transmission circuits built on common transmission structures. Extreme events from the NERC Table 1 resulting in the loss of gas supply to some of the power plants were considered in this study.

Among the contingencies above, it should be noted that violations triggered by Category P1 events do not allow for the curtailment of load following the event. Violations from Category P3 events share the same fate and solutions to violations identified by both of these types of events require a CAP to mitigate the violations. As for the other type of event Categories, curtailment of load may be allowed; however for violations occurring on the EHV system these are not allowed and require a CAP.

7 Balancing Authority

NERC Category P1 Event Results

The 2024 Light Load scenario 1 model has all the Harrington units retired; this resulted in high imports (1750MW, 299MVar) on SPS tie lines to meet the generation deficiency. Consequently the critical contingency for Light Load scenario 1 steady state analysis is the loss of Tuco to OKU 345kV Tie line (with import of 400MW, 87Mvar), which resulted in non-convergence due to localized voltage collapse in the SPS area. 2024 Light Load scenario 2 and 3 which modeled the Harrington generation converted from coal to natural gas did not dispatch the Harrington units due to the economic generation dispatch used in these models (based on economics of fuel used for the generation), which resulted in the similar issues in scenario 2 and 3 as that of scenario 1 model for category P1 events. Whereas in 2024 Light Load scenario 4 model with all the Harrington units converted to synchronous condensers generated a combined reactive capability of at least 389 MVars providing voltage support to the SPS system resulted in mitigating the issues caused in 2024 Light Load scenario 1, 2 and 3 for the loss of Tuco to OKU 345kV Tie line.

Potter 345/230 transformer was found to be overloaded in all 2024 Light Load Scenario 1, 2, 3, 4 and 5 models due to high import on the SPS tie lines and can be mitigated by adding second Potter 345/230 transformer. Also in 2024 Light Load scenario 1, 2, 3, and 4 models thermal violation at Bushland – Deafsmith 230kV (K11) and Deafsmith –PlantX 230kV (K21) lines were observed due to the north to south flow to meet the load demand in the southern part of SPS system, which can be mitigated by upgrading transmission line terminals on K11 and K21 circuits or adding generation in southern part of SPS system (scenario 5).

2024 Winter Peak scenario 1, 2, 3, 4 and 5 models observed thermal violation at Potter 345/230 transformer and Spearman to Hansford 115kV (T87) line due to high import on the SPS tie lines and can be mitigated by adding second Potter 345/230 transformer and/or upgrading transmission terminal on T87 line.

It is also observed that by the addition of Potter to Pleasant Hill 345kV line or Potter to Tolk 345kV line to the system mitigates all the above mentioned P1 violations in 2024 Light Load and 2024 Winter Peak scenario models.

2024 Summer Peak scenario 1, 2 and 4 observed thermal violation at Allen to Lubbock South 115kV for the loss of Lubbock S to Wolfforth 230kV line. The violation is not related to Harrington generation retirement since turning on all the Harrington generation to full capacity, did not fix this thermal violation. This violation was mitigated in scenario 3 and scenario 5 models with the addition of Gaines generation of about 186MW and 700MW respectively.

The scenario 5 model has the addition of Gaines combined cycle generation (~700MW) to the system without modelling the transmission upgrades required for the generation interconnection. This resulted in thermal and voltage violation near generation interconnection location at Gaines, Hobbs and Andrews which are not related to Harrington generation retirement but due to the lack of transmission upgrades at generation interconnection.

Transient Stability P1 results:

The 2024 Light Load scenario 1 model has all the Harrington units retired; this resulted in high imports on SPS tie lines to meet the generation deficiency. Consequently the critical contingencies for the Light Load scenario 1 transient stability analysis are the loss of Tuco to OKU 345kV or Tuco to Border 345kV Tie lines resulting in system instability generation at Hobbs, Tolk and Mustang losing synchronism and trip. 2024 Light Load scenario 2 and 3 which modeled the Harrington generation converted from coal to natural gas did not dispatch the Harrington units due to the economic generation dispatch used in these models (based on economics of fuel used for the generation), which resulted in the similar issues in scenario 2 and 3 as that of scenario 1 model for category P1 events.

In 2024 Light Load scenario 4 model with the conversion of all Harrington units to synchronous condensers and in 2024 Light Load scenario 5 model with the conversion of all Harrington units to synchronous condensers and addition of Gains generation (700MW) provided voltage and inertia support to the SPS system resulted in mitigating the issues caused in 2024 Light Load scenario 1, 2 and 3 for the loss of the Tie lines.

It is also observed that by the addition of Potter to Pleasant Hill 345kV line or Potter to Tolk 345kV line to the system mitigates the P1 transient stability issues in 2024 Light Load scenario 1, 2 and 3 models.

Based on the steady state and transient stability results retiring or converting (scenario 1,2,3) all Harrington units to gas powered generation would result in steady state and transient stability issues in Light Load off peak season, since the gas units are not dispatched due to the economics of running the units in Light load. The ideal scenario would be to convert 1 or 2 Harrington units to gas powered generation and the remaining unit/s to synchronous condensers. Also, due to the huge load growth in South East New Mexico adding generation in South East New Mexico (preferably south of the SPS area) would help the SPS system. It is also observed that by the addition of Potter to Pleasant Hill 345kV line or Potter to Tolk 345kV line to the system mitigates P1 violations in 2024 Light Load and 2024 Winter Peak scenario models.

NERC Category P2 Event Results

NERC TPL-001-4 Category P2 events that were assessed consisted of a single line-to-ground bus fault occurring on BES[8] substations having a straight bus or main and transfer bus design. A single line-to-ground bus fault at these substations results in the loss of the entire substation which could cause voltage violations and thermal overloads at other locations of the transmission system. There were 105 Category P2 events evaluated across five specific Harrington scenario models for both steady state and stability implications.

For the steady state analysis, with the exception of the Lubbock South 230 kV straight bus outage in the 2024 Summer Peak scenarios, all steady state violations were none persistent, meaning the violations did not occur across all of the scenarios and seasons. The greatest impact to the transmission system occurs in the scenario 1 model when all three Harrington units are retired. For these scenarios the transmission system experiences a deficiency in VAR[9] support and a greater occurrence of low bus voltages along with thermal overloads. The converse is also evident in scenarios 4 and 5, with Harrington going to synchronous condensers in scenario 4 and with the addition of new generation in southeast New Mexico in scenario 5. For these two scenarios, steady state violations occurred less frequently in comparison to the scenario 1 model.

Additionally, thermal violations are evident on the Lubbock South to Lubbock East 115kV line (V34) as a result of a bus fault outage of the Lubbock South 230 kV straight bus in the 2024 Summer Peak. This "persistence" implies that the dispatch during this season of the scenarios would cause a violation whether the Harrington generators were in-service or not. The violation can be mitigated by opening the 115kV line V34 from Lubbock South to Lubbock East.

For the Category P2 a stability analysis was conducted for all the aforementioned scenarios. The analysis determined that there were no unstable results indicating violations and no low bus voltage concerns that required a CAP.

The retirement of the Harrington units reduced the voltage and VAR support across the system. The addition of the synchronous condensers in scenarios 4 and 5 and the addition of generation in scenario 5 helped or eliminated many of the violations seen in scenarios 1, 2, and 3.

NERC Category P3 Event Results

8 Bulk Electric System
9 Volt-Ampere Reactive (Reactive Power)

NERC TPL 001-4 Category P3 events (multiple contingency) consist of the initial condition of the loss of a generating unit (G-1), followed by system adjustments, which is then followed by the loss of one of the following; Generator (P31), Transmission Circuit (P32), Transformer (P33), or Shunt Device (P34).

The Harrington study models were developed in accordance with the study scope. The generation dispatches for the three load levels (2024 Summer Peak, 2024 Winter Peak, and 2024 Light Load) and five Scenarios studied were provided by the Regional Planning Analytics Group and consisted of economic dispatches determined by the PROMOD IV IV production cost model. As per the study scope, the transmission circuits utilized for P32 events consisted of all SPS 230kV and 345kV circuits including Tie-Lines, and all the 115kV circuits and Tie-Lines in the Amarillo zone part of SPS transmission system, where Harrington is located.

Steady State P3 results:

This analysis showed that the Category P3 contingencies placed a great strain on the SPS transmission system in this study. There were several issues and concerns contributing to this: The first was the initial state of the transmission system having the Harrington units off-line, this alone removes over 480 MVAr's of Reactive Support from the SPS system. The second issue was the economic dispatches of the SPP RTO determined by the PROMOD IV IV model. These economic dispatches, particularly for 2024 Winter Peak Scenario cases and 2024 Light Load Scenario cases, seem to be importing more power into the SPS transmission system from the rest of the SPP RTO than has actually occurred in recent years. The 2024 Winter Peak Scenario loads were 5,350 MW. The PROMOD IV IV model determined economic dispatch had only 1,984 MW of non-wind/fossil fuel SPS generation on-line to serve this load. The 2024 Light Load Scenario loads were 3,796 MW. The PROMOD IV IV model determined economic dispatch only had 604 MW of non-wind/fossil fuel SPS generation on-line.

An additional concern is retirement of the three Harrington units could exacerbate the impact of a P3 contingency events by tripping up to two more generators, for a total of five SPS generators out-of-service. This can instantaneously cause the system to have to import a great deal of power, due to the loss of two additional generators or the loss of a Tie-Line in combination with a generator.

In addition P3 events also reduce the amount of reactive support on the system from tripping of generator(s), and from the loss of Tie-Lines that are providing reactive support. And in this study the amount of available Reactive Support for the transmission system is already diminished due to the Harrington units being off-line (They provide up to 400 MVAr's of support.). Due to this there were a great many times the load flow case was not able to converge and find a solution after a P3 contingency event occurred.. This is referred to as a case being non-convergent, diverging, and also as a case

"Blowing up". This can be indicative of system or voltage collapse due to lack of adequate reactive support, as well as dynamic/transient instability. This occurred two hundred fifty-eight (258) times in this study. This was consistent with number of P6 contingency events that had non-convergent solutions.

2024 Summer Peak

The five Summer Peak Scenarios fared the best of the load levels studied in regards to cases converging after applying P3 contingencies. In the five 2024 Summer Peak Scenarios studied, only seven P3 contingencies resulted in non-convergent solutions. These were the loss of one Tolk unit followed by the loss of the other Tolk unit in Scenario 1, which can be easily resolved with the addition of a new Tolk–Potter 345kV line that also resolves a number of other issues, or by adding a 400 MVAr SVC at the Tuco 345kV substation. There were also five instances of non-convergence in Scenario 5 resulting from the outage of the Gaines Plant out-feed transmission line. This is easily resolved by adding another line from the combined cycle plant to a different part of the transmission system, perhaps to the Taylor or Legacy 115kV substations.

The most overloaded line in the five Summer Peak Scenarios was the Wheeler–Sweetwater 230kV Tie-Line for loss of a Tolk unit in combination with loss of the Potter 345/230kV transformer. This can also be mitigated by adding a new Tolk–Potter 345kV line or by installing a second 345/230kV transformer at the Potter substation. The addition of a second auto at Potter County can cause thermal overloads in the HV system as more renewables are added to the northern portion of the Panhandle of Texas, as power tries to flow into lower voltage networks. The second most overloaded line in the Summer Peak Scenarios was the Hansford–Spearman 115kV line also for the loss of a Tolk unit in combination with loss of the Potter 345/230kV transformer. Both of these overloads can be mitigated by adding a new Tolk–Potter 345kV line or by installing a second 345/230kV transformer at Potter.

2024 Winter Peak

The five 2024 Winter Peak Scenarios had eighty-seven non-convergent results caused by P3 contingencies. Just over half of these were due to the loss of the Tuco–OKU 345 kV Tie-Line in combination with the loss of an SPS generator. These can be resolved by adding a new Tolk–Potter 345 kV line or by adding a 500 MVAr SVC at the Tuco 345 kV substation. The remaining non-convergent results can also be resolved with the addition of a new Tolk–Potter 345 kV line or by installing a 500 MVAr SVC at Tuco 345 kV substation.

The most overloaded element in the Winter Peak Scenarios was the Potter 345/230kV transformer for the loss Hobbs unit 3 and one of the Hitchland 230/115kV transformers. The second most overloaded

element is the Hansford-Spearman 115kV line for the loss of the Potter 345/230kV transformer in combination with Hobbs unit 3. Both overloads occur because they are primary import paths into the SPS transmission system from the north Texas Panhandle. These overloads can be resolved by adding a new Tolk–Potter 345kV line or by installing a second 345/230kV transformer at Potter. A benefit of a new Tolk–Potter 345k line that may be overlooked is that it provides an additional import path into the SPS transmission system.

2024 Light Load

Not surprisingly, the five Light Load Scenarios had the highest number of convergence issues of the three load levels. This is primarily because of the economic dispatch used in these Scenarios, where the only non-wind units dispatched within the SPS transmission system is the Hobbs combined cycle plant, the Mustang units and the Blackhawk units. No other SPS fossil unit was on-line in any of the five Light Load Scenarios, except for the Tolk and Harrington units as synchronous condensers. Accordingly SPS's rotational inertia and available reactive support were diminished in the Light Load Scenarios, lessening the SPS transmission system's capability to withstand disturbances, which directly contributed to the Light Load Scenarios having one hundred and sixty-four (164) P3 contingency events "Blow up" or be non-convergent. Though it should be noted this is only one specific economic dispatch. There are a number of variables that can easily cause more SPS NG units to be on-line during off-peak light load periods.

Similar to the Winter Peak Scenario results, just over half the one hundred sixty-four (164) P3 contingencies that "Blew up" or were non-convergent were due to the loss of the 345kV Tie–Lines into Tuco substation. Loss of either the Tuco–Border 345kV (**SPS–OGE**) or the Tuco–OKU 345kV (**SPS–AEP**) Tie-Lines tripped in combination with an SPS generator caused ninety two (92) non-convergent solutions. Consistent with the Winter Peak Scenario results these can be resolved by adding a new Tolk–Potter 345kV line, or by adding a 500 MVAr SVC at the Tuco 345kV substation.

The Light Load Scenarios 1, 2, 3, and 4 had two additional significant contingencies. These were the loss of the Crossroads–Eddy County 345kV line or the Crossroads–Tolk 345kV line in combination with loss of a Hobbs, Mustang or Tolk unit. These can be resolved by installing a 200 MVAr SVC at the Eddy County 345kV substation.

The most overloaded line in the Light Load Scenarios was the Bushland–Deaf Smith 230kV Line for loss of the Potter–Newhart 230kV line in combination with loss of the Sagamore Wind Farm. This can be mitigated by bringing one or more of the Mustang GT's on-line. The second most overloaded element in the Light Load Scenarios was the Potter 345/230kV transformer.

Overall the retirement of the Harrington plant and units had no adverse impacts on the local SPS transmission system in and around Amarillo where Harrington is located, with the exception of the Potter 345/230 kV transformer.

NERC Category P4 Event Results

Steady state results for the Light Load scenarios 1, 2, 3 and 4 models show Category P4 contingencies violations for outages on the major SPS 345kV tie lines like the Tuco-Border 345kV line and the Tuco-Oklaunion 345kV line. This was due to scenarios 1, 2, 3 and 4 not dispatching generation at Harrington station and importing power across the tie-lines. Even in scenario 4, when Harrington units are operated as synchronous condenser these violations are still present. When Harrington units are operated as synchronous condensers (scenario 5) and with the addition of new generation at Gaines County Plant located in southeast New Mexico generating real power (MW), these contingencies do not produce violations in comparison to the other scenarios.

The Summer Peak scenario 1, 2, 3 and 4 have similar violations across all these scenarios. Scenario 5 had significantly more P4 violations than the other Summer Peak scenario because when the Harrington units were operated as synchronous condenser and new generation is added at the Gaines County Plant, the outage of the 230kV Hobbs Substation to the Gaines County Plant tap causes non-convergence issues. The non-convergence was caused by not enough transmission upgrades to support the generation added in S.E New Mexico.

The Winter Peak scenario 1, 2, 3 and 4 have similar violations across scenarios 1, 2, 3 and 4. As for scenario 5 models, it appear to have similar issues as observed in summer scenario 5. It needs to be noted that even though Harrington was converted to Gas, owing to the economic dispatch, no units at Harrington were running in scenario 2 and 3 Winter Peak models. With respect to generation dispatch, scenario(s) 1, 2 and 3 had zero MW dispatch at Harrington station. When the Harrington units are operated as synchronous condenser and a new generation unit added at Gaines Co (scenario 5), the outage of the 230kV Hobbs-Gaines Co line causes violations.

The combined cycle plant was added in S.E. New Mexico in scenario 5 without any associated transmission upgrades. This caused scenario 5 cases to have convergence issues (for the Summer Peak and Winter Peak models) for the loss of elements at Andrews Co/ Hobbs Generating Station. These issues are not related to Harrington plant retirement and should be treated as localized issues mainly due to non-addition of any transmission upgrade to support the generation that were added. The mitigation is to build a 345kV line from Hobbs-Andrews-Roadrunner solves convergence issues with the outage of the 230kV Hobbs- Gaines Co line.

Based on the results observed, it can be summarized that cases where Harrington is being dispatch as a gas plant and when it operates as synchronous condenser generating MVARs and providing voltage support have less system convergence issues. It also needs to be noted that building a new 345kV line between Potter Co-Tolk or Potter-Pleasant Hill sub helps mitigate most of the overloads issues (not all the issues) due to P4 contingencies for outages on the major SPS 345kV tie lines like the Tuco-Border 345kV line and the Tuco-Oklaunion 345kV line in Light Load.

For an extreme event for the loss of all three units at Hobbs substation causes system convergence issues in the Light Load and Winter Peak models. This is cause by not having enough generation to the south of the SPS system. To mitigate this issue the addition of generation is needed in south of the SPS system.

The transient stability results did not cause any concerns to the SPS transmission system in this study.

NERC Category P5 Event Results

The power flow results for Category P5 events indicate the presence of violations as a result of these types of events. To resolved these violations, the addition of redundancy in the relaying, consistent with current company standards will be required. This may include replacing circuit breakers having single trip coils; typically old oil circuit breakers with breakers have dual trip coils in order to achieve full redundancy. The events and the violations produced among the different scenarios are most evident during periods of light load, one such violation of is the overloading of the Potter 345/230kV autotransformer. This violation is evident during system intact conditions, primarily due to the flow of power from the Hitchland-Potter 345kV line towards to the south via the high voltage network. Additional violations that produced which are also a cause for concern, are those emerging from P5 events associated with both bus and autotransformer outages at the Mustang Interchange and the Oasis Interchange. Some of these outages produce non-convergent results which could indicate local system collapse, while at Mustang these events could trigger the outage of Mustang generation. The Sunset 115kV substation bus outage is also the cause of low bus voltage conditions.

During Summer Peak loading conditions, the same events noted above during the light load conditions continue to cause concerns. However, due to the change in the generation dispatch additional events producing violations at Lamb County and South Georgia for bus and autotransformer outages cause thermal violations and low bus voltage conditions. At Deaf Smith Interchange, the 230kV circuit K11 event (Bushland-Deaf Smith) produces low bus voltages. Finally, a new violation which is the 230kV line from Hobbs to the Gaines Plant tap, going towards Andrews Interchange, overloads for outages associated with bus events at Johnson Draw, Taylor and West Hobbs.

Finally, during the Winter Peak scenarios, the same events and violations previously mentioned are evident and can be resolved with the addition of redundancy in the relaying, consistent with existing company standards.

It should be noted that these events which are triggering violations in this study have been previously identified as requiring relay upgrades as part the NERC TPL-001-4 reliability assessment. The one violation where a CAP has previously not been identified is the overload of the Potter 345/230kV autotransformer and shows up during multiple contingencies. The simple solution to this violation would be the addition of a second autotransformer at Potter County. However, a Potter-Tolk 345kV line also resolves the overload of the Potter 230/115kV autotransformer providing a 345kV path from the northern portion of the SPS transmission system during the outage of the tie-lines into Tuco Interchange resolving other NERC Category P-type TPL-001-4 violations. The 345kV line also provides a direct transmission path through the Amarillo area, minimizing the thermal impact on the underlying high voltage network through Amarillo.

NERC Category P6 Event Results

Owing to the fact that NERC TPL 001-4 Category P6 events allow for Interruption of Firm Transmission Service and load curtailment as a mitigation, only power flow analysis was performed for Category P6 events to identify the types of contingencies causing power flow case convergence issues (i.e. localized voltage collapse).

The Light Load (high wind – low load) scenario 1, 2 and 3 scenarios had many convergence issues for the loss of combination(s) of SPS' major 345kV tie lines like Tuco-Border 345kV line, Tuco-Oklaunion 345kV line, etc. This was due to the fact that these two lines were importing a total of approximately 20-25% of entire SPS load prior to any outages. When the Harrington unit(s) are operated as synchronous condensers (scenario 4 and 5) or operated as a gas fired plant generating real power (MW), the same contingencies didn't seem to cause as many convergence issues. It should be noted that even though Harrington was converted to a gas fired plant, owing to the economic dispatch, no units at Harrington were dispatched as part of scenarios 2 and 3 for the Light Load models. With respect to generation dispatch, scenario(s) 1, 2 and 3 had zero MW at the Harrington station and the issues noticed in all of these models were very similar to one another.

Amongst the different Summer Peak scenario models, the Category P6 events did not exhibit significant differences, where the same contingencies caused similar violations. Since there were a considerable amount of new loads added to southeast New Mexico footprint, the scenario 5 model having a new

combustion turbine and combined cycle plant, appears to be the scenario producing the most favorable results, independent of what happens to Harrington.

The Winter Peak scenario models generally appear to have similar issues as those observed during the Light Load scenario models.. Additionally, as with the Light Load models, when the Harrington unit(s) were operated as synchronous condenser (scenario 4 and 5) or operated as gas fired plant generating real power (MW), these same contingencies didn't seem to cause as many convergence issues.

Based on the results observed, it can be summarized that repowering the Harrington units to natural gas or operating them as synchronous condensers for voltage support lessens system convergence issues. Additionally, building a new 345kV line from Potter County to Tolk Station helps mitigate most of the system convergence issues (not all the issues) due to the combination of major SPS 345kV tie-lines outages in Light Load and Winter Peak scenario models and in scenario 5 models converting the Hobbs to Gaines Plant to Andrews 230kV line to 345kV operation, followed by the addition of new 345kV line from Andrews to Road Runner helps mitigate most of the system convergence issues.

NERC Category P7 Event Results

NERC TPL-001-4 Category P7 events that were assessed consisted of every two adjacent BES circuits on a common structure in the SPS system greater than 1 mile. A total of 67 events were evaluated for both steady-state and stability concerns. The evaluation of the steady-state results showed 5 violations while the stability results showed 0 violations. Steady-state violations were due to line overload issues.

The Light Load (high wind – low load) scenario 1, 2, 3 and 4 models had a line overload issue for 115kV line V04 Manhattan to Randall for the contingency of double circuit lines K19 Harrington to Randall County and K62 Nichols to Amarillo South. This overload issue may be resolved with LIDAR analysis for line V04 Manhattan to Randall County. Only scenario 1 had one line overload issue for line K21 Deaf Smith to Plant X for the contingency of double circuit lines K90 Potter County to Newhart and K91 Newhart to Plant X. This overload issue may be resolved by upgrading the wavetrap at Plant X. The scenario 5 model showed to be the best scenario since it had no issues.

The Summer Peak scenario 1, 2, 3, 4 and 5 models had a line overload issue for line V34 Lubbock East to Lubbock South for the contingency of double circuit lines K08 Lubbock South to Jones and K14 Lubbock South to Jones. This violation and contingency pair was also apparent in the 2024 Winter Peak case. Only scenario 1, 3 and 4 models had a line overload issue for the same line V34 Lubbock East to Lubbock South for a different contingency of double circuit lines K07 Tuco to Jones and K15 Lubbock East to Jones. Both line overload issues for line V34 Lubbock East to Lubbock South may be resolved by upgrading the limiting CTs at both Lubbock East and Lubbock South terminals. Only scenario 1 and 4

models had a line overload issue for line K10 Lubbock South to Wolfforth for the contingency of double circuit lines K07 Tuco Int. to Jones and K15 Lubbock East to Jones. The line overload issue for line K10 also appeared in scenario 1 and 4 models for the contingency of double circuit lines K07 Tuco Int. to Jones and T69 Lubbock East to Crosby. This issue may be resolved by analyzing LIDAR for line K10 Lubbock South to Wolfforth. Only scenario 3 had a line overload issue for line T01 Texas County to McMurry for the contingency of double circuit lines K76 Hitchland to Ochiltree and W10 Hitchland to Hansford. This issue may be resolved by upgrading CTs at the Texas County terminal.

The Winter Peak models showed similar issues found in the Summer Peak models. Scenarios 2 and 3 had the same line overload issue for line V34 Lubbock East to Lubbock South for the same contingency of double circuit lines K08 Lubbock South to Jones and K14 Lubbock South to Jones. This issue may be resolved by upgrading the limiting CTs at both Lubbock East and Lubbock South terminals. This violation and contingency pair was also apparent in the 2024 Summer Peak case. Scenarios 1, 4 and 5 had no violations.

Major P7 concerns from this study involved line overload issues. Resolutions for the line overload issues included fixing LIDAR issues and upgrading limiting elements such as terminals and wavetraps which exceeded either its facility or line ratings. LIDAR issues involved lines V04 Manhattan to Randall Co. and K10 Lubbock South to Wolfforth. CT upgrades involved Lubbock East and Lubbock South terminals for line V34 Lubbock East and Lubbock South and the Texas County terminal for line T01 Texas County to McMurry. Wavetrap upgrades involved Plant X for line K21 Deaf Smith to Plant X. The resolutions described above will mitigate line overload concerns for the Harrington Station area.

Transmission Planning Observations/Concerns

This section of the report highlights observations or concerns that Transmission Planning believes are a critical part of the Harrington repowering. One observation is related to the PROMOD dispatch specifically how the Harrington station was dispatched when converted to natural gas. During the Light Load and Winter Peak scenarios, the Harrington generation was not shown as dispatched in these two seasons and could present concerns during the outage of tie lines, other generation or a combination of both. This could results in system collapse due to import limitations. This leads to the concern that the conversion of Harrington to natural gas could result in units that may not be dispatched during off peak seasons in an economic based dispatch.

Another observation worth mentioning is the addition of new generation within the SPS transmission system. The Gaines Plant in Andrews County, Texas was previously sited as a location for the addition of non-renewable resources to the SPS system. Although this location is in close proximity to the developing oil and

natural gas resources, Planning believes that the addition of new generation south of the New Mexico-Texas state line, south of China Draw and Roadrunner is a better location for the addition of a natural gas fired generator. The reason being that generation south of China Draw will provide counter-flow from the southern part of the SPS system alleviating transmission line loading from power flowing in from the north into the SE NM region. This generation can also provide a southern source, which today we do not have one. This southern source also serves as a good contingent plan when the Hobbs generation experiences a forced outage, preventing the curtailment of the developing oil and gas load pocket. Finally, with the development of oil and gas industry south of the New Mexico-Texas state line, in close proximity to this location, this SPS generation location has the potential to grow and serve as a good location for grid switchers between the SPP and the Electric Reliability Council of Texas (ERCOT) systems. Allowing for service to ERCOT load during periods when all the generation at this location is not needed in SPP and providing power to the ERCOT grid along its western boundary.

Planning also has a concern with the PROMOD dispatch, specifically the addition of new generating resources without the needed transmission system facilities that would have been identified as part of the SPP Generation Interconnection (GI) process. Some of these generators, to name a few, which were added to the models, include the Gaines Plant in Andrews County, Texas, the Sagamore Wind Farm and new generators at Plant X. Absent the transmission upgrades needed for both these facilities, contingencies simulated which triggered non-convergent results, may have been non-issues if these GI upgrades where added to the models.

Finally, the cost to operate the Harrington units as natural gas fire generators at a low MW output to produce VARs rather than MW should perhaps be compared to the cost of operating the generators as a synchronous condenser. If the cost comparison permits operating the Harrington units for VAR support, rather than as generators, perhaps the conversion of the generators to natural gas fire units is a better approach than simply converting them to

Conclusions

The result of this study concludes that with the retirement of the MW capacity of the Harrington units, this will cause an increase of power imports into the SPS system during periods when wind resources are generating at a low output. It also shows that transient stability issues could develop if these units are retired without replacing these units with some other type of transmission system improvements to assist during transient stability excursions. The retirement of the Harrington generation will reduce the dynamic

performance of the SPS transmission system since these units contribute up to approximately 400 MVARs of dynamic reactive support, have high inertia values, and provides local MWs that does not have to flow across tie-lines for serving local load. The conversion of the Harrington generators to synchronous condensers reduces the inertia by 72%, retaining only 28% of the inertia that is present today at Harrington.

During periods of high-wind and low-load, wind resources in Texas Panhandle have a much higher probability of being dispatched, as part of an economic dispatch, causing high power flows through the Amarillo Metro area impacting the North-South interface. Since power from the north has to flow across the high-voltage network in the Amarillo Metro area, there is a need for a 345kV transmission path to bypass the Amarillo Metro and to alleviate flow-through across the North-South interface. Additionally, the need for this 345kV transmission path through the Amarillo metro area becomes more critical, especially during the forced outage of generation coupled with tie-line outages at Tuco Interchange, classified as a P3 type of event. The outage of SPS generation, without Harrington in the network, coupled with outages of 345kV transmission at Tuco Interchange, produces additional power flow from the Texas Panhandle across the North-South Interface triggering system collapse. NERC does not allow for the curtailment of load during this type of event and the TPL-001-4 reliability standard requires a CAP for violations triggered by these events.

The same can be said about Category P6 type events resulting in the outage of multiple tie-lines, specifically when one tie-line is out for maintenance and another is forced out of service. These types of EHV events, although allowing for the curtailment of load could result in NERC fines if cascading outages are evident and not addressed.

In conclusion, if the Harrington generation is converted to natural gas but it is not dispatched, it is the same as retiring the generation. It should also be noted that a "best attempt" was made in trying to assess what happens if the Harrington generators are retired or converted to synchronous condensers. This is mainly due to the introduction of new generators on the SPS transmission system by the PROMOD dispatch, with no transmission system upgrades that would have been identified once the Generation Interconnection studies for these new generators are completed. Some of the many renewable energy plants and a combined cycle plant were added to these models without any transmission upgrade included the Sagamore Wind Farm, the Gaines Plant connecting to Andrews County, and generation at Plant X was also added. The addition of the Sagamore wind farm (522MW) at Crossroads substation caused multiple combination(s) of outages of Eddy-Crossroads 345kV line with other 230/345kV elements in that region to cause system convergence issues.

These issues were predominantly noticed in the Light Load scenarios 1, 2, 3 and 4. A combined cycle plant was also added in Andrews County Texas, for scenario 5, without any associated transmission upgrades. This caused scenario 5 contingency events to produce non-convergence results for the outage of the generator outlet facilities connecting to the Hobbs Generating Station to Andrews County 230kV transmission line, resulting in the islanding of the combine cycle plant. These issues are not related to Harrington plant retirement and should be treated as localized issues mainly due missing transmission upgrades required to support this generation.

Recommendations

As a result of the wide range of NERC TPL-001-4 disturbances assessed as part of the study, this study recommends the conversion of the Harrington units to synchronous condensers, in lieu of retiring the units. In addition, the MW capacity from the Harrington generation should be replaced and relocated to the south west part of the SPS transmission system to serve the growing load pocket in the area. Equally important is the construction of a new 345kV transmission path from Potter County to Tolk Station, to alleviate flow-through across the Amarillo Metro HV network and the North-South interface. This will provide an EHV transmission path from the Texas Panhandle during the outage of tie-lines south of the North-South interface. There is also a need for the addition of a second Potter 345/230kV transformer, due to high power-flows from the Texas Panhandle.

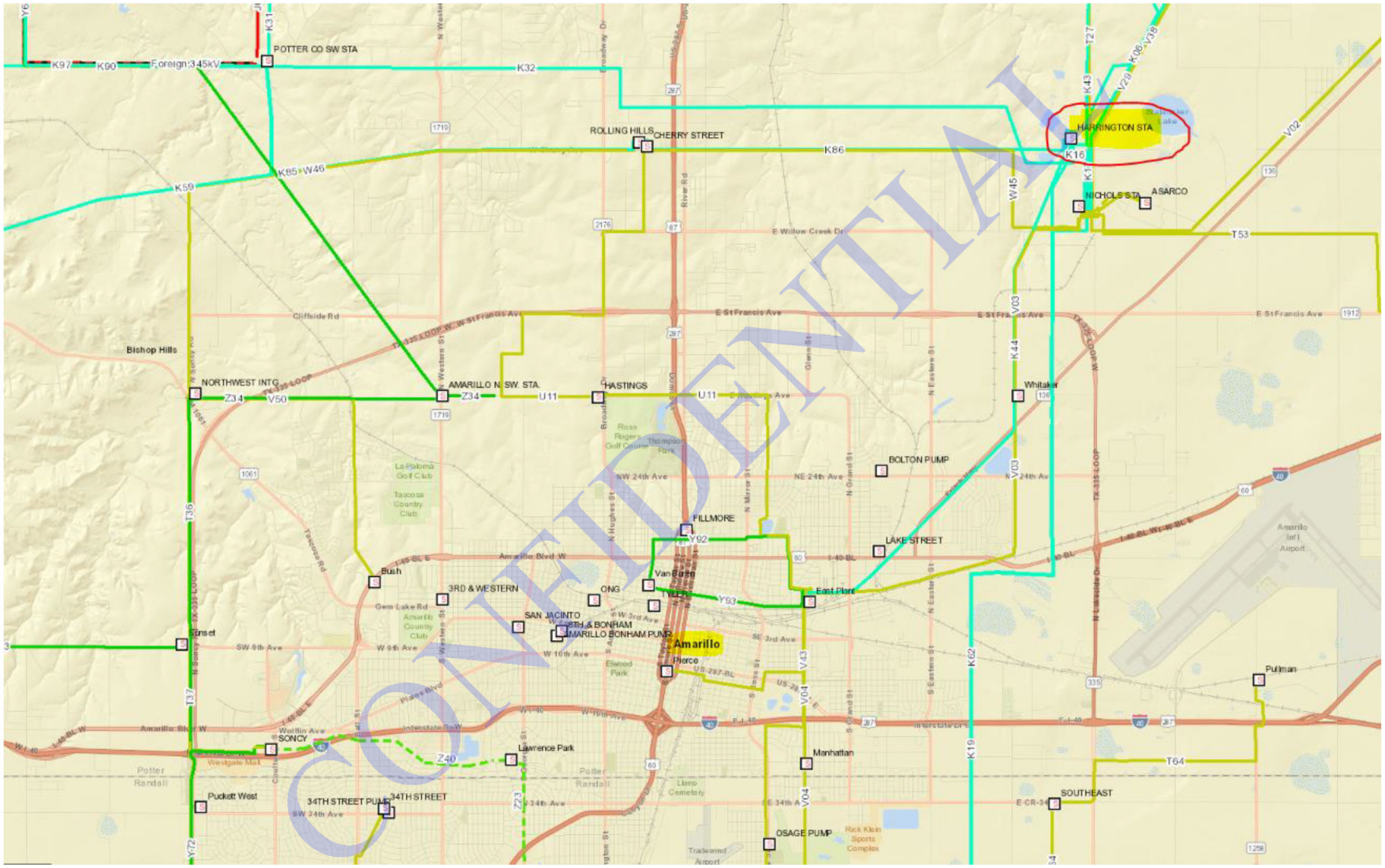


Figure 1, Local Transmission System to Harrington Station

[this page intentionally left blank]

[this page intentionally left blank]