

Exhibit No. JJS-1T  
Docket UE-180778  
Witness: John J. Spanos

**BEFORE THE WASHINGTON  
UTILITIES AND TRANSPORTATION COMMISSION**

In the Matter of the Petition of

PACIFIC POWER & LIGHT COMPANY

For an Order Approving a Change in  
Depreciation Rates Applicable to Electric  
Property.

Docket UE-180778

**PACIFIC POWER & LIGHT COMPANY  
DIRECT TESTIMONY OF JOHN J. SPANOS**

**September 2018**

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**ATTACHED EXHIBITS**

Exhibit No. JJS-2—Qualifications of John J. Spanos

Exhibit No. JJS-3—Depreciation Study

Exhibit No. JJS-4—California and Washington Steam Production Plant

1 **Q. Please state your name and address.**

2 A. My name is John J. Spanos. My business address is 207 Senate Avenue, Camp Hill,  
3 Pennsylvania 17011.

4 **Q. Are you associated with any firm?**

5 A. Yes. I am associated with the firm of Gannett Fleming Valuation and Rate  
6 Consultants, LLC (Gannett Fleming).

7 **Q. How long have you been associated with Gannett Fleming?**

8 A. I have been associated with the firm since college graduation in June 1986.

9 **Q. What is your position with the firm?**

10 A. I am a Senior Vice President.

11 **Q. On whose behalf are you testifying in this case?**

12 A. I am testifying on behalf of Pacific Power & Light Company (Pacific Power), a  
13 division of PacifiCorp.

14 **QUALIFICATIONS**

15 **Q. Please state your qualifications.**

16 A. Please refer to Exhibit No. JJS-2 for my qualifications.

17 **PURPOSE OF TESTIMONY**

18 **Q. What is the purpose of your testimony?**

19 A. I sponsor the depreciation study performed for PacifiCorp attached as Exhibit No.  
20 JJS-3 (Depreciation Study). The Depreciation Study sets forth the calculated annual  
21 depreciation accrual rates by account as of December 31, 2017. Based on the  
22 Depreciation Study, I recommend depreciation rates using the projected  
23 December 31, 2020 plant and reserve balances for approval. The proposed rates

1 appropriately reflect the rates at which PacifiCorp's assets should be depreciated over  
2 their useful lives and are based on the most commonly used methods and procedures  
3 for determining depreciation rates.

4 **Q. Can you summarize the results of your Depreciation Study?**

5 A. Yes. The depreciation rates as of December 31, 2017, appropriately reflect the rates  
6 at which the values of PacifiCorp's assets have been consumed over their useful lives  
7 to date. These rates are based on the most commonly used methods and procedures  
8 for determining depreciation rates. The life and salvage parameters are based on  
9 widely used techniques and the depreciation rates are based on the average service  
10 life procedure and remaining life method. Therefore, the depreciation rates set forth  
11 on pages VI-4 through VI-21 of Exhibit No. JJS-3 represent the calculated rates as of  
12 December 31, 2017.

#### 13 **DEPRECIATION STUDY**

14 **Q. Please define the concept of depreciation.**

15 A. Depreciation refers to the loss in service value not restored by current maintenance,  
16 incurred in connection with the consumption or prospective retirement of utility plant  
17 in the course of service from causes which are known to be in current operation,  
18 against which the company is not protected by insurance. Among the causes to be  
19 given consideration are wear and tear, decay, action of the elements, inadequacy,  
20 obsolescence, changes in the art, changes in demand, and the requirements of public  
21 authorities.

22 **Q. Did you prepare the Depreciation Study filed by PacifiCorp in this proceeding?**

23 A. Yes. I prepared the Depreciation Study submitted by PacifiCorp with its filing in this

1 proceeding. The Depreciation Study is entitled: Depreciation Study – Calculated  
2 Annual Depreciation Accruals Related to Electric Plant as of December 31, 2017.

3 This report sets forth the results of my Depreciation Study for PacifiCorp.

4 **Q. In preparing the Depreciation Study, did you follow generally accepted practices**  
5 **in the field of depreciation valuation?**

6 A. Yes.

7 **Q. Are the methods and procedures of this Depreciation Study consistent with past**  
8 **practices?**

9 A. The methods and procedures of this study are the same as those utilized in past  
10 studies of this company as well as others before the Washington Utilities and  
11 Transportation Commission (Commission). Depreciation rates are determined based  
12 on the average service life procedure and the remaining life method.

13 **Q. Please describe the contents of the Depreciation Study.**

14 A. The Depreciation Study is presented in nine parts: Part I, Introduction, presents the  
15 scope and basis for the Depreciation Study. Part II, Estimation of Survivor Curves,  
16 includes descriptions of the methodology of estimating survivor curves. Parts III and  
17 IV set forth the analysis for determining service life and net salvage estimates.  
18 Part V, Calculation of Annual and Accrued Depreciation, includes the concepts of  
19 depreciation and amortization using the remaining life. Part VI, Results of Study,  
20 presents a description of the results of my analysis and a summary of the depreciation  
21 calculations. Parts VII, VIII, and IX include graphs and tables that relate to the  
22 service life and net salvage analyses, and the detailed depreciation calculations by  
23 account.

1           The table on pages VI-4 through VI-21 of the Depreciation Study presents the  
2           estimated survivor curve, the net salvage percent, the original cost as of December 31,  
3           2017, the book depreciation reserve and the calculated annual depreciation accrual  
4           and rate for each account or subaccount. The section beginning on page VII-2  
5           presents the results of the retirement rate and simulated plant analyses prepared as the  
6           historical bases for the service life estimates. The section beginning on page VIII-2  
7           presents the results of the salvage analysis. The section beginning on page IX-2  
8           presents the depreciation calculations related to surviving original cost as of  
9           December 31, 2017. Finally, the section in the Appendix presents the recommended  
10          depreciation rates and parameters as of December 31, 2020.

11   **Q.    Please explain how you performed your Depreciation Study.**

12   A.    I used the straight line remaining life method of depreciation, with the average service  
13          life procedure. The annual depreciation is based on a method of depreciation  
14          accounting that seeks to distribute the unrecovered cost of fixed capital assets over  
15          the estimated remaining useful life of each unit, or group of assets, in a systematic  
16          and reasonable manner.

17   **Q.    How did you determine the recommended annual depreciation accrual rates?**

18   A.    I did this in two phases. In the first phase, I estimated the service life and net salvage  
19          characteristics for each depreciable group, that is, each plant account or subaccount  
20          identified as having similar characteristics. In the second phase, I calculated the  
21          composite remaining lives and annual depreciation accrual rates based on the service  
22          life and net salvage estimates determined in the first phase.

1 **Q. Please describe the first phase of the Depreciation Study, in which you estimated**  
2 **the service life and net salvage characteristics for each depreciable group.**

3 A. The service life and net salvage study consisted of compiling historical data from  
4 records related to PacifiCorp's plant; analyzing these data to obtain historical trends  
5 of survivor characteristics; obtaining supplementary information from management  
6 and operating personnel concerning practices and plans as they relate to plant  
7 operations; and interpreting the above data and the estimates used by other electric  
8 utilities to form judgments of average service life and net salvage characteristics.

9 **Q. What historical data did you analyze for the purpose of estimating service life**  
10 **characteristics?**

11 A. I analyzed the company's accounting entries that record plant transactions during the  
12 1937 through 2017 period, however, the earliest year of data varied by account. The  
13 transactions included additions, retirements, transfers, sales, and the related balances.

14 **Q. What method did you use to analyze this service life data?**

15 A. I used the retirement rate method for most plant accounts. This is the most  
16 appropriate method when retirement data covering a long period of time is available  
17 because this method determines the average rates of retirement actually experienced  
18 by the company during the period of time covered by the Depreciation Study.

19 **Q. Please describe how you used the retirement rate method to analyze PacifiCorp's**  
20 **service life data.**

21 A. I applied the retirement rate analysis to each different group of property in the study.  
22 For each property group, I used the retirement rate data to form a life table which,  
23 when plotted, shows an original survivor curve for that property group. Each original

1 survivor curve represents the average survivor pattern experienced by the several  
2 vintage groups during the experience band studied. The survivor patterns do not  
3 necessarily describe the life characteristics of the property group; therefore,  
4 interpretation of the original survivor curves is required in order to use them as valid  
5 considerations in estimating service life. The Iowa-type survivor curves were used to  
6 perform these interpretations.

7 **Q. Did you use any other methods to analyze service life data?**

8 A. Yes. For most distribution assets in Idaho and Utah, the company accounting records  
9 have not maintained the vintage of each transaction. Therefore, the simulated plant  
10 record method was utilized to determine life characteristics.

11 **Q. What is an “Iowa-type Survivor Curve” and how did you use such curves to  
12 estimate the service life characteristics for each property group?**

13 A. Iowa-type curves are a widely-used group of survivor curves that contain the range of  
14 survivor characteristics usually experienced by utilities and other industrial  
15 companies. The Iowa curves were developed at the Iowa State College Engineering  
16 Experiment Station through an extensive process of observing and classifying the  
17 ages at which various types of property used by utilities and other industrial  
18 companies had been retired.

19 Iowa-type curves are used to smooth and extrapolate original survivor curves  
20 determined by the retirement rate method. The Iowa curves and truncated Iowa-type  
21 curves were used in this study to describe the forecasted rates of retirement based on  
22 the observed rates of retirement and the outlook for future retirements.



1           The estimated survivor curve designations for each depreciable property  
2 group indicate the average service life, the family within the Iowa system to which  
3 the property group belongs, and the relative height of the mode. For example, the  
4 Iowa 60-R2 indicates an average service life of sixty years; a right-moded, or R-type  
5 curve (the mode occurs after average life for right-moded curves); and a relatively  
6 low height, 2, for the mode (possible modes for R-type curves range from 1 to 5).

7 **Q.   What approach did you use to estimate the lives of significant facilities**  
8 **structures such as production plants?**

9 A.   I used the life span technique to estimate the lives of significant facilities for which  
10 concurrent retirement of the entire facility is anticipated. In this technique, the  
11 survivor characteristics of such facilities are described by the use of interim survivor  
12 curves and estimated probable retirement dates.

13           The interim survivor curves describe the rate of retirement related to the  
14 replacement of elements of the facility, such as, for a building, the retirements of  
15 plumbing, heating, doors, windows, roofs, etc., that occurs during the life of the  
16 facility. The probable retirement date provides the rate of final retirement for each  
17 year of installation for the facility by truncating the interim survivor curve for each  
18 installation year at its attained age at the date of probable retirement. The use of  
19 interim survivor curves truncated at the date of probable retirement provides a  
20 consistent method for estimating the lives of the several years of installation for a  
21 particular facility inasmuch as a single concurrent retirement for all years of  
22 installation will occur when it is retired.

1 **Q. Has Gannett Fleming used this approach in other proceedings?**

2 A. Yes, we have used the life span technique in performing depreciation studies  
3 presented to and accepted by many public utility commissions across the United  
4 States and Canada. This technique is currently being utilized by PacifiCorp in the  
5 same manner recommended in this case.

6 **Q. What are the bases for the probable retirement years that you have estimated for**  
7 **each facility?**

8 A. The bases for the probable retirement years are life spans for each facility that are  
9 based on judgment, the life assessment study and incorporate consideration of the  
10 age, use, size, nature of construction, management outlook and typical life spans  
11 experienced and used by other electric utilities for similar facilities. Most of the life  
12 spans result in probable retirement years that are many years in the future. As a  
13 result, the retirements of these facilities are not yet subject to specific management  
14 plans. Such plans would be premature. At the appropriate time, detailed studies of  
15 the economics of rehabilitation and continued use or retirement of the structure will  
16 be performed and the results incorporated in the estimation of the facility's life span.

17 **Q. Have you physically observed PacifiCorp's plant and equipment during your**  
18 **past depreciation studies?**

19 A. Yes. I made field reviews of PacifiCorp's property as part of a past study in May and  
20 June 2012 to observe representative portions of plant. Field reviews are conducted to  
21 become familiar with company operations and obtain an understanding of the  
22 function of the plant and information with respect to the reasons for past retirements  
23 and the expected future causes of retirements. This knowledge as well as information

1 from other discussions with management was incorporated in the interpretation and  
2 extrapolation of the statistical analyses.

3 **Q. Please describe how you estimated net salvage percentages.**

4 A. I estimated the net salvage percentages by incorporating the historical data for the  
5 period 1992 through 2017 and considered estimates for other electric companies. The  
6 net salvage percentages are based on a combination of statistical analyses and  
7 informed judgment. The statistical analyses consider the cost of removal and gross  
8 salvage ratios to the associated retirements during the 26-year period. Trends of these  
9 data are also measured based on three-year moving averages and the most recent five-  
10 year indications.

11 **Q. Were the net salvage percentages for generation facilities based on the same  
12 analyses?**

13 A. Yes, for the interim analyses. The net salvage percentages for generation facilities  
14 were based on two components, the interim net salvage percentage and the final net  
15 salvage percentage. The interim net salvage percentage is determined based on the  
16 historical indications from the period, 1992–2017, of the cost of removal and gross  
17 salvage amounts as a percentage of the associated plant retired. The final net salvage  
18 or dismantlement component was determined based on the assets anticipated to be  
19 retired at the concurrent date of final retirement.

20 **Q. Have you included a dismantlement component into the overall recovery of  
21 generation facilities?**

22 A. Yes. A dismantlement component has been included to the net salvage percentage for  
23 steam and other production facilities. There is a separate decommissioning reserve

1 for small hydro facilities which are soon to be retired, as the dismantlement  
2 component for hydro facilities in the study is zero.

3 **Q. Can you explain how the dismantlement component is included in the**  
4 **Depreciation Study?**

5 A. Yes. The dismantlement component is part of the overall net salvage for each  
6 location within the production assets. Based on studies for other utilities and the cost  
7 estimates of PacifiCorp, it was determined that the dismantlement or  
8 decommissioning costs for steam production and other production facilities is best  
9 calculated on a \$/KW factor based on surviving plant at final retirement. These  
10 amounts at a location basis are added to the interim net salvage percentage of the  
11 assets anticipated to be retired on an interim basis to produce the weighted net salvage  
12 percentage for each location. The detailed calculation for each location is set forth on  
13 pages VIII-2 through VIII-12 of Exhibit No. JJS-3.

14 **Q. Please describe the second phase of the process that you used in the Depreciation**  
15 **Study in which you calculated composite remaining lives and annual**  
16 **depreciation accrual rates.**

17 A. After I estimated the service life and net salvage characteristics for each depreciable  
18 property group, I calculated the annual depreciation accrual rates for each group,  
19 using the straight line remaining life method, and using remaining lives weighted  
20 consistent with the average service life procedure.

21 **Q. Please describe the straight line remaining life method of depreciation.**

22 A. The straight line remaining life method of depreciation allocates the original cost of  
23 the property, less accumulated depreciation, less future net salvage, in equal amounts

1 to each year of remaining service life.

2 **Q. Please use an example to illustrate how the annual depreciation accrual rate for**  
3 **a particular group of property is presented in your Depreciation Study.**

4 A. I will use Account 353, Station Equipment, as an example because it is one of the  
5 largest depreciable mass accounts and represents approximately nine percent of  
6 depreciable plant.

7 The retirement rate method was used to analyze the survivor characteristics of  
8 this property group. Aged plant accounting data was compiled from 1924 through  
9 2017 and analyzed in periods that best represent the overall service life of this  
10 property. The life tables for the 1924-2017 and 1988-2017 experience bands are  
11 presented on pages VII-95 through VII-97 of the report. The life table displays the  
12 retirement and surviving ratios of the aged plant data exposed to retirement by age  
13 interval. For example, page VII-95 shows \$2,133,875 retired at age 0.5 with  
14 \$2,347,756,170 exposed to retirement. Consequently, the retirement ratio is 0.0009  
15 and the surviving ratio is 0.9991. These life tables, or original survivor curves, are  
16 plotted along with the estimated smooth survivor curve, the 58-S0 on page VII-94.

17 The net salvage percent is presented on pages VIII-49 and VIII-50. The  
18 percentage is based on the result of annual gross salvage minus the cost to remove  
19 plant assets as compared to the original cost of plant retired during the period 1992  
20 through 2017. The 26-year period experienced \$20,503,595 (\$8,621,261-  
21 \$29,124,856) in net salvage for \$179,971,886 plant retired. The result is negative net  
22 salvage of eleven percent ( $\$20,503,595/\$179,971,886$ ). Although recent trends have  
23 shown indications more negative, it was determined that based on industry ranges and

1 company expectations, that negative ten percent was the most appropriate estimate.

2 My calculation of the annual depreciation related to the original cost at  
3 December 31, 2017, of electric plant is presented on pages IX-299 through IX-301.  
4 The calculation is based on the 58-S0 survivor curve, ten percent negative net  
5 salvage, the attained age, and the allocated book reserve. The tabulation sets forth the  
6 installation year, the original cost, calculated accrued depreciation, allocated book  
7 reserve, future accruals, remaining life and annual accrual. These totals are brought  
8 forward to the table on page VI-18.

### 9 CONCLUSION

10 **Q. Was the Depreciation Study filed by Pacific Power in this proceeding prepared**  
11 **by you or under your direction and control?**

12 A. Yes.

13 **Q. Does your Depreciation Study recommend new depreciation rates based on**  
14 **December 31, 2020 plant and reserve balances?**

15 A. Yes. The depreciation accrual rates set forth in the Appendix to Exhibit No. JJS-3  
16 represent the rates most applicable in this proceeding. These rates utilize all the same  
17 methods and procedures as described in the Depreciation Study but apply the  
18 parameters to the projected December 31, 2020 plant and reserve balances. The  
19 projected plant balance as of December 31, 2020, and the bring forward of the book  
20 reserve from December 31, 2017, to December 31, 2020, properly established the  
21 most reasonable rate base when the rates will go into effect. Thus, the rates in the  
22 Appendix are the recommended depreciation accrual rates.

1 **Q. Were there alternative depreciation rates for coal-fired plant determined for**  
2 **Washington as compared with the company's other jurisdictions?**

3 A. Yes. The company has established depreciation rates based on probable retirement  
4 date for many steam generating units that are earlier than previously utilized. These  
5 results are set forth in Exhibit No. JJS-4 "California and Washington Steam  
6 Production Plant."

7 **Q. Does this conclude your direct testimony?**

8 A. Yes.