

Docket No. UM _____
Exhibit PAC/200
Witness: John J. Spanos

**BEFORE THE PUBLIC UTILITY COMMISSION
OF OREGON**

PACIFICORP

Direct Testimony of John J. Spanos

September 2018

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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 PacifiCorp d/b/a Pacific Power.

13 **QUALIFICATIONS**

14 **Q. Please state your qualifications.**

15 A. Please refer to Exhibit PAC/201 for my qualifications.

16 **PURPOSE OF TESTIMONY**

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

18 A. I sponsor the depreciation study performed for PacifiCorp attached hereto as
19 Exhibit PAC/202 (Depreciation Study). The Depreciation Study sets forth the
20 calculated annual depreciation accrual rates by account as of December 31, 2017.
21 Based on the Depreciation Study, I recommend depreciation rates using the projected
22 December 31, 2020 plant and reserve balances for approval. The proposed rates
23 appropriately reflect the rates at which PacifiCorp's assets should be depreciated over

1 their useful lives and are based on the most commonly used methods and procedures
2 for determining depreciation rates.

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

4 A. Yes. The depreciation rates as of December 31, 2017 appropriately reflect the rates at
5 which the values of PacifiCorp's assets have been consumed over their useful lives to
6 date. These rates are based on the most commonly used methods and procedures for
7 determining depreciation rates. The life and salvage parameters are based on widely
8 used techniques and the depreciation rates are based on the average service life
9 procedure and remaining life method. Therefore, the depreciation rates set forth on
10 pages VI-4 through VI-21 of Exhibit PAC/202 represent the calculated rates as of
11 December 31, 2017.

12 **DEPRECIATION STUDY**

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

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

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

22 A. Yes. I prepared the Depreciation Study submitted by PacifiCorp with its filing in this
23 proceeding. The Depreciation Study is titled: "Depreciation Study – Calculated

1 Annual Depreciation Accruals Related to Electric Plant as of December 31, 2017.”

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

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

5 A. Yes.

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

8 A. The methods and procedures of this Depreciation Study are the same as those used in
9 past studies of this company as well as others before the Public Utility Commission of
10 Oregon (Commission). Depreciation rates are determined based on the average
11 service life procedure and the remaining life method.

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

13 A. The Depreciation Study is presented in nine parts: Part I, Introduction, presents the
14 scope and basis for the Depreciation Study. Part II, Estimation of Survivor Curves,
15 includes descriptions of the methodology of estimating survivor curves. Parts III and
16 IV set forth the analysis for determining service life and net salvage estimates. Part
17 V, Calculation of Annual and Accrued Depreciation, includes the concepts of
18 depreciation and amortization using the remaining life. Part VI, Results of Study,
19 presents a description of the results of my analysis and a summary of the depreciation
20 calculations. Parts VII, VIII, and IX include graphs and tables that relate to the
21 service life and net salvage analyses, and the detailed depreciation calculations by
22 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
3 December 31, 2017, the book depreciation reserve, and the calculated annual
4 depreciation accrual and rate for each account or subaccount. The section beginning
5 on page VII-2 presents the results of the retirement rate and simulated plant analyses
6 prepared as the historical bases for the service life estimates. The section beginning
7 on page VIII-2 presents the results of the salvage analysis. The section beginning on
8 page IX-2 presents the depreciation calculations related to surviving original cost as
9 of December 31, 2017. Finally, the section in the Appendix on Page 1393 presents
10 the recommended depreciation rates and parameters as of December 31, 2020.

11 **Q. Please explain how you performed the 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 period 1937 through 2017, 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 these 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
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 occur 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 used by PacifiCorp in the same
5 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 the past study in May
20 and June 2012 to observe representative portions of plant. Field reviews are
21 conducted to become familiar with company operations and obtain an understanding
22 of the function of the plant and information with respect to the reasons for past
23 retirements and the expected future causes of retirements. This knowledge, as well as

1 information from other discussions with management, was incorporated in the
2 interpretation and 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 generating facilities based on the same
12 analyses?**

13 A. Yes, for the interim analyses. The net salvage percentages for generating 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 generating 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-287 of Exhibit PAC/202.

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

1 shown indications more negative, it was determined that based on industry ranges and
2 company expectations, that negative ten percent was the most appropriate estimate.

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

10 CONCLUSION

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

13 A. Yes.

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

16 A. Yes. The depreciation accrual rates set forth in the Appendix to Exhibit PAC/202
17 represent the rates most applicable in this proceeding. These rates utilize all the same
18 methods and procedures as described in the Depreciation Study but apply the
19 parameters to the projected December 31, 2020 plant and reserve balances. The
20 projected plant balance as of December 31, 2020 and the bring forward of the book
21 reserve from December 31, 2017 to December 31, 2020 properly establish the most
22 reasonable rate base when the rates will go into effect. Thus, the rates in the
23 Appendix are the recommended depreciation accrual rates.

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

3 A. Yes. In the company's previous depreciation proceedings in Oregon, the Commission
4 rejected a provision in a stipulation between the company and Commission Staff
5 proposing to extend the depreciable lives of PacifiCorp's coal-fired generating
6 facilities. Other jurisdictions approved longer depreciable lives for these plants.
7 Therefore, in this case, the company used the developed accumulated depreciation
8 based on shorter depreciable lives that the Commission ordered in the previous case.
9 The company conducted a separate Oregon-specific calculation for coal-fired plants
10 reflecting the developed accumulated depreciation from past cases as of
11 December 31, 2017 and as of December 31, 2020. The results of the two calculations
12 are set forth in Exhibit PAC/203 "Oregon Steam Production Plant."

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

14 A. Yes.