STATE OF NEW HAMPSHIRE

BEFORE THE

NEW HAMPSHIRE PUBLIC UTILITIES COMMISSION

DOCKET NO. DE 19-057

REQUEST FOR PERMANENT RATES

DIRECT TESTIMONY OF

JOHN J. SPANOS

Depreciation

On behalf of Public Service Company of New Hampshire

d/b/a Eversource Energy

May 28, 2019

Table of Contents

Attachments

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I. INTRODUCTION

Q. Please state your name and address.

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

Q. Are you associated with any firm?

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

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

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

Q. What is your position with the firm?

A. I am the President.

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

A. I am testifying on behalf of Public Service Company of New Hampshire d/b/a

Eversource Energy ("PSNH" or the "Company").

Q. Please state your qualifications.

A. I have over 32 years of utility depreciation experience, which includes providing expert testimony in over 300 cases before approximately 40 regulatory commissions. These cases have included depreciation studies in the electric, gas, water, wastewater and pipeline industries. In addition to the cases where I have submitted testimony, I have supervised in over 600 other depreciation or valuation assignments. Please refer to Schedule (JJS-1) for my qualification statement, which includes further information with respect to my work history, case experience and leadership in the Society of Depreciation Professionals.

II. PURPOSE OF TESTIMONY

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony is to present the depreciation study performed for PSNH attached hereto as Schedule (JJS-2) (the "Depreciation Study"). The Depreciation Study sets forth the calculated annual depreciation accrual rates by account as of December 31, 2018 for all electric plant.

Q. Can you summarize the impact in depreciation rates based on the Depreciation Study?

A. Yes. The table below sets forth a comparison of the current depreciation rates and resultant expense to the proposed depreciation rates and expense by function as of December 31, 2018.

	Current		Proposed	
Function	Rates	Proforma Expense	Rates	Expense
Intangible	6.80	3,600,045	4.66	$ 2,463,433
Distribution	2.81	53,989,029	3.07	58,831,543
General	5.12	9,686,491	3.47	6,558,461
General Reserve Amount		-		2,688,368
Total		$67,275,565		$70,541,805

Q. Can you explain some of the major factors that caused the change in depreciation rates?

A. Yes. The major components that caused depreciation rates to change by function are as follows:

- Intangible Plant: Assets are amortized on an individual basis specific to their amortization period. The primary cause of the rate change is the lack of growth in the 10-year category.
- Distribution Plant: The primary change causing a slight increase in depreciation expense is the higher negative net salvage percents for many accounts. Generally, the average service lives are longer.
- General Plant: Depreciation expense has decreased due to applying the proper amortization period rates to the appropriate vintage balances. Also, there are longer lives for transportation equipment.

Q. Are the recommended depreciation accrual rates presented in your study reasonable and applicable to the plant in service as of December 31, 2018?

A. Yes, they are. Based on the Depreciation Study, I am recommending depreciation rates using the December 31, 2018 plant and reserve balances for approval.

III. DEPRECIATION STUDY

Q. Please define the concept of depreciation.

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

Q. Please identify the Depreciation Study you performed for PSNH.

A. The study is a report entitled, "2018 Depreciation Study - Calculated Annual Depreciation Accruals Related to Electric Plant as of December 31, 2018." This report sets forth the results of my depreciation analysis for PSNH. The study was prepared, and the analyses that underlie the study were conducted under my direction and supervision.

Q. Is Schedule (JJS-2) a true and accurate copy of your Depreciation Study?

A. Yes.

Q. Does Schedule (JJS-2) accurately portray the results of your Depreciation Study as of December 31, 2018?

A. Yes.

Q. What was the purpose of your Depreciation Study?

A. The purpose of the Depreciation Study was to estimate the annual depreciation accruals related to electric plant in service for financial and ratemaking purposes and determine appropriate average service lives and net salvage percentages for the plant account.

Q. Are the methods and procedures of the Depreciation Study consistent with industry practices?

A. Yes, the methods and procedures of the study are generally in accordance with industry standards. Both the existing rates and the rates determined in the Depreciation Study are based on the average service life procedure. However, the proposed rates are determined based on the more common remaining life method while existing rates are based on the whole life method.

Q. What are the most common depreciation methods?

A. The calculation of depreciation requires the selection of a depreciation method, which includes the selection of a procedure and technique (or basis) for calculating depreciation rates. The recommended depreciation rates in the Depreciation Study are based on the straight-line method, average service life – broad group procedure and remaining life technique, which is the most commonly used depreciation method for public utility depreciation. The straight-line method and average service life – broad group procedure was used in the past depreciation study for PSNH. However, the use of the remaining life technique is a change from the previous depreciation study for the Company, in which the whole life technique

was used. The reason for this proposed change is that the whole life method can result in the recovery of an inaccurate amount of depreciation expense without a methodology to adjust based on actual experience, whereas the remaining life method will ensure recovery of no more or less than the full service value.

For the whole life technique, depreciation is calculated on the basis of the full service life, or whole life, estimated for a group of assets. For example, if the service life estimate for an asset that costs $100 is 10 years, and no net salvage is expected, then the annual depreciation rate would be 10% (or (1-0%)/10). Issues can arise with the whole life technique if service life estimates change or if the real-world experience of the group does not perfectly match the service life and net salvage estimates. Using the same example, if after five years of the asset's life the accumulated depreciation was $60, then applying a 10% whole life depreciation rate for each of the remaining five years of the asset's life would result in a total recovery through depreciation of $110 (the $60 in accumulated depreciation plus $10 per year for five years). As a result, the whole life technique would, without an adjustment, result in the recovery of the incorrect amount of depreciation expense. Such situations can, and do, arise regularly because depreciation is, by nature, a forecast of the future for thousands of individual assets.

The remaining life technique addresses the issue described in the previous paragraph by taking a prospective approach and allocating costs over the expected time the related assets will remain in service. Rather than calculating depreciation

based on the whole service life, the remaining life technique allocates the amount remaining to be recovered (which is the original cost for the group less net salvage less accumulated depreciation) over its estimated remaining life. As a result, the remaining life technique ensures that the full service value (original cost less net salvage) will be recovered through depreciation expense – and no more or no less. In part for this reason, the remaining life technique is used in the vast majority of U.S. regulatory jurisdictions. Its use is recommended in the Depreciation Study.

Q. Why is the remaining life methodology superior to the whole life method?

A. A simple example will explain why the remaining life methodology is superior. Assume that there are three assets in an account which live 2, 5, and 8 years; therefore, the average life is 5 years. Each asset costs $100 for a total account cost of $300. Using the whole life method, the rate is 20.0%, so through year 5 the recovery for the 2-year unit is $40, and the 5-year unit is $100, and the 8-year unit is $100. A new study is performed after year 5 and the average life is 8 years, so the rate is 12.5% and the recovery for the final three years is $37.50. Consequently, using the whole life method, recovery is $277.50 of the $300 in original cost, which fails to make the company whole.

Under the remaining life methodology, the average service life is still 5 years and the initial rate is 20.00%. Thus, the total accrual after 5 years is still $240.00 and the two retirements totaling $200 for an accumulated depreciation total of $40. Therefore, the remaining value is $60 to be recovered over 3 years at a rate of

20.00%. Consequently, under the remaining life method, full recovery is achieved at the end of life for the three units.

Q. Please describe the contents of Schedule (JJS-2).

A. My report is presented in nine parts. Part I, Introduction, describes the scope and basis for the Depreciation Study. Part II, Estimation of Survivor Curves, includes descriptions of the methodology of estimating survivor curves. Parts III and IV set forth the analysis for determining life and net salvage estimation. Part V, Calculation of Annual and Accrued Depreciation, includes the concepts of depreciation and amortization using the remaining life method. Part VI, Results of Study, presents a description of the results and a summary of the depreciation calculations. Parts VII, VIII and IX include graphs and tables that relate to the service life and net salvage analyses, and the detailed depreciation calculations.

The table on pages VI-4 and VI-5 of Schedule (JJS-2) presents the estimated survivor curve, the net salvage percent, the original cost as of December 31, 2018, the book depreciation reserve, and the calculated annual depreciation accrual and rate for the account or subaccount. The section beginning on page VII-2 presents the results of the retirement rate analyses prepared as the historical bases for the service life estimates. The section beginning on page VIII-2 presents the results of the salvage analysis. The section beginning on page IX-2 presents the depreciation calculations related to surviving original cost as of December 31, 2018.

Q. Please explain how you performed your Depreciation Study.

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

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

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

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

A. The service life and net salvage study consisted of compiling historic data from records related to PSNH's plant; analyzing these data to obtain historic trends of survivor and net salvage characteristics; obtaining supplementary information from PSNH management personnel and operating personnel concerning practices and plans as they relate to plant operations; and interpreting the above-mentioned data based on my experience and in reference to estimates used by other electric utilities to form judgments of average service life and net salvage characteristics.

Q. What historical data did you rely on to estimate service life characteristics?

A. I analyzed accounting entries for the Company relating to plant additions, transfers, and retirements recorded through 2018. The records of the Company also included transactional data and surviving dollar value by year installed for the plant account as of December 31, 2018.

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

A. I used the retirement rate method for all accounts. This is the most appropriate method when aged retirement data are available, because this method determines the average rates of retirement actually experienced by the Company during the period of time covered by the study.

Q. Would you explain how you used the retirement rate method to analyze PSNH's service life data?

A. I applied the retirement rate method to the group of property in the Depreciation Study. For the property group, I used the retirement rate method to form a life table, which, when plotted, shows an original survivor curve for that property group. The original survivor curve represents the average survivor pattern experienced by the several vintage groups during the experienced band studied. The survivor patterns do not necessarily describe the life characteristics of the property group; therefore, interpretation of the original survivor curves is required in order to use them as valid considerations in estimating service life. The Iowa-type Survivor Curves were used to perform these interpretations.

Q. What is an "Iowa-type Survivor Curve" and how did you use such curves to estimate the service life characteristics for the property group?

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

Iowa-type Survivor Curves are used to smooth and extrapolate original survivor curves determined by the retirement rate method. The Depreciation Study used Iowa curves and truncated Iowa curves to describe the forecasted rates of retirement based on the observed rates of retirement and the outlook for future retirements.

The estimated survivor curve designations for the depreciable property group indicate the average service life, the family within the Iowa system to which the property group belongs, and the relative height of the mode. For example, the Iowa 53-R0.5 indicates an average service life of 53 years; a right-moded, or R type curve (the mode occurs after average life for right-moded curves); and a low height, 0.5, for the mode (possible modes for R type curves range from 0.5 to 5).

Q. Did you physically observe PSNH's plant and equipment as part of the Depreciation Study?

A. Yes. I made a field review of PSNH's property as part of the study during January 2018 to observe representative portions of plant. Field reviews are conducted to

become familiar with operations of the Company and obtain an understanding of the function of the plant and information with respect to the reasons for past retirements and the expected future causes of retirements. This knowledge, as well as information from other discussions with PSNH management, was incorporated in the interpretation and extrapolation of the statistical analyses.

Q. How did your experience in development of other depreciation studies affect your work in this case for PSNH?

A. Since I customarily conduct field reviews for my depreciation studies, I have had the opportunity to visit scores of similar facilities and meet with management and operations personnel at many other companies. The knowledge I have accumulated from those visits and meetings provides me with useful information to draw upon to confirm or challenge my numerical analyses concerning asset condition and remaining life estimates.

Q. Are the factors considered in your estimates of service life and net salvage percents presented in Schedule (JJS-2)?

A. Yes. A discussion of the factors considered in the estimation of service lives and net salvage percents are presented in Parts III and IV of the study.

Q. Please describe the concept of "net salvage".

A. Net salvage is a component of the service value of capital assets that is recovered through depreciation rates. The service value of an asset is its original cost less its net salvage. Net salvage is the salvage value received for the asset upon retirement

less the cost to retire the asset. When the cost to retire the asset exceeds the salvage value, the result is negative net salvage.

Because depreciation expense is the loss in service value of an asset during a defined period (e.g., one year), it must include a ratable portion of both the original cost of the asset and the net salvage. That is, the net salvage related to an asset should be incorporated in the cost of service during the same period as its original cost, so that customers receiving service from the asset pay rates that include a portion of both elements of the asset's service value, the original cost and the net salvage value. For example, the full service value of a $5,000 circuit breaker may also include $1,300 of cost of removal and $50 gross salvage, for a total service value of $6,250.

Q. Please describe how you estimated net salvage percentages.

A. I estimated the net salvage percentages by incorporating the Company's actual historical data through 2018 and considered industry experience of net salvage estimates for other electric companies. The net salvage percentages in the Depreciation Study are based on a combination of statistical analyses and informed judgment. The statistical analyses consider the cost of removal and gross salvage ratios to the associated retirements during the 20-year period for PSNH. Trends of these data are also measured based on three-year moving averages and the most recent five-year indications.

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

A. After I estimated the service life and net salvage characteristics for the depreciable property group, I calculated the annual depreciation accrual rates for the group based on the straight-line remaining life method, using remaining lives weighted consistent with the average service life procedure. The calculation of annual depreciation accrual rates were developed as of December 31, 2018.

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

A. The straight-line remaining life method of depreciation allocates the original cost of the property, less accumulated depreciation, less future net salvage, in equal amounts to the year of remaining service life. This method recovers the variance between the actual book reserve with the theoretical book reserve over the remaining life of each asset class.

Q. Please describe the average service life procedure for calculating remaining life accrual rates.

A. The average service life procedure defines the group or account for which the remaining life annual accrual is determined. Under this procedure, the annual accrual rate is determined for the entire group or account based on its average remaining life and the rate is then applied to the surviving balance of the group's cost. The average remaining life of the group is calculated by first dividing the future book accruals (original cost less allocated book reserve less future net salvage) by the average remaining life for the vintage. The average remaining life

for the vintage is derived from the area under the survivor curve between the attained age of the vintage and the maximum age. The sum of the future book accruals is then divided by the sum of the annual accruals to determine the average remaining life of the entire group for use in calculating the annual depreciation accrual rate.

Q. Please describe amortization accounting in contrast to depreciation accounting.

A. Amortization accounting is used for accounts with a large number of units, but small asset values. In amortization accounting, units of property are capitalized in the same manner as they are in depreciation accounting. However, depreciation accounting is difficult for these types of assets because depreciation accounting requires periodic inventories to properly reflect plant in service. Consequently, amortization accounting is used for these types of assets, such that retirements are recorded when a vintage is fully amortized rather than as the units are removed from service. That is, there is no dispersion of retirements in amortization accounting. All units are retired when the age of the vintage reaches the amortization period. The plant account or group of assets is assigned a fixed period that represents an anticipated life during which the asset will render full benefit. For example, in amortization accounting, assets that have a 15-year amortization period will be fully recovered after 15 years of service and taken off the company's books at that time, but not necessarily removed from service. In contrast, assets

that are taken out of service before 15 years remain on the books until the amortization period for that vintage has expired.

Q. Is amortization accounting being utilized for certain plant accounts?

A. Yes. However, amortization accounting is only appropriate for certain General Plant accounts. The General Plant accounts are 391.10, 391.20, 393.00, 394.00, 395.00, 397.10, 397.20, 397.30 and 398.00. These accounts represent less than three percent of PSNH's depreciable plant.

Q. Have you made additional recommendations for these amortization accounts?

A. Yes. In order to achieve a more stable accrual rate for these accounts in the future, I have recommended a five-year amortization to adjust unrecovered reserve. This approach will achieve consistent amortization rates for existing assets as well as future assets.

Q. Please provide an example to illustrate the development of the annual depreciation accrual rate for a particular group of property in your Depreciation Study.

A. I will use Account 368.00, Line Transformers, as an example because it is one of the largest depreciable groups. The retirement rate method was used to analyze the survivor characteristics of this property group. Aged plant accounting data were compiled from 1998 through 2018 and analyzed to best represent the overall service life of this property. The life table for the 1998-2018 experience band is presented on pages VII-32 and VII-33 of Schedule (JJS-2). The life table displays the retirement and surviving ratios of the aged plant data exposed to retirement by age

interval. For example, page VII-32 shows $804,057 retired during age interval 0.5-1.5 with $198,510,976 exposed to retirement at the beginning of the interval. Consequently, the retirement ratio is 0.0041 ($804,057/$198,510,976) and the surviving ratio is 0.9959 (1-.0041). The percent surviving at age 0.5 of .9987 percent is multiplied by the survivor ratio of 99.59 to derive the percent surviving at age 1.5 of 99.46 percent. This process continues for the remaining age intervals for which plant was exposed to retirement during the period 1998-2018. The resultant life table, or original survivor curve, is plotted along with the estimated smooth survivor curve, the 40-S0 on page VII-31.

The net salvage percent is presented on pages VIII-12 and VIII-13 of Schedule (JJS-2). The percentage is based on the result of annual gross salvage minus the cost to remove plant assets as compared to the original cost of plant retired during the period 1999 through 2018. The 20-year period experienced negative $33,096 ($1,567,820 - $1,600,916) in net salvage for $48,019,151 plant retired. The result is net salvage of 0 percent ($33,096/$48,019,151); and, the most recent five-year average is negative 2 percent. Therefore, based on the statistics for this account, the three-year rolling averages, the trend in recent years, as well as the estimates of other electric companies, the recommended net salvage for line transformers is negative 2 percent.

My calculation of the annual depreciation related to original cost of Account 368.00, Line Transformers at December 31, 2018, is presented on pages IX-24 and

IX-25 of Schedule (JJS-2). The calculation is based on the 40-S0 survivor curve, the negative net salvage of 2 percent, the attained age, and the allocated book reserve. The tabulation sets forth the installation year, the original cost, calculated accrued depreciation, allocated book reserve, future accruals, remaining life and annual accrual. These totals are brought forward to the table on page VI-4.

Q. Were there any rates developed for future assets?

A. Yes. New assets may be added to Account 303.20, Miscellaneous Intangible Plant – 10 Year. The recommended rate will be 10.00 percent, which is based on a 10-year amortization period and 0 percent net salvage.

Q. Please compare the proposed depreciation expense to the current pro-forma depreciation expense as of December 31, 2018.

A. Schedule (JJS-3) sets forth the proposed versus current depreciation expense as of December 31, 2018 for the Company. The overall change reflected in the PSNH Depreciation Study is an increase of $3.3 million annually. Schedule (JJS-3) is being submitted in conformance with Puc 308.08 and is comparable to Form E-25E. The only significant difference between the information provided in Schedule (JJS-3) and the information customarily provided in Form E-25E relates to the Company's proposal to change from the whole life method to the remaining life method in this proceeding.

Q. Have you established any special amortizations within the study?

A. Yes. I have established a 5-year amortization for certain General Plant accounts in order to stabilize the current and future rates for these assets as well as ensure full recovery of the service value of the assets by the time the assets are taken out of service. The 5-year amortization is $2,688,368 annually for PSNH.

Q. In your opinion, are the depreciation rates set forth in Schedule (JJS-2) the appropriate rates for the Commission to adopt in this proceeding for PSNH?

A. Yes. These rates appropriately reflect the rates at which the value of PSNH's assets are being consumed over their useful lives. These rates are an appropriate basis for setting electric rates in this matter and for the Company to use for booking depreciation and amortization expense going forward.

Q. Does this conclude your direct testimony?

A. Yes.