UNITIL ENERGY SYSTEMS, INC.

DIRECT TESTIMONY OF

NED W. ALLIS

EXHIBIT NWA-1

New Hampshire Public Utilities Commission

Docket No. DE 21-030

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I. INTRODUCTION

Q. Please state your name and address.

A. My name is Ned W. Allis. 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 2006.

Q. What is your position with the firm?

A. I am Vice President.

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

A. I am testifying on behalf of Unitil Energy Systems, Inc. ("UES" or the "Company").

Q. Please state your qualifications.

A. I have 14 years of experience within the field of depreciation, which includes providing expert testimony in more than 40 cases before 14 regulatory commissions. I have also worked on numerous depreciation studies for which I did not submit testimony, including assisting other expert witnesses from Gannett

Fleming in additional U.S. jurisdictions and two Canadian provinces. Exhibit NWA-2 to my testimony provides my qualifications, including leadership in the Society of Depreciation Professionals (the "Society") and participation as a faculty member for depreciation training conducted by the Society.

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 UES attached hereto as Exhibit NWA-3. The Depreciation Study sets forth the calculated annual depreciation accrual rates by account as of December 31, 2020 for all electric plant.

Q. Please summarize the impact in depreciation rates based on the Depreciation Study.

A. The table below sets forth a comparison of the current depreciation rates and resultant expense of the proposed depreciation rates by function as of December 31, 2020.

Table 1: Comparison of Current and Proposed Depreciation Rates as of December 31, 2020

	Current		Proposed	
Function	Rates (pct)	Pro Forma Expense	Rates (pct)	Expense
Production	6.67	$3,774	18.66	$10,559
Distribution	3.59	12,654,504	3.39	11,945,637
General	3.23	936,655	2.62	760,082
General Reserve Adj.		-		86,569

Total	3.57	13,594,933	3.36	12,802,847

Q. Please explain the major factors that caused the change in depreciation rates.

A. The major factors that cause changes in depreciation rates are the estimated service lives, estimated net salvage, and the recovery of the theoretical reserve imbalances that result from the study. For many accounts, the recommended service life estimates are longer than those used for the current depreciation rates. While this is partially offset by more negative net salvage estimates for many accounts, the overall result is a net reduction in depreciation expense.

In the Company's previous depreciation study, the whole life technique was used, which does not automatically address any difference between the book reserve and calculated (or "theoretical") reserve. For the current study, the remaining life technique was used, which effectively recovers any such differences over the remaining lives of the Company's assets. The method of recovering any differences between the book and theoretical reserve will also impact the resultant depreciation expense, and the use of the remaining life technique in the depreciation study also impacts the recommended depreciation rates.

Q. Are the recommended depreciation accrual rates presented in your study reasonable and applicable to the plant in service as of December 31, 2020?

A. Yes, they are. Based on the Depreciation Study, I am recommending depreciation rates using the December 31, 2020 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 UES.

A. The study is a report entitled, "2020 Depreciation Study - Calculated Annual Depreciation Accruals Related to Electric Plant as of December 31, 2020." This report sets forth the results of my depreciation study for UES. The study was prepared and the analyses that underlie the study were conducted under my direction and supervision.

Q. Is Exhibit NWA-3 a true and accurate copy of your Depreciation Study?

A. Yes.

Q. Does Exhibit NWA-3 accurately portray the results of your Depreciation Study as of December 31, 2020?

A. Yes.

Q. What was the purpose of the 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 service lives and net salvage percentages for each 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 proposed 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 previous depreciation study for UES. 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.

For the whole life technique, depreciation is calculated based 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 used to develop depreciation rates. 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 of allocating unrecovered 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 a depreciable 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 – 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 and for most depreciation studies. Its use is recommended in the Depreciation Study.

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

A. A simple example will explain why the remaining life methodology is superior. Assume that there is a single asset with a cost of $100, an estimated service life of 10 years and no net salvage. The depreciation rate would be 10% and the annual depreciation expense would be $10. After five years, a new depreciation study is performed and the service life is determined to be 15 years. Using the whole life technique, the depreciation rate would be changed to 6.67% and the annual depreciation expense would be $6.67. If the whole life technique were used, then over the full 15-year service life, a total of $116.70 would be recovered through depreciation expense ($10 per year for the first five years and $6.67 per year for the final ten years). However, this means that too much depreciation expense is recovered over the service life, as more than the $100 cost of the asset is recovered through depreciation expense.

When using the remaining life technique, the depreciation expense would be the same $10 per year for the first five years. However, when the updated depreciation study is performed after year five and the 15-year life is determined, the depreciation rate is calculated to incorporate the amount of depreciation recovered to date. That is, the remaining life technique recognizes that $50 of the $100 has been recovered allocates the remaining $50 (i.e., $100 - $50) in future depreciation expense over the 10 year remaining life, for a depreciation rate of 5% and an annual depreciation expense of $5. Over the 15-year service life of the asset, $100 is recovered through depreciation expense ($10 per year for the first five years and $5 per year for the last ten years). Thus, the remaining life technique corrects the issue that arises from the use of the whole life technique, for which too much depreciation expense would be recovered.

Q. Please describe the contents of Exhibit NWA-3.

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 estimates. 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 Exhibit NWA-3 presents the estimated survivor curve, the net salvage percent, the original cost as of December 31, 2020, 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 net salvage analysis. The section beginning on page IX-2 presents the depreciation calculations related to surviving original cost as of December 31, 2020.

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 each depreciable group, that is, the plant accounts or subaccounts 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 analyses consisted of compiling historic data from records related to UES's plant; analyzing these data to obtain historic trends of survivor and net salvage characteristics; obtaining supplementary information from UES management personnel and operating personnel concerning practices and plans as they relate to plant operations; and interpreting the above data based on my experience and consideration of 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 2020. The records of the Company also included transactional data and surviving dollar value by year installed for each plant account as of December 31, 2020. For the current study, aged data – i.e., data that incorporates the actual age of retirements – were available from 2010 through 2020. Because many of the assets studied have historically had lives that, on average, spanned many decades, the aged data was supplemented with statistically aged data through 2009 based on the unaged data analyzed in previous studies. This allowed for a longer period of data to be included in the study. Actuarial analyses were performed on both the full period of data available – i.e., both aged and statistically aged – as well as for the period for which only aged data was available.

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. Please explain how you used the retirement rate method to analyze UES's service life data.

A. I applied the retirement rate method to each group of property in the Depreciation Study. For each 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 multiple vintage groups during the experienced band studied. The survivor patterns alone 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 curves are used to smooth and extrapolate original survivor curves determined by the retirement rate method. The Depreciation Study used Iowa curves and truncated original 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 45-R3 indicates an average service life of 45 years; a right-moded, or R type curve (the mode occurs after average life for right-moded curves); and a medium height, 3, for the mode (possible modes for R type curves range from 0.5 to 5).

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

A. No. My typical practice is to perform physical site visits for depreciation studies. However, due to restrictions in place related to the COVID-19 pandemic, I have not been able to perform a physical site visit for this study. In lieu of a physical site visit, the Company provided virtual site visits of certain facilities. In addition, I conducted meetings with the Company's operating and engineering personnel to develop an understanding of the Company's assets and future plans. Accordingly, despite the COVID-19 related restrictions, I was able to obtain the information needed for the study through the combination of virtual site visits, meetings with

Company personnel and my experience with other depreciation studies allowed.

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

A. Since I customarily conduct field reviews for my depreciation studies, I have had the opportunity to visit 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 percentages presented in Exhibit NWA-3?

A. Yes. Discussions of the factors considered in the estimation of service lives and net salvage percentages 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 gross salvage value received for the asset upon retirement less the cost to retire the asset. When the cost to retire the asset exceeds the gross 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 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 $1,000 pole may also include $550 of cost of removal and $50 gross salvage, for a total service value of $1,500.

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 2020 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 26-year period for which data were available for UES. 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 was developed as of December 31, 2020.

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 and 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. For 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 recommended 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 provide service. 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 391.01, 393.00, 394.00, 395.00, 397.00 and 398.00. These accounts represent less than three percent of UES'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 the reserve for these amortization accounts. 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 362.00, Station Equipment, 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 2010 through 2020 and statistically aged data were compiled from 1995 through 2009. The life tables for the 1995-2020 experience band and 2010-2020 experience bands are presented on pages VII-9 through VII-14 of Exhibit NWA-3. The life tables display the retirement and surviving ratios of the aged plant data exposed to retirement by age interval. For example, page VII-9 shows $4,964 retired during age interval 0.5-1.5 with $42,384,257 exposed to retirement at the beginning of the interval. Consequently, the retirement ratio is 0.0001 ($4,964/$42,384,257) and the survivor ratio is 0.9999 (1-0.0001). The percent surviving at age 0.5 of 100.00 percent is multiplied by the survivor ratio of 0.9999 to derive the percent surviving at age 1.5 of 99.99 percent. This process continues for the remaining age intervals for which plant was exposed to retirement during the period 1995-2020. The resultant life tables, or original survivor curves, are plotted along with the estimated smooth survivor curve, the 49-R1.5 on page VII-8.

The experienced net salvage percentages are presented on page VIII-4 and VIII-5 of Exhibit NWA-3. The percentages are 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 1995 through 2020. The twenty-six-year period experienced negative $1,997,460 ($129,984 - $2,127,444) in net salvage for $3,827,889 plant retired. The result is net salvage of negative 52 percent ($1,997,460/$3,827,889). The most recent five-year average is negative 51 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 station equipment is negative 40 percent.

The calculation of the annual depreciation related to original cost of Account 362.00, Station Equipment as of December 31, 2020, is presented on pages IX-4 through IX-6 of Exhibit NWA-3. The calculation is based on the 49-R1.5

survivor curve, the negative net salvage of 40 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. Please compare the proposed depreciation expense to the current pro forma depreciation expense as of December 31, 2020.

A. Exhibit NWA-4 sets forth the proposed versus current depreciation expense as of December 31, 2020 for the Company. The overall change reflected in the UES Depreciation Study is a decrease in annual depreciation expense at this date of $792,086.

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 $86,569 annually for UES.

Q. In your opinion, are the depreciation rates set forth in Exhibit NWA-3 the appropriate rates for the Commission to adopt in this proceeding for UES?

A. Yes. These rates appropriately reflect the rates at which the value of UES'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.