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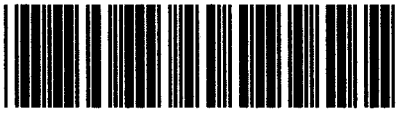

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**SOAH DOCKET NO. 473-07-0833**
**PUC DOCKET NO. 33309**

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| **APPLICATION OF AEP TEXAS CENTRAL COMPANY FOR AUTHORITY TO CHANGE RATES** | § § § § § | **BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS** |


# DIRECT TESTIMONY
# OF
# NARA V. SRINIVASA, P.E.
# INFRASTRUCTURE RELIABILITY DIVISION
# PUBLIC UTILITY COMMISSION OF TEXAS

**MARCH 23, 2007**

480

**SOAH DOCKET NO. 473-07-0833**

**PUC DOCKET NO. 33309**

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## I. INTRODUCTION AND SCOPE OF TESTIMONY

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

A. My name is Nara V. Srinivasa and my business address is 1701 North Congress Avenue, Austin TX.

**Q. By whom are you employed and in what capacity?**

A. I am employed by the Public Utility Commission of Texas ("The Commission" or "PUC") as Director of Network and Service Quality Oversight section in the Infrastructure Reliability Division.

**Q. How long have you been employed at the PUC?**

A. I have been employed by the PUC of Texas since June 6, 1990.

**Q. What is your primary job responsibility?**

A. My primary responsibilities are as follows; 1) supervisory responsibility over network staff, 2) analysis of depreciation filings by telecom and electric utilities, 3) wholesale and retail service quality oversight of regulated telecom utilities, 4) certification of local exchange carriers, and cable TV providers, 5) infrastructure reliability analysis of telecom and electric utilities, 6) participation in rulemaking activities as related to telecom and electric utilities, and 7) participation in arbitration proceedings related to interconnection agreements.

**Q. Please state your qualifications and experience.**

A. I hold a Bachelor's degree in Electrical Engineering and have done graduate work in business administration. I am a licensed professional engineer in the state of Texas. I have 30 plus years of experience in various aspects of engineering and management.

**Q. Have you had additional training in regulatory matters?**

A. Yes. I have attended Annual Regulatory Studies Program sponsored by the National Association of Regulatory Utility Commissioners (NARUC) at Michigan State University. I have also attended a depreciation seminar sponsored by the Society of Depreciation Professionals, as well as a power distribution conference sponsored by the University of Texas at Austin.

**Q. Are you a member of any professional organization or society?**

A. Yes. I am a member of IEEE.

**Q. Have you filed testimony or worked on cases filed at this commission?**

A. Yes. I have filed several testimonies and worked on arbitration cases filed at this commission. Please see Exhibit NVS-4 for a list of the dockets and projects, I have worked on at this commission.

**Q. Have you specifically worked on electric depreciation cases?**

A. Yes. I have filed direct testimony addressing depreciation of electric utility assets in Dockets 15195 (TU Electric Fuel Reconciliation Case, Depreciation Rates for TUMCO

properties) and 32766 (Application of Southwestern Public Service Company for Authority to Change Rates). Also, I trained and supervised staff witness Carlos Gonzalez, who filed depreciation testimony in Docket 16705, Application of Entergy for Approval of its Transition to Competition Plan and the Tariffs Implementing the Plan and for the Authority to Reconcile Fuel Factors, to Set Revised Fuel Factors, to Recover a Surcharge for Under-Recovered Fuel Costs, Docket 15560, Application of Texas-New Mexico Power Company for Approval of Community Choice Transition Plan. I have also worked on depreciation related issues in Docket 32093, rate case filing of Centerpoint Energy Houston Electric.

**Q. Please state the scope of your testimony and the issues you address in this proceeding**

A. The purpose of my testimony is to make recommendations and to comment on the depreciation filing as proposed by AEP Texas Central Company (TCC or "company"). Specifically, I will address depreciation rates and costs subsumed in issues numbered 1 and 3 in the preliminary order.

## II. CONCLUSIONS AND RECOMMENDATIONS

**Q. Please summarize the background of this proceeding.**

A. On November 9, 2006 TCC filed its application seeking authority to change its rates, including depreciation testimony and work papers prepared by its witness James E.

Henderson (Henderson) in this docket. This testimony is concerned with the issues related to reasonable and necessary cost of providing electric service to TCC's customers.

**Q. Please summarize your findings and recommendations in this case**

A. Based on my review of the depreciation study filed by the company, and the recommendations filed by Cities witness Nancy Heller Hughes, I have recommended several changes to the company proposal. The following is a summary of my recommendations contained in my testimony:

- I have proposed depreciation rates for TCC's transmission, distribution and general plant accounts that differ from the company proposal for various accounts as shown in Exhibit-NVS-1 of my testimony. This schedule shows the development of my proposed depreciation rates based on the December 31, 2005 depreciation data included in the company depreciation study.
- I have listed my proposed life parameters and net salvage values for all FERC accounts in Exhibit-NVS-3 of my testimony.
- I have listed the calculated annual depreciation and amortization accrual for the test period ending June 30, 2006, by applying my proposed depreciation rates for all FERC accounts in Exhibit-NVS-2 of my testimony.
- The depreciation life and net salvage parameters, and depreciation rates proposed by TCC for various mass property accounts, including transmission, distribution and general plant accounts are not reasonable as explained in the account specific section

of my testimony. I have provided a list of my recommendations for those accounts as staff proposed life parameter and net salvage value in Exhibit-NVS-3.

- My recommendations as to the methodologies used to study the life characteristics of the plant assets are consistent with the company methodology for mass property accounts in that I have recommended the actuarial method of depreciation for determining the life parameters. For certain mass property accounts I have proposed appropriate life parameters, consisting of average life and Iowa survivor curve shape, which differ from the company proposal. Appendix-A shows the curve plots and the statistical tests performed in selecting the appropriate curve shape for the FERC accounts for which my recommendation is different than the company proposed.
- The life parameters I have proposed are the basis for determining the composite remaining life (CRL) for the FERC account category using the Average Life Group procedure. Work shown in Appendix-B to my testimony shows the calculation of the derived CRL.
- My proposals for survivor curve shape and life for each mass property account category are based on the following: 1) analysis of depreciation study filed by the company, 2) additional information obtained from the company through staff RFIs and 3) independent statistical study. I have included work papers to show the selection process of the curves used in the actuarial analysis in Appendix A to my testimony.
- I have recommended net salvage value for each mass property account category based on my analysis of the company provided historical salvage data. I have proposed a

modified traditional methodology for determining the future estimates of gross salvage and cost of removal ratios used in calculating the net salvage value for each FERC account category. My modifications to the traditional method of determining the future net salvage value includes discounted future expectation for the cost of removal and gross salvage by calculating the net present value of the gross salvage and cost of removal amounts for the remaining life of the assets, rather than continuing to reflect the past high inflation rates experienced during the years 1968-1982. I have used the 5-year average inflation rate as of December 31, 2005, based on the employment cost index[1] for Transportation and Utilities to calculate the discounted net present value of the future cost of removal amount. I have used 5-year average inflation rate based on Consumer Price Index (CPI-U)[2] to calculate the discounted net present value of the future gross salvage amount. I have attached work papers, in Appendix-C of my testimony, to show my analysis of the historical salvage data provided by the company for each FERC account category.

- To calculate the depreciation rates, I have used remaining life technique. This technique involves calculating the depreciation rate by using the Composite Remaining life (CRL), net salvage value, and the book reserve ratio for each account category.
- Consistent with the company filing, my proposed depreciation rates are also based on the depreciation study data as of December 31, 2005.

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1 The data was obtained from the web site; http://www.bls.gov/web/echistry.pdf, Table 1a, on page 9.

2 The data was obtained from the federal reserve web site, http://woodrow.mpls.frb.fed.us/Research/data/us/calc/hist1800.cfm

- The annual depreciation expenses for the test period ending June 30, 2006 calculated by using TCC proposed and staff recommended depreciation rates are shown in Table-1 below.

**Table-1 (Summary of Depreciation Accrual as of June 30, 2006)**

| | Original Investment June 30, 2006 | Current Depreciation Accrual | Company Proposed Depreciation Accrual | Recommended Annual Depreciation Accrual |
|---|---|---|---|---|
| **Transmission Plant** | $886,737,606 | $14,606,676 | $13,729,425 | $11,685,169 |
| **Distribution Plant** | $1,539,777,184 | $52,897,209 | $50,067,326 | $38,684,188 |
| **General Plant** | $170,263,167 | $6,369,637 | $6,308,012 | $6,205,751 |
| **Total Depreciable Plant** | $2,596,777,957 | $73,873,522 | $70,104,763 | $56,575,108 |

The annual depreciation accrual as of December 31, 2005 calculated by using TCC and my recommended depreciation rates are shown in Table-2 below.

**Table-2 (Summary of Depreciation Accrual as of 12/31/2005)**

| | Original Investment Dec. 31, 2005 | Current Depreciation Accrual | Company Proposed Depreciation. Accrual | Recommended Annual Depreciation. Accrual |
|---|---|---|---|---|
| **Transmission Plant** | $811,615,610 | $13,453,134 | $12,619,040 | $10,658,910 |
| **Distribution Plant** | $1,473,610,405 | $50,713,411 | $47,847,166 | $36,831,231 |
| **General Plant** | $161,227,986 | $5,791,983 | $5,975,832 | $5,871,181 |
| **Total Depreciable Plant** | $2,446,454,001 | $69,958,527 | $66,442,038 | $53,361,322 |

My recommendation, for December 31, 2005, based on a composite rate of 2.18%, is $53,361,322, which is $13,080,716 less than the company proposed, and $16,597,205 less than the current annual accrual amount.

## III. OVERVIEW OF DEPRECIATION CONCEPTS

**Q. What is the purpose of this section?**

A. The purpose of this section is to explain the basic concepts of depreciation as related to the field of regulated utilities. This section analyzes the concepts of life, net salvage value for mass property accounts, which include transmission, distribution, and general plant account categories. Each plant account in those categories is identified by using FERC system of accounts designation.

### A. Basic Depreciation Concepts

**Q. What is depreciation?**

A. Depreciation is the loss in service value, not restored by current maintenance that is incurred in connection with the consumption or prospective retirement of electric plant in the course of service due to 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, inadequacy, obsolescence, changes in the art, changes in demand and requirements of public utilities. Many of the terms used throughout my testimony are included in the depreciation reference manual Public Utility Depreciation Practices,[3] published in August 1996 by the National Association of Regulatory Utility Commissioners (NARUC) Subcommittee on Depreciation of the NARUC Finance and Technology Committee. This reference manual gives information on the various aspects of depreciation including definitions of common

[3] A copy of this manual is available for viewing at the Public Utility Commission of Texas library.

terms, mathematical equations and calculation tables for determining depreciation rates and lives, and explanations of how different types of depreciation analyses are performed.

The American Institute of Certified Public Accountants (1961) treats the concept of depreciation as a cost. Its definition is as follows: "Depreciation accounting is a system of accounting that aims to distribute cost or other basic value of tangible assets, less salvage value (if any), over the estimated useful life of the unit (which may be a group of assets) in a systematic and rational manner. It is a process of allocation not valuation." Thus, depreciation "spreads" the dollar cost of a unit or set of units over a period of time.

I will include definitions and explanations of some of the concepts discussed in my testimony here for ease of reference for the reader.

**Q. What is a Depreciation Rate?**

A. A depreciation rate is a ratio that allows the total plant balance less net salvage to be recovered over the service life of the plant account.

**Q. What is Depreciation Expense?**

A. Depreciation expense is the dollar amount determined by applying a depreciation rate to the original plant balance of the account.

**Q. What is a Depreciation Model?**

A. A depreciation model is a computer program used to conduct a depreciation study comprised of varying methods of life analysis to determine industrial plant retirement and survivor characteristics and to derive a depreciation rate based on described depreciation method, procedure, and technique.

**Q. What is a Depreciation Method?**

A. A depreciation method describes how depreciation is accrued relative to either the use of the plant or to accounting periods. Examples of depreciation methods are straight line depreciation, sum of the year digits, declining balance, and deferred method. Generally for utility ratemaking purposes, the straight line method of depreciation is used.

**Q. Please define the straight line method.**

A. The straight-line method charges an equal amount to each accounting period over the service life of the plant item or group.

**Q. Please define "Depreciation Procedure".**

A. A depreciation procedure describes how items of plant are grouped or not grouped together. There are three types of procedures used for depreciation; namely; the broad group or average life group, the vintage group, and the equal life group.

**Q. Please define "Average Life Group Procedure"** (a.k.a. Broad Group Procedure).

A. This procedure places all units of like plant (e.g. utility poles or meters) in a single group. This procedure tends to produce fairly stable depreciation rates from year to year because of the averaging effects.

**Q. Please describe "Vintage Group Procedure".**

A. This procedure groups all plant placed in service the same calendar year in a single account as a single group. This single group is then depreciated over the average service life of the account.

**Q. Please describe "Equal Life Group Procedure".**

A. This procedure groups each vintage into groups so that all of the dollars in a group have the same probable life. This procedure depreciates each dollar over its estimated life. In the vintage group procedure the rate used for depreciation is an average rate for the entire vintage, thus some of the earlier retirements may not be recovered until long after they are retired. In contrast, in the equal life group procedure, the dollar is recovered over the useful life of the asset, thus avoiding intergenerational inequity concerns.

**Q. What is a mass property account?**

A. A mass property account is an account where there are large numbers of similar type of plant. Examples of mass property accounts for electric utility are the accounts included in the transmission, distribution and general plant account categories. The nature of depreciation accounting is such that it is usually burdensome for companies to monitor the depreciation of individual units. Companies therefore use mass property accounts to evaluate the depreciation of several units of property at one time. These accounts lump together various units of property which are expected to have reasonably similar life and salvage characteristics (i.e. groups of cars and vans, for example, as opposed to a group of cars and cellular phones). The equation used to calculate annual depreciation rates for these accounts are based on either whole life or remaining life technique. The average service life (ASL) and the composite remaining life CRL for mass property accounts are derived from the survivor curve of the life parameter that best fit the actual observed data for the mass property account. The net salvage value is expressed in percent of original investment and is determined by analyzing the historical data and future expectations.

The book reserve is the accumulated depreciation expressed as a percent of the original investment.

**Q. What is a Life Parameter?**

A. The life parameter for a mass property account is a combination of average life and survivor curve shape for the group of assets contained in the account. For example, for a mass property account category the life parameter would be expressed as 40-R3; where, 40 is the average life of the property group and R3 is the shape of the Iowa survivor curve that describes the survivor characteristics of the property group.

**Q. Please define "Average Service Life"** (ASL).

A. Average service life is the average expected life of all units when new. The ASL for a mass property account is determined by dividing the area under the selected survivor curve from age zero to maximum life by 100%. Because the observed survivor curve must reach the maximum life for the ASL calculations, a stub survivor curve may be extended to maximum life using curve fitting techniques described later in my testimony.

**Q. Please define "Remaining Life".**

A. The remaining life of an account is the remaining period of time, in years, that plant in an account is expected to be used and useful.

**Q. Please define "Average Remaining Life".**

A. The average remaining life (ARL) represents the future years of service expected for the surviving property. The ARL for a vintage of any age is found by dividing the area under the estimated future portion of the survivor curve by the percent surviving at that age.

**Q. Please define "Composite Remaining Life".**

A. The composite remaining life (CRL) is the weighted average remaining life of the mass property account for a group of all vintages.

**Q. Please define "Depreciation Technique".**

A. The depreciation technique determines how the depreciation rate is calculated. There are two techniques that are generally used by the utilities, the whole life technique and the remaining life technique.

**Q. What is the whole life technique?**

A. The whole life technique (a.k.a. Average Service Life technique) calculates the depreciation rate based on the estimated average service life (in years) of the plant category. The formula used to calculate the depreciation expense under this technique is as follows;

$$depreciation\ rate\ (\%) = \left\{ \frac{1 - net\ salvage\ ratio}{average\ service\ life} \right\} * 100$$

**Q. What is the remaining life technique?**

A. The remaining life technique calculates the depreciation rate by seeking to recover the undepreciated original plant balance less future net salvage over the remaining life of the plant category. The formula used to calculate the depreciation rate under this technique is as follows;

$$depreciation\ rate\ (\%) = \left\{ \frac{1 - book\ reserve\ ratio - net\ salvage\ ratio}{composite\ remaining\ life} \right\} * 100$$

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**Q Please explain the term "Reserve" as used in the study?**

A. The term reserve means the accumulated depreciation. There are two types of reserves, actual or book reserve and theoretical reserve.

Actual Reserve – Actual reserve or book reserve is the total depreciation expense that has been booked to the reserve account for a category of plant.

Theoretical reserve – Theoretical reserve is the total depreciation expense that should be booked to the reserve account for a category of plant if that category of plant exactly followed the retirement characteristics of the survivor curve chosen as best representing the retirement pattern of the account.

**Q. What is a book reserve ratio?**

A. The book reserve ratio is calculated by dividing the book accumulated depreciation expense (or book reserve dollars) by the original plant investment amount for each plant category.

**Q. What is net salvage?**

**A.** Net salvage is the sum of the gross salvage minus the cost of removing the item. A positive net salvage means a company gets back more money in gross salvage than it costs the company to remove the item. Positive net salvage decreases the depreciation rate. A negative net salvage means a company pays more money to remove the item than it gets back in gross salvage. Negative net salvage increases the depreciation rate. Net salvage value is expressed as a ratio or a percent of the total original plant for calculating the depreciation rate.

**Q. What is gross salvage?**

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A. Gross salvage is the amount recorded for the property due to the sale, reimbursement, or reuse of the property. Depending upon the type of plant the gross salvage may decrease with age. However, the gross salvage of scarp metal, such as copper, steel, aluminum may increase with age due to inflation.

**Q. What is Cost of Removal?**

A. The costs incurred in connection with the retirement from service and disposition of the depreciable plant. The cost of retiring which are labor and equipment intensive increases with age because of inflation.

**Q. What are the varying methods of life analysis used in the depreciation study of mass property accounts?**

A. In conducting life analysis as part of the depreciation study of electric utility plant assets, varying methods that are typically used in determining the life parameters are actuarial or retirement rate method, and simulated plant record method.

**Q Please explain the actuarial or retirement rate method of life analysis.**

A. The actuarial or retirement rate method is used for determining the Iowa curve parameters for mass property account that has aged data.[4] Based on the analysis of the retirement data for each account, the proportion surviving for each period or vintage is developed as part of the original life table[5] to plot a stub curve. In order to smooth out and extend the stub curve, an Iowa survivor curve is selected by visually comparing the proportion surviving of the selected curve to the corresponding stub curve. The survivor

[4] A collection of property data for which the dates of placements, retirements, transfers, and other actions are known.

[5] See Appendix-A of my testimony

curve that best fits the data, visually, is used to calculate the composite remaining life of the mass property account. Statistical tests for the goodness of fit indicator (GFI) and conformance Index (CI) which are based on the sum of the squared differences between the selected and observed data[6] may also be used to mathematically fit the curve. The Iowa curve which typically yields a lower goodness of fit indicator (GFI) and higher conformance index (CI) may be considered to be the curve which the mass property account under study is experiencing.

**Q. What are survivor curves?**

A. Survivor curves are graphical representations showing the number of items in service at any given age. The most common survivor curves used in utility depreciation are the family of curves known as Iowa survivor curves (developed at Iowa State University)[7]. There are four types of curves named for the relation of the mode of the curve with respect to the average service life of the survivor curve. Iowa curves are distinguished both by their modal characteristics and by their interval number. These characteristics are specified in two-character designations which dictate the shape of an Iowa curve. Examples of such designations are R3, S1, and L5. In this convention, the first character is a letter which indicates one of four modal characteristics: R, S, L, or O. The first three types of Iowa curves are shown in Figure 1. For an L, or "left," curve the sharpest drop in population occurs before the average service life (ASL) for the entire group. An R, or

[6] GFI= Square root of the sum of the squared deviations between the observed and selected data points of the curve, CI = Average of the observed data divided by the square root of the average squared deviation.

[7] The source for most of the Iowa curve data points used in the staff analysis are derived, by interpolation, from "Statistical Analyses of Industrial Properties" by Robley Winfrey, Published by Iowa State University, Engineering Research Institute, Bulletin 125 (Revised), pages 102-106. A copy of which is available for viewing in the PUC library. The data points for R0.5 Iowa Curve, the data points are derived from the company filed data and the Cities testimony Schedule-4, pages 16-17.

"right," curve represents a population which experiences its sharpest drop in percent of survivors *after* the ASL. An S, or "symmetrical," curve suffers its sharpest rate of decline *at* the ASL. An O, or "original" curve suffers its sharpest drop in survivors right at the beginning, or origin, of the graph. In other words the retirement occurs at the earliest years. The second character in the Iowa curve designation represents the curve's interval number. This number shows variation of the curve in terms of maximum life or tail of the curve. Figure-2 shows left modal ("L") Iowa curves with different interval numbers. A low interval number (L0) means that the maximum life for the curve is higher than the curve with the higher interval number L5. .

**Figure-1, Iowa Curves**

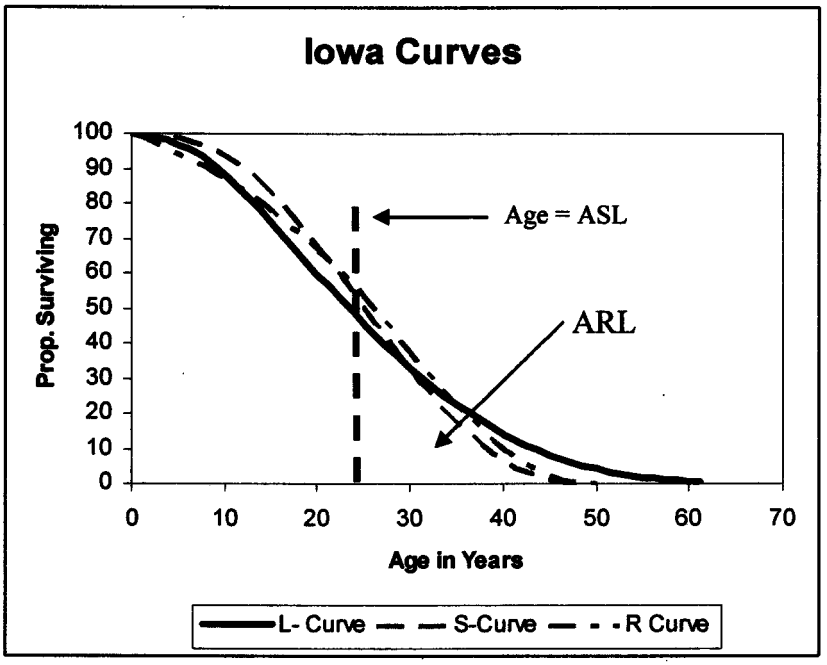


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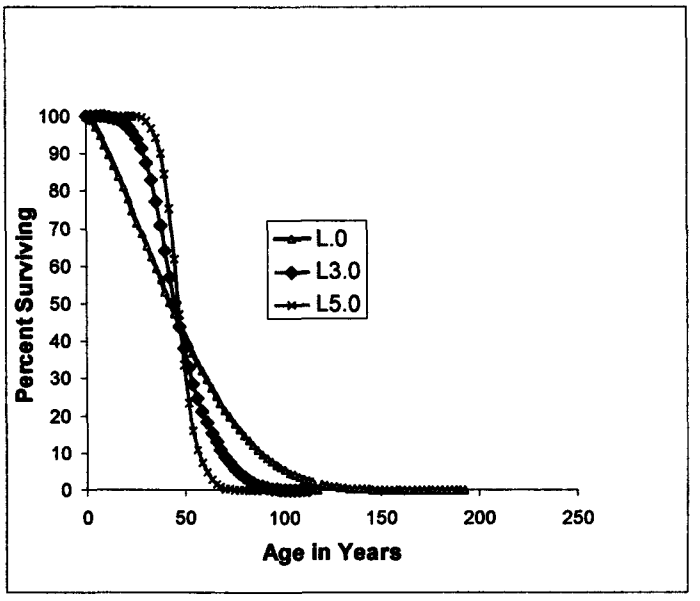
**Figure 2: Samples of L0, L3, and L5 curves**




**Q. What is a stub survivor curve ?**

A. A stub survivor curve represents the observed experience for a particular account or class of property that does not reach the value of 0% surviving. A curve developed by statistical analysis of the observed experience is spoken of as a "smoothed" curve. Often observed experience does not extend to older lived units. Under these conditions the predicted experience for older lived units is spoken of as an "extended" curve. Generally a curve developed or selected for estimating purposes is a curve which has been both "smoothed and extended"

**Q. What method is used for calculating depreciation expense for TCC? And Why?**

A. To calculate the depreciation rates for TCC, straight line remaining life technique is used. Public Utility Regulatory Act (PURA) section 36.056(a) authorizes the Commission to establish methodology for determining depreciation of a regulated utility. PUC

Substantive Rule §25.231(b)(1)(B) states that depreciation expense shall be based on original cost and computed on a straight line basis as approved by the commission. Other methods of depreciation may be used when it is determined that such depreciation methodology is a more equitable means of recovering the cost of the plant. Based on my review of the NARUC publication,[8] most of the regulated utilities nationwide use the straight-line method of depreciation for rate-making purposes. In this method, the yearly depreciation accrual is constant. This means that the value of the property drops at a constant rate throughout the useful life of the property.

**B. Summary of Depreciation Concepts**

**Q. Please summarize the basic concepts presented in this first part of your testimony.**

A. The depreciation study of steam and other production plant unit consists of determining remaining life of the plant unit using life span and interim retirement rate method and determining the appropriate net salvage value based on reasonable and credible evidence. The depreciation rate for each production plant and other production plant is calculated by using remaining life technique.

The depreciation study for mass property account consists of the following; 1) conducting life analysis by reviewing historical additions and retirement data for the account for selecting the appropriate life parameter, 2) using the selected life parameter, derive CRL for each mass property account from the company depreciation model by applying the appropriate depreciation procedure, such as broad group, 3) determining the net salvage value for the mass property account based on historical data and future

[8] Public Utility Depreciation Practices, published August 1996 by the NARUC staff subcommittee on depreciation.

expectation of cost of removal and salvage for the account, 4) calculating the book reserve ratio based on the company's accounting data, 5) calculating the depreciation rate by using the straight line remaining life technique, and 6) calculating the depreciation expense by multiplying the original investment by the calculated depreciation rate.

## IV. ANALYSIS OF TCC's PROPOSED DEPRECIATION

**Q. Have you conducted a detailed analysis of TCC's proposed depreciation rates?**

A. Yes, I have. I will provide my analysis for each account category, describing the methodology used by the company to determine the life parameter, the proposed net salvage value, book reserve ratio, the depreciation rate, and the annual depreciation expense. I have also provided my recommendations for the life parameter, net salvage value, the depreciation rate and the annual depreciation expense amount for each account. Staff Exhibits -1, 2 and 3 provide a list of my proposals for each FERC account.

### A. Analysis of TCC's Methodology for Life Analysis

**Q. What methodologies were used by the company to do life analysis? And what is your assessment?**

A. The company used the actuarial method for the mass property accounts. This method is generally used by the utilities to determine the life and the survivor characteristics of the

mass property accounts for which the aged historical retirement data is recorded by the company.

Although I have used the same methodology for the life analysis for the mass property accounts as used by TCC, the resulting life parameter for some of the accounts are different in my proposal. My proposed life parameters are a better fit to the observed data because the statistical tests yield better results than the TCC proposed values and also yield a better visual fit in terms of the curve plot. I have provided detailed information of these tests and analysis in the account specific depreciation section of my testimony.

**Q. Please explain how the actuarial method of life analysis was used in the TCC's Depreciation study.**

A. TCC used the actuarial method for determining the life parameters for some of the account categories for which the company had aged data.[9] Based on the analysis of the retirement data, the company developed the proportion surviving for each period as part of the original life table[10] and plotted a stub curve. In order to smooth out and extend the stub curve, the company selected a life parameter and plotted the survivor curve for visually comparing the proportion surviving of the selected curve to the corresponding stub curve. The survivor curves that best fit the data, visually, in the company's estimate was used to calculate the composite remaining life of the mass property account. The company used this method for nine (9) account categories of transmission plant assets,

[9] A collection of property data for which the dates of placements, retirements, transfers, and other actions are known.
[10] See Appendix-A to my testimony.

twelve (12) account categories of distribution plant assets and one (1) account category of General Plant assets. The company did not conduct life analysis for seven (7) account categories of its general plant assets.

I analyzed the company study for all the account categories and agreed with the company proposed life parameter and the CRL for all but six FERC accounts in the distribution plant asset category. For those six accounts I used the company provided aged data contained in its study[11] and independently plotted the stub curves using the company's actual proportion survival data. I then compared it to the curve plot of my proposed life parameter, the current life parameter and the company proposed life parameter. Next, I observed the curve plots for visual matching and conducted the statistical test to verify the best fit. The statistical test consisted of computing the Goodness of fit indicator (GFI)[12], and conformance index (CI) value[13]. For each one of those six accounts I proposed a different life parameter that was a better visual and mathematical fit.

Specifically, I agree with TCC's proposed life parameters for all nine (9) transmission plant accounts that use actuarial method of analysis. I agree with TCC's proposed life parameters for four (4) distribution plant accounts that use actuarial method of analysis, but propose different life parameters for FERC Account No. 361, Structures and Improvements, Account No. 362, Station Equipment, Account No. 364, Poles, Towers and Fixtures, Account No. 365, Overhead Conductors and Devices, Account No.

[11] Depreciation study work papers, TCCWP/Exhibit JEH-1
[12] GFI is the square root of the sum of the differences of the company proposed Iowa curve and actual data, and my recommended Iowa curve and the actual data, the lower the value of GFI better the fit.
[13] The CI is calculated by dividing the average of the original data by the square root of the mean of the differences, higher the value of CI better the fit.

367, Underground Conductor, Account No. 368, Line Transformers, Account No. 371, Installation on Customer Premises, and Account No 373, Street Lighting and Signal Systems.

I agree with TCC's proposed life parameter for one (1) General Plant account that uses the actuarial method of analysis. Also, I agree with TCC proposal to retain the currently effective life parameters for the remaining seven (7) General Plant accounts for which no life analysis study was conducted

A detailed analysis included in the account specific depreciation section of my testimony shows the curve plot for my recommended life parameter along with the statistical test for each account to support my recommendation.

**B. <u>Analysis Of TCC's Procedure for Determining the CRL.</u>**

**Q. How did the Company determine the CRL for the mass property accounts?**

A. Based on its proposed life parameter, the company used its proprietary computer model to determine the average remaining life for each vintage and applied Average Life group procedure to determine the CRL.

**Q. How did you calculate the CRL?**

A. I independently calculated the CRL based on my proposed life parameter. For each vintage of the account I derived the average remaining life from the proposed survivor curve for the attained age. A theoretical reserve (TR) amount for each vintage was

calculated based on the proposed average service life and the remaining life[14]. The CRL for the account was calculated by using the following formula.

$$CRL = ASL \times \left(1 - \frac{Total\ Theoretical\ \text{Re}serve}{Total\ Surviving\ Balance}\right)$$

The methodology, I have used for deriving the remaining life for each vintage is consistent with the methodology described on page 135 of the Public Utility Depreciation Practices, published by NARUC in August 1996. The calculation of the theoretical reserve and the CRL is consistent with my observation of the methodology used in the TCC's depreciation study.

## V. Analysis of TCC's Traditional Method of Determining the Future Net Salvage Value.

**Q. Please explain the methodology used for determining the Net Salvage Value.**

A. For the mass property accounts, (Transmission, Distribution and General Plant) the company used the historical salvage data for the time period 1984-2005. After calculating 3-year rolling averages to study the trend for gross salvage value and cost of removal, it applied its judgment based on its future expectations to propose the net salvage value for each FERC account.

**Q. Do you agree with the methodology used by the company?**

[14] Theoretical Reserve % (TR) = (1-Remaining Life ÷ Average Service Life), Theoretical Reserve Amount= (TR × Surviving Balance). Please see Staff Appendix B for the detailed calculations and the formula used in calculating the Remaining life and the Theoretical Reserve amount for each vintage.

A. Not completely. Although I agree with the traditional methodology to determine the trend for the gross salvage and the cost of removal, I do not agree with its methodology in projecting the future net salvage value to be used in calculating the depreciation rate.

Q. **Please explain.**

A. The company used a limited number of years to determine the gross salvage ratio (GS) and the cost of removal ratio (CR) and calculated the future net salvage value (FNS) by deducting the CR from the GS. The company calculated the ratio by dividing the dollar amounts of salvage and cost of removal amounts for the period 1984-2005, by the total original investment dollars retired during those years and proposed to use the resulting ratio to calculate the future net salvage value for the entire plant balance of the account. I find that this approach is problematic. The dollars included in the denominator, for calculating the ratios, are from different time periods than the numerator and thus reflect past periods of very high inflation in the calculation. In other words the investment dollars included in the denominator as retired in 1984 are the sum total of the original dollars of several vintages dating from 1921 through 1984, whereas the cost of removal shown in the numerator is the amount incurred in 1984. The company's proposal, to use this ratio as the basis to be applied across the entire plant balance of the account over the expected remaining life, is tantamount to predicting that the future inflation will be the same as the past. This is problematic because the inflation rates during the years 1964-1984 were very high and projecting that into the future would result in overestimating the cost of removal. In Table-3 below I have provided a hypothetical example to demonstrate the problem.

**Table-3 (Hypothetical Example)**

| Year Plant Added | Year Plant Retired. | Original Cost of Retirement | Recorded Cost of Removal $ | Cost of Removal (%) |
|---|---|---|---|---|
| (a) | (b) | (c) | (d) | (e)=(d)/(c) |
| 1928 | 2000 | 1,000 | 500 | 50 |
| 1938 | 2001 | 2,000 | 1,200 | 60 |
| 1948 | 2002 | 3,000 | 2,100 | 70 |
| 1958 | 2003 | 4,000 | 3,200 | 80 |
| 1968 | 2005 | 5,000 | 6,000 | 120 |
| Total | | 15,000 | 13,000 | 87% |
| 5-year Avg. | | | 2,600 | |

In the hypothetical example shown in Table-3, the years of "plant added" shown in column (a) are the years in which the assets in column (c) were originally added to plant. The years of "plant retired" in column (b) are the years these assets were retired from service. These assets were added to plant in service several years ago, they lived their service life, and then they were retired or withdrawn from service. The cost of removal amounts in column (d) are the retirement costs recorded in the retirement year. For example, an asset purchased for $4,000 in 1958 was retired from service in 2003. At the same time, the company in the example replaces the asset and assigns $3,200 to the cost of removal as shown in column (d). The ratios in column (e) are the cost of removal amount expressed as a percentage of the original cost of the retired assets; that is: $3,200 removal ÷ $4,000

original cost = 80 percent. Instead, if the cost of removal was expressed in 1958 dollars, the amount would be \$474[15], which would be equal to 12% of the original dollars retired. Thus the effect of inflation is almost 670%. Now, assuming that the total plant balance in the account is \$10,000,000, under the company's proposal the CR of 87% will be applied across the entire plant balance for the expected remaining life of the assets. Assuming that the expected remaining life is 20 years, under the company's proposal, the total amount requested for the cost of removal would be \$8,700,000, which is about \$435,000 per year. This requested amount is approximately 167 times higher than the actual average experienced (\$2,600) during the five years of history, which is based on a small percentage (0.15%) of retirement dollars. I have used this example to show the magnitude of the overestimation that might result by using small samples and projecting past inflation that is implicit in the traditional calculations.

**Q. What does TCC specifically request for the cost of removal in its proposal?**

A. The total cost of removal amounts requested by TCC on a going forward basis is shown in Table-4 below for the transmission, distribution and general plant accounts. The company's proposal is an order of magnitude higher than its actual historical experience. As shown in Table-4 below, the company requested amount for transmission plant is 642% higher than the average cost of removal it experienced during 1984 -2005.

[15] \$474 = \$3200 × {86.6 (CPIU for 1958) ÷ 584.2 (CPIU for 2005)}

**Table-4 (Summary of Cost of Removal)**

| Plant | Total Cost of Removal (CR) 1984-2005 | Average Actual Cost of Removal | Company Proposed CR for the Remaining Life of Plant | Comp Prop. Rem. Life | Comp Prop CR Per Year | % Increase |
|---|---|---|---|---|---|---|
| **Transmission** | $ 14,559,100 | $ 661,777 | $ 278,792,291 | 56.76 | $4,911,774 | 642% |
| **Distribution** | $115,342,874 | $ 5,242,858 | $ 754,381,649 | 31.40 | $ 24,024,893 | 358% |
| **General Plant** | $1,184,327 | $ 53,833 | $2,992,366 | 13.83 | $216,368 | 302% |
| **Total** | $131,086,301 | $5,958,468 | $1,036,166,306 | 34.63 | $29,153,035 | 389% |

**Q. Is the methodology used by the Company addressed in any texts?**

A. Yes, the NARUC's 1996 Public Utilities Depreciation Practices Manual has addressed, and is even read by some as endorsing this methodology. Specifically, on page 18 it states:

> *"Net salvage is expressed as a percentage of plant retired by dividing the dollars of net salvage by the dollars of original cost of plant retired. The goal of accounting for net salvage is to allocate the net cost of an asset to accounting periods, making due allowance for net salvage, positive or negative, that will be obtained when the asset is retired. This concept carries with it the premise that property ownership includes the responsibility for the property's ultimate abandonment or removal. Hence, if current users benefit from its use, they should pay their pro rata share of the costs involved in the abandonment or removal of the property and also receive their pro rata share of the benefits of the proceeds realized. This treatment is in harmony with the generally accepted accounting principles and tends to remove from the income statement any fluctuations caused by erratic, although necessary, abandonment and removal operations. It also has the advantage that current customers pay or receive a fair share of costs associated with the property devoted to their service, even though the costs may be estimated."*

**Q. What is your opinion of NARUC's thinking in this regard?**

A. I believe that the matching principle is at the heart of NARUC's thinking. NARUC focuses on the timing or pattern of cost of removal allocation and intergenerational equity. Unfortunately, NARUC does not address the fundamental questions of whether a company will actually incur the costs that the traditional methodology anticipates, and the intergenerational inequity of charging these inflated amounts to ratepayers when the historical experience show that the actual spending pattern is an order of magnitude lower than the traditional methodology's indicated pattern and that the inflation element implicit in the methodology is so overstated. Also, it is worth noting that the 1996 NARUC manual pre-dates SFAS No.143, which according to the company, addresses issues associated with tracking the cost of removal of the legal and non-legal asset removal obligations (ARO) for financial reporting as regulatory liabilities to the SEC [16]. The regulatory liability could be a huge amount under the traditional method, used by TCC, for estimating the future cost of removal.

**Q. Does the NARUC Manual recognize approaches other than the traditional method for estimating the future net salvage value?**

A. Yes. Even though the NARUC Manual seems to endorse the traditional methodology, it recognizes, on page 157, that some jurisdictions have reconsidered:

> *"Some commissions have abandoned the above procedure [gross salvage and cost of removal reflected in depreciation rates] and moved to current-period accounting for gross salvage and/or cost of removal. In some jurisdictions gross salvage and cost of removal are accounted for as income and expense, respectively, when they are realized. Other jurisdictions consider only gross salvage in depreciation rates, with the cost of removal being expensed in the year incurred.*
>
> *Determining a reasonably accurate estimate of the average or future net*

[16] Please see page 12 of company witness Henderson testimony.

*salvage value is not an easy task; estimates can be subject of considerable discussion and controversy between regulators and utility personnel. --- When estimating future net salvage, every effort should be made to ensure that the estimate is as accurate is possible"*

The NARUC depreciation manual further opines on the underlying rationale for treating removal cost as a current-period expense[17], instead of incorporating it in depreciation rates:

*"It is frequently the case that net salvage for a class of property is negative, that is, cost of removal exceeds gross salvage. This circumstance has increasingly become dominant over the past 20 to 30 years; in some cases negative net salvage even exceeds the original cost of plant. Today few utility plant categories experience positive net salvage; this means that most depreciation rates must be designed to recover more than the original cost of plant. The predominance of this circumstance is another reason why some utility commissions have switched to current- period accounting for gross salvage and, particularly, cost of removal."*

**Q. Are there other problems with the TCC study of cost of removal and gross salvage?**

A. My discussion of the TCC methodology and the overstated inflation due to mismatch of the reported dollar amounts assumes reliable data and a relationship between the retirements and the cost of removal shown in the company's studies. Based on my review of the company's historical salvage data and the Company response to staff RFI NVS-3, I find that the data may not be very reliable to study the trend for several accounts because it is typically sporadic, and also has been subject to adjustment by AEPN's accounting department.

[17] See page 158 of the NARUC Manual "Public Utility Depreciation Practices"

A. **Alternatives to Traditional Method**

**Q. Are there any alternatives to traditional method of net salvage analysis?**

A. Yes, there are alternatives to traditional methodology. Below I will briefly discuss a "cash basis" alternative, and three "accrual basis" alternatives. There are probably more alternatives but these are the ones that I believe are plausible alternatives.

Cash Basis Method - Expensing

SFAS No. 143 Fair Value Approach

Normalized Net Salvage Approach

Modified Traditional Approach

**1. Cash Basis Method**

**Q. What is the cash basis method?**

A. The cash basis method removes non-legal removal and dismantlement costs from the depreciation rate process. Those costs would no longer be charged to accumulated depreciation, but instead be either capitalized or expensed. Usually, most utility plant retirements occur in conjunction with replacement of the asset and as such the company allocates a portion of the cost of a replacement project to cost of removal. The allocation, like all allocations, is subjective. Thus, one component of the cash basis method would be to consider capitalizing the entire cost of replacements to plant in service, rather than allocating a portion to cost of removal. This would have the same effect on rate base as the Company's current accounting and would eliminate the problems created by the

allocation. It would have the same effect on rate base because the current accounting debits actual cost to accumulated depreciation which increases rate base.

**2. Accrual Basis Alternatives For determining Future Net Salvage**

**Q. What are the accrual basis alternatives for determining future net salvage value?**

A. There are three accrual basis alternatives to traditional method of determining future net salvage value: the SFAS No. 143 ARO fair value approach, the normalized net salvage allowance approach, and the modified approach.

***a) SFAS No. 143 Fair Value Accrual Approach***

**Q. What is the SFAS No. 143 Fair Value Approach?**

A. The SFAS No. 143 Fair Value Approach calculates the costs for TCC 's non-legal AROs as if they were legal AROs. They are estimated at their future value and then reduced to their fair net present value. It is my understanding that several opening entries would be required under SFAS No. 143 and FERC Order no. 631. This approach is complicated, therefore, I am not recommending that it be used to analyze the TCC future net salvage estimates.

***b) Normalized Net Salvage Allowance Approach***

**Q. What is Normalized Net Salvage Allowance Approach?**

A. The normalized net salvage allowance approach is similar to the cash basis approach except that the annual average net salvage, which includes cost of removal, is included as

a specifically identifiable amount or rate within the annual depreciation accrual. In other words, a normalized net salvage amount is still a component of the depreciation expense accrual and is credited to accumulated depreciation and actual cost of removal continues to be charged to accumulated depreciation. It is my understanding that in the states of Georgia and Pennsylvania some utilities are required to follow this approach. In my opinion, this approach does not take into account the effect of future inflation to the cost of removal and gross salvage. As such, I am not recommending that this method be used at this time. However, I am not precluding the use of this option in the future from the perspective of ratemaking policy considerations.

***c) Modified Traditional Approach***

**Q. What is the modified traditional approach?**

A. The modified traditional approach is my recommended methodology. The modified traditional approach would merely calculate TCC's estimated future cost of removal and gross salvage by modifying the future expectation of the net salvage amount to eliminate the past inflation rate inherent in the company's traditional method of estimation. Under this method, first the annual amount for the cost of removal and gross salvage is determined by using the traditional method and the total net present value of this annual payment is calculated for the remaining life of the asset by discounting it by the appropriate inflation rate. The gross salvage ratio and the cost of removal ratio are calculated by dividing the future amounts determined in the previous steps by the most recent plant balance. The future net salvage ratio is calculated by subtracting the cost of removal ratio by the gross salvage ratio. The inflation rates or discount rate used for

calculating the net present value of the future amount are the 5-year average private employment cost index[18] for the cost of removal and the 5-year average CPIU[19] for the gross salvage value.

Q. **What is your recommendation for determining the future net salvage value?**

A. I recommend using the modified traditional approach, as explained above, for determining the future net salvage value of TCC's plant accounts. I believe that this approach is more reasonable because it is a modification to the traditional method that addresses my concerns regarding inflation. It is less complicated than the SFAS No. 143, Fair Value approach and it is not too drastic a change to the traditional method, unlike the cash value method and the normalized net salvage allowance approach. I believe that the 5-year average inflation rate based on the employment cost index is the appropriate factor for determining the net present value of the cost of removal because it reasonably reflects the future expectation for the labor costs associated with the utility plant removal activity. Also, the 5-year average inflation rate based on CPI-U is the appropriate factor for determining the future gross salvage because it reasonably reflects the future salvage expectations for the amalgamated mix of the utility plant assets. Also, this method relies on the traditional method for determining the annual cost of removal and gross salvage amounts for accounts that have reasonable historical salvage information. For some of the accounts for which the historical retirement activity is sporadic and the cost of removal are not reflective of the economy of scale associated with larger scale retirement,

[18] Employment Cost Index for Transportation and Public Utilities
[19] Consumer Price Index-Urban published by Federal Reserve

either a 10-year or a 5-year average cost of removal and salvage amount may be used as the basis for calculating the net present value over the remaining life of the asset.

**Q. Please provide an example of calculating the Future net salvage value using the traditional method and your recommended modified traditional method for TCC's.**

A. I will demonstrate the future net salvage calculations for FERC Account No 368, Line Transformers using the traditional method, which is the company proposed, and my recommended method. Table -5 below shows the historical salvage data contained in the work papers of the company witness Henderson testimony.

**Table-5 (Historical Salvage Data for Account 368: Line Transformers - Distribution Plant)**

| Year | Original Cost Retired | Gross salvage | Cost of Removal | Net Salvage | NS % |
|---|---|---|---|---|---|
| 1984 | 1276260 | 157849 | 186538 | -28689 | -2% |
| 1985 | 2146621 | 161213 | 182135 | -20922 | -1% |
| 1986 | 1677127 | 203033 | 261838 | -58805 | -4% |
| 1987 | 1290992 | 143340 | 178996 | -35656 | -3% |
| 1988 | 1419305 | 25344 | 80421 | -55077 | -4% |
| 1989 | 1618991 | 79957 | 105240 | -25283 | -2% |
| 1990 | 1887674 | 34827 | 51629 | -16802 | -1% |
| 1991 | 1387963 | 10591 | 84308 | -73717 | -5% |
| 1992 | 1178180 | 13643 | 88756 | -75113 | -6% |
| 1993 | 2453886 | 59622 | 451148 | -391526 | -16% |
| 1994 | 1784317 | 49381 | 224115 | -174734 | -10% |
| 1995 | 844129 | 0 | 0 | 0 | 0% |
| 1996 | 7699 | 3697 | 33139 | -29442 | -382% |
| 1997 | 3914116 | 44160 | 1025186 | -981026 | -25% |
| 1998 | 336295 | 8971 | 97363 | -88392 | -26% |
| 1999 | 6538119 | 286821 | 1856295 | -1569474 | -24% |
| 2000 | 2595455 | 128362 | 831824 | -703462 | -27% |
| 2001 | 2351703 | 135473 | 1182705 | -1047232 | -45% |
| 2002 | 1348274 | 169216 | 928249 | -759033 | -56% |
| 2003 | 13148035 | 120710 | 1133852 | -1013142 | -8% |
| 2004 | 3700646 | 264152 | 722893 | -458741 | -12% |

| | | | | | |
|---|---|---|---|---|---|
| 2005 | 4884731 | 157 | 23479 | -23322 | 0% |
| | | | | | |
| Total | $ 57,790,518 | $ 2,100,519 | $9,730,109 | $(7,629,590) | -13% |
| | Overall Average | 4% | 17% | | |
| Company Proposal | | **4%** | **17%** | **-13%** | |

Using the traditional method, TCC calculated the overall average ratio for GS and Cost of removal as 4% and 17% and proposed to use the ratios to calculate the future net salvage of negative 13% to be applied to the plant balance amount of $303,338,815 over its proposed remaining life of the asset. Under my recommended modified traditional method, as shown in Table-6, the future net salvage value (FNS) is calculated using the data contained in Table-5.

**Table-6**
**Account 368: Line Transformers – Modified Traditional Method of Calculation of FNS**

| | | |
|---|---|---|
| Surviving Plant Balance as of (12/31/2005) | $ 303,338,815 | |
| Retirement % | 19.05% | |
| Remaining Life | 29.92 years | |
| | **GS** | **CR** |
| Company Prop Ratio | 4% | 17% |
| Company Prop Total Amount | $12,133,553 | $51,567,599 |
| Company Prop Annual Amount | $405,533 | $1,723,516 |
| | | |
| Present Value (PV)[20] | $8,295,060 | $30,835,705 |
| PV/SB | **3%** | **10%** |
| **FNS -Staff** | **-7%** | |

[20] PV= C * [(1-(1/(1+i)^n) / i], where C= Annual amount, i = inflation rate, and n= remaining life in years

As shown in Table –6 above, there are five steps involved in calculating the FNS, using my recommended modified traditional method.

Step-1: The Company proposed total amounts of GS and CR are calculated by multiplying the surviving plant balance of $303,338,815 by company ratios of 4% and 17% respectively.

Step-2: The company proposed annual amount based on tradition method is calculated by dividing the amounts from Step-1 by the staff proposed remaining life (29.92 years) of the asset.

Step-3: The present values of the annual amounts for GS and CR are calculated by using the inflation rates of 2.66% and 3.71% over the composite remaining life of the assets; respectively.

Step-4: The results obtained in Step-3 are divided by the surviving plant balance of the study period to obtain the GS and the CR ratios.

Step-5: FNS value is calculated by subtracting CR ratio from the GS. All ratios are rounded to the nearest whole number.

**Q. Have you calculated the FNS for all of the TCC's FERC accounts using your recommended methodology?**

A. Yes. I have. A summary list of my proposed GS, CR and the FNS values are shown in attached Exhibit NVS-3. The detailed calculation showing my analysis of the TCC salvage history is included in Appendix-C of my testimony.

## B. ACCOUNT SPECIFIC DEPRECIATION ANALYSIS

**Q. Have you conducted plant specific depreciation analysis?**

A. Yes. I have provided a detailed analysis and my recommended rates for each account category in the following paragraphs. The development and calculation of the company proposed depreciation rate and my proposed depreciation rate for different FERC accounts, based on plant balance ending December 31, 2005, are shown in attached Exhibit-NVS-1. The proposed life parameter and net salvage value for different FERC accounts are shown in attached Exhibit NVS-3 of my testimony. The original plant balance, reserve balance and the annual accrual amounts based on the current depreciation rate, TCC's proposed depreciation rate, and my recommended depreciation rate for the test period ending June 30, 2006 are shown in attached Exhibit NVS-2 of my testimony.

### 1. TRANSMISSION PLANT ACCOUNTS

**Q. Please provide your analysis for transmission plant accounts?**

A. My analysis for transmission plant account category includes nine (9) accounts. Table-7 shown below provides information on proposed life parameter, and net salvage values. As of the test date, June 30, 2006, the original investment for the total transmission plant assets is $886,737,606. For the depreciation study period ending December 31, 2005, the original investment is $811,615,610 and the book reserve is $269,733,364 (33.23%). For the test period ending June 30, 2006, the current composite annual depreciation accrual

for the transmission plant assets is $14,606,676. The company has proposed, effective June 30, 2006, the composite depreciation expense for the transmission plant at $13,729,425, which is a decrease of $877,251 (approximately 6%). Based on my review of the company's depreciation data included in the study, I recommend an annual depreciation accrual of $11,685,169, which is a decrease of $2,921,507 (approximately 20%) to the current accrual for the total transmission plant. My recommendation decreases the company proposed depreciation expense by $2,044,255 for the total transmission plant.

Table-7 below provides a summary of my recommended life and net salvage value parameters for the transmission plant assets. The following paragraphs show a detailed depreciation analysis for each FERC account category of the transmission plant.

**Table–7 Summary of Life and Salvage Values- Transmission Plant**

| Account No. | Account Description | Current Curve | Current Net Salv. %. | Comp. Prop. Curve | Comp Prop Net Salv. % | Staff Prop Curve | Staff Prop Net Salv. % |
|---|---|---|---|---|---|---|---|
| 350.1 | Land Rights/Right of Way | 65-R4.0 | 0 | 75-R5.0 | 0 | 75-R5.0 | 0 |
| 352.0 | Structures & Improvements | 55-R3.0 | -9 | 55-L1.0 | -1 | 55-L1.0 | 0 |
| 353.0 | Station Equipment | 62-R2.0 | 0 | 62-L0.5 | 1 | 62-L0.5 | 2 |
| 354.0 | Towers & Fixtures | 71-S3.0 | -21 | 81-S3.0 | -2 | 81-S3.0 | 5 |
| 355.0 | Poles & Fixtures | 65-R2.0 | -50 | 70-R1.0 | -70 | 70-R1.0 | -27 |
| 356.0 | OH Conductor & Devices | 65-R2.0 | -31 | 75-R3.0 | -29 | 75-R3.0 | -10 |
| 357 | Underground Conduit | 60-R2.0 | -5 | 65-R2.0 | -5 | 65-R2.0 | -3 |

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| Account No. | Account Description | Current Curve | Current Net Salv. % | Comp. Prop. Curve | Comp Prop Net Salv. % | Staff Prop Curve | Staff Prop Net Salv. % |
|---|---|---|---|---|---|---|---|
| 358 | Underground Conductor | 40-R2.0 | 0 | 50-R3.0 | 0 | 50-R3.0 | 0 |
| 359 | Roads and Trails | 55-R4.0 | 0 | 65-R4.0 | 0 | 65-R4.0 | 0 |

**Q. What is your analysis for Account No. 350.1 Rights of Way?**

A. This account includes, as of June 30, 2006, original investment of $36,741,615. For the depreciation study period ending December 31, 2005, the original investment is $36,666,721 and the book reserve is $16,401,633 (44.73%). This account consists of land and land rights and easements associated with Transmission lines or Transmission substations. There was minimal retirement activity in this account. The company stated that the rights-of-way for transmission plant will most likely be retained and reused whenever possible. Based on the limited life analysis, the company proposed to change to a 75-R5 life parameter. The current life parameter is 65-R4. Since land rights intrinsically have no removal costs (removal costs are attributed to the property on the land) and have no salvage value, the company proposed a 0 percent net salvage for this account. My review indicates that the company proposals for the life parameter and net salvage value are reasonable. The company used the proposed life parameter to derive the CRL from its depreciation model, which yielded 54.43 years. To calculate the depreciation rate the remaining life technique was used which yielded 1.02%. I concur with the company on the proposed depreciation rate. The current depreciation rate for the account is 1.23% and the annual expense is $451,922 for the test period. The proposed

depreciation rate of 1.02% results in an annual expense of $374,764, which decreases the current annual accrual by $77,157 for the test period ending June 30, 2006. I recommend approval of a 1.02% depreciation rate for this account, because it is based on reasonable life parameter and net salvage value as discussed above.

**Q. What is your analysis for account No. 352, Structures and Improvement?**

A. For the test period ending June 30, 2006, this account includes original investment of $7,376,422. For the depreciation study period ending December 31, 2005, the original investment is $7,474,333 and the book reserve is $3,270,608 (43.76%). The assets in this account include in-place structures and improvements used in connection with the transmission operations. The company proposed a 55-L1.0 Iowa curve for the life parameter and a negative 1% net salvage value. The company used the actuarial method of analysis to determine the curve shape. The currently effective life parameter and net salvage value are 55-R3 and negative 9% respectively. My review of the company study indicates that the company proposed life parameter fits better than the currently effective life parameter for the observed retirement as shown in its study, TCC WP/Exhibit JEH-1, pages 27-30, for the experience bands 1956-2005, 1976-2005, and 1996-2005. Therefore, I recommend approving 55-L1.0 as the life parameter for this account.

The derived CRL from the company model by using the recommended life parameter is 43.12.

The current net salvage estimate for this account is negative 9%. The company proposed net salvage value of negative 1% is not reasonable for this account. My analysis of the company filed historical data (see Appendix-C) indicates that the

calculated GS and CR, using my recommended modified traditional approach, are 1% each and the resulting future net salvage value is 0%.

The current depreciation rate and the annual expense for the account is 1.69% and the annual accrual is $124,662 for the test year. The company proposed depreciation rate and the annual accrual for the account is 1.33% and $98,106. The depreciation rate derived by using my recommended life parameter and future net salvage value is 1.30% and the annual accrual is $95,893. The recommended rate of 1.30% reduces the annual accrual by $28,768 from the current accrual and by $2,213 from the company proposed accrual. I recommend approval of a 1.30% depreciation rate for this account, because it is based on reasonable life parameter and net salvage value as discussed above.

**Q. What is your analysis for account No. 353, Station Equipment?**

This account includes original investment of $417,468,281, for the test period ending June 30, 2006. For the depreciation study period ending December 31, 2005, the original investment is $355,337,613 and the book reserve is $88,885,926 (25.01%). The assets included in this account are the installed equipment used for transforming, converting and switching to change the characteristics of electricity in connection with its transmission or for controlling transmission circuits. The company proposed a 62-L0.5 for life parameter and positive 1% for net salvage value. The company used the actuarial method of analysis to determine the curve shape. The currently effective life parameter and net salvage value are 62-R2 and 0%. My review of the company study for this account indicates that the company proposal for the life parameter is a better fit for the observed life table. I recommend approving the company proposed life parameter.

The derived CRL from the TCC's depreciation model using the recommended life parameter for the account is 53.62 years.

The company proposed net salvage value of positive 1% is not reasonable. My analysis of the historical net salvage data for this account (see Appendix C), using the modified traditional methodology, indicates that it should be 2%.

The current depreciation rate and the annual expense for the account is 1.45% and the calculated annual accrual is $6,053,290. For the test period ending June 30, 2006, the Company proposed depreciation rate is 1.38% and the annual accrual is $5,761,062. My recommended depreciation rate is 1.36% with an annual accrual of $5,677,569. My proposal decreases the annual accrual by $375,721 from the currently approved rate and reduces the accrual by $83,494 from the company proposed rate. I recommend approval of a 1.36% depreciation rate for this account, because it is based on reasonable life parameter and net salvage value as discussed above.

**Q. What is your analysis for Account No. 354, Towers and Fixtures?**

A. This account includes original investment of $36,367,901 for the test period ending June 30, 2006. For the depreciation study period ending December 31, 2005, the original investment is $36,919,777 and the book reserve is $20,237,309 (54.81%). The assets included in this account are the installed towers and appurtenant fixtures used for supporting overhead transmission conductors. The company proposed an 81-S3 Iowa curve for the life and negative 2% net salvage value. The current life parameter and net salvage value are 71-S3 and negative 21% respectively. First, my review of the company study indicates that the company used the actuarial method of analysis to determine the

life parameter, which indicates that the company proposed life parameter is reasonable, therefore, I recommend approval of the life parameter 81-S3. The company derived CRL for the recommended life parameter is 58.9 years.

My review of the historical salvage data for this account (see Appendix C) using the modified traditional method indicates that positive 2% future net salvage is appropriate for this account. The company's proposed net salvage value of negative 2% is not reasonable.

The current depreciation rate and the annual expense for the account is 1.39% and the annual accrual is $505,514 as of test period ending June 30, 2006. The Company proposed depreciation rate is 0.8% and the annual expense is $290,943. My calculated remaining life depreciation rate based on recommended life parameter and net salvage value is 0.68% with an annual accrual of $247,302. My recommended depreciation rate results in a decrease of $258,212 to the current accrual and a decrease of $43,641 to the company proposal. The decrease I am recommending is due to the adjustment I recommended for the cost of removal as discussed previously in my testimony. I recommend approval of a 0.68% depreciation rate for this account, because it is based on reasonable life parameter and net salvage value for this account as discussed above.

**Q. What is your analysis for account No. 355, Poles and Fixtures?**

A. This account includes original investment of $185,462,174 as of the test period ending June 30, 2006. For the depreciation study period ending December 31, 2005, the original investment is $178,244,059 and the book reserve is $66,111,110 (37.09%). The assets in this account include the installed transmission line poles, wood, steel, or concrete

together with appurtenant fixtures used for supporting overhead transmission conductors. The company proposed a 70-R1 Iowa curve for life parameter and a negative 70% for net salvage value. The company used the actuarial method to determine the curve shape using the experience bands for 1956-2005, 1976-2005, and 1996-2005. The study shows that the company proposed life parameter is reasonable. Therefore, I recommend approval of the company proposed life parameter.

The derived CRL for the recommended life parameter is 60.1 years for the account.

Based on my review of the historical net salvage data (see Appendix-C), using the modified traditional approach, the calculated future net salvage value is negative 27%. I recommend approval of negative 27% FNS for the account. The company's proposed net salvage value of negative 70% is unreasonable.

The current depreciation rate and the annual expense for the account for the test period ending June 30, 2006 are 2.06% and $3,820,521 respectively. The company proposed depreciation rate is 2.21% and the annual accrual is $4,098,714 and my recommended depreciation rate is 1.5% with an annual accrual of $2,781,933. My recommendation decreases the annual accrual by $1,038,588 from the currently approved rate and reduces the accrual by $1,316,781 from the company proposed rate. I recommend approval of a 1.5% depreciation rate for this account, because it is based on reasonable values of life parameter and net salvage value as discussed above.

**Q. What is your analysis for account No. 356, Overhead Conductors and Devices?**

A. This account includes original investment of $186,831,546 for the test period ending June 30, 2006. For the depreciation study period ending December 31, 2005, the original investment is $180,482,790 and the book reserve is $68,268,027 (37.83%). The assets included in this account are the installed overhead conductors and devices used for transmission purposes. The company proposed life parameter is 75-R3. The current life parameter is 65-R2. I recommend approving 75-R3 for the life parameter. The actuarial method of life analysis is used to set the life parameter. The derived CRL from the TCC's depreciation model, based on the recommended life parameter, is 60.05 years.

The company proposed net salvage value of negative 29% for this account is not reasonable. The current net salvage value is positive 15%. My analysis of the company filed historical net salvage data, using the modified traditional approach, indicates that a negative 10% FNS is appropriate for this account. (See Appendix C.)

For the test period ending June 30, 2006, the current depreciation rate is 1.77% and the calculated annual accrual is $3,306,918. The company proposed depreciation rate is 1.52% and the annual accrual is $2,839,839 and my recommended depreciation rate is 1.2% with an annual accrual of $2,241,979. My recommendation decreases the annual accrual by $1,064,940 from the currently approved rate and reduces the accrual by $597,861 from the company proposed rate. I recommend approval of a 1.2% depreciation rate for this account, because it is based on reasonable life parameter and net salvage value as discussed above.

**Q. What is your analysis for Account No. 357, Underground Conduit?**