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BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 160021-EI
FLORIDA POWER & LIGHT COMPANY
AND SUBSIDIARIES

IN RE: PETITION FOR RATE INCREASE BY
FLORIDA POWER & LIGHT COMPANY
AND SUBSIDIARIES

DIRECT TESTIMONY & EXHIBITS OF:

NED W. ALLIS

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

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DIRECT TESTIMONY OF NED W. ALLIS

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I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Ned W. Allis. My business address is 207 Senate Avenue, Camp Hill, PA 17011.

Q. By whom are you employed and what is your position?

A. I am Supervisor of Depreciation Studies for Gannett Fleming Valuation and Rate Consultants, LLC ("Gannett Fleming"). Gannett Fleming provides depreciation consulting services to utility companies in the United States and Canada.

Q. Please describe your duties and responsibilities in that position.

A. As Supervisor of Depreciation Studies, I am responsible for conducting depreciation, valuation and original cost studies, determining service life and salvage estimates, conducting field reviews, presenting recommended depreciation rates to clients, and supporting such rates before state and federal regulatory agencies.

Q. Please describe your educational background and professional experience.

A. I have a Bachelor of Science degree in Mathematics from Lafayette College in Easton, PA. I joined Gannett Fleming in October 2006 as an analyst. My responsibilities included assembling data required for depreciation studies, conducting statistical analyses of service life and net salvage data, calculating annual and accrued depreciation, and assisting in preparing reports and testimony setting forth and defending the results of the studies. I also developed and maintained Gannett Fleming's proprietary depreciation software. In March 2013, I was promoted to my current position of Supervisor of Depreciation Studies. Since joining Gannett Fleming, I have worked on more than one hundred depreciation assignments.

I am a member of the Society of Depreciation Professionals (the "Society") and an associate member of the joint American Gas Association ("AGA") and Edison Electric Institute ("EEI") industry Accounting Committee ("AGA/EEI"). The Society has established national standards for depreciation professionals. The Society administers an examination to become certified in this field. I passed the certification exam in September 2011. I have also served on the Executive Board of the Society and am an instructor for depreciation training sponsored by the Society.

I have submitted testimony on depreciation related topics to the New York Public Service Commission, the Public Utilities Commission of Nevada, the District of Columbia Public Service Commission, and to the Federal Energy Regulatory Commission ("FERC"). I have also assisted other witnesses in the preparation of direct and rebuttal testimony in nineteen other states and two Canadian provinces. Exhibit NWA-2 provides a list of depreciation cases in which I have been involved and also identifies cases in which I submitted testimony.

Q. Have you received any additional education relating to utility plant depreciation?

A. Yes. I have completed the following courses conducted by the Society of Depreciation Professionals: "Depreciation Basics," "Life and Net Salvage Analysis" and "Preparing and Defending a Depreciation Study."

Q. Are you sponsoring any exhibits in this case?

A. Yes. I am sponsoring the following exhibits:

- NWA-1 2016 Depreciation Study
- NWA-2 List of Depreciation Assignments and Depreciation Testimony

Q. Are you sponsoring any Minimum Filing Requirements ("MFRs") in this case?

A. No.

Q. What is the purpose of your testimony?

A. I am sponsoring the results of a new depreciation study (the "2016 Depreciation Study" or "Study"), filed on behalf of Florida Power & Light Company ("FPL" or the "Company") with the Florida Public Service Commission ("FPSC" or the "Commission") on March 15, 2016. The 2016 Depreciation Study is Exhibit NWA-1 to my testimony. The Study covers depreciable electric properties in service as of December 31, 2014, and actual and projected plant and reserve balances through the end of 2017.

Q. Please summarize your testimony.

A. My testimony will explain the methods and procedures of the 2016

Depreciation Study and will set forth the annual depreciation rates that result from the Study. The Study includes comparison schedules showing current and proposed depreciation parameters, including average service lives, net salvage percentages, depreciation rates, depreciation accruals as well as a comparison of the theoretical reserve to the forecasted booked reserve at December 31, 2017. I also provide additional detail on each section of the Study in my testimony.

The overall result of the 2016 Depreciation Study is an increase in FPL's depreciation rates over the currently approved rates, which will increase FPL's total depreciation expense as of December 31, 2017 by approximately $221 million.[1] As I detail later in my testimony, this increase is primarily due to the impact of capital additions for the Company's generating facilities. That overall increase in depreciation expense is partially mitigated by the service lives and net salvage estimates recommended in the Study.

II. 2016 DEPRECIATION STUDY

Q. Please define the concept of depreciation.

A. The FERC Uniform System of Accounts defines depreciation as:

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[1] Depreciation expense amounts cited in my testimony are based on the pro forma annual depreciation expense calculated as of December 31, 2017 in Exhibit NWA-1. I should note that these may differ from the amounts included in the Company adjustment for 2017 that are referenced in the testimony of FPL witness Ferguson. The Company adjustment is based on the forecast annual depreciation expense to be recorded throughout the year, which will be different from a pro forma amount calculated based on plant balances at the end of the year.

> *Depreciation*, as applied to depreciable electric plant, means the loss in service value not restored by current maintenance, incurred in connection with the consumption or prospective retirement of electric plant in the course of service from causes which are known to be in current operation and against which the utility 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 authorities.[2]

Q. In preparing the 2016 Depreciation Study, did you follow generally accepted practices in the field of depreciation?

A. Yes. The methods, procedures and techniques used in the Study are accepted practices in the field of depreciation and are detailed in my testimony.

Q. Please describe the contents of the 2016 Depreciation Study.

A. The Study is presented in eleven parts:

- Part I, Introduction, presents the scope and basis for the 2016 Depreciation Study;
- Part II, Estimation of Survivor Curves, explains the process of estimating survivor curves and the retirement rate method of life analysis;
- Part III, Service Life Considerations, discusses factors and the

[2] 18 C.F.R. 101 (FERC Uniform System of Accounts), Definition 12.

informed judgment involved with the estimation of service life;

- Part IV, Net Salvage Considerations, discusses factors and the informed judgment involved with the estimation of net salvage;
- Part V, Calculation of Annual and Accrued Depreciation, explains the method, procedure and technique used in the calculation of annual depreciation expense and the theoretical reserve;
- Part VI, Results of Study, sets forth the service life estimates, net salvage estimates, annual depreciation rates and accruals and theoretical reserves for each depreciable group. This section also includes a description of the detailed tabulations supporting the 2016 Depreciation Study;
- Part VII, Service Life Statistics, sets forth the survivor curve estimates and original life tables for each plant account and subaccount;
- Part VIII, Net Salvage Statistics, sets forth the net salvage analysis for each plant account and subaccount;
- Part IX, Detailed Depreciation Calculations, sets forth the calculation of average remaining life for each property group;
- Part X, Detail of Generation Plant, provides a description of the Company's generating units and provides a discussion of the considerations that inform the service life and net salvage estimates for each plant account and the probable retirement dates for each generating unit; and

- Part XI, Detail of Transmission, Distribution and General Plant, provides a description of transmission, distribution and general plant by account and provides a discussion of the considerations that inform the service life and net salvage estimates for each plant account.

Q. Please identify the depreciation method that you used.

A. I used the straight line method of depreciation, remaining life technique, and the average service life (or average service life – broad group) procedure. The annual depreciation accruals presented in my study are 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 each unit, or group of assets, in a systematic and rational manner.

In compliance with the FPSC depreciation rule prescribed in Rule 25-6.0436, Florida Administrative Code ("F.A.C."), depreciation rates are also presented using the whole life technique. Theoretical reserves, which will be discussed in more detail later in my testimony, were calculated using the prospective method of calculating theoretical reserves and compared with the actual book reserves.

Q. Would you please explain the difference between the whole life technique and the remaining life technique?

A. Yes. When using the whole life technique, the cost of an asset (original cost less net salvage) is allocated over the service life of the asset. For a group of assets, the costs of the assets in the group are allocated over the average service life of the group. However, if the service life or net salvage estimates change, or if activity such as retirements or cost of removal do not occur precisely as forecast, the whole life technique will not recover the full cost of the assets over their service lives without an adjustment to depreciation expense.

The remaining life technique accounts for the fact that estimates can (and will) change over time. For this technique, the remaining undepreciated cost (that is, the original cost less net salvage less the book accumulated depreciation) is allocated over the remaining life of the asset. For a group of assets, the remaining undepreciated costs are allocated over the average remaining life. Thus, when using the remaining life technique there is an automatic adjustment, or self-correcting mechanism, that will increase or decrease depreciation expense to account for any imbalances between the book and theoretical reserves.

Q. Is the remaining life technique the predominant depreciation technique used in the utility industry?

A. Yes. Almost all U.S. jurisdictions, including the FERC, use the remaining life technique.

Q. Did you review prior Commission orders on FPL's depreciation accrual rates?

A. Yes. The previous FPL depreciation study ("2009 Depreciation Study"), which was presented in FPSC Docket No. 090130-EI, was performed by my firm. I assisted the depreciation witness in that case, C. Richard Clarke, with the 2009 Depreciation Study, related testimony and attended hearings in that case. I am therefore familiar with all depreciation related testimonies filed in that docket and FPSC Order No. PSC-10-0153-FOF-EI, which included the approval of FPL's current depreciation rates. I have also reviewed the stipulation and settlement orders approved by the Commission in other FPL retail base rate proceedings (Docket Nos. 050045-EI and 120015-EI).

Q. Is the 2016 Depreciation Study consistent with prior Commission orders?

A. Yes. The use of the straight line method, average service life procedure and remaining life technique is consistent with prior Commission orders. The methods used for the estimation of service lives and net salvage are also generally consistent with prior Commission orders.

In Docket No. 090130-EI, the Commission expressed concerns related to the calculation of the average remaining life for each depreciable group that was presented in the 2009 Depreciation Study. The calculation of the composite remaining life in the 2016 Depreciation Study has been modified from the calculation used in the 2009 Depreciation Study to address the Commission's concerns.

The ordered depreciation rates in Docket No. 090130-EI also used a somewhat different method to estimate interim retirements for life span property than was presented in FPL's 2009 Depreciation Study. However, the Commission recognized that the method used in FPL's study was an acceptable method. For the current study, I have used the same method for interim retirements as was used in FPL's last study. As I will explain later in my testimony, the method I have used produces better estimates of future interim retirements and properly reflects the dispersion of interim retirements over the life span of the facilities.

The 2016 Depreciation Study and my testimony also address concerns expressed by the Commission related to the trend of increasing cost of removal for certain mass property accounts. I will discuss that trend in the net salvage section of this testimony.

Q. What are your recommended annual depreciation accrual rates for FPL?

A. My recommended annual depreciation accrual rates are the remaining life rates set forth in Table 1 of Exhibit NWA-1 beginning on page VI-4. These rates were developed using the same methods[3] used by FPL in the 2009 Depreciation Study and follow the rules of depreciation prescribed by the FPSC previously discussed.

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[3] Both the prior and current study used the straight-line method, remaining life technique and average service life procedure. As noted above, in order to address concerns of the Commission related to the calculation of the average remaining life, I have used a different manner of calculating the remaining life in the 2016 Depreciation Study than was used in the 2009 Depreciation Study. While this calculation is different than that used in the study Gannett Fleming performed for Docket No. 090130-EI, both the current and previous study use the remaining life technique.

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, each plant account or subaccount identified as having similar characteristics. In the second phase, I calculated the composite remaining lives and annual depreciation accrual rates based on the service life and net salvage estimates determined in the first phase. The next two sections of my testimony will explain each of these phases of the study.

III. SERVICE LIVES AND NET SALVAGE

Q. Please describe the first phase of the 2016 Depreciation Study, in which you estimated the service life and net salvage characteristics for each depreciable group.

A. The service life and net salvage study consisted of compiling historic data from records related to FPL's plant; analyzing these data to obtain historic trends of survivor and net salvage characteristics; obtaining supplementary information from management and operating personnel concerning accounting and operating practices and plans; and interpreting the above data and the estimates used by other electric utilities to form judgments of average service life and net salvage characteristics.

Q. Did you physically observe FPL's plant and equipment as part of the 2016 Depreciation Study?

A. Yes. For the 2016 Depreciation Study, I held meetings with operating personnel and made field visits to FPL properties to observe representative portions of plant. I also participated in meetings and field visits for the preparation of the Company's previous study filed in 2009. The meetings and field reviews were conducted to become familiar with Company operations and obtain an understanding of the function of the plant and information with respect to the reasons for past retirements and the expected future causes of retirements. This knowledge, as well as information from other discussions with management, was incorporated in the interpretation and extrapolation of the statistical analyses. Meetings were held with various personnel from FPL's Power Generation, Nuclear and Power Delivery business units, as well as meetings with accounting personnel.

Q. What facilities did you observe?

A. In connection with the preparation of the 2016 Depreciation Study, I visited the following facilities and observed operations and maintenance practices at each location:

- Riviera Beach Generating Station
- Martin Generating Station
- Plumosus Substation
- Landings Substation
- Storm Hardening Project, Belvedere Road, West Palm Beach

- St. Lucie Nuclear Generating Station
- West County Generating Station
- Jupiter Substation

Additionally, in connection with the preparation of the study filed in Docket No. 090130-EI, I toured the following facilities:

- Corporate offices - Juno Beach
- General offices – Miami
- Turkey Point Nuclear Generating Station
- Turkey Point Steam Generating Station
- Turkey Point Combined Cycle Generating Station
- Lauderdale Combined Cycle and Gas Turbine facilities
- FPL system control center
- Meter technology center

I also attended meetings with FPL personnel during the preparation of that study.

A. Service Lives

Q. What is the process for the estimation of service lives in the 2016 Depreciation Study?

A. The process for the estimation of service lives was based on informed judgment that incorporated a number of factors, including the statistical analyses of historical data, general knowledge of the property studied, and information obtained from field trips and management meetings. The method of estimation for each depreciable group depended on the type of property studied for each account. "Mass property" refers to assets such as poles, wires and transformers that are continually added and replaced. Depreciable transmission, distribution and general plant assets were studied as mass property. "Life Span property" refers to assets such as power plants for which all assets at a facility are expected to retire concurrently. The processes of estimating service life for mass property and life span property are described in the following sections.

1. Mass Property

Q. What historical data did you analyze for the purpose of estimating service life characteristics for mass property?

A. I analyzed the Company's accounting entries that record plant transactions during the period 1941 through 2014. The transactions included additions, retirements, transfers and the related balances. The Company records also included surviving dollar value by year installed for each plant account as of December 31, 2014.

Q. What methods are generally used to analyze service life data?

A. There are two methods widely used in a typical depreciation study to estimate a survivor curve for a group of plant assets; these are the simulated plant balances method and the retirement rate method.

The simulated plant balance method is used for property groups for which the retirements of property by age are not known. However, it does require continuous records of vintage plant additions and year-end plant balances. The method suggests probable survivor curves for a property group by successively applying a number of alternative survivor curves to the group's historical additions in order to simulate the group's surviving balance over a selected period of time. One of the several survivor curves which results in simulated balances that conform most closely to the book balance may be considered to be the survivor curve which the group under study is experiencing.

The retirement rate method is an actuarial method of deriving survivor curves using the average rates at which property of each age group is retired. It is the preferred method when sufficient data are available. The method relates to property groups for which aged accounting experience is available or for which aged accounting experience is developed by statistically aging unaged amounts. FPL maintains aged accounting data (meaning that the vintage year is recorded for each addition, retirement or transfer), and thus the data at FPL are kept in a manner that enabled the use of the retirement rate method.

The application of the retirement rate method is illustrated through the use of an example in Part II of the 2016 Depreciation Study. The retirement rate method was used for mass property accounts (i.e., depreciable transmission, distribution and general plant accounts). As I will discuss in the next section on life span property, the retirement rate method was also used for the estimation of interim survivor curves for production plant accounts.

Q. Did you use statistical survivor characteristics to estimate average service lives of the property?

A. Yes. I used Iowa-type survivor curves.

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

A. Iowa-type 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 had been retired.

Iowa-type curves are used to smooth and extrapolate original survivor curves determined by the retirement rate method. Iowa curves were used in this study to describe the forecasted rates of retirement based on the observed rates of retirement and expectations regarding future retirements. Iowa-type curves have been accepted by every state commission and the FERC.

The estimated survivor curve designations for each 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, an Iowa 40-R2 designation indicates an average service life of forty years; a right-moded, or R-type curve (the mode occurs after average life for right-moded curves); and a moderate height, two, for the mode (possible modes for R-type curves range from 1 to 5).[4] The Iowa curves are discussed in more detail in Part II of Exhibit NWA-1.

Q. How are Iowa type survivor curves compared to the historical data for the purpose of forecasting service lives?

A. For each depreciable property group, original life tables are developed from the Company's historical records of aged additions, transfers and retirements. Original life tables can be developed using the full experience of historical data. Original life tables can also be developed using different ranges of years of activity, such as the most recent 30 or 40 years of experience. The range of transaction years used to develop a life table is referred to as an "experience band," and the range of vintages used for the life table is referred to as a "placement band."

Once life tables have been developed using the retirement rate method, specific Iowa curves can be compared both visually and mathematically to the life tables. For visual curve matching, Iowa survivor curves are plotted on the same graph as an original life table, and the points of the curves are visually compared to the life table to assess how closely the Iowa curve matches the historical data. For mathematical curve matching, Iowa curves are compared

[4] There are also half-mode curves (e.g., R1.5) that are the average of the full mode curves.

to an original life table mathematically using an algorithm that compares the differences between an Iowa curve and the original life table.

For both visual and mathematical curve matching, not all of the historical data points should be given the same consideration, as different data points on a life table will have different significance based on both the level of exposures (i.e., the amount of assets that has survived to a given age) and the level of retirements. For example, data points for later ages in an original life table may be based on the experience of a small number of units of property. Due to a smaller sample size, these data points would not provide as meaningful information as earlier ages. Additionally, the middle portion of the curve is where the largest portion of retirements occurs. This portion of the curve therefore typically provides the best indications of the survivor characteristics of the property studied.

Q. Can you provide an example of the process of fitting Iowa curves to an original life table?

A. Yes. Account 364.1 Poles, Towers and Fixtures – Wood provides a good example of this process. For this account, the life table for the overall experience and placement bands is shown on Exhibit NWA-1, pages VII-94 and VII-95. The original life table develops the percent of plant that has survived to each age for the experience and placement bands. The representative data points from this life table are depicted graphically on Exhibit NWA-1, page VII-93.

Also shown on page VII-93 is the 40-R2 survivor curve. As can be seen in the chart, this curve is a visually good match of the historical data, as the smooth line depicting the 40-R2 survivor curve is close to the historical data points for most ages. It is a particularly good fit for the middle portion of the curve, or the data points from about 80% surviving to about 20% surviving. These data points provide the most information on the survivor characteristics for this account. The 40-R2 is also a good mathematical fit of the historical data. The degree of mathematical fit can be measured by the residual measure,[5] which is a normalized sum of squares difference between the original life table and a given Iowa curve. The residual measure for the 40-R2 survivor curve and the representative data points from the original life table is 1.36, which is considered to be a very good fit.[6] The statistical analysis for this account, using both visual and mathematical techniques, therefore indicates that the 40-R2 survivor curve provides a good representation of the historical mortality characteristics for the account.

Q. Is the statistical analysis of historical data based on the retirement rate method the only consideration in estimating service life?

A. No. The estimation of service life is a forecast of the future experience of property currently in service, and therefore informed judgment that incorporates a number of factors must be used in the process of estimating service life. The statistical analysis can provide a good indication of what has

[5] The residual measure is the square root of the total sum of the squares of differences between points on the original and smooth curves divided by the number of points.
[6] The smaller the residual measure, the more closely the Iowa curve mathematically matches the original life table.

occurred for the Company's assets in the past, but other factors can affect the service lives of the assets going forward. Further, the historical data often does not provide a definitive indication of service life. For these reasons other factors must be considered when estimating future service life characteristics.

Q. Can you provide an example of types of factors considered in the process of estimating service life?

A. Yes. An example is Account 364, Poles, Towers and Fixtures. I have explained previously that the 40-R2 survivor curve is a good fit of the historical data for wood poles. However, other factors were also considered for this account.

In previous depreciation studies, Account 364 has been studied as one property group. That is, both wood poles and concrete poles were combined into one property group. In the 2009 Order, the Commission approved the 39-R2 survivor curve for this account. For the current study, data was available for the retirement rate method analysis for the years 1941 through 2014. The historical data indicated a modest increase in the service life for this account and a similar Iowa curve type. The statistical analysis indicated an average service life of around 40 years, and the 40-R2 represented a good fit of the historical data.

In addition to the statistical analysis, I had discussions with engineering and operations personnel with knowledge of the assets and Company plans.

Through these discussions I learned in more detail the Company's storm hardening program wherein FPL is investing to make its transmission and distribution infrastructure more resilient. Additionally, I visited the job site of a storm hardening project to see the installation of a stronger new concrete pole. Through these discussions and observations, I concluded that the service life expectations for wood poles were likely to be different than the expectations for concrete poles.

Data was available to perform separate retirement rate analyses on historical data for wood poles and concrete poles. As noted previously, the statistical analyses indicated service lives of around 40 years for wood poles, and that the 40-R2 survivor curve was a good fit of the historical data. For concrete poles, the statistical analysis indicated longer service lives than for wood poles. The analysis of historical data indicated average service lives of around 45 years for concrete poles, with the 45-R1.5 being a good fit of the historical concrete pole data.

For wood poles, discussions with management indicated that the results from the statistical analysis provide a reasonable indication of the future service life expectations for this account. However, information obtained from discussions with management and site visits provided reason to expect that newer concrete poles will remain in service for a somewhat longer period of time than older concrete poles have historically remained in service. Concrete poles installed today are stronger poles than those installed 30 or 40 years ago. Retirements due to causes such as damage and deterioration should therefore be expected to occur somewhat less frequently for newer concrete poles. However, poles are also retired for other reasons, such as relocations, loading and clearances, which may not be materially different in the future than what has been experienced in the past. Thus, while the 45-R1.5 is a good fit of the historical data, the future expectations for concrete poles are for somewhat longer service lives than have occurred historically. The 50-R1.5 survivor curve incorporates these expectations and represents a longer service life than the indications based solely on the historical data.

For these reasons, the recommendation in the 2016 Depreciation Study is for Account 364, Poles, Towers and Fixtures to be subdivided into wood poles and concrete poles. Based on the considerations discussed above, the recommendation for wood poles is the 40-R2 survivor curve, and for concrete poles is the 50-R1.5 survivor curve.

Q. Was the process for estimating service lives for other accounts similar to Account 364?

A. Yes. A similar process for estimating service life was used for other mass property accounts. The estimated survivor curves for each account can be found in Part VII of the 2016 Depreciation Study. A narrative description of considerations for each estimate can be found in Part XI of the study.

Q. Do you have any other recommendations for Account 364 Poles, Towers and Fixtures?

A. Yes. In addition to the service life and net salvage estimates for this account, I recommend that the account be formally segregated into two subaccounts, one for wood poles and one for concrete poles. This will allow for plant activity, as well as accumulated depreciation, cost of removal, and gross salvage to be tracked separately for the two types of assets currently in Account 364. This subaccount distinction is in accordance with Rule 25-6.04361, Subcategorization of Electric Plant for Depreciation Studies and Rate Design, F.A.C.

2. Life Span Property

Q. What method was used to estimate the lives of production facilities?

A. For production facilities the life span method was used to estimate the lives of electric generation facilities, for which concurrent retirement of the entire facility is anticipated. In this method, the survivor characteristics of such facilities are described by the use of interim retirement survivor curves (typically Iowa curves) and economic recovery dates. The interim survivor curve describes the rate of retirement related to the replacement of elements of the facility. For a power plant, examples of interim retirements include the retirement of piping, boiler tubes, condensers, turbine blades, and rotors that occur during the life of the facility. Interim survivor curves were developed using the retirement rate method in a manner similar to that used for mass property. The economic recovery date, an estimate of the probable retirement date of a facility based on its anticipated operating life, affects each year of installation for the facility by truncating the interim survivor curve for each installation year at its attained age as of that date. The life span of the facility is the time from when the plant is originally placed in service to the expected date of its eventual retirement (i.e., the economic recovery date).

The use of interim survivor curves, truncated at the estimated economic recovery dates, provides a consistent method of estimating the lives of several years' installation for a particular facility inasmuch as a single concurrent retirement for all the years of installation will occur at that specified date.

Q. Has the life span method been used previously by the Commission?

A. Yes. The life span method was approved by the Commission for the Company's current depreciation rates in Docket No. 090130-EI.

Q. Is the life span method widely used in the electric industry to determine the depreciation rates for production plants?

A. Yes. My firm has used the life span method in performing depreciation studies presented to many public utility commissions across the United States and Canada, and the life span method is the predominant method used for property such as production plants.

Q. Are interim survivor curves the most common method of estimating interim retirements for life span property?

A. Yes. The use of interim survivor curves to estimate interim retirements is also the predominant method of estimating interim retirements for assets such as power plants. In Docket No. 090130-EI, the study performed by Gannett Fleming used interim survivor curves. However, the Commission ordered depreciation rates using a somewhat different method that is best thought of as an approximation of the use of interim survivor curves. I will discuss why the use of interim survivor curves is more appropriate later in this section.

Q. What are the economic recovery dates and what was your basis for each selection?

A. The economic recovery dates estimated in the study are set forth on Exhibit NWA-1 on pages III-6 and III-7. For each generating unit, the life span used in the 2016 Depreciation Study is either the same as or longer than the life span ordered by the Commission in Docket No. 090130-EI.

The economic recovery dates are based on a number of factors, including the operating characteristics of the facilities, the type of technology used at each plant, environmental and other regulations, and the Company's outlook for each facility. Economic recovery dates are specific to each generating unit, and, therefore, the characteristics for each generating unit are considered when estimating an economic recovery date. Typically the owner and operator of each facility best understands the operation and the outlook of each power plant, and is therefore in the best position to determine the most probable retirement of each facility. The Company performed an analysis of the life span for its steam and combined cycle plants. I have discussed the estimated life span of each facility with FPL. In addition, FPL has retired a number of generating units in recent years. The experienced life spans of these retired facilities were also reviewed. I have also incorporated my firm's experience performing depreciation studies for other utilities and our knowledge of other generating facilities. I have compared the estimates for FPL's facilities with the estimates typically made for other utilities and have confirmed that FPL's estimates are reasonable and are within the range of estimates typically used in the industry.

This process results in economic recovery dates for the 2016 Depreciation Study that are in my judgment the most reasonable based on the current information available. Further discussion of these estimates can be found in Part X of Exhibit NWA-1, as well as later in this testimony.

Q. What are the life span estimates for steam generating plants?

A. For each of the Martin, Manatee, St. Johns River Power Park ("SJRPP") and Scherer generating units, the estimated life spans are consistent with the 50-year life span approved in Docket No. 090130-EI. Martin and Manatee are dual fuel (oil and gas-fired) steam power plants, and SJRPP and Scherer are coal-fired generating stations. In recent years a variety of environmental rules have been put in place that have had an impact on the service lives of steam power plants, and in particular on coal-fired generation. Many power plants in the industry have been retired earlier than anticipated due in part to these environmental rules. Given these considerations, in my judgment the approved 50 year life spans continue to be reasonable estimates for these plants.

Q. Has the Company retired any steam generating plants in recent years?

A. Yes. The Company has retired a number of steam generating plants. The facilities retired, as well as the retirement date and life span of each facility, are summarized in Table 1 below. The actual experienced life spans for these units ranged from 41 to 57 years, with an average life span of approximately 50 years. This experience further supports a 50 year life span for the Company's remaining steam generating plants.

Table 1: Retirements of FPL Steam Generating Units

Generating Unit	Retirement Date	Life Span
Cape Canaveral Unit 1	2010	45
Cape Canaveral Unit 2	2010	41
Cutler Unit 5	2012	58
Cutler Unit 6	2012	57
Pt Everglades Unit 1	2012	52
Pt Everglades Unit 2	2012	51
Pt Everglades Unit 3	2013	49
Pt Everglades Unit 4	2013	48
Riviera Unit 3	2011	49
Riviera Unit 4	2011	48
Sanford Unit 3	2012	53
Turkey Point Unit 1	2016	49
Turkey Point Unit 2	2013	45

Q. What are the life spans for the Company's nuclear generating facilities?

A. The life spans for the Turkey Point and St. Lucie nuclear units are based on the facilities' Nuclear Regulatory Commission ("NRC") operating licenses.

Each unit has been granted a 20 year extension to its original 40 year license. The estimated life span for each unit is therefore 60 years.

Q. What is the life span estimate for the Company's combined cycle generating facilities?

A. The life span estimate for the combined cycle facilities is 40 years. FPL has performed an analysis on the overall expected life spans of these facilities, and has concluded that 40 years is the most reasonable expectation for the life spans of these facilities at this time. This represents an increase over the 30 year life spans approved in Docket No. 090130-EI. The increase in the life span estimates reflects significant investments in the combined cycle fleets to extend the lives of many components, improve efficiency, and mitigate corrosion issues. With these changes, the Company's expectation is that a 40 year life span is attainable.

Q. How does a 40 year life span compare to the range of estimates by others in the industry for combined cycle power plants?

A. A 40 year life span is at the upper end of the range of typical estimates for combined cycle plants in the industry. Estimates for other utilities typically have ranged from 30 to 40 years, although estimates of 35 or 40 years have been more common in recent years.

Q. Has the Company retired any combined cycle power plants?

A. Yes. The Company has retired both units at its Putnam combined cycle plant. The actual experienced life spans for the two units at this site were 36 and 37 years. The life spans of the Putnam units support that 35 to 40 year life spans are reasonable for combined cycle plants, and also offers evidence that a longer life span estimate would not be appropriate at this time for these types of facilities.

Table 2: Retirements of Combined Cycle Generating Units

Generating Unit	Retirement Date	Life Span
Putnam Unit 1	2014	36
Putnam Unit 2	2014	37

Q. What are the life span estimates for other facilities?

A. The 2016 Depreciation Study uses the same 40 year life span for the Company's new peaker facilities and its existing simple cycle plant at Ft. Myers as is used for combined cycle plants. For the existing Pt. Everglades gas turbines, an economic recovery date of 2028 is recommended, which corresponds to a 57 year life span. The currently approved 30 year life span is recommended for the Company's solar facilities, with the exception of the Martin Solar facility. Because this facility provides steam to the Martin Unit 8 combined cycle plant, the same economic recovery date is used as for Martin Unit 8.

Q. In addition to the life span, you have also recommended estimates for interim retirements. Is the estimation of interim retirements using the retirement rate method similar to the process of estimating survivor curves for mass property?

A. Yes. Similar to mass property the interim survivor curve estimates are based on informed judgment that incorporates actuarial analyses of historical data using the retirement rate method of analysis. Iowa survivor curves have been estimated for each plant account which, combined with the life span estimate for each generating unit, provide the overall survivor curve, average service life and average remaining life for each plant account at each generating unit. A narrative discussion of the considerations for the estimation of interim survivor curves for each account can be found in Part X of the 2016 Depreciation Study. Graphical depictions of the interim survivor curves estimated for each generation plant account are presented in Part VII of the study.

Q. Were the currently approved depreciation rates developed with interim survivor curves?

A. No. As I mentioned earlier, the approved depreciation rates used a slightly different methodology referred to as "interim retirement rates." While the interim retirement rate methodology also estimates interim retirements, it is based on the assumption that an equal rate of retirements will occur in each year of a plants' operation. An assumption of an equal rate of annual retirements is often not a realistic assumption for interim retirements for power plants. As a result, the use of interim survivor curves is a more accurate method of estimating interim retirements.

Q. Why is the use of interim survivor curves more accurate for estimating interim retirements?

A. Interim survivor curves are more accurate because they recognize the concept of dispersion. That is, survivor curves recognize that retirements will occur at different rates at different ages. For a power plant, typically retirements tend to increase as the assets in the plant age, because wear and tear over time results in more assets needing to be replaced. Thus, the rate of retirement should be expected to increase over time for most types of assets. Interim survivor curves recognize this dispersion, while the interim retirement rate methodology used for the existing depreciation rates does not.

Q. Are there any production plant accounts you would like to discuss in more detail?

A. Yes. Account 343 Prime Movers is the largest plant account in Other Production Plant. In the previous study there were different service life estimates for two different types of assets in this account. For the first type of assets, referred to as "capital spare parts," a five year average service life was recommended. For the second type of assets, which contained the remaining balance for this account, a longer service life was recommended because most assets were expected to be in service for the life of the plant.

The use of different service life estimates for the different types of assets in Account 343 is consistent with the Commission's order in Docket No. 090130-EI, in which the Commission adopted a 0.1565 interim retirement rate for capital spare parts (a subset of the assets in this account) that was different than the rate used for the other assets in the account.[7]

[7] Order No. PSC-10-0153-FOF-EI, p. 32.

Q. What is a "capital spare part" for combined cycle plants?

A. The term capital spare parts, as is used for FPL's combined cycle plants, refers to a number of different types of assets associated with the combustion turbines for the plant. Capital spare parts include turbine blades, rotor blades and transition nozzles that typically have a shorter life than the overall facility. During outages at regular intervals many of these components are replaced. The parts removed from the plant can be refurbished and reused within FPL's combined cycle fleet. When capital spare parts are removed from a plant, the Company records a retirement as well as positive net salvage that reflects the fact that the parts can be refurbished and reused. Refurbished parts are then recapitalized when they return to service. Capital spare parts are typically refurbished and reused two times before they are no longer able to be used.

As a result of these operational characteristics, capital spare parts on average have a shorter service life than the entire facility, but also have a positive net salvage value when retired. It should also be noted that there is a range of lives for the Company's capital spare parts, with some assets having lives as short as two to three years while others remain in service ten years or longer.

Q. In addition to the statistical life analysis, are there other considerations for the service life estimate for capital spare parts in the current study?

A. Yes. FPL has made, and continues to make, significant investments to upgrade its capital spare parts. For instance, the original parts installed for the Company's General Electric ("GE") plants, which are referred to as 7FA.03

parts, experienced shorter service lives than is expected for new parts installed today. One reason for the shorter service lives is that some of FPL's plants experienced corrosion issues with many of their components. Another reason is that for the plants, the manufacturer has developed more robust components (referred to as 7FA.04 and 7FA.05 parts) that have longer intervals between outages. The result of the longer intervals should be an increase in service life for those capital spare parts.

For these reasons, the expectation is that the service life of capital spare parts will be longer going forward than is indicated in the historical data. While the historical data indicates an average service life for these assets in the 6 to 7 year range, the 9-L0 survivor curve is recommended for interim retirements for capital spare parts. This estimate reflects the impact of the 7FA.04 and 7FA.05 parts, as well as the impact of fewer run-hours for some of the Company's combined cycle plants.

Q. Do you have any other recommendations for Account 343 Prime Movers?

A. Yes. In addition to the service life and net salvage estimates for this account, I recommend that the account be formally subdivided into two subaccounts, one for capital spare parts and one for all other assets in the account. This will allow for plant activity, as well as accumulated depreciation, cost of removal, and gross salvage to be tracked separately for the two types of assets currently in Account 343. This subaccount distinction is in accordance with Rule 25-6.04361, Subcategorization of Electric Plant for Depreciation Studies and

Rate Design, F.A.C.

B. Net Salvage

Q. Would you please explain the concept of "net salvage"?

A. Net salvage is the salvage value received for the asset upon retirement less the cost to retire the asset. When the cost to retire exceeds the salvage value, the result is negative net salvage. 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. Thus, net salvage is considered to be a component of the cost of an asset that is recovered through depreciation.

Inasmuch as 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 and the net salvage. That is, the net salvage related to an asset should be incorporated in the cost of service during the same period as its original cost, so that customers receiving service from the asset pay rates that include a portion of both elements of the asset's service value, the original cost and the net salvage value.

For example, the full recovery of the service value of a $1,000 transformer may include not only the $1,000 of original cost, but also, on average, $300 to remove the transformer at the end of its life less $150 in salvage value. In this example, the net salvage component is negative $150 ($150 - $300), and the net salvage percentage is negative 15% (($150 - $300)/$1,000).

Q. Please describe the process you used to estimate net salvage percentages.

A. The net salvage estimate for each plant account is based on informed judgment that incorporates the analysis of historical net salvage data. I reviewed net salvage data from 1986 through 2014. Cost of removal and salvage were expressed as a percent of the original cost of the plant retired, both on an annual basis and a three-year moving average bases. The most recent five-year average was also calculated.

Q. Were there other considerations used in developing your final estimates for net salvage?

A. Yes. In addition to the statistical analyses of historical data, I considered the information provided to me by the Company's operating personnel, general knowledge and experience of the industry practices, and trends in the industry in general.

Q. Is the same process used for the estimation of net salvage for production plant?

A. The same process is used for interim net salvage for generating plant accounts as is used for the estimation of net salvage for mass property accounts. However, interim net salvage is applied only to the portion of plant expected to be retired as interim retirements. Assets expected to remain in service until the final retirement of a generating facility will experience terminal net salvage – that is, the cost to dismantle the facility.

Q. Do the depreciation rates used for electric generating facilities have a component for dismantlement?

A. No. The dismantlement component of net salvage is not included in the depreciation rates recommended in the 2016 Depreciation Study. Consistent with the longstanding practice of FPL, and as approved by the FPSC, the Company has made estimates of final dismantlement for their fossil and solar generation facilities, but these costs are handled separately and are not part of the 2016 Depreciation Study. Fossil and solar generation dismantlement costs are included separately in this docket, in Exhibit KF-4 sponsored by FPL witness Ferguson. End of life costs for nuclear units are also addressed separately, in decommissioning studies. FPL filed its most recent nuclear decommissioning study with the FPSC on December 14, 2015. Therefore, net salvage estimates for fossil, solar and nuclear production facilities provided in this Study only reflect interim retirement activity.

Q. In Docket No. 090130-EI, did the Commission order that FPL provide any additional information regarding the net salvage for certain mass property accounts?

A. Yes. For certain plant accounts[8] the Commission recommended that the Company investigate further the causes of a trend towards increasing cost of removal. For example, the Commission stated for Account 364 Poles, Towers and Fixtures that "[w]e believe it would be a useful exercise for FPL to perform an analysis to determine why this is occurring and whether it is

[8] Account 364 Poles, Towers and Fixtures; Account 365 Overhead Conductors and Devices; Account 369.1 Overhead Services; and Account 370 Meters.

possible for FPL to make internal changes that might mitigate this trend."[9]

Q. Has the Company investigated the trend of increasing cost of removal for these accounts?

A. Yes, and I have discussed the results of the Company's investigation with its operating personnel. Costs have increased for a number of reasons, including permitting costs, work requirements, environmental regulations, safety requirements, traffic control and labor and contractor costs. In addition to these discussions, I have physically observed a pole replacement project. I observed the work involved in replacing a concrete pole, including the construction crew, equipment, traffic control and work required to complete the replacement project. Discussions with management and observations in the field confirm that there are significant costs to retire assets and that these costs have been increasing.

Q. Can you provide an example of how costs have increased?

A. Yes. Distribution poles provide a good example of factors that have resulted in increasing costs to retire assets. FPL has both wood and concrete distribution poles. The retirement of a wood pole requires a multiple person crew as well as equipment including a pole truck. For concrete poles, additional equipment such as a crane is typically required. In addition to the replacement of the actual pole, the Company must also transfer the primary and secondary cable, as well as other devices, from the old pole to the new pole.

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[9] Docket No. 090130-EI, Order, p. 67.

Costs for retiring poles have increased for a number of reasons. Labor and contractor costs have increased over time. Crew sizes have also increased as a result of enhanced safety practices. An additional crew member acting as an observer is now standard for a crew when replacing a pole. The cost of cutting poles has also increased. Cutting costs are higher for concrete poles, as cutting a concrete pole requires more effort than for a wood pole. Other factors have also contributed to higher project costs. For example, work requirements such as traffic control and limitations on when work can be performed have resulted in higher project costs.

Each of the factors described here contribute to higher cost of removal going forward than was the case ten or twenty years ago. This trend is consistent with the historical net salvage data, which indicates increasing cost of removal for distribution poles.

Q. Is the trend to higher cost of removal consistent with the experience of other utilities in the industry?

A. Yes. My firm conducts depreciation studies for utilities across the country. The trend towards increasing cost of removal is consistent with the experience of many others in the industry. The reasons that FPL's costs have increased are also experienced by other utilities.

IV. REMAINING LIVES AND DEPRECIATION RATES

Q. Please describe the second phase of the 2016 Depreciation Study, in which you calculated composite remaining lives and annual depreciation accrual rates.

A. After I estimated the service life and determined net salvage characteristics to use for each depreciable property group, I calculated the annual depreciation accrual rates for each group based on the straight line remaining life method, using remaining lives weighted consistent with the average life procedure. The study used actual plant and reserve balances as of December 31, 2014. Actual plant and reserve activity through September 30, 2015, estimated plant and reserve for the remainder of 2015, and estimated activity for 2016 and 2017 were then used to develop depreciation rates based on plant and reserve balances as of December 31, 2017.

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

A. The straight line remaining life method (also referred to as the straight line method and remaining life technique) of depreciation allocates the original cost of the property, less accumulated depreciation, less future net salvage, in equal amounts to each year of remaining service life.

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

A. The average service life procedure defines the group for which the remaining life annual accrual is determined. Under this procedure, the annual accrual rate is determined for the entire group or account based on its average remaining life, and this rate is applied to the surviving balance of the group's cost. The average remaining life for the group is determined by first calculating the average remaining life for each vintage of plant within the group. The average remaining life for each vintage is derived from the area under the survivor curve between the attained age of the vintage and the maximum age. Then, the average remaining life for the group is determined by calculating the dollar-weighted average of the calculated remaining lives for each vintage. The annual depreciation accruals for the group are calculated by dividing the remaining depreciation accruals (original cost less accumulated depreciation less net salvage) by the average remaining life for the group.

Q. Have you used the same method to calculate the average remaining life as used in Gannett Fleming's previous study filed in Docket No. 090130-EI?

A. No. While the average service life procedure and remaining life technique were used in the previous study, I have used a different method of calculating the average remaining life for each depreciable group in the current study. In Docket No. 090130-EI, the Commission expressed concern with the calculation of average remaining life used in the 2016 Depreciation Study performed by my firm for that proceeding. While my opinion is that the methodology used in the prior study was correct and is widely accepted by regulatory commissions, I have addressed the Commission's concerns by using a different methodology in this case than was used in Docket No.

090130-EI. In the current Study, the average remaining life is calculated for each depreciable group based on "average service life weighting."[10] Average service life weighting is an acceptable method for calculating the average remaining life for a depreciable group that is consistent with Rule 25-6.0436(1)(e) and addresses the Commission's concerns from Docket No. 090130-EI.

Q. Please use an example to illustrate the development of the annual depreciation accrual rate for a particular group of property in the 2016 Depreciation Study.

A. For purposes of illustrating this process I will use Account 368, Line Transformers. The survivor curve estimate for this account is the 34-S0, and the net salvage estimate is for negative 15 percent net salvage. A discussion of these estimates, as well as the statistical analyses that support the estimates for this account can be found on Exhibit NWA-1, pages XI-41 and XI-42. The calculation of the annual depreciation related to the original cost of Account 368, Line Transformers, at December 31, 2017, is presented on Exhibit NWA-1, page VI-13. The calculation is based on the 34-S0 survivor curve, negative 15 percent net salvage, the attained age, and the book reserve. The calculated annual depreciation accrual and rate are based on the estimated survivor curve and net salvage, the original cost, book reserve, future accruals and composite remaining life for the account. The calculation of the composite remaining life as of December 31, 2017 is provided in the

[10] For a further discussion of the calculation of average service lives using average service life weighting, please refer to pages 138 and 139 of NARUC's *Public Utility Depreciation Practices*.

tabulations presented on Exhibit NWA-1, pages IV-204 and IV-205. The tabulation sets forth the installation year, the original cost, the average service life, the whole life annual depreciation rate and accruals, the remaining life and theoretical future accruals factor and amounts. The average service life weighted composite remaining life of 23.37 years is equal to the total theoretical future accruals divided by the total whole life depreciation accruals.

Q. Did you use this same methodology for the general plant accounts?

A. Yes. This methodology was used for the general plant accounts that are depreciated. However, most of the general plant accounts are amortized in accordance with amortization periods prescribed by the FPSC.

Q. What were your overall results of the 2016 Depreciation Study?

A. The Study resulted in an increase in average service lives for many accounts. This is generally a reflection of the study using longer service lives as well as increases in the life span estimates for combined cycle plants. The trend towards longer service lives is not uncommon in the electric utility industry today. Additionally, for some types of property, such as transmission and distribution poles and capital spare parts for combined cycle plants, changes in the composition of assets in the account resulted in the estimation of longer service lives than indicated by the historical data. For example, the Company has replaced wood poles with concrete poles that are expected to have a longer service life, and has upgraded capital spare parts to components that have longer inspection intervals. Both of these changes have resulted in longer average service lives.

The 2016 Depreciation Study also resulted in increases in negative net salvage (i.e. net salvage estimates that are more negative) for some accounts, which is attributable to the increasing cost of removal discussed previously. A trend to more negative net salvage is also consistent with the experience of many other utilities.

The Study results in an increase of total company depreciation expense of approximately $221 million as of December 31, 2017. This increase is primarily due to the addition of plant for the Company's production plant accounts and is somewhat mitigated by the overall results of the service life and net salvage studies. I will discuss factors affecting the Study results in the next section.

V. FACTORS AFFECTING DEPRECIATION EXPENSE

Q. What are the major factors that affect the depreciation expense resulting from application of the 2016 Depreciation Study?

A. The changes in annual depreciation rates and expense are shown in Table 3 of the 2016 Depreciation Study and summarized below by class of plant:

<u>Steam Production:</u> The depreciation expense for this class of plant increased

by approximately $42 million. The increase in expense is due primarily to the additions of assets such as pollution control equipment that have occurred since the 2009 Depreciation Study. The life spans used for each facility are the same as those ordered by the Commission in Docket No. 090130-EI.

Nuclear Production: This class of plant showed an increase in depreciation expense of approximately $165 million. The increase in depreciation expense is due primarily to the significant additions for the nuclear plants, such as additions for the extended power uprates ("EPUs").

Other Production (Combined Cycle): This class of plant showed an overall increase in depreciation expense of approximately $59 million. For this Study, the estimated service lives for capital spare parts as well as the estimated life spans for combined cycle plants have been increased, which all else equal would result in a decrease in depreciation expense. The overall increase in depreciation expense is therefore largely driven by significant additions to the Company's facilities. Most of the increase is for the West County, Canaveral, Riviera and Pt. Everglades combined cycle plants. These facilities account for $35 million, or 60%, of the increase for combined cycle production plants. The last ordered depreciation rates for these plants did not incorporate any interim retirements, and as a result, the approved depreciation rates were lower for these facilities than for the Company's other combined cycle plants. The increase in depreciation for these plants is due primarily to this cause, and would be even higher if the estimated life spans for combined cycle plants were not proposed to be increased from the Commission ordered 30 years to 40 years. For the other plants, a significant portion of the increase in depreciation expense is due to increased balances for capital spare parts and other interim additions that have occurred since the 2009 Depreciation Study.

Other Production (Peaker Plants): The depreciation expense for this class of plant decreased by approximately $300,000. Most of the decrease is the result of extending the life spans for these plants from 30 to 40 years.

Other Production (Solar): The depreciation expense for this class of plant decreased by approximately $1 million. The decrease is the result of a change in the economic recovery date for Martin Solar.

Transmission Plant: The depreciation expense for this class of plant decreased by approximately $14 million. The decrease in depreciation expense was due primarily to longer service lives for most accounts, which was offset to some degree by more negative net salvage for certain accounts.

Distribution Plant: The depreciation expense for this class of plant decreased by approximately $26 million. The decrease in depreciation expense was due primarily to longer service lives for most accounts and less negative net salvage estimates for certain accounts. The decrease in expense for these accounts was offset to some degree by more negative net salvage for certain accounts.

General Plant: Depreciation expense for this class of plant decreased by approximately $4 million. A portion of the decrease was due to longer service lives, but the impact of plant and reserve balances on the remaining life calculation was also a factor.

Q. Why do capital additions for production plant result in an increase in depreciation rates?

A. Additions to life span property typically will result in an increase not only to depreciation expense due to a resulting higher plant balance, but also because additions typically increase the depreciation rate for this type of property. For life span property, interim additions (that is, additions added subsequent to the original in service date of the facility) will have a shorter service life than the original installation of the facility. This occurs because the facility has a final retirement date at which time all assets will be retired. Thus, for interim additions, the length of time between installation and the end of the life span of the facility is shorter than for the original installation of the plant.

To help illustrate this concept, consider as an example a power plant that is installed in 1970 for $1 million. For simplicity, assume that there will be no interim retirements and no net salvage. If the plant is retired in 2030, the life span of the facility is 60 years. The average service life for the 1970 vintage is also 60 years. The depreciation rate at the time of the original installation is

1.67%.[11] Assume that in 2000 an additional $500,000 is added to the facility. These assets will not have an average service life of 60 years, but instead will have an average service life of 30 years since they will be retired in 2030. That is, the interim additions have a shorter service life than the original addition of the facility.

For this reason, the overall average service life of life span property will decrease as new interim additions are made. Similarly, the annual depreciation rate will tend to increase over time as interim additions occur. After the installation of the 2000 vintage assets the depreciation rate increases to 2.22%[12] from 1.67%. Thus, although the service life estimate for the plant did not change, the depreciation rate increased due to the interim additions to the facility.

This same concept explains increases in depreciation rates for FPL's production plant facilities, as significant additions have occurred at steam, nuclear and combined cycle plants. All else equal, these additions cause increases in depreciation rates and are the primary factor contributing to the overall increase in depreciation expense resulting from the 2016 Depreciation Study.

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[11] Equal to 1/60

[12] Equal to ($1,000,000/60+$500,000/30)/($1,000,000+$500,000)

Q. Pursuant to Commission orders in the previous two rate cases, there has been an amortization of the theoretical reserve imbalance that had been calculated in Docket No. 090130-EI based on the depreciation parameters that were approved by the Commission at that time. How has the impact of that amortization been incorporated into the 2016 Depreciation Study?

A. The adjustment ordered by the Commission in Docket No. 090130-EI totaled approximately $1.2 billion.[13] This amount was a reduction to accumulated depreciation. FPL recorded a reduction to accumulated depreciation on its books subsequent to the Commission order and transferred these amounts to either the capital recovery schedules or a separate account for the amortization of the reserve imbalance. The calculations as of December 31, 2017 therefore include this adjustment to accumulated depreciation.

Q. What is the impact of this reserve credit on the current depreciation expense?

A. The impact of decreasing the reserve is (all else equal) an increase in the future depreciation accruals. The annual depreciation accruals in the 2016 Depreciation Study are higher than they would be had the Commission not ordered the adjustment based on the theoretical reserve imbalance in Docket No. 090130-EI.

Q. What is the overall change in annual depreciation expense for 2017?

A. As noted above, comparison between existing rates and proposed rates using

[13] A portion of this $1.2 billion offset capital recovery schedules in Docket No. 090130-EI and a portion was amortized over a period of time. However, the full $1.2 billion was an adjustment to accumulated depreciation for the accounts included in the 2009 Depreciation Study for which there were no capital recovery schedules.

the plant at December 31, 2017, showed an overall increase in total company depreciation expense of $221 million.

VI. THEORETICAL RESERVE IMBALANCE

Q. What is a theoretical reserve imbalance?

A. A theoretical reserve imbalance ("TRI" or "imbalance") is calculated as the difference between a company's book accumulated depreciation, or book reserve, and the calculated accrued depreciation, or theoretical reserve. I should note that in prior proceedings in both Florida and other jurisdictions, different terms have been used for the theoretical reserve imbalance, including "theoretical reserve variance," "reserve excess," "reserve surplus" or "reserve deficit" and "theoretical excess depreciation reserve." For this testimony I will use the term "theoretical reserve imbalance," which is consistent with the terminology used in the National Association of Regulatory Utility Commissioners' ("NARUC") publication *Public Utility Depreciation Practices*.

Q. What is the book reserve?

A. The book reserve, also referred to as the "book accumulated depreciation" or the "accumulated provision for depreciation," is a running total of historical depreciation activity. It is equal to the historical depreciation accruals, less retirements and cost of removal, plus historical gross salvage. The book reserve also represents a reduction to the original cost of plant when calculating rate base.

Q. What is the theoretical reserve?

A. The theoretical reserve is an estimate of the accumulated depreciation based on the current plant balances and depreciation parameters (service life and net salvage estimates) at a specific point in time. It is equal to the portion of the depreciable cost of plant that will not be allocated to expense through future whole life depreciation accruals based on the current forecasts of service life and net salvage. The theoretical reserve is also referred to as the "Calculated Accrued Depreciation" or "CAD."

Q. Is the theoretical reserve the "correct" reserve?

A. No, the theoretical reserve is an estimate at a given point in time based on the current plant balances and current life and net salvage estimates. It can provide a benchmark of a Company's reserve position, but it is should not be thought of generally as the "correct" reserve amount.

In Wolf and Fitch's *Depreciation Systems*, this point is explained as follows on page 86:

> The CAD is not a precise measurement. It is based on a model that only approximates the complex chain of events that occur in an actual property group and depends upon forecasts of future life and salvage. Thus, it serves as a guide to, not a prescription for, adjustments to the accumulated provision for depreciation.

Q. If a TRI exists, does a utility normally take action to address the imbalance?

A. No. In most jurisdictions an explicit adjustment to the book reserve is not made. Instead, the remaining life technique is used. When using remaining life technique, there is an automatic adjustment, or self-correcting mechanism, that will increase or decrease depreciation expense to account for any imbalances between the book and theoretical reserves.

The 2016 Depreciation Study uses the remaining life technique. The depreciation rates presented in the study therefore already include an adjustment for the theoretical reserve imbalance. No further adjustment is needed.

Q. What is the theoretical reserve imbalance, based on the estimates from the current study and plant and reserve balances as of December 31, 2017?

A. The 2016 Depreciation Study estimates a negative theoretical reserve imbalance of approximately \$99 million. That is, the book reserve is approximately \$99 million less than the estimated theoretical reserve. While \$99 million may seem like a large number without context, this amount is quite small in terms of a theoretical reserve imbalance. The \$99 million represents less than 1% of the calculated theoretical reserve of approximately \$13.5 billion at December 31, 2017 and is an even smaller percentage when compared to the \$46.0 billion in original cost of plant in service as of the same date. Given that the 2016 Depreciation Study is the forecast of events that will occur over many decades, a difference of only 1% between the book and theoretical reserves should be considered a minor difference.

Q. Do you believe an adjustment based on the theoretical reserve imbalance estimated in the 2016 Depreciation Study is needed for FPL at this time?

A. No. The theoretical reserve imbalance is small when compared to the theoretical reserve. An adjustment to any reserve imbalances (other than the use of the remaining life technique) would therefore imply a level of precision that is not possible, as depreciation is a process of forecasting events that will occur many years in the future. Theoretical reserve imbalances will change from study to study, which occurs due to both changes in estimates and due to plant and reserve activity. Future studies will estimate a different TRI (either more positive or more negative) than is calculated in the 2016 Depreciation Study.

Q. Does this conclude your direct testimony?

A. Yes.

FLORIDA POWER AND LIGHT COMPANY

JUNO BEACH, FLORIDA

DEPRECIATION STUDY

CALCULATED ANNUAL DEPRECIATION ACCRUALS RELATED TO ELECTRIC PLANT AS OF DECEMBER 31, 2017

Note: Filed on March 15, 2016 in a separate docket and not duplicated here due to volume.

Prepared by:

Gannett Fleming

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LIST OF DEPRECIATION ASSIGNMENTS AND DEPRECIATION TESTIMONY
NED W. ALLIS

No.	Year	Jurisdiction	Docket	Client/Utility	Subject
1	2007	STB		Burlington Northern Santa Fe Corporation	Depreciation
2	2007	STB		CSXT, Inc.	Depreciation
3	2007	STB		CSXT, Inc.	Depreciation
4	2007	MO	ER-2007-002	AmerenUE	Depreciation
5	2007	IL	07-0585, 07-0586, 07-0587, 07-0588, 07-0589 & 07-0590	Ameren Illinois Utilities	Depreciation
6	2007	NS		Nova Scotia Power Inc.	Depreciation
7	2007	PA		UGI Utilities, Inc. – Electric Division	Depreciation
7	2007	PA		UGI Utilities, Inc. – Gas Division	Depreciation
8	2008	Non-regulated		Ameren Services - Generation	Depreciation
9	2008	PA		UGI Utilities, Inc. – Electric Division	Depreciation
10	2008	PA		UGI Utilities, Inc. – Gas Division	Depreciation
11	2008	PA		UGI – Penn Natural Gas	Depreciation
12	2008	PA		Equitable Gas Company	Depreciation
13	2008	STB		Burlington Northern Santa Fe Corporation	Depreciation
14	2008	UT		Questar Gas Company	Depreciation
15	2008	PA	R-2008-2029325	Equitable Gas Company	Depreciation
16	2008	PA		UGI Utilities – Gas Division	Depreciation
17	2008	MO	ER-2008-0318	AmerenUE – Electric Division	Depreciation
18	2008	FL	080677-EI & 090130-EI	Florida Power & Light Company	Depreciation
19	2008	MO	GR-2010-0363	AmerenUE – Gas Division	Depreciation
20	2008	PA	R-2008-2079660	UGI Utilities – Penn Natural Gas	Depreciation
21	2008	PA	R-2008-2079675	UGI Utilities – Central Penn Gas	Depreciation
22	2008	IL		Commonwealth Edison	Depreciation
23	2009	PA		UGI Utilities, Inc. – Electric Division	Depreciation
24	2009	PA		UGI Utilities, Inc. – Gas Division	
25	2009	PA		UGI Central Penn Gas	Depreciation
26	2009	PA		UGI Penn Natural Gas	Depreciation
27	2009	Non-regulated		Ameren Services	Depreciation
28	2009	STB		Burlington Northern Santa Fe Corporation	Depreciation
29	2009	CA	A. 09-12-020	Pacific Gas & Electric Company	Depreciation
30	2009	FERC	ER09-1521-0000	Pacific Gas & Electric Company TO12	Depreciation
31	2009	PA		Equitable Gas Company	Depreciation
32	2009	Non-regulated		Exelon Corporation	Depreciation
33	2009	STB		Norfolk Southern Corporation	Depreciation
34	2009	PA		Exelon Corporation - PECO	Depreciation
35	2009	Non-regulated		AmeriGas Propane, Inc.	Depreciation
36	2009	PA		Exelon Corporation - PECO	Depreciation
37	2009	STB		CSXT, Inc.	Depreciation
38	2009	Non-regulated		Ameren Services	Depreciation
39	2009	MO	ER-2010-0036	AmerenUE	Depreciation
40	2010	HA	2010-0053	Hawaiian Electric Company	Depreciation
41	2010	HA	2009-0286	Maui Electric Co., Ltd	Depreciation
42	2010	HA	2009-0321	Hawaii Electric Light Co., Inc.	Depreciation
43	2010	PA	R-2010-2214415	UGI Central Penn Gas	Depreciation
44	2010	PA		UGI Penn Natural Gas	Depreciation
45	2010	PA		UGI Utilities, Inc. – Electric Division	Depreciation
46	2010	PA		UGI Utilities, Inc. – Gas Division	Depreciation
47	2010	NL		Newfoundland Power	Depreciation
48	2010	NS	P-891	Nova Scotia Power	Depreciation
49	2010	PA		Exelon Corporation/PECO	Depreciation
50	2010	STB		Norfolk Southern Corporation	Depreciation

LIST OF DEPRECIATION ASSIGNMENTS AND DEPRECIATION TESTIMONY
NED W. ALLIS

No.	Year	Jurisdiction	Docket	Client/Utility	Subject
51	2010	PA		Equitable Gas Company	Depreciation
52	2010	NV	10-06003	Sierra Pacific Power Company – Electric	Depreciation
53	2010	NV	10-06004	Sierra Pacific Power Company – Gas	Depreciation
54	2010	STB		Canadian National Railway Company	Depreciation
55	2010	FERC	ER10-2026-000	Pacific Gas & Electric TO13	Depreciation
56	2010	WA		Puget Sound Energy, Inc.	Depreciation
57	2010	KS	10-KCPE-415-RTS	Kansas City Power & Light Co.	Depreciation
58	2010	MO	ER-2010-0355	Kansas City Power & Light Co	Depreciation
59	2011	NV	11-06007	Nevada Power Company	Depreciation
60	2011	Non-regulated		Exelon Corporation	Depreciation
61	2011	PA		UGI Central Penn Gas	Depreciation
62	2011	PA		UGI Penn Natural Gas	Depreciation
63	2011	PA		UGI Utilities, Inc. – Electric Division	Depreciation
64	2011	PA		UGI Utilities, Inc. – Gas Division	Depreciation
65	2011	PA		Aqua Pennsylvania	Depreciation
66	2011	STB		CSX Transportation, Inc.	Depreciation
67	2011	NL		Newfoundland Power	Depreciation
68	2011	Non-regulated		Exelon Corporation	Depreciation
69	2011	WA		Puget Sound Energy, Inc.	Depreciation
70	2011	FERC	ER12-2701-000	Pacific Gas & Electric Company TO14	Depreciation
71	2012	CA	A 12-11-009	Pacific Gas & Electric Company	Depreciation
72	2012	KY	2012-00222	Louisville Gas & Electric Company	Depreciation
74	2012	KY	2012-00221	Kentucky Utilities Company	Depreciation
75	2012	PA		Equitable Gas Company	Depreciation
76	2012	PA		UGI Central Penn Gas	Depreciation
77	2012	PA		UGI Penn Natural Gas	Depreciation
78	2012	PA		UGI Utilities, Inc. – Electric Division	Depreciation
79	2012	PA		UGI Utilities, Inc. – Gas Division	Depreciation
80	2012	NL	2013/2014 GRA	Newfoundland Power	Depreciation
81	2012	UT	13-035-02	PacifiCorp	Depreciation
82	2012	WY	20000-427-EA-13	PacifiCorp	Depreciation
83	2012	CA		PacifiCorp	Depreciation
84	2012	WA		PacifiCorp	Depreciation
85	2012	ID	PAC-E-13-02	PacifiCorp	Depreciation
86	2012	OR	UM-1647	PacifiCorp	Depreciation
87	2013	FERC	ER13-2022-000	Pacific Gas & Electric Company TO15	Depreciation
88	2013	CA	A 13-12-012	Pacific Gas & Electric Company GT&S	Depreciation
89	2013	Non-regulated		Exelon Corporation - Generation	Depreciation
90	2013	PA		UGI Central Penn Gas	Depreciation
91	2013	PA		UGI Penn Natural Gas	Depreciation
92	2013	PA		UGI Utilities, Inc. – Electric Division	Depreciation
93	2013	PA		UGI Utilities, Inc. – Gas Division	Depreciation
94	2013	PA		Equitable Gas Company	Depreciation
95	2013	NV	13-06004	Sierra Pacific Power Company	Depreciation (witness)
96	2013	NY	13-E-0030, 13-G-0031 & 13-S-0032	Consolidated Edison Company of New York	Depreciation (witness)
97	2013	DC	Case No. 1103	Pepco	Depreciation (witness)
98	2013	OK	PUD 201300217	Public Service Company of Oklahoma	Depreciation
99	2014	NY	14-G-0494	Orange and Rockland - Gas	Depreciation (witness)
100	2014	NY	14-E-0493	Orange and Rockland - Electric	Depreciation (witness)

LIST OF DEPRECIATION ASSIGNMENTS AND DEPRECIATION TESTIMONY
NED W. ALLIS

No.	Year	Jurisdiction	Docket	Client/Utility	Subject
101	2014	ME	2013-00168	Central Maine Power Company	Depreciation
102	2014	ME	2013-00443	Bangor Hydro Electric Company / Maine Public Service Company	Depreciation
103	2014	PA		UGI Central Penn Gas	Depreciation
104	2014	PA		UGI Penn Natural Gas	Depreciation
105	2014	PA		UGI Utilities, Inc. – Electric Division	Depreciation
106	2014	PA		UGI Utilities, Inc. – Gas Division	Depreciation
107	2014	Non-regulated		Exelon Corporation - Generation	Depreciation
108	2014	PA		Equitable Gas Company	Depreciation
109	2014	MD	9355	Baltimore Gas and Electric Company	Depreciation
110	2014	FERC	ER14-2529-000	Pacific Gas & Electric Company TO16	Depreciation
111	2014	WV	14-0701-E-D	Monongahela Power Company	Depreciation
112	2014	WV	14-0701-E-D	The Potomac Edison Company	Depreciation
113	2014	PA		Penn Power	Depreciation
114	2014	PA		Penelec	Depreciation
115	2014	NY	15-E-0050	Consolidated Edison of New York - Electric	Depreciation (witness)
116	2014	Non-regulated		AmeriGas Propane, Inc.	Depreciation
117	2014	MO	ER-2014-0258	Ameren Missouri	Depreciation
118	2014	MO	ER-0214-0370	Kansas City Power & Light Company	Depreciation
119	2015	CA	A 15-05-008	Liberty Utilities – CalPeco Electric	Depreciation
120	2015	CT		Yankee Gas Company	Depreciation
121	2015	MA	DPU 14-150	NSTAR Gas Company	Depreciation
122	2015	OH	14-1929-EL-RDR	Toledo Electric Company	Depreciation
123	2015	Non-regulated		Exelon Corporation - Generation	Depreciation
124	2015	IN	44576	Indianapolis Power & Light Company	Depreciation
125	2015	NY	15-E-01092	NY State Electric and Gas	Depreciation
126	2015	NY	15-E-0285	Rochester Gas & Electric	Depreciation
127	2015	OK	PUD 201500208	Public Service Company of Oklahoma	Depreciation
128	2015	CA	A 15-09-001	Pacific Gas & Electric Company	Depreciation
129	2015	FERC	ER15-2294-000	Pacific Gas & Electric Company TO17	Depreciation (witness)
130	2015	NY	16-E-0060	Consolidated Edison Company of New York - Electric	Depreciation (witness)
131	2015	NY	16-G-0061	Consolidated Edison Company of New York - Gas	Depreciation (witness)
132	2015	NY		Consolidated Edison Company of New York - Steam	Depreciation
133	2015	PA		Equitable Gas Company	Depreciation
134	2015	TX	44941	El Paso Electric Company	Depreciation
135	2016	IN	44688	Northern Indiana Public Service Co.	Depreciation
136	2016	Non-regulated		Exelon Corporation - Generation	Depreciation
137	2016	PA		UGI Central Penn Gas	Depreciation
138	2016	PA		UGI Penn Natural Gas	Depreciation
139	2016	PA		UGI Utilities, Inc. – Electric Division	Depreciation
140	2016	PA	R-2015-2518438	UGI Utilities, Inc. – Gas Division	Depreciation
141	2016	WA		Puget Sound Energy, Inc.	Depreciation