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BEFORE THE

FLORIDA PUBLIC SERVICE COMMISSION

IN RE: PETITION FOR RATE INCREASE BY FLORIDA POWER & LIGHT COMPANY	)))))	**DOCKET NO. 160021-EI**

Direct Testimony and Exhibits of

Brian C. Andrews

On behalf of

Federal Executive Agencies

July 7, 2016

BRUBAKER & ASSOCIATES, INC.

Project 10228

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Direct Testimony of Brian C. Andrews

Q PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A Brian C. Andrews. My business address is 16690 Swingley Ridge Road, Suite 140, Chesterfield, MO 63017.

Q WHAT IS YOUR OCCUPATION?

A I am a Consultant in the field of public utility regulation with Brubaker & Associates, Inc., energy, economic and regulatory consultants.

Q PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND EXPERIENCE.

A This information is included in Appendix A to my testimony.

Q ON WHOSE BEHALF ARE YOU APPEARING IN THIS PROCEEDING?

A I am testifying on behalf of the Federal Executive Agencies ("FEA"), consisting of certain agencies of the United States government, which have offices, facilities, and/or installations in the service area of Florida Power & Light Company ("FPL" or "Company"), from whom they purchase electricity and energy services.

Q WHAT IS THE SUBJECT MATTER OF YOUR DIRECT TESTIMONY?

A My testimony will address FPL's proposed changes to depreciation rates for certain accounts. I will propose adjustments to the survivor curves utilized for three distribution accounts. My silence in regard to any issue should not be construed as an endorsement of FPL's position.

Q PLEASE SUMMARIZE YOUR CONCLUSIONS AND RECOMMENDATIONS.

A My conclusions and recommendations are summarized as follows:

1. FPL has overstated its depreciation rates for three distribution accounts. These rates produce an excessive amount of depreciation expense and overstate the test year revenue requirement.
2. FPL has underestimated the average service lives of three distribution accounts, Accounts 362, 365 and 369.1, due to its reliance on fitting survivor curves to a set of data containing outdated retirement history.
3. The average service lives for three distribution accounts should be based on the more recent retirement history contained in the original life tables reflecting retirement history from 1995-2014 rather than 1941-2014.
4. These adjustments to the average service lives for these three accounts result in an overstatement of the 2017 test year depreciation expense of $22.5 million, as developed on Exhibit BCA-1.

Book Depreciation Concepts

Q PLEASE EXPLAIN THE PURPOSE OF BOOK DEPRECIATION ACCOUNTING.

A Book depreciation is the recognition in a utility's income statement of the consumption or use of assets to provide utility service. Book depreciation is recorded as an

expense and is included in the ratemaking formula to calculate the utility's overall revenue requirement.

Book depreciation provides for the recovery of the original cost of the utility's assets that are currently providing service. Book depreciation expense is not intended to provide for replacement of the current assets, but provides for capital recovery or return of current investment. Generally, this capital recovery occurs over the average service life of the investment or assets. As a result, it is critical that appropriate average service lives be used to develop the depreciation rates so no generation of ratepayers is disadvantaged.

In addition to capital recovery, depreciation rates also contain a provision for net salvage. Net salvage is simply the scrap or reused value less the removal cost of the asset being depreciated. Accordingly, a utility will also recover the net salvage costs over the useful life of the asset.

Q ARE THERE ANY DEFINITIONS OF DEPRECIATION ACCOUNTING THAT ARE UTILIZED FOR RATEMAKING PURPOSES?

A Yes. One of the most quoted definitions of depreciation accounting is the one contained in the Code of Federal Regulations:

> "Depreciation, as applied to depreciable electric plant, means the loss in service value not restored by current maintenance, incurred in connection with the consumption of 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."
>
> (Electronic Code of Federal Regulations, Title 18, Chapter 1, Subchapter C, Part 101)

Effectively, depreciation accounting provides for the recovery of the original cost of an asset, adjusted for net salvage, over its useful life.

Q WHAT METHOD, PROCEDURE AND TECHNIQUE WERE USED TO CALCULATE THE PROPOSED DEPRECIATION RATES FOR FPL?

A The proposed depreciation rates were calculated using the straight line method, the average life group procedure and the remaining life technique. Under this method, procedure and technique of developing depreciation rates, the unrecovered cost of plant in service is adjusted for the cost of net salvage, and is recovered over the remaining life of the asset or group of assets. At the end of the useful life, the asset is fully depreciated.

Q IS YOUR METHOD OF CALCULATING DEPRECIATION RATES DIFFERENT THAN THE COMPANY'S?

A No, both the Company and I utilized the same method to calculate depreciation rates. FPL witness Ned Allis discusses the depreciation calculation process in his pre-filed direct testimony and the depreciation study filed as Direct Exhibit NWA-1.

Q PLEASE DESCRIBE THE ACTUARIAL LIFE ANALYSIS THAT IS PERFORMED TO EVALUATE HISTORICAL ASSET RETIREMENT EXPERIENCE.

A I will first provide the description of actuarial life analysis (retirement rate method) that is contained in the National Association of Regulatory Utility Commissioners' ("NARUC") Public Utility Depreciation Practices manual.

> "Actuarial analysis is the process of using statistics and probability to describe the retirement history of property. The process may be used as a basis for estimating the probable future life characteristics of a group of property.

> Actuarial analysis requires information in greater detail than do other life analysis models (e.g., turnover, simulation) and, as a result, may be impractical to implement for certain accounts (see Chapter VII). However, for accounts for which application of actuarial analysis is practical; **it is a powerful analytical tool and, therefore, is generally considered the preferred approach**.
>
> Actuarial analysis objectively measures how the company has retired its investment. The analyst must then judge whether this historical view depicts the future life of the property in service. The analyst takes into consideration various factors, such as changes in technology, services provided, or, capital budgets."

(NARUC Public Utility Depreciation Practices Manual, 1996, Page 111, Emphasis Added).

As explained by NARUC, when the required data exists, a database that contains the year of installation and the year of retirements for each vintage of property, actuarial life analysis is the preferred method of determining the life, and thus retirement, characteristics of a group of property. In this type of analysis, there are two major steps. The first step is to use available aged data from the company's continuing plant records to create an observed life table. The observed life table provides the percent surviving for each age interval of property. The observed life tables can be created from multiple combinations of placements and experience of the aged property data. It is important to select a combination of data that will best reflect future lives of the property. The second step is to match the actual survivor data from the observed life table to a standard set of mortality, or survivor curves. Typically, the observed life table data is matched to Iowa Curves. The fitting process is both a mathematical fitting process, which would minimize the Sum of Squared Differences ("SSD") between the actual data and the Iowa Curves, and a visual fitting process. Though the mathematically fitting process provides a curve that is theoretically possible, the visual matching process will allow the trained depreciation

professional to use informed judgment in the determination of the best fitting survivor curve.

Q PLEASE PROVIDE FURTHER EXPLANATION OF THE SUM OF SQUARED DIFFERENCES STATISTICAL MEASUREMENT.

A In the Actuarial Life Analysis section of the NARUC Depreciation Manual, it describes SSD as follows:

> "Generally, the goodness of fit criterion is the least sum of squared deviations. The difference between the observed and projected data is calculated for each data point in the observed data. This difference is squared, and the resulting amounts are summed to provide a single statistic that represents the quality of the fit between the observed and projected curves.
>
> The difference between the observed and projected data points is squared for two reasons: (1) the importance of large differences is increased, and (2) the result is a positive number, hence the squared differences can be summed to generate a measure of the total absolute difference between the two curves. The curves with the least sum of squared deviations are considered the best fits."

Q PLEASE EXPLAIN SURVIVOR CURVES AND THE NOTATION USED TO REFERENCE THEM.

A A survivor curve is a visual representation of the amount of property existing at each age interval throughout the life of a group of property. From the survivor curve, parameters required to calculate depreciation rates can be determined, such as the average service life of the group of property and the composite remaining life. In this case, as well as the majority of others throughout the U.S. and Canada, the Iowa Curves are the general survivor curves utilized to describe the mortality characteristics of group property. There are four types of Iowa Curves: right-moded, left-moded, symmetrical-moded, and origin-moded. Each type describes where the

greatest frequency of retirements occur relative to the average service life. Mr. Allis provides a more detailed explanation of Iowa Curves in his Direct Exhibit NWA-1.

A survivor curve consists of an average service life and Iowa Curve type combination. When describing property with a 50-year average service life that has mortality characteristics of the R2 Iowa Curve, the survivor curve would simply be notated as "50-R2."

Q IN THE ANALYSIS PERFORMED BY MR. ALLIS, DID HE RELY ON GOODNESS OF FIT STATISTICS SUCH AS THE SSD?

A Yes, however, rather than reliance on the SSD, Mr. Allis utilized a statistic called the "Residual Measure." This statistic is simply the square root of the SSD divided by the number of points that were tested for fit on the original survivor curve. As an example, if in a fitting analysis to the first 50 data points of the original curve, the SSD was determined for a certain Iowa curve to be 100. The resulting Residual Measure would be the square root of 100, which is 10, divided by 50 data points, which equals 0.2. This measurement indicates that the average deviation at each data point between the original survivor curve and the standardized Iowa Curve is 0.2.

Book Depreciation Recommendations

Q PLEASE SUMMARIZE THE PROPOSED CHANGES THAT YOU ARE RECOMMENDING TO FPL'S PROPOSED DISTRIBUTION DEPRECIATION RATES.

A The distribution book depreciation rates should be reduced by increasing the average service lives associated with the property contained in Accounts 362, 365, and 369.1

such that the survivor curves better fit the retirement data that is reflective of more recent retirement history.

Q WHAT IS THE BASIS FOR YOUR RECOMMENDATIONS?

A FPL has largely based its proposals on retirement history that spans the 74 years between 1941 and 2014. The use of such a long history of retirement data averages out any trends of increased property lives that are expected with newer and better maintenance practices. When retirement data are analyzed from more recent periods, a clear trend of increasing lives can be seen for the accounts to which I propose making changes. When recommending survivor curves for a group of property, it is important that those recommendations reflect the analyst's best forecast of the life expectations of property in the future. A more recent retirement experience will more accurately reflect the future lives of property than will the reliance on data that is older than the majority of property being studied.

It is obvious that maintenance and operational practices that occurred over 70 years ago are no longer relevant, as are maintenance and operational practices from 30 years ago. Maintenance and operational practices are a large driver of the lives of utility property; therefore, a forecast of the lives of this property should largely be based on recent retirement activity. Furthermore, construction practices and materials have significantly changed over the past 70 years, and the majority of the investments in the accounts to which I propose adjustments were constructed after 1994.

FPL recognizes this trend of increasing service lives. Mr. Allis states:

> "the trend towards longer service lives is not uncommon" and "changes in the composition of assets in the account resulted on the estimation of longer service lives than indicated by the historical data."[1]

Q DO AUTHORITATIVE TEXTS SUPPORT YOUR CLAIM THAT MORE RECENT EXPERIENCE BANDS OFFER BETTER INFORMATION?

A Yes, two authoritative texts cited by FPL witness Mr. Allis both provide support for this claim.

First, Wolf and Fitch's "Depreciation Systems," states:

> "Recent experience bands yield the most recent retirement ratios providing the forecaster with valuable information about the current retirement ratios for all ages…..The ultimate combination of bands is the overall band which combines all individual placement and experience bands into a single, overall band. The major attribute of the survivor curve obtained from this band is that it uses every available exposure and retirement. On the other hand, this grand average obscures the dynamic characteristics of the life characteristics of the property. In addition, it is difficult to define the meaning of the resulting curve. The first retirement ratio will include observations from all vintages and the second retirement ratio from all but the most recent. This pattern continues until the final point is based on observations from only one vintage. **It is difficult to figure out the exact meaning of the overall band, and, in spite of the fact it does include all the data points, it should be given limited significance**."

(Wolf and Fitch, Depreciation Systems, 1994, Pages 186-87; emphasis added)

Additionally, the NARUC manual states: "In general, historical data used to forecast future retirements should not contain events that either anomalous of unlikely to recur."

(NARUC Public Utility Depreciation Practices Manual, 1996 Page 112)

[1]Ned Allis Direct Testimony at page 44.

Both of these authoritative texts on depreciation, which are cited by Mr. Allis, support my claim that more recent experience bands offer better information to the forecaster to determine the future retirement activity that is likely to occur with this property.

BCA Depreciation Model

Q PLEASE DISCUSS THE DEPRECIATION MODEL YOU CREATED TO DETERMINE THE APPROPRIATE SURVIVOR CURVES FOR THE TRANSMISSION AND DISTRIBUTION ACCOUNTS.

A I created an Excel-based model ("BCA Model") that tests the fit of the various Iowa curves to the original life table data for the FPL accounts. The BCA Model also calculates the annual original cost accrual and composite remaining for the account being studied. In the fitting process, the model determines for each curve type, the average service life that minimizes the sum of the squared differences ("SSD") between the Iowa Curves and the actual data points that were determined to be significant.[2] This analysis provides for each dispersion, the average service life that best fits the data. Once that analysis is performed, I conducted a visual analysis of the curves that had the lowest SSD. After utilizing judgment to select the appropriate curve, the model then can calculate the annual accrual amount and the corresponding depreciation rate for the account. The annual accrual amount is calculated in the same manner as described in the FPL Depreciation Study for the Average Life Group method with the Remaining Life technique.

[2]Significant data points were determined by dividing the exposures for each vintage by the Age 0 vintage exposures. If that ratio was greater than 1%, the data point was determined to be significant.

Q HOW DOES THE BCA MODEL DEPRECIATION MODEL COMPARE TO THE FPL DEPRECIATION MODEL WHEN THE SAME INPUTS ARE UTILIZED?

A For the accounts that I am recommending changes to, the original cost annual accrual and composite remaining lives are nearly identical to what is calculated by FPL. This comparison is shown below in Table 1.

TABLE 1

Comparison of FPL and BCA Depreciation Models with FPL's Proposed Survivor Curves

	FPL Model		BCA Model		Delta	
Account	Original Cost Annual Accrual	Composite Remaining Life	Original Cost Annual Accrual	Composite Remaining Life	Original Cost Annual Accrual	Composite Remaining Life
362 – Station Equipment	$42,429,353	34.06	$42,471,825	34.03	$42,472	(0.03)
365 – Overhead Conductors and Devices	$46,465,421	39.29	$46,539,885	39.23	$74,464	(0.06)
369.1 – Services - Overhead	$11,022,092	47.09	$11,003,386	47.17	($18,706)	0.08
Total	**$99,916,866**		**$100,015,096**		**$98,230**	

Sources: Exhibits NWA-1, BCA-2, BCA-3, BCA-4

As can be seen above in Table 1, the differences between the original cost annual accrual amount between the BCA Model and FPL's are insignificant. The total expense for these three accounts only differ by $98,230 which is only a difference of 0.01% of the approximately $100 million original cost annual accrual for these three accounts.

Q WHAT CAN YOU CONCLUDE ABOUT THE RESULTS SHOWN ABOVE IN TABLE 1?

A Table 1 shows that the BCA depreciation model is sufficiently benchmarked to the calculations arrived at with the model utilized by FPL witness Mr. Allis. This benchmarking exercise confirms the accuracy of my own model and that the results

calculated by the model when utilizing different Iowa Curves will be an accurate reflection of the composite remaining life resulting from those Iowa Curves.

Distribution Proposed Survivor Curves

Q WHICH DISTRIBUTION ACCOUNTS ARE YOU RECOMMENDING A SURVIVOR CURVE THAT DIFFERS FROM FPL PROPOSALS?

A I am recommending that the survivor curves used to determine the composite remaining life and thus depreciation rates for Accounts 362, 365, and 369.1 be changed to reflect dispersions and average service lives that better fit the more recent retirement data for the property in the account.

Q PLEASE SUMMARIZE THE IMPACT ON THE DEPRECIATION EXPENSE FOR THE ACCOUNTS WHICH YOU ARE RECOMMENDING SURVIVOR CURVES THAT DIFFER FROM FPL'S RECOMMENDATIONS.

A Table 2 below shows the impact on each account. The sum of these three adjustments is a reduction of $22.5 million to FPL's 2017 test year depreciation expense. This information is also shown in my Exhibit BCA-1.

TABLE 2

BCA Proposed Depreciation Adjustments

	FPL Model			BCA Model			Delta	
Account	Survivor Curve	2017 Annual Accrual	Accrual Rate	Survivor Curve	2017 Annual Accrual	Accrual Rate	2017 Annual Accrual	Accrual Rate
362	45-R1.5	$45,136,206	2.36%	51-S0.5	$38,910,129	2.04%	$(6,226,077)	-0.32%
365	48-R1	$82,040,086	3.67%	57-R1	$66,999,688	3.00%	$(15,040,398)	-0.67%
369.1	53-R1	$25,050,963	4.30%	56-R1.5	$23,802,458	4.08%	$(1,248,505)	-0.22%
Total		$152,227,255			$129,710,304		$(22,516,951)	

Account 362

Q WHAT TYPE OF PROPERTY IS CONTAINED IN ACCOUNT 362?

A This account is for Station Equipment. Per the FERC Uniform System of Accounts,

> "This account shall include the cost installed of station equipment, including transformer banks, etc., which are used for the purpose of changing the characteristics of electricity in connection with its distribution."

This includes much of the equipment located within the fence at a distribution substation, including busses, conduit, control equipment, transformers, switching equipment, insulators, general station equipment, platforms, foundations, etc.

Q WHAT SURVIVOR CURVE IS FPL RECOMMENDING FOR ACCOUNT 362?

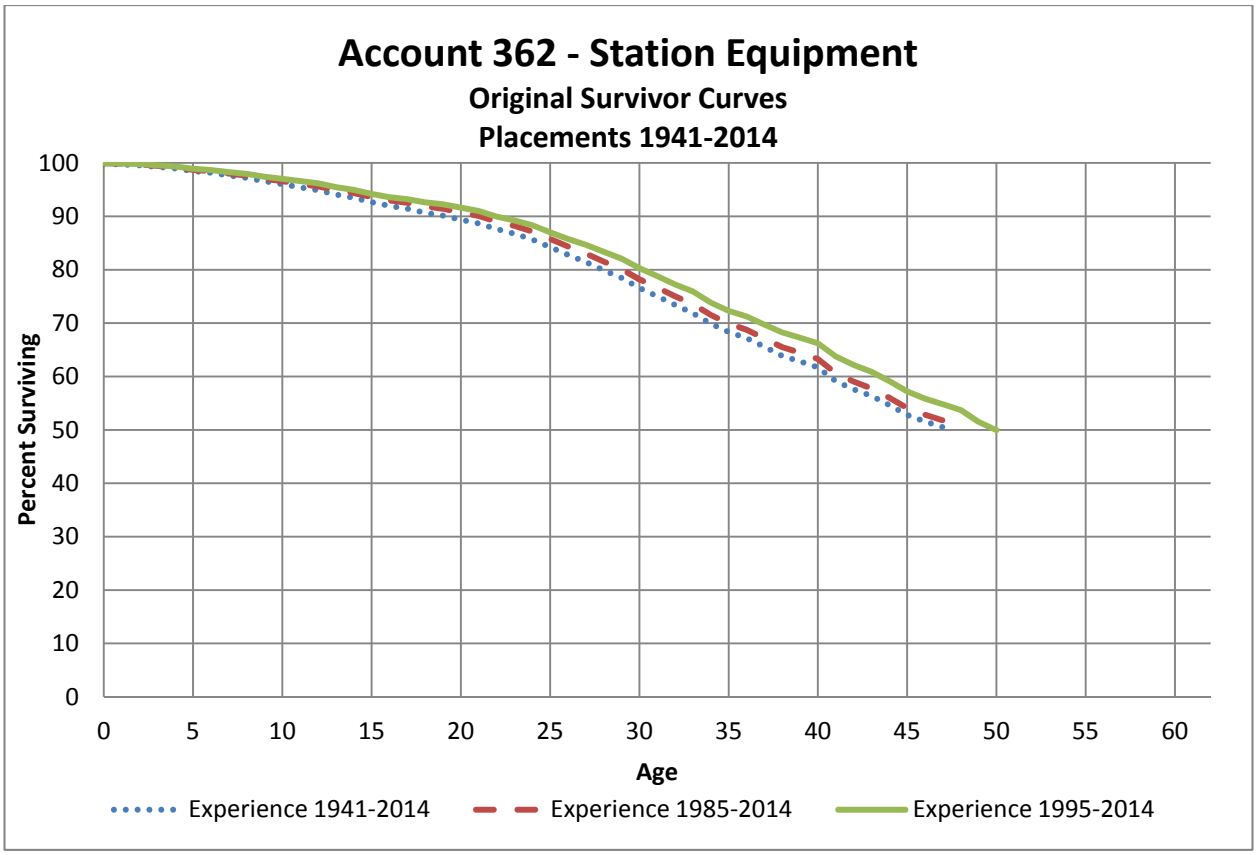
A FPL is proposing to use a 45-R1.5 survivor curve. That is the Iowa R1.5 dispersion curve with an average service life of 45 years. This proposal yields a composite remaining life for this account of 34.06 years and a depreciation rate of 2.36%.

Q DO YOU AGREE WITH FPL'S RECOMMENDATION FOR THE SURVIVOR CURVE TO UTILIZE FOR ACCOUNT 362?

A No, I do not. Mr. Allis has chosen a survivor curve that does not account for a trend of increasing lives. The survivor curve recommended by Mr. Allis is an excellent fit for the retirements experienced between 1941-2014; however, more recent retirement history indicates a longer life is appropriate. Figure 1 below shows three of the original survivor curves created by Mr. Allis for his actuarial analysis. All three curves reflect property installed between 1941 and 2014; it is the years in which retirement activity occurred that differentiates these lines. The dotted line is the overall band which contains retirement experience from 1941 through 2014, the dashed line

contains retirement experience from 1985-2014, and the solid line contains the data from 1995-2014.

Figure 1



As Figure 1 clearly shows, there is a trend of increasing lives as the older retirement history is removed from the analysis. As I stated earlier, it is the more recent retirement history that will be most indicative of the future lives of this property and while the overall band does contain all of the placement and retirement data, it should be given limited significance relative to more recent bands.

Q DOES THE ACTUARIAL ANALYSES PERFORMED BY MR. ALLIS SHOW THERE IS A TREND OF INCREASING LIVES FOR THE PROPERTY IN THIS ACCOUNT?

A Yes. My Table 3 below shows the average service lives that best fit the R1.5 Iowa Curve for each experience band analyzed by Mr. Allis for property installed between 1941 and 2014.

TABLE 3

Account 362 – Station Equipment
Average Service Life Associated with R1.5 Iowa Curve
Placements: 1941-2014

Experience Band	1941-2014	1985-2014	1995-2014
Average Service Life	45.7	47.3	49.5

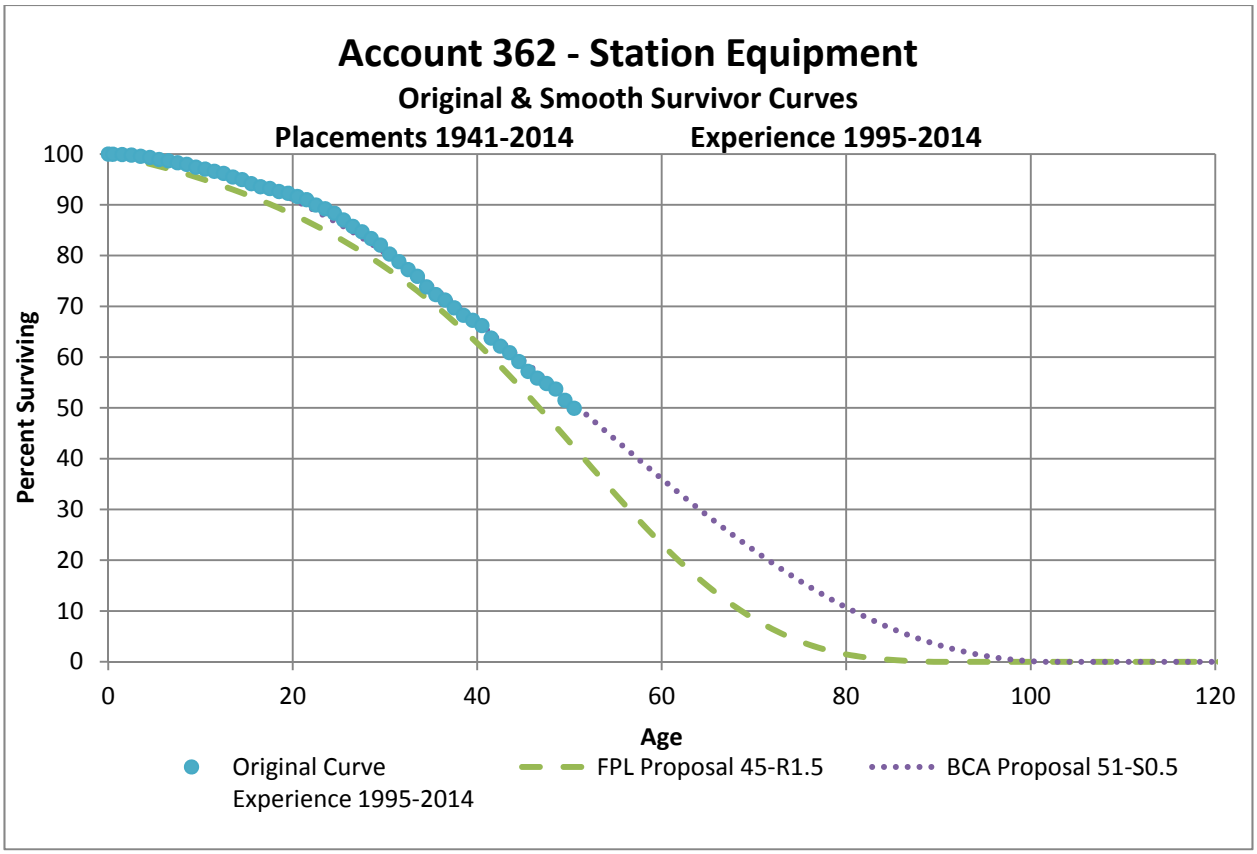
Source: "160021 - OPC's 1st POD No. 2 - FPL - 2014 - Trans, Dist and Gen Plant - OLTs and Preliminary Curve Fits.pdf"

As Table 3 shows, the average service life estimated by actuarial analysis increases as the older retirement history is removed from the analysis.

Q WHAT IS YOUR RECOMMENDED SURVIVOR CURVE FOR ACCOUNT 362?

A My recommended survivor curve for this account is the 51-S0.5 and is shown below in Figure 2. As can be seen in Figure 2, the 51-S0.5 survivor curve is a much better fit to the FPL's retirement data that was experienced between 1995 and 2014. The SSD for the 51-S0.5 is only 30 versus FPL's recommended 45-R1.5 which has an SSD of 684.

Figure 2



Q WHAT IS THE IMPACT ON THE ANNUAL ACCRUAL, ACCRUAL RATE, AND COMPOSITE REMAINING LIFE FOR ACCOUNT 362 DUE TO A CHANGE IN THE SURVIVOR CURVE?

A Changing the survivor curve for Account 362 from a 45-R1.5 to a 51-S0.5 reduces the 2017 annual accrual by $6,226,077 to $38,910,129. This also reduces the accrual rate to 2.04%, down from the FPL proposal of 2.36%. The recommendation results in a composite remaining life of 39.51 years versus FPL's proposal of 34.06 years. The calculation of composite remaining life is shown in my Exhibit BCA-2.

Account 365

Q WHAT TYPE OF PROPERTY IS CONTAINED IN ACCOUNT 365?

A This account is for Overhead Conductors and Devices. According to the FERC Uniform System of Accounts, "This account shall include the cost installed of overhead conductors and devices used for distribution purposes." The items contained within this account include circuit breakers, conductors, ground wires, insulators, lightning arresters, railroad and highway crossing guards, switches, the initial cost of tree trimming including permits, and other line devices.

Q WHAT SURVIVOR CURVE IS FPL RECOMMENDING FOR ACCOUNT 365?

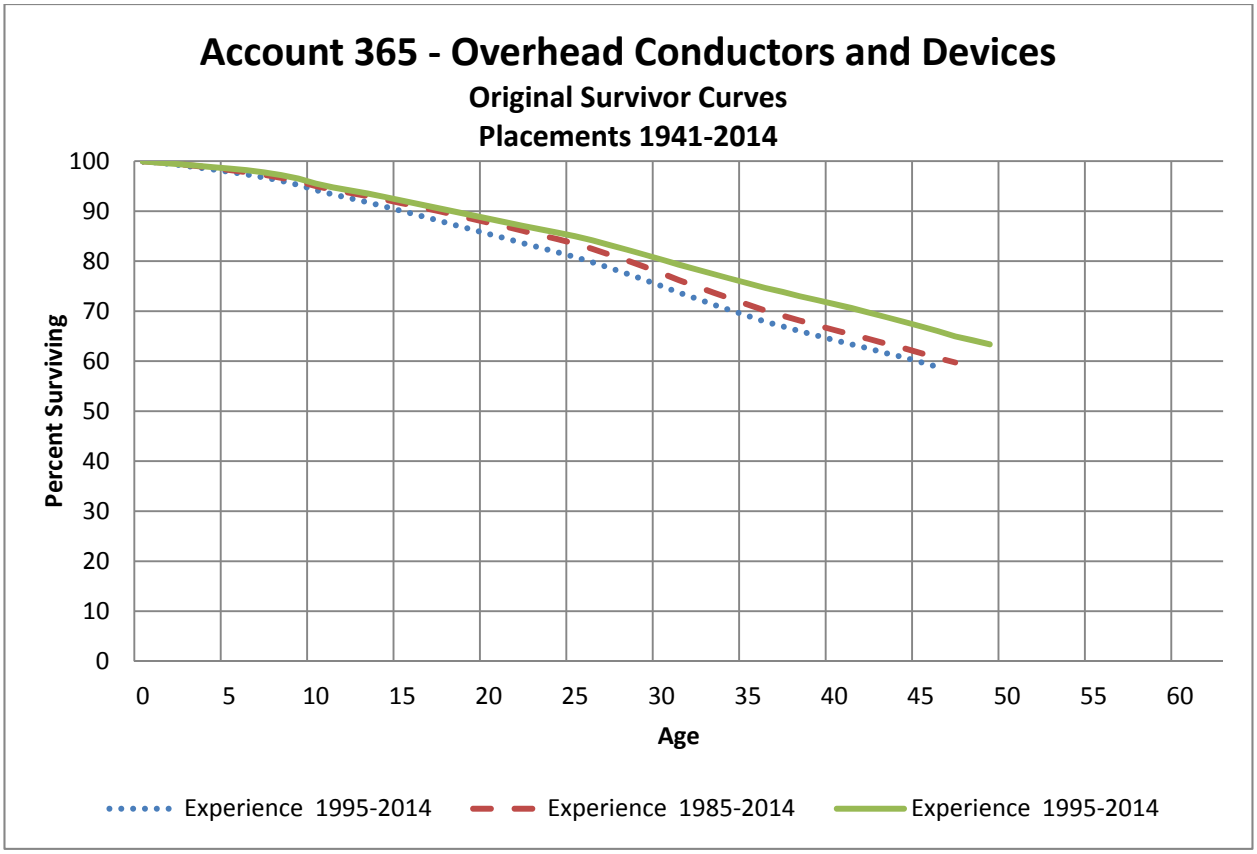
A FPL is proposing to use a 48-R1 survivor curve. That is the Iowa R1 dispersion curve with an average service life of 48 years. This proposal yields a composite remaining life for this account of 39.29 years and a depreciation rate of 3.67%.

Q DO YOU AGREE WITH FPL'S RECOMMENDATION FOR THE SURVIVOR CURVE TO UTILIZE FOR ACCOUNT 365?

A No, I do not. Mr. Allis has chosen a survivor curve that does not account for a trend of increasing lives. The survivor curve recommended by Mr. Allis is an excellent fit for the retirements experienced between 1941-2014; however more recent retirement history indicates a longer life is appropriate. Figure 3 below shows three of the original survivor curves created by Mr. Allis for his actuarial analysis. All three curves reflect property installed between 1941 and 2014; it is the years in which retirement activity occurred that differentiates these lines. The dotted line is the overall band which contains retirement experience from 1941 through 2014, the dashed line

contains retirement experience from 1985-2014, and the solid line contains the data from 1995-2014.

Figure 3



As Figure 3 clearly shows, there is a trend of increasing lives as the older retirement history is removed from the analysis. As I stated earlier, it is the more recent retirement history that will be most indicative of the future lives of this property and while the overall band does contain all of the placement and retirement data, it should be given limited significance relative to more recent bands.

Q DOES THE ACTUARIAL ANALYSES PERFORMED BY MR. ALLIS SHOW THERE IS A TREND OF INCREASING LIVES FOR THE PROPERTY IN THIS ACCOUNT?

A Yes. My Table 4 below shows the average service lives that best fit the R1 Iowa Curve for each experience band analyzed by Mr. Allis for property installed between 1941 and 2014.

TABLE 4

Account 365 – Overhead Conductors and Devices
Average Service Life Associated with R1 Iowa Curve
Placements: 1941-2014

Experience Band	1941-2014	1985-2014	1995-2014
Average Service Life	48.5	51.9	57.3

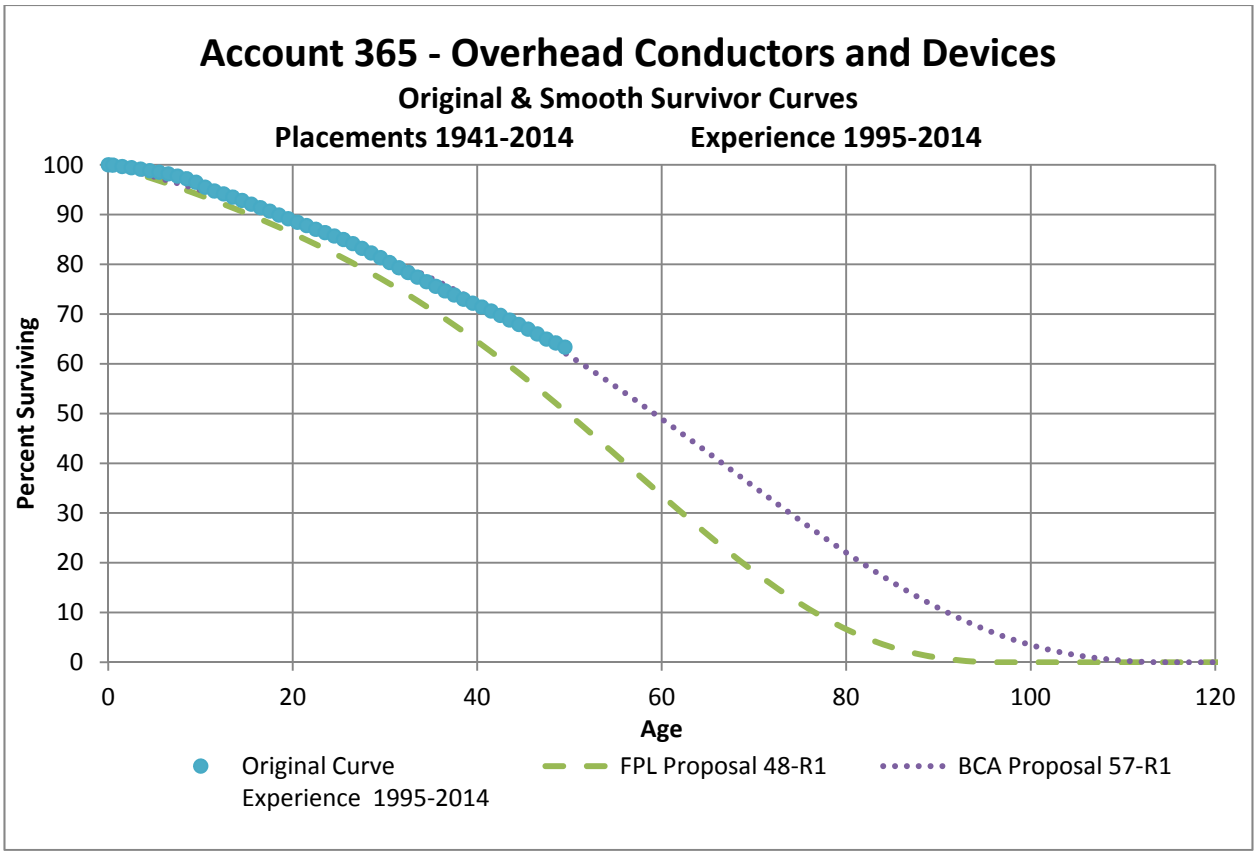
Source: "160021 - OPC's 1st POD No. 2 - FPL - 2014 - Trans, Dist and Gen Plant - OLTs and Preliminary Curve Fits.pdf"

As Table 4 shows, the average service life estimated by actuarial analysis increases as the older retirement history is removed from the analysis.

Q WHAT IS YOUR RECOMMENDED SURVIVOR CURVE FOR ACCOUNT 365?

A My recommended survivor curve for this account is the 57-R1 and is shown below in Figure 4. As can be seen in Figure 4, the 57-R1 survivor curve is a much better fit to the FPL's retirement data that was experienced between 1995 and 2014. The SSD for the 57-R1 is only 28 versus FPL's recommended 48-R1 which has an SSD of 1,527.

Figure 4



Q WHAT IS THE IMPACT ON THE ANNUAL ACCRUAL, ACCRUAL RATE, AND COMPOSITE REMAINING LIFE FOR ACCOUNT 365 DUE TO A CHANGE IN THE SURVIVOR CURVE?

A Changing the survivor curve for Account 365 from a 48-R1 to a 57-R1 reduces the 2017 annual accrual by $15,040,398 to $66,999,688. This also reduces the accrual rate to 3.00%, down from the FPL proposal of 3.67%. The recommendation results in a composite remaining life of 48.11 years versus FPL's proposal of 39.29 years. The calculation of composite remaining life is shown in my Exhibit BCA-3.

Account 369.1

Q WHAT TYPE OF PROPERTY IS CONTAINED IN ACCOUNT 369.1?

A This account is for Overhead Services. Per the FERC Uniform System of Accounts for Account 369,

> "This account shall include the cost installed of overhead conductors leading from a point where wires leave the last pole of the overhead system or the distribution box or the top of the pole of the distribution line, to the point of connection with the customer's outlet or wiring."

The items contained within this account include brackets, cables and wires, insulators, inspection, permits, suspension wire, and service switch.

Q WHAT SURVIVOR CURVE IS FPL RECOMMENDING FOR ACCOUNT 369.1?

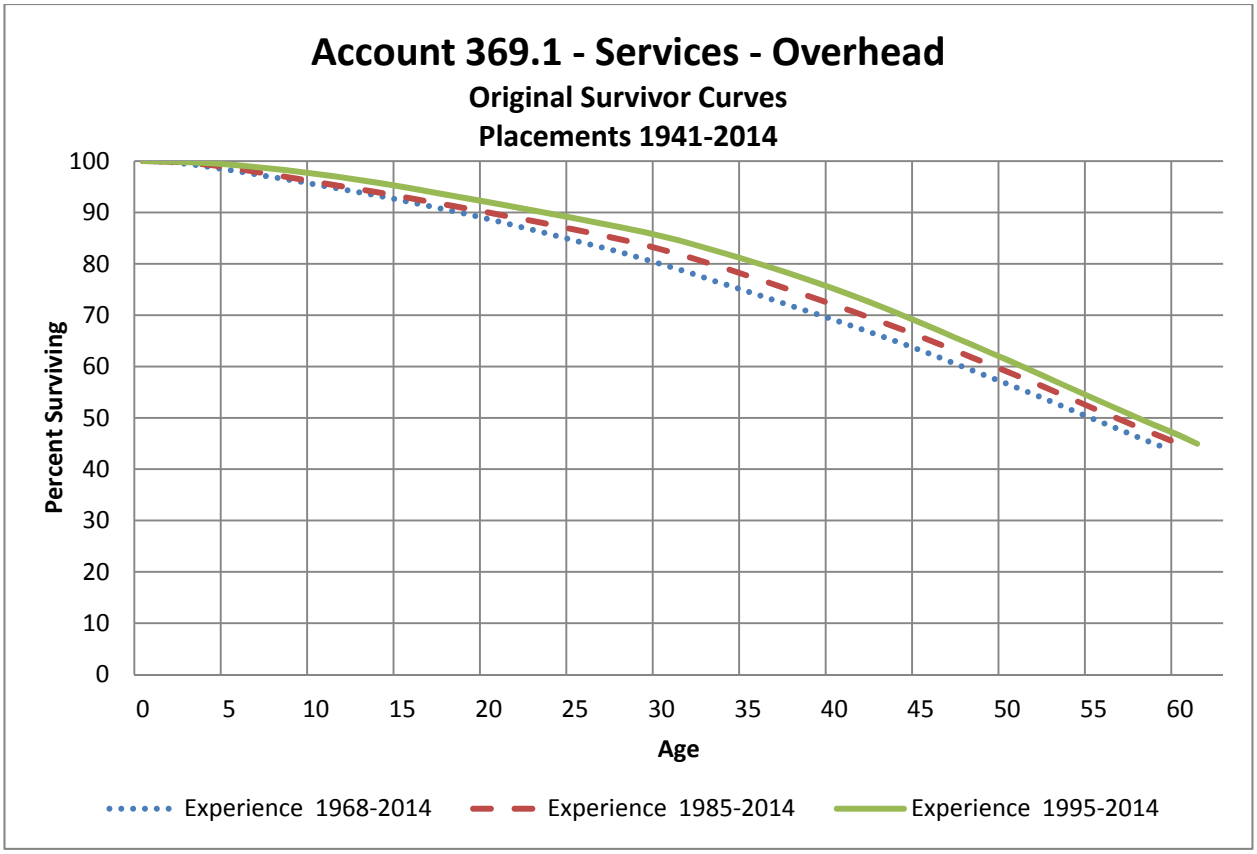
A FPL is proposing to use a 53-R1 survivor curve. That is the Iowa R1 dispersion curve with an average service life of 53 years. This proposal yields a composite remaining life for this account of 47.09 years and a depreciation rate of 4.30%.

Q DO YOU AGREE WITH FPL'S RECOMMENDATION FOR THE SURVIVOR CURVE TO UTILIZE FOR ACCOUNT 369.1?

A No, I do not. Mr. Allis has chosen a survivor curve that does not account for a trend of increasing lives. The survivor curve recommended by Mr. Allis is an excellent fit for the retirements experienced between 1941-2014; however more recent retirement history indicates a longer life is appropriate. Figure 5 below shows three of the original survivor curves created by Mr. Allis for his actuarial analysis. All three curves reflect property installed between 1941 and 2014; it is the years in which retirement activity occurred that differentiates these lines. The dotted line is the overall band which contains retirement experience from 1941 through 2014, the dashed line

contains retirement experience from 1985-2014, and the solid line contains the data from 1995-2014.

Figure 5



As Figure 5 clearly shows, there is a trend of increasing lives as the older retirement history is removed from the analysis. As I stated earlier, it is the more recent retirement history that will be most indicative of the future lives of this property and while the overall band does contain all of the placement and retirement data, it should be given limited significance relative to more recent bands.

Q DOES THE ACTUARIAL ANALYSES PERFORMED BY MR. ALLIS SHOW THERE IS A TREND OF INCREASING LIVES FOR THE PROPERTY IN THIS ACCOUNT?

A Yes. My Table 5 below shows the average service lives that best fit the R1 Iowa Curve for each experience band analyzed by Mr. Allis for property installed between 1941 and 2014.

TABLE 5

Account 369.1 – Services - Overhead
Average Service Life Associated with R1 Iowa Curve
Placements: 1941-2014

Experience Band	1941-2014	1985-2014	1995-2014
Average Service Life	54.2	57.2	61.0

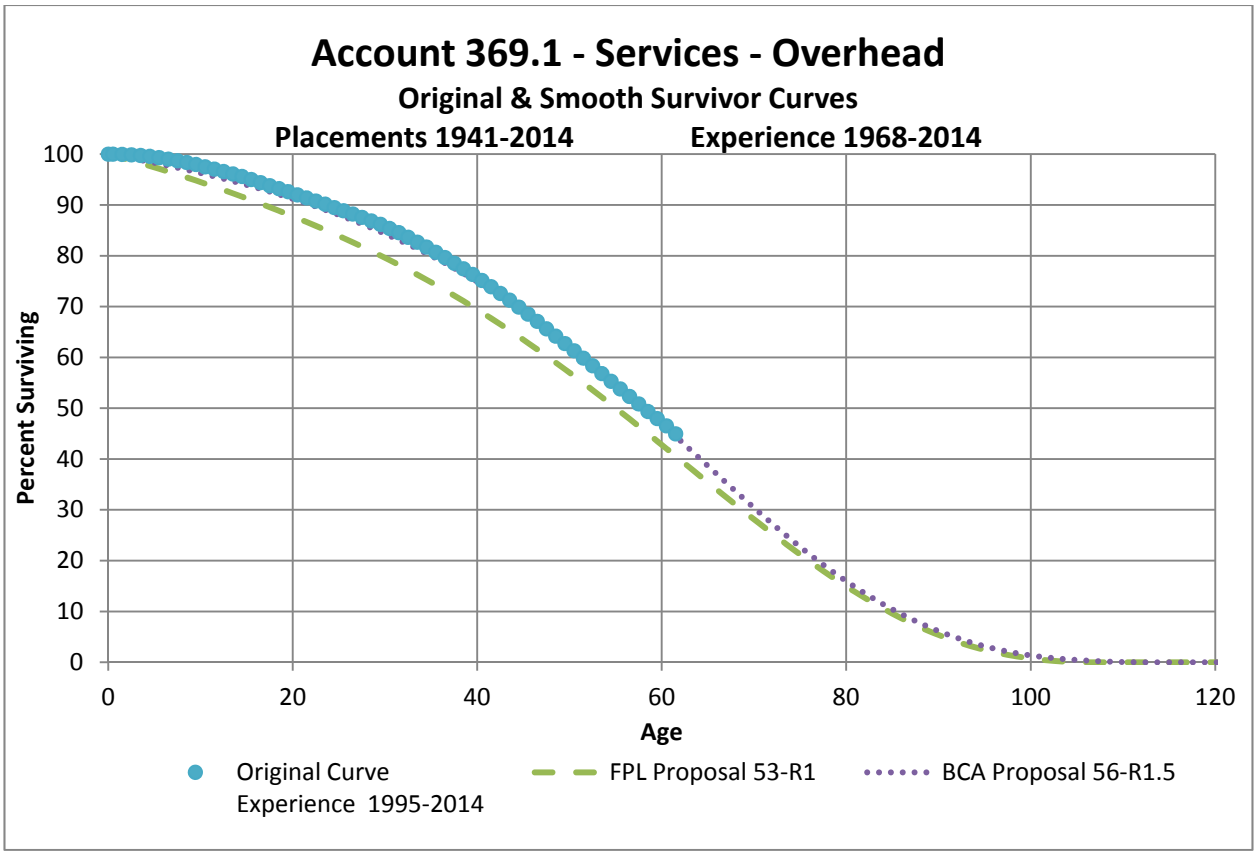
Source: "160021 - OPC's 1st POD No. 2 - FPL - 2014 - Trans, Dist and Gen Plant - OLTs and Preliminary Curve Fits.pdf"

As Table 5 shows, the average service life estimated by actuarial analysis increases as the older retirement history is removed from the analysis.

Q WHAT IS YOUR RECOMMENDED SURVIVOR CURVE FOR ACCOUNT 369.1?

A My recommended survivor curve for this account is the 56-R1.5 and is shown below in Figure 6. As can be seen in Figure 6, the 56-R1.5 survivor curve is a much better fit to the FPL's retirement data that was experienced between 1995 and 2014. The SSD for the 56-R1.5 is only 61 versus FPL's recommended 53-R1 which has an SSD of 1,422.

Figure 6



Q WHAT IS THE IMPACT ON THE ANNUAL ACCRUAL, ACCRUAL RATE, AND COMPOSITE REMAINING LIFE FOR ACCOUNT 369.1 DUE TO A CHANGE IN THE SURVIVOR CURVE?

A Changing the survivor curve for Account 369.1 from a 53-R1 to a 56-R1.5 reduces the 2017 annual accrual by $1,248,505 to $23,802,458. This also reduces the accrual rate to 4.08%, down from the FPL proposal of 4.30%. The recommendation results in a composite remaining life of 49.56 years versus FPL's proposal of 47.09 years. The calculation of composite remaining life is shown in my Exhibit BCA-4.

Q DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A Yes, it does.

Qualifications of Brian C. Andrews

Q PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A Brian C. Andrews. My business address is 16690 Swingley Ridge Road, Suite 140, Chesterfield, MO 63017.

Q PLEASE STATE YOUR OCCUPATION.

A I am a Consultant in the field of public utility regulation with the firm of Brubaker & Associates, Inc. ("BAI"), energy, economic and regulatory consultants.

Q PLEASE STATE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EMPLOYMENT EXPERIENCE.

A I received a Bachelor of Science Degree in Electrical Engineering from the Washington University in St. Louis/University of Missouri - St. Louis Joint Engineering Program. I have also received a Master of Science Degree in Applied Economics from Georgia Southern University.

I have attended training seminars on multiple topics including class cost of service, depreciation, power risk analysis, production cost modeling, cost-estimation for transmission projects, transmission line routing, MISO load serving entity fundamentals and more.

Additionally, I am a certified Engineer Intern in the State of Missouri, and I am a member of the Society of Depreciation Professionals.

In January 2012, I accepted the position of Engineer Intern with BAI. Upon graduation, in May 2012, I was offered the position of Assistant Engineer. In January 2014, I was promoted to Associate Consultant and in January 2016, I was promoted

to Consultant. At BAI, I have been involved with several regulated and competitive electric service issues. These have included book depreciation, fuel and purchased power cost, transmission planning, transmission line routing, resource planning including renewable portfolio standards compliance, electric price forecasting, class cost of service, power procurement, and rate design. This has involved use of power flow, production cost, cost of service, and various other analyses and models to address these issues, utilizing, but not limited to, various programs such as STRATEGIST, RealTime, PSS/E, MatLab, R Studio, ArcGIS, Excel, and the United States Department of Energy/Bonneville Power Administration's Corona and Field Effects ("CAFÉ") Program. Additionally, I have received extensive training on the PLEXOS Integrated Energy Model.

BAI was formed in April 1995. BAI provides consulting services in the economic, technical, accounting, and financial aspects of public utility rates and in the acquisition of utility and energy services through RFPs and negotiations, in both regulated and unregulated markets. Our clients include large industrial and institutional customers, some utilities and, on occasion, state regulatory agencies. We also prepare special studies and reports, forecasts, surveys and siting studies, and present seminars on utility-related issues.

In general, we are engaged in energy and regulatory consulting, economic analysis and contract negotiation. In addition to our main office in St. Louis, the firm also has branch offices in Phoenix, Arizona and Corpus Christi, Texas.

BCA Recommended Adjustments

FLORIDA POWER AND LIGHT COMPANY

ESTIMATED SURVIVOR CURVE, NET SALVAGE, ORIGINAL COST, BOOK RESERVE AND CALCULATED REMAINING LIFE ANNUAL DEPRECIATION ACCRUALS AND RATES RELATED TO ELECTRIC PLANT IN SERVICE AS OF DECEMBER 31, 2017

		SURVIVOR CURVE (1)	NET SALVAGE (2)	ORIGINAL COST (3)	BOOK RESERVE (4)	FUTURE ACCRUALS (5)=(100%-(2))x(3)-(4)	COMPOSITE REMAINING LIFE (6)	ANNUAL DEPRECIATION ACCRUALS (7)=(5)/(6)	ANNUAL DEPRECIATION RATE (8)=(7)/(3)
I. FPL Proposal									
362	STATION EQUIPMENT	45 - R1.5	(10)	1,911,232,119	565,016,145	1,537,339,186	34.06	45,136,206	2.36
365	OVERHEAD CONDUCTORS AND DEVICES	48 - R1	(80)	2,233,914,472	797,691,076	3,223,354,972	39.29	82,040,086	3.67
369.1	SERVICES - OVERHEAD	53 - R1	(125)	583,179,472	132,503,973	1,179,649,839	47.09	25,050,963	4.30
	TOTAL			**4,728,326,063**	**1,495,211,194**	**5,940,343,997**	***39.02***	**152,227,255**	***3.22***
II. BCA Proposal									
362	STATION EQUIPMENT	51 - S0.5	(10)	1,911,232,119	565,016,145	1,537,339,186	39.51	38,910,129	2.04
365	OVERHEAD CONDUCTORS AND DEVICES	57 - R1	(80)	2,233,914,472	797,691,076	3,223,354,972	48.11	66,999,688	3.00
369.1	SERVICES - OVERHEAD	56 - R1.5	(125)	583,179,472	132,503,973	1,179,649,839	49.56	23,802,458	4.08
	TOTAL			**4,728,326,063**	**1,495,211,194**	**5,940,343,997**	***45.80***	**129,712,275**	***2.74***
III. Depreciation Expense and Rate Adjustment									
362	STATION EQUIPMENT	6 -		-	-	-	5.45	(6,226,077)	(0.33)
365	OVERHEAD CONDUCTORS AND DEVICES	9 -		-	-	-	8.82	(15,040,398)	(0.67)
369.1	SERVICES - OVERHEAD	3 -		-	-	-	2.47	(1,248,505)	(0.21)
	TOTAL							**(22,514,980)**	***(0.48)***

Account 362 Station Equipment
Calculation of Composite Remaining Life
Related to Original Cost at December 31, 2017

Account	362	Total Annual Accrual	37,475,140
Survivor Curve	51-S0.5	Composite Remaining Life	39.51

Year Installed	Original Cost	Average Life	Annual Accrual Rate	Annual Accrual Amount	Remaining Life	Future Accrual Rate	Future Accrual Amount
1941	$ 28,831	51.00	1.96	$ 565	8.71	0.1708	$ 4,924
1942	$ 2,916	51.00	1.96	$ 57	9.05	0.1775	$ 518
1944	$ 1,146	51.00	1.96	$ 22	9.75	0.1911	$ 219
1945	$ 9,217	51.00	1.96	$ 181	10.10	0.1980	$ 1,825
1946	$ 61,499	51.00	1.96	$ 1,206	10.45	0.2049	$ 12,602
1947	$ 32,926	51.00	1.96	$ 646	10.80	0.2119	$ 6,976
1948	$ 75,241	51.00	1.96	$ 1,475	11.16	0.2189	$ 16,467
1949	$ 165,404	51.00	1.96	$ 3,243	11.52	0.2259	$ 37,365
1950	$ 117,001	51.00	1.96	$ 2,294	11.88	0.2330	$ 27,261
1951	$ 171,323	51.00	1.96	$ 3,359	12.25	0.2401	$ 41,142
1952	$ 76,923	51.00	1.96	$ 1,508	12.61	0.2473	$ 19,027
1953	$ 249,994	51.00	1.96	$ 4,902	12.98	0.2546	$ 63,650
1954	$ 445,754	51.00	1.96	$ 8,740	13.36	0.2619	$ 116,755
1955	$ 491,062	51.00	1.96	$ 9,629	13.73	0.2693	$ 132,246
1956	$ 566,904	51.00	1.96	$ 11,116	14.11	0.2768	$ 156,891
1957	$ 390,069	51.00	1.96	$ 7,648	14.50	0.2843	$ 110,882
1958	$ 1,059,911	51.00	1.96	$ 20,783	14.88	0.2918	$ 309,325
1959	$ 844,191	51.00	1.96	$ 16,553	15.27	0.2995	$ 252,827
1960	$ 885,211	51.00	1.96	$ 17,357	15.67	0.3072	$ 271,948
1961	$ 675,888	51.00	1.96	$ 13,253	16.07	0.3150	$ 212,913
1962	$ 1,143,691	51.00	1.96	$ 22,425	16.47	0.3229	$ 369,286
1963	$ 1,495,438	51.00	1.96	$ 29,322	16.87	0.3308	$ 494,763
1964	$ 2,043,964	51.00	1.96	$ 40,078	17.28	0.3389	$ 692,681
1965	$ 3,000,320	51.00	1.96	$ 58,830	17.70	0.3470	$ 1,041,170
1966	$ 2,975,856	51.00	1.96	$ 58,350	18.12	0.3552	$ 1,057,138
1967	$ 4,717,915	51.00	1.96	$ 92,508	18.54	0.3635	$ 1,715,193
1968	$ 9,069,315	51.00	1.96	$ 177,830	18.97	0.3720	$ 3,373,376
1969	$ 2,817,925	51.00	1.96	$ 55,253	19.40	0.3805	$ 1,072,106
1970	$ 10,238,916	51.00	1.96	$ 200,763	19.84	0.3891	$ 3,983,610
1971	$ 7,257,861	51.00	1.96	$ 142,311	20.29	0.3978	$ 2,887,006
1972	$ 10,389,176	51.00	1.96	$ 203,709	20.74	0.4066	$ 4,224,191
1973	$ 6,683,396	51.00	1.96	$ 131,047	21.19	0.4155	$ 2,777,123
1974	$ 11,270,041	51.00	1.96	$ 220,981	21.65	0.4246	$ 4,784,932
1975	$ 10,530,627	51.00	1.96	$ 206,483	22.12	0.4337	$ 4,567,497
1976	$ 4,721,315	51.00	1.96	$ 92,575	22.59	0.4430	$ 2,091,639
1977	$ 3,339,147	51.00	1.96	$ 65,473	23.07	0.4524	$ 1,510,737
1978	$ 3,303,488	51.00	1.96	$ 64,774	23.56	0.4620	$ 1,526,124
1979	$ 4,668,052	51.00	1.96	$ 91,530	24.05	0.4716	$ 2,201,680
1980	$ 10,414,997	51.00	1.96	$ 204,216	24.55	0.4815	$ 5,014,422
1981	$ 11,720,497	51.00	1.96	$ 229,814	25.06	0.4914	$ 5,759,648
1982	$ 16,160,909	51.00	1.96	$ 316,881	25.58	0.5015	$ 8,104,991
1983	$ 10,022,484	51.00	1.96	$ 196,519	26.10	0.5118	$ 5,129,213
1984	$ 8,854,594	51.00	1.96	$ 173,619	26.63	0.5222	$ 4,623,678
1985	$ 13,773,729	51.00	1.96	$ 270,073	27.17	0.5327	$ 7,337,905
1986	$ 17,189,722	51.00	1.96	$ 337,053	27.72	0.5435	$ 9,342,261
1987	$ 18,015,166	51.00	1.96	$ 353,239	28.27	0.5544	$ 9,987,293
1988	$ 19,331,782	51.00	1.96	$ 379,055	28.84	0.5655	$ 10,931,361
1989	$ 38,347,064	51.00	1.96	$ 751,903	29.41	0.5767	$ 22,115,480
1990	$ 56,244,012	51.00	1.96	$ 1,102,824	30.00	0.5882	$ 33,080,651
1991	$ 60,354,412	51.00	1.96	$ 1,183,420	30.59	0.5998	$ 36,200,474
1992	$ 55,822,192	51.00	1.96	$ 1,094,553	31.19	0.6116	$ 34,142,546
1993	$ 34,567,948	51.00	1.96	$ 677,803	31.81	0.6237	$ 21,558,907
1994	$ 23,988,833	51.00	1.96	$ 470,369	32.43	0.6359	$ 15,254,817
1995	$ 14,119,414	51.00	1.96	$ 276,851	33.07	0.6484	$ 9,154,653
1996	$ 17,228,320	51.00	1.96	$ 337,810	33.71	0.6611	$ 11,388,854
1997	$ 28,596,145	51.00	1.96	$ 560,709	34.37	0.6740	$ 19,272,711
1998	$ 26,980,140	51.00	1.96	$ 529,022	35.04	0.6871	$ 18,538,125
1999	$ 41,923,967	51.00	1.96	$ 822,039	35.72	0.7005	$ 29,367,025
2000	$ 56,779,452	51.00	1.96	$ 1,113,323	36.42	0.7141	$ 40,546,741
2001	$ 53,821,029	51.00	1.96	$ 1,055,314	37.13	0.7280	$ 39,181,092
2002	$ 63,250,785	51.00	1.96	$ 1,240,211	37.85	0.7421	$ 46,940,118
2003	$ 69,787,213	51.00	1.96	$ 1,368,377	38.58	0.7565	$ 52,796,238
2004	$ 49,971,565	51.00	1.96	$ 979,835	39.33	0.7712	$ 38,538,533
2005	$ 58,153,381	51.00	1.96	$ 1,140,262	40.09	0.7862	$ 45,718,247
2006	$ 62,935,447	51.00	1.96	$ 1,234,028	40.87	0.8014	$ 50,437,141
2007	$ 49,876,126	51.00	1.96	$ 977,963	41.66	0.8169	$ 40,746,226
2008	$ 49,955,779	51.00	1.96	$ 979,525	42.47	0.8328	$ 41,602,527
2009	$ 40,375,887	51.00	1.96	$ 791,684	43.30	0.8489	$ 34,276,448
2010	$ 22,415,508	51.00	1.96	$ 439,520	44.14	0.8654	$ 19,398,281
2011	$ 57,727,911	51.00	1.96	$ 1,131,920	44.99	0.8822	$ 50,926,447
2012	$ 33,963,154	51.00	1.96	$ 665,944	45.86	0.8993	$ 30,542,972
2013	$ 49,992,488	51.00	1.96	$ 980,245	46.75	0.9168	$ 45,830,854
2014	$ 78,243,333	51.00	1.96	$ 1,534,183	47.66	0.9346	$ 73,123,445
2015	$ 112,738,888	51.00	1.96	$ 2,210,566	48.59	0.9527	$ 107,410,994
2016	$ 191,061,698	51.00	1.96	$ 3,746,308	49.54	0.9713	$ 185,579,636
2017	$ 180,508,294	51.00	1.96	$ 3,539,378	50.51	0.9903	$ 178,758,448
Total	$ 1,911,232,119			$ 37,475,140	39.51		$ 1,480,825,417

Account 365 Overhead Conductors and Devices
Calculation of Composite Remaining Life
Related to Original Cost at December 31, 2017

Account	365	Total Annual Accrual	39,191,482
Survivor Curve	57-R1	Composite Remaining Life	48.11

Year Installed	Original Cost	Average Life	Annual Accrual Rate	Annual Accrual Amount	Remaining Life	Future Accrual Rate	Future Accrual Amount
1941	$ 570,915	57.00	1.75	$ 10,016	12.51	0.2195	$ 125,340
1942	$ 101,818	57.00	1.75	$ 1,786	12.90	0.2263	$ 23,039
1943	$ 18,943	57.00	1.75	$ 332	13.29	0.2331	$ 4,416
1944	$ 17,061	57.00	1.75	$ 299	13.68	0.2400	$ 4,095
1945	$ 38,000	57.00	1.75	$ 667	14.08	0.2470	$ 9,386
1946	$ 144,703	57.00	1.75	$ 2,539	14.48	0.2541	$ 36,766
1947	$ 262,274	57.00	1.75	$ 4,601	14.89	0.2613	$ 68,519
1948	$ 357,207	57.00	1.75	$ 6,267	15.31	0.2685	$ 95,914
1949	$ 533,170	57.00	1.75	$ 9,354	15.72	0.2759	$ 147,079
1950	$ 505,179	57.00	1.75	$ 8,863	16.15	0.2833	$ 143,117
1951	$ 292,915	57.00	1.75	$ 5,139	16.58	0.2908	$ 85,190
1952	$ 331,549	57.00	1.75	$ 5,817	17.01	0.2985	$ 98,955
1953	$ 226,381	57.00	1.75	$ 3,972	17.45	0.3062	$ 69,315
1954	$ 225,363	57.00	1.75	$ 3,954	17.90	0.3140	$ 70,766
1955	$ 187,138	57.00	1.75	$ 3,283	18.35	0.3219	$ 60,245
1956	$ 107,138	57.00	1.75	$ 1,880	18.81	0.3299	$ 35,350
1957	$ 218,067	57.00	1.75	$ 3,826	19.27	0.3381	$ 73,720
1958	$ 256,711	57.00	1.75	$ 4,504	19.74	0.3463	$ 88,895
1959	$ 292,872	57.00	1.75	$ 5,138	20.21	0.3546	$ 103,853
1960	$ 342,292	57.00	1.75	$ 6,005	20.69	0.3630	$ 124,261
1961	$ 867,500	57.00	1.75	$ 15,219	21.18	0.3716	$ 322,321
1962	$ 944,368	57.00	1.75	$ 16,568	21.67	0.3802	$ 359,035
1963	$ 1,082,040	57.00	1.75	$ 18,983	22.17	0.3889	$ 420,829
1964	$ 1,360,660	57.00	1.75	$ 23,871	22.67	0.3978	$ 541,219
1965	$ 1,372,596	57.00	1.75	$ 24,081	23.18	0.4067	$ 558,250
1966	$ 1,628,768	57.00	1.75	$ 28,575	23.70	0.4158	$ 677,192
1967	$ 2,010,705	57.00	1.75	$ 35,276	24.22	0.4249	$ 854,415
1968	$ 2,302,253	57.00	1.75	$ 40,390	24.75	0.4342	$ 999,641
1969	$ 3,839,600	57.00	1.75	$ 67,361	25.28	0.4436	$ 1,703,165
1970	$ 9,033,491	57.00	1.75	$ 158,482	25.82	0.4531	$ 4,092,785
1971	$ 6,388,355	57.00	1.75	$ 112,076	26.37	0.4627	$ 2,955,650
1972	$ 8,927,775	57.00	1.75	$ 156,628	26.92	0.4724	$ 4,217,133
1973	$ 8,896,376	57.00	1.75	$ 156,077	27.48	0.4822	$ 4,289,542
1974	$ 8,319,129	57.00	1.75	$ 145,950	28.05	0.4921	$ 4,093,723
1975	$ 8,977,045	57.00	1.75	$ 157,492	28.62	0.5021	$ 4,507,433
1976	$ 7,830,896	57.00	1.75	$ 137,384	29.20	0.5122	$ 4,011,218
1977	$ 7,387,292	57.00	1.75	$ 129,602	29.78	0.5225	$ 3,859,539
1978	$ 9,445,894	57.00	1.75	$ 165,717	30.37	0.5328	$ 5,032,699
1979	$ 16,568,110	57.00	1.75	$ 290,669	30.96	0.5432	$ 9,000,235
1980	$ 18,259,852	57.00	1.75	$ 320,348	31.56	0.5538	$ 10,111,529
1981	$ 17,096,392	57.00	1.75	$ 299,937	32.17	0.5644	$ 9,648,954
1982	$ 13,949,771	57.00	1.75	$ 244,733	32.78	0.5751	$ 8,022,742
1983	$ 17,778,309	57.00	1.75	$ 311,900	33.40	0.5859	$ 10,416,995
1984	$ 22,056,876	57.00	1.75	$ 386,963	34.02	0.5968	$ 13,164,635
1985	$ 20,950,409	57.00	1.75	$ 367,551	34.65	0.6078	$ 12,734,664
1986	$ 21,698,395	57.00	1.75	$ 380,674	35.28	0.6189	$ 13,430,013
1987	$ 25,224,046	57.00	1.75	$ 442,527	35.92	0.6301	$ 15,894,021
1988	$ 33,395,952	57.00	1.75	$ 585,894	36.56	0.6414	$ 21,419,015
1989	$ 40,769,641	57.00	1.75	$ 715,257	37.20	0.6527	$ 26,610,057
1990	$ 44,078,469	57.00	1.75	$ 773,306	37.85	0.6641	$ 29,272,618
1991	$ 36,269,351	57.00	1.75	$ 636,304	38.51	0.6756	$ 24,502,876
1992	$ 31,020,465	57.00	1.75	$ 544,219	39.17	0.6871	$ 21,314,937
1993	$ 38,840,856	57.00	1.75	$ 681,419	39.83	0.6987	$ 27,139,355
1994	$ 26,928,400	57.00	1.75	$ 472,428	40.49	0.7104	$ 19,130,123
1995	$ 23,873,125	57.00	1.75	$ 418,827	41.16	0.7221	$ 17,239,705
1996	$ 22,244,963	57.00	1.75	$ 390,263	41.83	0.7339	$ 16,326,105
1997	$ 24,621,244	57.00	1.75	$ 431,952	42.51	0.7458	$ 18,361,530
1998	$ 30,223,313	57.00	1.75	$ 530,234	43.19	0.7577	$ 22,898,709
1999	$ 29,086,968	57.00	1.75	$ 510,298	43.87	0.7696	$ 22,384,998
2000	$ 35,399,641	57.00	1.75	$ 621,046	44.55	0.7816	$ 27,667,343
2001	$ 29,899,291	57.00	1.75	$ 524,549	45.24	0.7936	$ 23,728,013
2002	$ 37,000,718	57.00	1.75	$ 649,135	45.92	0.8057	$ 29,810,521
2003	$ 52,099,200	57.00	1.75	$ 914,021	46.61	0.8178	$ 42,606,587
2004	$ 42,670,834	57.00	1.75	$ 748,611	47.31	0.8300	$ 35,415,424
2005	$ 55,211,155	57.00	1.75	$ 968,617	48.00	0.8422	$ 46,498,164
2006	$ 67,963,338	57.00	1.75	$ 1,192,339	48.70	0.8545	$ 58,072,261
2007	$ 51,704,148	57.00	1.75	$ 907,090	49.41	0.8668	$ 44,816,978
2008	$ 46,002,919	57.00	1.75	$ 807,069	50.11	0.8792	$ 40,445,008
2009	$ 44,316,211	57.00	1.75	$ 777,477	50.82	0.8916	$ 39,513,537
2010	$ 43,439,316	57.00	1.75	$ 762,093	51.54	0.9041	$ 39,274,983
2011	$ 53,030,756	57.00	1.75	$ 930,364	52.25	0.9167	$ 48,613,553
2012	$ 51,840,905	57.00	1.75	$ 909,490	52.97	0.9293	$ 48,177,675
2013	$ 79,850,399	57.00	1.75	$ 1,400,884	53.70	0.9420	$ 75,221,679
2014	$ 140,383,761	57.00	1.75	$ 2,462,873	54.42	0.9548	$ 134,038,125
2015	$ 268,809,881	57.00	1.75	$ 4,715,963	55.16	0.9676	$ 260,109,427
2016	$ 232,234,555	57.00	1.75	$ 4,074,290	55.89	0.9805	$ 227,714,536
2017	$ 251,478,102	57.00	1.75	$ 4,411,897	56.63	0.9935	$ 249,846,001
Total	$ 2,233,914,472			$ 39,191,482	48.11		$ 1,885,557,644

Account 369.1 Services - Overhead
Calculation of Composite Remaining Life
Related to Original Cost at December 31, 2017

Account 369.1 — Total Annual Accrual 10,413,919
Survivor Curve 56-R1.5 — Composite Remaining Life 49.56

Year Installed	Original Cost	Average Life	Annual Accrual Rate	Annual Accrual Amount	Remaining Life	Future Accrual Rate	Future Accrual Amount
1941	$ 70,554	56.00	1.79	$ 1,260	10.17	0.1816	$ 12,815
1942	$ 14,833	56.00	1.79	$ 265	10.49	0.1872	$ 2,777
1943	$ 5,400	56.00	1.79	$ 96	10.80	0.1929	$ 1,042
1944	$ 2,698	56.00	1.79	$ 48	11.13	0.1987	$ 536
1945	$ 10,304	56.00	1.79	$ 184	11.46	0.2046	$ 2,108
1946	$ 26,060	56.00	1.79	$ 465	11.79	0.2106	$ 5,488
1947	$ 74,071	56.00	1.79	$ 1,323	12.14	0.2167	$ 16,054
1948	$ 99,231	56.00	1.79	$ 1,772	12.49	0.2230	$ 22,126
1949	$ 242,367	56.00	1.79	$ 4,328	12.84	0.2293	$ 55,584
1950	$ 261,348	56.00	1.79	$ 4,667	13.21	0.2358	$ 61,636
1951	$ 258,924	56.00	1.79	$ 4,624	13.58	0.2425	$ 62,784
1952	$ 349,990	56.00	1.79	$ 6,250	13.96	0.2493	$ 87,239
1953	$ 318,665	56.00	1.79	$ 5,690	14.35	0.2562	$ 81,640
1954	$ 332,921	56.00	1.79	$ 5,945	14.74	0.2633	$ 87,650
1955	$ 431,932	56.00	1.79	$ 7,713	15.15	0.2705	$ 116,843
1956	$ 461,208	56.00	1.79	$ 8,236	15.56	0.2779	$ 128,173
1957	$ 528,181	56.00	1.79	$ 9,432	15.99	0.2855	$ 150,776
1958	$ 531,445	56.00	1.79	$ 9,490	16.42	0.2932	$ 155,810
1959	$ 479,560	56.00	1.79	$ 8,564	16.86	0.3011	$ 144,380
1960	$ 453,755	56.00	1.79	$ 8,103	17.31	0.3091	$ 140,263
1961	$ 454,990	56.00	1.79	$ 8,125	17.77	0.3173	$ 144,382
1962	$ 499,121	56.00	1.79	$ 8,913	18.24	0.3257	$ 162,571
1963	$ 500,033	56.00	1.79	$ 8,929	18.72	0.3343	$ 167,145
1964	$ 489,437	56.00	1.79	$ 8,740	19.21	0.3430	$ 167,871
1965	$ 477,959	56.00	1.79	$ 8,535	19.70	0.3519	$ 168,181
1966	$ 513,909	56.00	1.79	$ 9,177	20.21	0.3609	$ 185,481
1967	$ 628,281	56.00	1.79	$ 11,219	20.73	0.3701	$ 232,555
1968	$ 781,749	56.00	1.79	$ 13,960	21.25	0.3795	$ 296,698
1969	$ 833,032	56.00	1.79	$ 14,876	21.79	0.3891	$ 324,114
1970	$ 1,019,609	56.00	1.79	$ 18,207	22.33	0.3988	$ 406,605
1971	$ 1,025,430	56.00	1.79	$ 18,311	22.88	0.4087	$ 419,043
1972	$ 1,268,759	56.00	1.79	$ 22,656	23.45	0.4187	$ 531,210
1973	$ 1,256,093	56.00	1.79	$ 22,430	24.02	0.4289	$ 538,702
1974	$ 1,077,310	56.00	1.79	$ 19,238	24.60	0.4392	$ 473,165
1975	$ 1,064,995	56.00	1.79	$ 19,018	25.18	0.4497	$ 478,925
1976	$ 1,242,736	56.00	1.79	$ 22,192	25.78	0.4603	$ 572,080
1977	$ 1,476,943	56.00	1.79	$ 26,374	26.38	0.4711	$ 695,835
1978	$ 1,524,693	56.00	1.79	$ 27,227	27.00	0.4821	$ 735,004
1979	$ 2,677,648	56.00	1.79	$ 47,815	27.62	0.4931	$ 1,320,459
1980	$ 2,779,261	56.00	1.79	$ 49,630	28.24	0.5044	$ 1,401,729
1981	$ 2,425,787	56.00	1.79	$ 43,318	28.88	0.5157	$ 1,251,002
1982	$ 1,885,467	56.00	1.79	$ 33,669	29.52	0.5272	$ 994,018
1983	$ 3,058,814	56.00	1.79	$ 54,622	30.17	0.5388	$ 1,648,146
1984	$ 3,569,666	56.00	1.79	$ 63,744	30.83	0.5506	$ 1,965,326
1985	$ 3,830,347	56.00	1.79	$ 68,399	31.50	0.5624	$ 2,154,312
1986	$ 3,673,629	56.00	1.79	$ 65,601	32.17	0.5744	$ 2,110,250
1987	$ 3,956,954	56.00	1.79	$ 70,660	32.85	0.5865	$ 2,320,944
1988	$ 4,187,236	56.00	1.79	$ 74,772	33.53	0.5988	$ 2,507,224
1989	$ 4,736,577	56.00	1.79	$ 84,582	34.22	0.6111	$ 2,894,608
1990	$ 4,983,658	56.00	1.79	$ 88,994	34.92	0.6236	$ 3,107,668
1991	$ 4,659,939	56.00	1.79	$ 83,213	35.62	0.6361	$ 2,964,352
1992	$ 3,790,753	56.00	1.79	$ 67,692	36.33	0.6488	$ 2,459,441
1993	$ 4,196,728	56.00	1.79	$ 74,942	37.05	0.6616	$ 2,776,401
1994	$ 4,615,686	56.00	1.79	$ 82,423	37.77	0.6744	$ 3,112,918
1995	$ 3,995,295	56.00	1.79	$ 71,345	38.49	0.6874	$ 2,746,287
1996	$ 3,783,483	56.00	1.79	$ 67,562	39.22	0.7004	$ 2,650,064
1997	$ 3,771,443	56.00	1.79	$ 67,347	39.96	0.7136	$ 2,691,172
1998	$ 3,759,044	56.00	1.79	$ 67,126	40.70	0.7268	$ 2,732,017
1999	$ 4,023,606	56.00	1.79	$ 71,850	41.44	0.7401	$ 2,977,819
2000	$ 4,672,777	56.00	1.79	$ 83,442	42.19	0.7535	$ 3,520,826
2001	$ 4,625,010	56.00	1.79	$ 82,589	42.95	0.7669	$ 3,547,113
2002	$ 5,615,895	56.00	1.79	$ 100,284	43.71	0.7805	$ 4,383,109
2003	$ 6,467,202	56.00	1.79	$ 115,486	44.47	0.7941	$ 5,135,597
2004	$ 6,628,852	56.00	1.79	$ 118,372	45.24	0.8078	$ 5,354,745
2005	$ 14,623,427	56.00	1.79	$ 261,133	46.01	0.8216	$ 12,014,124
2006	$ 10,987,785	56.00	1.79	$ 196,210	46.78	0.8354	$ 9,179,350
2007	$ 16,939,523	56.00	1.79	$ 302,491	47.56	0.8493	$ 14,387,331
2008	$ 2,687,214	56.00	1.79	$ 47,986	48.35	0.8633	$ 2,319,952
2009	$ 8,035,125	56.00	1.79	$ 143,484	49.13	0.8774	$ 7,050,054
2010	$ 7,978,992	56.00	1.79	$ 142,482	49.93	0.8916	$ 7,113,697
2011	$ 8,262,703	56.00	1.79	$ 147,548	50.72	0.9058	$ 7,484,151
2012	$ 8,976,244	56.00	1.79	$ 160,290	51.52	0.9201	$ 8,258,769
2013	$ 10,058,511	56.00	1.79	$ 179,616	52.33	0.9344	$ 9,399,053
2014	$ 13,716,886	56.00	1.79	$ 244,944	53.14	0.9489	$ 13,015,742
2015	$ 55,342,499	56.00	1.79	$ 988,259	53.95	0.9634	$ 53,317,137
2016	$ 143,210,232	56.00	1.79	$ 2,557,326	54.77	0.9780	$ 140,058,652
2017	$ 154,901,049	56.00	1.79	$ 2,766,090	55.59	0.9927	$ 153,763,323
Total	$ 583,179,472			$ 10,413,919	49.56		$ 516,124,172