Gannett Fleming

Excellence Delivered As Promised

Data, Retirements and Their Impact on Service Lives, Net Salvage and Depreciation

Ned W. Allis, CDP

Supervisor, Depreciation Studies

Gannett Fleming Valuation and Rate Consultants, Inc.

New Orleans, LA

September 16, 2014

Data

- **How does data impact depreciation?**
  - Depreciation is based, in part, on analysis of historical data
  - How data is recorded impacts:
    - Plant and reserve balances
    - Service lives
    - Net salvage
    - Depreciation expense
    - Rate base
    - Return on rate base

Data

- **Model the history for a utility account**
  - What if recorded retirements differ from the field?
  - What retirement pricing model best represents the field?

Gannett Fleming

Excellence Delivered As Promised

Model

STAFF 000060
FPL RC-16

Model

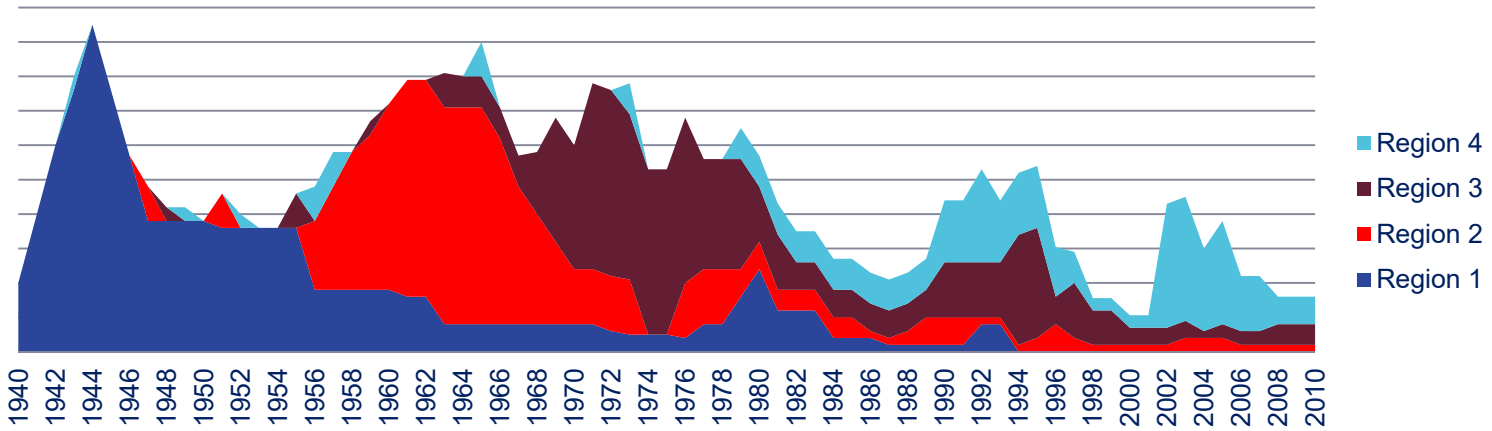
- **Model impact of retirements**
  - Account 364, Poles Towers and Fixtures
  - New pole costs on average $2,000 to install today
  - Cost inflation of 3% per Year
  - 20% of replacement costs are for removal, 80% for new asset
  - Data assembled for 1940 through 2010
  - Depreciation studies conducted every 5 years
  - Actuarial data for life analysis

Model

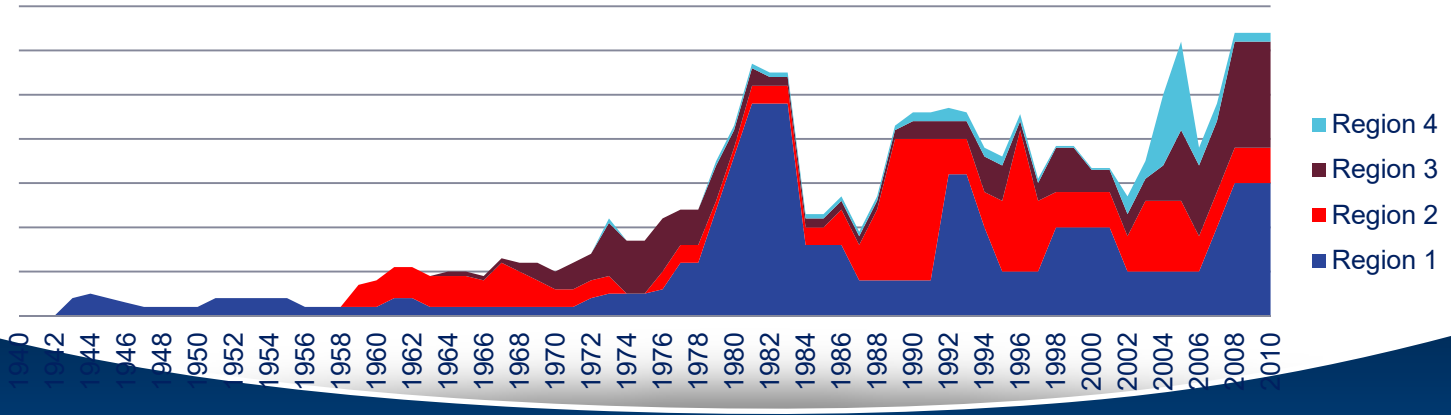
- **Electric Utility**
- **Four regions**
  - Region 1 – Urban
  - Region 2 – Suburban, strong growth in 1960s
  - Region 3 – Suburban, strong growth in 1970s
  - Region 4 – Rural, but some growth in 1990s, 2000s

Model

Growth, by Region



Pole Retirements, by Region



Gannett Fleming

Excellence Delivered ***As Promised***

STAFF 000063
FPL RC-16

Baseline Case

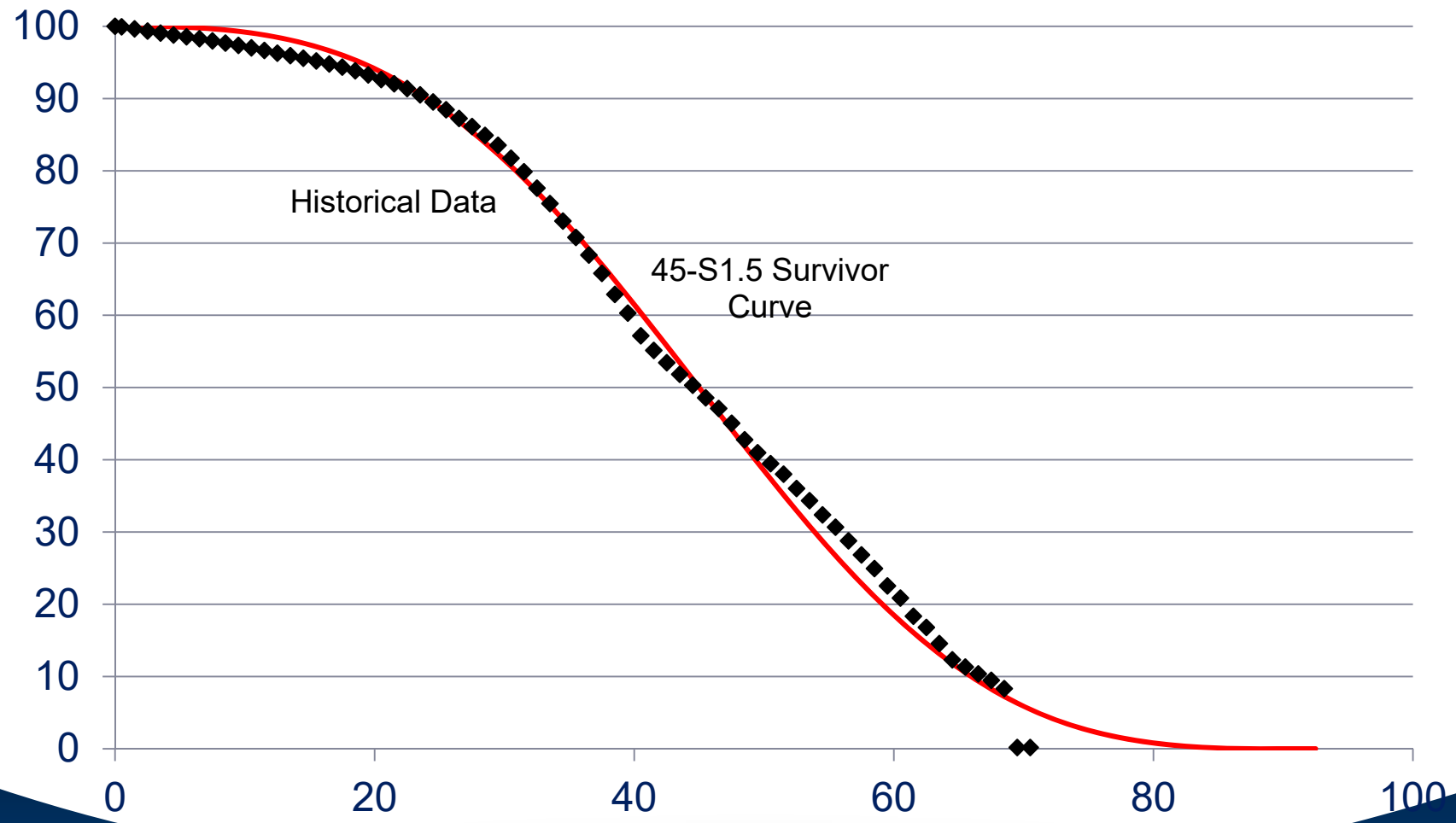
- **Everything is recorded perfectly**
  - Actual vintage and cost information for each pole retirement
  - Retirements reported as they occur
  - Accounting data matches the field

- **What is the estimated depreciation expense over time?**

Survivor Curve

- **Actuarial data**
  - Aged retirements
- **Develop original life table**
  - Compare retirements to exposures by age
- **Fit Iowa survivor curves to historical data**

Survivor Curve - 2010



Gannett Fleming

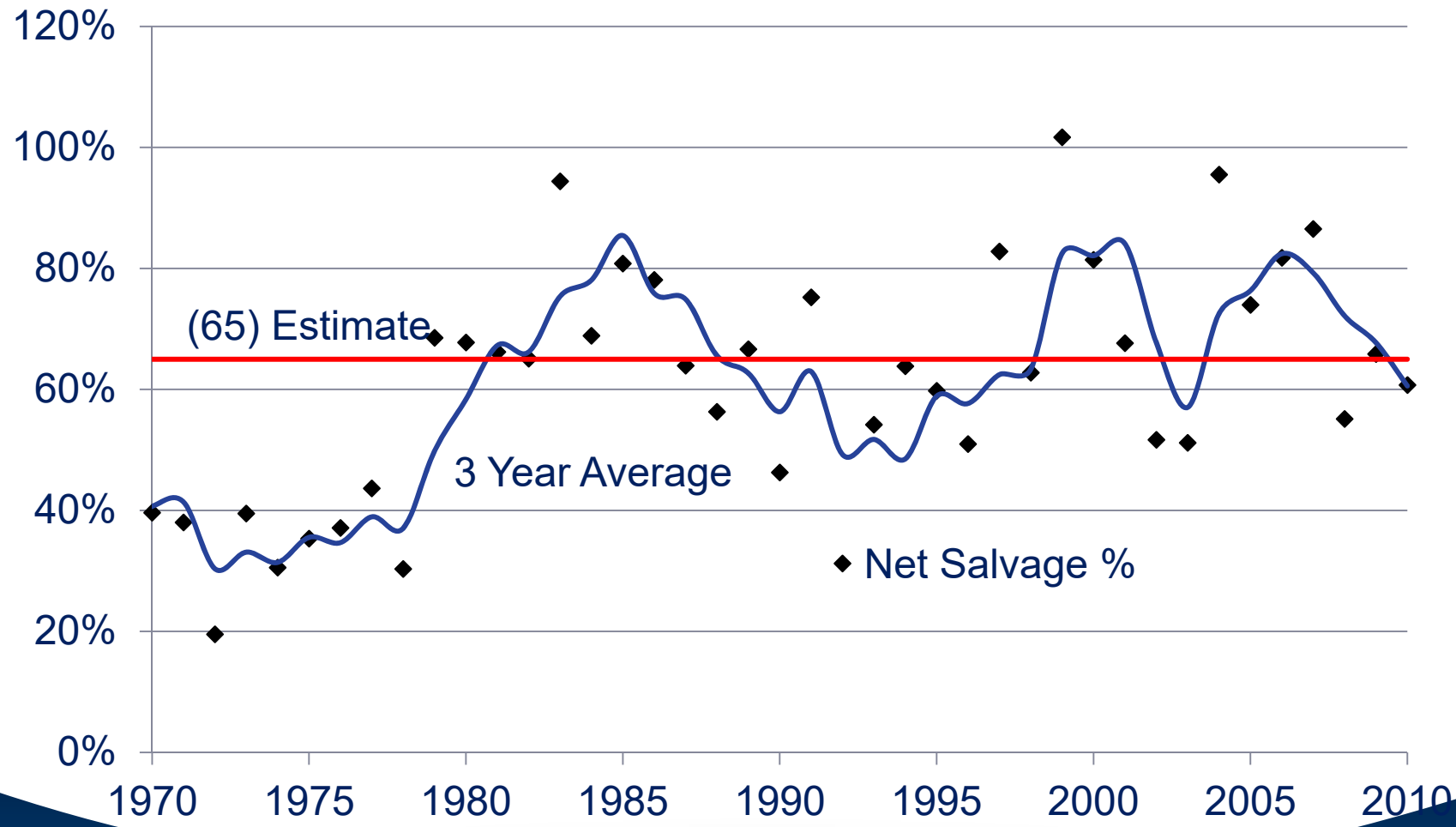
Excellence Delivered ***As Promised***

Net Salvage

- **Analysis of historical data**
  - Retirements
  - Cost of Removal
  - Gross Salvage
- **Expressed as percent of retirements**

$$\frac{(Gross\ Salvage\ -\ Cost\ of\ Removal)}{Retirements}$$

Net Salvage - 2010



Gannett Fleming

Excellence Delivered As Promised

STAFF 000068
FPL RC-16

Depreciation Expense - 2010

- **Average Service Life – Broad Group**
- **Remaining Life Technique**
- **Annual Accrual at 12/31/2010**

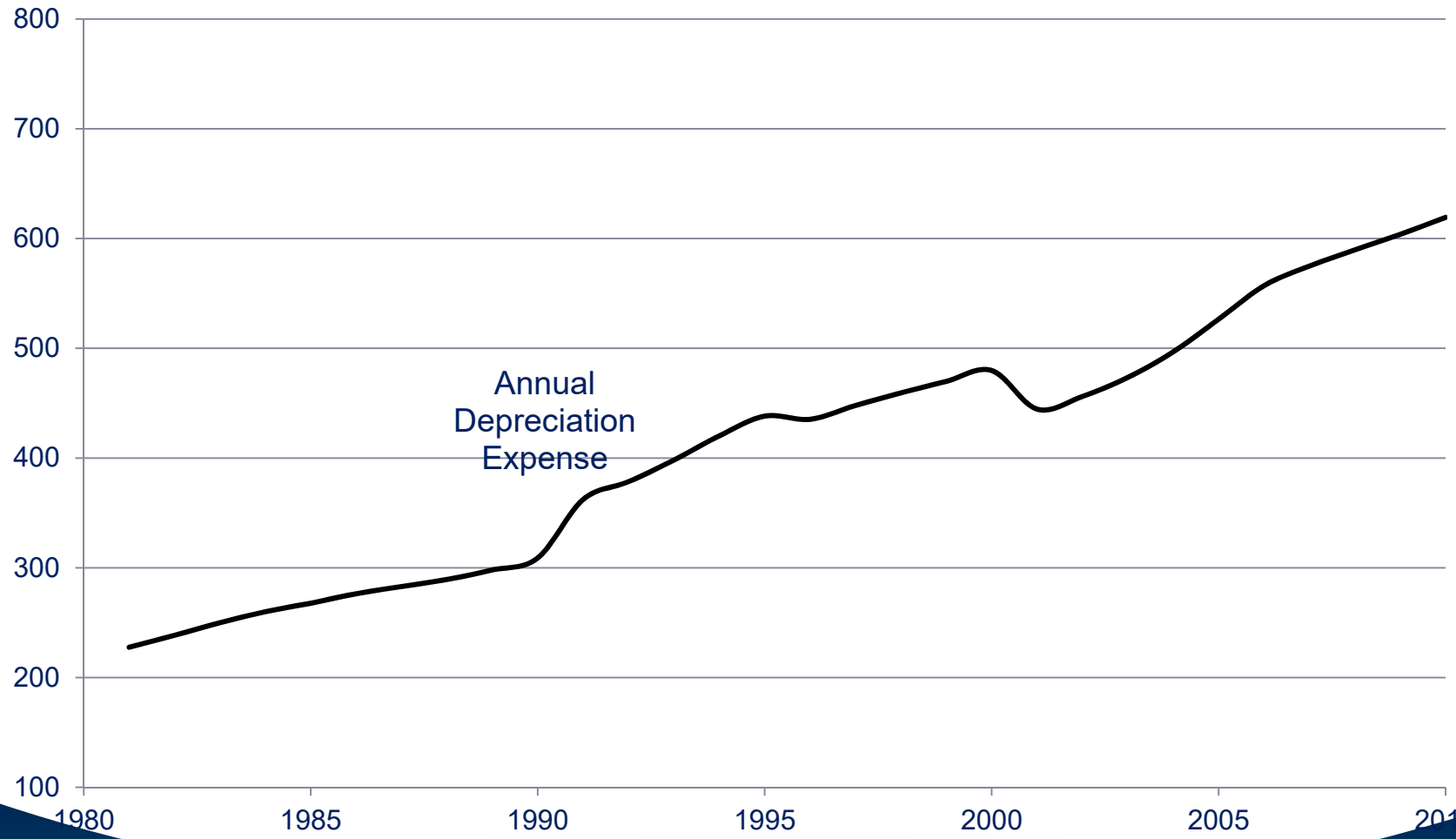
$$= \frac{(100\% - \textit{Net Salvage}\ \%) \times \textit{Cost} - \textit{Book Reserve}}{\textit{Average Remaining Life}}$$

$$= \frac{(100\% - (-65\%)) \times \$17,276,468 - \$9,452,796}{30.11}$$

$$= \$632,792$$

$$\textit{Depreciation Rate} = \frac{\$632,792}{\$17,276,468} = 3.66\%$$

Annual Depreciation Expense, 1981 - 2010



Gannett Fleming

Excellence Delivered ***As Promised***

Gannett Fleming

Excellence Delivered As Promised

Scenarios

Scenarios

- **What happens if everything is not recorded perfectly?**

- **Scenarios modeled:**
  - Unrecorded retirements
  - Different vintages recorded for retirements
  - Existing database does not match field

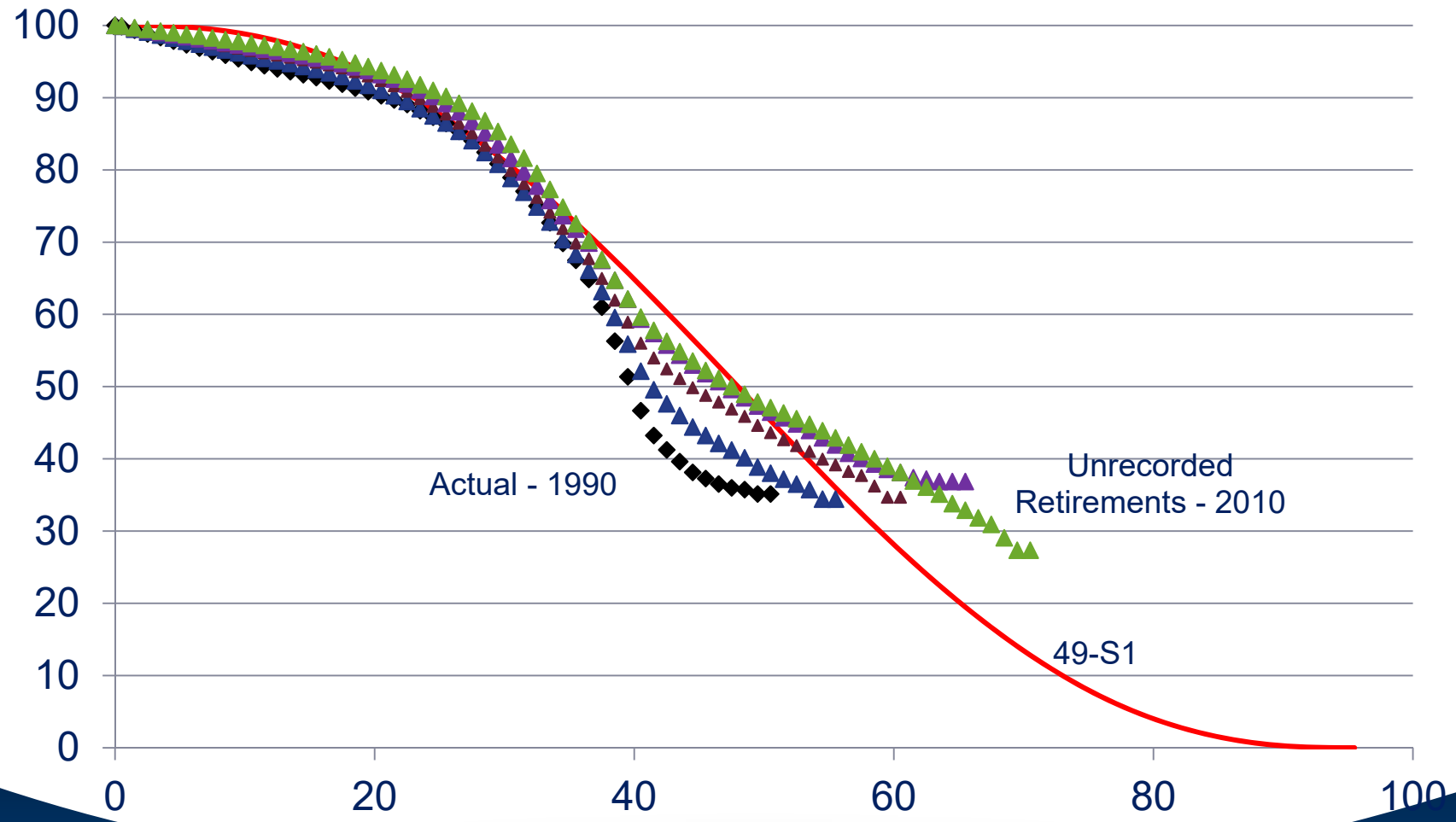
Unrecorded Retirements

- Retirements not reported
- Software issues
- Conversion issues
- Work orders with additions and removal cost but no retirements

Unrecorded Retirements - Model

- **Conversion to new Accounting System in 1991**
  - Region 1 – 50% of retirements not recorded
  - Region 2 – 20% of retirements not recorded
  - Region 3 – 0% of retirements not recorded
  - Region 4 – 50% of retirements not recorded

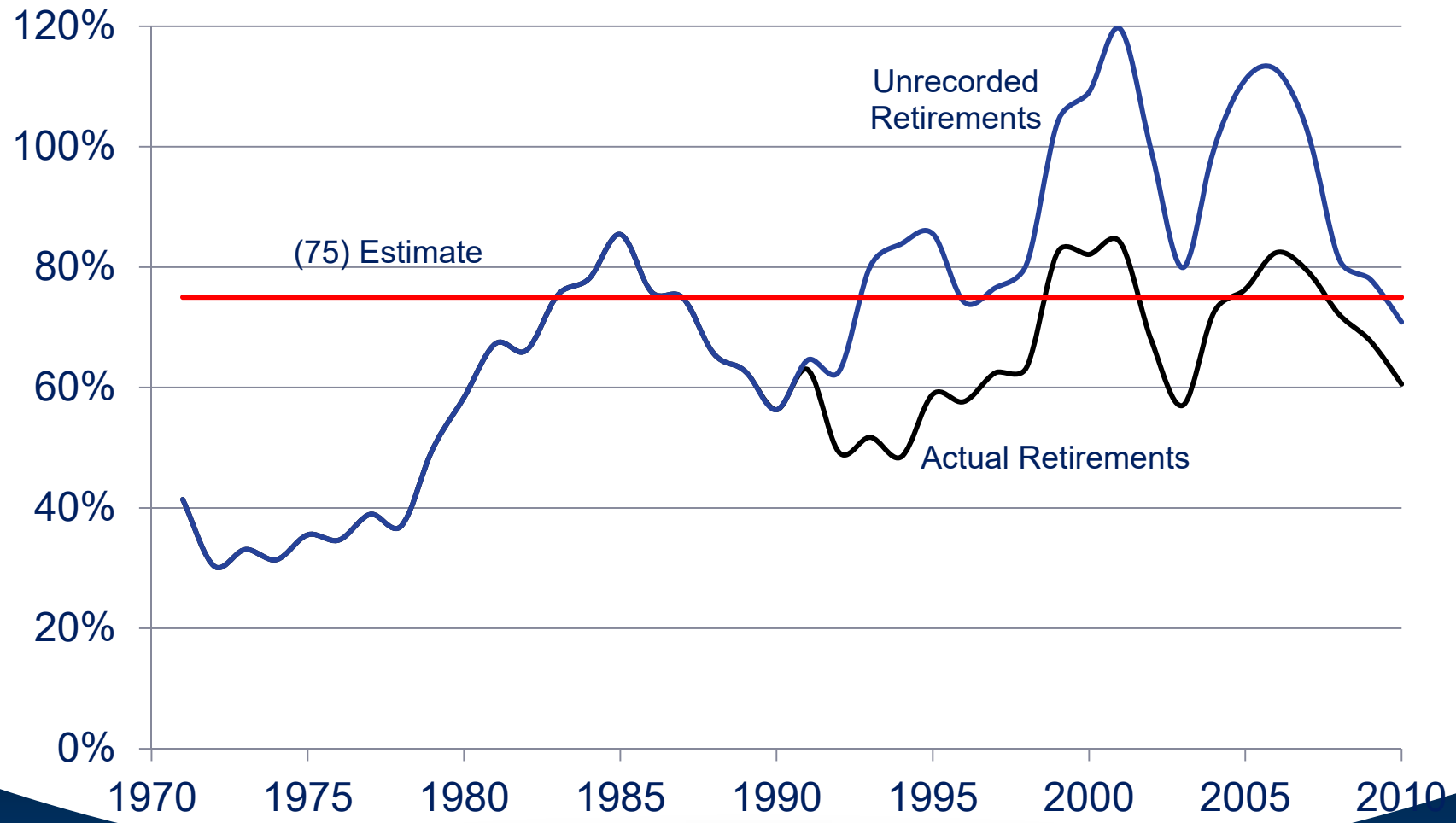
Unrecorded Retirements – Life Analysis



Gannett Fleming

Excellence Delivered ***As Promised***

Unrecorded Retirements - Net Salvage Analysis



Gannett Fleming

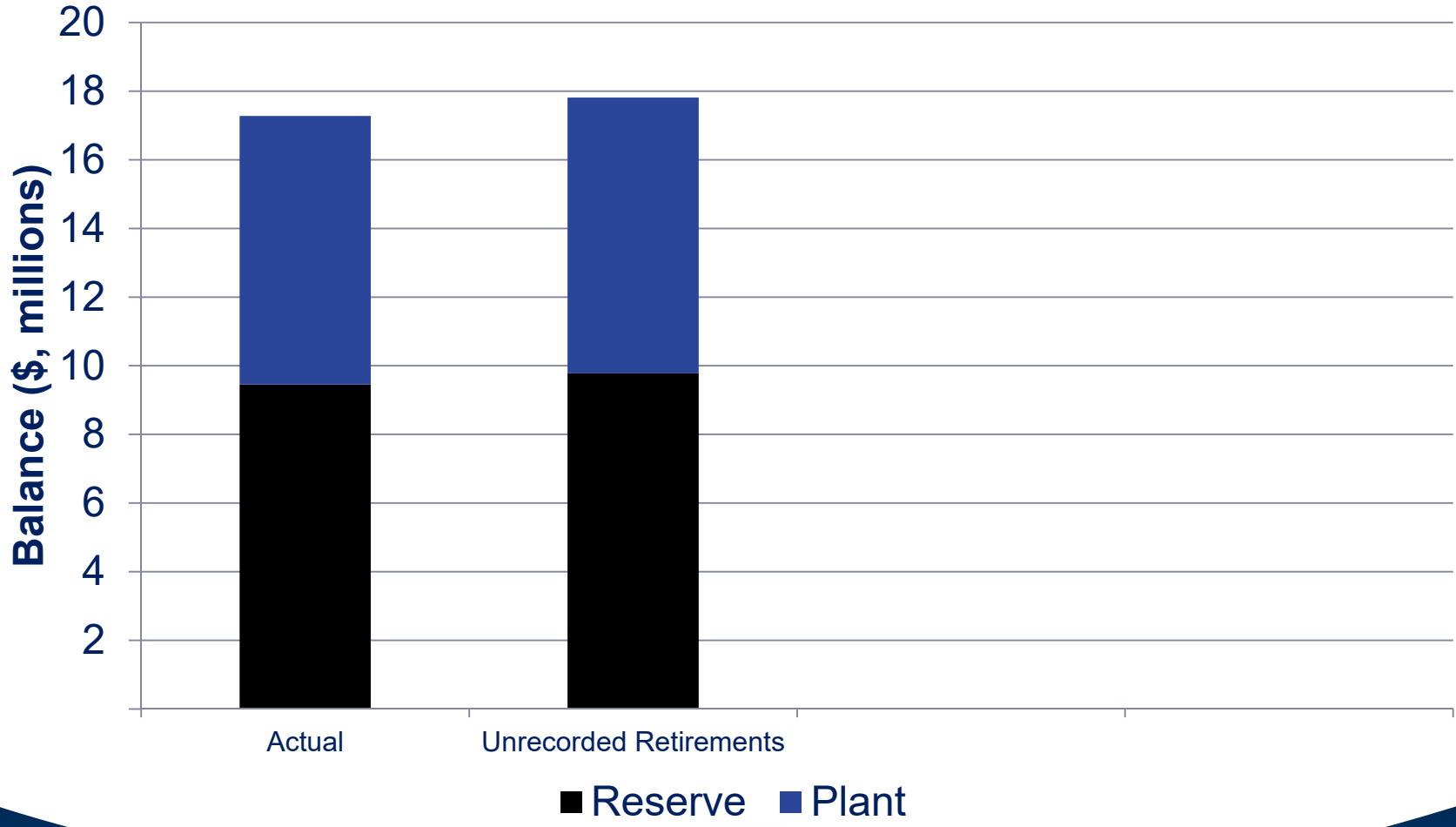
*Excellence Delivered **As Promised***

STAFF 000076
FPL RC-16

Depreciation Parameters, 2010

	Survivor Curve	Net Salvage	Depr Rate	Depreciation Expense	Pct Diff from Actual
Actual	45-S1.5	(65)	3.66%	$632,792	-
Unrecorded Retirements	49-S1	(75)	3.53%	$629,499	-0.5%

Plant and Reserve Balances at 2010



Gannett Fleming

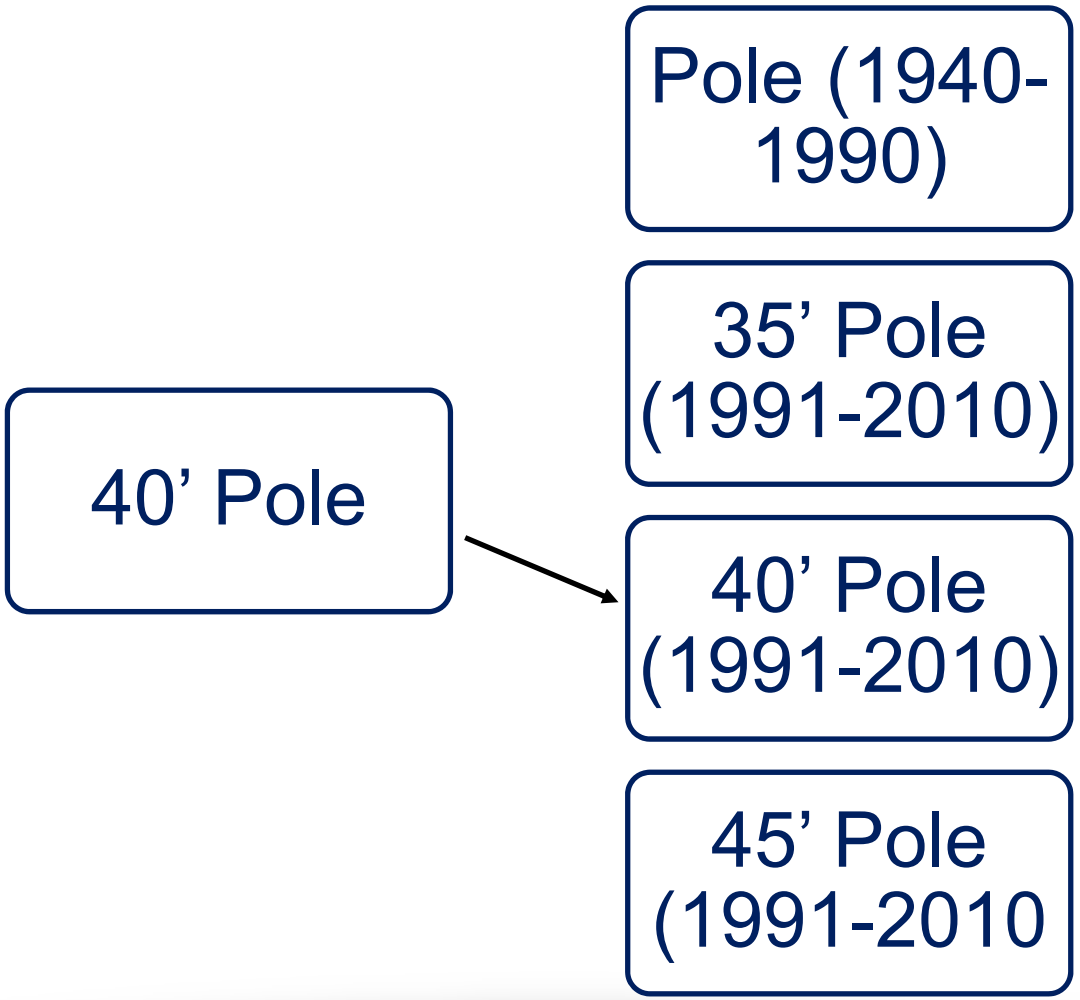
*Excellence Delivered **As Promised***

Different Vintage Retirements

- **System configuration issue**
- **Retirement units**

- **Example**
  - Historical Data
    - Retirement Unit – Poles
  - Current Retirement Units
    - 35 foot poles, 40 foot poles, 45 foot poles, etc.
  - What is retired when you replace 40 foot pole?

Different Vintage Retirements

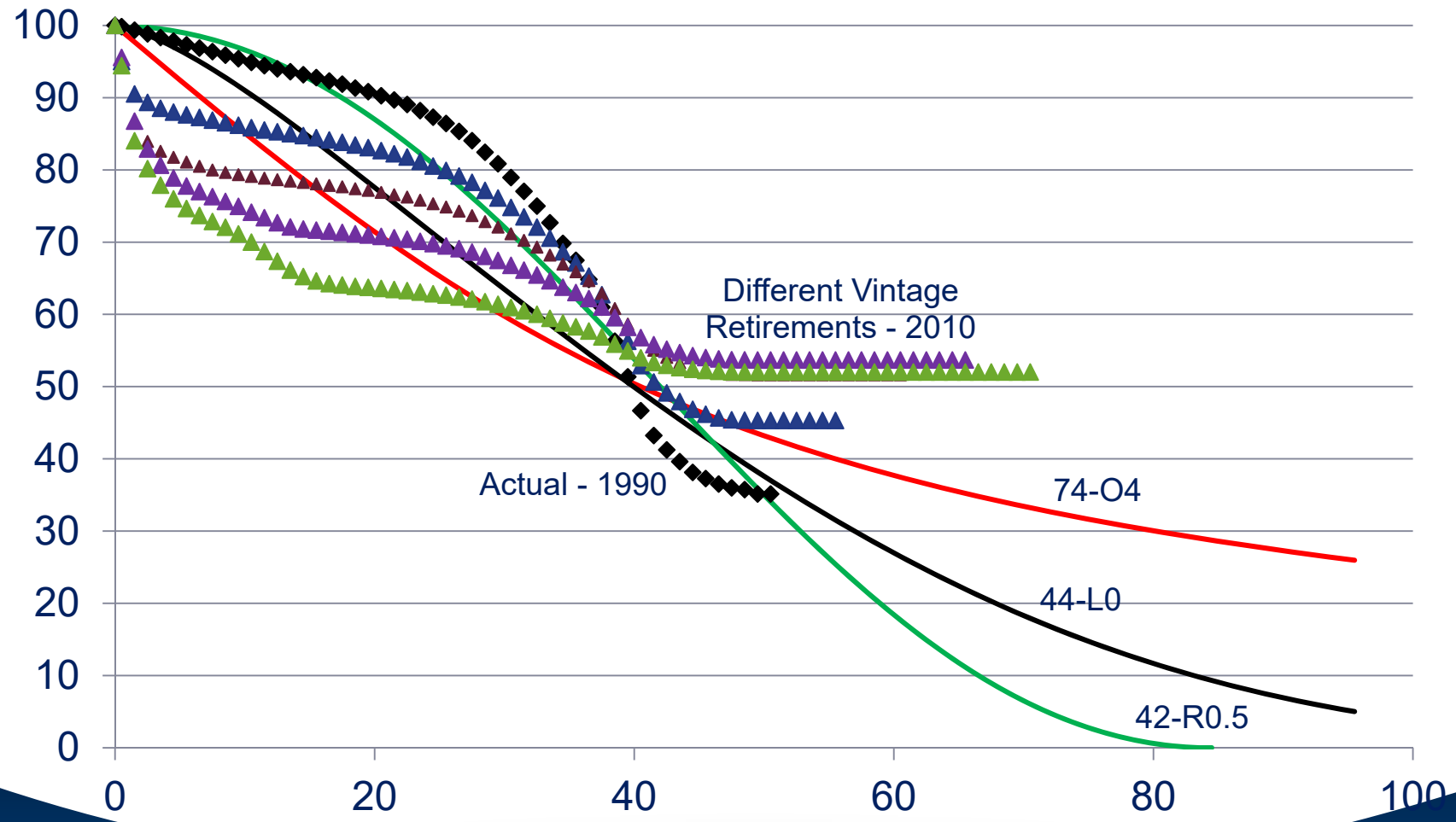


STAFF 000080
FPL RC-16

Different Vintage Retirements - Model

- **Retirement units modified in 1991**
  - System conversion in 1990
  - Poles recorded by type, size and region
  - Retirements only made from vintages 1991 and later

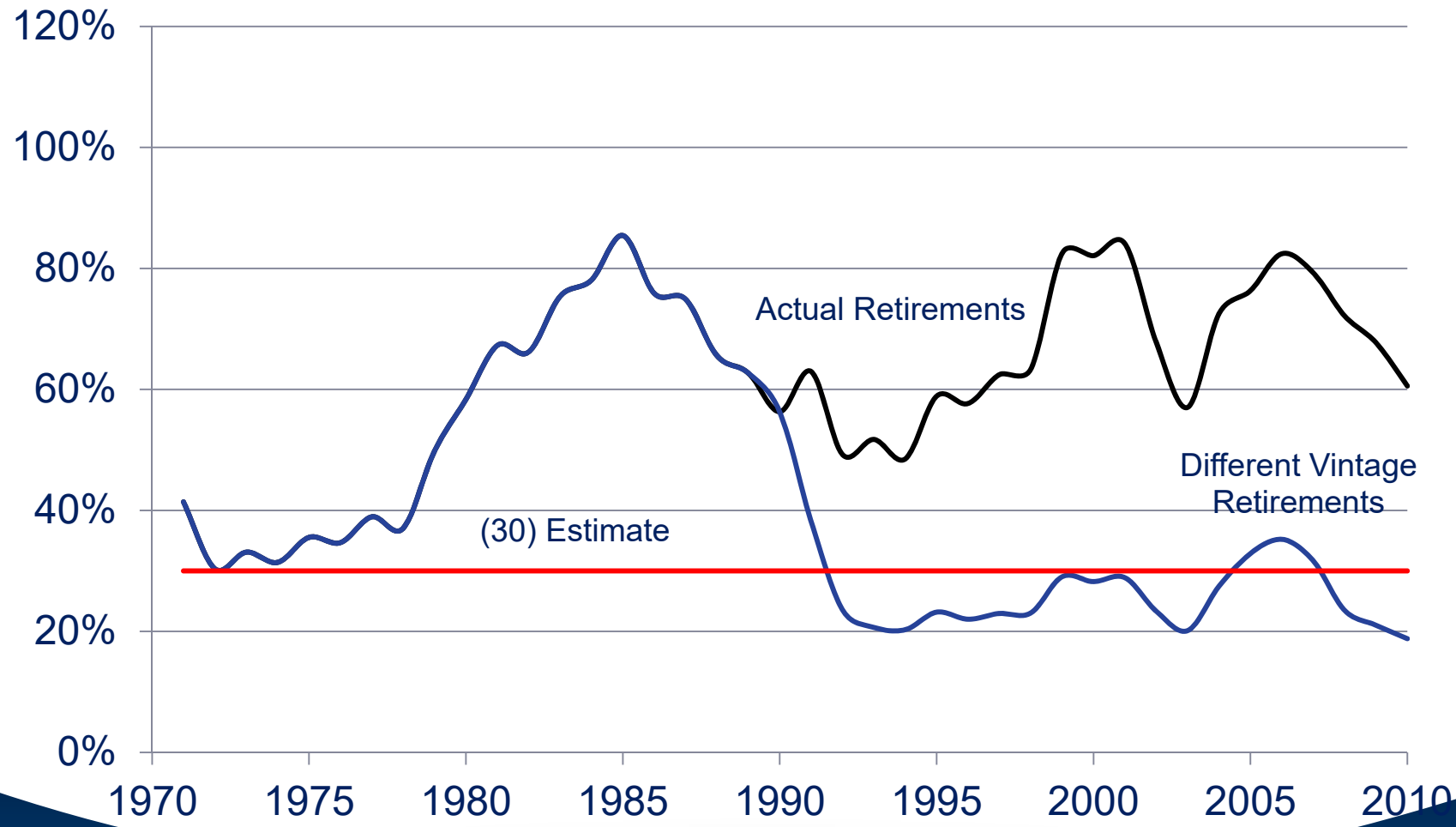
Different Vintage Retirements – Life Analysis



Gannett Fleming

Excellence Delivered ***As Promised***

Different Vintage Retirements - Net Salvage



Gannett Fleming

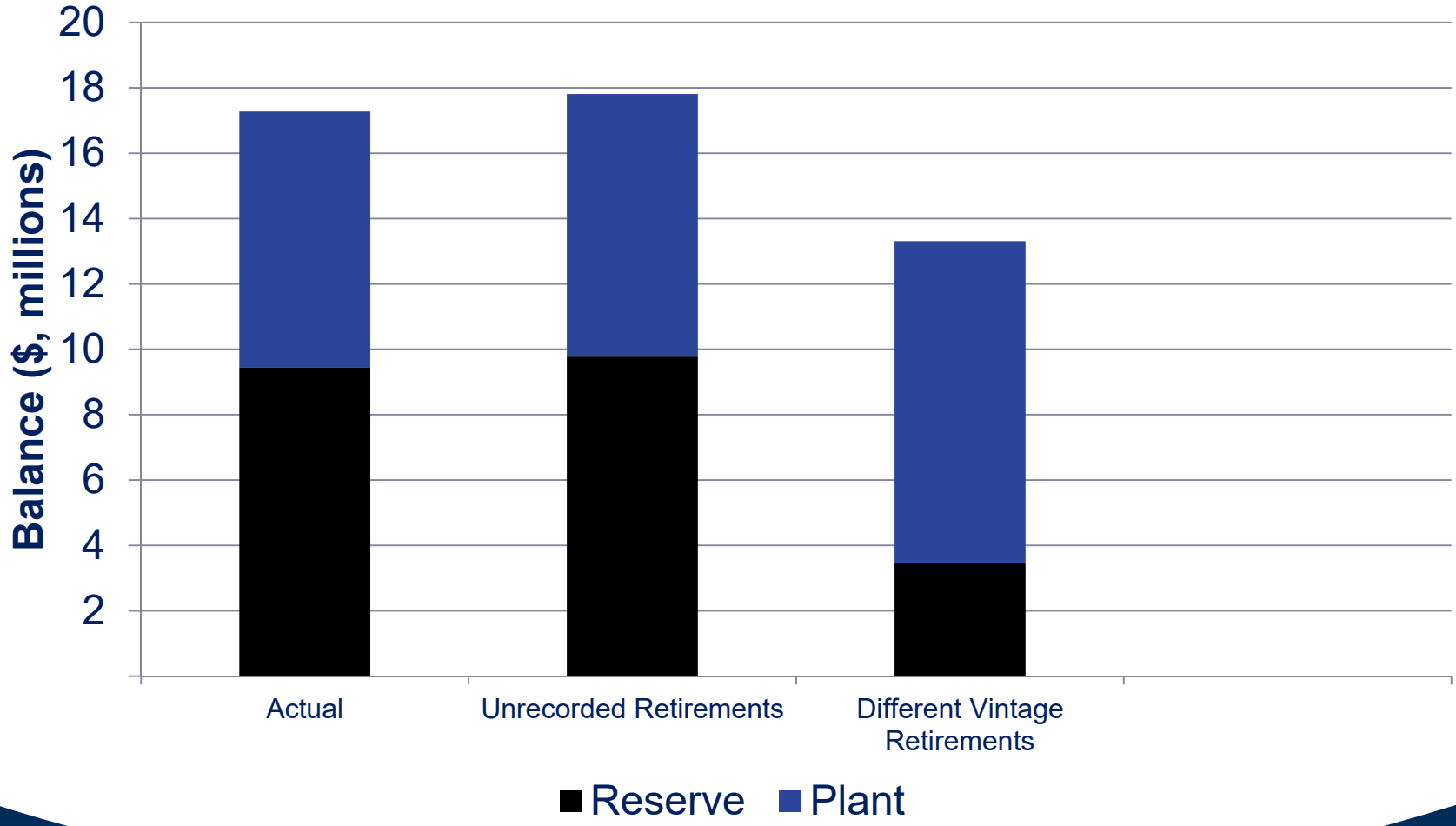
*Excellence Delivered **As Promised***

STAFF 000083
FPL RC-16

Depreciation Parameters, 2010

	Survivor Curve	Net Salvage	Depr Rate	Depreciation Expense	Pct Diff from Actual
Actual	45-S1.5	(65)	3.66%	$632,792	-
Unrecorded Retirements	49-S1	(75)	3.53%	$629,499	-0.5%
Different Vintage Retirements	42-R0.5	(30)	3.73%	$496,537	-21.5%

Plant and Reserve Balances at 2010



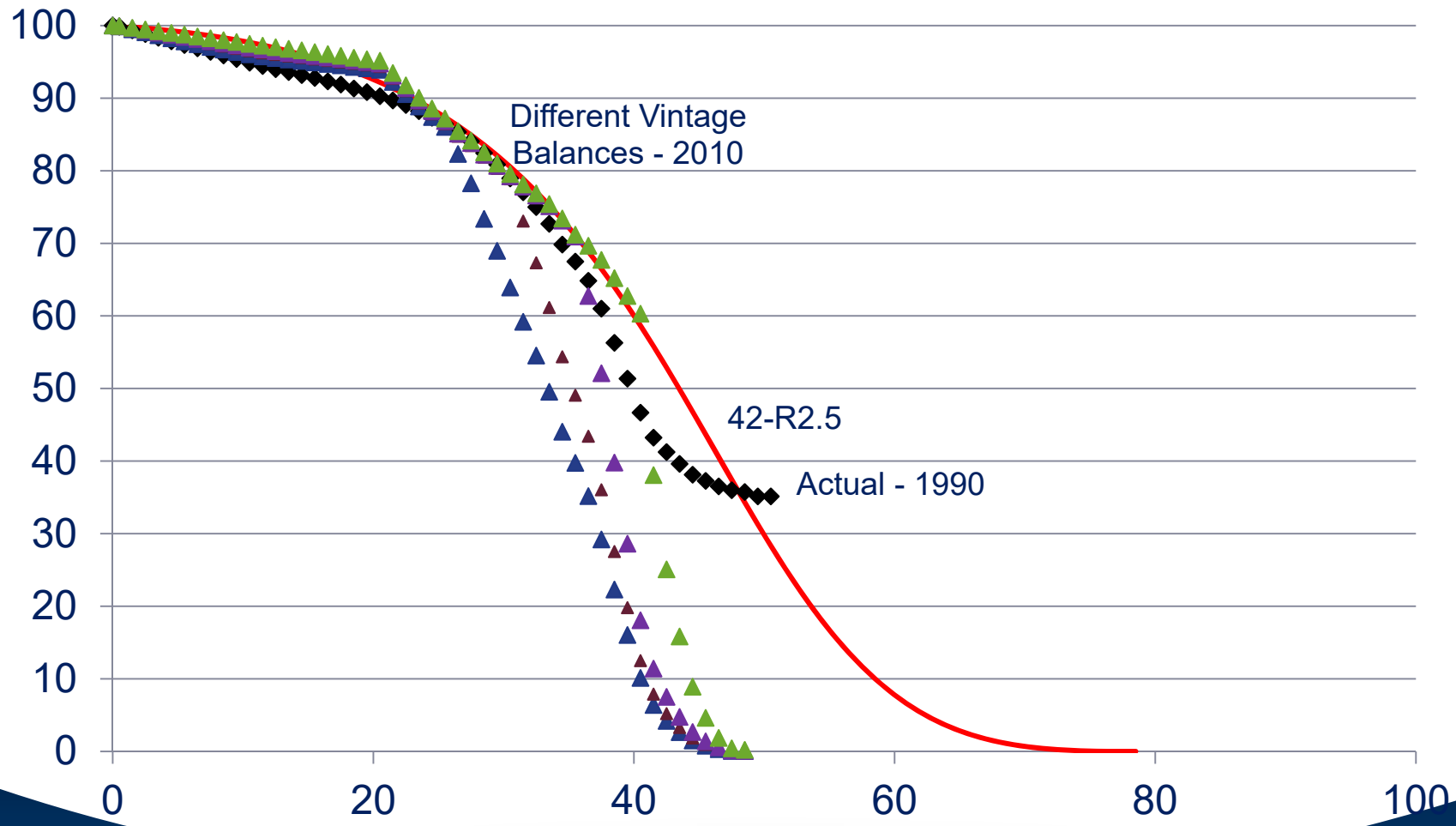
Gannett Fleming

Excellence Delivered As Promised

Different Vintage Balances

- **System conversion in 1990**
  - Previously Unaged Data
- **All vintages grouped into 1970 vintage**

Different Vintage Balances – Life Analysis

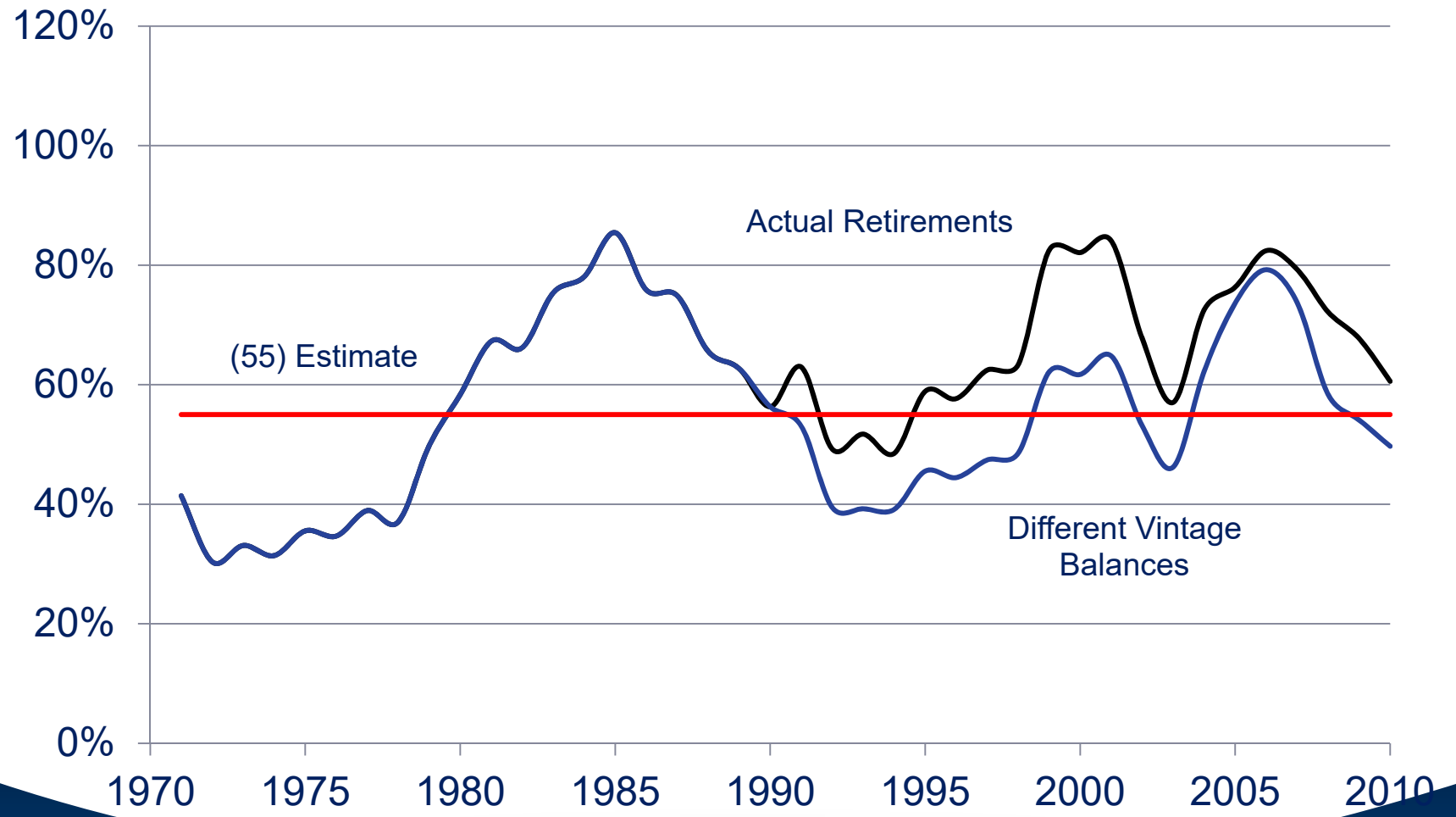


Gannett Fleming

*Excellence Delivered **As Promised***

STAFF 000087
FPL RC-16

Incorrect Balances - Net Salvage Analysis



Gannett Fleming

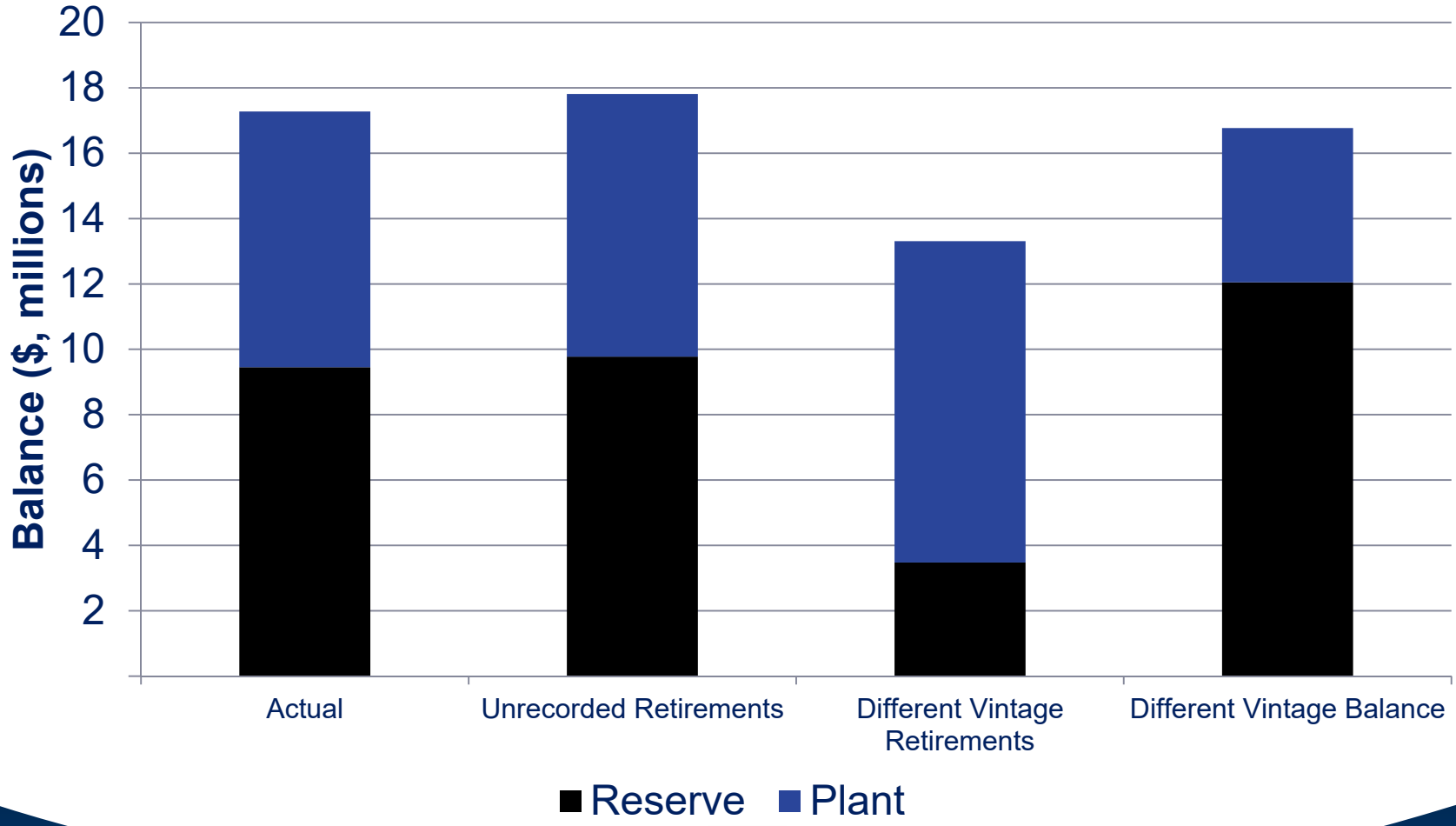
Excellence Delivered As Promised

STAFF 000088
FPL RC-16

Depreciation Parameters, 2010

	Survivor Curve	Net Salvage	Depr Rate	Depreciation Expense	Pct Diff from Actual
Actual	45-S1.5	(65)	3.66%	$632,792	-
Unrecorded Retirements	49-S1	(75)	3.53%	$629,499	-0.5%
Different Vintage Retirements	42-R0.5	(30)	3.73%	$496,537	-21.5%
Different Vintage Balances	42-R2.5	(55)	3.23%	$541,557	-14.4%

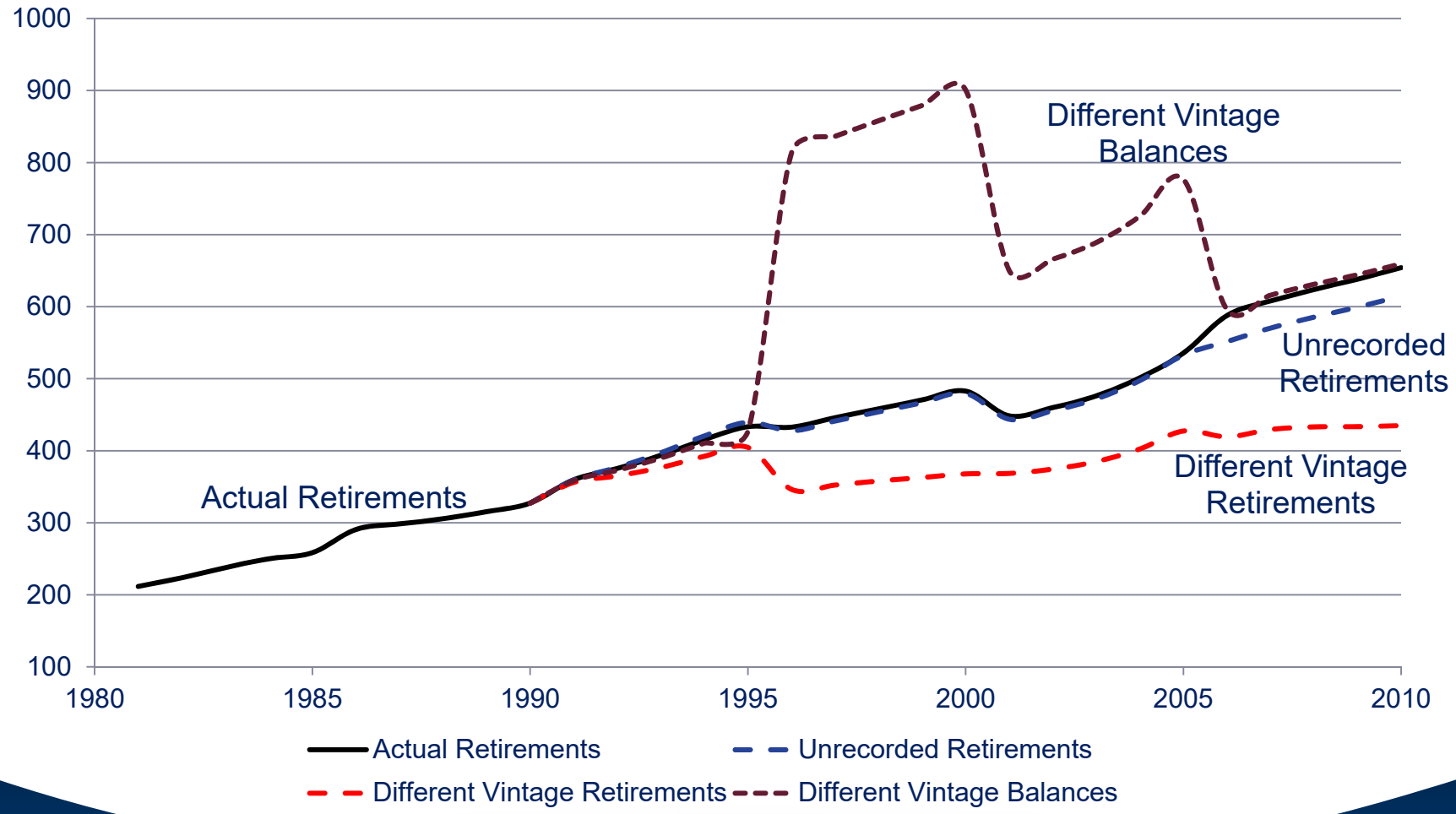
Plant and Reserve Balances at 2010



Gannett Fleming

Excellence Delivered ***As Promised***

Depreciation Expense, 1981 - 2010

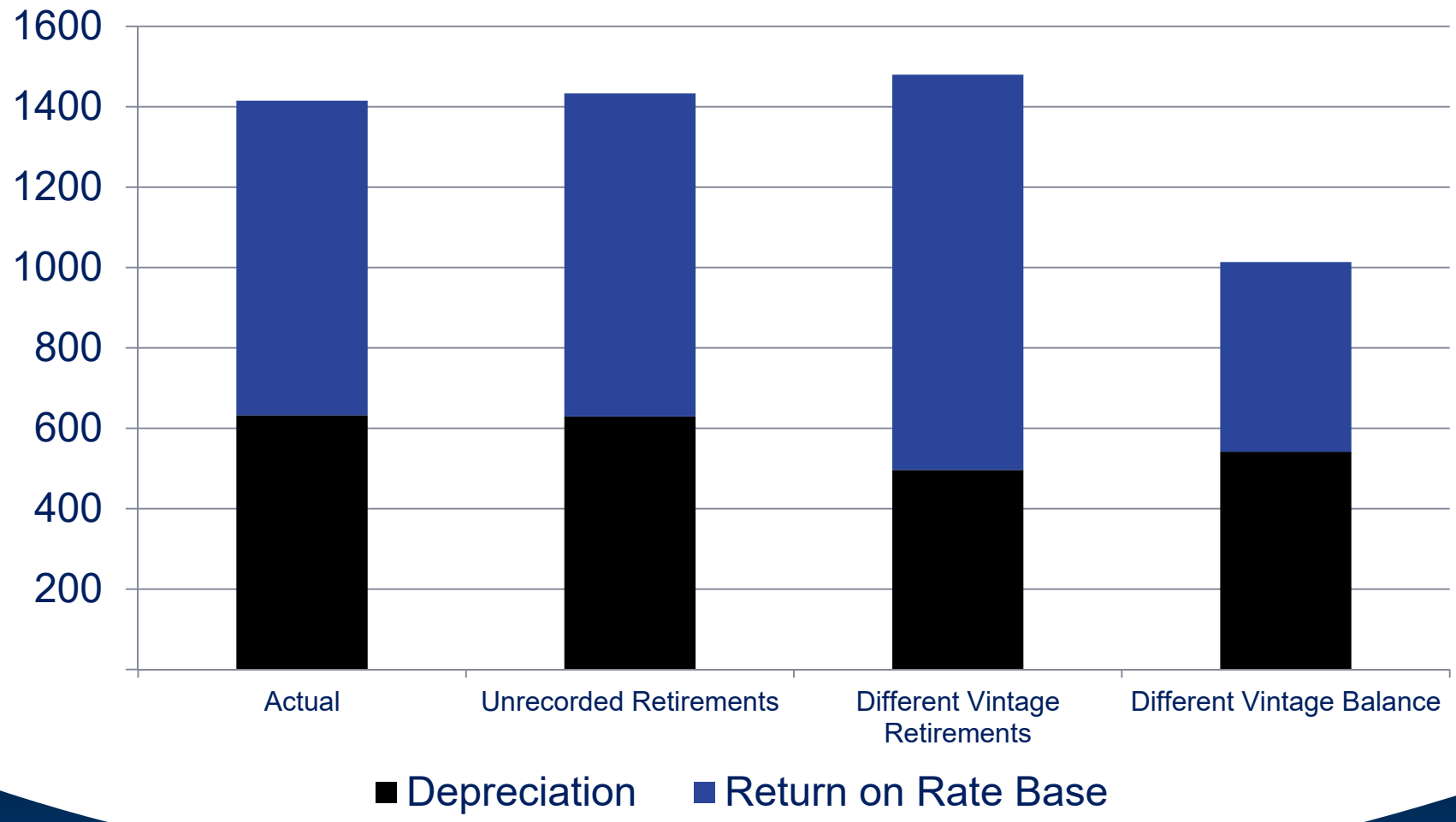


Gannett Fleming

Excellence Delivered ***As Promised***

STAFF 000091
FPL RC-16

Depreciation and Return on Rate Base



Gannett Fleming

*Excellence Delivered **As Promised***

Retirement Issues

- **Historical data impacts depreciation and rate base**
  - Retirements
  - Initial state (balances)
- **Differences in data can have impact**
  - Service lives
  - Net salvage
  - Plant and reserve balances

Gannett Fleming

Excellence Delivered As Promised

Retirement Pricing Models

Retirement Pricing Models

- **What happens if you do not have perfect information?**
  - Still need to determine what to retire
  - Still need to record retirements

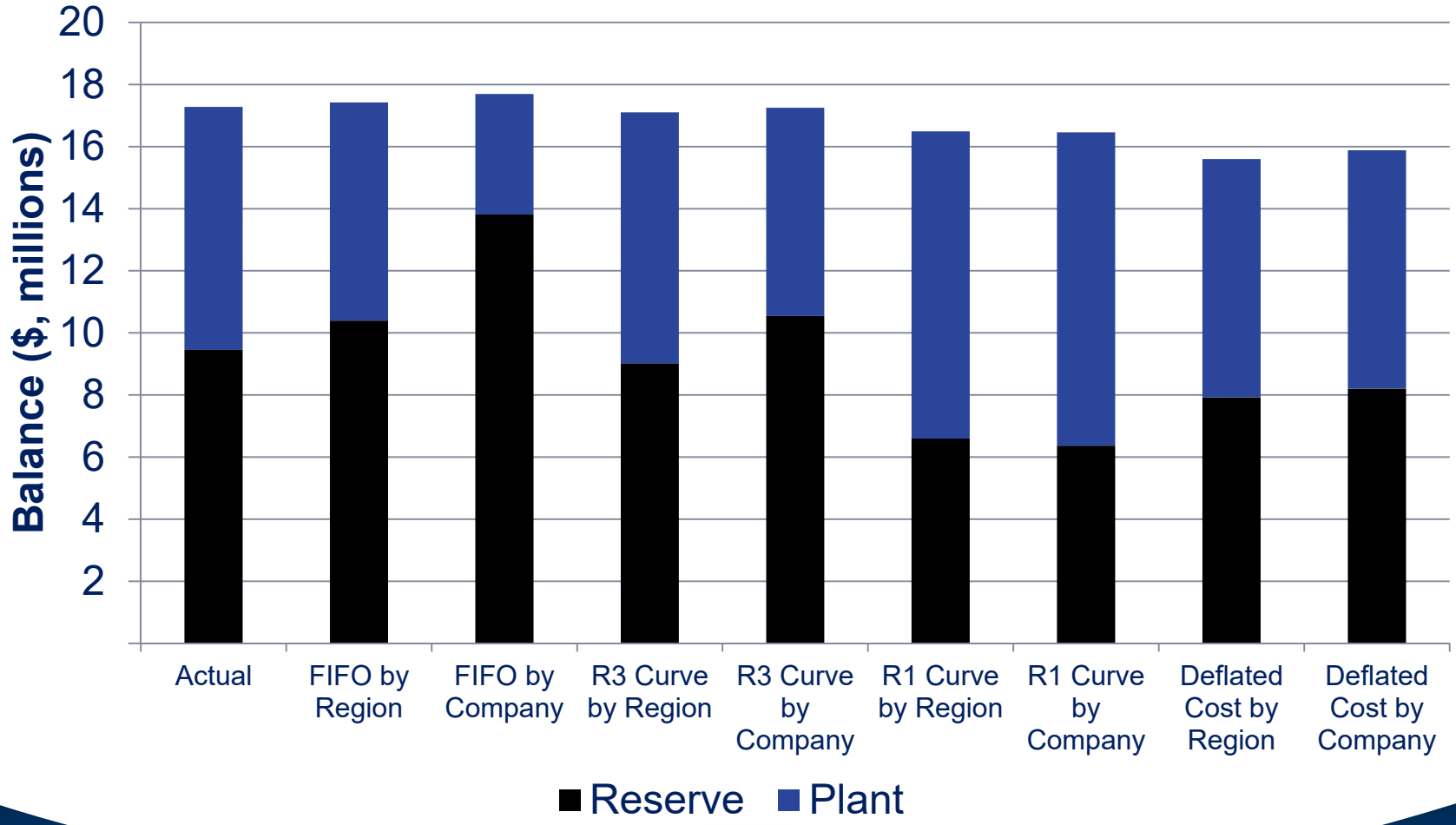
Retirement Pricing Models

- **Actual Retirements**
- **FIFO**
- **Survivor Curve, Units**
  - Two scenarios
    - R1 Curve
    - R3 Curve
- **Deflated Cost**
  - Based on curve and inflation index
- **Two scenarios for each method**
    - Region
    - Company

Depreciation Parameters, 2010

	Survivor Curve	Net Salvage	Depr Rate	Depreciation Expense	% Variance from Actual
Actual	45-S1.5	(65)	3.66%	$632,792	-
FIFO – By Region	42-R3	(65)	3.94%	$685,938	8.4%
FIFO – By Company	40-R5	(70)	3.92%	$693,773	9.6%
R3 Curve – By Region	44-S1.5	(60)	3.64%	$623,331	-1.5%
R3 Curve – By Company	42-R2.5	(60)	3.61%	$622,518	-1.6%
R1 Curve – By Region	44-S0	(50)	3.47%	$571,983	-9.6%
R1 Curve – By Company	45-S0	(50)	3.41%	$561,693	-11.2%
Deflated Cost – By Region	36-R2	(45)	4.04%	$629,874	-0.5%
Deflated Cost – By Company	37-R2	(45)	3.86%	$612,652	-3.2%

Plant and Reserve Balances at 2010

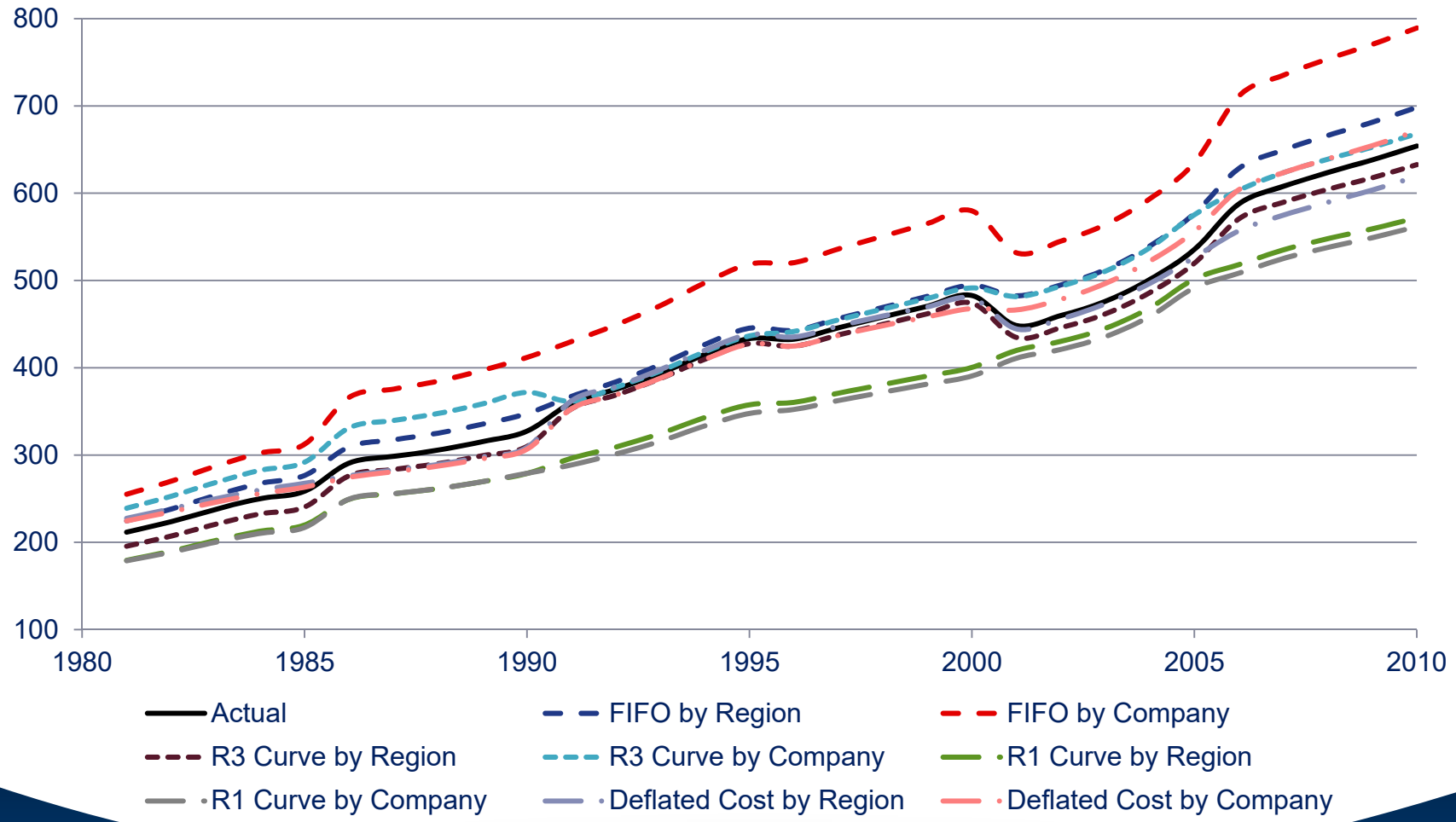


Gannett Fleming

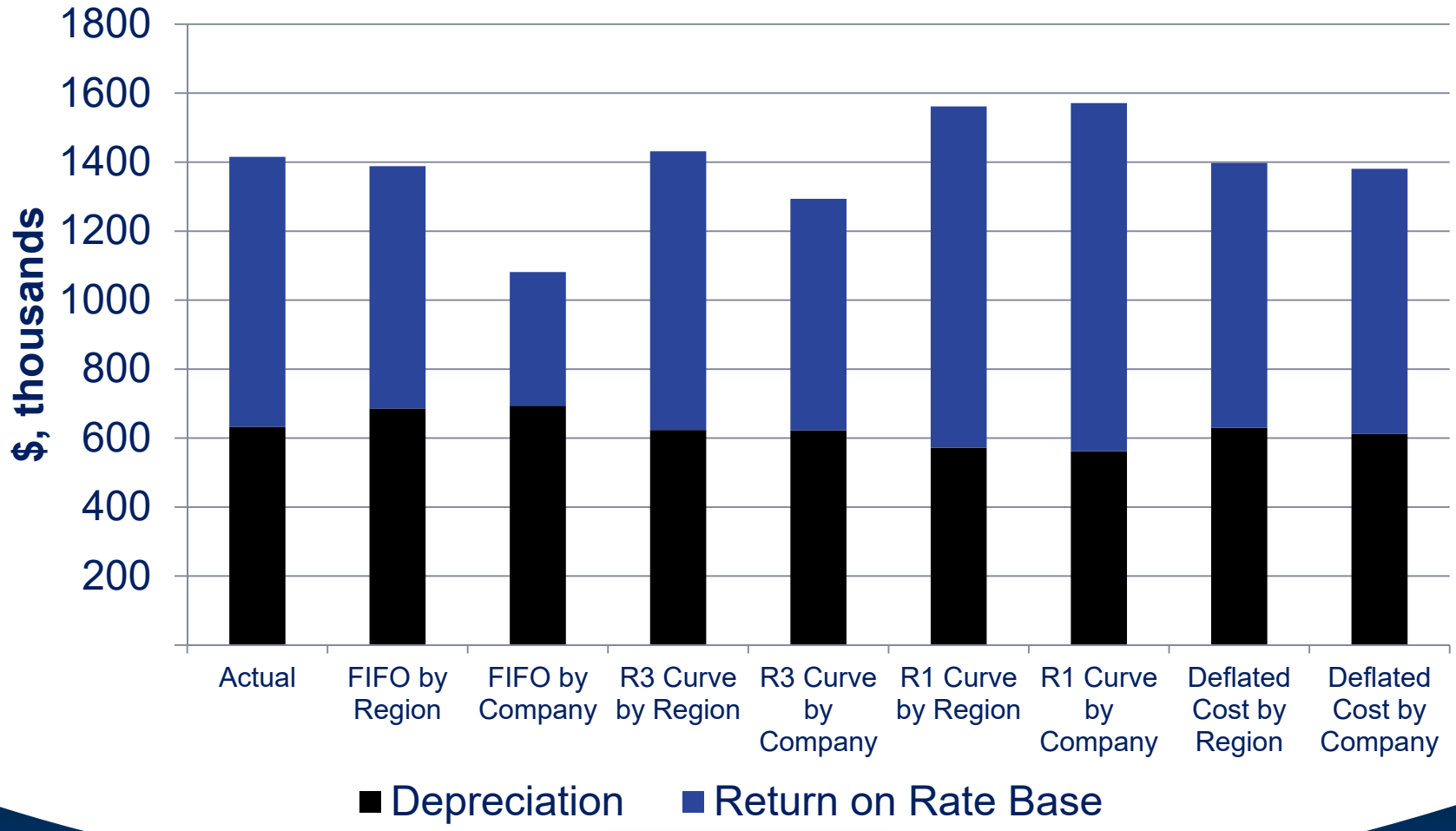
*Excellence Delivered **As Promised***

STAFF 000098
FPL RC-16

Depreciation Expense, 1981 - 2010



Depreciation and Return at 2010



Gannett Fleming

Excellence Delivered ***As Promised***

Gannett Fleming

Excellence Delivered As Promised

Conclusion

Data

- **What's the point?**
  - Data, and retirements, have significant impact
  - Goal is to be as accurate as possible
- **Effect of retirement practices:**
  - Plant and reserve balances
  - Service lives
  - Net salvage
  - Depreciation expense
  - Rate base
  - Return on rate base

Gannett Fleming

Excellence Delivered As Promised

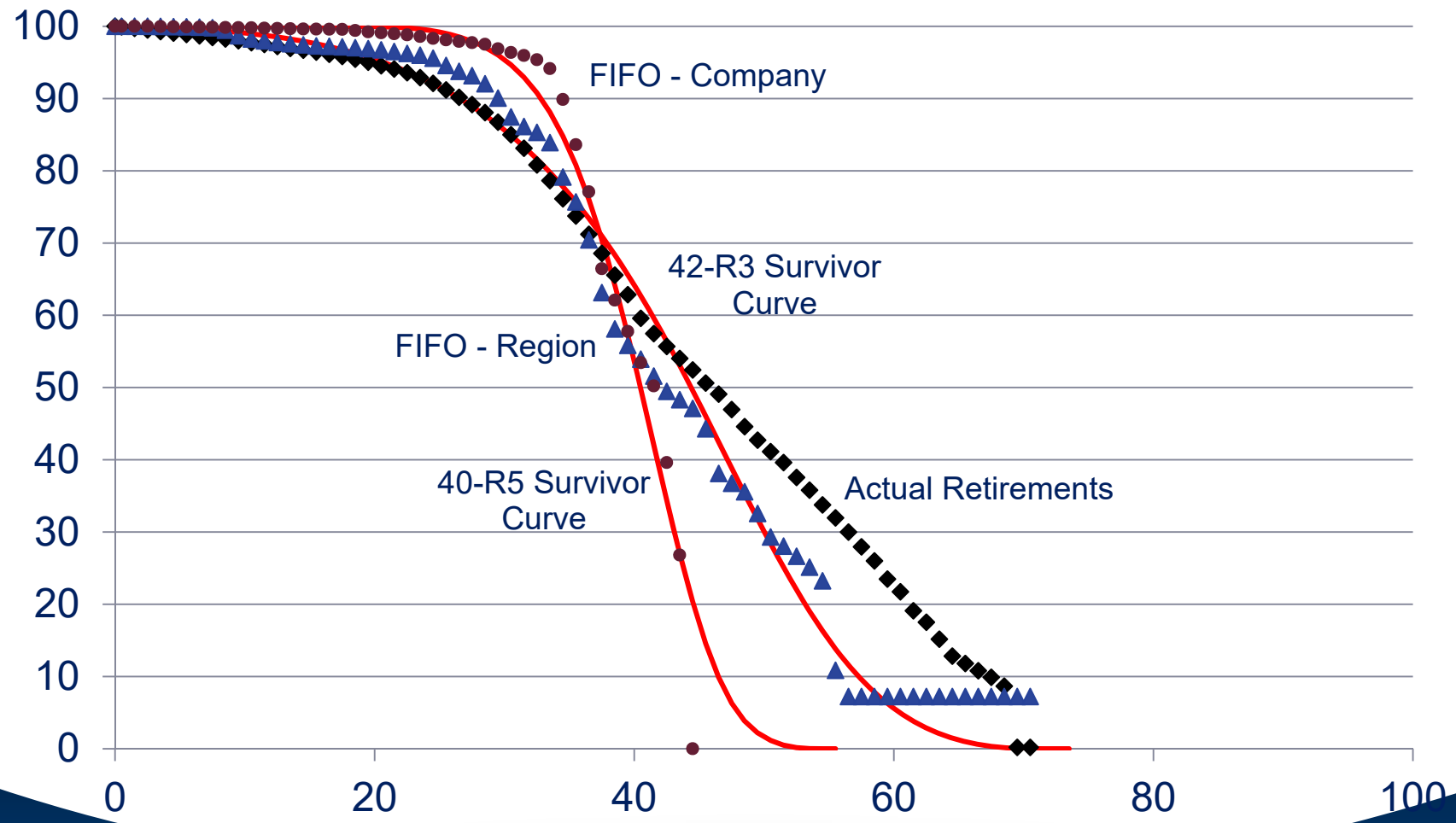
Questions?

Gannett Fleming

Excellence Delivered As Promised

Appendix – Retirement Pricing Models

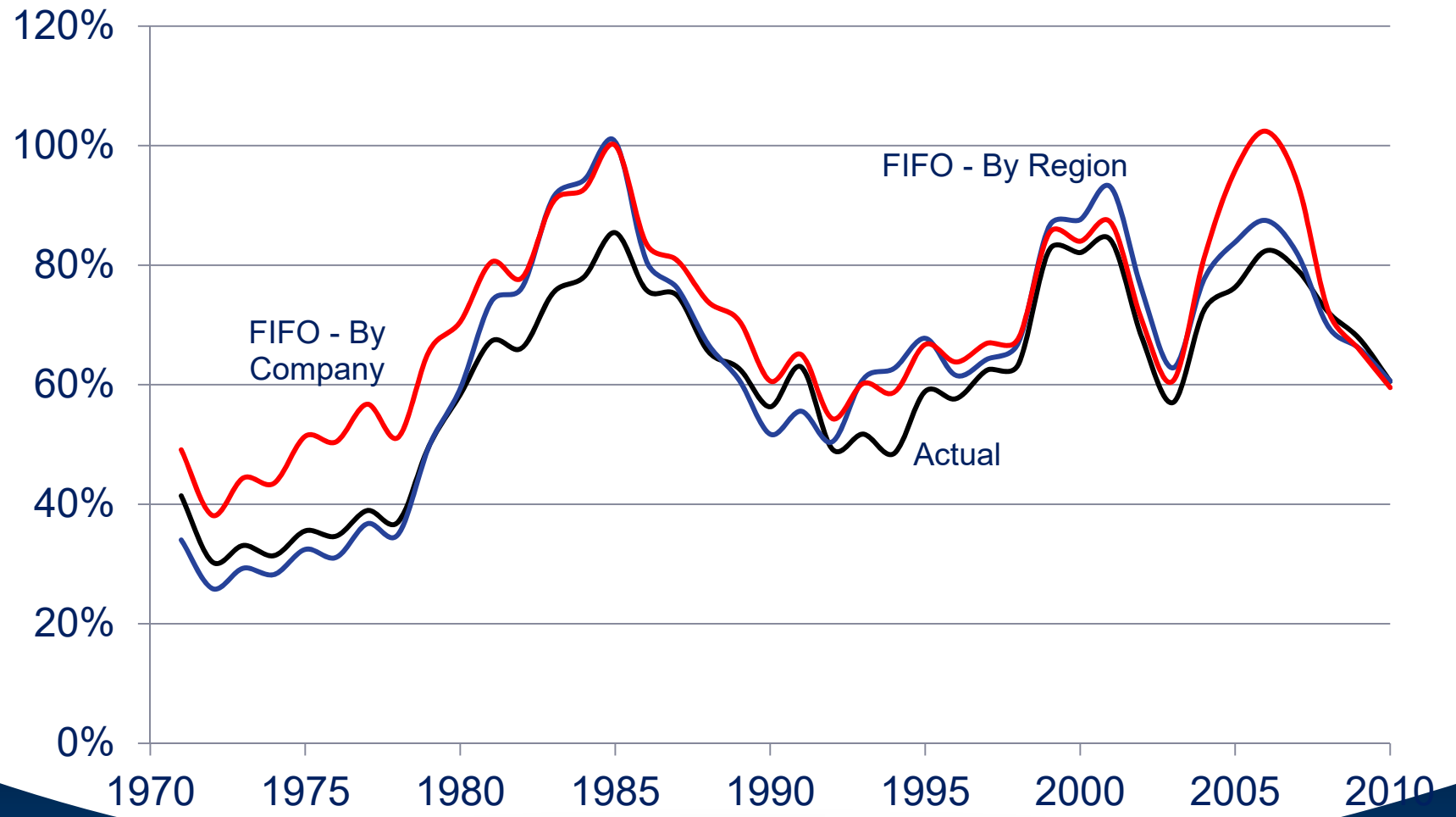
Life Analysis Comparison – Actual to FIFO



Gannett Fleming

Excellence Delivered ***As Promised***

Net Salvage Comparison – Actual to FIFO

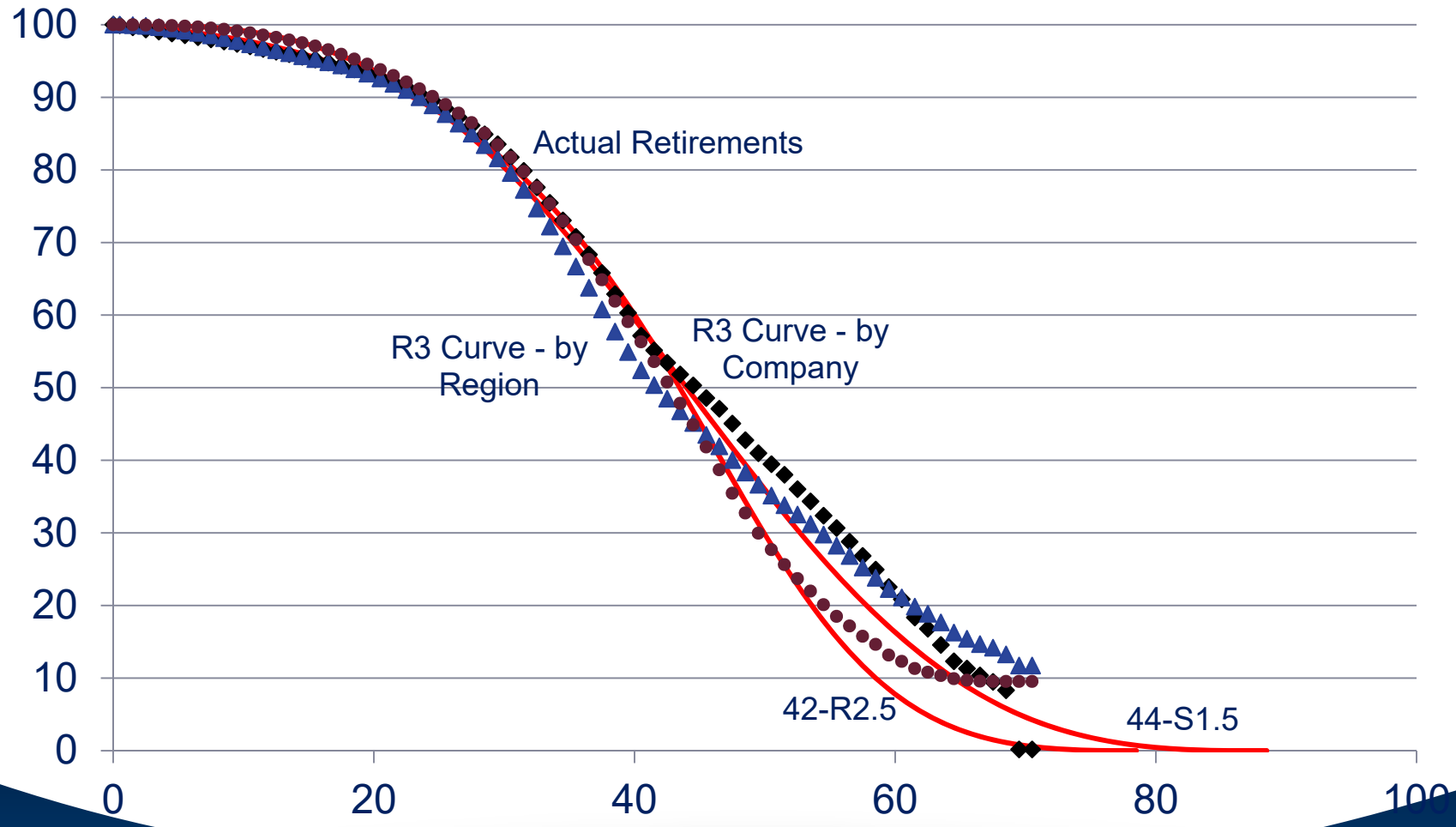


Gannett Fleming

*Excellence Delivered **As Promised***

STAFF 000106
FPL RC-16

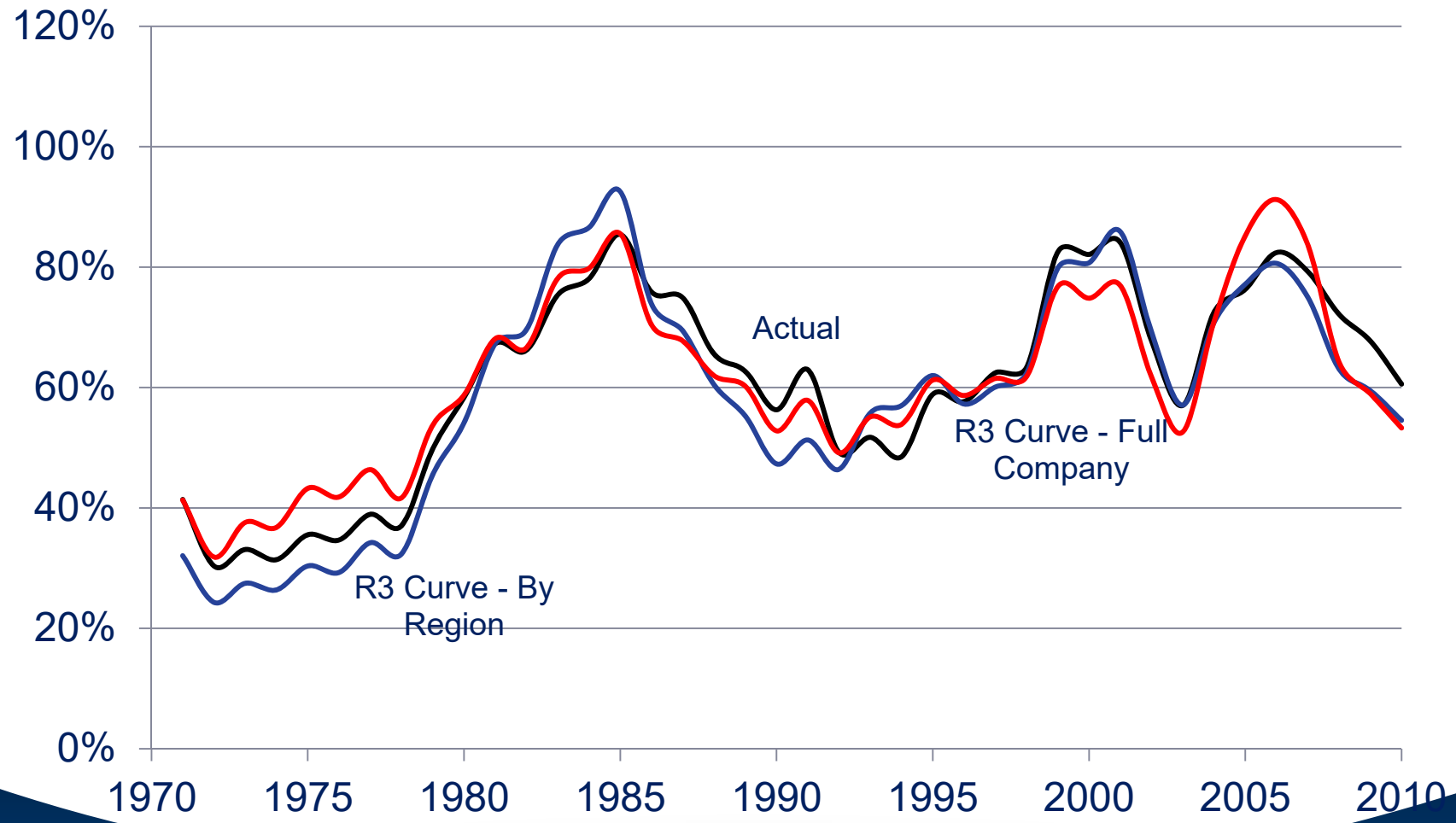
Life Analysis Comparison – Actual to R3 Curve



Gannett Fleming

Excellence Delivered ***As Promised***

Net Salvage Comparison – Actual to R3 Curve

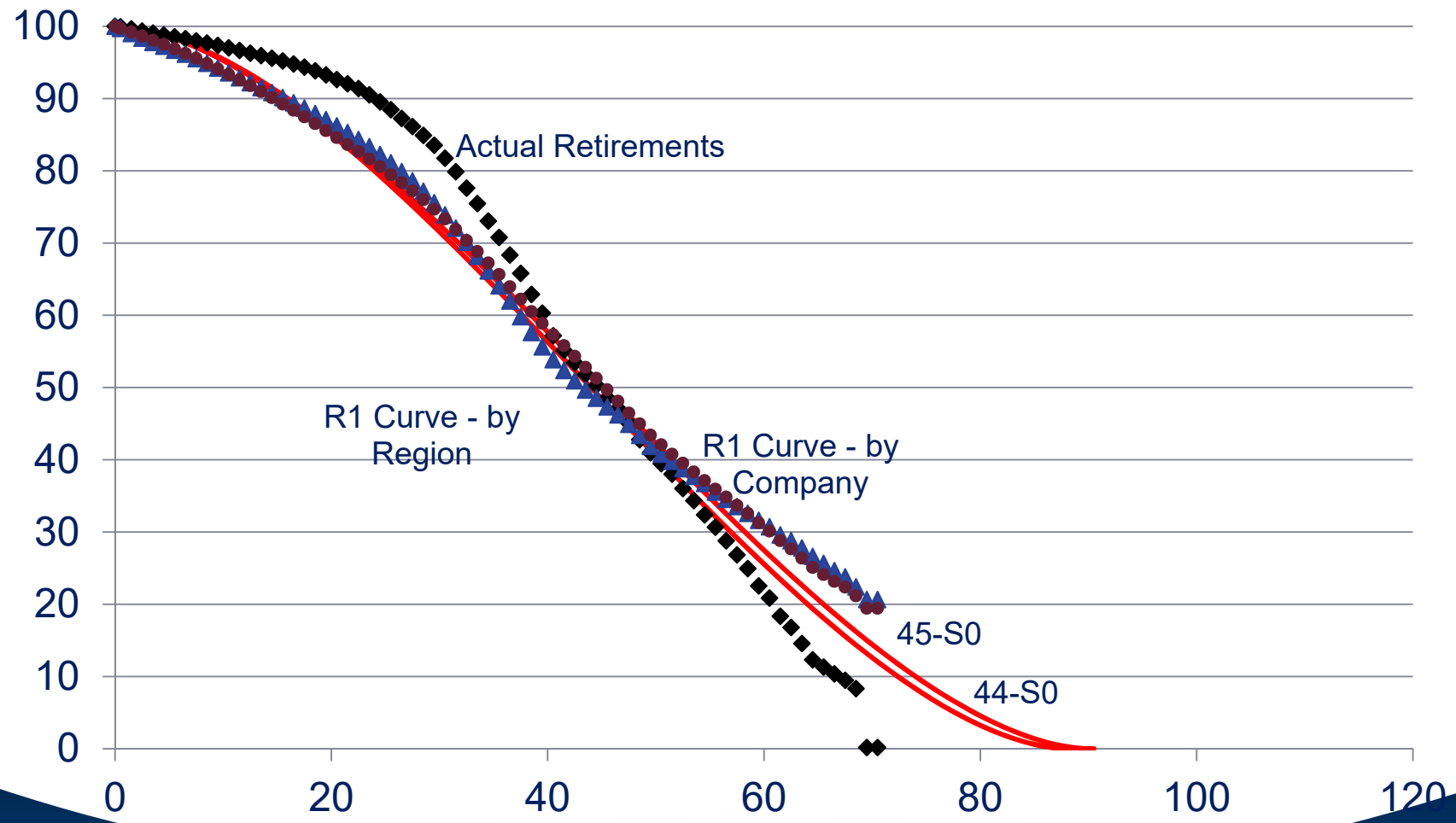


Gannett Fleming

*Excellence Delivered **As Promised***

STAFF 000108
FPL RC-16

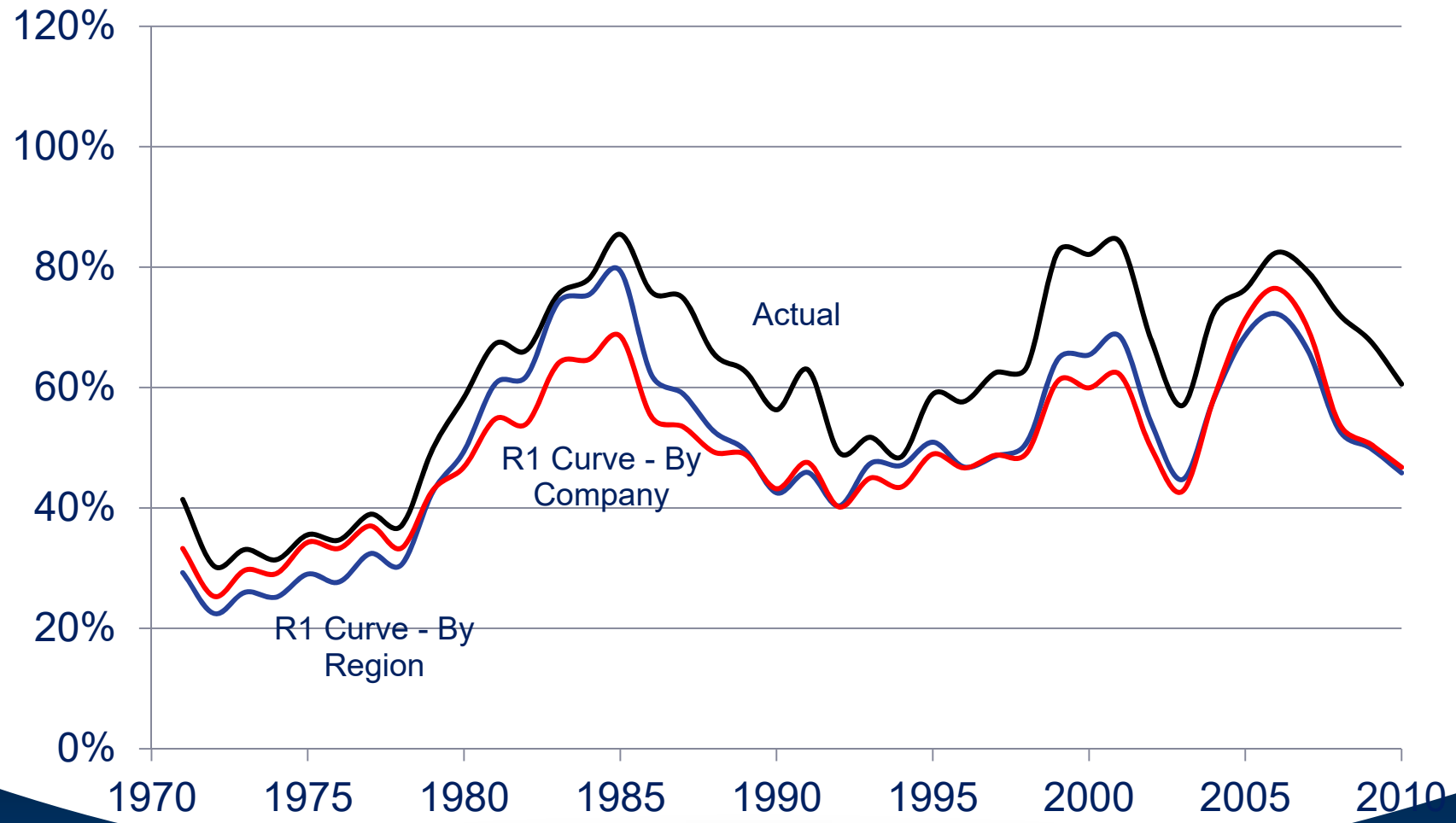
Life Analysis Comparison – Actual to R1 Curve



Gannett Fleming

Excellence Delivered ***As Promised***

Net Salvage Comparison – Actual to R1 Curve

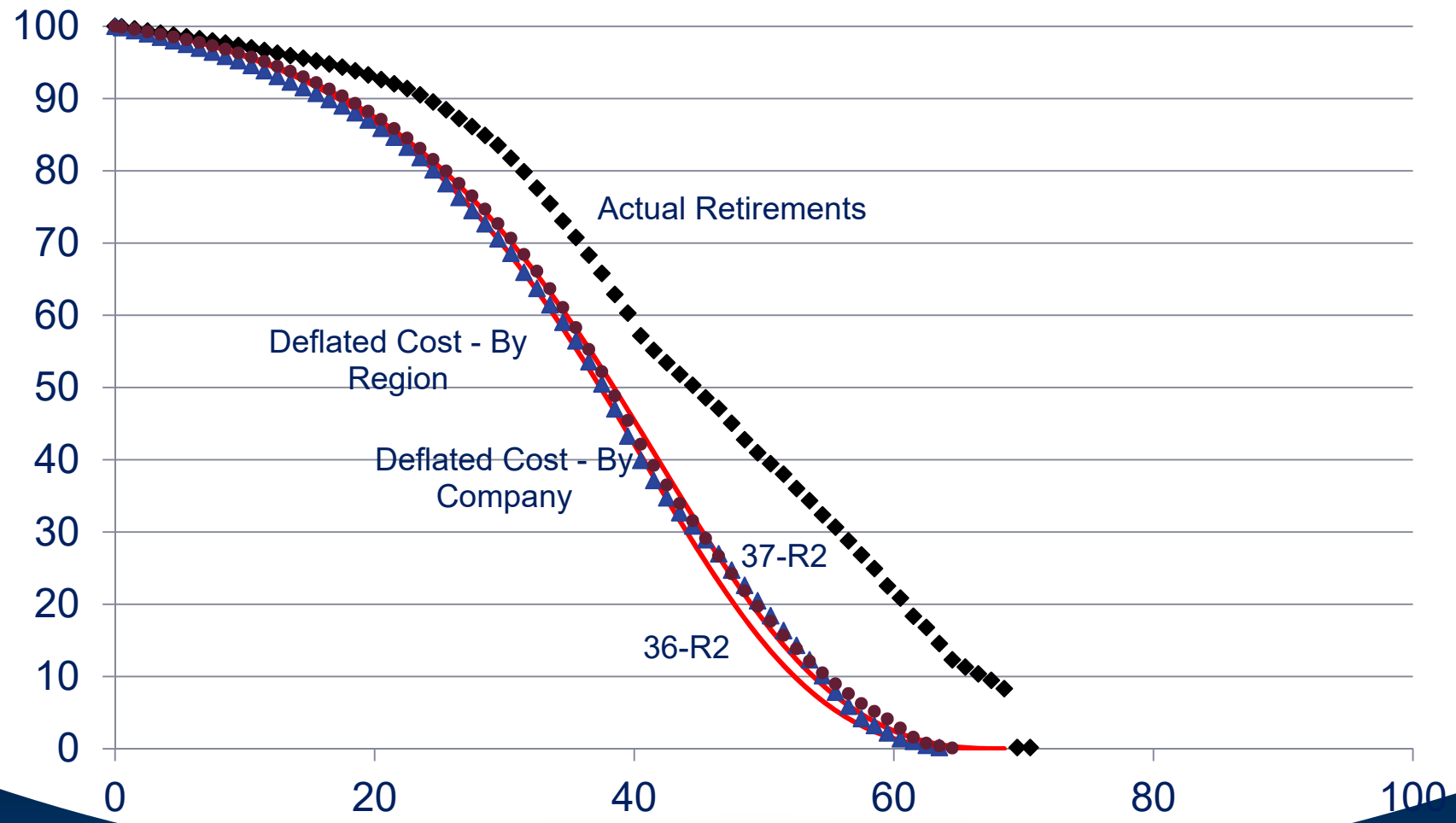


Gannett Fleming

*Excellence Delivered **As Promised***

STAFF 000110
FPL RC-16

Life Analysis Comparison – Actual to Deflated Cost

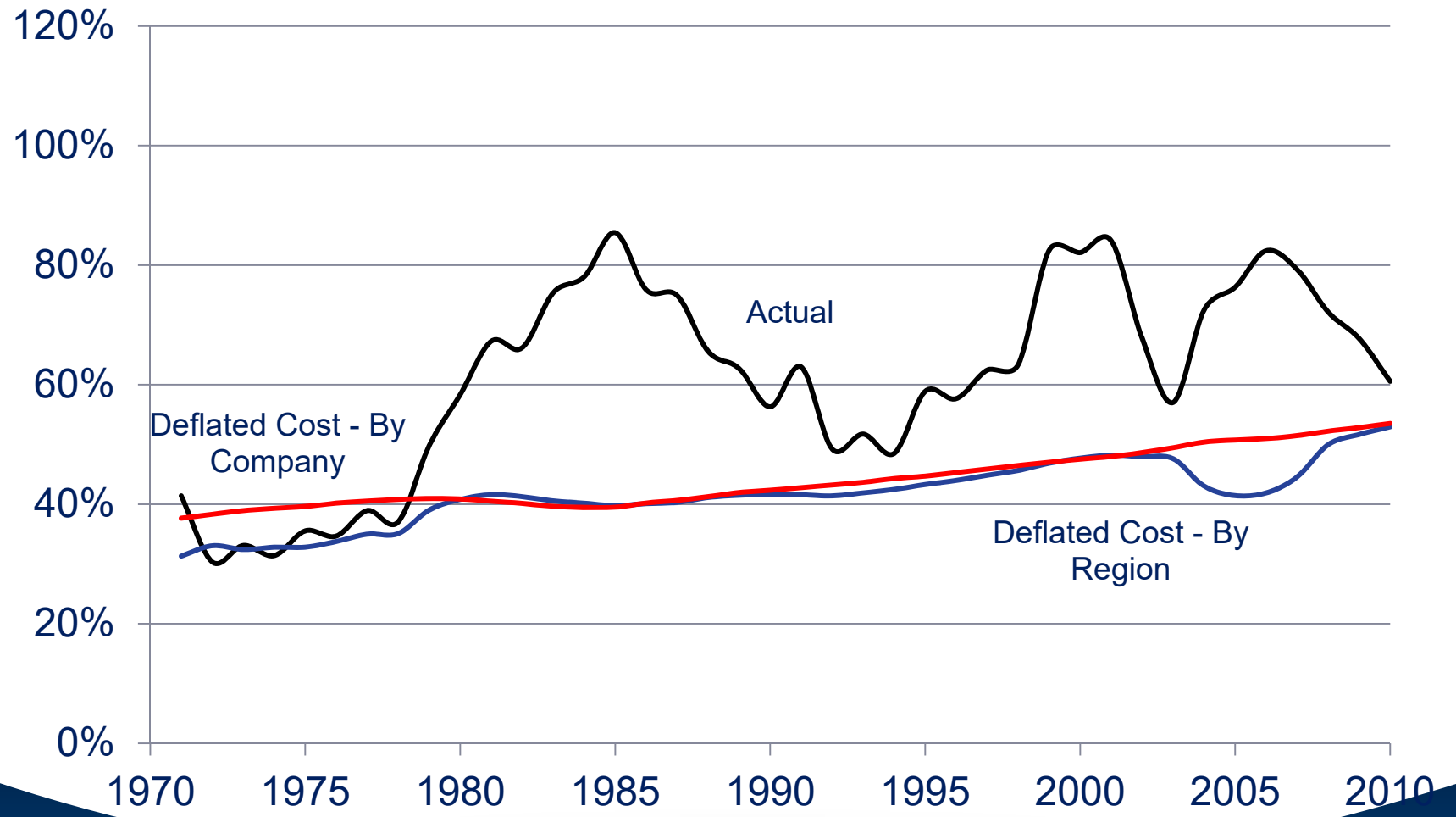


Gannett Fleming

Excellence Delivered ***As Promised***

STAFF 000111
FPL RC-16

Net Salvage Comparison – Actual to Deflated Cost



Gannett Fleming

Excellence Delivered ***As Promised***

STAFF 000112
FPL RC-16