

**RETIREMENT SYSTEM FOR JUDGES AND SOLICITORS OF  
THE STATE OF SOUTH CAROLINA (JSRS)**

*ACTUARIAL VALUATION REPORT*

*AS OF JULY 1, 2016*

December 8, 2016

Public Employee Benefit Authority  
South Carolina Retirement Systems  
P.O. Box 11960  
Columbia, SC 29211-1960

**Subject: Actuarial Valuation as of July 1, 2016**

Dear Members of the Board:

This report describes the current actuarial condition of the Retirement System for Judges and Solicitors of the State of South Carolina (JSRS), determines the calculated employer contribution requirement, and analyzes changes in the System's financial condition. In addition, the report provides various summaries of the data. A separate report is issued with regard to valuation results determined in accordance with Governmental Accounting Standards Board (GASB) Statements 67 and 68. Results of this report should not be used for any other purpose without consultation with the undersigned. Valuations are prepared annually as of July 1, the first day of the plan year for JSRS. This report was prepared at the request of the Board of Directors of the South Carolina Public Employee Benefit Authority (Board) and is intended for use by the Public Employee Benefit Authority (PEBA) staff and those designated or approved by the Board.

Under South Carolina State statutes, the Board must certify the employer contribution annually. This amount is determined actuarially, based on the Board's funding policy. The contribution rate is determined by a given actuarial valuation and becomes effective twenty-four months after the valuation date. In other words, the contribution rate determined by this July 1, 2016 actuarial valuation will be used by the Board when certifying the employer contribution rate for the year beginning July 1, 2018. If new legislation is enacted between the valuation date and the date the contribution rate becomes effective, the Board may adjust the calculated amount before certifying them, in order to reflect this new legislation. Such adjustments are based on information supplied by the actuary.

#### **FINANCING OBJECTIVES AND FUNDING POLICY**

The principle objectives in the funding policy that are maintained by the Board include:

- Establish a contribution rate that remains relatively level over time.
- To set a rate so that the measures of the System's funding progress which includes the unfunded actuarial accrued liability, funded ratio, and funding period will be maintained or improved.

- To set a contribution rate that will amortize the unfunded actuarial accrued liability (UAAL) over a period that does not exceed 30 years.

For JSRS, the Board's funding policy is to determine an employer contribution rate that is at least equal to the sum of the employer normal cost rate (which pays the current year's cost) and an amortization rate which results in the UAAL to be funded over a period that does not exceed 30 years in installments that increase at the assumed rate of growth in payroll for JSRS.

The employer contribution rates that have been certified by the Board to become effective July 1, 2016 are no longer sufficient to maintain a 30 year funding period. As a result, the employer contribution will increase to 49.42% effective July 1, 2018 as a result of this actuarial valuation.

### **PROGRESS TOWARD REALIZATION OF FINANCING OBJECTIVES**

The funded ratio (the ratio of the actuarial value of assets to the actuarial accrued liability) is a standard measure of a plan's funded status. In the absence of benefit improvements, it should increase over time, until it reaches at least 100%.

The funded ratio of the System slightly decreased from 58.6% to 56.1%. Absent experience that is significantly different than assumed, we expect the funded ratio to remain relatively constant for the next several years before it begins to gradually improve.

If market value of assets had been used in the calculation instead of actuarial (smoothed) value of assets, the funded ratio for the System would have been 49.7%, compared to 54.3% in the prior year. The decrease in the funded ratio on a market value basis is primarily due to the use of updated actuarial assumptions and unfavorable investment experience during the last fiscal year. Specifically, the market value of assets earned a -0.47% return determined using the method specified by GASB 67 and reported in the financial statement of the South Carolina Retirement Systems for the year ending June 30, 2016. The -0.7% return documented in this report was determined on a dollar-weighted basis and is net of expenses and assumed mid-year cash flows.

### **ASSUMPTIONS AND METHODS**

South Carolina State Code also requires that an experience analysis that reviews the economic and demographic assumptions be performed at least every five years. An experience study was conducted for the five-year period ending June 30, 2015. The following is a summary of the assumptions that were adopted by the Board and used in preparing this actuarial valuation:

- Decrease the price inflation assumption from 2.75% to 2.25%.
- Decrease in the assumed rate of salary increases for individual members and the COLA provided to retirees from 3.00% to 2.75% per year.
- Decrease the payroll growth assumption from 3.00% to 2.75%.
- Adopt new post-retirement mortality tables specific to South Carolina retiree experience. Mortality for retirees is assumed to improve based on generational projection Scale AA.

- Minor adjustments to the pre-retirement mortality assumption.
- Modify the rates of retirement and disability.
- Modify the asset method such that each year's investment gain or loss (determined on a market value of asset basis) is recognized over a closed five-year period at the rate of 20% per year.

The investment return assumption is a prescribed assumption in Section 9-16-335 in South Carolina State Code and remains at 7.50% investment return assumption.

It is our opinion that the current assumptions are internally consistent and reasonably reflect the anticipated future experience of the System.

The results of the actuarial valuation are dependent on the actuarial assumptions used. Actual results can, and almost certainly will, differ as actual experience deviates from the assumptions. Even seemingly minor changes in the assumptions can materially change the liabilities, calculated contribution rate, and funding periods. The actuarial calculations are intended to provide information for rational decision making.

#### **BENEFIT PROVISIONS**

The benefit provisions reflected in this valuation are those which were in effect on July 1, 2016. There were no legislative changes enacted since the previous valuation that had a measureable effect on the current valuation.

#### **DATA**

Census data for retired, active and inactive members was supplied as of July 1, 2016, by the PEBA staff. The staff also supplied asset information as of July 1, 2016. We did not audit this data, but we did apply a number of tests to the data, and we concluded that it was reasonable and consistent with the prior year's data. GRS is not responsible for the accuracy or completeness of the information provided to us by PEBA.

#### **CERTIFICATION**

We certify that the information presented herein is accurate and fairly portrays the actuarial position of JSRS as of July 1, 2016.

All of our work conforms with generally accepted actuarial principles and practices and with the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, our calculations also comply with the requirements of South Carolina Code of Laws and, where applicable, the Internal Revenue Code, ERISA, and the Statements of the Governmental Accounting Standards Board.

Public Employee Benefit Authority  
South Carolina Retirement Systems  
December 8, 2016  
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The undersigned are independent actuaries and consultants. Mr. Newton and Mr. White are Enrolled Actuaries and Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries. Both are experienced in performing valuations for large public retirement systems.

Sincerely,

**Gabriel, Roeder, Smith & Co.**



Joseph P. Newton, FSA, MAAA, EA  
Senior Consultant



Daniel J. White, FSA, MAAA, EA  
Senior Consultant

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## **SECTION A**

### EXECUTIVE SUMMARY

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**Executive Summary**  
(Dollar amounts expressed in thousands)

Valuation Date:	July 1, 2016	July 1, 2015
<b>Membership</b>		
• Number of		
- Active members <sup>1</sup>	157	157
- Retirees and beneficiaries	187	186
- DROP and Retired-in-Place members	23	20
- Inactive members	<u>2</u>	<u>2</u>
- Total	346	345
• Projected payroll of active members	\$21,958	\$21,267
<b>Contribution Rates</b>		
• Employer contribution rate	49.42% <sup>2</sup>	47.97%
• Member	10.00%	10.00%
<b>Assets</b>		
• Market value	\$140,717	\$146,353
• Actuarial value	158,837	157,983
• Return on market value	-0.7%	1.5%
• Return on actuarial value	3.6%	5.6%
• Ratio of actuarial to market value of assets	112.9%	107.9%
• External cash flow %	-3.3%	-2.2%
<b>Actuarial Information</b>		
• Normal cost %	27.69%	27.68%
• Actuarial accrued liability (AAL)	\$283,304	\$269,675
• Unfunded actuarial accrued liability (UAAL)	124,467	111,692
• Funded ratio	56.1%	58.6%
• Funding period (years)	30	27
<b>Reconciliation of UAAL</b>		
• Beginning of Year UAAL	\$111,692	\$111,454
- Interest on UAAL	8,377	8,359
- Amortization payment	(7,609)	(7,104)
- Assumption/method changes	6,102	0
- Asset experience	6,129	3,104
- COLA	907	(5,377)
- Salary experience	(2,346)	(594)
- Other liability experience	1,215	1,381
- Legislative Changes	<u>0</u>	<u>469</u>
• End of Year UAAL	\$124,467	\$111,692

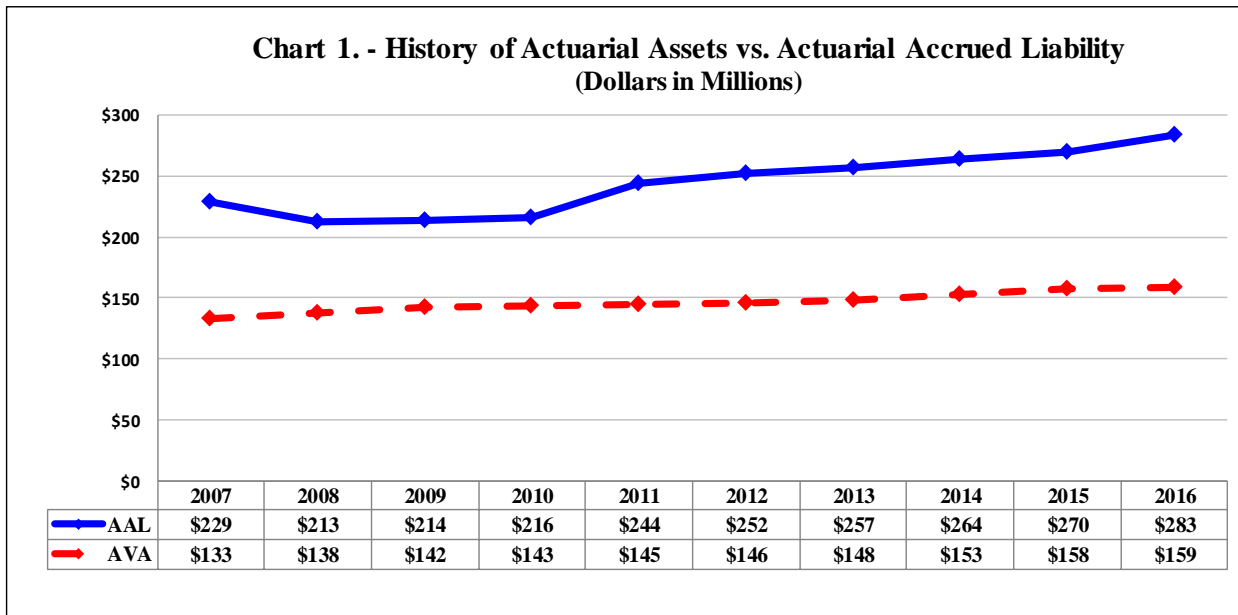
<sup>1</sup> Active member counts include unfilled positions and members in DROP or Retired-in-Place.

<sup>2</sup> The contribution rate determined by the July 1, 2016 actuarial valuation is subject to approval and adoption by the Public Employee Benefit Authority before becoming effective for the fiscal year beginning July 1, 2018. The contribution rate includes the cost of incidental death benefits.



**EXECUTIVE SUMMARY (CONTINUED)**

The unfunded actuarial accrued liability increased by \$12.8 million since the prior year’s valuation to \$124.5 million. The largest source of this increase is the \$6.1 million increase because of the recognition of investment losses that were incurred in prior years (including a portion of the FY 2016 investment loss). Below is a chart with the historical actuarial value of assets and actuarial accrued liability for JSRS.



Due to the investment return for the fiscal year ending June 30, 2016, the deferred investment loss increased from \$11.6 million in the prior year’s valuation to \$18.1 million in this year’s actuarial valuation. Absent favorable investment experience, those deferred losses will be reflected in the actuarial value of assets over the next few years.

The required employer contribution rate will increase to 49.42% of pay for fiscal year 2019 (i.e. effective July 1, 2018). Absent legislative changes or significantly favorable investment experience, we expect the required contribution rate will need to increase in each of the next four or five years as the \$18.1 million in deferred investment loss becomes recognized in the actuarial value of assets.

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**SECTION B**  
DISCUSSION

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## **DISCUSSION**

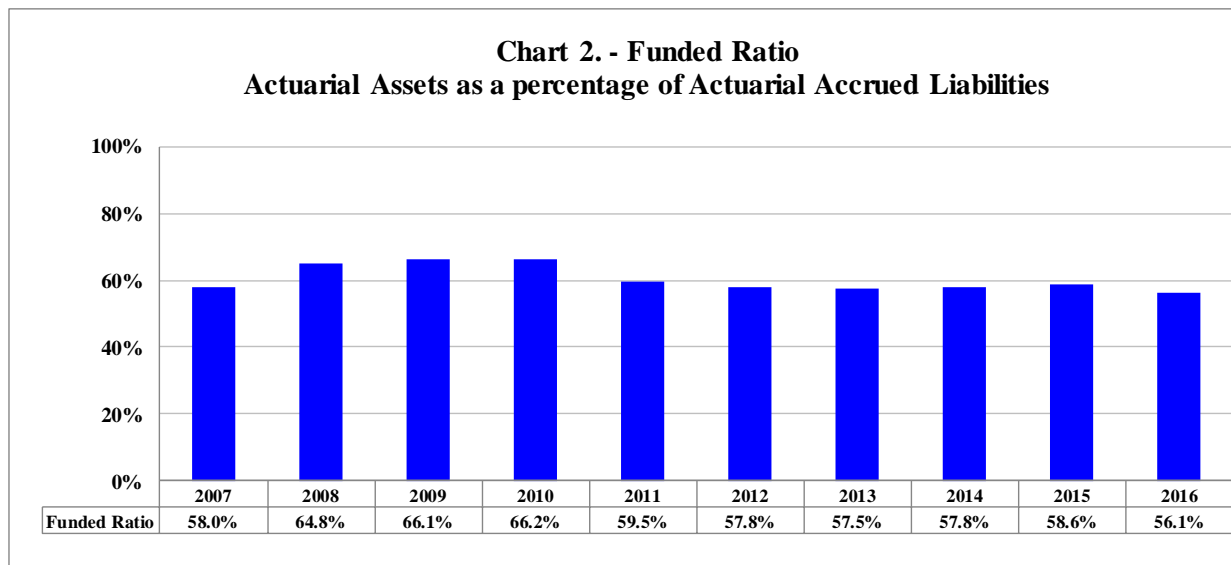
The results of the July 1, 2016 actuarial valuation of the Retirement System for Judges and Solicitors are presented in this report. The purposes of the valuation report are to depict the current financial condition of the System, determine the amortization period resulting from the current contribution rates, and analyze changes in the System's financial condition. In addition, the report provides various summaries of the members participating in the plan.

This section discusses the determination of the current funding requirements and the System's funded status, as well as changes in the financial condition of the retirement system.

All of the actuarial and financial tables referenced by the other sections of this report appear in Section C. Section D provides member data and statistical information. Appendices A and B provide summaries of the principle actuarial assumptions and methods and plan provisions. Finally, Appendix C provides a glossary of technical terms that are used throughout this report.

### Funding Progress

The funded ratio slightly decreased from 58.6% to 56.1% since the prior valuation. As shown in the table below, the funding ratio (on a smoothed asset basis) has been relatively level over the past 10 years. Table 10, Schedule of Funding Progress, in the following section of the report provides additional detail regarding the funding progress of the Retirement System.



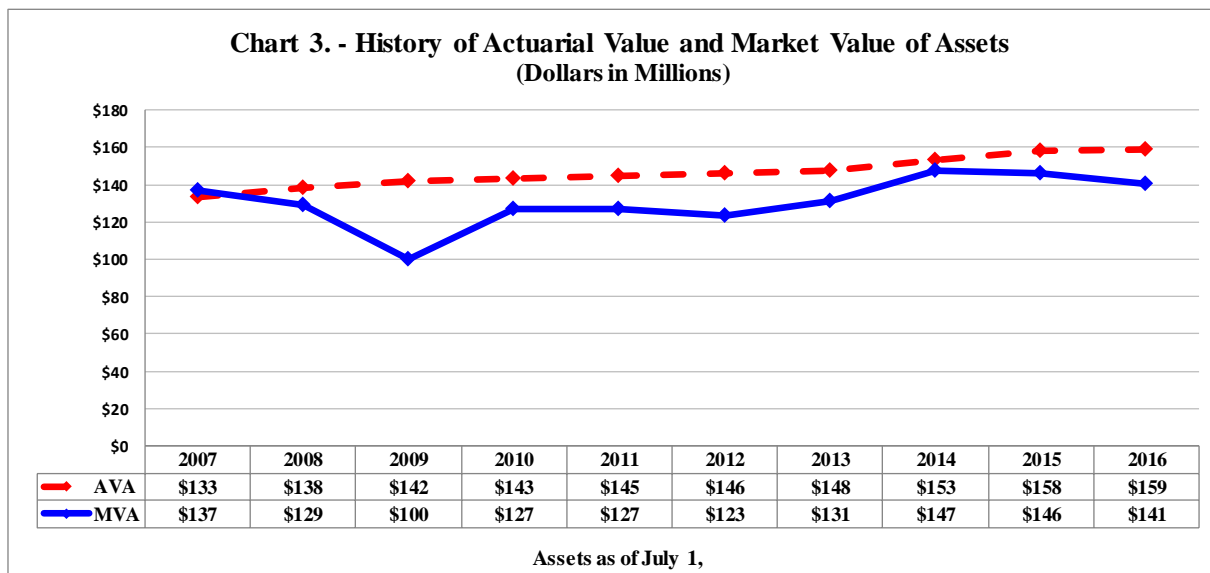
It is expected that the funded ratio (on an actuarial value of asset basis) will remain relatively constant for the next few years, then gradually improve. Also, based on the current funding policy and contribution rates, we expect the dollar amount of the unfunded actuarial accrued liability, or the difference between the actuarial accrued liability and the actuarial value of assets, to gradually increase for the next eight to ten years before beginning to decrease.

### Asset Gains/(Losses)

The actuarial value of assets (“AVA”) is based on a smoothed market value of assets, using a systematic approach to phase-in the difference between the actual and expected investment return on the market value of assets (adjusted for receipts and disbursements during the year). This is appropriate because it dampens the short-term volatility inherent in investment markets. The returns are computed net of investment expenses. The actuarial value of assets increased from \$158.0 million to \$158.8 million since the prior valuation. Table 8 in the following section of the report provides the development of the actuarial value of assets.

The rate of return on the mean market value of assets in 2016 was -0.7%. Additionally, because of the recognition of prior investment experience, the actuarial (smoothed) asset value returned only 3.6%. This difference in the estimated return on market value and actuarial value illustrates the smoothing effect of the asset valuation method.

The market value of assets is less than the actuarial value of assets, which signifies that the retirement system is in a position of deferred losses. Therefore, unless the System experiences investment returns in excess of the assumed rate of return, the future recognition of these deferred losses is expected to increase the unfunded actuarial accrued liability and decrease the System’s funded ratio over the next few years.



Tables 6 and 7 in the following section of this report provide asset information that was included in the annual financial statements of the System. Also, Table 9 shows the estimated yield on a market value basis and on the actuarial asset valuation method.

### Actuarial Gains/(Losses) and the Contribution Requirement

The annual actuarial valuation is a snapshot analysis of the benefit liabilities, assets and funded position of the System as of the first day of the plan year. In any one fiscal year, the experience can be better or worse from that which is assumed or expected. The actuarial assumptions do not necessarily attempt to model what the experience will be for any one given fiscal year, but instead try to model the overall experience over many years. The demographic experience for the last year is briefly summarized in the chart below.

The unfunded actuarial accrued liability (UAAL) has increased from \$111.7 million in 2015 to \$124.5 million in 2016. The table below shows the source of the gains and losses and the impact of those gains and losses on the UAAL.

<b>Reconciliation of UAAL</b>	
(Dollars in thousands)	
• Beginning of Year UAAL	\$111,692
- Interest on UAAL	8,377
- Amortization payment	(7,609)
- Assumption/method changes	6,102
- Asset Experience	6,129
- COLA	907
- Salary Experience	(2,346)
- Other Liability Experience	1,215
- Legislative Changes	<u>0</u>
• End of Year UAAL	\$124,467

The following table provides a reconciliation of the change in the funding period from 2015 to 2016 based on the current employer contribution rate of 47.97%. The liability experience providing the largest positive impact to the funding period includes the impact of deferred losses and other negative demographic experience.

<b>Change in Funding Period (Years)</b>	
<b>Based on a 47.97% Contribution Rate</b>	
• Prior Year	26.7
- Expected Experience	(1.0)
- Assumption Change	3.8
- Asset Experience	3.8
- COLA Experience	0.6
- Salary Experience	(1.8)
- Other Demographic Experience	1.2
- Legislative Changes	0.0
- Total Change	6.6
• Current Year Valuation (before reflecting an increase in the contribution rate)	33.3

This funding method and contribution policy is designed to result in relatively level contribution requirements from year to year. However, absent favorable future investment or liability experience, it is possible the contribution requirement will increase over the next several years as existing deferred investment losses become fully recognized in the actuarial value of assets and the calculation of the recommended contribution rate.

Also, note that the current funding policy utilizes a level percentage of payroll amortization method, which assumes that covered payroll will increase at the rate of 2.75% per year in the future (it does not assume an increase in active membership). As a result, the amortization payments will not be sufficient to cover all of the interest cost on the UAAL until the funding period decreases to approximately 20 years. Therefore, stakeholders should expect the dollar amount of the unfunded actuarial accrued liability to gradually increase until the funding period decreases below 20 years.

## **Actuarial Assumptions and Methods**

In determining costs and liabilities, actuaries use assumptions about the future, such as probabilities of retirement, termination, death and disability, and an annual investment return assumption. South Carolina State Code also requires that an experience analysis that reviews the economic and demographic assumptions be performed at least every five years. An experience study was conducted for the five-year period ending June 30, 2015. The following is a summary of the assumptions that were adopted by the Board and used in preparing this actuarial valuation:

- Decrease the price inflation assumption from 2.75% to 2.25%.
- Decrease in the assumed rate of salary increases for individual members and the COLA provided to retirees from 3.00% to 2.75% per year.
- Decrease the payroll growth assumption from 3.00% to 2.75%.
- Adopt new post-retirement mortality tables specific to South Carolina retiree experience. Mortality for retirees is assumed to improve based on generational projection Scale AA.
- Minor adjustments to the pre-retirement mortality assumption.
- Modify the rates of retirement and disability.
- Modify the asset method such that each year's investment gain or loss (determined on a market value of asset basis) is recognized over a closed five-year period at the rate of 20% per year.

The investment return assumption is a prescribed assumption in Section 9-16-335 in South Carolina State Code and remains at 7.50% investment return assumption.

Appendix A includes a summary of the actuarial assumptions and methods used in this valuation. It is our opinion that the assumptions are internally consistent and are reasonable and reflect anticipated future experience of the System. The next experience study will be conducted no later than as of June 30, 2020.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. This report does not include a more robust assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment.



## **Benefit Provisions**

Appendix B of this report includes a summary of the benefit provisions for JSRS. There were no legislative changes enacted since the previous valuation that had a measurable effect on the current valuation.

Below is a summary of the retirement provisions for members in the Retirement System.

### **Summary of Retirement Provisions**

- A retirement benefit equal to 71.3% of the current active salary of the position from which the member retired plus an additional 2.67% of compensation for each year of service beyond 25 years for judges and 24 years for solicitors and public defenders (subject to a maximum retirement allowance that does not exceed 90% of salary).
- The normal form of payment for a married member is a 33 1/3 joint and survivor annuity.
- Active members contribute 10% of compensation.
- Members are eligible for retirement after they have (i) attained age 70 with 15 years of service, or (ii) attained age 65 with 20 years of service or (iii) completed 25 years of creditable service for judges and 24 years for solicitors and public defenders regardless of age.
- Members who have accrued a retirement allowance that is 90% of salary may elect to “retire in place” and begin to receive their accrued retirement benefits while remaining employed. Members who have retired in place but have not attained age 60 will have their retirement benefit paid into a deferred retirement option program (DROP) and receive the balance of their DROP account upon attaining age 60.
- The mandatory retirement age is 72.

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## **SECTION C**

### ACTUARIAL TABLES

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**ACTUARIAL TABLES**

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9	22	ESTIMATION OF YIELDS
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**Summary of Cost Items**  
(Dollar amounts expressed in thousands)

	July 1, 2016	July 1, 2015
	(1)	(2)
1. Projected payroll of active members <sup>1</sup>	\$ 21,958	\$ 21,267
2. Present value of future pay	\$ 140,075	\$ 150,870
3. Normal cost rate		
a. Total normal cost rate	27.69%	27.68%
b. Less: member contribution rate	<u>-10.00%</u>	<u>-10.00%</u>
c. Employer normal cost rate	17.69%	17.68%
4. Actuarial accrued liability for active members		
a. Present value of future benefits	\$ 119,772	\$ 123,305
b. Less: present value of future normal costs	<u>(36,850)</u>	<u>(40,170)</u>
c. Actuarial accrued liability	\$ 82,922	\$ 83,135
5. Total actuarial accrued liability for:		
a. Retirees and beneficiaries	\$ 200,323	\$ 186,481
b. Inactive members	59	59
c. Active members (Item 4c)	<u>82,922</u>	<u>83,135</u>
d. Total	\$ 283,304	\$ 269,675
6. Actuarial value of assets	\$ 158,837	\$ 157,983
7. Unfunded actuarial accrued liability (UAAL) (Item 5d - Item 6)	\$ 124,467	\$ 111,692
8. Applicable required contribution rate		
a. Employer normal cost rate	17.69%	17.68%
b. Employer contribution rate available to amortize the UAAL	<u>31.73%</u>	<u>30.29%</u>
c. Total employer contribution rate <sup>2</sup>	49.42%	47.97%
9. Funding period based on the current employer contribution rate (years)	30	27

<sup>1</sup> The projected payroll is based on all filled and unfilled positions.

<sup>2</sup> The contribution rate of 49.42% is scheduled to become effective July 1, 2018.

**Actuarial Present Value of Future Benefits**  
 (Dollar amounts expressed in thousands)

	<u>July 1, 2016</u>	<u>July 1, 2015</u>
	(1)	(2)
1. Active members		
a. Service retirement	\$ 110,239	\$ 111,951
b. Survivor benefits	1,840	3,418
c. Disability benefits	<u>7,693</u>	<u>7,936</u>
d. Total	\$ 119,772	\$ 123,305
2. Retired members		
a. Service retirement	\$ 184,248	\$ 170,481
b. Disability retirement	0	0
c. Beneficiaries	<u>16,075</u>	<u>16,000</u>
d. Total	\$ 200,323	\$ 186,481
3. Inactive members		
a. Vested terminations	\$ 0	\$ 0
b. Nonvested terminations	<u>59</u>	<u>59</u>
c. Total	\$ 59	\$ 59
4. Total actuarial present value of future benefits	\$ 320,154	\$ 309,845

**Analysis of Normal Cost**

	<u>July 1, 2016</u>	<u>July 1, 2015</u>
	(1)	(2)
1. Total normal cost rate		
a. Service retirement	23.04%	22.23%
b. Survivor benefits	0.69%	1.67%
c. Disability benefits	<u>3.84%</u>	<u>3.78%</u>
d. Total	27.57%	27.68%
2. Admin expense	0.12%	N/A
3. Less: member contribution rate	<u>10.00%</u>	<u>10.00%</u>
4. Net employer normal cost rate	17.69%	17.68%

Note: The normal cost includes the cost for incidental death benefits.

**Results of July 1, 2016 Valuation**  
**(Dollar amounts expressed in thousands)**

	<u>July 1, 2016</u>
	(1)
1. Actuarial Present Value of Future Benefits	
a. Present retired members and beneficiaries	\$ 200,323
b. Present active and inactive members	<u>119,831</u>
c. Total actuarial present value	\$ 320,154
2. Present Value of Future Normal Contributions	
a. Employee	\$ 14,008
b. Employer	<u>22,842</u>
c. Total future normal contributions	\$ 36,850
3. Actuarial Liability	\$ 283,304
4. Current Actuarial Value of Assets	\$ 158,837
5. Unfunded Actuarial Liability	\$ 124,467
6. UAAL Amortization rates based on a 49.42% employer contribution rate	
a. Active members	31.73%
b. DROP and Retired-in-Place Members (including employee contributions)	59.42%
7. Unfunded Actuarial Liability Liquidation Period	30 Years

Note: The employer contribution rate includes the cost for incidental death benefits.

**Actuarial Balance Sheet**  
(Dollar amounts expressed in thousands)

	July 1, 2016	July 1, 2015
	(1)	(2)
1. Assets		
a. Current assets (actuarial value)		
i. Employee annuity savings fund	\$ 25,082	\$ 24,650
ii. Employer annuity accumulation fund	133,755	133,333
iii. Total current assets	\$ 158,837	\$ 157,983
b. Present value of future member contributions	\$ 14,008	\$ 15,087
c. Present value of future employer contributions		
i. Normal contributions	\$ 22,842	\$ 25,083
ii. Accrued liability contributions	124,467	111,692
iii. Total future employer contributions	\$ 147,309	\$ 136,775
d. Total assets	\$ 320,154	\$ 309,845
2. Liabilities		
a. Employee annuity savings fund		
i. Past member contributions	\$ 25,082	\$ 24,650
ii. Present value of future member contributions	14,008	15,087
iii. Total contributions to employee annuity savings fund	\$ 39,090	\$ 39,737
b. Employer annuity accumulation fund		
i. Benefits currently in payment	\$ 200,323	\$ 186,481
ii. Benefits to be provided to other members	80,741	83,627
iii. Total benefits payable from employer annuity accumulation fund	\$ 281,064	\$ 270,108
c. Total liabilities	\$ 320,154	\$ 309,845



**System Net Assets**  
**Assets at Market or Fair Value**  
**(Dollar amounts expressed in thousands)**

Item (1)	July 1, 2016 (2)	July 1, 2015 (3)
1. Cash and cash equivalents (operating cash)	\$ 21,386	\$ 16,640
2. Receivables	4,477	3,249
3. Investments		
a. Short-term securities	\$ 3,913	\$ 3,753
b. Fixed income (global)	28,906	39,115
c. Public equity (global)	35,597	34,975
d. Global tactical asset allocation	9,707	10,896
e. Alternative investments	44,424	43,964
f. Total investments	\$ 122,547	\$ 132,703
4. Securities lending cash collateral invested	\$ 275	\$ 344
5. Prepaid administrative expenses	18	15
6. Capital assets, net of accumulated depreciation	12	13
7. Total assets	\$ 148,715	\$ 152,964
8. Liabilities		
a. Due to other systems	\$ 0	\$ 0
b. Accounts payable	7,117	5,870
c. Investment fees payable	47	41
d. Obligations under securities lending	275	344
e. Deferred retirement benefits	0	0
f. Due to employee insurance program	0	0
g. Benefit payable	0	0
h. Other liabilities	559	356
i. Total liabilities	\$ 7,998	\$ 6,611
9. Total market value of assets available for benefits (Item 7. - Item 8.i.)	\$ 140,717	\$ 146,353
10. Asset allocation (investments) <sup>1</sup>		
a. Net invested cash	15.7%	11.9%
b. Fixed income	20.5%	26.8%
c. Public equity	25.3%	23.9%
d. Global tactical asset allocation	6.9%	7.4%
e. Alternative investments	31.6%	30.0%
f. Total investments	100.0%	100.0%

<sup>1</sup> These asset allocations are calculated based on the dollar amounts shown in items 1. through 9. above and, due to cash flow and rebalancing timing, may be slightly different than the allocation percentages reported by the South Carolina Retirement System Investment Commission.

**Reconciliation of System Net Assets**  
(Dollar amounts expressed in thousands)

	Year Ending	
	July 1, 2016 (1)	July 1, 2015 (2)
1. Value of assets at beginning of year	\$ 146,353	\$ 147,496
2. Revenue for the year		
a. Contributions		
i. Member contributions	\$ 2,303	\$ 3,153
ii. Employer contributions	10,202	10,109
iii. Total	\$ 12,505	\$ 13,262
b. Income		
i. Interest, dividends, and other income	\$ 2,005	\$ 1,723
ii. Investment expenses	(1,299)	(236)
iii. Net	\$ 706	\$ 1,487
c. Net realized and unrealized gains (losses)	(1,577)	729
d. Total revenue	\$ 11,634	\$ 15,478
3. Expenditures for the year		
a. Disbursements		
i. Refunds	\$ 60	\$ 0
ii. Regular annuity benefits	16,989	16,832
iii. Other benefit payments	143	4
iv. Transfers to other systems	3	(286)
v. Total	\$ 17,195	\$ 16,550
b. Administrative expenses and depreciation	75	71
c. Total expenditures	\$ 17,270	\$ 16,621
4. Increase in net assets (Item 2. - Item 3.)	\$ (5,636)	\$ (1,143)
5. Value of assets at end of year (Item 1. + Item 4.)	\$ 140,717	\$ 146,353
6. Net external cash flow		
a. Dollar amount	\$ (4,690)	\$ (3,288)
b. Percentage of market value	-3.3%	-2.2%

**Development of Actuarial Value of Assets**  
(Dollar amounts expressed in thousands)

	<u>Year Ending</u> <u>June 30, 2016</u>		
1. Actuarial value of assets at beginning of year	\$ 157,983		
2. Market value of assets at beginning of year	\$ 146,353		
3. Net new investments			
a. Contributions	\$ 12,505		
b. Disbursements <sup>1</sup>	<u>(17,195)</u>		
c. Subtotal	(4,690)		
4. Market value of assets at end of year	\$ 140,717		
5. Net earnings (Item 4. - Item 2. - Item 3.c.)	\$ (946)		
6. Assumed investment return rate for fiscal year	7.50%		
7. Expected return	\$ 10,801		
8. Excess return (Item 5. - Item 7.)	\$ (11,747)		
9. Excess return on assets as of June 30, 2016:			
	Deferred		
<u>Fiscal Year</u>	<u>Return</u>	<u>Percent</u>	<u>Amount</u>
<u>Ending June 30,</u>	<u>(2)</u>	<u>Deferred</u>	<u>(4)</u>
(1)		(3)	
a. 2016	\$ (11,747)	80%	\$ (9,398)
b. 2015	(14,537)	60%	(8,722)
c. 2014	N/A	40%	N/A
d. 2013	N/A	20%	N/A
e. 2012	N/A	0%	N/A
f. Total			<u>\$ (18,120)</u>
10. Actuarial value of assets as of June 30, 2016 (Item 4. - Item 9.f.)	\$ 158,837		
11. Expected actuarial value as of June 30, 2016	\$ 164,966		
12. Asset gain (loss) for year (Item 10. - Item 11.)	\$ (6,129)		
13. Asset gain (loss) as % of the actuarial value of assets	-3.9%		
14. Ratio of actuarial value to market value	112.9%		

<sup>1</sup> For the year ending June 30, 2016, the investment return assumption was net of administration and investment expenses. Beginning July 1, 2016, the investment return assumption is only net of investment expenses.

**Estimation of Yields**  
(Dollar amounts expressed in thousands)

	Year Ending	
	July 1, 2016 (1)	July 1, 2015 (2)
1. Market value yield		
a. Beginning of year market assets	\$ 146,353	\$ 147,496
b. Contributions to fund during the year	12,505	13,262
c. Disbursements	(17,195)	(16,550)
d. Investment income (net of investment and administrative expenses)	<u>(946)</u>	<u>2,145</u>
e. End of year market assets	\$ 140,717	\$ 146,353
f. Estimated dollar weighted market value yield	-0.7%	1.5%
2. Actuarial value yield		
a. Beginning of year actuarial assets	\$ 157,983	\$ 152,839
b. Contributions to fund during the year	12,505	13,262
c. Disbursements	(17,195)	(16,550)
d. Investment income (net of investment and administrative expenses)	<u>5,544</u>	<u>8,432</u>
e. End of year actuarial assets	\$ 158,837	\$ 157,983
f. Estimated actuarial value yield	3.6%	5.6%

**Schedule of Funding Progress**  
**(Dollar amounts expressed in thousands)**

July 1,	Actuarial Value of Assets (AVA)	Actuarial Accrued Liability (AAL)	Unfunded Actuarial Accrued Liability (UAAL) (3) - (2)	Funded Ratio (2)/(3)	Annual Covered Payroll	UAAL as % of Payroll (4)/(6)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2002	100,074	166,440	66,366	60.1%	14,211	467.0%
2003	106,114	166,655	60,541	63.7%	14,437	419.3%
2004	112,016	185,052	73,036	60.5%	14,870	491.2%
2005	118,888	204,847	85,959	58.0%	15,465	555.8%
2006	124,837	211,384	86,547	59.1%	15,929	543.3%
2007	132,990	229,388	96,398	58.0%	16,407	587.5%
2008	138,323	213,406	75,083	64.8%	18,661	402.4%
2009	141,797	214,363	72,566	66.1%	18,661	388.9%
2010	142,871	215,823	72,952	66.2%	18,661	390.9%
2011	144,927	243,514	98,587	59.5%	18,661	528.3%
2012	145,604	251,729	106,125	57.8%	19,221	552.1%
2013	147,648	256,988	109,340	57.5%	20,407	535.8%
2014	152,839	264,293	111,454	57.8%	20,815	535.4%
2015	157,983	269,675	111,692	58.6%	21,267	525.2%
2016	158,837	283,304	124,467	56.1%	21,958	566.8%

### Summary of Principle Assumptions and Methods

Below is a summary of the principle economic assumptions, cost method, and the method for financing the unfunded actuarial accrued liability:

Valuation date:	July 1, 2016
Actuarial cost method:	Entry Age Normal
Amortization method:	Level percentage of payroll
Amortization period for contribution rate:	30-year open period <sup>1</sup>
Asset valuation method:	5-Year Smoothing
Actuarial assumptions:	
Investment rate of return <sup>2</sup>	7.50%
Projected salary increases	2.75%
Inflation	2.25%
Cost-of-living adjustments	2.75%
Retiree mortality	The 2016 Public Retirees of South Carolina Mortality Table projected at Scale AA from the year 2016. Male rates are multiplied by 92% and female rates are multiplied by 98%.

<sup>1</sup> The Board will maintain the prior year's contribution rate to the extent the amortization period does not exceed 30 years.

<sup>2</sup> This is a prescribed assumption in Section 9-16-335 of South Carolina State Code.

**Solvency Test**  
**(Dollar amounts expressed in thousands)**

July 1, (1)	Actuarial Accrued Liability			Valuation Assets (5)	Portion of Aggregate Accrued Liabilities Covered by Assets		
	Active Member Contributions (2)	Retirants & Beneficiaries (3)	Active & Inactive Members (Employer Financed) (4)		Active (6)	Retirants (7)	ER Financed (8)
	2002	\$ 16,162	\$ 101,716		\$ 48,562	\$ 100,074	100.0%
2003	16,545	96,409	53,701	106,114	100.0%	92.9%	0.0%
2004	17,640	106,159	61,253	112,016	100.0%	88.9%	0.0%
2005	20,005	110,876	73,966	118,888	100.0%	89.2%	0.0%
2006	21,857	112,823	76,704	124,837	100.0%	91.3%	0.0%
2007	18,999	149,435	60,954	132,990	100.0%	76.3%	0.0%
2008	17,367	141,510	54,529	138,323	100.0%	85.5%	0.0%
2009	18,431	144,464	51,468	141,797	100.0%	85.4%	0.0%
2010	17,816	150,696	47,311	142,871	100.0%	83.0%	0.0%
2011	18,864	169,841	54,809	144,927	100.0%	74.2%	0.0%
2012	20,005	177,483	54,241	145,604	100.0%	70.8%	0.0%
2013	21,369	178,526	57,093	147,648	100.0%	70.7%	0.0%
2014	22,926	184,625	56,742	152,839	100.0%	70.4%	0.0%
2015	24,650	186,481	58,544	157,983	100.0%	71.5%	0.0%
2016	25,082	200,323	57,899	158,837	100.0%	66.8%	0.0%

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## **SECTION D**

### **MEMBERSHIP DATA**

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**MEMBERSHIP TABLES**

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17	32	SCHEDULE OF RETIREES ADDED TO AND REMOVED FROM ROLLS

**Summary of Membership Data**

	July 1, 2016 (1)	July 1, 2015 (2)
1. Active members		
a. Males	113	115
b. Females	44	42
c. Total members <sup>1</sup>	157	157
d. Total annualized pay <sup>2</sup>	\$ 21,958,224	\$ 21,267,185
e. Average pay <sup>2</sup>	\$ 138,102	\$ 133,756
f. Average age	57.2	56.5
g. Average credited service	15.4	15.1
h. Member contributions with interest	\$ 25,082,000	\$ 24,650,000
i. Average contributions with interest	\$ 159,758	\$ 157,006
2. Vested inactive members		
a. Number	0	0
b. Total annual deferred benefits	\$ 0	\$ 0
c. Average annual deferred benefit	\$ 0	\$ 0
3. Nonvested inactive members		
a. Number	2	2
b. Member contributions with interest	\$ 59,482	\$ 59,482
c. Average contributions with interest	\$ 29,741	\$ 29,741
4. Service retirees		
a. Number <sup>1</sup>	155	151
b. Total annual benefits	\$ 16,123,054	\$ 15,075,781
c. Average annual benefit	\$ 104,020	\$ 99,840
d. Average age at the valuation date	71.1	70.5
5. Disabled retirees		
a. Number	0	0
b. Total annual benefits	\$ 0	\$ 0
c. Average annual benefit	\$ 0	\$ 0
d. Average age at the valuation date	N/A	N/A
6. Beneficiaries		
a. Number	55	55
b. Total annual benefits	\$ 1,593,995	\$ 1,586,613
c. Average annual benefit	\$ 28,982	\$ 28,848
d. Average age at the valuation date	69.8	69.9

<sup>1</sup> Includes members in DROP and Retired-in-Place. It does not include unfilled positions.

<sup>2</sup> Based on filled and unfilled positions.

**Summary of Historical Active Membership**

July 1,	Active Members		Covered Payroll	Average Annual Pay			
	Number of Employers	Number <sup>1</sup>	Amount in Thousands <sup>1</sup>	Amount	Percent Increase / (Decrease)	Average Age	Average Service
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2002	2	128	14,211	111,026	0.73%	53	16
2003	2	128	14,437	112,789	1.59%	54	17
2004	2	128	14,870	116,172	3.00%	54	18
2005	2	128	15,465	120,820	4.00%	55	19
2006	2	128	15,929	124,445	3.00%	55	20
2007	2	128	16,407	128,176	3.00%	55	19
2008	3	144	18,661	129,590	1.10%	54	15
2009	3	144	18,661	129,590	0.00%	55.0	15.4
2010	3	144	18,661	129,590	0.00%	54.9	15.0
2011	3	144	18,661	129,590	0.00%	55.1	14.3
2012	3	144	19,221	133,476	3.00%	55.6	15.1
2013	3	153	20,407	133,381	-0.07%	56.0	15.5
2014	3	153	20,815	136,048	2.00%	56.3	15.1
2015	3	157	21,267	133,756	0.28%	56.5	15.1
2016	3	157	21,958	139,861	4.56%	57.2	15.4

<sup>1</sup> Includes filled and unfilled positions and members in DROP or Retired-in-Place.

**Distribution of Active Members by Age and by Years of Service**

Attained Age	Years of Credited Service													Total Count & Avg. Comp.
	0 Count & Avg. Comp.	1 Count & Avg. Comp.	2 Count & Avg. Comp.	3 Count & Avg. Comp.	4 Count & Avg. Comp.	5-9 Count & Avg. Comp.	10-14 Count & Avg. Comp.	15-19 Count & Avg. Comp.	20-24 Count & Avg. Comp.	25-29 Count & Avg. Comp.	30-34 Count & Avg. Comp.	35 & Over Count & Avg. Comp.		
Under 20	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0
20-24	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0
25-29	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0
30-34	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0
35-39	1 \$135,432	3 \$135,704	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	4 \$135,636
40-44	0 \$0	0 \$0	0 \$0	2 \$135,103	0 \$0	2 \$136,905	2 \$135,103	1 \$136,905	0 \$0	0 \$0	0 \$0	0 \$0	0 \$0	7 \$135,875
45-49	1 \$135,432	0 \$0	1 \$133,302	5 \$135,464	1 \$133,302	7 \$135,876	1 \$136,905	3 \$136,905	4 \$136,905	0 \$0	0 \$0	0 \$0	0 \$0	23 \$135,901
50-54	0 \$0	2 \$136,168	0 \$0	4 \$134,203	2 \$135,103	7 \$134,846	2 \$135,103	2 \$140,014	5 \$136,184	1 \$136,905	0 \$0	0 \$0	0 \$0	25 \$135,653
55-59	0 \$0	3 \$131,141	1 \$133,302	3 \$133,302	0 \$0	8 \$135,103	5 \$134,050	3 \$136,414	7 \$134,846	4 \$138,706	0 \$0	0 \$0	0 \$0	34 \$134,873
60-64	0 \$0	1 \$136,905	0 \$0	0 \$0	0 \$0	6 \$135,103	1 \$133,302	5 \$135,464	5 \$135,890	4 \$136,905	1 \$144,111	0 \$0	0 \$0	23 \$136,058
65 & Over	1 \$135,432	0 \$0	0 \$0	0 \$0	0 \$0	8 \$135,554	2 \$136,905	2 \$133,302	3 \$135,704	1 \$136,905	1 \$140,508	0 \$0	0 \$0	18 \$135,822
Total	3 \$135,432	9 \$134,420	2 \$133,302	14 \$134,589	3 \$134,503	38 \$135,388	13 \$134,975	16 \$136,301	24 \$135,793	10 \$137,625	2 \$142,310	0 \$0	0 \$0	134 \$135,601

Information shown above is for members in JSRS earning retirement benefits. It does not include unfilled positions or members that are retired-in-place.

**Distribution of Annuitants by Monthly Benefit**

Monthly Benefit Amount	Number of Annuitants	Female	Male	Average Service
(1)	(2)	(3)	(4)	(5)
Under \$500	0	0	0	0.00
\$ 500 - 999	10	10	0	25.37
1,000 - 1,499	1	1	0	12.00
1,500 - 1,999	5	5	0	23.87
2,000 - 2,499	3	3	0	13.53
2,500 - 2,999	25	25	0	21.13
3,000 - 3,499	13	12	1	29.28
3,500 - 3,999	4	4	0	27.08
4,000 - 4,499	2	1	1	22.21
4,500 - 4,999	3	1	2	13.61
5,000 - 5,499	3	0	3	18.75
5,500 - 5,999	1	1	0	16.50
6,000 - 6,499	4	2	2	21.48
6,500 - 6,999	4	0	4	19.29
7,000 - 7,499	4	0	4	23.50
7,500 - 7,999	2	0	2	22.42
8,000 - 8,499	43	3	40	22.56
8,500 - 8,999	16	1	15	26.05
9,000 - 9,499	12	2	10	28.40
9,500 - 9,999	7	0	7	30.01
10,000 & Over	48	3	45	31.81
Total	210	74	136	25.56

**Schedule of Retirants Added to and Removed from Rolls**  
**(Dollar amounts except average allowance expressed in thousands)**

July 1, (1)	Added to Rolls		Removed from Rolls		Rolls End of the Year		% Increase in Annual Benefit (8)	Average Annual Benefit (9)
	Number (2)	Annual Benefits (3)	Number (4)	Annual Benefits (5)	Number (6)	Annual Benefits (7)		
2002	13	706	5	248	126	8,052	6.0%	63,905
2003	11	716	7	493	130	8,275	2.8%	63,654
2004	11	925	2	139	139	9,061	9.5%	65,190
2005	3	581	1	27	141	9,615	6.1%	68,191
2006	4	464	1	28	144	10,051	4.5%	69,799
2007	32	2,690	1	30	175	12,711	26.5%	72,634
2008	6	545	3	156	178	13,100	3.1%	73,596
2009	10	903	4	259	184	13,744	4.9%	74,696
2010	18	1,210	8	593	194	14,361	4.5%	74,025
2011	9	827	5	196	198	14,992	4.4%	75,717
2012	6	912	4	184	200	15,720	4.9%	78,600
2013	10	279	9	42	201	15,957	1.5%	79,388
2014	7	637	4	192	204	16,402	2.8%	80,402
2015	8	757	6	497	206	16,662	1.6%	80,883
2016	10	1,355	6	300	210	17,717	6.3%	84,367

Beginning July 1, 2007, includes participants who have retired in place.

Annual benefits added to rolls include COLAs for continuing retirees.

The removed from rolls count does not include members who are replaced by beneficiaries.

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## **APPENDIX A**

### ACTUARIAL ASSUMPTIONS AND METHODS

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## Summary of Actuarial Methods and Assumptions

The following presents a summary of the actuarial assumptions and methods used in the valuation of the Retirement System for Judges and Solicitors of South Carolina.

### *Investment Rate of Return*

Assumed annual rate of 7.50% net of investment expenses composed of a 2.25% inflation component and a 5.25% real rate of return, net of investment expenses.

This is a prescribed assumption by in Section 9-16-335 of the South Carolina State Code.

### *Rates of Annual Salary Increase*

Rates of salary are assumed to increase at an annual rate of 2.75%.

### *Active Member Decrement Rates*

- a. Assumed rates of service retirement are shown in the following table. In addition to the rates in the table below, all participants are assumed to retire upon reaching the mandatory retirement age of 72.

<b>Service Based Retirement Rates</b>		
<b>Years of Service</b>	<b>Male</b>	<b>Female</b>
15-19	10.00%	10.00%
20-24	40.00%	40.00%
25-31	15.00%	15.00%
32+	100.00%	100.00%

\*Retirement rate will be 100% at 31 years of service for solicitors.



- b. An abbreviated table with the assumed rates of disability incidence and pre-retirement mortality is shown below. The pre-retirement mortality assumption is based upon the RP-2014 Mortality Table for Employees with applicable multipliers to better reflect anticipated experience and provide margin for future improvement in mortality.

Age	Disability Incidence Rates		Pre-Retirement Mortality	
	Males	Females	Males	Females
25	0.0419%	0.0458%	0.0460%	0.0147%
30	0.0629%	0.0616%	0.0429%	0.0185%
35	0.0838%	0.0616%	0.0497%	0.0243%
40	0.1572%	0.1074%	0.0597%	0.0337%
45	0.2620%	0.2200%	0.0924%	0.0558%
50	0.4192%	0.3520%	0.1602%	0.0937%
55	0.6812%	0.5720%	0.2649%	0.1422%
60	1.0480%	0.8800%	0.4454%	0.2076%
Multiplier	105%	88%	95%	85%

Note: The multiplier has been applied to the decrement in the illustrative table.

- c. There is no active employment withdrawal assumption.

### Post Retirement Mortality

- a. Healthy retirees and beneficiaries – The 2016 Public Retirees of South Carolina Mortality Table for Males and the 2016 Public Retirees of South Carolina Mortality Table for Females, both projected used the AA projection table from the year 2016 with multipliers based on plan experience. The following are sample rates:

Healthy Annuitant Mortality Rates Before Projection		
Age	Males	Females
50	0.1875%	0.1284%
55	0.2949%	0.2177%
60	0.5394%	0.3765%
65	0.9382%	0.5230%
70	1.4461%	0.8511%
75	2.5019%	1.6363%
80	4.6454%	3.2910%
85	8.4266%	6.2277%
90	14.6319%	10.9026%
Multiplier	92%	98%

Note: The multiplier has been applied to the decrement in the illustrative table.

The following table provides the life expectancy for individuals retiring in future years based on the assumption with full generational projection:

Life Expectancy for an Age 65 Retiree in Years				
Gender	Year of Retirement			
	2020	2025	2030	2035
Male	21.2	21.5	21.9	22.2
Female	23.6	23.8	24.0	24.1

- b. A separate table of mortality rates is used for disabled retirees based on the RP-2014 Disabled Mortality table projected using the AA projection table from the year 2016 and with multipliers based on plan experience. The following are sample rates:

Disabled Annuitant Mortality Rates		
Age	Males	Females
50	2.5494%	1.4884%
55	2.9211%	1.8099%
60	3.3255%	2.1249%
65	3.9606%	2.6075%
70	5.0433%	3.5254%
75	6.7859%	5.1306%
80	9.5770%	7.6295%
85	14.1629%	11.3025%
90	21.6256%	16.5815%
Multiplier	125%	125%

Note: The multiplier has been applied to the decrement in the illustrative table.

### ***Asset Valuation Method***

The actuarial value of assets is equal to the market value, adjusted for the five-year phase in of the actual investment return in excess of (or less than) the expected investment return on a market value of asset basis. This five-year phase in begins with the investment experience for the fiscal year ending June 30, 2016. The actual return is calculated net of investment expenses, and the expected investment return is equal to the assumed investment return rate multiplied by the prior year's market value of assets, adjusted for contributions, benefits paid, and refunds.

### ***Actuarial Cost Method***

The Entry Age Normal actuarial cost method allocates the System's actuarial present value of future benefits to various periods based upon service. The portion of the present value of future benefits allocated to years of service prior to the valuation date is the actuarial accrued liability, and the portion allocated to years following the valuation date is the present value of future normal costs. The normal cost is determined for each active member as the level percent of payroll necessary to fully fund the expected benefits to be earned over the career of each individual active member. The normal cost is partially funded with active member contributions

with the remainder funded by employer contributions.

An unfunded accrued liability exists in the amount equal to the excess of accrued liability over valuation assets. The amortization period of the System is the number of years required to fully amortize the unfunded accrued liability, on an actuarial value of asset basis, with the expected amount of employer contributions in excess of the employers' portion of the normal cost.

The calculation of the amortization period takes into account scheduled increases to contribution rates applicable to future years and payroll growth. Also, the calculation of the amortization period reflects additional contributions the System receives with respect to members in DROP and who are retired-in-place. These contributions are assumed to grow at the same payroll growth rate as for active employees. It is assumed that amortization payments are made monthly at the end of the month.

Note, the principle financial measurement calculations in this actuarial valuation, which include the unfunded actuarial accrued liability, funded ratio, contributions rates, and funding period, are based on an actuarial value of assets (smoothed value) basis. The actuarial value of assets is a calculated asset value which may be greater than or less than the market value of assets and is used to dampen some of the volatility in the market value of assets. As a result, many of these measures would be different if they were determined on a market value of asset basis.

### ***Future Cost-of-living Increases***

Future benefits are assumed to increase at an annual rate of 2.75%.

### ***Payroll Growth Rate***

The total annual payroll of active members (including DROP and RIP participants) is assumed to increase at an annual rate of 2.75%. This rate represents the underlying expected annual rate of wage inflation and does not anticipate increases in the number of members.

### ***Other Assumptions***

1. The normal cost rate is increased by 0.12% to account for administrative expenses that are paid with plan assets.
2. Percent married: 95% of male and female employees are assumed to be married.
2. Age difference: Males are assumed to be four years older than their spouses.
3. Percent electing annuity on death (when eligible): All of the spouses of vested, married participants are assumed to elect an immediate life annuity.
4. Inactive Population: All non-vested members are assumed to take an immediate refund. Members with a vested benefit are assumed to elect a deferred benefit commencing at their earliest possible commencement age.
5. There will be no recoveries once disabled.

6. Decrement timing: Decrements of all types are assumed to occur mid-year.
7. Eligibility testing: Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
8. Benefit Service: All active and members are assumed to accrue one year of eligibility service each year.

### ***Participant Data***

Participant data was securely supplied in electronic text files. There were separate files for (i) active and inactive members, and (ii) members and beneficiaries receiving benefits.

The data for active members included birth date, gender, service with the current city and total vesting service, salary, and employee contribution account balances. For retired members and beneficiaries, the data included date of birth, gender, spouse's date of birth (where applicable), amount of monthly benefit, date of retirement, and form of payment code.

Salary supplied for the current year was based on the annualized earnings for the year preceding the valuation date. Assumptions were made to correct for missing or inconsistent data. These had no material impact on the results presented.

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## **APPENDIX B**

### BENEFIT PROVISIONS

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**SUMMARY OF BENEFIT PROVISIONS FOR  
RETIREMENT SYSTEM FOR JUDGES AND SOLICITORS FOR  
THE STATE OF SOUTH CAROLINA RETIREMENT SYSTEM  
(JSRS)**

**Effective Date:** July 1, 1979.

**Administration:** The South Carolina Public Employee Benefit Authority, is responsible for the general administrative operations and day to day management of the Plan.

**Type of Plan:** This is a qualified governmental defined benefit retirement plan and considered to be a single employer plan under GASB No. 67.

**Eligibility:** This System covers all solicitors, circuit public defenders, judges of a Circuit or Family Court, Administrative Law Judges who elect to participate in the System, and justices of the Court of Appeals and Supreme Court who take office prior to age 72 are required to participate upon taking office unless exempted by statute.

**Employee Contributions:** Members contribute 10.00% of compensation per year. Contributions are credited with interest at the rate of 4.0% per annum.

**Service Retirement:**

- a. **Eligibility:** There is a mandatory retirement age of 72. Members may retire if they have met one of the following eligibility conditions:
  - i. Age 65 with 20 years of credited service.
  - ii. Age 70 with 15 years of credited service.
  - iii. Completed 25 years of credited service as a judge or 24 years as a solicitor or public defender.
- b. **Monthly Benefit:** The monthly benefit is equal to one-twelfth (1/12<sup>th</sup>) of the member's current salary, times 71.3% plus 2.67% of pay for each year of credited service beyond 25 for judges and 24 for solicitors and public defenders. The monthly benefit may not exceed one-twelfth of 90% of the member's current salary.
- c. **Payment Form:** Standard Annuity Payment.

A JSRS member whose annuity as calculated at retirement exceeds the 90 percent maximum annuity will receive an additional lump-sum benefit at retirement. The additional benefit is equal to the member's contributions and interest paid in to the system after the member attained sufficient service credit to be eligible to receive the maximum annuity of 90 percent of the current active salary. The 90 percent maximum annuity amount is generally reached when the following JSRS service credit is obtained: 32 years for justices and judges; and 31 years for solicitors and circuit public defenders.

***Disability Retirement:***

- a. Eligibility: Member must have five or more years of earned service.
- b. Monthly Benefit: The monthly disability benefit payable is determined the same as a service retirement benefit and payable immediately.
- c. Payment Form: Standard Annuity Payment.
- d. Death while Disabled: A disabled member is treated as a retired member for purposes of determining a death benefit.

***Vesting and Refunds:***

- a. Eligibility: Judges are vested in the system after attaining ten (10) years of earned service. Solicitors and public defenders are vested in the system after attaining eight (8) years of earned service. Vested members may also elect to receive a refund in lieu of the deferred termination benefit described below.
- b. Amount: The refund benefit is the accumulated value of the member's contributions plus interest credited by the fund. Members do not earn interest on their employee contribution account balance while they are inactive.

***Deferred Termination Benefit:***

- a. Eligibility: Member must be vested and must elect to leave his/her contributions on deposit. Members who began service before July 1, 2004 are eligible for a monthly benefit beginning at age 55. Members hired after July 1, 2004 are eligible to commence their deferred monthly benefit at age 65.
- b. Monthly Benefit: The member's benefit is determined by multiplying the base benefit by a fraction, in which the numerator is the member's total credited service and twenty-four is the denominator.
- c. Payment Form: Standard Annuity Payment.
- d. Death Benefit: The beneficiary of an inactive member who dies is entitled to receive the amount of the member's accumulated contributions (with interest). A beneficiary of an inactive member who was eligible to commence his retirement annuity at the time of his death may elect a monthly survivor annuity equal to one-third the annuity that would have been payable to the deceased member.

***Death while an Active Member:***

- a. In General: A refund of the member's accumulated contributions (with interest) is paid to the beneficiary of a deceased member.
- b. Beneficiary Annuity: If the deceased member was married and eligible to commence his retirement annuity at the time of his death, then his beneficiary may elect a monthly survivor annuity equal to one-third the annuity that would have been payable to the deceased member.

**Standard Annuity Payment:** The monthly retirement benefit will be paid as follows. Other, reduced optional forms of payment are also available to a member to elect at retirement.

- a. Unmarried Retiree: A life annuity. Upon the member’s death, any remaining member contributions plus interest will be paid to the member’s designated beneficiary.
- b. Married Retiree (One-third Joint & Survivor): An unreduced annuity is payable during the member’s life, and continues after the member’s death at one-third of the rate paid to the member for the life of the surviving spouse, unless a contingent non-spousal beneficiary is named.
- c. Optional Allowance: A reduced lifetime annuity is payable during the member’s life, and continues after the member’s death at one-third of the rate paid to the member for the life of the non-spousal beneficiary (or in equal shares to multiple beneficiaries).

**Incidental Death Benefit:**

- a. Active Employees: The beneficiary (or estate) of an active employee who completes at least one full year of membership service, will receive a death benefit equal to the member’s annual earnable compensation at the time of death.

The one full year membership requirement is waived for members whose death is a result of an injury arising out of and in the course of performing his duties.

- b. Post Employment: The beneficiary (or estate) of a retiree, both current and future, will receive a one-time payment upon the retiree’s death. The amount of the one-time payment is based on the retiree’s credited service.

Years of Service Credit	Death Benefit
10 or more, but less than 20	\$1,000
20 or more, but less than 30	\$2,000
30 or more	\$3,000

**Retire in Place:** Members who have accrued their maximum monthly benefit (i.e. 90% of salary) may elect to “retire in place”. These members will receive their monthly retirement benefit while they remain employed. Members who retire in place under the age of 60 will have his retirement benefit accumulated into a deferred retirement option program (DROP). These members will receive a distribution of their DROP balance upon reaching the age of 60 or retirement (if earlier).

**Postretirement Benefit Increases:** Benefits paid to retired members or surviving spouses are increased annually by an amount equal to the percentage increase in the current salary paid to the respective position from which the member retired. The cost of living adjustment for non-spousal beneficiaries is based on the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W), and said beneficiaries will receive a 4.00% increase in their benefit in years in which the annual increase in CPI-W exceeds 3.00%.



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## **APPENDIX C**

### **GLOSSARY**

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## GLOSSARY

**Actuarial Accrued Liability (AAL):** That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of Future Plan Benefits which is not provided for by future Normal Costs. It is equal to the Actuarial Present Value of Future Plan Benefits minus the actuarial present value of future Normal Costs.

**Actuarial Assumptions:** Assumptions as to future experience under the Fund. These include assumptions about the occurrence of future events affecting costs or liabilities, such as:

- mortality, withdrawal, disablement, and retirement;
- future increases in salary;
- future rates of investment earnings and future investment and administrative expenses;
- characteristics of members not specified in the data, such as marital status;
- characteristics of future members;
- future elections made by members; and
- other relevant items.

**Actuarial Cost Method or Funding Method:** A procedure for allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability. These items are used to determine the ADC.

**Actuarial Gain or Actuarial Loss:** A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. Through the actuarial assumptions, rates of decrements, rates of salary increases, and rates of fund earnings have been forecasted. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., the Fund's assets earn more than projected, salaries do not increase as fast as assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results that produce actuarial liabilities which are larger than projected. Actuarial gains will shorten the time required for funding of the actuarial balance sheet deficiency while actuarial losses will lengthen the funding period.

**Actuarially Equivalent:** Of equal actuarial present value, determined as of a given date and based on a given set of Actuarial Assumptions.

**Actuarial Present Value (APV):** The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. For purposes of this standard, each such amount or series of amounts is:

- a. adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.)

b. multiplied by the probability of the occurrence of an event (such as survival, death, disability, termination of employment, etc.) on which the payment is conditioned, and

c. discounted according to an assumed rate (or rates) of return to reflect the time value of money.

**Actuarial Present Value of Future Plan Benefits:** The Actuarial Present Value of those benefit amounts which are expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future compensation and service credits. The Actuarial Present Value of Future Plan Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive, nonretired members either entitled to a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due.

**Actuarial Valuation:** The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial valuation for a governmental retirement system typically also includes calculations that provide the financial information of the plan, such as the funded ratio, unfunded actuarial accrued liability and the ADC.

**Actuarial Value of Assets or Valuation Assets:** The value of the Fund's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly actuaries use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the ADC.

**Actuarially Determined:** Values which have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the law.

**Actuarially Determined Contribution (ADC):** The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation. The ADC consists of the Employer Normal Cost and the Amortization Payment.

**Amortization Method:** A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the Amortization payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.

**Amortization Payment:** That portion of the pension plan contribution or ADC which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

**Closed Amortization Period:** A specific number of years that is counted down by one each year, and therefore declines to zero with the passage of time. For example, if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. See Funding Period and Open Amortization Period.

**Decrements:** Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or termination.

**Defined Benefit Plan:** A retirement plan that is not a Defined Contribution Plan. Typically a Defined Benefit Plan is one in which benefits are defined by a formula applied to the member's compensation and/or years of service.

**Defined Contribution Plan:** A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, and the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.

**Employer Normal Cost:** The portion of the Normal Cost to be paid by the employers. This is equal to the Normal Cost less expected member contributions.

**Experience Study:** A periodic review and analysis of the actual experience of the Fund which may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified as deemed appropriate by the Actuary.

**Funded Ratio:** The ratio of the Actuarial Value of Assets (AVA) to the Actuarial Accrued Liability (AAL). Plans sometimes calculate a market Funded Ratio, using the Market Value of Assets (MVA), rather than the AVA, although GASB 25 reporting requires the use of the AVA.

**Funding Period or Amortization Period:** The term "Funding Period" is used two ways. In the first sense, it is the period used in calculating the Amortization Payment as a component of the ADC. This funding period is chosen by the Board of Trustees. In the second sense, it is a calculated item: the number of years in the future that will theoretically be required to amortize (i.e., pay off or eliminate) the Unfunded Actuarial Accrued Liability, based on the statutory employer contribution rate, and assuming no future actuarial gains or losses.

**GASB:** Governmental Accounting Standards Board.

**GASB 67 and GASB 68:** Governmental Accounting Standards Board Statements No. 67 and No. 68. These are the governmental accounting standards that set the accounting and reporting rules for public retirement systems and the employers that sponsor, participate in, or contribute to them. Statement No. 67 sets the accounting rules for the financial reporting of the retirement systems, while Statement No. 68 sets the rules for the employers that sponsor, participate in, or contribute to public retirement systems.

**Normal Cost:** That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method. Any payment in respect of an Unfunded Actuarial Accrued Liability is not part of Normal Cost (see Amortization Payment). For pension plan benefits which are provided in part by employee contributions, Normal Cost refers to the total of employee contributions and employer Normal Cost unless otherwise specifically stated. Under the entry age normal cost method, the Normal Cost is intended to be the level cost (when expressed as a percentage of pay) needed to fund the benefits of a member from hire until ultimate termination, death, disability or retirement.

**Open Amortization Period:** An open amortization period is one which is used to determine the Amortization Payment but may not decrease by exactly one year in the subsequent year's actuarial valuation. In some instances, if the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In other instances, such as the case with the South Carolina Retirement System (SCRS), Police Officers Retirement System (PORS), and the Retirement System for Judges and Solicitors (JSRS) the amortization period denotes the expected number of years until the plan attains a 100% funded ratio (on an actuarial value of asset basis), based on the contribution rate that is in effect. In this instance, the amortization period may "float" from year to year, meaning it could increase, decrease, or remain relatively unchanged from the amortization period in the prior year's valuation.

**Unfunded Actuarial Accrued Liability:** The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus.

**Valuation Date or Actuarial Valuation Date:** The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Plan Benefits is determined. The expected benefits to be paid in the future are discounted to this date.