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Department of Employee Trust Funds  
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SECRETARY

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## CORRESPONDENCE MEMORANDUM

**DATE:** March 17, 2014  
**TO:** Employee Trust Funds Board  
**FROM:** Robert C. Willett, Chief Trust Finance Officer  
**SUBJECT:** December 31, 2013 Actuarial Valuation of Retired Lives

**Staff requests the Employee Trust Funds Board (Board) approve the report, 31<sup>st</sup> Annual Actuarial Valuation of Retired Lives as of December 31, 2013.**

Gabriel Roeder Smith & Company (GRS) has completed the actuarial valuation of Wisconsin Retirement System retired lives as of December 31, 2013. This valuation determines the amounts to be transferred from member and employer accounts to fund 2013 new annuities, and the amount available to provide increases for existing Core and Variable annuities.

GRS is recommending that Core annuities be increased by 4.7% and Variable annuities by 25%. Core annuity increases will be applied equally to all annuities other than those beginning in 2013 who will receive a pro-rated increase based on the effective date. Variable annuity increases will be applied equally to all annuities, regardless of the effective date. All increases will be paid beginning on May 1, 2014.

Consultants from GRS will be at the March 27 Board meeting to present the report and answer questions.

Attachment: 31<sup>st</sup> Annual Actuarial Valuation of Retired Lives

Reviewed and approved by Robert J. Marchant, Deputy Secretary

Electronically Signed 3/13/14

Board	Mtg Date	Item #
ETF	3.27.14	6A

**WISCONSIN RETIREMENT SYSTEM**  
**31<sup>ST</sup> ANNUAL ACTUARIAL VALUATION OF RETIRED LIVES**  
**DECEMBER 31, 2013**

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February 26, 2014

Employee Trust Funds Board  
Madison, Wisconsin

Ladies and Gentlemen:

The results of the **31st annual actuarial valuation of core and variable annuities** being paid from the Wisconsin Retirement System are presented in this report. This report should not be relied on for any other purpose.

The date of this valuation was **December 31, 2013**. Actuarial assumptions used in the valuation are summarized in the Appendix.

The results of the valuation may be briefly summarized as follows (\$ millions).

	<b>Core</b>	<b>Variable</b>
Number of Annuitants	180,056	40,317
Annual Amount	\$ 3,800.7	\$ 324.5
Fund Balance	44,273.2	4,187.3
Actuarial Reserve	42,300.5	3,347.0
<b>Ratio</b>	<b>1.047</b>	<b>1.251</b>

**Based upon these results, the increase in the core annuities is 4.7% and variable annuities will be increased by 25%.**

This report was prepared at the request of the Wisconsin Retirement System and those designated or approved by the Wisconsin Retirement System. This report may be provided to parties other than the Wisconsin Retirement System only in its entirety and only with the permission of the Wisconsin Retirement System. The valuation was based upon data furnished by the WRS staff, concerning Fund assets and individual annuitants and beneficiaries. Data was checked for internal consistency, but was not otherwise audited. We are not responsible for the accuracy or completeness of the information provided by the Wisconsin Retirement System.

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; and changes in plan provisions or applicable law.

To the best of our knowledge this report is complete and accurate. All calculations have been made in conformity with generally accepted actuarial principles and practices and with the Actuarial Standards of Practice issued by the Actuarial Standards Board. Brian Murphy, Mark Buis and James Anderson are all Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. The signing actuaries are independent of the plan sponsor.

The cooperation of the Secretary and his staff in gathering materials for this valuation is acknowledged with appreciation.

Respectfully submitted,

The image shows three handwritten signatures in black ink. From left to right: 'Brian B. Murphy' in a cursive script, 'Mark Buis' in a more stylized cursive, and 'James D. Anderson' in a clear cursive.

Brian B. Murphy, FSA, MAAA    Mark Buis, FSA, MAAA    James D. Anderson, FSA, MAAA

BBM/MB/JDA:bd

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**SECTION A**  
**OPERATION OF THE SYSTEM**

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## **OPERATION OF THE RETIREMENT SYSTEM**

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Each year, as of December 31, an actuarial valuation of the liability for retired persons receiving benefits from the Wisconsin Retirement System is conducted. The purpose of the valuation is to determine the actuarial present value of future benefit payments on behalf of current retired lives. This present value is the “actuarial reserve”. Theoretically, if an amount of money equal to the actuarial present value were invested at a yield equal to the valuation interest rate, the initial amount plus the continuing investment income would provide exactly the right amount of money to pay the annuities of all current retired persons and their beneficiaries for the rest of their lives. The fund would decrease each year, and would become zero many decades in the future when the last annuitant dies.

The above is a “closed group” description of the operation of the annuity reserve fund. But the fund is really an “open group”. The size of the fund does not actually decrease because each year more benefits are added to the rolls than are removed, and fresh money is transferred into the annuity reserve fund to finance the benefits of the new annuitants. (The actuary calculates the reserve transfers for new annuitants each year as a by-product of the actuarial valuation.)

According to theory, the fund will eventually reach a state when the number of people entering (retiring) each year is approximately equal to the number of people exiting (dying) each year. When this mature state is reached, the amount of money in the fund will remain approximately level in constant dollars from year to year. Each year, the reserve transfers for the new annuitants plus real investment earnings on the whole fund (total money in) will be approximately equal to the benefit payments (total money out). The only source of growth in assets would be the result of the effects of inflation. The dollars in the fund would increase, but the “real” value of the fund would not change.

There are at least two factors that cause the actual operation to be different from the theoretical operation described above. The first is that annuitants may have longer or shorter lifetimes than expected. In recognition of this, the actuary monitors mortality experience of the retirement system and recommends a new mortality table when appropriate. The second factor is that actual investment earnings are rarely equal to the assumed rate. When investment earnings differ from the assumed rate, the difference, positive or negative, is recorded in a supplemental reserve.

## OPERATION OF THE RETIREMENT SYSTEM

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The Wisconsin Retirement System maintains separate reserves for core and variable annuities. Each year, the actuary determines the actuarial reserve for core and variable annuities separately. WRS' practice with respect to the use of supplemental reserves is described below.

***Core Annuity Division:*** If the supplemental reserve is positive and is at least 0.5% of core annuity liabilities, core annuity increases (dividends) may be granted. If the supplemental reserve is negative and is equal to or greater than 0.5% of core annuity liabilities in absolute value, prior core annuity dividends are reduced by an aggregate amount equal to the shortfall. Increases or decreases become effective in April following the December 31 valuation.

***Variable Annuity Division:*** If the supplemental reserve is at least 2% of variable annuity liabilities, substantially all of the reserve (dropping fractions of a percent) is used to increase or decrease variable annuities for the ensuing year. Increases or decreases become effective in April following the December 31 valuation.

**In calculating both the dividend for the Core annuities and the adjustment for Variable annuities, a 5.0% assumed investment return is used to fund the original benefit. Only returns in excess of 5.0% can produce an increase in a member's annuity. Returns below 5% result in a decrease. Please see page 30 for a full description of these benefits.**



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**SECTION B**  
**CORE ANNUITIES**

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**CORE ANNUITY DIVISION**  
**DEVELOPMENT OF ASSETS AND LIABILITIES**

	\$ Millions		Ratio
	Assets	Liabilities	
<b>Ending Balance December 31, 2012</b>	\$40,591.6	\$41,852.4	0.970
Closing Adjustments	(4.0)	0.0	
Variable Terminations	98.6	98.6	
2013 Core Annuity Average Adjustment: -3% *	0.0	(1,178.9)	
<b>Beginning Balance January 1, 2013</b>	40,686.2	40,772.1	0.998
<b>Increases</b>			
Reserve Transfers	3,208.2	3,208.2	
Regular Interest	2,023.6	2,023.6	
Additional Earnings	2,171.9	0.0	
Addition for Mortality Improvement/Data Reserve	0.0	125.9	
Experience Study	0.0	0.0	
Other	0.0	0.0	
<b>Total Increases</b>	7,403.7	5,357.7	
<b>Decreases</b>			
Annuities & Lump Sums	3,813.7	3,813.7	
Credit Re-establishments	3.0	3.0	
Releases for Mortality Improvement/Data Reserve	0.0	0.0	
Experience Study	0.0	0.0	
Other	0.0	12.6	
<b>Total Decreases</b>	3,816.7	3,829.3	
<b>Ending Balance December 31, 2013</b>	<b>\$44,273.2</b>	<b>\$42,300.5</b>	<b>1.047</b>

The ending liability balance includes a data reserve of \$42.3 million and a liability for previously granted dividends of \$2,969 million (prior to the 2014 adjustment).

\* Core Annuity Reserve adjustment ranged from 0% to a maximum of -9.6% dividend.

**RESERVE TRANSFER RECOMMENDATION**  
**DECEMBER 31, 2013**

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Amounts to be transferred from the Employer Reserve and the Employee Reserve to the Annuity Reserve to cover liabilities for new annuities are computed as the first step in the annual actuarial valuation. The actuarial present value at time of retirement of core annuities reported as new since the last actuarial valuation is \$3,162,401,722. Adjustments to prior transfers, related to estimated annuities for which final computations have now been made, totaled \$45,769,688. Reserve transfers are distributed as follows:

<b>Group</b>	<b>Regular Transfer</b>	<b>Adjustment to Prior Transfer</b>	<b>Total Transfer</b>
General	\$2,750,807,799	\$41,530,295	\$2,792,338,095
Protective with Social Security	275,663,371	3,029,680	278,693,052
Protective without Social Security	97,982,775	572,930	98,555,705
Executive & Elected	37,947,777	636,782	38,584,559
<b>Totals</b>	<b>\$3,162,401,722</b>	<b>\$45,769,688</b>	<b>\$3,208,171,410</b>

Accordingly, we recommend that \$3,208,171,410 be transferred to the Core Annuity Reserve. The results in this report assume that this transfer has been made.

**DISCUSSION OF DIVIDEND  
DECEMBER 31, 2013**

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The Core Annuity Fund balance, \$44,273.2 million, was greater than the actuarial present value of core annuities and reserves, \$42,300.5 million, by \$1,972.7 million which resulted in an annuity adjustment of 4.7%. The primary sources of the 4.7% adjustment are:

	<b>% of APV</b>
1. SWIB published investment return	13.60%
2. MRA adjustment	(2.70)%
3. Published effective earnings rate	10.90%
4. Adjustment to relate earnings to average core annuity fund balance	(0.51)%
5. Earnings rate based on average balance	10.39%
6. Expected dividend before adjustments: 1.1039/1.05-1	5.13%
7. Adjustment to relate average asset to ending liability	0.00%
8. Carryover from last year due to timing of dividend accounting adjustments and rounding	(0.20)%
9. Adjustments for mortality improvement and data reserve	(0.30)%
10. Experience study	0.00%
11. Experience and other effects	0.03%
12. Statutory adjustment to round to nearest one-tenth percent	0.04%
<b>13. Computed average dividend rate: (6)+(7)+(8)+(9)+(10)+(11)+(12)</b>	<b>4.7%</b>
14. Adjustment for members at or near the statutory floor	0.0%
<b>15. Final maximum computed dividend rate: (13)+(14)</b>	<b>4.7%</b>

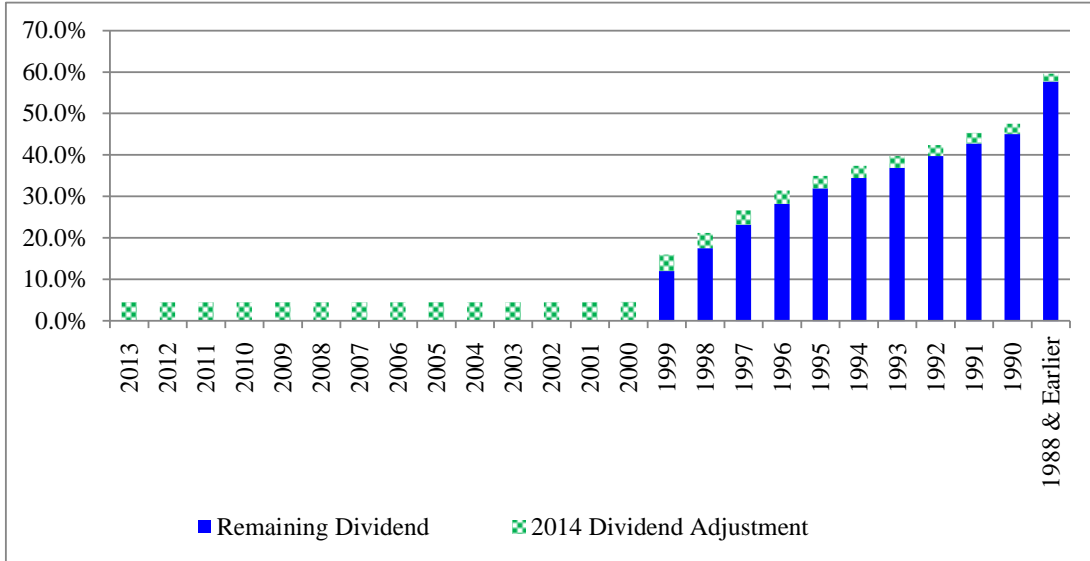
**See pages 31 and 32 for a description of items on this page.**

In accordance with the Administrative Code, ETF 20.25 and Section 40.27(2) Wisconsin Statutes (see page 30), the dividend adjustment is 4.7% effective April 1, 2014.

## DISCUSSION OF DIVIDEND DECEMBER 31, 2013

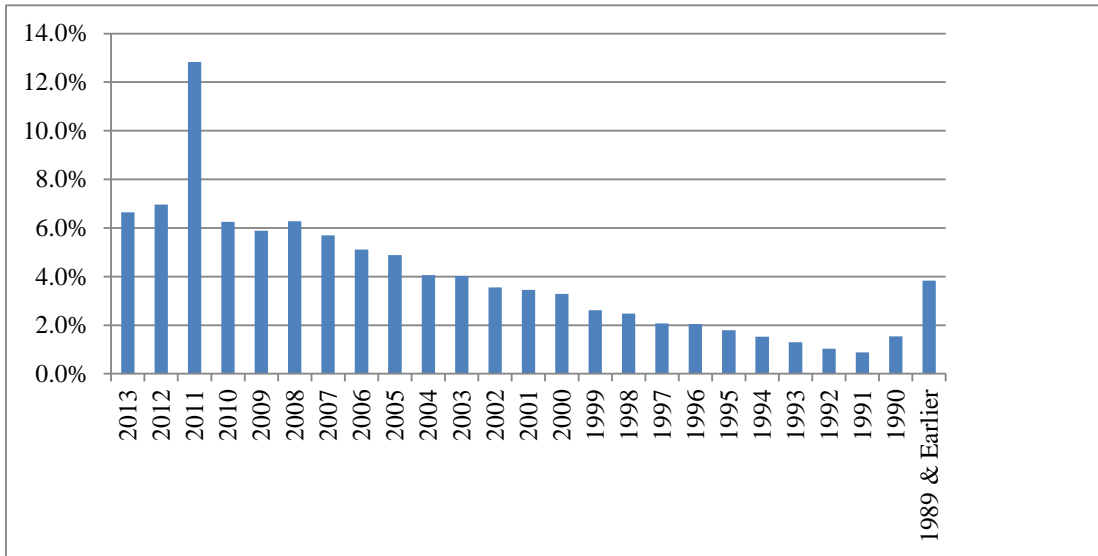
As shown on the prior page, the adjustment for all core fund members is 4.7%. This is the first positive adjustment since 2008, and will be spread equally over all annuitants as shown in the chart below.

### Dividend Remaining (as a Percentage of Total Benefit) by Year of Retirement



After the 2014 dividend adjustment, members retired prior to 2000 continue to have the highest dividend remaining as a percentage of total benefit and also represent a shrinking portion of the liabilities. The chart below shows liabilities by year of retirement.

### Liabilities (as a Percentage of Total) by Year of Retirement



Looking ahead, a few years of spreading positive dividends over all annuitants is needed to decrease the probability of leveraged negative dividends that occurred over the past 5 years. Over this period, the liability for dividends decreased from about \$9.2 billion to \$3.0 billion. In 2014 the dividend liability will increase to about \$5.0 billion. Another positive dividend for 2015 is likely provided there is a positive return on assets in 2014.

**TRANSFERS TO ANNUITY RESERVE  
TO FINANCE CORE ANNUITIES APPROVED IN 2013  
TABULATED BY TYPE OF ANNUITY AND OPTION**

Alpha Code	Type of Benefit	Number	Annual Amount	Present Value
<b>REGULAR RETIREMENT</b>				
SL	Straight Life	1,617	\$ 29,744,822	\$ 403,287,757
SL	Straight Life (accelerated)	0	5,108,998	17,171,391
A60	Life Annuity with 60 payments guaranteed	1,020	18,987,918	260,505,626
A60	Life Annuity with 60 payments guaranteed (accelerated)	0	4,076,390	13,917,343
A180	Life Annuity with 180 payments guaranteed	1,975	34,350,298	493,955,204
A180	Life Annuity with 180 payments guaranteed (accelerated)	0	8,406,565	32,759,617
JOINT	Joint and 75% Survivor	974	23,698,053	356,979,612
JOINT	Joint and 75% Survivor (accelerated)	0	5,025,066	18,233,905
R25	Reduced 25% on First Death	454	11,990,554	174,502,848
R25	Reduced 25% on First Death (accelerated)	0	1,928,069	7,290,894
C100	100% Continued to Named Survivor	1,032	20,292,951	309,614,358
C100	100% Continued to Named Survivor (accelerated)	0	3,890,012	14,790,078
C180	100% Continued to Named Survivor with 180 payments guaranteed	2,796	58,469,209	916,548,372
C180	100% Continued to Named Survivor with 180 payments guaranteed (accelerated)	0	14,644,654	58,394,027
AC24	Annuity Certain with 24 Payments	2	49,051	118,638
AC60	Annuity Certain with 60 Payments	6	76,422	376,309
AC120	Annuity Certain with 120 Payments	6	112,482	910,527
AC180	Annuity Certain between 24 and 180 Payments	6	89,225	842,951
SLNSD	Straight Life - Named Survivor Deceased	1	66,694	925,505
	Total Regular	9,889	\$ 241,007,433	\$ 3,081,124,962
	Average Age at Retirement	60.9 Years		
<b>DISABILITY RETIREMENT</b>				
SL	Straight Life	31	\$ 1,103,274	\$ 15,735,113
A60	Life Annuity with 60 payments guaranteed	12	355,954	4,625,962
A180	Life Annuity with 180 payments guaranteed	28	671,117	9,400,088
JOINT	Joint and 75% Survivor	6	168,254	2,574,272
R25	Reduced 25% on First Death	5	246,157	3,556,926
C100	100% Continued to Named Survivor	15	399,988	6,490,634
C180	100% Continued to Named Survivor with 180 payments guaranteed	49	1,500,999	24,470,062
	Total Disability	146	\$ 4,445,743	\$ 66,853,056
	Average Age at Retirement	54.8 Years		
<b>DEATH-IN-SERVICE BENEFITS</b>				
SL	Straight Life	14	\$ 153,726	\$ 2,219,253
SL	Straight Life (accelerated)	0	42,924	230,143
A60	Life Annuity with 60 payments guaranteed	4	135,464	1,397,908
A60	Life Annuity with 60 payments guaranteed (accelerated)	0	15,560	107,507
A180	Life Annuity with 180 payments guaranteed	51	690,173	9,958,457
A180	Life Annuity with 180 payments guaranteed (accelerated)	0	112,479	504,665
	Total Death-in-Service	70	\$ 1,152,463	\$ 14,423,704
	Average Age at Retirement	53.3 Years		
<b>GRAND TOTAL</b>		<b>10,105</b>	<b>\$ 246,605,639</b>	<b>\$ 3,162,401,722</b>

*In cases where an individual is receiving more than one annuity, the person only appears once in the above number counts, but the corresponding annual amounts can show up in several different places, depending on the option elected for the different annuities. This can result in, for example, a number count of zero (or a very low number count) combined with a significant annual dollar amount in the above table.*

## CORE ANNUITIES BEING PAID DECEMBER 31, 2013 TABULATED BY TYPE OF ANNUITY AND OPTION

Alpha Code	Type of Benefit	Number	Annual Amount	Present Value
<b>REGULAR RETIREMENT</b>				
SL	Straight Life	23,345	\$ 420,065,368	\$ 4,540,637,635
SL	Straight Life (accelerated)	0	23,959,643	56,082,049
A60	Life Annuity with 60 payments guaranteed	19,942	356,190,218	3,654,370,338
A60	Life Annuity with 60 payments guaranteed (accelerated)	0	17,719,765	39,273,671
A120	Life Annuity with 120 payments guaranteed	138	1,848,462	5,412,325
A180	Life Annuity with 180 payments guaranteed	35,756	620,581,590	6,706,424,220
A180	Life Annuity with 180 payments guaranteed (accelerated)	0	42,394,378	107,383,458
A180F	Life Annuity with 180 payments guaranteed (forced)	234	1,595,063	14,289,052
JOINT	Joint and 75% Survivor	20,745	471,079,029	5,615,659,247
JOINT	Joint and 75% Survivor (accelerated)	0	25,669,586	59,133,877
R25	Reduced 25% on First Death	13,816	344,813,455	3,540,660,728
R25	Reduced 25% on First Death (accelerated)	0	9,826,416	23,094,535
C100	100% Continued to Named Survivor	15,911	308,248,966	3,799,045,946
C100	100% Continued to Named Survivor (accelerated)	0	18,570,703	46,628,803
C180	100% Continued to Named Survivor with 180 payments guaranteed	41,312	890,156,471	12,063,271,495
C180	100% Continued to Named Survivor with 180 payments guaranteed (accelerated)	0	81,037,230	204,431,875
LOL	Life with Optional Length Guaranteed	67	947,974	4,507,072
LOLF	Life with Optional Length Guaranteed (Forced)	5	129,342	514,103
AC24	Annuity Certain with 24 Payments	9	153,037	167,612
AC60	Annuity Certain with 60 Payments	33	498,105	1,303,165
AC120	Annuity Certain with 120 Payments	33	991,715	5,677,486
AC180	Annuity Certain between 24 and 180 Payments	38	2,320,534	10,855,610
C50	50% Continued to One Beneficiary	64	870,553	3,237,858
C50W180	50% Continued to One Beneficiary with 180 Months guaranteed	6	35,503	113,164
C75WSS	75% Continued to One Beneficiary and Social Security Integrated	72	1,373,476	7,402,588
R25W120	Reduced 25% on Death of Annuitant or Named Survivor with 120 Months guaranteed	6	72,086	210,389
A60WSS	Life with 60 Months Guaranteed and Social Security Integrated	116	681,546	2,299,985
A180WSS	Life with 180 Months Guaranteed and Social Security Integrated	105	1,880,094	7,219,224
PF6213	Police and Firemen s.62.13 *	115	3,189,363	12,969,302
SLNSD	Straight Life - Named Survivor Deceased	562	14,240,011	141,594,004
Total Regular		172,430	\$3,661,139,682	\$40,673,870,817

(concluded on next page)

*In cases where an individual is receiving more than one annuity, the person only appears once in the above number counts, but the corresponding annual amounts can show up in several different places, depending on the option elected for the different annuities. This can result in, for example, a number count of zero (or a very low number count) combined with a significant annual dollar amount in the above table.*

## CORE ANNUITIES BEING PAID DECEMBER 31, 2013 TABULATED BY TYPE OF ANNUITY AND OPTION

Alpha Code	Type of Benefit	Number	Annual Amount	Present Value
<b>DISABILITY RETIREMENT</b>				
SL	Straight Life	796	\$ 17,989,007	\$ 178,577,111
A60	Life Annuity with 60 payments guaranteed	437	9,720,870	94,964,497
A180	Life Annuity with 180 payments guaranteed	1,163	24,378,121	258,195,592
JOINT	Joint and 75% Survivor	531	9,998,246	110,826,234
R25	Reduced 25% on First Death	245	4,661,962	51,155,604
C100	100% Continued to Named Survivor	1,273	20,262,309	232,591,158
C180	100% Continued to Named Survivor with 180 payments guaranteed	1,893	35,300,007	469,844,029
DWSMC	Disability with Spouse or Minor/Dependent Child	25	520,380	4,219,633
DWOSMC	Disability without Spouse or Minor/Dependent Child	2	36,733	303,215
PF6213	Police and Firemen s.62.13 *	21	331,585	1,451,011
SLNSD	Straight Life - Named Survivor Deceased	7	171,060	1,812,613
Total Disability		6,393	\$ 123,370,280	\$ 1,403,940,697
<b>DEATH-IN-SERVICE BENEFITS</b>				
SL	Straight Life	231	\$ 2,924,542	\$ 30,583,952
SL	Straight Life (accelerated)	0	83,913	354,951
A60	Life Annuity with 60 payments guaranteed	127	1,945,249	21,135,322
A60	Life Annuity with 60 payments guaranteed (accelerated)	0	58,664	291,783
A180	Life Annuity with 180 payments guaranteed	828	10,144,998	123,826,791
A180	Life Annuity with 180 payments guaranteed (accelerated)	0	838,015	3,229,132
C180	100% Continued to Named Survivor with 180 payments guaranteed	2	9,767	153,486
LOL	Life with Optional Length Guaranteed	4	56,691	371,166
AC180	Annuity Certain between 24 and 180 Payments	4	36,226	75,228
A60WSS	Life with 60 Months Guaranteed and Social Security Integrated	35	34,923	154,359
PF6213	Police and Firemen s.62.13 *	2	54,886	266,279
Total Death-in-Service		1,233	\$ 16,187,874	\$ 180,442,449
<b>GRAND TOTAL</b>		<b>180,056</b>	<b>\$3,800,697,836</b>	<b>\$42,258,253,963</b>

*In cases where an individual is receiving more than one annuity, the person only appears once in the above number counts, but the corresponding annual amounts can show up in several different places, depending on the option elected for the different annuities. This can result in, for example, a number count of zero (or a very low number count) combined with a significant annual dollar amount in the above table.*

### \*Additional Information for Police and Firemen 62.13 Annuities

	Regular Retirement			Disability Retirement			Death-in-Service Retirement		
	Original	Dividends	Total	Original	Dividends	Total	Original	Dividends	Total
<b>Benefit Amount</b>	932,734	2,256,629	3,189,363	83,820	247,765	331,585	14,477	40,409	54,886
<b>Present Value</b>	3,864,590	9,104,712	12,969,302	367,808	1,083,203	1,451,011	70,222	196,057	266,279



**CORE ANNUITIES BEING PAID DECEMBER 31, 2013**  
**TABULATED BY ATTAINED AGES**

Attained Ages	Regular		Disability		Death-in-Service		Totals	
	No.	Annual Amount	No.	Annual Amount	No.	Annual Amount	No.	Annual Amount
Under 20	0	\$ 0	1	\$ 5,463	6	\$ 53,940	7	\$ 59,403
20-24	0	0	3	31,761	13	56,363	16	88,124
25-29	0	0	12	79,153	17	96,757	29	175,910
30-34	0	0	14	93,518	19	141,134	33	234,652
35-39	3	18,412	20	152,442	22	154,640	45	325,494
40-44	14	91,083	33	508,908	27	138,828	74	738,819
45-49	71	860,708	135	2,968,005	33	323,068	239	4,151,781
50-54	1,109	30,866,860	418	9,786,930	84	1,047,629	1,611	41,701,419
55-59	14,169	410,883,321	884	19,788,942	135	2,318,348	15,188	432,990,611
60-64	33,936	851,474,514	1,267	27,109,025	181	3,066,111	35,384	881,649,650
65-69	40,694	836,563,947	1,139	21,901,312	170	2,840,418	42,003	861,305,677
70-74	29,183	558,270,552	920	16,399,844	140	1,989,271	30,243	576,659,667
75-79	21,149	392,409,161	719	12,348,765	106	1,289,473	21,974	406,047,399
80-84	15,409	294,276,356	476	7,305,136	103	932,981	15,988	302,514,473
85-89	9,817	179,249,755	251	3,487,375	81	970,321	10,149	183,707,451
90-94	4,334	72,569,372	82	1,149,245	38	294,196	4,454	74,012,813
95& Up	1,332	16,465,753	19	254,456	23	120,689	1,374	16,840,898
Certain Only*	1,210	17,139,888	0	0	35	353,707	1,245	17,493,595
<b>Totals</b>	<b>172,430</b>	<b>\$3,661,139,682</b>	<b>6,393</b>	<b>\$123,370,280</b>	<b>1,233</b>	<b>\$16,187,874</b>	<b>180,056</b>	<b>\$3,800,697,836</b>

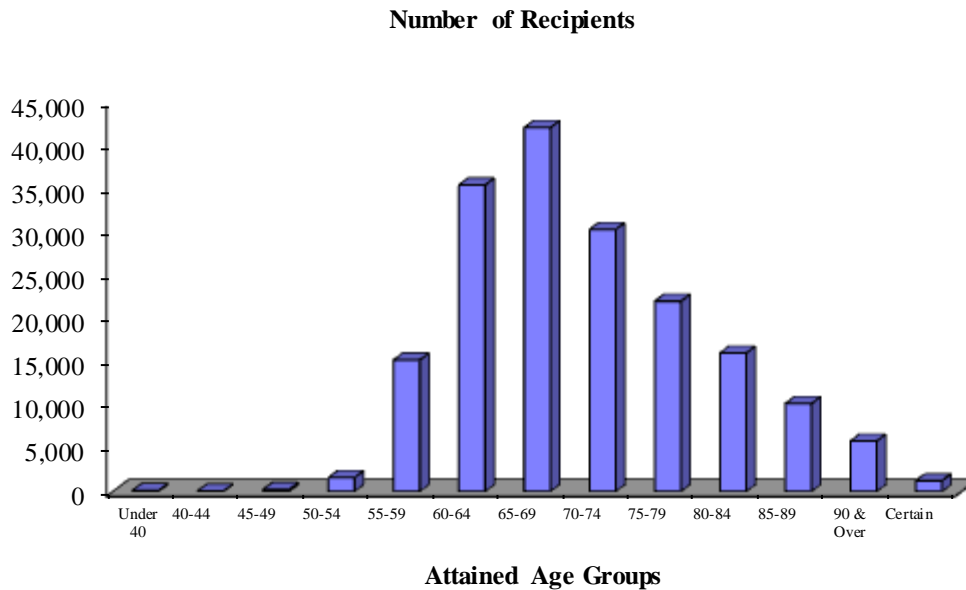
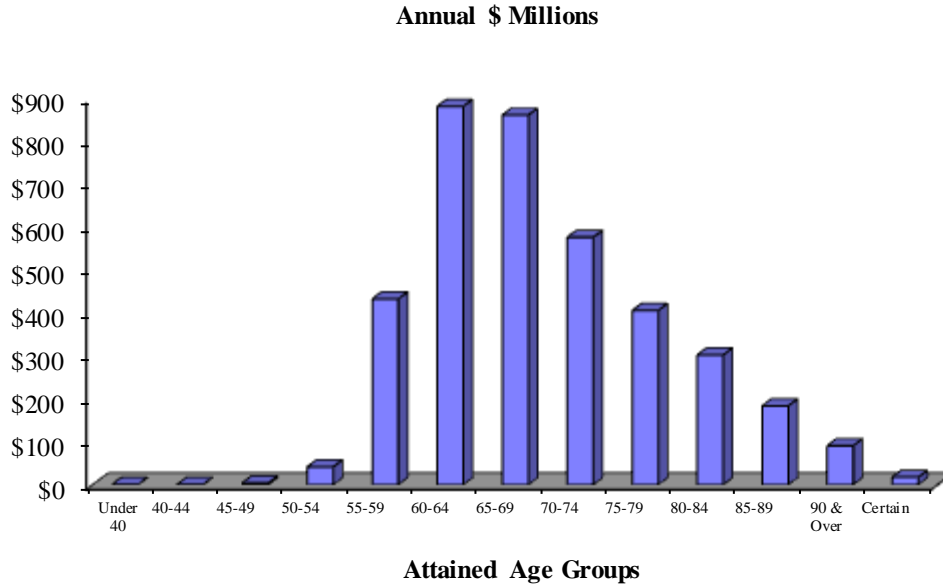
Averages in Years

Age at retirement	59.6	52.0	51.3	59.3
Attained age	69.7	66.6	67.2	69.6

\* Certain Only category consists of continuations of 5, 10 and 15-year certain and life annuities to beneficiaries of deceased annuitants.

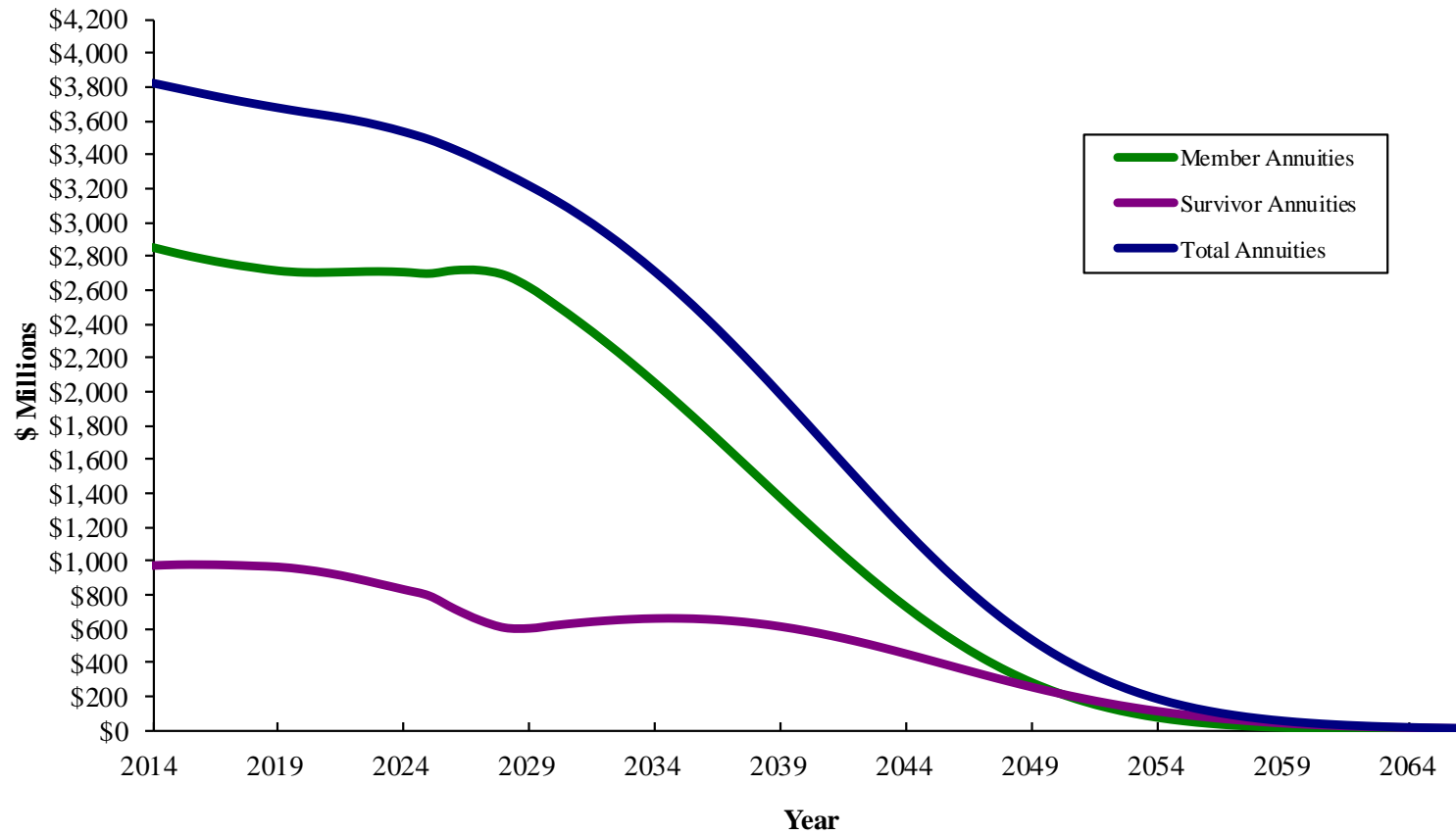
## CORE ANNUITIES BEING PAID BY ATTAINED AGE\* DECEMBER 31, 2013

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\* Includes regular and disability retirees and survivor beneficiaries. The "certain" category includes annuities paid for a fixed period which is not dependent upon the age of the recipient.

**PROJECTED FUTURE CORE ANNUITY PAYMENTS  
ON BEHALF OF PRESENT RETIRED LIVES  
INCLUDING PRESENT DIVIDENDS**



Total Future Payments	\$96.7 billion
From Present Assets	44.3
From Investment Return	52.4

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**SECTION C**  
**VARIABLE ANNUITIES**

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**VARIABLE ANNUITY DIVISION**  
**DEVELOPMENT OF ASSETS AND LIABILITIES**

	\$ Millions		Ratio
	Assets	Liabilities	
<b>Ending Balance December 31, 2012</b>	\$3,463.9	\$3,169.6	1.093
Closing Adjustments	1.4	0.0	
Variable Terminations	(98.6)	(98.6)	
2013 Adjustment: 9%	0.0	276.7	
Beginning Balance January 1, 2013	3,366.7	3,347.7	1.006
<b>Increases</b>			
Reserve Transfers	150.0	150.0	
Regular Interest	163.2	163.2	
Additional Earnings	827.7	0.0	
Addition for Mortality Improvement/Data Reserve	0.0	8.9	
Experience Study	0.0	0.0	
Other	0.0	0.0	
<b>Total Increases</b>	1,140.9	322.1	
<b>Decreases</b>			
Annuities & Lump Sums	320.2	320.2	
Credit Re-establishments	0.1	0.1	
Release for Mortality Improvement/Data Reserve	0.0	0.0	
Experience Study	0.0	0.0	
Other	0.0	2.5	
<b>Total Decreases</b>	320.3	322.8	
<b>Ending Balance December 31, 2013</b>	<b>\$4,187.3</b>	<b>\$3,347.0</b>	<b>1.251</b>

**RESERVE TRANSFER RECOMMENDATION**  
**DECEMBER 31, 2013**

---

Amounts to be transferred from the Employer Reserve and the Employee Reserve to the Annuity Reserve to cover liabilities for new annuities are computed as the first step in the annual actuarial valuation. The actuarial present value at time of retirement of variable annuities reported as new since the last actuarial valuation is \$138,955,282. Adjustments to prior transfers, relating to estimated annuities for which final computations have now been made, totaled \$11,019,623. Reserve transfers were distributed as follows:

Group	Regular Transfer	Adjustment to Prior Transfer	Total Transfer
General	\$126,750,251	\$10,066,216	\$136,816,467
Protective with Social Security	8,867,624	648,616	9,516,240
Protective without Social Security	1,438,344	136,114	1,574,458
Executive & Elected	1,899,063	168,676	2,067,739
<b>Totals</b>	<b>\$138,955,282</b>	<b>\$11,019,623</b>	<b>\$149,974,904</b>

Accordingly, we recommend that \$149,974,904 be transferred to the Variable Annuity Reserve. The results in this report assume that this transfer has been made.

## DISCUSSION OF VARIABLE ANNUITY CHANGE DECEMBER 31, 2013

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Variable Annuity Reserves, \$4,187.3 million, exceeded the actuarial present value of variable annuities, \$3,347.0 million, by \$840.3 million as of December 31, 2013 or 25% of the actuarial present value (APV) of variable annuity payments. In accordance with Section 40.28(2) of the Wisconsin statutes (see page 30), variable annuities will be increased by 25% effective April 1, 2014. The primary sources of the 25% are as follows:

	<b>% of APV</b>
1. SWIB published investment return	29.0%
2. Adjustment to published effective rate	2.0%
3. Published effective earnings rate	31.0%
4. Adjustment to relate earnings to average variable annuity fund balance	(0.8)%
5. Earnings rate based on average balance	30.2%
6. Expected change before adjustments: 1.302/1.05-1	24.0%
7. Adjustment to relate average asset to ending liability	0.7%
8. Carryover from last year due to timing of distribution, accounting adjustments and truncation	0.6%
9. Adjustments for mortality improvement	(0.3)%
10. Experience study	0.0%
11. Experience and other effects	0.1%
12. Statutory adjustment: (truncate to whole percent)	(0.1)%
<b>13. Variable annuity change: (6)+(7)+(8)+(9)+(10)+(11)+(12)</b>	<b>25.0%</b>

**Please see pages 31 and 32 for a description of the items on this page.**

**TRANSFERS TO ANNUITY RESERVE  
TO FINANCE VARIABLE ANNUITIES APPROVED IN 2013  
TABULATED BY TYPE OF ANNUITY AND OPTION**

Alpha Code	Type of Benefit	Number	Annual Amount	Present Value
<b>REGULAR RETIREMENT</b>				
SL	Straight Life	247	\$ 1,056,899	\$ 14,200,132
SL	Straight Life (accelerated)	0	174,123	592,143
A60	Life Annuity with 60 payments guaranteed	178	738,388	10,125,871
A60	Life Annuity with 60 payments guaranteed (accelerated)	0	152,704	480,493
A180	Life Annuity with 180 payments guaranteed	408	1,567,662	22,131,633
A180	Life Annuity with 180 payments guaranteed (accelerated)	0	384,969	1,446,444
JOINT	Joint and 75% Survivor	234	1,238,163	18,254,187
JOINT	Joint and 75% Survivor (accelerated)	0	243,428	821,918
R25	Reduced 25% on First Death	105	562,736	7,827,028
R25	Reduced 25% on First Death (accelerated)	0	118,535	400,609
C100	100% Continued to Named Survivor	211	1,110,658	16,028,386
C100	100% Continued to Named Survivor (accelerated)	0	168,525	622,277
C180	100% Continued to Named Survivor with 180 payments guaranteed	604	2,664,164	40,829,481
C180	100% Continued to Named Survivor with 180 payments guaranteed (accelerated)	0	699,817	2,641,956
AC24	Annuity Certain with 24 Payments	0	3,480	9,396
AC60	Annuity Certain with 60 Payments	1	5,802	29,296
AC120	Annuity Certain with 120 Payments	0	2,685	22,581
AC180	Annuity Certain between 24 and 180 Payments	1	3,888	22,683
SLNSD	Straight Life - Named Survivor Deceased	1	4,454	61,810
	Total Regular	1,990	\$ 10,901,080	\$ 136,548,325
	Average Age at Retirement	60.0 Years		
<b>DISABILITY RETIREMENT</b>				
SL	Straight Life	10	\$ 29,826	\$ 416,375
A60	Life Annuity with 60 payments guaranteed	1	3,267	35,728
A180	Life Annuity with 180 payments guaranteed	15	39,539	546,821
JOINT	Joint and 75% Survivor	1	2,760	42,386
R25	Reduced 25% on First Death	1	4,124	63,538
C100	100% Continued to Named Survivor	2	3,968	61,700
C180	100% Continued to Named Survivor with 180 payments guaranteed	17	50,561	842,007
	Total Disability	47	\$ 134,045	\$ 2,008,555
	Average Age at Retirement	54.2 Years		
<b>DEATH-IN-SERVICE BENEFITS</b>				
SL	Straight Life	2	\$ 3,779	\$ 57,520
A60	Life Annuity with 60 payments guaranteed	1	2,413	38,153
A60	Life Annuity with 60 payments guaranteed (accelerated)	0	2,440	16,855
A180	Life Annuity with 180 payments guaranteed	11	14,815	240,719
A180	Life Annuity with 180 payments guaranteed (accelerated)	0	6,129	45,155
	Total Death-in-Service	14	\$ 29,576	\$ 398,402
	Average Age at Retirement	45.4 Years		
<b>GRAND TOTAL</b>		<b>2,051</b>	<b>\$ 11,064,701</b>	<b>\$ 138,955,282</b>

*In cases where an individual is receiving more than one annuity, the person only appears once in the above number counts, but the corresponding annual amounts can show up in several different places, depending on the option elected for the different annuities. This can result in, for example, a number count of zero (or a very low number count) combined with a significant annual dollar amount in the above table.*



## VARIABLE ANNUITIES BEING PAID DECEMBER 31, 2013 TABULATED BY TYPE OF ANNUITY AND OPTION

Alpha Code	Type of Benefit	Number	Annual Amount	Present Value
<b>REGULAR RETIREMENT</b>				
SL	Straight Life	4,728	\$ 34,192,866	\$ 327,443,241
SL	Straight Life (accelerated)	0	973,127	2,029,559
A60	Life Annuity with 60 payments guaranteed	3,953	28,413,235	261,217,751
A60	Life Annuity with 60 payments guaranteed (accelerated)	0	706,633	1,272,538
A120	Life Annuity with 120 payments guaranteed	28	135,098	418,951
A180	Life Annuity with 180 payments guaranteed	7,535	51,919,712	516,734,796
A180	Life Annuity with 180 payments guaranteed (accelerated)	0	1,764,442	4,285,253
A180F	Life Annuity with 180 payments guaranteed (forced)	26	182,641	1,459,211
JOINT	Joint and 75% Survivor	5,018	44,506,325	491,194,207
JOINT	Joint and 75% Survivor (accelerated)	0	1,124,993	2,365,618
R25	Reduced 25% on First Death	3,805	44,672,379	412,091,700
R25	Reduced 25% on First Death (accelerated)	0	427,821	946,010
C100	100% Continued to Named Survivor	3,587	28,522,769	309,613,709
C100	100% Continued to Named Survivor (accelerated)	0	721,555	1,712,094
C180	100% Continued to Named Survivor with 180 payments guaranteed	9,721	73,174,940	915,929,704
C180	100% Continued to Named Survivor with 180 payments guaranteed (accelerated)	0	3,101,086	7,352,836
LOL	Life with Optional Length Guaranteed	8	112,632	464,510
AC24	Annuity Certain with 24 Payments	2	13,189	11,300
AC60	Annuity Certain with 60 Payments	8	40,510	105,371
AC120	Annuity Certain with 120 Payments	6	47,459	282,119
AC180	Annuity Certain between 24 and 180 Payments	7	499,454	2,885,830
C50	50% Continued to One Beneficiary	39	295,272	1,045,011
C50W180	50% Continued to One Beneficiary with 180 Months guaranteed	6	32,298	109,714
C75WSS	75% Continued to One Beneficiary and Social Security Integrated	24	141,988	799,116
R25W120	Reduced 25% on Death of Annuitant or Named Survivor with 120 Months guaranteed	2	20,860	62,418
A60WSS	Life with 60 Months Guaranteed and Social Security Integrated	39	105,688	362,930
A180WSS	Life with 180 Months Guaranteed and Social Security Integrated	20	103,717	391,785
SLNSD	Straight Life - Named Survivor Deceased	110	1,291,603	11,584,824
Total Regular		38,672	\$317,244,292	\$3,274,172,105

(concluded on next page)

*In cases where an individual is receiving more than one annuity, the person only appears once in the above number counts, but the corresponding annual amounts can show up in several different places, depending on the option elected for the different annuities. This can result in, for example, a number count of zero (or a very low number count) combined with a significant annual dollar amount in the above table.*

## VARIABLE ANNUITIES BEING PAID DECEMBER 31, 2013 TABULATED BY TYPE OF ANNUITY AND OPTION

Numeric Code	Alpha Code	Type of Benefit	Number	Annual Amount	Present Value
<b>DISABILITY RETIREMENT</b>					
1	SL	Straight Life	152	\$ 570,799	\$ 4,513,863
3	A60	Life Annuity with 60 payments guaranteed	79	406,711	3,564,004
7	A180	Life Annuity with 180 payments guaranteed	252	999,264	9,749,681
10	JOINT	Joint and 75% Survivor	113	655,908	6,831,689
12	R25	Reduced 25% on First Death	58	292,304	2,826,675
14	C100	100% Continued to Named Survivor	237	1,052,156	10,480,371
16	C180	100% Continued to Named Survivor with 180 payments guaranteed	396	1,668,053	19,792,504
30	DWSMC	Disability with Spouse or Minor/Dependent Child	4	14,967	53,620
35	SLNSD	Straight Life - Named Survivor Deceased	1	10,547	68,717
Total Disability			1,292	\$ 5,670,709	\$ 57,881,124
<b>DEATH-IN-SERVICE BENEFITS</b>					
1	SL	Straight Life	64	\$ 389,013	\$ 3,546,424
2	SL	Straight Life (accelerated)	0	557	4,540
3	A60	Life Annuity with 60 payments guaranteed	36	218,374	1,894,889
4	A60	Life Annuity with 60 payments guaranteed (accelerated)	0	2,440	16,329
7	A180	Life Annuity with 180 payments guaranteed	236	951,550	9,191,344
8	A180	Life Annuity with 180 payments guaranteed (accelerated)	0	44,594	225,231
23	AC180	Annuity Certain between 24 and 180 Payments	3	9,871	5,799
28	A60WSS	Life with 60 Months Guaranteed and Social Security Integrated	14	7,605	36,909
Total Death-in-Service			353	\$ 1,624,004	\$ 14,921,465
<b>GRAND TOTAL</b>			<b>40,317</b>	<b>\$ 324,539,005</b>	<b>\$ 3,346,974,695</b>

*In cases where an individual is receiving more than one annuity, the person only appears once in the above number counts, but the corresponding annual amounts can show up in several different places, depending on the option elected for the different annuities. This can result in, for example, a number count of zero (or a very low number count) combined with a significant annual dollar amount in the above table.*

**VARIABLE ANNUITIES BEING PAID DECEMBER 31, 2013**  
**TABULATED BY ATTAINED AGES**

Attained Ages	Regular		Disability		Death-in-Service		Totals	
	No.	Annual Amount	No.	Annual Amount	No.	Annual Amount	No.	Annual Amount
20-24	0	\$ 0	2	\$ 3,114	3	\$ 1,441	5	\$ 4,555
25-29	0	0	7	2,669	5	2,510	12	5,179
30-34	0	0	7	1,893	4	1,487	11	3,380
35-39	2	1,038	5	1,535	4	4,446	11	7,019
40-44	2	19,194	12	44,723	11	19,125	25	83,042
45-49	22	63,551	40	59,510	9	7,288	71	130,349
50-54	328	899,322	97	152,828	29	76,557	454	1,128,707
55-59	3,598	15,475,080	198	443,407	34	100,926	3,830	16,019,413
60-64	8,267	44,320,177	242	772,865	52	163,940	8,561	45,256,982
65-69	9,332	70,306,606	220	1,228,765	41	186,378	9,593	71,721,749
70-74	5,621	58,279,984	159	1,178,393	41	327,566	5,821	59,785,943
75-79	4,032	48,673,836	129	858,645	26	146,086	4,187	49,678,567
80-84	3,369	38,909,382	99	545,301	27	177,821	3,495	39,632,504
85-89	2,377	25,410,793	51	254,028	32	136,767	2,460	25,801,588
90-94	1,142	10,579,060	18	86,860	14	151,386	1,174	10,817,306
95& Up	348	2,805,594	6	36,173	9	46,647	363	2,888,414
Certain Only*	232	1,500,675	0	0	12	73,633	244	1,574,308
<b>Totals</b>	<b>38,672</b>	<b>\$317,244,292</b>	<b>1,292</b>	<b>\$5,670,709</b>	<b>353</b>	<b>\$1,624,004</b>	<b>40,317</b>	<b>\$324,539,005</b>

Averages in Years

Age at retirement	59.1	52.5	51.2	58.9
Attained age	69.0	65.8	67.6	68.9

\* Certain only category consists of continuations of 5, 10 and 15-year certain and life annuities to beneficiaries of deceased annuitants.

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**SECTION D**  
**COMPARATIVE STATEMENTS**

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**CORE ANNUITIES  
COMPARATIVE STATEMENT  
1983 THROUGH 2013**

Valuation Date	Number	\$ Millions				Change in		
		Annual Annuities	Fund Balance	Actuarial Reserve	Ratio	Annuitants Average	Maximum	CPI*
1983	57,770	\$ 177.7	\$ 1,830.3	\$ 1,738.3	1.053	5.0 %		3.8 %
1984	60,302	214.3	2,255.5	2,120.3	1.064	6.0 %		4.0 %
1985	62,953	257.6	2,758.2	2,561.0	1.077	7.2 %		3.8 %
1986	65,425	303.5	3,256.9	3,021.2	1.078	7.6 %		1.1 %
1987	67,688	366.9	3,833.7	3,594.6	1.067	6.7 %		4.4 %
1988	70,017	420.6	4,319.6	4,150.9	1.041	4.1 %		4.4 %
1989	73,232	488.7	5,487.4	4,928.1	1.113	11.3 %		4.6 %
1990	77,666	611.3	6,443.8	6,219.1	1.036	3.6 %		6.2 %
1991	79,465	660.4	7,137.8	6,711.3	1.063	6.3 %		3.0 %
1992	81,508	732.3	7,782.4	7,456.6	1.044	4.4 %		3.0 %
1993	83,836	801.7	8,608.2	8,205.3	1.049	4.9 %		2.7 %
1994	86,214	882.2	9,286.2	9,029.6	1.028	2.8 %		2.7 %
1995	88,998	955.8	10,351.7	9,804.1	1.056	5.6 %		2.6 %
1996	92,198	1,065.8	11,699.8	10,977.1	1.066	6.6 %		3.3 %
1997	95,128	1,188.4	13,185.1	12,240.4	1.077	7.7 %		1.7 %
1998	99,112	1,349.5	14,951.8	13,943.0	1.072	7.2 %		1.6 %
1999	102,817	1,513.8	16,857.8	15,687.2	1.075	17.1 %	**	2.7 %
2000	107,425	1,867.0	20,517.8	19,405.3	1.057	5.7 %		3.4 %
2001	112,142	2,048.6	21,979.7	21,283.6	1.033	3.3 %		1.6 %
2002	116,289	2,226.6	23,142.4	23,202.9	0.997	0.0 %		2.4 %
2003	121,582	2,364.7	25,071.9	24,724.0	1.014	1.4 %		1.9 %
2004	126,211	2,500.3	26,920.0	26,232.2	1.026	2.6 %		3.3 %
2005	131,674	2,691.4	28,575.3	28,359.7	1.008	0.8 %		3.4 %
2006	137,117	2,843.6	31,180.5	30,273.9	1.030	3.0 %		2.6 %
2007	142,906	3,075.3	35,050.1	32,877.5	1.066	6.6 %		4.1 %
2008	144,033	3,399.3	35,798.1	36,551.5	0.979	(2.1)%	(2.1)%	0.1 %
2009	150,671	3,449.3	36,655.8	37,072.7	0.989	(1.1)%	(1.3)%	2.7 %
2010	155,775	3,532.4	37,798.4	38,148.5	0.991	(0.9)%	(1.2)%	1.5 %
2011	167,453	3,842.0	40,411.5	42,078.3	0.960	(4.0)%	(7.0)%	3.0 %
2012	173,655	3,806.3	40,591.6	41,852.4	0.970	(3.0)%	(9.6)%	1.7 %
2013	180,056	3,800.7	44,273.2	42,300.5	1.047	4.7 %	4.7 %	1.5 %
<b>31-Year Average</b>						<b>4.1 %</b>		<b>2.9 %</b>
<b>10-Year Average</b>						<b>0.6 %</b>		<b>2.4 %</b>

\* CPI percentage increase determined by ratio of current year CPI-U67 December index over prior year December index.

\*\* Including 10.6% Act 11 transfer.

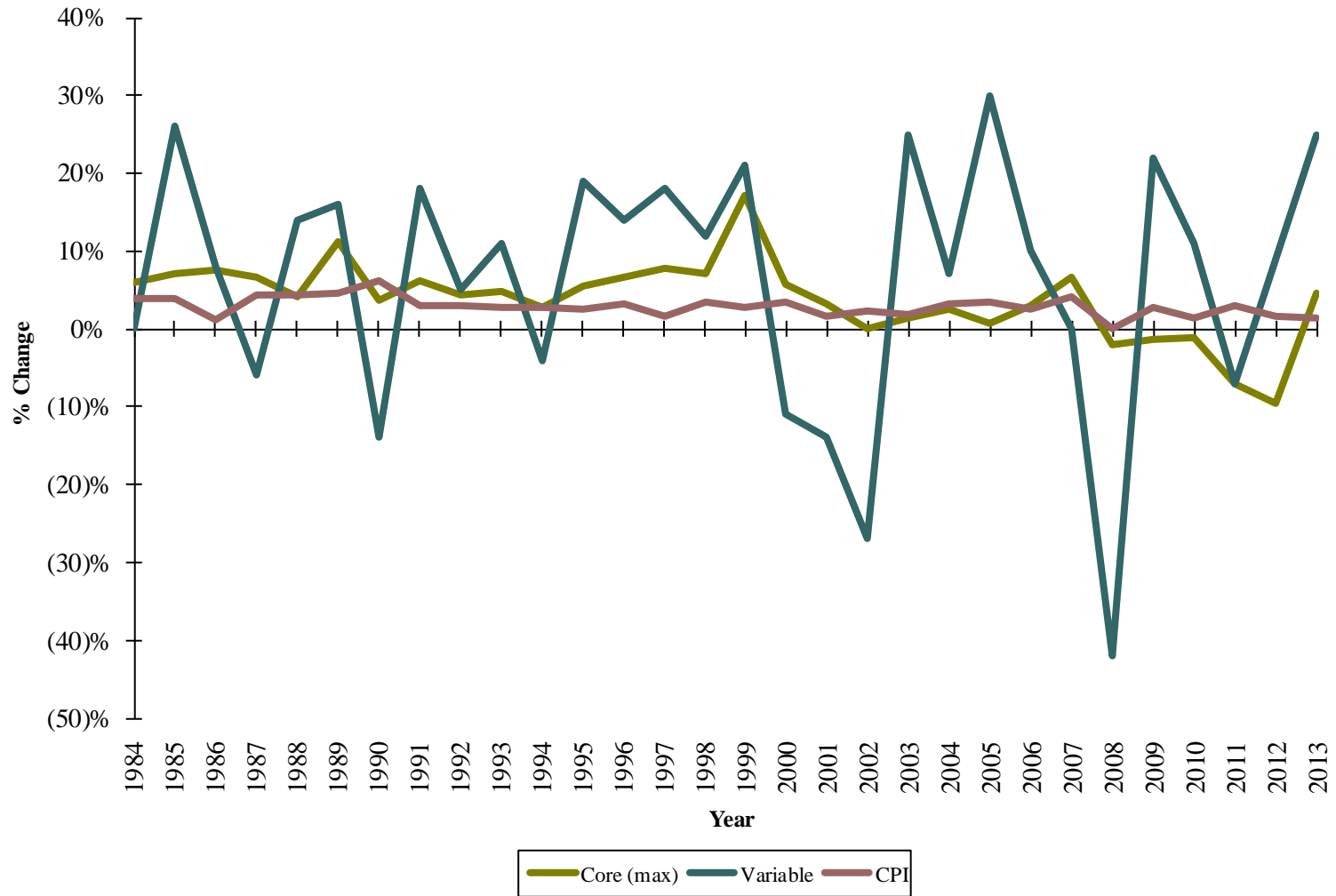
In cases where there is a negative dividend, a maximum decrease is calculated to account for annuitants that are already at the floor and whose dividend cannot be reduced.

**VARIABLE ANNUITIES  
COMPARATIVE STATEMENT  
1983 THROUGH 2013**

Valuation		\$ Millions				Change in	
		Annual	Fund	Actuarial	Ratio		
Date	Number	Annuities	Balance	Reserve		Annuities	CPI*
1983	13,598	\$ 25.9	\$ 289.4	\$ 245.0	1.181	18.0 %	3.8 %
1984	14,520	34.2	329.2	327.5	1.005	0.0 %	4.0 %
1985	15,529	38.0	463.1	366.6	1.263	26.0 %	3.8 %
1986	16,276	51.8	538.7	498.6	1.080	8.0 %	1.1 %
1987	17,084	60.4	548.8	584.2	0.939	(6.0)%	4.4 %
1988	17,779	61.4	682.6	594.0	1.149	14.0 %	4.4 %
1989	18,502	75.9	878.1	756.5	1.161	16.0 %	4.6 %
1990	19,922	101.0	868.6	1,013.4	0.857	(14.0)%	6.2 %
1991	20,538	91.5	1,101.3	929.7	1.184	18.0 %	3.0 %
1992	20,968	112.6	1,208.6	1,147.4	1.053	5.0 %	3.0 %
1993	21,623	123.7	1,407.9	1,268.6	1.110	11.0 %	2.7 %
1994	22,248	144.6	1,418.0	1,487.0	0.954	(4.0)%	2.7 %
1995	22,978	150.2	1,854.2	1,556.0	1.192	19.0 %	2.6 %
1996	23,725	189.8	2,264.9	1,976.7	1.146	14.0 %	3.3 %
1997	24,462	228.2	2,800.0	2,371.5	1.181	18.0 %	1.7 %
1998	25,424	289.5	3,400.5	3,035.5	1.120	12.0 %	1.6 %
1999	26,257	345.8	4,432.9	3,659.1	1.212	21.0 %	2.7 %
2000	27,321	445.3	4,211.4	4,749.3	0.887	(11.0)%	3.4 %
2001	28,314	424.4	3,901.8	4,547.4	0.858	(14.0)%	1.6 %
2002	28,662	374.0	2,899.3	3,999.1	0.726	(27.0)%	2.4 %
2003	29,496	273.3	3,635.9	2,892.2	1.257	25.0 %	1.9 %
2004	30,270	346.0	3,909.9	3,654.5	1.070	7.0 %	3.3 %
2005	31,499	376.5	4,092.7	3,970.7	1.031	3.0 %	3.4 %
2006	32,683	391.8	4,594.2	4,145.2	1.108	10.0 %	2.6 %
2007	33,880	432.6	4,625.0	4,563.7	1.013	0.0 %	4.1 %
2008	34,927	427.0	2,574.5	4,491.0	0.573	(42.0)%	0.1 %
2009	34,836	240.3	3,078.4	2,512.7	1.225	22.0 %	2.7 %
2010	35,866	288.4	3,340.6	3,005.4	1.111	11.0 %	1.5 %
2011	38,949	330.3	3,197.9	3,462.9	0.924	(7.0)%	3.0 %
2012	39,873	304.6	3,463.9	3,169.6	1.093	9.0 %	1.7 %
2013	40,317	324.5	4,187.3	3,347.0	1.251	25.0 %	1.5 %
<b>31-Year Average</b>						<b>4.7 %</b>	<b>2.9 %</b>
<b>10-Year Average</b>						<b>1.9 %</b>	<b>2.4 %</b>

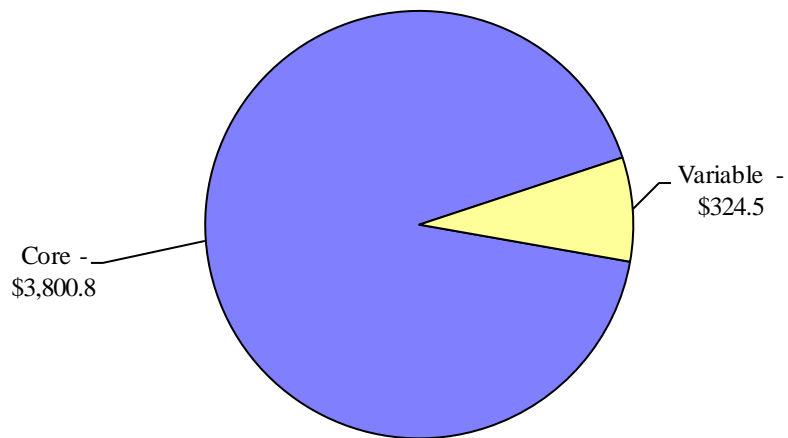
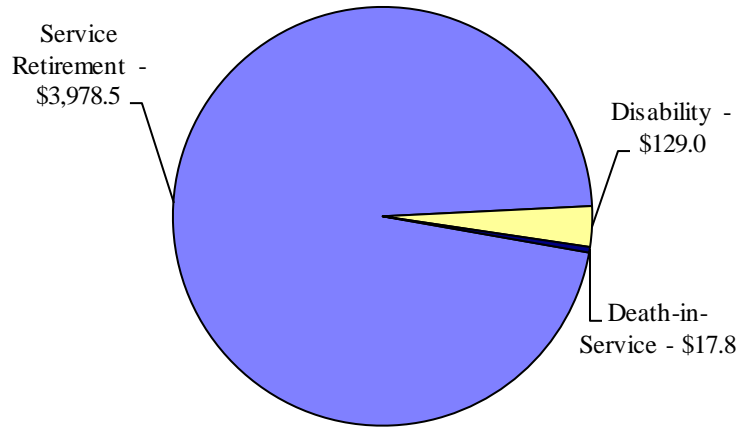
\* *CPI percentage increase determined by ratio of current year CPI-U67 December index over prior year December index.*

## HISTORY OF % CHANGES IN ANNUITIES AND CPI



**ANNUITIES BEING PAID BY TYPE**  
**DECEMBER 31, 2013**  
**\$ MILLIONS**

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**ANNUITIES BEING PAID DECEMBER 31, 2013**  
**TABULATED BY YEAR OF RETIREMENT**  
**(\$1,000S ANNUALLY)**

Year Ret'd	Core Annuities				Variable Annuities				Avg. Total Annuity
	No.	Initial	Increases	Total	No.	Initial	Increases	Total	
2013	9,176	\$ 221,223	\$ 0	\$ 221,223	1,906	\$ 9,739	\$ 0	\$ 9,739	\$29,128
2012	9,617	234,491	0	234,491	2,028	8,860	797	9,657	29,836
2011	15,407	433,501	0	433,501	4,062	22,632	310	22,942	35,345
2010	8,448	211,850	0	211,850	1,964	8,607	1,077	9,684	30,485
2009	7,990	200,481	0	200,481	1,640	5,626	2,098	7,724	30,118
2008	8,583	211,506	0	211,506	1,941	14,341	(2,917)	11,424	26,571
2007	8,441	190,824	0	190,824	2,044	14,731	(3,000)	11,731	23,996
2006	8,157	167,989	0	167,989	1,861	13,502	(1,677)	11,825	21,996
2005	8,144	163,764	0	163,764	1,871	14,130	(1,382)	12,748	21,624
2004	7,337	139,284	0	139,284	1,714	12,832	(446)	12,386	20,593
2003	7,425	140,847	0	140,847	1,599	10,684	2,207	12,891	20,664
2002	7,037	127,678	0	127,678	1,418	14,416	(1,712)	12,704	19,946
2001	7,107	127,894	0	127,894	1,508	22,914	(5,552)	17,362	20,453
2000	7,160	125,450	107	125,557	1,337	26,367	(8,591)	17,776	20,010
1999	6,032	91,572	12,499	104,071	1,120	17,901	(3,300)	14,601	19,687
1998	5,760	83,377	17,673	101,050	1,113	15,848	(1,369)	14,479	19,994
1997	4,873	68,117	20,525	88,642	957	11,507	895	12,402	20,765
1996	4,800	65,439	25,672	91,111	969	10,152	2,309	12,461	21,618
1995	4,322	57,143	26,793	83,936	864	7,408	3,414	10,822	22,006
1994	3,908	48,972	25,732	74,704	877	7,374	2,981	10,355	21,844
1993	3,571	42,259	24,699	66,958	791	5,527	3,079	8,606	21,208
1992	3,016	33,857	22,313	56,170	686	4,605	2,930	7,535	21,115
1991	2,735	29,043	21,723	50,766	643	3,514	3,248	6,762	21,236
1990	4,406	49,476	40,606	90,082	1,067	6,658	4,400	11,058	23,139
1989	3,257	36,130	34,653	70,783	727	3,945	3,653	7,598	24,282
1988	2,425	21,058	23,313	44,371	596	2,492	2,980	5,472	20,742
1987	2,056	16,648	20,774	37,422	544	2,204	2,348	4,552	20,676
1986	1,819	14,081	20,274	34,355	497	1,856	2,281	4,137	21,278
1985	1,631	12,799	20,854	33,653	430	1,199	2,166	3,365	22,936
1984	1,209	8,703	15,599	24,302	372	1,047	1,894	2,941	22,912
1983	996	5,559	10,569	16,128	306	715	1,648	2,363	18,603
1982	732	3,271	7,042	10,313	199	356	1,004	1,360	15,948
1981	636	2,297	5,321	7,618	169	249	694	943	13,462
1980	429	1,387	3,390	4,777	123	154	559	713	12,797
1979	292	920	2,431	3,351	87	80	327	407	12,825
1978	244	662	1,787	2,449	60	43	188	231	10,981
1977	194	522	1,421	1,943	64	47	201	248	11,296
1976	184	443	1,295	1,738	49	29	131	160	10,492
1975	126	268	767	1,035	38	26	136	162	9,506
1974	93	185	535	720	28	17	79	96	8,768
Prior	281	353	1,008	1,361	48	23	94	117	3,227
<b>Total</b>	<b>180,056</b>	<b>\$3,391,323</b>	<b>\$409,375</b>	<b>\$3,800,698</b>	<b>40,317</b>	<b>\$304,357</b>	<b>\$20,182</b>	<b>\$324,539</b>	<b>\$22,911</b>

**LIABILITIES AS OF DECEMBER 31, 2013**  
**TABULATED BY YEAR OF RETIREMENT**  
**(\$1,000S ANNUALLY)**

Year Ret'd	Core Liabilities				Variable Liabilities				Total Liabilities
	No.	Initial	Increases	Total	No.	Initial	Increases	Total	
2013	9,176	\$ 2,808,962	\$ 0	\$ 2,808,962	1,906	\$ 123,926	\$ 0	\$ 123,926	\$2,932,888
2012	9,617	2,939,635	0	2,939,635	2,028	111,547	10,035	121,582	3,061,217
2011	15,407	5,423,760	0	5,423,760	4,062	282,750	3,872	286,622	5,710,382
2010	8,448	2,643,883	0	2,643,883	1,964	107,310	13,425	120,735	2,764,618
2009	7,990	2,484,523	0	2,484,523	1,640	68,265	25,460	93,725	2,578,248
2008	8,583	2,651,872	0	2,651,872	1,941	177,051	(36,030)	141,021	2,792,893
2007	8,441	2,405,852	0	2,405,852	2,044	185,808	(37,843)	147,965	2,553,817
2006	8,157	2,159,233	0	2,159,233	1,861	172,338	(21,402)	150,936	2,310,169
2005	8,144	2,064,783	0	2,064,783	1,871	176,157	(17,229)	158,928	2,223,711
2004	7,337	1,713,531	0	1,713,531	1,714	158,041	(5,495)	152,546	1,866,077
2003	7,425	1,698,653	0	1,698,653	1,599	128,999	26,644	155,643	1,854,296
2002	7,037	1,500,478	0	1,500,478	1,418	172,775	(20,520)	152,255	1,652,733
2001	7,107	1,457,088	0	1,457,088	1,508	259,593	(62,938)	196,655	1,653,743
2000	7,160	1,387,324	1,148	1,388,472	1,337	291,865	(95,094)	196,771	1,585,243
1999	6,032	971,497	131,857	1,103,354	1,120	187,515	(34,566)	152,949	1,256,303
1998	5,760	861,764	182,237	1,044,001	1,113	160,968	(13,907)	147,061	1,191,062
1997	4,873	673,760	202,335	876,095	957	111,642	8,678	120,320	996,415
1996	4,800	621,615	242,996	864,611	969	93,509	21,252	114,761	979,372
1995	4,322	516,441	241,521	757,962	864	64,731	29,821	94,552	852,514
1994	3,908	421,675	221,190	642,865	877	61,530	24,876	86,406	729,271
1993	3,571	347,588	202,650	550,238	791	43,806	24,390	68,196	618,434
1992	3,016	262,406	173,109	435,515	686	33,968	21,613	55,581	491,096
1991	2,735	213,763	159,789	373,552	643	24,573	22,739	47,312	420,864
1990	4,406	358,242	293,890	652,132	1,067	46,869	30,975	77,844	729,976
1989	3,257	241,307	230,983	472,290	727	25,480	23,589	49,069	521,359
1988	2,425	127,248	141,040	268,288	596	14,399	17,216	31,615	299,903
1987	2,056	93,658	116,204	209,862	544	11,829	12,603	24,432	234,294
1986	1,819	73,954	106,791	180,745	497	9,719	11,944	21,663	202,408
1985	1,631	64,336	104,839	169,175	430	5,896	10,643	16,539	185,714
1984	1,209	39,932	71,857	111,789	372	4,755	8,602	13,357	125,146
1983	996	23,482	44,532	68,014	306	2,936	6,744	9,680	77,694
1982	732	13,642	29,302	42,944	199	1,369	3,860	5,229	48,173
1981	636	9,245	21,649	30,894	169	966	2,686	3,652	34,546
1980	429	5,395	13,208	18,603	123	534	1,947	2,481	21,084
1979	292	3,178	8,450	11,628	87	274	1,127	1,401	13,029
1978	244	2,305	6,263	8,568	60	158	698	856	9,424
1977	194	1,787	4,952	6,739	64	166	707	873	7,612
1976	184	1,709	5,021	6,730	49	107	466	573	7,303
1975	126	910	2,611	3,521	38	73	390	463	3,984
1974	93	625	1,739	2,364	28	62	280	342	2,706
Prior	281	1,292	3,758	5,050	48	88	370	458	5,508
<b>Total</b>	<b>180,056</b>	<b>\$39,292,333</b>	<b>\$2,965,921</b>	<b>\$42,258,254</b>	<b>40,317</b>	<b>\$3,324,347</b>	<b>\$22,628</b>	<b>\$3,346,975</b>	<b>\$45,605,229</b>

**COMPARISON OF ACTUAL TO EXPECTED DEATHS AMONG RETIRED LIVES  
(NORMAL RETIREMENT ONLY)  
DURING 2013**

Age	Male Deaths			Female Deaths			Total Deaths		
	Actual	Expected	Exposure	Actual	Expected	Exposure	Actual	Expected	Exposure
30-34									
35-39						3			3
40-44			1			14			15
45-49			13			78			91
50-54	3	2	742	3		532	6	2	1,274
55-59	32	31	6,203	28	24	8,139	60	55	14,342
60-64	81	94	13,665	82	86	20,104	163	180	33,769
65-69	164	184	17,045	148	144	22,195	312	328	39,240
70-74	207	227	12,799	188	183	15,791	395	410	28,590
75-79	283	287	9,218	231	246	11,554	514	533	20,772
80-84	419	396	6,828	386	366	8,987	805	762	15,815
85-89	435	402	3,836	458	498	6,244	893	900	10,080
90-94	266	251	1,451	470	450	3,275	736	701	4,726
95-99	83	84	288	268	246	1,041	351	330	1,329
100 & Up	15	10	27	63	49	160	78	59	187
<b>Totals</b>	<b>1,988</b>	<b>1,968</b>	<b>72,116</b>	<b>2,325</b>	<b>2,292</b>	<b>98,117</b>	<b>4,313</b>	<b>4,260</b>	<b>170,233</b>
Average Ages	80.9	80.3	70.3	83.9	83.7	70.8	82.5	82.2	70.6

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**SECTION E**  
**APPENDIX**

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## ACTUARIAL ASSUMPTIONS USED IN THE RETIRED LIFE ACTUARIAL VALUATION

The interest rate used in the valuation was 5.0% a year, compounded yearly, as provided in Section 40.02 of the Wisconsin Statutes. Please note that we have assumed all current dividends to be payable in the future. To the extent that unfavorable investment performance reduces current dividends, liabilities would be lower than reported in this valuation. The mortality table used in the valuation was the Wisconsin 2012 Mortality Table, as adopted by the Board in connection with the 2009-2011 Experience Study. This table includes margin for future improvements in mortality. Present values are multiplied by 0.993, 0.996 and 1.000 during the 3 respective years of the experience study cycle. Please note that this method replaces an earlier method of adding a gradually increasing reserve to each year's liabilities. This is the second year of the experience study cycle and consequently a factor of 0.996 is used.

### SINGLE LIFE RETIREMENT VALUES Wisconsin Projected Experience Table - 2012 with 5% Interest

Sample Attained Ages	Present Value of \$1 Monthly for Life		Future Life Expectancy (years)		Probability of Death Next Year	
	Males	Females	Males	Females	Males	Females
40	\$209.20	\$214.70	42.9	46.1	0.098%	0.060%
45	200.43	207.06	38.1	41.3	0.130%	0.094%
50	189.60	197.69	33.3	36.5	0.176%	0.139%
55	176.75	186.37	28.7	31.8	0.405%	0.245%
60	162.35	172.92	24.4	27.2	0.572%	0.352%
65	145.13	156.75	20.1	22.7	0.875%	0.541%
70	125.71	137.76	16.1	18.4	1.451%	0.919%
75	104.34	116.43	12.4	14.3	2.468%	1.665%
80	82.05	93.57	9.0	10.7	4.536%	3.110%
85	61.28	70.89	6.3	7.6	8.463%	6.219%

The values shown above are for non-disabled participants. Sample values for disabled participants are as follows:

Sample Attained Ages	Present Value of \$1 Monthly for Life		Future Life Expectancy (years)		Probability of Death Next Year	
	Males	Females	Males	Females	Males	Females
40	\$195.27	\$204.53	35.7	39.9	0.149%	0.103%
45	183.23	194.56	30.9	35.1	0.251%	0.158%
50	169.52	182.61	26.4	30.4	0.498%	0.275%
55	153.66	168.39	22.1	25.8	0.665%	0.402%
60	135.14	151.44	18.0	21.4	1.162%	0.629%
65	114.76	131.73	14.1	17.2	1.908%	1.097%
70	92.83	109.91	10.6	13.2	3.324%	1.995%
75	71.03	86.92	7.6	9.7	6.330%	3.754%
80	52.06	64.92	5.2	6.8	11.650%	7.641%
85	36.73	47.23	3.5	4.7	18.779%	13.173%

## **STATUTORY PROVISIONS - POST-RETIREMENT ADJUSTMENTS**

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### **CORE ANNUITIES - 40.27(2)**

“CORE ANNUITY RESERVE SURPLUS DISTRIBUTIONS. Surpluses in the core annuity reserve established under s. 40.04 (6) and (7) shall be distributed by the board if the distribution will result in at least a 0.5% increase in the amount of annuities in force, except as otherwise provided by the department by rule, on recommendation of the actuary, as follows:

(a) The distributions shall be expressed as percentage increases in the amount of the monthly annuity in force, including prior distributions of surpluses but not including any amount paid from funds other than the core annuity reserve fund, preceding the effective date of the distribution. For purposes of this subsection, annuities in force include any disability annuity suspended because the earnings limitation had been exceeded by that annuitant in that year.

(b) Prorated percentages based on the annuity effective date may be applied to annuities with effective dates during the calendar year preceding the effective date of the distribution, as provided by rule, but no other distinction may be made among the various types of annuities payable from the core annuity reserve.

(c) The distributions shall not be offset against any other benefit being received but shall be paid in full, nor shall any other benefit being received be reduced by the distributions. The annuity reserve surplus distributions authorized under this subsection may be revoked by the board in part or in total as to future payments upon recommendation of the actuary if a deficit occurs in the core annuity reserves and such deficit would result in a 0.5 percent or greater decrease in the amount of annuities in force, except as otherwise provided by the department by rule.

(d) Notwithstanding s 40.03 (2) (i), (7) (d), and (8) (d), the department may promulgate rules under this subsection without the approval of the teachers retirement board and the Wisconsin retirement board.”

### **VARIABLE ANNUITIES - 40.28(2)**

“Whenever the balance in the variable annuity reserve, as of December 31 of any year, exceeds or is less than the then present value of all variable annuities in force, determined in accordance with the rate of interest and approved actuarial tables then in effect, by at least 2% of the present value of all variable annuities in force, the amount of each variable annuity payment shall be proportionately increased or decreased, disregarding fractional percentages, and effective on a date determined by rule, so as to reduce the variance between the balance of the variable annuity reserve and the present value of variable annuities to less than one percent.”

## **NARRATIVE REGARDING THE DEVELOPMENT OF DIVIDEND AND VARIABLE ANNUITY CHANGES SHOWN ON PAGES 7 AND 17**

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**1. SWIB Published Investment Return**

The earnings rate published by State of Wisconsin Investment Board on the Core/Variable Fund.

**2. MRA Adjustment (Core)/Adjustment to Published Effective Rate (Variable)**

Item 3 below minus Item 1 above. For core annuities, this is the MRA adjustment which takes into account five-year smoothing of gains and losses. For variable annuities, it converts a figure based on an average balance to a figure based on a beginning year balance.

**3. Published Effective Earnings Rate**

The earnings rate published by DETF is funds' earnings credits expressed as a percentage of the beginning year balance adjusted for benefit payments and reserve transfers.

**4. Adjustment to Relate Earnings to Average Core/Variable Annuity Balance**

Item 5 below minus Item 3 above.

**5. Earnings Rate Based on Average Balance**

This is similar to the published earnings rate except that the rate is determined as a percentage of the average balance during the year instead of the adjusted beginning of year balance.

**6. Expected Dividend (Variable Change) before Adjustments**

The relative difference in fund growth based on actual versus the 5% assumed earnings rates.

**7. Adjustment to Relate Average Asset to Ending Liability**

The final dividend/variable change is calculated based on the end of year assets divided by the end of year liabilities. Since the calculations in Items 5 and 6 are based on average (approximately mid-year) balances, this adjustment is needed so that the final rate will be based on the end of year liabilities.

**8. Carryover from Last Year Due to Timing of Distribution and Accounting Adjustments (and Truncation for Variable Annuity)**

The dividend or variable rate changes are made effective April 1 of each year. This adjustment takes into account the fact that the prior year dividend/variable increase was in effect for less than a full year as well as any accounting adjustments made to the asset value at the beginning of the year. This adjustment also carries over any truncated or rounded amounts from the prior year.

## **NARRATIVE REGARDING THE DEVELOPMENT OF DIVIDEND AND VARIABLE ANNUITY CHANGES SHOWN ON PAGES 7 AND 17**

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### **9. Adjustments to Contingency Reserve and Data Reserve**

Currently there is a reserve for incomplete data for the dividend calculation of 0.1%. Although the mortality table now includes a projection for expected future improvements in mortality, each valuation phases into the full table incrementally over the three year experience study cycle. The current process will create an increase in the contingency reserve of approximately 0.3% each year of the three year cycle. By increasing reserves gradually each year, instead of all at once every three years, the effect on dividends and variable increases will also be more gradual.

### **10. Experience Study**

A study is conducted for WRS every three years to analyze the assumptions that are made in the valuation versus the experience that actually occurred. If the results of the study show material changes in experience, WRS generally adopts a new set of assumptions. When assumptions are changed, this item displays the effect of the change on the dividend/variable rate calculation.

### **11. Experience and Other Effects**

After making all other known adjustments, this is the remainder of all other experience. Changes here are primarily attributable to mortality experience and, generally to a lesser extent, on any data adjustments.

### **12. Statutory Adjustment to Round/Truncate**

By statute, the dividend rate is calculated to the nearest one-tenth of a percent. For the variable annuity change, the rate is truncated to a whole percent. This is the adjustment made from the calculated dividend/variable annuity rate change without rounding/truncation to the statutory rate.

### **13. Computed Average Dividend Rate/Variable Annuity Change**

This is the end of year asset value divided by the end of year liability. It is reconciled to the published earnings rate (Item 3) by making the adjustments in Items 6 through 12.

### **14. Adjustment for Members Not Eligible for Negative Dividend**

This is an adjustment that is sometimes made for Core Fund recipients to reflect that some members may not have any remaining dividends and hence are not subject to a further negative dividend.

### **15. Final Maximum Computed Dividend Rate**

When there is a negative dividend for the Core fund, it will affect people differently based upon year of retirement. In years when there is a negative dividend, this will be the largest negative dividend that will occur in the Core fund. Item 13 plus Item 14.



