

**ILLINOIS MUNICIPAL RETIREMENT FUND**  
TRIENNIAL EXPERIENCE STUDY  
2011 – 2013

December 10, 2014

Board of Trustees  
Illinois Municipal Retirement Fund  
Oak Brook, Illinois 60523

Ladies and Gentlemen:

The results of the 3-year *investigation of experience* of the Illinois Municipal Retirement Fund are presented in this report. The investigation was made for the purpose of updating the actuarial assumptions used in valuing the actuarial liabilities of IMRF in compliance with Section 7-213 of the Illinois Pension Code.

The investigation was based upon the statistical data furnished for annual actuarial valuations, and upon supplemental information furnished by IMRF staff, concerning members who died, withdrew, became disabled or retired during the last 3 years and on published economic historical data.

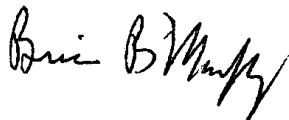
The investigation covered the 3-year period from *January 1, 2011 to December 31, 2013* and was carried out using generally accepted actuarial principles and techniques.

**We believe that the new actuarial assumptions that are the result of this investigation represent a reasonable estimate of future experience of IMRF based upon the data reviewed in the study and general trends among Public Employee Retirement Systems.**

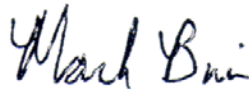
Brian Murphy, Mark Buis and Francois Pieterse are independent of the plan sponsor and are Members of the American Academy of Actuaries (MAAA) who meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

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 and with applicable statutes.

Respectfully submitted,



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## EXECUTIVE SUMMARY

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The Board of Trustees has established a policy of reviewing the actuarial assumptions every three years. The last review was prepared for the period from January 1, 2008 to December 31, 2010. In this report, we review the current actuarial assumptions and methods and compare them to the actual experience of the Retirement Fund for the years 2011-2013.

The table below lists each of the primary assumptions and methods that we analyzed, including our recommendations for each item, and the impact of any recommended changes on average liabilities and contribution rates.

<b>Assumption</b>	<b>Recommendation</b>	<b>Financial Impact</b>
Withdrawal rates	Higher Rates	Decrease
Disability rates	Lower Rates	Decrease
Pay increases due to seniority	Lower Rates	Decrease
Retirement rates	Various	Increase
Pre and post-retirement mortality rates	Lower Rates	Increase
Interest rate	No Change	N/A
Wage inflation	Lower Rate	Decrease
Price inflation	Lower Rate	Decrease
Amortization method	No Change	N/A
<b>Total</b>	<b>Various</b>	<b>Increase</b>

The overall impact on the contribution rate was an increase of approximately 0.4% of payroll for Regular members and 0.7% of payroll for SLEP members, which is primarily attributable to the change in mortality rates. Please note that the December 31, 2014 valuation is likely to show an asset gain under the 5-year smoothing method which could potentially offset any increase in average rates due to a change in assumptions. The effect on each employer will vary.

## **INTRODUCTION**

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Each year as of December 31, the liabilities of the Illinois Municipal Retirement Fund are valued. The purpose of the valuation is to adjust the contribution rates for IMRF employers to take into account changes in participant demographics and recent financial results as well as to measure the financial soundness of the benefit programs. In order to perform the valuation, assumptions must be made regarding the future experience of the system with regard to the following risk areas:

### **Non-Economic Assumptions**

- Rates of quitting among active members.
- Rates of disability among active members.
- Patterns of merit & longevity pay increases to active members.
- Rates of retirement among active members.
- Rates of mortality among active members, retirees and beneficiaries.

### **Economic Assumptions**

- Long-term rates of investment return to be generated by the assets of the Fund.
- Long-term rates of growth of total payroll also called wage inflation.
- Price Inflation.

Assumptions should be carefully chosen and continually monitored. Use of outdated assumptions can lead to:

- Understated costs resulting in either an inability to pay benefits when due, or sharp increases in required contributions at some point in the future;
- Overstated costs resulting in either benefit levels that are kept below the level that could be supported by the computed rate, or an unnecessarily large burden on the current generation of members, employers and taxpayers.

A single set of assumptions will not be suitable indefinitely. Things change, and our understanding of things (whether or not they are changing) also changes.

In recognition of this, Illinois statutes require that assumptions used to value the liabilities of IMRF be studied in depth every three years. The package of assumptions is then adjusted to reflect basic experience trends -- but not random year to year fluctuations. Actuarial assumptions were last revised following the December 31, 2010 regular actuarial valuation.

## **SUMMARY OF FINDINGS -NON-ECONOMIC ASSUMPTIONS**

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In general, the present assumptions provide a reasonable match to the experience of the past three years and recommended adjustments to assumptions are relatively minor. In most cases, when adjustments are indicated, the proposed assumptions give partial recognition to present assumptions as well as to results from actual experience. Complete recognition is rarely given to actual experience over a limited period. In general, the rates were moved about half way to the observed experience, except for the case of mortality which is discussed in further detail later in this report.

In most recent experience studies, we have noticed that in order to develop assumptions that reduce the size of the gain or loss in a particular decrement it is necessary to consider the relative magnitude of the liability of the members that decrement, rather than number counts alone. For example, consider a plan with only two members who are both the same age and assume member one has a liability of \$10,000 and member two has a liability of \$90,000. If one of the members leaves and forfeits all of his or her liability, the net rate of decrement is one out of two for a rate of 50%. However, the net gain or loss to the system will be 10% if member one leaves versus 90% if member two leaves.

As a result, some of our tables include a column entitled 'liability weighted rate'. This represents the crude rate of decrement on a liability weighted basis as opposed to strictly a number count basis. The liability weighted rates were found to be most highly correlated with age based withdrawal and retirement decrements. This makes some intuitive sense, since retirement and termination decisions are often made based on how much the members have to gain or lose if they retire or change jobs, whereas death and disability is typically not a decision at all, rather an event that happens to someone. Comments on specific assumptions are provided on the following page. Tabular results are presented in summary form on page 8.

## SUMMARY OF FINDINGS -NON-ECONOMIC ASSUMPTIONS (CONTINUED)

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***Withdrawal Rates:*** A “withdrawal” or a quit is a separation from service without entitlement to an immediate monthly benefit. For age based withdrawal, experience was found to be more highly correlated with the liability weighted method described above. Rates for the age based tables were adjusted accordingly to be closer to the liability weighted rates. For service based withdrawal, the traditional method based on counts was used. Rates for most groups, based on the first several years of service, were increased slightly to be closer to the actual rates. The changes in withdrawal rates had downward pressure on contribution rates.

***Disability Rates:*** A disability can be either a temporary disability or a permanent disability. Disabilities are initially reported as temporary and are not reclassified as permanent until after the end of the experience period. The actuary then adjusted disability rates to bring the number of expected permanent disabilities closer to the number of actual approved permanent disabilities. Because this is still a relatively new technique, the adjustment in assumptions did not reduce the expected all the way to the actual. We will continue to monitor this assumption as experience emerges. The changes in disability rates had downward pressure on contribution rates.

***Pay Increase Rates*** (portion related to the employee's age and seniority): These rates are difficult to analyze because of the non-homogeneous nature of the IMRF population. For Regular members the combination of both age and service related rates during the first 6 years of service produced higher than actual pay increases. Therefore, we adjusted the rates to use a service related rate for the first 5 years of service and an age related rate for members with more than 5 years of service. For SLEP members, rates were adjusted slightly to be closer to the actual rates. The change exerts downward pressure on contribution rates.

***Retirement Experience:*** Retirement experience was found to be highly correlated with the liability weighted method described on page 3. As such, we modified the retirement rates slightly for most groups to move closer to the liability weighted rates. As more experience emerges, we will monitor these rates to see if further adjustments are necessary. The changes in retirement assumptions were minor and had upward pressure on contribution rates for Regular members and downward pressure on contribution rates for SLEP members.

## SUMMARY OF FINDINGS -NON-ECONOMIC ASSUMPTIONS (CONTINUED)

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***Mortality Among Retirees:*** Mortality rates among retired public employees have been declining for years. Additionally, and perhaps consequently, the Actuarial Standards of Practice with regard to the mortality assumption has recently been revised. ASOP No. 35 Disclosure Section 4.1.1 now states: ***“...The disclosure of the mortality assumption should contain sufficient detail to permit another qualified actuary to understand the provision made for future mortality improvement. If the actuary assumes zero mortality improvement after the measurement date, the actuary should state that no provision was made for future mortality improvement.”*** While the current mortality table did provide some margin for future improvement, the current tables used a static (1 dimensional) projection for future improvement in life expectancy. The Society of Actuaries recently released a new set of mortality tables (RP-2014) and recommended the use of a ‘fully generational’ (2 dimensional) projection scale (MP-2014). Because the RP-2014 table did not match current IMRF experience and was not produced with public sector data, we are recommending the use of an IMRF specific mortality table. This table was developed from the RP-2014 blue collar mortality table with adjustments to match current IMRF experience. In addition, we are recommending the use of the MP-2014 fully generational projection scale to produce appropriate margin for future experience. This change produced upward pressure on contribution rates.

Data for disabled retirees was insufficient to use as a basis for judgment. Therefore, we developed an IMRF disabled mortality table from the RP-2014 disabled mortality table (applying the same adjustments for healthy lives) and project future rates with the MP-2014 fully generational projection scale.



## SUMMARY OF FINDINGS -NON-ECONOMIC ASSUMPTIONS (CONTINUED)

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***Mortality Among Active Members:*** Active member deaths were higher than assumed. In conjunction with the change in post-retirement mortality to a mortality table that projects future improvements in mortality, we recommend a change in the pre-retirement mortality table to the RP-2014 fully generational Employee Mortality table using 2-dimensional projection scale MP-2014 (multiplied by 88% for males and 82% for females).

***Option Factors:*** The calculation of retirement benefit amounts involves the computation of survivor benefit options. If a retiring member elects an optional form of benefit, the standard form of benefit is multiplied by the appropriate option factor to produce the benefit actually payable. Currently, option factors for survivor benefits are calculated using a 7.5% interest rate assumption and assumed rates of mortality. As a matter of common practice, optional benefit reduction factors are usually revised to correspond with the new interest and mortality assumptions adopted after the last experience study. The use of a fully generational mortality table can make the development of option factors more complicated. Since there are many alternatives to consider, we recommend developing a set of alternative option factors after the Board has adopted the recommended mortality table and interest rate. Consistent with past practice, any change in option factors would be adopted for retirements on or after October 1, 2015 to allow time for administrative changes.

## SUMMARY OF FINDINGS -NON-ECONOMIC ASSUMPTIONS (CONCLUDED)

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***Other Risk factors:*** Historically, the gain/loss reports have indicated a pattern of non-decrement losses. These have been attributed to various factors, including changes in final average compensation, rehire of former employees, addition of new employers, data refinements and differences between actual and estimated reserve transfers. In the 2005-2007 Experience Study, we recommended a contingency reserve of 0.25% be added to the normal cost component. This change resulted in a significantly reduced “Other” loss category in 2008, 2009, 2012 and 2013. The large “other” category loss in 2010 was primarily attributable to one-time data losses and the large “other” category loss in 2011 was primarily attributable to changes in assumptions. We recommend that this assumption be maintained at the current 0.25%. We will continue to monitor this assumption to see if future experience indicates a need for further change.

***Assumptions for Tier 2 members:*** Tier 2 members have different retirement eligibilities and benefits and will likely have different experience with regard to withdrawal, turnover, retirement and other assumptions. Currently, there is insufficient data to perform an experience review for Tier 2 members. Current Assumptions for Tier 2 are shown at the end of the report. Additionally, in conjunction with the recommended changes in the price inflation assumption discussed on page 11, we recommend that the wage cap growth assumption be lowered from 1.75% to 1.40%.

***Amortization Method:*** While no changes in the amortization method are recommended, we do note that the use of a 15 year rolling amortization period will typically result in the use of a lower discount rate for GASB reporting purposes. While the new GASB statements do not have a direct impact on developing contribution rates for each employer, this will result in higher reported liabilities on the employers financial statements. Changing from a 15 year rolling to 15 year closed period could alleviate this situation for most employers. However, as the period shrinks, contributions would become increasingly volatile.

**ACTIVE MEMBER DECREMENTS**  
**COMPARISON OF ACTUAL, PRESENT, AND PROPOSED EXPERIENCE**

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Decrement	Regular & ECO						SLEP & ECO		
	Males			Females					
	Actual	Assumed		Actual	Assumed		Actual	Assumed	
		Present	Proposed		Present	Proposed		Present	Proposed
Normal Retirement	4,032	4,652	4,640	6,743	7,182	7,454	321	372	363
Early Retirement	998	1,284	1,284	1,789	2,324	2,324	-	-	-
Withdrawals	12,603	10,754	11,532	26,786	22,733	24,290	332	382	348
Pre Retirement Death	462	398	456	378	319	377	18	12	18
Permanent Disability	67	128	96	64	137	99	3	10	8

This page compares actual total decrement experience during the 3-year experience period with experience that was assumed by the present assumption package and with experience that would have been assumed if the proposed assumptions had been in force throughout the experience period. ECO experience is blended in with Regular and SLEP experience in the above chart. The actual and assumed retirement counts include only people who retired directly from active service. People who retired after having previously separated from service with deferred vested benefits are excluded from all of the counts. Please note that due to the use of liability weighted rates, looking at people counts alone is not the best indicator for the appropriateness of a particular assumption. Assumptions for normal retirement, early retirement and withdrawal after 8 years for Regular (7 years for SLEP) use liability weighted rates.

## SUMMARY OF FINDINGS - ECONOMIC ASSUMPTIONS

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Economic assumptions include **long-term rates of investment return** (net of administrative and investment expenses), **wage inflation** (the across-the-board portion of salary increases), and pay increases due to **merit and seniority**. Unlike demographic activities, economic activities do not lend themselves to analysis solely on the basis of internal historical patterns because both salary increases and investment return are affected more by external forces; namely inflation (both wage and price), general productivity changes and the local economic environment which defy accurate long-term prediction. Estimates of economic activities are generally selected on the basis of the expectations in an inflation-free environment and then both long-term rates of investment return and wage inflation are increased by some provision for long-term inflation.

If inflation and/or productivity increases are lower than expected, it will probably result in both actual rates of salary increases and investment return below the assumed rates. Salaries increasing at rates less than expected produce lower liabilities. However, actual investment return below the assumed rate of investment return (whether due to manager performance, change in the mix of assets, or general market conditions) results in lower than expected asset amounts.

Sources considered in the analysis of the economic assumptions included:

- Actual system experience over the last 3 years (i.e., merit and seniority pay increases)
- Future expectations of the investment consultant for IMRF and future expectations of other investment consultants
- 2014 Social Security Trustees Report
- Historical observations of inflation statistics (both price and wage) and investment returns

Current economic assumptions for the System are as follows:

Investment Return	7.50%
Wage Inflation	4.00%
Price Inflation	3.00%
Spread Between Investment Return and Wage Inflation	3.50%
Spread Between Investment Return and Price Inflation	4.50%

The remainder of this section addresses the economic assumptions other than pay increases due to merit and seniority. Pay increases due to merit and seniority are addressed on pages 45 to 47.

## **ECONOMIC ASSUMPTIONS – ASOP No. 27**

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Guidance regarding the selection of economic assumptions for measuring pension obligations is provided by Actuarial Standards of Practice (ASOP) No. 27. The standard requires that the selected economic assumptions be consistent with each other. That is, the selection of the investment return assumption should be consistent with the selection of the wage inflation and price inflation assumptions.

The recently adopted revision of ASOP No. 27 (applicable to valuation dates on or after September 30, 2014) defines a reasonable economic assumption as an assumption that has the following characteristics:

- (a) It is appropriate for the purpose of the measurement;
- (b) It reflects the actuary's professional judgment;
- (c) It takes into account historical and current economic data that is relevant as of the valuation date;
- (d) It reflects the actuary's estimate of future experience, the actuary's observation of the estimates inherent in market data, or a combination thereof; and
- (e) It has no significant bias (i.e., it is not significantly optimistic or pessimistic), except when provisions for adverse deviation or plan provisions that are difficult to measure are included and disclosed under Section 3.5.1, or when alternative assumptions are used for the assessment of risk.

## SUMMARY OF FINDINGS - ECONOMIC ASSUMPTIONS (CONTINUED)

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**Price Inflation.** Price inflation underlies both the wage inflation and investment return assumptions. Since price inflation underlies the wage inflation assumption and the investment return assumption, we recommend that a specific price inflation assumption be adopted in conjunction with this Experience Study. The chart below shows historical averages of both price and wage inflation. Over the past 50 years, price inflation has averaged 4.1%. This result is heavily affected by the high inflationary period of the 1970's and early 1980's. During the past decade, price inflation averaged 2.4%. The 2014 Social Security Trustees report uses 2.7% as the long-range intermediate price inflation assumption. The low-cost assumption is 1.7%, and the high-cost assumption is 3.7%. **Based upon the reviewed data, we suggest that the Board adopt a price inflation assumption of 2.75%.** (Remember that the selected wage inflation and investment return assumptions should be consistent with the final selected price inflation assumption.)

Year	Annual Increase in		
	Prices (CPI-U)	Wages (NAE)	Difference
1954-1963	1.4%	3.4%	2.0%
1964-1973	4.1%	5.6%	1.5%
1974-1983	8.2%	7.2%	-1.0%
1984-1993	3.7%	4.3%	0.6%
1994-2003	2.4%	3.9%	1.5%
2004-2013	2.4%	2.8%	0.4%
3-Year Avg	2.1%	2.5%	0.4%
5-Year Avg	2.1%	1.6%	-0.5%
10-Year Avg	2.4%	2.8%	0.4%
20-Year Avg	2.4%	3.4%	1.0%
30-Year Avg	2.8%	3.7%	0.9%
50-Year Avg	4.1%	4.8%	0.7%

## SUMMARY OF FINDINGS - ECONOMIC ASSUMPTIONS (CONTINUED)

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***Wage Inflation.*** Wage inflation consists of two components, 1) a portion due to pure price inflation (i.e., increases due to changes in the CPI), and 2) increases in average salary levels in excess of pure price inflation (i.e., increases due to changes in productivity levels, supply and demand in the labor market and other macroeconomic factors). The long-term rate of increase in National Average Earnings over the last 50 years is somewhat higher than the current IMRF assumption, although shorter term averages are below it. It is expected that, in the long run, salary increases in all parts of the country will be close to the national averages. However, few economists are forecasting a repeat of the high inflation rates experienced in the 1970s. In addition, average salaries in IMRF have risen at approximately 3.0% a year since 1989 - a slower pace than the assumed 4.00% a year, although, the active member group has increased in size, which distorts this statistic. **Given our recommendation for a 2.75% price inflation assumption, we believe a reasonable range for this assumption is from 3.0% to 4.0% a year. We recommend a change in the wage inflation assumption to 3.5%.**

We have illustrated the approximate impact on contribution requirements if the wage inflation assumption were changed from 4.0% to 3.50% on page 17.

## SUMMARY OF FINDINGS - ECONOMIC ASSUMPTIONS (CONTINUED)

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**Investment Return.** The investment return assumption is the actuarial assumption that has the largest impact on actuarial valuation results. As more of the actuarial accrued liabilities are related to non-active members, the nominal (as opposed to real) investment return assumption becomes a more prominent factor. Since one of IMRF's fundamental financial objectives is the receipt of level contributions over time, the discount rate assumption is set equal to the investment return assumption (with perhaps an adjustment for conservatism).

Presented below is the approximate current asset allocation for IMRF:

Asset Class	Approximate Asset Allocation
Domestic Equity	38.0%
International Equity	17.0
Fixed Income	27.0
Real Estate	8.0
Alternative Investments	9.0
Cash Equivalents	1.0

Based upon the approximate asset allocation, future expectations of various investment consultants (including Callan) were analyzed. The next few exhibits show the results of this analysis. Final expected nominal investment return results are based upon a 2.75% price inflation assumption. We used the actuarial assumption for price inflation rather than the consultant assumption, in order to be consistent with the calculation of liabilities. Investment results presented are net of expenses and are based upon an expense assumption of 35 basis points



## SUMMARY OF FINDINGS - ECONOMIC ASSUMPTIONS (CONTINUED)

The exhibits presented below are based upon the approximate asset allocation and the capital market assumptions of various investment consultants (identified by numbers 1 through 8 below) other than Callan.

Investment Consultant	Investment Consultant Expected Nominal Return	Investment Consultant Inflation Assumption	Expected Real Return (2)-(3)	Actuary Inflation Assumption	Expected Nominal Return (4)+(5)	Administrative Expenses	Expected Nominal Return Net of Expenses (6)-(7)	Standard Deviation of Expected Return (1-Year)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	7.05%	3.00%	4.05%	2.75%	6.80%	0.08%	6.72%	12.80%
2	7.04%	2.75%	4.29%	2.75%	7.04%	0.08%	6.96%	12.50%
3	7.07%	2.50%	4.57%	2.75%	7.32%	0.08%	7.24%	13.20%
4	7.06%	2.22%	4.83%	2.75%	7.58%	0.08%	7.50%	12.10%
5	7.75%	2.26%	5.49%	2.75%	8.24%	0.08%	8.16%	11.90%
6	7.69%	2.20%	5.49%	2.75%	8.24%	0.08%	8.16%	13.70%
7	7.81%	2.25%	5.56%	2.75%	8.31%	0.08%	8.23%	13.80%
8	8.28%	2.50%	5.78%	2.75%	8.53%	0.08%	8.45%	13.50%
<b>Average</b>	<b>7.47%</b>	<b>2.46%</b>	<b>5.01%</b>	<b>2.75%</b>	<b>7.76%</b>	<b>0.08%</b>	<b>7.68%</b>	<b>12.94%</b>

Investment Consultant	Distribution of 20-Year Average Geometric Net Nominal Return			Probability of exceeding 7.50% *
	25th	50th	75th	
(1)	(2)	(3)	(4)	(5)
1	4.05%	5.94%	7.87%	29.2%
2	4.38%	6.22%	8.10%	32.2%
3	4.48%	6.43%	8.41%	35.7%
4	5.02%	6.81%	8.64%	39.9%
5	5.73%	7.49%	9.29%	49.9%
6	5.26%	7.28%	9.34%	47.1%
7	5.31%	7.34%	9.41%	47.9%
8	5.62%	7.61%	9.63%	51.4%
<b>Average</b>	<b>4.98%</b>	<b>6.89%</b>	<b>8.83%</b>	<b>41.7%</b>

\*Plan's current return assumption net of expenses.

## SUMMARY OF FINDINGS - ECONOMIC ASSUMPTIONS (CONCLUDED)

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The prior version of ASOP No. 27 (applicable to valuation dates prior to September 30, 2014) defines a reasonable investment return assumption as an assumption in the “best-estimate” range. This is generally interpreted as an assumption between the 25<sup>th</sup> and 75<sup>th</sup> percentiles. Based on the average of each of the investment consultants’ expectations, this would result in a range of 4.98% to 8.83%. There is some thought in the actuarial community that this range is too wide. A recently adopted revision to ASOP No. 27 (applicable to valuation dates on or after September 30, 2014) leads some in the actuarial community to believe that a better range is between the expected geometric return (i.e., 50<sup>th</sup> percentile) and the expected arithmetic return. Based on the average of each of the investment consultants’ expectations, this would result in a range of 6.89% to 7.68%. While the current assumption of 7.5% is at the upper end of this range, keep in mind that this analysis is based on broad ranges and average of averages. **Given IMRF’s level percent of payroll financing objective (which would suggest using the expected arithmetic return), we are not recommending any change to the investment return assumption at this time. However, we believe a modest change of 25 basis points to 7.25% would be reasonable and could be considered.**

Based upon our analysis, and staff discussions with the Investment Consultant, we conclude that a change in the interest rate assumption is not necessary at this time. However, this assumption should be carefully monitored, and continued review at the time of the next experience study will be important.

While we are not recommending a change, we have illustrated the approximate impact on contribution requirements if the investment return assumption were changed to 7.25% on page 17.

## HISTORICAL PATTERNS OF INVESTMENT RETURN, PAY INCREASES & INFLATION

Calendar Year Period	Gross Market Returns			Stocks (S&P 500)	Price Inflation (CPI)	National Average Earnings	Sample Balanced Fund	
	Bonds (Long)		Cash Equiv. (T Bills)				Total Return (I)	Spread: I - NAE - e
	U.S. Treasury	Corp. (S&P AA)						
1959-1968	1.7 %	2.4 %	3.5 %	10.0 %	2.1 %	4.3 %	7.4 %	2.8 %
1969-1978	5.1 %	5.8 %	5.9 %	3.2 %	6.7 %	6.6 %	4.2 %	(2.8)%
1979-1988	10.6 %	10.8 %	9.1 %	16.3 %	5.9 %	6.2 %	14.5 %	8.0 %
1989-1998	11.7 %	10.9 %	5.3 %	19.2 %	3.1 %	4.1 %	16.4 %	12.0 %
1999-2008	8.4 %	6.5 %	3.2 %	(1.4)%	2.5 %	3.7 %	2.6 %	(1.5)%
2009	(14.9)%	3.0 %	0.1 %	26.5 %	2.7 %	(1.5)%	14.9 %	16.1 %
2010	10.1 %	12.4 %	0.1 %	15.1 %	1.5 %	2.4 %	13.6 %	10.9 %
2011	28.2 %	18.0 %	0.0	2.1 %	3.0 %	3.1 %	9.4 %	6.0 %
2012	3.3 %	10.7 %	0.1 %	16.0 %	1.7 %	3.1 %	12.7 %	9.3 %
2013	(11.4)%	(7.1)%	0.0	32.4 %	1.5 %	1.1 %	17.5 %	16.1 %
<b>Last 5 Years</b>	<b>1.9 %</b>	<b>7.0 %</b>	<b>0.1 %</b>	<b>17.9 %</b>	<b>2.1 %</b>	<b>1.6 %</b>	<b>13.6 %</b>	<b>11.7 %</b>
<b>Last 10 Years</b>	<b>6.1 %</b>	<b>6.4 %</b>	<b>1.5 %</b>	<b>7.4 %</b>	<b>2.4 %</b>	<b>2.8 %</b>	<b>7.8 %</b>	<b>4.7 %</b>
<b>Last 55 Years</b>	<b>6.9 %</b>	<b>7.2 %</b>	<b>4.9 %</b>	<b>10.0 %</b>	<b>3.9 %</b>	<b>4.7 %</b>	<b>9.3 %</b>	<b>4.3 %</b>

Sample Balanced Fund	
Equities	64%
Bonds - Government	17%
- Corporate	18%
Cash Equivalents	<u>1%</u>
	100%
Fund expenses(e)	0.35%

Historical Spread	
Observed spread is very sensitive to the observation period, even over long periods, as illustrated below:	
Observation Period	Spread
55 years	4.3%
45 years	4.8%
35 years	6.9%

**SUMMARY OF FINDINGS  
AVERAGE EFFECT ON CONTRIBUTION RATES  
(RESULTS BASED UPON DECEMBER 31, 2013 DATA)**

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**REGULAR**

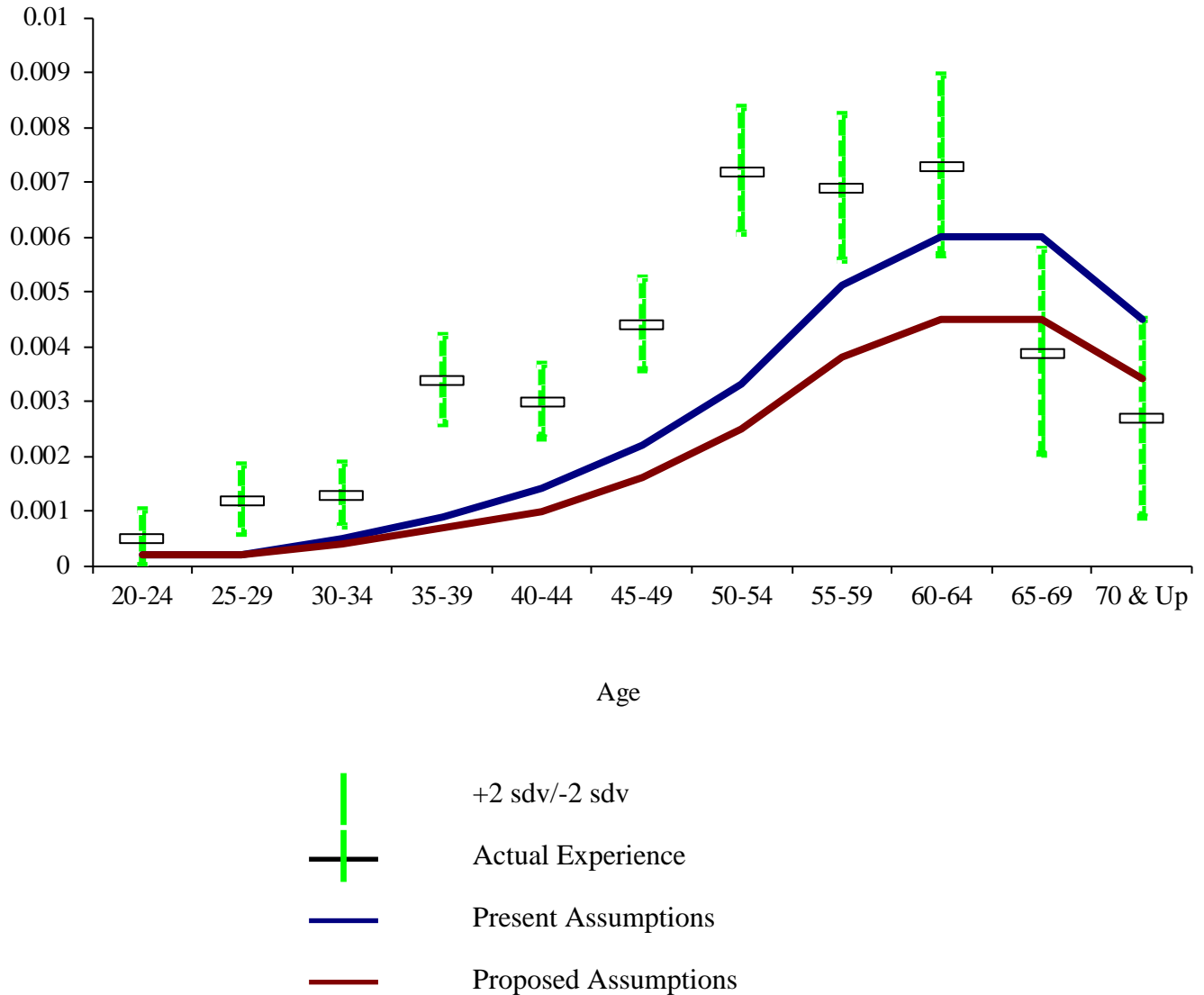
<b>Employer Contributions for</b>	<b>Percent of Active Member Payroll</b>			
	<b>Current Assumptions</b>	<b>New Decrement</b>		
		<b>7.50%/4.00%</b>	<b>7.50%/3.50%</b>	<b>7.25%/3.50%</b>
Normal Cost	7.51%	7.70%	<b>7.09%</b>	7.71%
Lump Sum Death-In-Service Benefits	0.17%	0.17%	<b>0.17%</b>	0.17%
Temporary Disability	0.11%	0.11%	<b>0.11%</b>	0.11%
13th Checks	0.62%	0.62%	<b>0.62%</b>	0.62%
Unfunded Liabilities	3.28%	4.18%	<b>4.12%</b>	4.83%
<b>Total</b>	<b>11.69%</b>	<b>12.78%</b>	<b>12.11%</b>	<b>13.44%</b>

**SLEP**

<b>Employer Contributions for</b>	<b>Percent of Active Member Payroll</b>			
	<b>Current Assumptions</b>	<b>New Decrement</b>		
		<b>7.50%/4.00%</b>	<b>7.50%/3.50%</b>	<b>7.25%/3.50%</b>
Normal Cost	12.42%	13.49%	<b>12.34%</b>	13.57%
Lump Sum Death-In-Service Benefits	0.18%	0.18%	<b>0.18%</b>	0.18%
Temporary Disability	0.11%	0.11%	<b>0.11%</b>	0.11%
13th Checks	0.62%	0.62%	<b>0.62%</b>	0.62%
Unfunded Liabilities	9.00%	9.57%	<b>9.74%</b>	10.98%
<b>Total</b>	<b>22.33%</b>	<b>23.97%</b>	<b>22.99%</b>	<b>25.46%</b>

The above results are presented as an aid in understanding the average combined effects of the changes in assumptions that have been proposed in this experience study. The results are approximate and indicate only the general direction and approximate average magnitude of the effects of the assumption changes. *Contribution rates for 2015 have already been scheduled based upon the December 31, 2013 regular valuation and are not affected by the experience study.* The experience study would begin to affect rates in 2016.

## STANDARD DEVIATION GRAPH EXAMPLE



Standard Deviation graphs of the type shown above appear frequently in this report. The navy blue line represents the present assumptions used in the valuation. After experience is reviewed for a given decrement, an actual value is computed (based on actual experience) along with its standard deviation value. The green vertical bars on the graph above represent the standard deviation value. If the standard deviation value is large, this means that the group being tested is from a small population. A small group should have less influence on deriving the new proposed value than a large group. In comparison, if the standard deviation has a small value, this means the group being tested is from a large population and should have a greater impact on the decision of the proposed value.

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## WITHDRAWAL EXPERIENCE

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## REGULAR MALES WITHDRAWAL EXPERIENCE

There were 10,825 withdrawals and 78,464 years of exposure included in the male service-based withdrawal investigation for members with less than 8 years of service. Currently, the threshold for the service based table is 8 years. The proposed rates recommend the same threshold and slightly higher rates of withdrawal.

### MALE SERVICE-BASED WITHDRAWALS

Service Index	Withdrawals	Exposure	Actual Rates	Sample Rates		Expected Withdrawals	
				Present	Proposed	Present	Proposed
1	1,972	7,822	0.2521	0.2400	0.2450	1,878	1,917
2	2,677	13,136	0.2038	0.1800	0.1900	2,365	2,497
3	1,784	11,191	0.1594	0.1300	0.1450	1,455	1,623
4	1,369	10,697	0.1280	0.1050	0.1200	1,123	1,284
5	1,077	10,616	0.1015	0.0850	0.0950	902	1,009
6	832	9,795	0.0849	0.0720	0.0800	705	784
7	636	8,833	0.0720	0.0600	0.0700	530	618
8	478	6,374	0.0750	0.0550	0.0650	350	413
9	304	4,572	0.0665	0.0000	0.0000	-	-
10	277	4,408	0.0628	0.0000	0.0000	-	-
11	209	4,441	0.0471	0.0000	0.0000	-	-
12	219	4,513	0.0485	0.0000	0.0000	-	-
13	186	4,228	0.0440	0.0000	0.0000	-	-
14	152	3,827	0.0397	0.0000	0.0000	-	-
15	95	3,276	0.0290	0.0000	0.0000	-	-
16	96	2,900	0.0331	0.0000	0.0000	-	-
17	81	2,565	0.0316	0.0000	0.0000	-	-
18	70	2,296	0.0305	0.0000	0.0000	-	-
19	51	1,967	0.0259	0.0000	0.0000	-	-
20	51	1,777	0.0287	0.0000	0.0000	-	-
21	46	1,740	0.0264	0.0000	0.0000	-	-
22	45	1,900	0.0237	0.0000	0.0000	-	-
23	50	1,968	0.0254	0.0000	0.0000	-	-
24	50	1,858	0.0269	0.0000	0.0000	-	-
25	33	1,657	0.0199	0.0000	0.0000	-	-
26	27	1,415	0.0191	0.0000	0.0000	-	-
27	38	1,278	0.0297	0.0000	0.0000	-	-
28	17	1,130	0.0150	0.0000	0.0000	-	-
29	24	899	0.0267	0.0000	0.0000	-	-
30 & over	131	3,769	0.0348	0.0000	0.0000	-	-
Totals (Less Than or Equal to 8)	10,825	78,464	0.1380	0.1186	0.1293	9,308	10,145

## REGULAR MALES WITHDRAWAL EXPERIENCE

---

There were 1,736 withdrawals and 58,379 years of exposure included in the male age-based withdrawal investigation for members with 8 or more years of service. Age based withdrawal was found to be more highly correlated with the liability weighted rates and therefore the proposed rates were lowered to be closer to these rates.

### MALE AGE-BASED WITHDRAWALS WITH MORE THAN 8 YEARS OF SERVICE

Age	Withdrawals	Exposure	Actual Rates Weighted by		Sample Rates*		Expected Withdrawals	
			Population	Liability	Present	Proposed	Present	Proposed
25-29	39	603	0.0647	0.0520	0.0450	0.0490	26	27
30-34	194	4,434	0.0438	0.0330	0.0380	0.0360	165	159
35-39	270	7,650	0.0353	0.0272	0.0300	0.0290	232	223
40-44	349	10,898	0.0320	0.0232	0.0250	0.0240	273	262
45-49	361	14,743	0.0245	0.0169	0.0210	0.0200	314	299
50-54	523	20,051	0.0261	0.0192	0.0200	0.0190	403	383
Totals	1,736	58,379	0.0297	0.0204	0.0242	0.0232	1,413	1,353

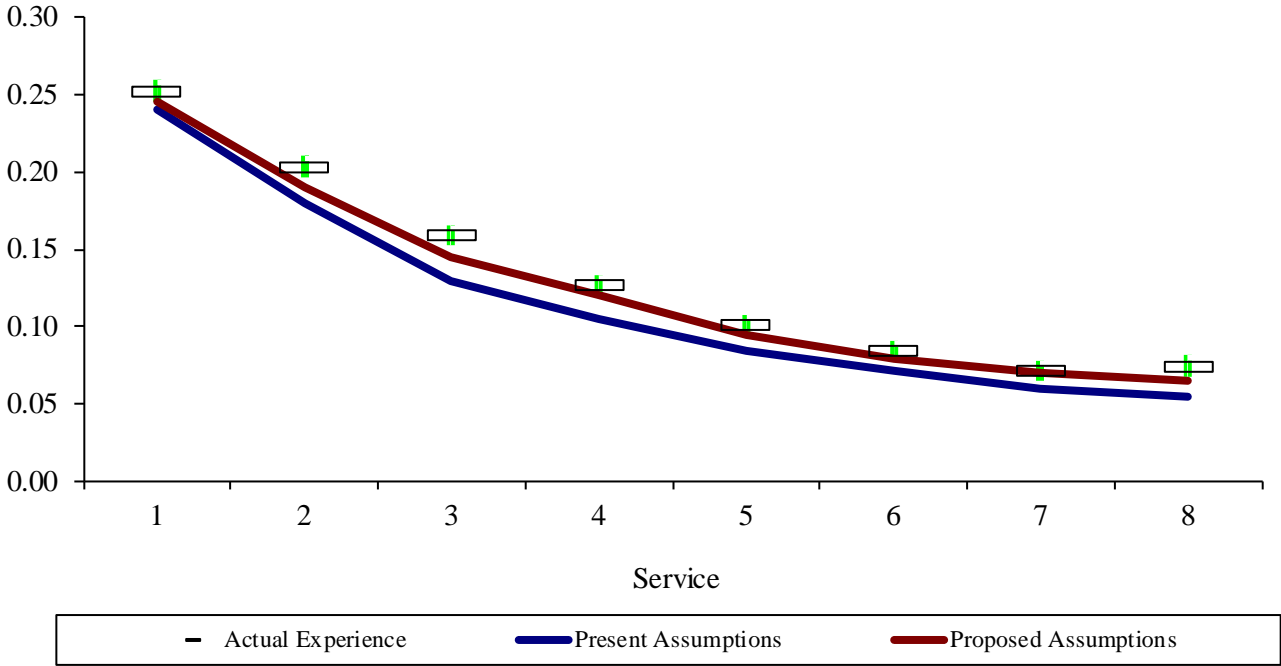
	<u>Actual</u>	<u>Liability</u>	<u>Proposed</u>
<b>Current</b>	0.0297	0.0204	0.0232
<b>Previous Investigation Results</b>	0.0278	0.0193	0.0241
<b>2005-2007</b>	0.0305	0.0217	0.0270
<b>2002-2004</b>	0.0308		0.0304

\* Sample rates are taken from midpoint of age group.

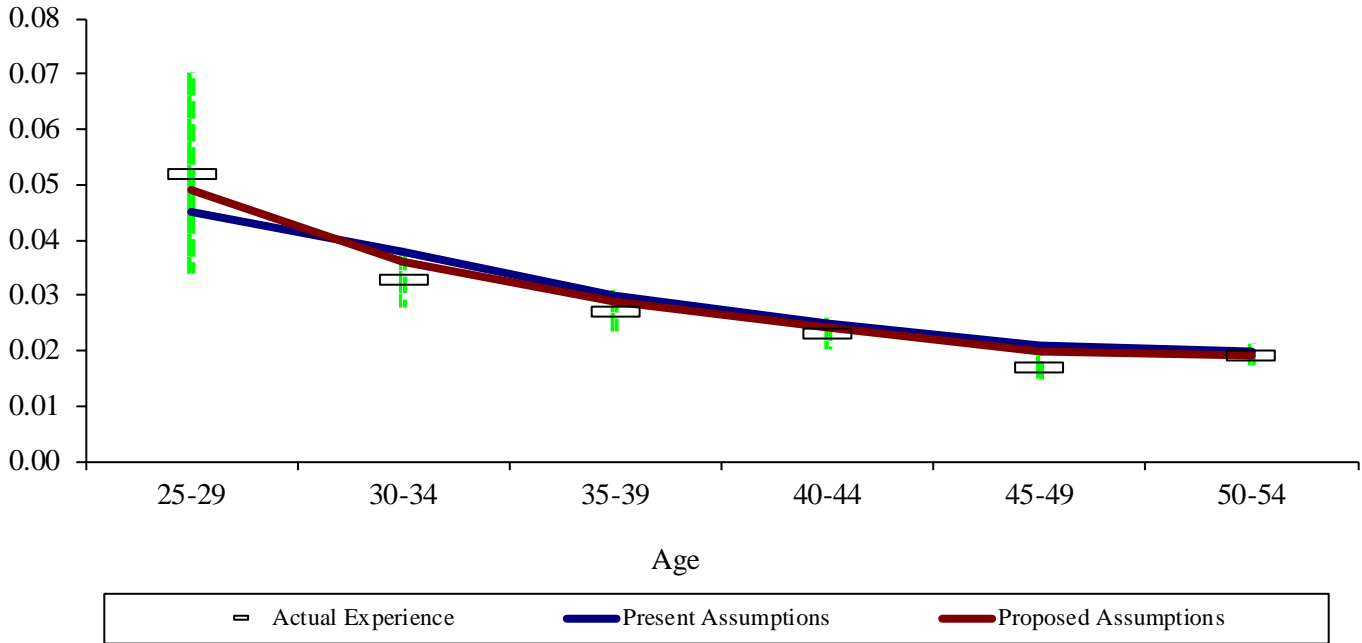


**REGULAR MALES WITHDRAWAL EXPERIENCE**

**MALE SERVICE-BASED WITHDRAWALS**



**MALE AGE-BASED WITHDRAWALS**



## REGULAR FEMALES WITHDRAWAL EXPERIENCE

There were 22,988 withdrawals and 146,842 years of exposure included in the female service-based withdrawal investigation for members with less than 8 years of service. Currently, the threshold for the service based table is 8 years. The proposed rates recommend the same threshold and slightly higher rates of withdrawal.

### FEMALE SERVICE-BASED WITHDRAWALS

Service Index	Withdrawals	Exposure	Actual Rates	Sample Rates		Expected Withdrawals	
				Present	Proposed	Present	Proposed
1	4,460	15,164	0.2941	0.2850	0.2900	4,322	4,398
2	5,272	22,539	0.2339	0.2100	0.2200	4,734	4,960
3	3,658	19,835	0.1844	0.1500	0.1700	2,976	3,373
4	2,884	20,028	0.1440	0.1200	0.1300	2,403	2,604
5	2,456	20,335	0.1208	0.1000	0.1100	2,034	2,237
6	1,897	19,326	0.0982	0.0830	0.0900	1,604	1,739
7	1,342	17,085	0.0785	0.0680	0.0750	1,162	1,281
8	1,019	12,530	0.0813	0.0620	0.0700	777	877
9	724	9,303	0.0778	0.0000	0.0000	-	-
10	603	8,772	0.0687	0.0000	0.0000	-	-
11	576	8,924	0.0645	0.0000	0.0000	-	-
12	502	8,861	0.0567	0.0000	0.0000	-	-
13	458	8,129	0.0563	0.0000	0.0000	-	-
14	352	6,876	0.0512	0.0000	0.0000	-	-
15	298	5,685	0.0524	0.0000	0.0000	-	-
16	203	4,690	0.0433	0.0000	0.0000	-	-
17	183	3,911	0.0468	0.0000	0.0000	-	-
18	145	3,214	0.0451	0.0000	0.0000	-	-
19	91	2,564	0.0355	0.0000	0.0000	-	-
20	92	2,180	0.0422	0.0000	0.0000	-	-
21	63	1,921	0.0328	0.0000	0.0000	-	-
22	70	1,810	0.0387	0.0000	0.0000	-	-
23	62	1,605	0.0386	0.0000	0.0000	-	-
24	37	1,367	0.0271	0.0000	0.0000	-	-
25	46	1,113	0.0413	0.0000	0.0000	-	-
26	37	938	0.0394	0.0000	0.0000	-	-
27	30	792	0.0379	0.0000	0.0000	-	-
28	21	650	0.0323	0.0000	0.0000	-	-
29	16	524	0.0305	0.0000	0.0000	-	-
30 & over	84	2,050	0.0410	0.0000	0.0000	-	-
Totals (Less Than or Equal to 8)	22,988	146,842	0.1565	0.1363	0.1462	20,012	21,469

## REGULAR FEMALES WITHDRAWAL EXPERIENCE

---

There were 3,780 withdrawals and 85,877 years of exposure included in the female age-based withdrawal investigation for members with more than 8 years of service. Age based withdrawal was found to be highly correlated with the liability weighted rates and therefore the proposed rates were increased to be closer to those rates.

### FEMALE AGE-BASED WITHDRAWALS WITH MORE THAN 8 YEARS OF SERVICE

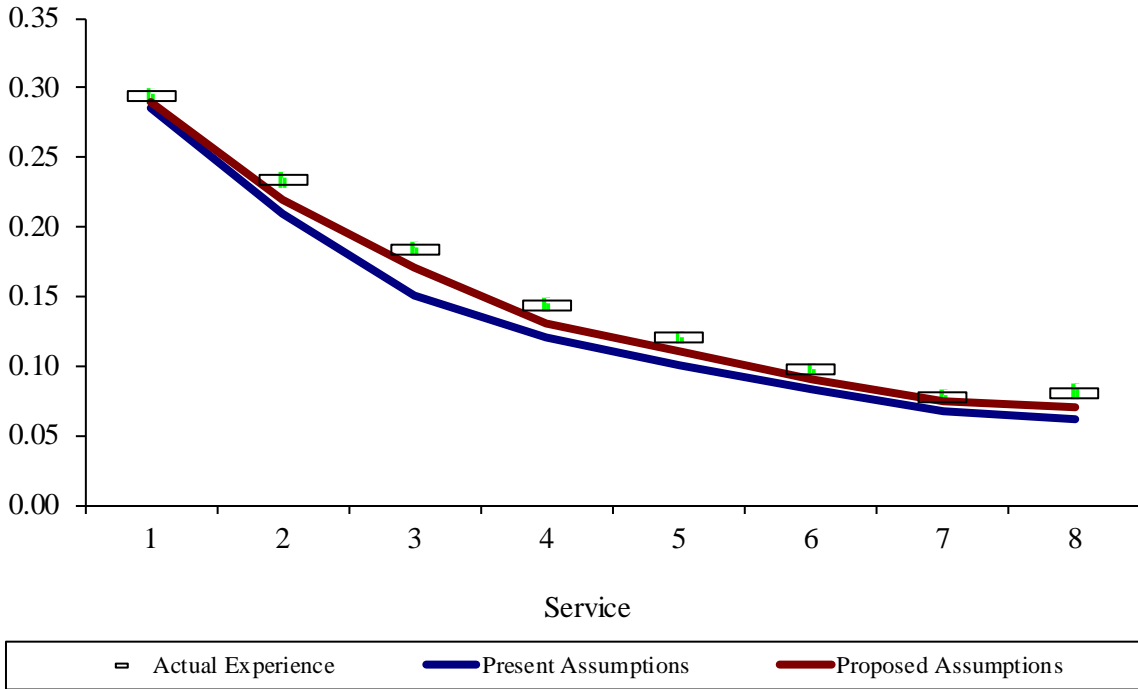
Age	Withdrawals	Exposure	Actual Rates Weighted by		Sample Rates*		Expected Withdrawals	
			Population	Liability	Present	Proposed	Present	Proposed
25-29	34	492	0.0691	0.0564	0.0680	0.0620	32	30
30-34	319	4,299	0.0742	0.0621	0.0570	0.0600	239	248
35-39	438	7,837	0.0559	0.0453	0.0440	0.0450	346	355
40-44	630	13,025	0.0484	0.0360	0.0350	0.0350	458	463
45-49	987	23,140	0.0427	0.0338	0.0300	0.0320	689	727
50-54	1,372	37,084	0.0370	0.0272	0.0250	0.0260	947	988
Totals	3,780	85,877	0.0440	0.0325	0.0316	0.0327	2,711	2,811

	<u>Actual</u>	<u>Liability</u>	<u>Proposed</u>
<b>Current</b>	0.0440	0.0325	0.0327
<b>Previous Investigation Results</b>	0.0372	0.0262	0.0315
<b>2005-2007</b>	0.0418	0.0304	0.0361
<b>2002-2004</b>	0.0415		0.0415

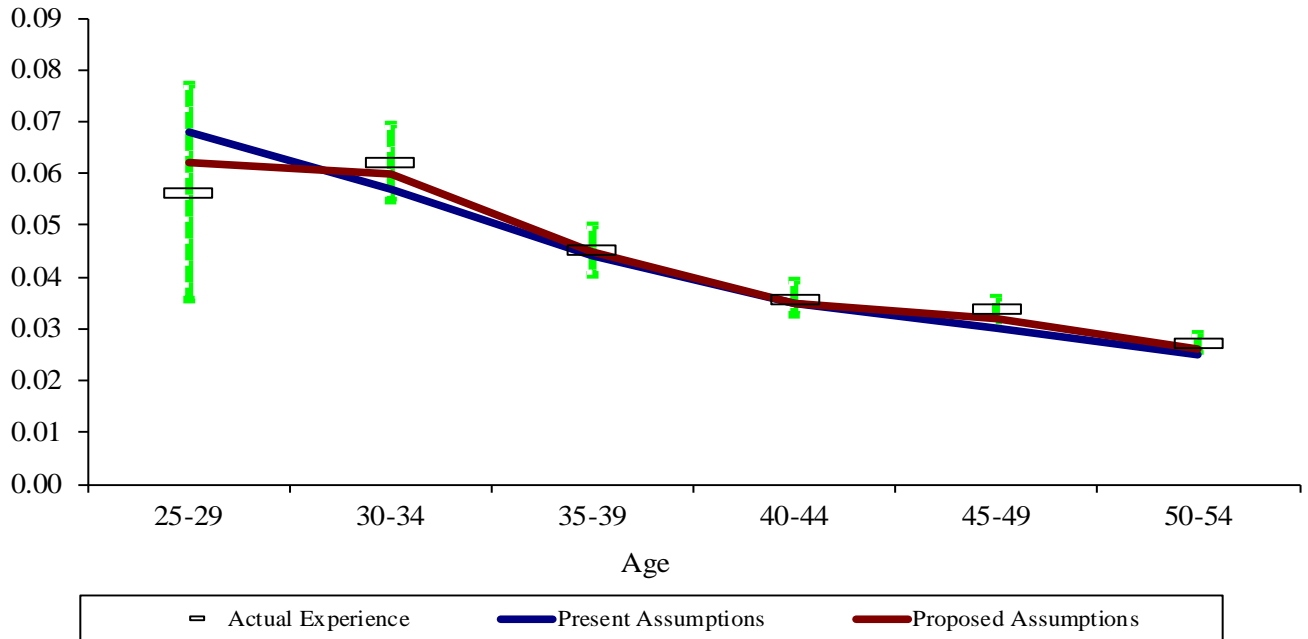
\* Sample rates are taken from midpoint of age group.

# REGULAR FEMALES WITHDRAWAL EXPERIENCE

## FEMALE SERVICE-BASED WITHDRAWALS



## FEMALE AGE-BASED WITHDRAWALS



## SLEP WITHDRAWAL EXPERIENCE

There were 216 withdrawals and 3,720 years of exposure included in the service based withdrawal investigation for SLEP members with less than 7 years of service. Currently, the threshold for the service based table is 7 years. The proposed rates recommend the same threshold and slightly lower rates of withdrawal.

### SLEP SERVICE-BASED WITHDRAWALS

Service Index	Withdrawals	Exposure	Actual Rates	Sample Rates		Expected Withdrawals	
				Present	Proposed	Present	Proposed
1	45	223	0.2018	0.1600	0.1800	35.7	40.1
2	43	463	0.0929	0.1000	0.1000	46.3	46.3
3	21	505	0.0416	0.0770	0.0650	38.9	32.8
4	41	606	0.0677	0.0680	0.0600	41.2	36.4
5	29	662	0.0438	0.0500	0.0470	33.1	31.1
6	18	654	0.0275	0.0420	0.0350	27.5	22.9
7	19	607	0.0313	0.0350	0.0330	21.2	20.0
8	14	583	0.0240	0.0000	0.0000	-	-
9	13	546	0.0238	0.0000	0.0000	-	-
10	13	547	0.0238	0.0000	0.0000	-	-
11	7	522	0.0134	0.0000	0.0000	-	-
12	11	506	0.0217	0.0000	0.0000	-	-
13	11	493	0.0223	0.0000	0.0000	-	-
14	10	471	0.0212	0.0000	0.0000	-	-
15	6	489	0.0123	0.0000	0.0000	-	-
16	6	462	0.0130	0.0000	0.0000	-	-
17	3	471	0.0064	0.0000	0.0000	-	-
18	2	384	0.0052	0.0000	0.0000	-	-
19	2	337	0.0059	0.0000	0.0000	-	-
20	3	259	0.0116	0.0000	0.0000	-	-
21	1	228	0.0044	0.0000	0.0000	-	-
22	3	242	0.0124	0.0000	0.0000	-	-
23	4	238	0.0168	0.0000	0.0000	-	-
24	1	204	0.0049	0.0000	0.0000	-	-
25	2	165	0.0121	0.0000	0.0000	-	-
26	1	109	0.0092	0.0000	0.0000	-	-
27	2	64	0.0313	0.0000	0.0000	-	-
28	-	32	0.0000	0.0000	0.0000	-	-
29	-	19	0.0000	0.0000	0.0000	-	-
30 & over	4	20	0.2000	0.0000	0.0000	-	-
Totals (Less Than or Equal to 7)	216	3,720	0.0581	0.0656	0.0617	243.9	229.6

## SLEP WITHDRAWAL EXPERIENCE

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There were 116 withdrawals and 7,387 years of exposure included in the age based withdrawal investigation for SLEP members with more than 7 years of service. Age based withdrawal was found to be more highly correlated with the liability weighted rates and therefore the proposed rates were lowered to be closer to these rates.

### SLEP AGE-BASED WITHDRAWALS WITH MORE THAN 7 YEARS OF SERVICE

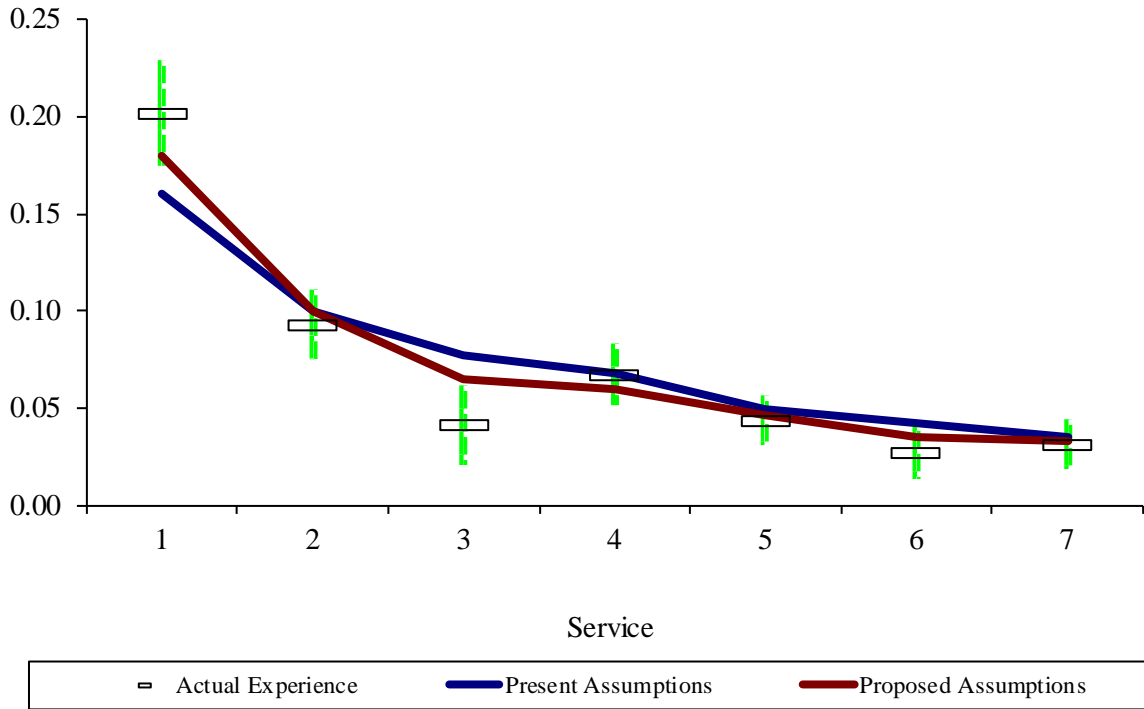
Age	Withdrawals	Exposure	Actual Rates Weighted by		Sample Rates*		Expected Withdrawals	
			Population	Liability	Present	Proposed	Present	Proposed
25-29	3	102	0.0294	0.0256	0.0400	0.0250	3.6	2.4
30-34	21	917	0.0229	0.0187	0.0260	0.0200	23.6	18.0
35-39	30	1,516	0.0198	0.0150	0.0170	0.0150	27.1	23.5
40-44	28	2,119	0.0132	0.0103	0.0170	0.0150	36.0	31.8
45-49	24	1,962	0.0122	0.0093	0.0170	0.0150	33.4	29.4
50-54	6	490	0.0122	0.0138	0.0170	0.0150	8.2	7.3
55-59	4	281	0.0142	0.0225	0.0140	0.0140	4.0	4.0
Totals	116	7,387	0.0157	0.0116	0.0184	0.0158	135.9	116.4

	<u>Actual</u>	<u>Liability</u>	<u>Proposed</u>
<b>Current</b>	0.0157	0.0116	0.0158
<b>Previous Investigation Results</b>	0.0179	0.0130	0.0183
<b>2005-2007</b>	0.0203	0.0160	0.0198
<b>2002-2004</b>	0.0257		0.0215

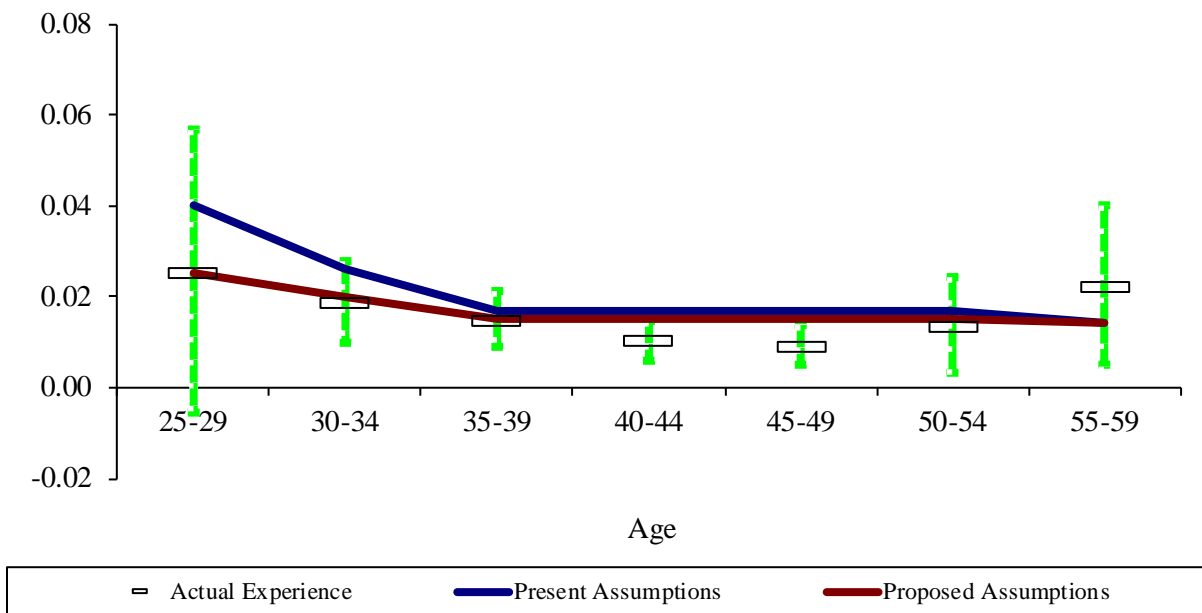
\* Sample rates are taken from midpoint of age group.

# SLEP WITHDRAWAL EXPERIENCE

## SLEP SERVICE-BASED WITHDRAWALS



## SLEP AGE-BASED WITHDRAWALS



## ECO MALES WITHDRAWAL EXPERIENCE

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There were 24 withdrawals and 257 years of exposure included in the male service based withdrawal investigation for ECO members with less than 8 years of service. Currently, the threshold for the service based table is 8 years. The proposed rates recommend the same threshold and the same rates of withdrawal.

### MALE SERVICE-BASED WITHDRAWALS

Service Index	Withdrawals	Exposure	Actual Rates	Sample Rates		Expected Withdrawals	
				Present	Proposed	Present	Proposed
1	-	16	0.0000	0.2000	0.2000	3.2	3.2
2	-	26	0.0000	0.1200	0.1200	3.1	3.1
3	3	55	0.0545	0.1000	0.1000	5.5	5.5
4	3	42	0.0714	0.0900	0.0900	3.8	3.8
5	3	43	0.0698	0.0800	0.0800	3.4	3.4
6	8	22	0.3636	0.0700	0.0700	1.5	1.5
7	3	39	0.0769	0.0600	0.0600	2.3	2.3
8	4	14	0.2857	0.0550	0.0550	0.8	0.8
9	5	17	0.2941	0.0000	0.0000	-	-
10	6	11	0.5455	0.0000	0.0000	-	-
11	5	13	0.3846	0.0000	0.0000	-	-
12	2	11	0.1818	0.0000	0.0000	-	-
13	1	13	0.0769	0.0000	0.0000	-	-
14	-	11	0.0000	0.0000	0.0000	-	-
15	3	9	0.3333	0.0000	0.0000	-	-
16	1	3	0.3333	0.0000	0.0000	-	-
17	-	8	0.0000	0.0000	0.0000	-	-
18	2	5	0.4000	0.0000	0.0000	-	-
19	1	12	0.0833	0.0000	0.0000	-	-
20	1	9	0.1111	0.0000	0.0000	-	-
21	2	9	0.2222	0.0000	0.0000	-	-
22	2	3	0.6667	0.0000	0.0000	-	-
23	1	4	0.2500	0.0000	0.0000	-	-
24	1	4	0.2500	0.0000	0.0000	-	-
25	1	2	0.5000	0.0000	0.0000	-	-
26	1	1	1.0000	0.0000	0.0000	-	-
27	-	2	0.0000	0.0000	0.0000	-	-
28	-	4	0.0000	0.0000	0.0000	-	-
29	-	6	0.0000	0.0000	0.0000	-	-
30 & over	5	18	0.2778	0.0000	0.0000	-	-
Totals (Less Than or Equal to 8)	24	257	0.0934	0.0918	0.0918	23.6	23.6



## ECO MALES WITHDRAWAL EXPERIENCE

---

There were 18 withdrawals and 175 years of exposure included in the male age based withdrawal investigation for ECO members with more than 8 years of service. Age based withdrawal was found to be more highly correlated with the liability weighted rates and therefore the proposed rates were increased to be closer to these rates.

### MALE AGE-BASED WITHDRAWALS WITH MORE THAN 8 YEARS OF SERVICE

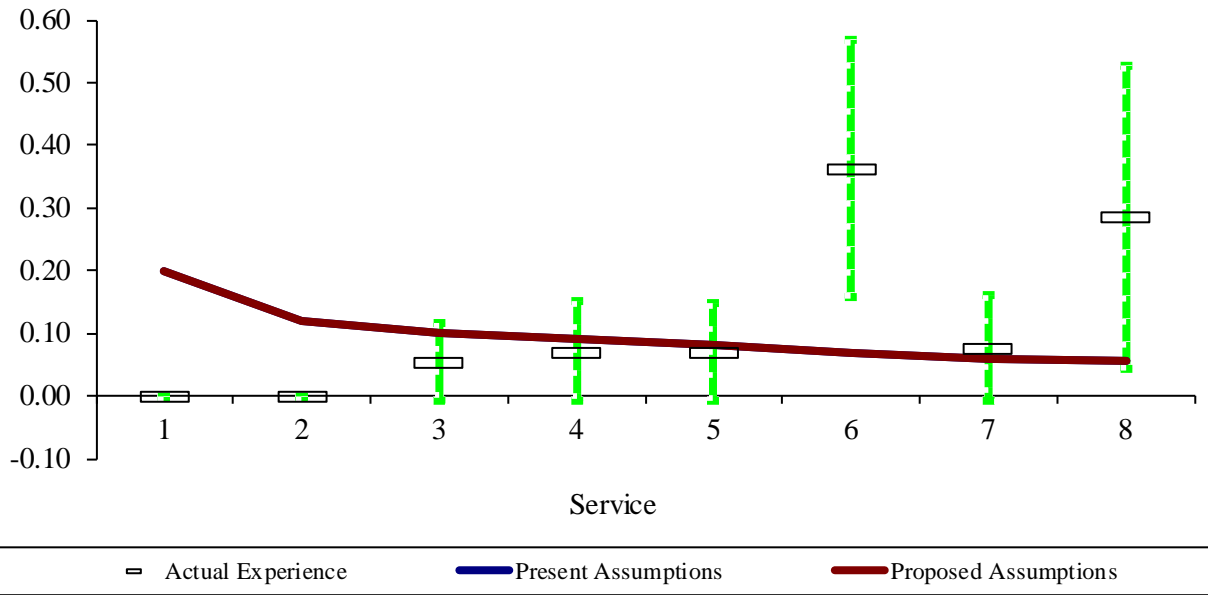
Age	Withdrawals	Exposure	Actual Rates Weighted by		Sample Rates*		Expected Withdrawals	
			Population	Liability	Present	Proposed	Present	Proposed
25-29	-	-	0.0000	0.0000	0.0550	0.0600	-	-
30-34	-	-	0.0000	0.0000	0.0550	0.0600	-	-
35-39	-	13	0.0000	0.0000	0.0550	0.0600	0.7	0.8
40-44	6	22	0.2727	0.2541	0.0550	0.0600	1.2	1.3
45-49	3	48	0.0625	0.0109	0.0550	0.0600	2.6	2.9
50-54	9	92	0.0978	0.0681	0.0550	0.0600	5.1	5.5
Totals	18	175	0.1029	0.0666	0.0550	0.0600	9.6	10.5

	<u>Actual</u>	<u>Liability</u>	<u>Proposed</u>
<b>Current</b>	0.1029	0.0666	0.0600
<b>Previous Investigation Results</b>	0.0846	0.0818	0.0550
<b>2005-2007</b>	0.0590	0.0404	0.0450
<b>2002-2004</b>	0.0833		0.0500

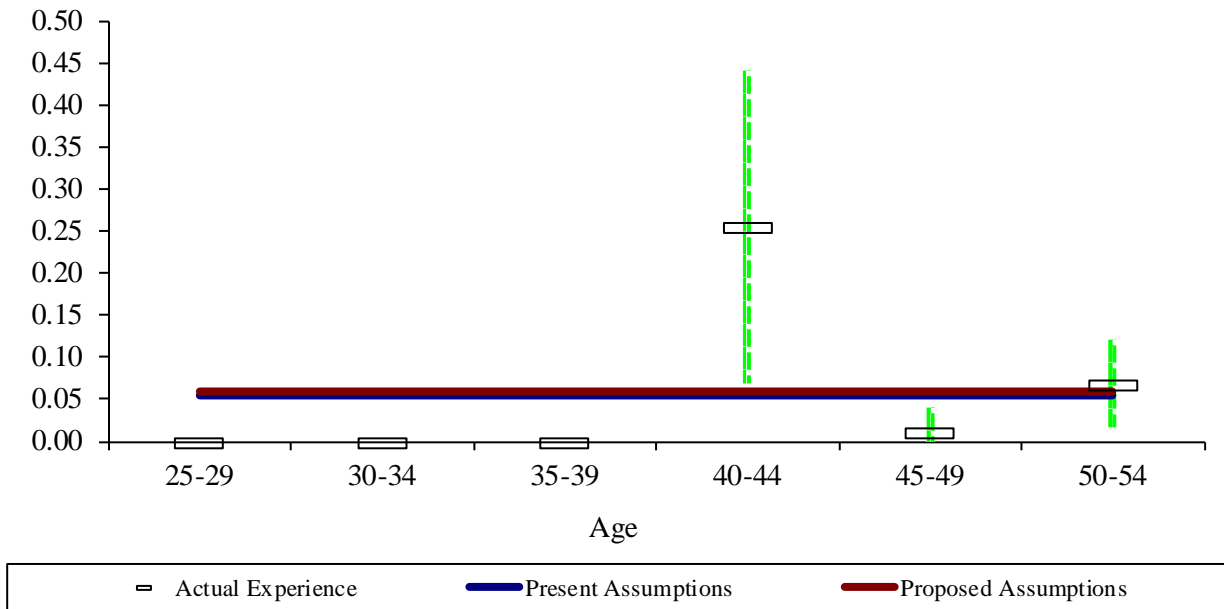
\* Sample rates are taken from midpoint of age group.

# ECO MALES WITHDRAWAL EXPERIENCE

## MALE SERVICE-BASED WITHDRAWALS



## MALE AGE-BASED WITHDRAWALS



## ECO FEMALES WITHDRAWAL EXPERIENCE

There were 11 withdrawals and 100 years of exposure included in the female service based withdrawal investigation for ECO members with less than 8 years of service. Currently, the threshold for the service based table is 8 years. The proposed rates recommend the same threshold and the same rates of withdrawal.

### FEMALE SERVICE-BASED WITHDRAWALS

Service Index	Withdrawals	Exposure	Actual Rates	Sample Rates		Expected Withdrawals	
				Present	Proposed	Present	Proposed
1	-	3	0.0000	0.1500	0.1500	0.5	0.5
2	-	11	0.0000	0.1000	0.1000	1.1	1.1
3	2	21	0.0952	0.0800	0.0800	1.7	1.7
4	4	19	0.2105	0.0700	0.0700	1.3	1.3
5	1	18	0.0556	0.0600	0.0600	1.1	1.1
6	2	10	0.2000	0.0500	0.0500	0.5	0.5
7	1	11	0.0909	0.0400	0.0400	0.4	0.4
8	1	7	0.1429	0.0350	0.0350	0.2	0.2
9	2	12	0.1667	0.0000	0.0000	-	-
10	2	9	0.2222	0.0000	0.0000	-	-
11	-	8	0.0000	0.0000	0.0000	-	-
12	2	9	0.2222	0.0000	0.0000	-	-
13	-	4	0.0000	0.0000	0.0000	-	-
14	3	5	0.6000	0.0000	0.0000	-	-
15	1	7	0.1429	0.0000	0.0000	-	-
16	1	4	0.2500	0.0000	0.0000	-	-
17	-	4	0.0000	0.0000	0.0000	-	-
18	1	2	0.5000	0.0000	0.0000	-	-
19	-	2	0.0000	0.0000	0.0000	-	-
20	-	1	0.0000	0.0000	0.0000	-	-
21	-	1	0.0000	0.0000	0.0000	-	-
22	1	1	1.0000	0.0000	0.0000	-	-
23	1	2	0.5000	0.0000	0.0000	-	-
24	-	2	0.0000	0.0000	0.0000	-	-
25	-	2	0.0000	0.0000	0.0000	-	-
26	-	2	0.0000	0.0000	0.0000	-	-
27	-	2	0.0000	0.0000	0.0000	-	-
28	-	3	0.0000	0.0000	0.0000	-	-
29	-	4	0.0000	0.0000	0.0000	-	-
30 & over	-	11	0.0000	0.0000	0.0000	-	-
Totals (Less Than or Equal to 8)	11	100	0.1100	0.0680	0.0680	6.8	6.8

## ECO FEMALES WITHDRAWAL EXPERIENCE

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There were 7 withdrawals and 97 years of exposure included in the female age based withdrawal investigation for ECO members with more than 8 years of service. Age based withdrawal was found to be more highly correlated with the liability weighted rates and therefore the proposed rates were decreased to be closer to these rates.

### FEMALE AGE-BASED WITHDRAWALS WITH MORE THAN 8 YEARS OF SERVICE

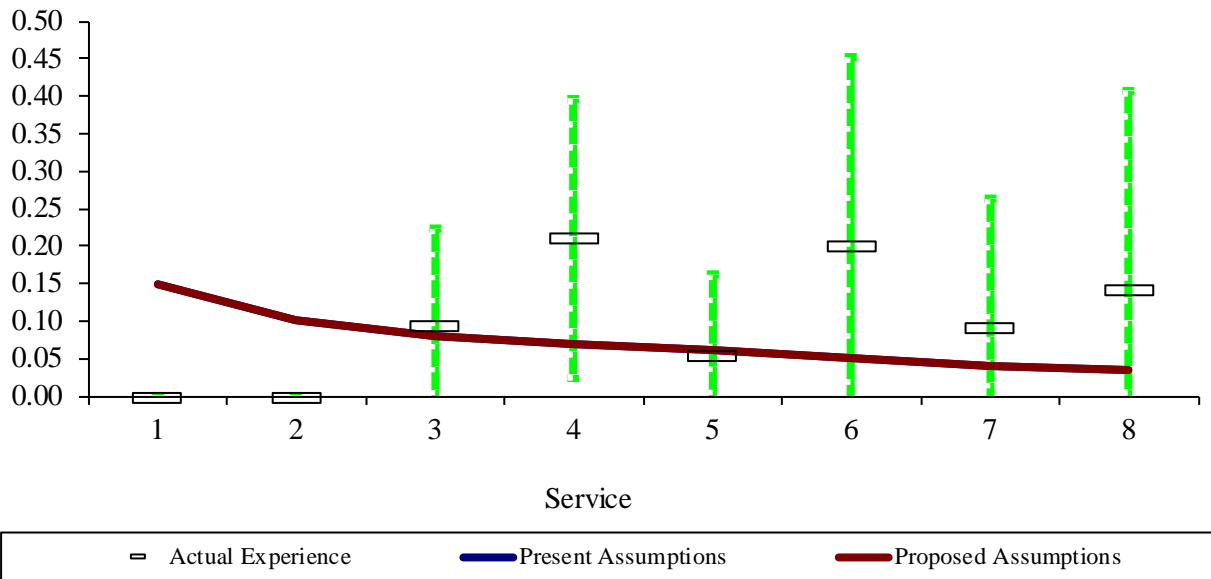
Age	Withdrawals	Exposure	Actual Rates Weighted by		Sample Rates*		Expected Withdrawals	
			Population	Liability	Present	Proposed	Present	Proposed
25-29	-	-	0.0000	0.0000	0.0350	0.0320	-	-
30-34	-	-	0.0000	0.0000	0.0350	0.0320	-	-
35-39	-	-	0.0000	0.0000	0.0350	0.0320	-	-
40-44	1	10	0.1000	0.1519	0.0350	0.0320	0.4	0.3
45-49	2	29	0.0690	0.0367	0.0350	0.0320	1.0	0.9
50-54	4	58	0.0690	0.0149	0.0350	0.0320	2.0	1.9
Totals	7	97	0.0722	0.0289	0.0350	0.0320	3.4	3.1

	<u>Actual</u>	<u>Liability</u>	<u>Proposed</u>
<b>Current</b>	0.0722	0.0289	0.0320
<b>Previous Investigation Results</b>	0.0544	0.0494	0.0350
<b>2005-2007</b>	0.0263	0.0162	0.0180
<b>2002-2004</b>	0.0198		0.0200

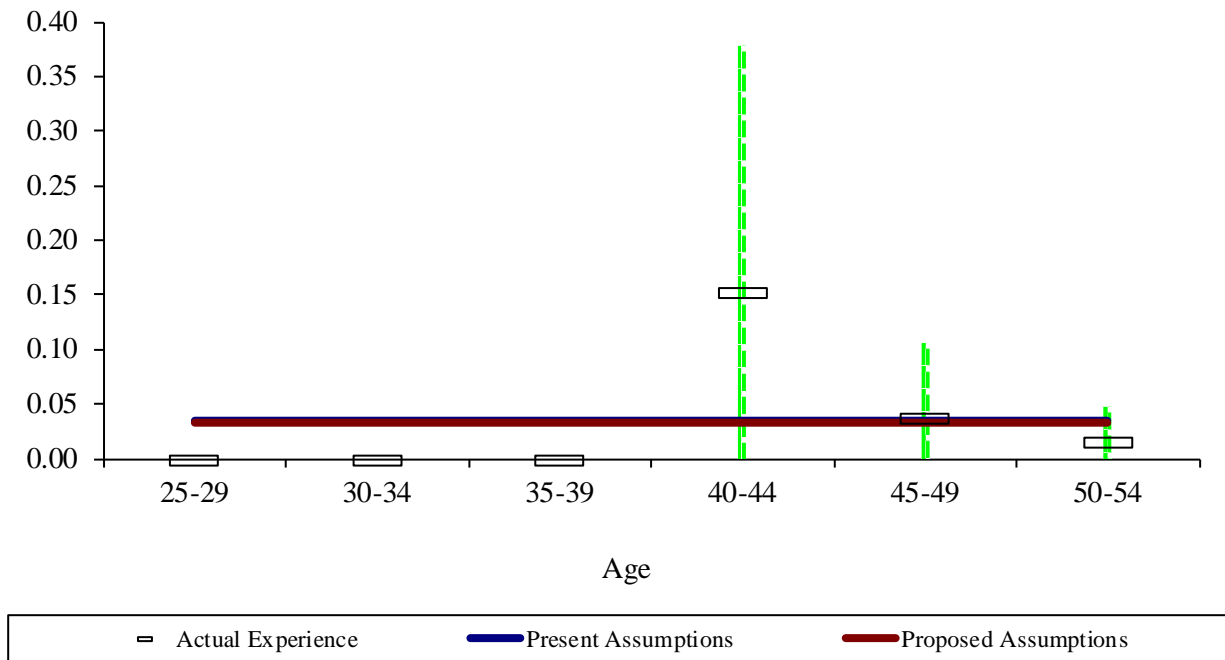
\* Sample rates are taken from midpoint of age group.

# ECO FEMALES WITHDRAWAL EXPERIENCE

## FEMALE SERVICE-BASED WITHDRAWALS



## FEMALE AGE-BASED WITHDRAWALS



## ECO-SLEP WITHDRAWAL EXPERIENCE

There were 0 withdrawals and 19 years of exposure included in the service based withdrawal investigation for ECO-SLEP members with less than 7 years of service. Exposure for this group is very limited.

### SERVICE-BASED WITHDRAWALS

Service Index	Withdrawals	Exposure	Actual Rates	Sample Rates		Expected Withdrawals	
				Present	Proposed	Present	Proposed
1	-	2	0.0000	0.1600	0.1800	0.3	0.4
2	-	5	0.0000	0.1000	0.1000	0.5	0.5
3	-	5	0.0000	0.0800	0.0650	0.4	0.3
4	-	1	0.0000	0.0600	0.0600	0.1	0.1
5	-	2	0.0000	0.0500	0.0470	0.1	0.1
6	-	2	0.0000	0.0450	0.0350	0.1	0.1
7	-	2	0.0000	0.0400	0.0330	0.1	0.1
8	-	1	0.0000	0.0000	0.0000	-	-
9	-	3	0.0000	0.0000	0.0000	-	-
10	-	3	0.0000	0.0000	0.0000	-	-
11	1	3	0.3333	0.0000	0.0000	-	-
12	-	1	0.0000	0.0000	0.0000	-	-
13	-	1	0.0000	0.0000	0.0000	-	-
14	-	1	0.0000	0.0000	0.0000	-	-
15	-	-	0.0000	0.0000	0.0000	-	-
16	-	-	0.0000	0.0000	0.0000	-	-
17	-	1	0.0000	0.0000	0.0000	-	-
18	-	1	0.0000	0.0000	0.0000	-	-
19	-	1	0.0000	0.0000	0.0000	-	-
20	-	-	0.0000	0.0000	0.0000	-	-
21	-	-	0.0000	0.0000	0.0000	-	-
22	-	1	0.0000	0.0000	0.0000	-	-
23	-	1	0.0000	0.0000	0.0000	-	-
24	-	-	0.0000	0.0000	0.0000	-	-
25	-	-	0.0000	0.0000	0.0000	-	-
26	-	-	0.0000	0.0000	0.0000	-	-
27	-	-	0.0000	0.0000	0.0000	-	-
28	-	-	0.0000	0.0000	0.0000	-	-
29	-	-	0.0000	0.0000	0.0000	-	-
30 & over	1	-	0.0000	0.0000	0.0000	-	-
Totals (Less Than or Equal to 7)	-	19	0.0000	0.0842	0.0842	1.6	1.6

## ECO SLEP WITHDRAWAL EXPERIENCE

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There was 0 withdrawal and 18 years of exposure included in the age based withdrawal investigation for members with more than 7 years of service. Exposure is very limited for this group.

### ECO SLEP AGE-BASED WITHDRAWALS WITH MORE THAN 7 YEARS OF SERVICE

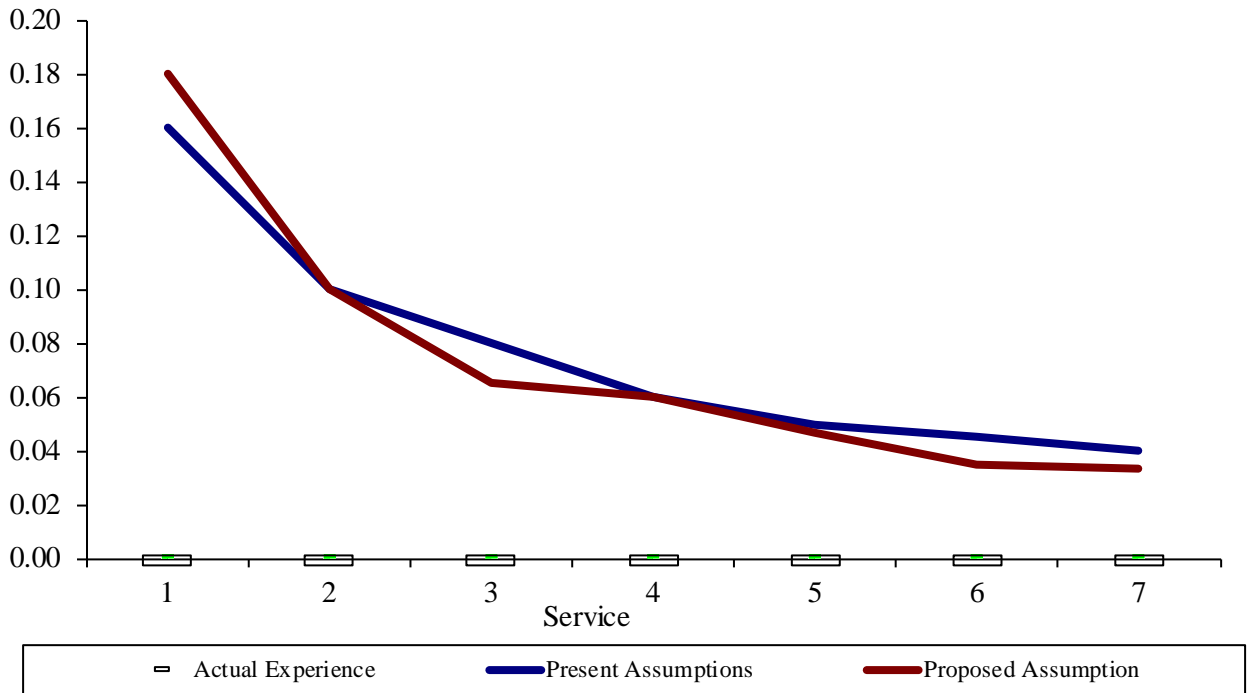
Age	Withdrawals	Exposure	Actual Rates Weighted by		Sample Rates*		Expected Withdrawals	
			Population	Liability	Present	Proposed	Present	Proposed
25-29	-	-	0.0000	0.0000	0.0150	0.0250	-	-
30-34	-	-	0.0000	0.0000	0.0150	0.0200	-	-
35-39	-	-	0.0000	0.0000	0.0150	0.0150	-	-
40-44	-	1	0.0000	0.0000	0.0150	0.0150	-	-
45-49	-	12	0.0000	0.0000	0.0150	0.0150	0.2	0.2
50-54	-	5	0.0000	0.0000	0.0150	0.0150	0.1	0.1
Totals	-	18	0.0000	0.0000	0.0150	0.0150	0.3	0.3

	<u>Actual</u>	<u>Liability</u>	<u>Proposed</u>
<b>Current</b>	0.0000	0.0000	0.0150
<b>Previous Investigation Results</b>	0.0417	0.0620	0.0192
<b>2005-2007</b>	0.0000	0.0000	0.0150
<b>2002-2004</b>	0.0755		0.0000

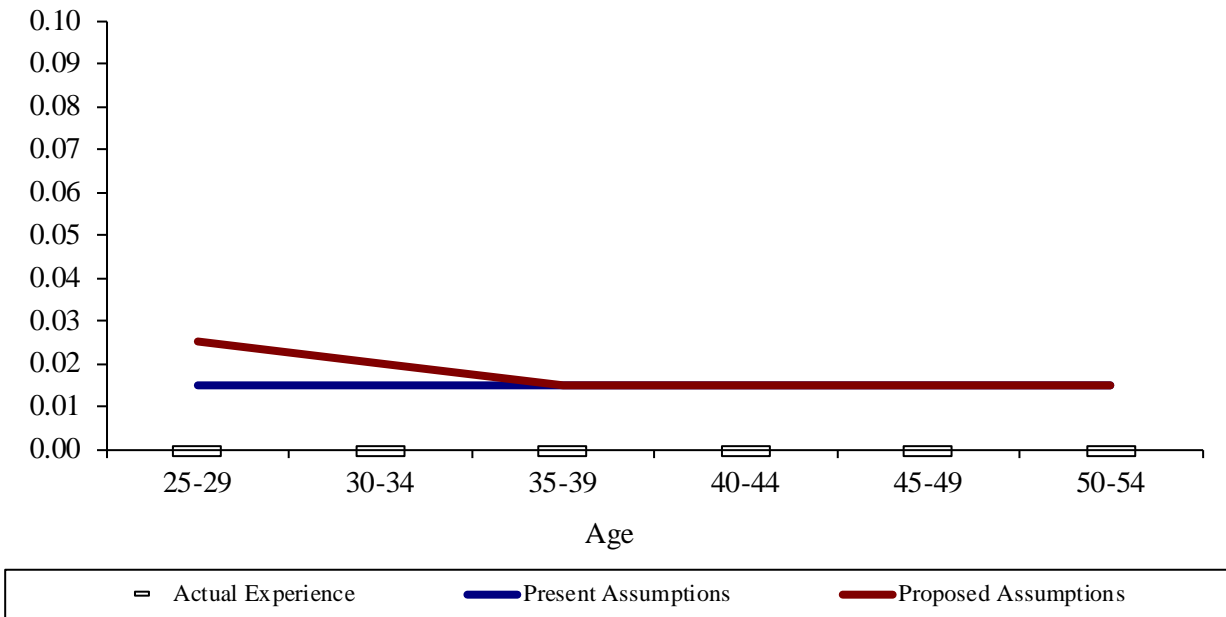
\* Sample rates are taken from midpoint of age group.

# ECO SLEP WITHDRAWAL EXPERIENCE

## ECO SLEP SERVICE-BASED WITHDRAWALS



## ECO SLEP AGE-BASED WITHDRAWALS





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## DISABILITY EXPERIENCE

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## REGULAR MALES - DISABILITY RETIREMENT EXPERIENCE

There were 504 temporary disability benefit claims reported for the 3-year period and 177,902 years of exposure. However, there were approximately 67 permanent disabilities. The proposed rates recommend lower rates of permanent disability.

Age	Temporary Disabilities	Exposure	Actual Rates		Permanent Disabilities				
			Weighted by		Sample Rates*		Actual	Expected	
			Population	Liability	Old	New		Present	Proposed
Under 20	-	127	0.0000	0.0000	0.0001	0.0000		-	-
20-24	-	4,761	0.0000	0.0000	0.0001	0.0000		-	-
25-29	7	13,597	0.0005	0.0010	0.0001	0.0000		1	1
30-34	12	15,486	0.0008	0.0010	0.0001	0.0001		2	1
35-39	26	15,224	0.0017	0.0017	0.0002	0.0002		3	2
40-44	28	18,221	0.0015	0.0019	0.0003	0.0003		6	5
45-49	54	22,244	0.0024	0.0026	0.0005	0.0004		12	9
50-54	134	28,177	0.0048	0.0050	0.0008	0.0006		24	18
55-59	111	26,955	0.0041	0.0036	0.0013	0.0009		33	25
60-64	103	19,088	0.0054	0.0042	0.0015	0.0011		28	21
65-69	20	8,420	0.0024	0.0017	0.0015	0.0011		12	9
70-74	5	3,655	0.0014	0.0006	0.0011	0.0008		4	3
75 & over	4	1,947	0.0021	0.0030	0.0008	0.0006		2	1
Totals	504	177,902	0.0028	0.0034	0.0007	0.0005	67	127	95

	<u>Actual</u>	<u>Liability</u>	<u>Proposed</u>
<b>Current</b>	0.0004	0.0004	0.0005
<b>Previous Investigation Results</b>	0.0005	0.0005	0.0007
<b>2005-2007</b>	0.0005	0.0005	0.0009
<b>2002-2004</b>	0.0005		0.0012

\* Sample rates are taken from midpoint of age group.

Approximate techniques were used to develop the actual number of permanent cases. These techniques did not lend themselves to allocating the cases within age groups.

## REGULAR FEMALES - DISABILITY RETIREMENT EXPERIENCE

There were 639 temporary disability benefit claims reported for the 3-year period and 316,452 years of exposure. However, there were approximately 64 permanent disabilities. The proposed rates recommend lower rates of permanent disability.

Age	Temporary Disabilities	Exposure	Actual Rates		Permanent Disabilities				
			Weighted by		Sample Rates*		Actual	Expected	
			Population	Liability	Old	New		Present	Proposed
Under 20	-	206	0.0000	0.0000	0.0000	0.0000		-	-
20-24	1	6,454	0.0002	0.0000	0.0000	0.0000		-	-
25-29	8	18,429	0.0004	0.0006	0.0000	0.0000		1	-
30-34	21	20,085	0.0010	0.0010	0.0001	0.0000		1	1
35-39	32	22,999	0.0014	0.0012	0.0001	0.0001		2	2
40-44	43	33,900	0.0013	0.0014	0.0002	0.0001		6	4
45-49	88	47,351	0.0019	0.0021	0.0002	0.0002		12	9
50-54	169	59,065	0.0029	0.0030	0.0004	0.0003		25	18
55-59	143	54,295	0.0026	0.0018	0.0006	0.0004		35	25
60-64	95	35,370	0.0027	0.0020	0.0011	0.0008		37	27
65-69	31	12,889	0.0024	0.0014	0.0011	0.0008		14	10
70-74	6	3,845	0.0016	0.0005	0.0008	0.0006		3	2
75 & over	2	1,564	0.0013	0.0007	0.0006	0.0004		1	1
Totals	639	316,452	0.0020	0.0020	0.0004	0.0003	64	137	99

	<u>Actual</u>	<u>Liability</u>	<u>Proposed</u>
<b>Current</b>	0.0002	0.0002	0.0003
<b>Previous Investigation Results</b>	0.0003	0.0003	0.0004
<b>2005-2007</b>	0.0003	0.0003	0.0005
<b>2002-2004</b>	0.0003		0.0006

\* Sample rates are taken from midpoint of age group.

Approximate techniques were used to develop the actual number of permanent cases. These techniques did not lend themselves to allocating the cases within age groups.

## SLEP MALES - DISABILITY RETIREMENT EXPERIENCE

There were 26 temporary disability benefit claims reported for the 3-year period and 10,819 years of exposure. However, there were three permanent disabilities. The proposed rates recommend lower rates of permanent disability.

Age	Temporary Disabilities	Exposure	Actual Rates		Permanent Disabilities				
			Weighted by		Sample Rates*		Actual	Expected	
			Population	Liability	Old	New		Present	Proposed
Under 20	-	-	0.0000	0.0000	0.0000	0.0000		-	-
20-24	-	82	0.0000	0.0000	0.0001	0.0001		-	-
25-29	-	1,155	0.0000	0.0000	0.0002	0.0002		0.2	0.2
30-34	1	1,658	0.0006	0.0013	0.0003	0.0002		0.5	0.4
35-39	7	1,671	0.0042	0.0029	0.0004	0.0003		0.7	0.5
40-44	5	2,183	0.0023	0.0022	0.0006	0.0005		1.3	1.0
45-49	3	1,843	0.0016	0.0016	0.0008	0.0006		1.6	1.2
50-54	7	1,124	0.0062	0.0045	0.0013	0.0010		1.4	1.1
55-59	1	675	0.0015	0.0007	0.0018	0.0013		1.1	0.8
60-64	2	340	0.0059	0.0043	0.0012	0.0009		0.4	0.3
65-69	-	88	0.0000	0.0000	0.0008	0.0006		0.1	0.1
70-74	-	-	0.0000	0.0000	0.0004	0.0003		-	-
75 & over	-	-	0.0000	0.0000	0.0000	0.0000		-	-
Totals	26	10,819	0.0024	0.0024	0.0007	0.0005	3	7.3	5.6

	<u>Actual</u>	<u>Liability</u>	<u>Proposed</u>
<b>Current</b>	0.0003	0.0003	0.0005
<b>Previous Investigation Results</b>	0.0000	0.0000	0.0007
<b>2005-2007</b>	0.0000	0.0000	0.0008
<b>2002-2004</b>	0.0000		0.0011

\* Sample rates are taken from midpoint of age group.

Approximate techniques were used to develop the actual number of permanent cases. These techniques did not lend themselves to allocating the cases within age groups.

## SLEP FEMALES - DISABILITY RETIREMENT EXPERIENCE

There were 13 temporary disability benefit claims reported for the 3-year period and 1,870 years of exposure. However, there were no permanent disabilities. The proposed rates recommend no changes for this group.

Age	Temporary Disabilities	Exposure	Actual Rates		Permanent Disabilities				
			Weighted by		Sample Rates*		Actual	Expected	
			Population	Liability	Old	New		Present	Proposed
Under 20	-	-	0.0000	0.0000	0.0001	0.0001	-	-	
20-24	-	17	0.0000	0.0000	0.0002	0.0002	-	-	
25-29	1	193	0.0052	0.0020	0.0004	0.0004	0.1	0.1	
30-34	2	288	0.0069	0.0028	0.0005	0.0005	0.2	0.2	
35-39	2	335	0.0060	0.0081	0.0008	0.0008	0.3	0.3	
40-44	2	311	0.0064	0.0085	0.0011	0.0011	0.3	0.3	
45-49	2	314	0.0064	0.0106	0.0016	0.0016	0.5	0.5	
50-54	2	232	0.0086	0.0039	0.0024	0.0024	0.5	0.5	
55-59	2	103	0.0194	0.0253	0.0033	0.0033	0.3	0.3	
60-64	-	71	0.0000	0.0000	0.0023	0.0023	0.2	0.2	
65-69	-	6	0.0000	0.0000	0.0015	0.0015	-	-	
70-74	-	-	0.0000	0.0000	0.0008	0.0008	-	-	
75 & over	-	-	0.0000	0.0000	0.0000	0.0000	-	-	
Totals	13	1,870	0.0070	0.0084	0.0013	0.0013	-	2.4	2.4

	<u>Actual</u>	<u>Liability</u>	<u>Proposed</u>
<b>Current</b>	0.0000	0.0000	0.0013
<b>Previous Investigation Results</b>	0.0000	0.0000	0.0012
<b>2005-2007</b>	0.0000	0.0000	0.0017
<b>2002-2004</b>	0.0000		0.0013

\* Sample rates are taken from midpoint of age group.

Approximate techniques were used to develop the actual number of permanent cases. These techniques did not lend themselves to allocating the cases within age groups.

## ECO MALES - DISABILITY RETIREMENT EXPERIENCE

There were 0 temporary disability benefit claims reported for the 3-year period and 764 years of exposure. However, there were no permanent disabilities. The proposed rates recommend no changes for this group.

Age	Temporary Disabilities	Exposure	Actual Rates		Permanent Disabilities				
			Weighted by		Sample Rates*		Actual	Expected	
			Population	Liability	Old	New		Present	Proposed
Under 20	-	-	0.0000	0.0000	0.0001	0.0001	-	-	-
20-24	-	1	0.0000	0.0000	0.0001	0.0001	-	-	-
25-29	-	4	0.0000	0.0000	0.0001	0.0001	-	-	-
30-34	-	15	0.0000	0.0000	0.0002	0.0002	-	-	-
35-39	-	30	0.0000	0.0000	0.0003	0.0003	-	-	-
40-44	-	52	0.0000	0.0000	0.0005	0.0005	-	-	-
45-49	-	78	0.0000	0.0000	0.0007	0.0007	0.1	0.1	0.1
50-54	-	141	0.0000	0.0000	0.0011	0.0011	0.2	0.2	0.2
55-59	-	171	0.0000	0.0000	0.0017	0.0017	0.3	0.3	0.3
60-64	-	127	0.0000	0.0000	0.0020	0.0020	0.2	0.2	0.2
65-69	-	64	0.0000	0.0000	0.0020	0.0020	0.1	0.1	0.1
70-74	-	46	0.0000	0.0000	0.0015	0.0015	0.1	0.1	0.1
75 & over	-	35	0.0000	0.0000	0.0010	0.0010	-	-	-
Totals	-	764	0.0000	0.0000	0.0013	0.0013	-	1.0	1.0

	<u>Actual</u>	<u>Liability</u>	<u>Proposed</u>
<b>Current</b>	0.0000	0.0000	0.0013
<b>Previous Investigation Results</b>	0.0000	0.0000	0.0014
<b>2005-2007</b>	0.0000	0.0000	0.0020
<b>2002-2004</b>	0.0000		0.0027

\* Sample rates are taken from midpoint of age group.

Approximate techniques were used to develop the actual number of permanent cases. These techniques did not lend themselves to allocating the cases within age groups.

## ECO FEMALES - DISABILITY RETIREMENT EXPERIENCE

There were 0 disability benefit claims reported for the 3-year period and 366 years of exposure. The proposed rates recommend no changes for this group.

Age	Temporary Disabilities	Exposure	Actual Rates		Permanent Disabilities				
			Weighted by		Sample Rates*		Actual	Expected	
			Population	Liability	Old	New		Present	Proposed
Under 20	-	-	0.0000	0.0000	0.0001	0.0001		-	-
20-24	-	-	0.0000	0.0000	0.0001	0.0001		-	-
25-29	-	-	0.0000	0.0000	0.0001	0.0001		-	-
30-34	-	4	0.0000	0.0000	0.0001	0.0001		-	-
35-39	-	7	0.0000	0.0000	0.0002	0.0002		-	-
40-44	-	22	0.0000	0.0000	0.0003	0.0003		-	-
45-49	-	44	0.0000	0.0000	0.0004	0.0004		-	-
50-54	-	76	0.0000	0.0000	0.0008	0.0008		0.1	0.1
55-59	-	97	0.0000	0.0000	0.0011	0.0011		0.1	0.1
60-64	-	65	0.0000	0.0000	0.0020	0.0020		0.1	0.1
65-69	-	23	0.0000	0.0000	0.0020	0.0020		-	-
70-74	-	10	0.0000	0.0000	0.0015	0.0015		-	-
75 & over	-	18	0.0000	0.0000	0.0010	0.0010		-	-
Totals	-	366	0.0000	0.0000	0.0011	0.0011	-	0.3	0.3

	<u>Actual</u>	<u>Liability</u>	<u>Proposed</u>
<b>Current</b>	0.0000	0.0000	0.0011
<b>Previous Investigation Results</b>	0.0000	0.0000	0.0010
<b>2005-2007</b>	0.0000	0.0000	0.0015
<b>2002-2004</b>	0.0000		0.0018

\* Sample rates are taken from midpoint of age group.

Approximate techniques were used to develop the actual number of permanent cases. These techniques did not lend themselves to allocating the cases within age groups.

## ECO SLEP MALES - DISABILITY RETIREMENT EXPERIENCE

There were 0 disability benefit claims reported for the 3-year period and 77 years of exposure. The proposed rates recommend no changes for this group.

Age	Temporary Disabilities	Exposure	Actual Rates Weighted by		Permanent Disabilities				
			Population	Liability	Sample Rates*		Actual	Expected	
					Old	New		Present	Proposed
Under 20	-	-	0.0000	0.0000	0.0001	0.0001	-	-	-
20-24	-	-	0.0000	0.0000	0.0002	0.0001	-	-	-
25-29	-	-	0.0000	0.0000	0.0004	0.0001	-	-	-
30-34	-	-	0.0000	0.0000	0.0005	0.0002	-	-	-
35-39	-	-	0.0000	0.0000	0.0008	0.0003	-	-	-
40-44	-	2	0.0000	0.0000	0.0011	0.0005	-	-	-
45-49	-	24	0.0000	0.0000	0.0016	0.0007	-	-	-
50-54	-	7	0.0000	0.0000	0.0024	0.0011	-	-	-
55-59	-	14	0.0000	0.0000	0.0033	0.0017	-	-	-
60-64	-	27	0.0000	0.0000	0.0023	0.0020	0.1	0.1	-
65-69	-	3	0.0000	0.0000	0.0015	0.0020	-	-	-
70-74	-	-	0.0000	0.0000	0.0008	0.0015	-	-	-
75 & over	-	-	0.0000	0.0000	0.0000	0.0010	-	-	-
Totals	-	77	0.0000	0.0000	0.0022	0.0014	-	0.1	0.1

	<u>Actual</u>	<u>Liability</u>	<u>Proposed</u>
<b>Current</b>	0.0000	0.0000	0.0014
<b>Previous Investigation Results</b>	0.0000	0.0000	0.0023
<b>2005-2007</b>	0.0000	0.0000	0.0031
<b>2002-2004</b>	0.0000	0.0000	0.0038

\* Sample rates are taken from midpoint of age group.

Approximate techniques were used to develop the actual number of permanent cases. These techniques did not lend themselves to allocating the cases within age groups.



## **ECO SLEP FEMALES - DISABILITY RETIREMENT EXPERIENCE**

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There were 0 disability benefit claims reported for the 3-year period and 0 years of exposure.

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**PAY INCREASES**

MERIT AND LONGEVITY PORTION

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**REGULAR MEMBERS**  
**MERIT & LONGEVITY PAY INCREASE ASSUMPTIONS**  
**SERVICE RELATED PORTION**

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Service Index	Pay Increase During the Next Year		
	Actual	Sample Values	
		Present	Proposed
1	7.21 %	7.00 %	7.00 %
2	6.17 %	5.00 %	5.50 %
3	3.19 %	3.50 %	3.25 %
4	2.27 %	3.00 %	2.50 %
5	1.93 %	2.00 %	2.00 %
6	1.63 %		
7	1.40 %		
8	1.07 %		
9	0.84 %		
10	0.92 %		
11	0.73 %		
12	0.47 %		
13	0.33 %		
14	0.39 %		
15	0.32 %		
16	0.50 %		
17	0.25 %		
18	0.21 %		
19	0.17 %		
20	0.25 %		
21	0.16 %		
22	0.10 %		
23	(0.01)%		
24	0.22 %		
25	(0.02)%		
26	0.19 %		
27	0.16 %		
28	0.09 %		
29	0.07 %		
30	0.16 %		
31	(0.01)%		
32	0.20 %		
33	0.07 %		
34	0.26 %		
35	0.59 %		
36	0.84 %		
37	0.12 %		
38	0.63 %		
39	(0.36)%		
40	0.54 %		

*Exposure weighted average of all ages.*

**REGULAR MEMBERS  
MERIT & LONGEVITY PAY INCREASE ASSUMPTIONS  
AGE RELATED PORTION**

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**MORE THAN 5 YEARS OF SERVICE**

Age Group Beginning of Year	Pay Increase During the Next Year		
	Actual	Sample Values*	
		Present	Proposed
25-29	2.02 %	2.00 %	2.00 %
30-34	1.58 %	1.50 %	1.50 %
35-39	0.97 %	1.00 %	1.00 %
40-44	0.81 %	0.80 %	0.80 %
45-49	0.53 %	0.70 %	0.60 %
50-54	0.43 %	0.60 %	0.50 %
55-59	0.25 %	0.50 %	0.30 %
60-64	0.22 %	0.40 %	0.25 %

*\* Sample values are selected from midpoint of age group.*

The prior tables for Regular members included both an age component and service component for members with less than 6 years of service and only an age component for members with more than 6 years of service. After reviewing experience, we are recommending only a service component for members with less than 5 years of service and only an age component for members with more than 5 years of service.

**SLEP MEMBERS**  
**MERIT & LONGEVITY PAY INCREASE ASSUMPTIONS**  
**SERVICE RELATED PORTION**

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Service Index	Total Pay Increase During the Next Year		
	Actual	Sample Values	
		Present	Proposed
1	10.42 %	12.00 %	11.00 %
2	7.95 %	9.00 %	8.50 %
3	2.70 %	4.30 %	4.00 %
4	3.03 %	3.80 %	3.50 %
5	2.38 %	3.00 %	3.00 %
6	3.20 %	2.50 %	2.50 %
7	2.63 %	1.50 %	2.00 %
8	2.17 %	1.25 %	1.50 %
9	1.60 %	1.00 %	1.25 %
10	1.22 %	0.75 %	1.00 %
11	0.73 %	0.75 %	0.75 %
12	0.86 %	0.75 %	0.75 %
13	0.95 %	0.50 %	0.50 %
14	0.11 %	0.50 %	0.50 %
15	0.76 %	0.50 %	0.50 %
16	0.61 %	0.50 %	0.50 %
17	0.01 %	0.50 %	0.50 %
18	0.12 %	0.50 %	0.50 %
19	0.94 %	0.50 %	0.50 %
20	0.63 %	0.50 %	0.50 %
21	0.34 %	0.50 %	0.50 %
22	(0.52)%	0.50 %	0.50 %
23	0.47 %	0.50 %	0.50 %
24	0.38 %	0.50 %	0.50 %
25	0.51 %	0.50 %	0.50 %
26	2.26 %	0.50 %	0.50 %
27	1.52 %	0.50 %	0.50 %
28	4.92 %	0.50 %	0.50 %
29	1.10 %	0.50 %	0.50 %
30	1.28 %	0.50 %	0.50 %
31	5.02 %	0.50 %	0.50 %
32	1.66 %	0.50 %	0.50 %
33	(0.06)%	0.50 %	0.50 %
34	(0.46)%	0.50 %	0.50 %
35	(7.87)%	0.50 %	0.50 %
36	2.29 %	0.50 %	0.50 %
37	0.50 %	0.50 %	0.50 %
38	6.02 %	0.50 %	0.50 %
39	(6.39)%	0.50 %	0.50 %
40	0.00 %	0.50 %	0.50 %

*Exposure weighted average of all ages.*

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## NORMAL & EARLY RETIREMENT EXPERIENCE

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## REGULAR MALES NORMAL RETIREMENT EXPERIENCE

There were 3,998 age and service unreduced retirements and 23,346 life years of exposure (exposure includes active members eligible for unreduced retirement) in the male retirement investigation. Retirement rates were found to be more highly correlated with the liability weighted rates. We recommend no changes in the proposed rates.

Age	Retirement	Exposure	Actual Rates Weighted by		Sample Rates		Expected Retirements	
			Population	Liability	Present	Proposed	Present	Proposed
Under 55	92	92	1.0000	1.0000	N/A	N/A	-	-
55	100	326	0.3067	0.3235	0.3300	0.3300	108	108
56	71	314	0.2261	0.2557	0.2500	0.2500	79	79
57	63	333	0.1892	0.2126	0.2500	0.2500	83	83
58	64	332	0.1928	0.1836	0.2500	0.2500	83	83
59	59	323	0.1827	0.1956	0.2500	0.2500	81	81
60	309	3,249	0.0951	0.1301	0.1200	0.1200	390	390
61	268	2,959	0.0906	0.1259	0.1200	0.1200	355	355
62	466	2,646	0.1761	0.2115	0.2200	0.2200	582	582
63	372	2,187	0.1701	0.2161	0.2000	0.2000	437	437
64	242	1,812	0.1336	0.1650	0.2000	0.2000	362	362
65	367	1,619	0.2267	0.2532	0.2500	0.2500	405	405
66	350	1,252	0.2796	0.3081	0.3000	0.3000	376	376
67	206	922	0.2234	0.2612	0.2500	0.2500	231	231
68	137	771	0.1777	0.2123	0.2000	0.2000	154	154
69	153	726	0.2107	0.2251	0.2000	0.2000	145	145
70	141	621	0.2271	0.2500	0.2000	0.2000	124	124
71	121	513	0.2359	0.2532	0.2000	0.2000	103	103
72	74	408	0.1814	0.1771	0.2000	0.2000	82	82
73	67	359	0.1866	0.1909	0.2000	0.2000	72	72
74	56	309	0.1812	0.1815	0.2000	0.2000	62	62
75 & over	312	1,365	0.2286	0.2349	0.2000	0.2000	273	273
Total (55 & over)	3,998	23,346	0.1712	0.1962	0.1965	0.1965	4,587	4,587

	<u>Actual</u>	<u>Liability</u>	<u>Proposed</u>
<b>Current</b>	0.1712	0.1962	0.1965
<b>Previous Investigation Results</b>	0.1775	0.1943	0.1958
<b>2005-2007</b>	0.1739	0.2002	0.1985
<b>2002-2004</b>	0.1700		0.1944

**REGULAR MALES**  
**EARLY RETIREMENT EXPERIENCE**

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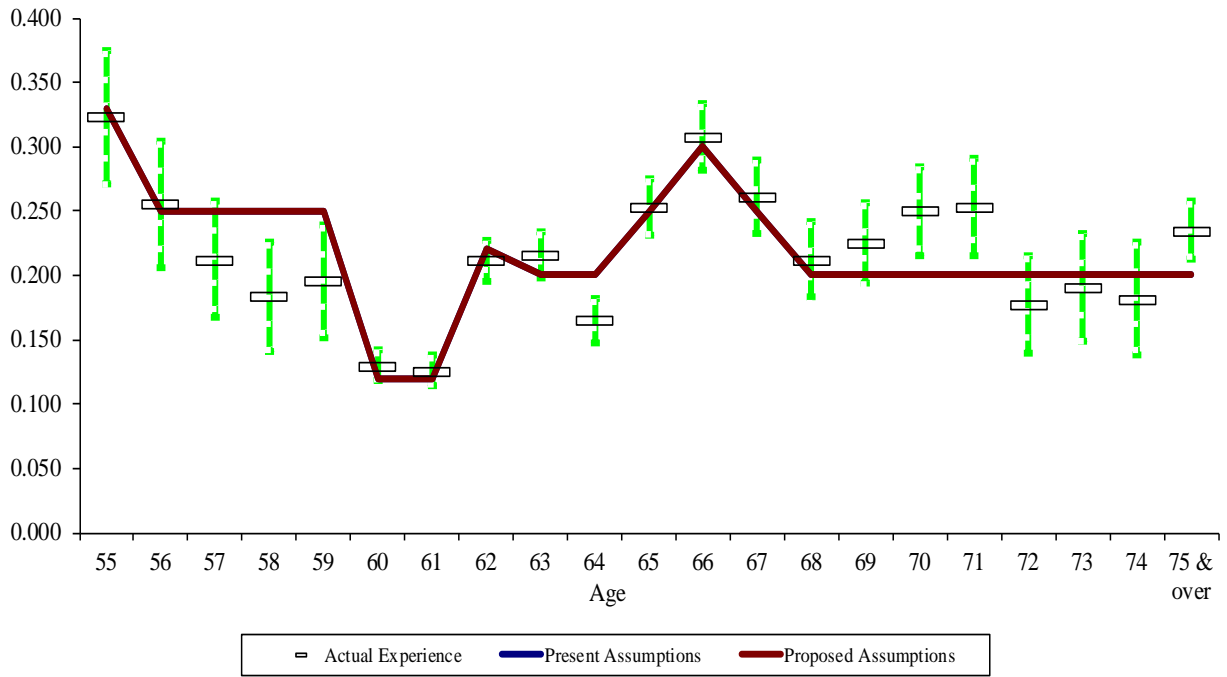
There were 998 age and service reduced retirements and 17,707 life years of exposure (exposure includes active members eligible for reduced retirement) in the male retirement investigation. Retirement rates were found to be more highly correlated with the liability weighted rates. We recommend no changes in the proposed rates.

Age	Retirement	Exposure	Actual Rates Weighted by		Sample Rates		Expected Retirements	
			Population	Liability	Present	Proposed	Present	Proposed
55	257	4,131	0.0622	0.0824	0.0725	0.0725	300	300
56	227	3,777	0.0601	0.0824	0.0725	0.0725	274	274
57	166	3,409	0.0487	0.0676	0.0725	0.0725	247	247
58	160	3,260	0.0491	0.0628	0.0725	0.0725	236	236
59	188	3,130	0.0601	0.0696	0.0725	0.0725	227	227
Total	998	17,707	0.0564	0.0741	0.0725	0.0725	1,284	1,284

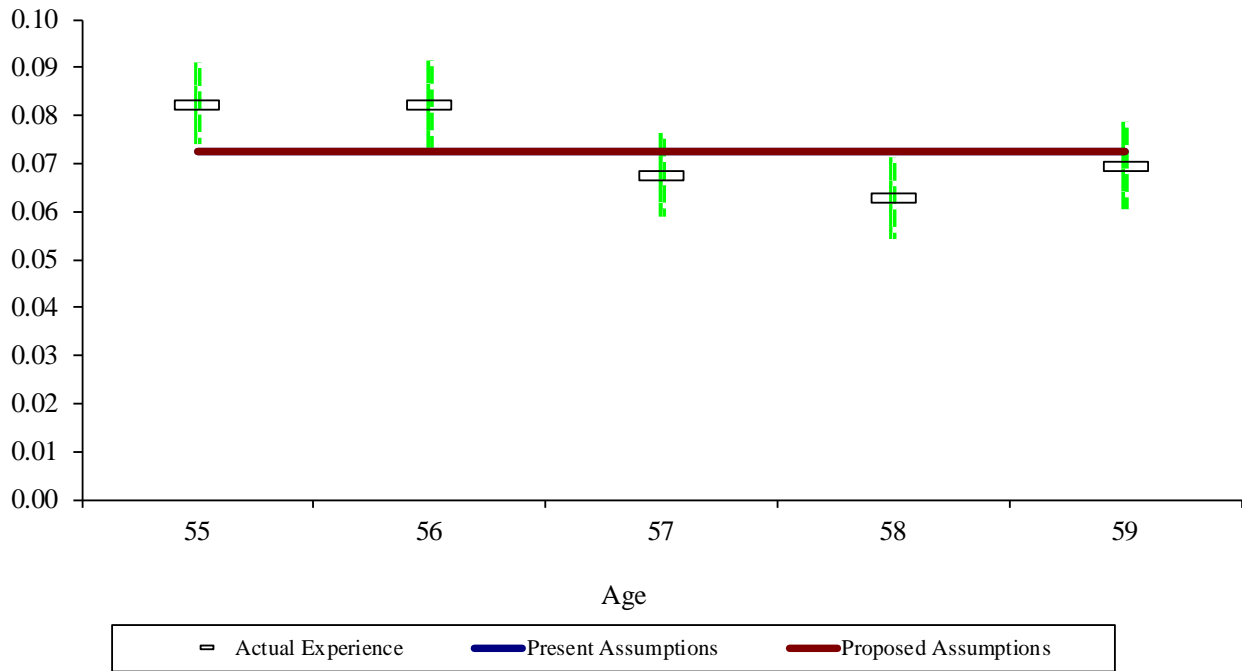
	<u>Actual</u>	<u>Liability</u>	<u>Proposed</u>
<b>Current</b>	0.0564	0.0741	0.0725
<b>Previous Investigation Results</b>	0.0510	0.0705	0.0725
<b>2005-2007</b>	0.0620	0.0821	0.0750
<b>2002-2004</b>	0.0692		0.0650



## RATES OF NORMAL RETIREMENT REGULAR MALES



## RATES OF EARLY RETIREMENT REGULAR MALES



## REGULAR FEMALES NORMAL RETIREMENT EXPERIENCE

There were 6,721 age and service reduced retirements and 43,327 life years of exposure (exposure includes active members eligible for reduced retirement) in the female retirement investigation. Retirement rates were found to be highly correlated with the liability weighted rates and therefore the proposed rates were adjusted slightly at various ages.

Age	Retirement	Exposure	Actual Rates Weighted by		Sample Rates		Expected Retirements	
			Population	Liability	Present	Proposed	Present	Proposed
Under 55	56	56	1.0000	1.0000	N/A	N/A	-	-
55	44	165	0.2667	0.2547	0.2700	0.2700	45	45
56	39	168	0.2321	0.2369	0.2200	0.2000	37	34
57	35	192	0.1823	0.1599	0.2200	0.2000	42	38
58	33	181	0.1823	0.1708	0.2200	0.2000	40	36
59	31	171	0.1813	0.1902	0.2200	0.2000	38	34
60	559	7,083	0.0789	0.1008	0.1000	0.1000	708	708
61	533	6,415	0.0831	0.0964	0.1000	0.1000	642	642
62	870	5,717	0.1522	0.1713	0.1800	0.1800	1,029	1,029
63	680	4,735	0.1436	0.1600	0.1800	0.1800	852	852
64	568	4,096	0.1387	0.1607	0.1800	0.1800	737	737
65	860	3,518	0.2445	0.2633	0.2300	0.2500	809	880
66	648	2,528	0.2563	0.2757	0.2300	0.2500	581	632
67	419	1,739	0.2409	0.2563	0.2300	0.2500	400	435
68	299	1,340	0.2231	0.2373	0.1800	0.2000	241	268
69	191	1,068	0.1788	0.2084	0.1800	0.2000	192	214
70	200	965	0.2073	0.2401	0.1800	0.2000	174	193
71	147	718	0.2047	0.2380	0.1800	0.2000	129	144
72	112	566	0.1979	0.2111	0.1800	0.2000	102	113
73	77	391	0.1969	0.2270	0.1800	0.2000	70	78
74	76	329	0.2310	0.2623	0.1800	0.2000	59	66
75 & over	300	1,242	0.2415	0.2496	0.1800	0.2000	224	248
Total (55 & over)	6,721	43,327	0.1551	0.1729	0.1650	0.1714	7,151	7,426

	<u>Actual</u>	<u>Liability</u>	<u>Proposed</u>
<b>Current</b>	0.1551	0.1729	0.1714
<b>Previous Investigation Results</b>	0.1467	0.1539	0.1637
<b>2005-2007</b>	0.1606	0.1758	0.1719
<b>2002-2004</b>	0.1672		0.1731

**REGULAR FEMALES  
EARLY RETIREMENT EXPERIENCE**

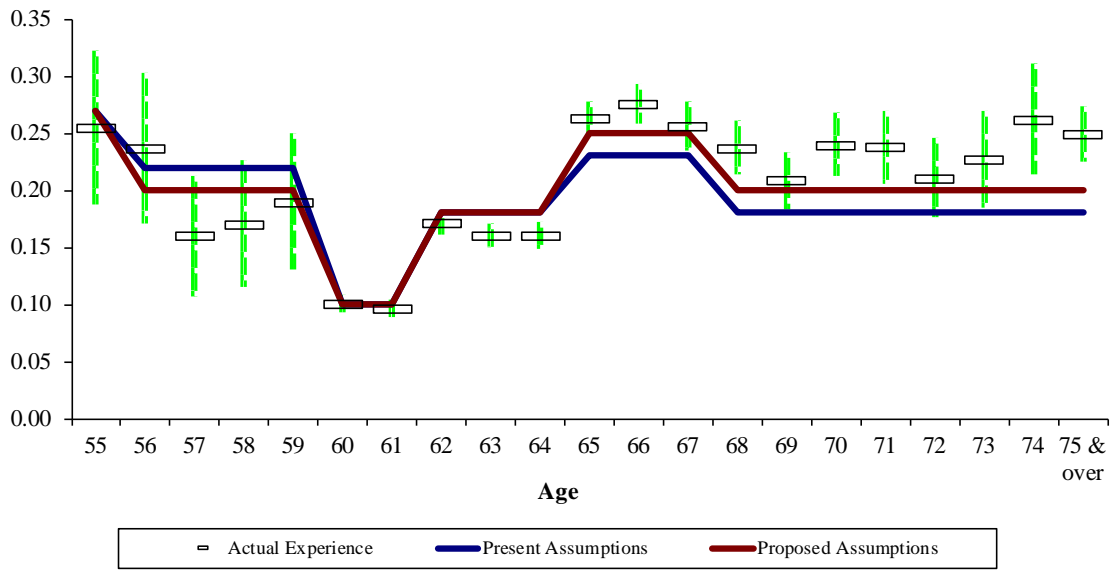
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There were 1,789 age and service reduced retirements and 40,403 life years of exposure (exposure includes active members eligible for reduced retirement) in the female retirement investigation. Retirement rates were found to be highly correlated with the liability weighted rates. We recommend no changes in the proposed rates.

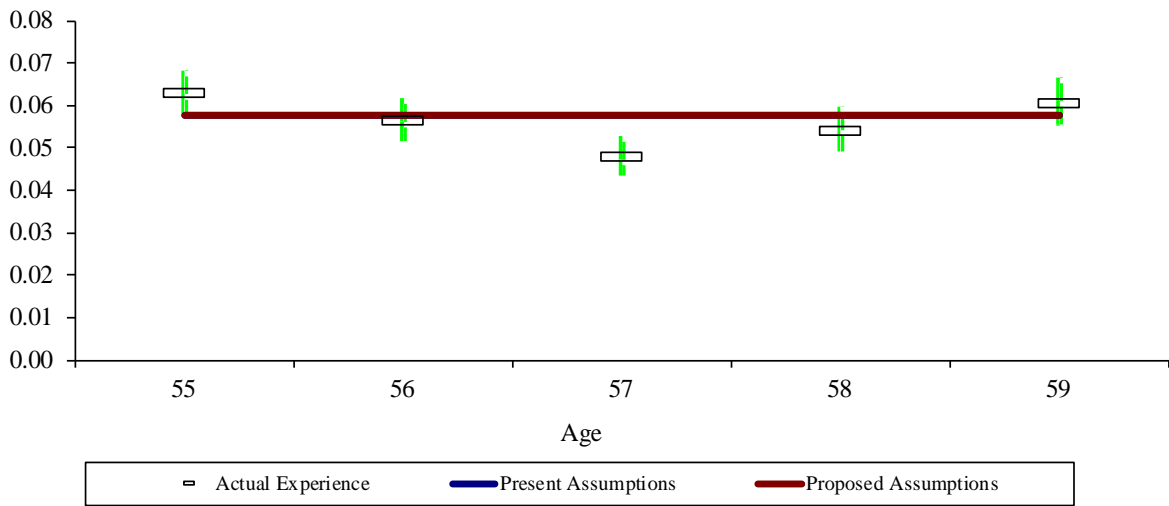
Age	Retirement	Exposure	Actual Rates Weighted by		Sample Rates		Expected Retirements	
			Population	Liability	Present	Proposed	Present	Proposed
55	375	8,731	0.0430	0.0632	0.0575	0.0575	502	502
56	370	8,523	0.0434	0.0568	0.0575	0.0575	490	490
57	324	8,153	0.0397	0.0482	0.0575	0.0575	469	469
58	338	7,665	0.0441	0.0543	0.0575	0.0575	441	441
59	382	7,331	0.0521	0.0609	0.0575	0.0575	422	422
Total	1,789	40,403	0.0443	0.0567	0.0575	0.0575	2,324	2,324

	<u>Actual</u>	<u>Liability</u>	<u>Proposed</u>
<b>Current</b>	0.0443	0.0567	0.0575
<b>Previous Investigation Results</b>	0.0387	0.0504	0.0575
<b>2005-2007</b>	0.0547	0.0651	0.0650
<b>2002-2004</b>	0.0573		0.0650

## RATES OF NORMAL RETIREMENT REGULAR FEMALES



## RATES OF EARLY RETIREMENT REGULAR FEMALES



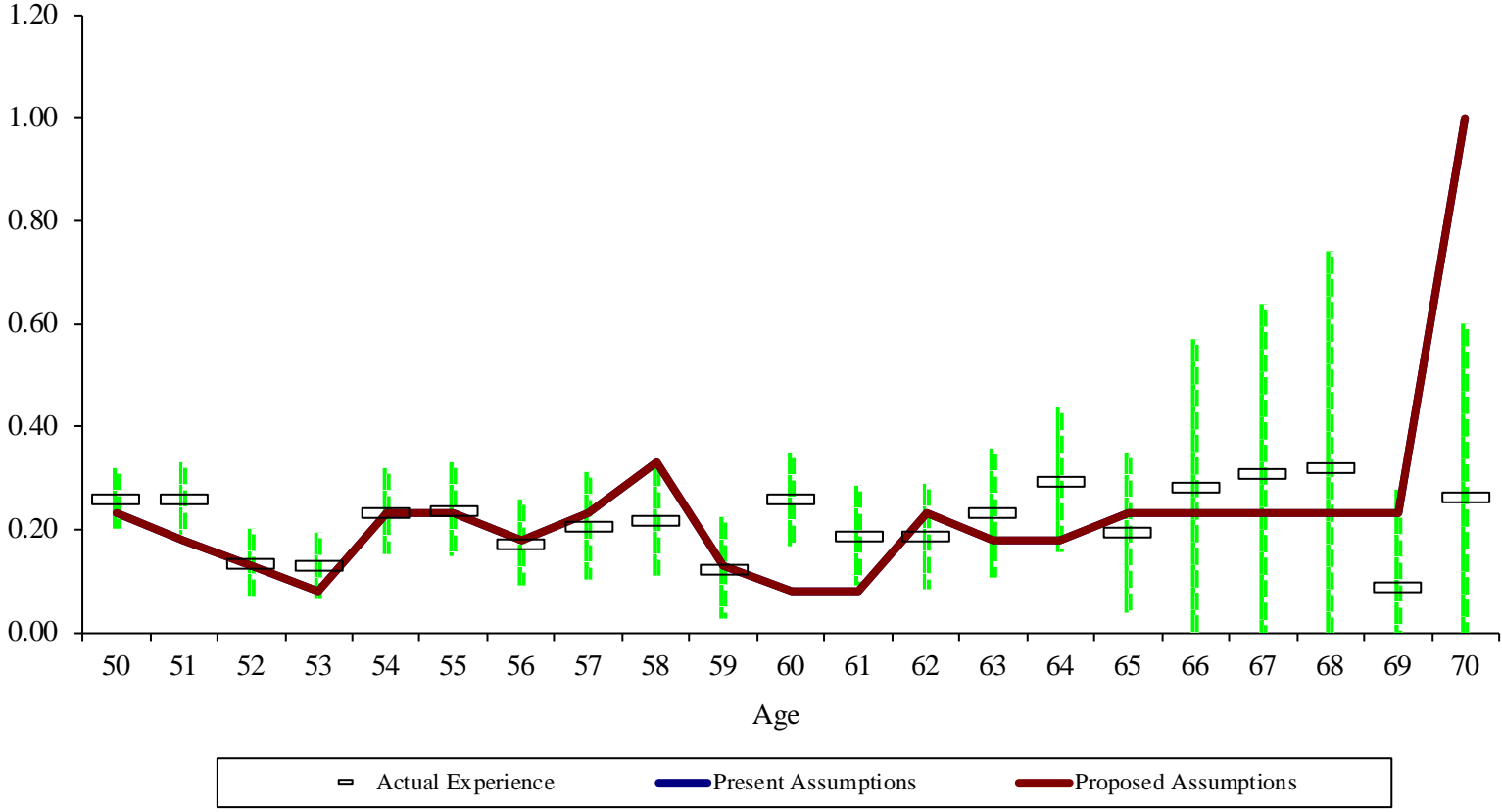
## SLEP MEMBERS NORMAL RETIREMENT EXPERIENCE

There were 321 age and service unreduced retirements and 1,608 life years of exposure (exposure includes active members eligible for unreduced retirement) in the retirement investigation. Of these 50 retired after attaining 32 years of service and therefore a maximum of 80% of FAC. We recommend no changes in the proposed rates for members with less than 32 years of service, and slightly lower rates for members with greater than 32 years of service. We are also recommending the same table be used for both males and females.

Service	Age	Retirements	Exposure	Actual Rates Weighted by		Sample Rates		Expected Retirements	
				Population	Liability	Present	Proposed	Present	Proposed
less than 32 years	50	50	228	0.2193	0.2592	0.2300	0.2300	52.4	52.4
	51	36	160	0.2250	0.2607	0.1800	0.1800	28.8	28.8
	52	14	110	0.1273	0.1351	0.1300	0.1300	14.3	14.3
	53	12	104	0.1154	0.1293	0.0800	0.0800	8.3	8.3
	54	20	102	0.1961	0.2354	0.2300	0.2300	23.5	23.5
	55	18	88	0.2045	0.2386	0.2300	0.2300	20.2	20.2
	56	14	82	0.1707	0.1745	0.1800	0.1800	14.8	14.8
	57	12	60	0.2000	0.2068	0.2300	0.2300	13.8	13.8
	58	14	59	0.2373	0.2186	0.3300	0.3300	19.5	19.5
	59	5	44	0.1136	0.1251	0.1300	0.1300	5.7	5.7
	60	17	91	0.1868	0.2587	0.0800	0.0800	7.3	7.3
	61	9	66	0.1364	0.1870	0.0800	0.0800	5.3	5.3
	62	11	57	0.1930	0.1869	0.2300	0.2300	13.1	13.1
	63	8	45	0.1778	0.2318	0.1800	0.1800	8.1	8.1
	64	10	42	0.2381	0.2957	0.1800	0.1800	7.6	7.6
	65	6	26	0.2308	0.1942	0.2300	0.2300	6.0	6.0
	66	2	10	0.2000	0.2847	0.2300	0.2300	2.3	2.3
	67	3	8	0.3750	0.3100	0.2300	0.2300	1.8	1.8
	68	1	5	0.2000	0.3212	0.2300	0.2300	1.2	1.2
	69	2	9	0.2222	0.0886	0.2300	0.2300	2.1	2.1
	70	1	7	0.1429	0.2648	1.0000	1.0000	7.0	7.0
	71	1	11	0.0909	0.1993	1.0000	1.0000	11.0	11.0
	72	1	7	0.1429	0.0638	1.0000	1.0000	7.0	7.0
73	2	4	0.5000	0.6940	1.0000	1.0000	4.0	4.0	
74	-	1	0.0000	0.0000	1.0000	1.0000	1.0	1.0	
75 & over	2	5	0.4000	0.6757	1.0000	1.0000	5.0	5.0	
	Total	271	1,431	0.1894	0.2168	0.2034	0.2034	291.1	291.1
more than 32 years	All	50	177	0.2825	0.2770	0.4000	0.3500	70.8	62.0

	<u>Actual</u>	<u>Liability</u>	<u>Proposed</u>
<b>Current</b>	0.1894	0.2168	0.2034
<b>Previous Investigation Results</b>	0.1935	0.2130	0.1790
<b>2005-2007</b>	0.2093	0.2180	0.1830
<b>2002-2004</b>	0.2127		0.2166

# SLEP MEMBERS NORMAL RETIREMENT EXPERIENCE



## ECO MALES NORMAL RETIREMENT EXPERIENCE

There were 34 age and service unreduced retirements and 332 life years of exposure (exposure includes active members eligible for unreduced retirement) in the male retirement investigation. Retirement rates were found to be highly correlated with the liability weighted rates and therefore the proposed rates were adjusted slightly at various ages.

Age	Retirements	Exposure	Actual Rates Weighted by		Sample Rates		Expected Retirements	
			Population	Liability	Present	Proposed	Present	Proposed
Under 55	-	-	N/A	N/A	N/A	N/A	-	-
55	2	33	0.0606	0.2121	0.3000	0.2500	9.9	8.3
56	3	23	0.1304	0.2559	0.2500	0.2500	5.8	5.8
57	4	26	0.1538	0.1953	0.2500	0.2000	6.5	5.2
58	1	23	0.0435	0.0577	0.2500	0.2000	5.8	4.6
59	2	26	0.0769	0.1035	0.2500	0.2000	6.5	5.2
60	-	17	0.0000	0.0000	0.0500	0.0500	0.9	0.9
61	1	17	0.0588	0.0229	0.0500	0.0500	0.9	0.9
62	2	22	0.0909	0.2499	0.2000	0.1000	4.4	2.2
63	2	21	0.0952	0.0931	0.1500	0.1500	3.2	3.2
64	2	17	0.1176	0.0913	0.1500	0.1500	2.6	2.6
65	-	8	0.0000	0.0000	0.3000	0.1500	2.4	1.2
66	1	15	0.0667	0.0055	0.2500	0.1300	3.8	2.0
67	1	12	0.0833	0.0233	0.2000	0.1300	2.4	1.6
68	1	8	0.1250	0.2882	0.1300	0.1300	1.0	1.0
69	2	5	0.4000	0.0689	0.1300	0.1300	0.7	0.7
70	-	6	0.0000	0.0000	0.1300	0.1300	0.8	0.8
71	2	4	0.5000	0.2856	0.1300	0.1300	0.5	0.5
72	-	4	0.0000	0.0000	0.1300	0.1300	0.5	0.5
73	1	4	0.2500	0.2311	0.1300	0.1300	0.5	0.5
74	1	6	0.1667	0.2863	0.1300	0.1300	0.8	0.8
75 & over	6	35	0.1714	0.4251	0.1300	0.1300	4.6	4.6
Total	34	332	0.1024	0.1367	0.1943	0.1599	64.5	53.1

	<u>Actual</u>	<u>Liability</u>	<u>Proposed</u>
<b>Current</b>	0.1024	0.1367	0.1599
<b>Previous Investigation Results</b>	0.1717	0.1817	0.1837
<b>2005-2007</b>	0.0986	0.0958	0.1884
<b>2002-2004</b>	0.1642		0.2418

**ECO FEMALES**  
**NORMAL RETIREMENT EXPERIENCE**

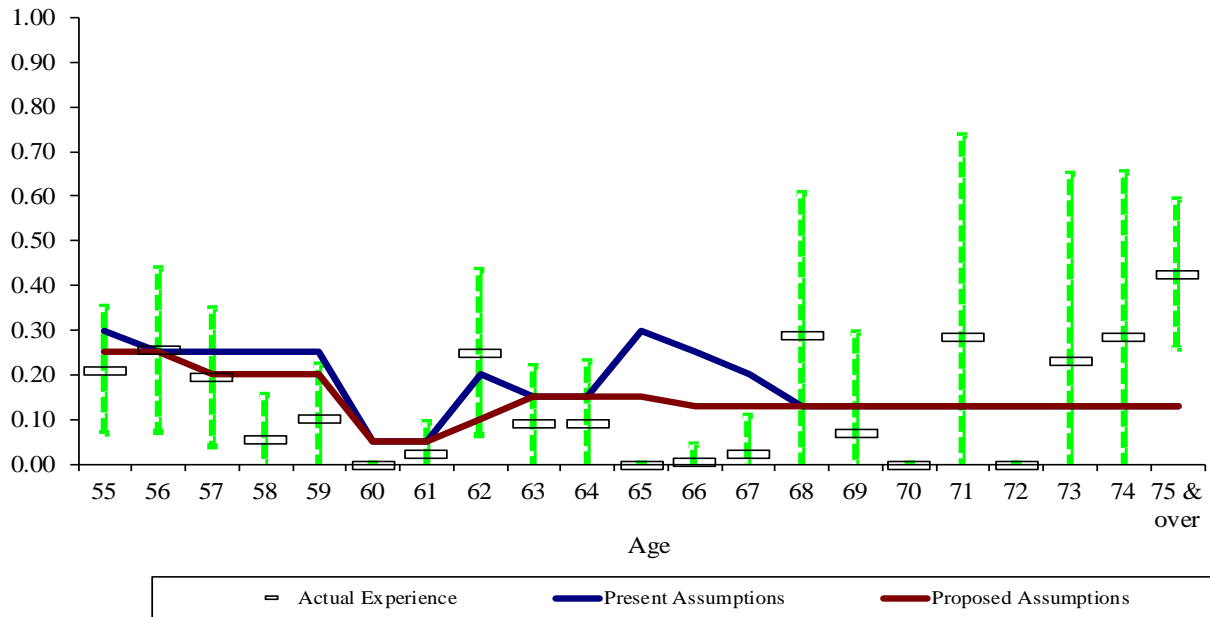
There were 22 age and service unreduced retirements and 173 life years of exposure (exposure includes active members eligible for unreduced retirement) in the female retirement investigation. Retirement rates were found to be highly correlated with the liability weighted rates and therefore the proposed rates were adjusted slightly at various ages.

Age	Retirements	Exposure	Actual Rates Weighted by		Sample Rates		Expected Retirements	
			Population	Liability	Present	Proposed	Present	Proposed
Under 55	-	-	N/A	N/A	N/A	N/A	-	-
55	3	22	0.1364	0.2417	0.3000	0.2500	5.4	5.5
56	3	16	0.1875	0.2069	0.2500	0.2500	4.0	4.0
57	-	11	0.0000	0.0000	0.2500	0.2000	2.8	2.2
58	1	13	0.0769	0.0703	0.2500	0.2000	3.3	2.6
59	1	12	0.0833	0.0793	0.2500	0.2000	3.0	2.4
60	1	12	0.0833	0.0375	0.0500	0.0500	0.6	0.6
61	1	10	0.1000	0.0102	0.0500	0.0500	0.5	0.5
62	2	12	0.1667	0.1507	0.1500	0.1000	1.8	1.2
63	4	11	0.3636	0.4634	0.1500	0.1500	1.7	1.7
64	-	8	0.0000	0.0000	0.1500	0.1500	1.2	1.2
65	1	8	0.1250	0.0653	0.2000	0.1500	1.6	1.2
66	-	5	0.0000	0.0000	0.1500	0.1300	0.8	0.7
67	1	4	0.2500	0.1650	0.1500	0.1300	0.6	0.5
68	-	2	0.0000	0.0000	0.1300	0.1300	0.3	0.3
69	-	1	0.0000	0.0000	0.1300	0.1300	0.1	0.1
70	-	2	0.0000	0.0000	0.1300	0.1300	0.3	0.3
71	1	2	0.5000	0.9501	0.1300	0.1300	0.3	0.3
72	-	1	0.0000	0.0000	0.1300	0.1300	0.1	0.1
73	-	1	0.0000	0.0000	0.1300	0.1300	0.1	0.1
74	-	2	0.0000	0.0000	0.1300	0.1300	0.3	0.3
75 & over	3	18	0.1667	0.2632	0.1300	0.1300	2.3	2.3
Total	22	173	0.1272	0.1356	0.1798	0.1624	31.1	28.1

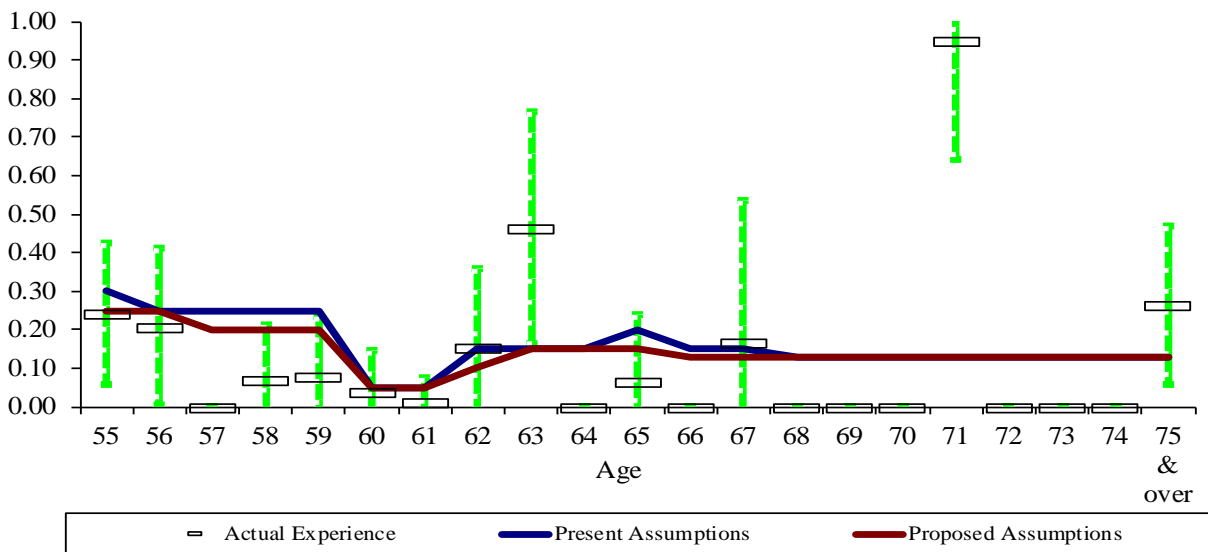
	<u>Actual</u>	<u>Liability</u>	<u>Proposed</u>
<b>Current</b>	0.1272	0.1356	0.1624
<b>Previous Investigation Results</b>	0.1705	0.1587	0.1889
<b>2005-2007</b>	0.1117	0.1212	0.1844
<b>2002-2004</b>	0.1313		0.2438



## RATES OF NORMAL RETIREMENT ECO MALES



## RATES OF NORMAL RETIREMENT ECO FEMALES



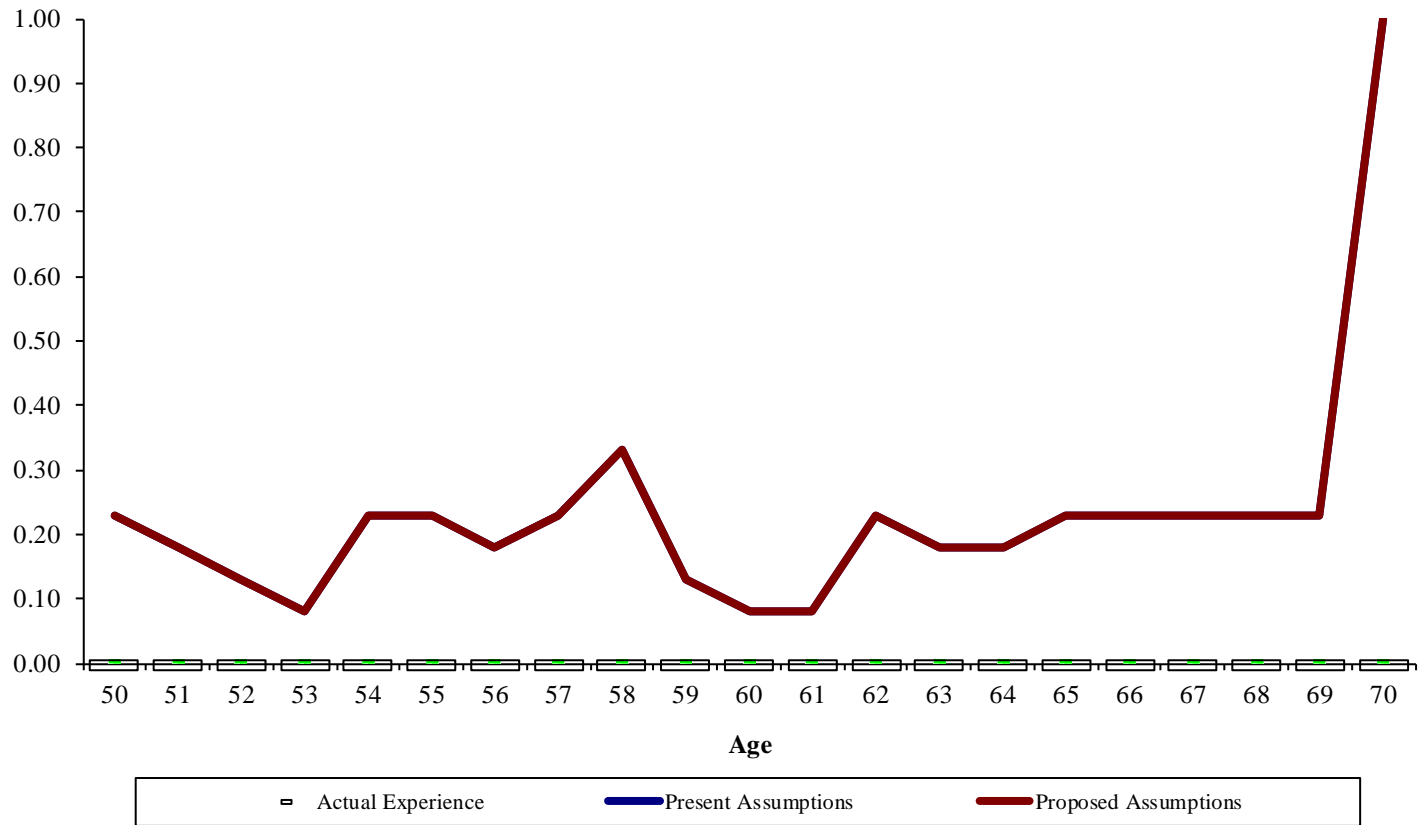
## ALL ECO-SLEP NORMAL RETIREMENT EXPERIENCE

There were 0 age and service unreduced retirements and 43 life years of exposure (exposure includes active members eligible for unreduced retirement) in the retirement investigation. We recommend no changes to the proposed rates.

Age	Retirements	Exposure	Actual Rates Weighted by		Sample Rates		Expected Retirements	
			Population	Liability	Present	Proposed	Present	Proposed
Under 50	-	-	0.0000	0.0000	N/A	N/A	-	-
50	-	1	0.0000	0.0000	0.2300	0.2300	0.2	0.2
51	-	-	0.0000	0.0000	0.1800	0.1800	-	-
52	-	-	0.0000	0.0000	0.1300	0.1300	-	-
53	-	-	0.0000	0.0000	0.0800	0.0800	-	-
54	-	-	0.0000	0.0000	0.2300	0.2300	-	-
55	-	3	0.0000	0.0000	0.2300	0.2300	0.7	0.7
56	-	4	0.0000	0.0000	0.1800	0.1800	0.7	0.7
57	-	3	0.0000	0.0000	0.2300	0.2300	0.7	0.7
58	-	1	0.0000	0.0000	0.3300	0.3300	0.3	0.3
59	-	1	0.0000	0.0000	0.1300	0.1300	0.1	0.1
60	-	5	0.0000	0.0000	0.0800	0.0800	0.4	0.4
61	-	7	0.0000	0.0000	0.0800	0.0800	0.6	0.6
62	-	7	0.0000	0.0000	0.2300	0.2300	1.6	1.6
63	-	4	0.0000	0.0000	0.1800	0.1800	0.7	0.7
64	-	2	0.0000	0.0000	0.1800	0.1800	0.4	0.4
65	-	1	0.0000	0.0000	0.2300	0.2300	0.2	0.2
66	-	1	0.0000	0.0000	0.2300	0.2300	0.2	0.2
67	-	-	0.0000	0.0000	0.2300	0.2300	-	-
68	-	-	0.0000	0.0000	0.2300	0.2300	-	-
69	-	-	0.0000	0.0000	0.2300	0.2300	-	-
70	-	1	0.0000	0.0000	1.0000	1.0000	1.0	1.0
71	-	-	0.0000	0.0000	1.0000	1.0000	-	-
72	-	-	0.0000	0.0000	1.0000	1.0000	-	-
73	-	-	0.0000	0.0000	1.0000	1.0000	-	-
74	-	-	0.0000	0.0000	1.0000	1.0000	-	-
75 & over	-	2	0.0000	0.0000	1.0000	1.0000	2.0	2.0
Total	-	43	0.0000	0.0000	0.2279	0.2279	9.8	9.8

	<u>Actual</u>	<u>Liability</u>	<u>Proposed</u>
<b>Current</b>	0.0000	0.0000	0.2279
<b>Previous Investigation Results</b>	0.1897	0.2094	0.1897
<b>2005-2007</b>	0.1940	0.1524	0.1940
<b>2002-2004</b>	0.2295		0.2623

## RATES OF NORMAL RETIREMENT ALL ECO-SLEP



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## MORTALITY EXPERIENCE

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## PRE-RETIREMENT MORTALITY - REGULAR MALES

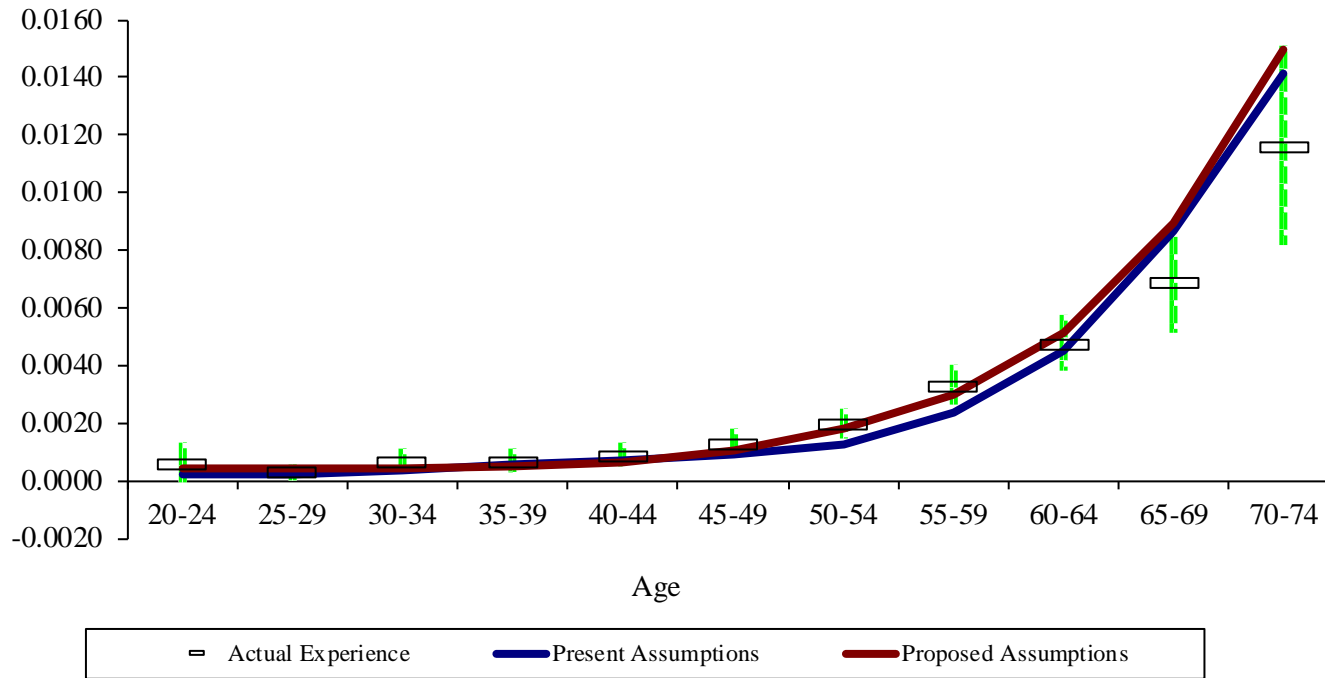
There were slightly more deaths than expected among active Regular males. The current rates are based on static projection for future improvements in mortality. The proposed rates represent the recommended base table only. Margin for future improvements in mortality will be built into the 'fully generational' projection which cannot be displayed in a table with this format.

Age	Deaths	Exposure	Actual Rates Weighted by		Sample Rates*		Expected Deaths	
			Population	Liability	Present	Proposed	Present	Proposed
Under 20	-	130	0.0000	0.0000	0.0001	0.0003	-	-
20-24	3	4,878	0.0006	0.0008	0.0002	0.0004	1	2
25-29	4	14,052	0.0003	0.0003	0.0002	0.0004	3	5
30-34	11	15,944	0.0007	0.0007	0.0004	0.0004	6	7
35-39	11	15,756	0.0007	0.0006	0.0006	0.0005	9	7
40-44	17	18,738	0.0009	0.0007	0.0007	0.0006	13	12
45-49	30	22,887	0.0013	0.0012	0.0009	0.0011	20	24
50-54	57	28,991	0.0020	0.0024	0.0012	0.0018	36	52
55-59	92	27,744	0.0033	0.0034	0.0023	0.0030	63	81
60-64	94	19,700	0.0048	0.0043	0.0045	0.0052	85	97
65-69	60	8,705	0.0069	0.0076	0.0087	0.0090	70	73
70-74	44	3,784	0.0116	0.0104	0.0141	0.0150	50	53
75 & over	39	2,014	0.0194	0.0196	0.0253	0.0251	42	43
Totals	462	183,323	0.0025	0.0028	0.0022	0.0025	398	456

	<u>Actual</u>	<u>Liability</u>	<u>Proposed</u>
<b>Current</b>	0.0025	0.0028	0.0025
<b>Previous Investigation Results</b>	0.0023	0.0025	0.0021
<b>2005-2007</b>	0.0022	0.0022	0.0021
<b>2002-2004</b>	0.0020		0.0019

\* Sample values are selected from midpoint of age group.

# RATES OF PRE-RETIREMENT MORTALITY REGULAR MALES



## PRE-RETIREMENT MORTALITY - REGULAR FEMALES

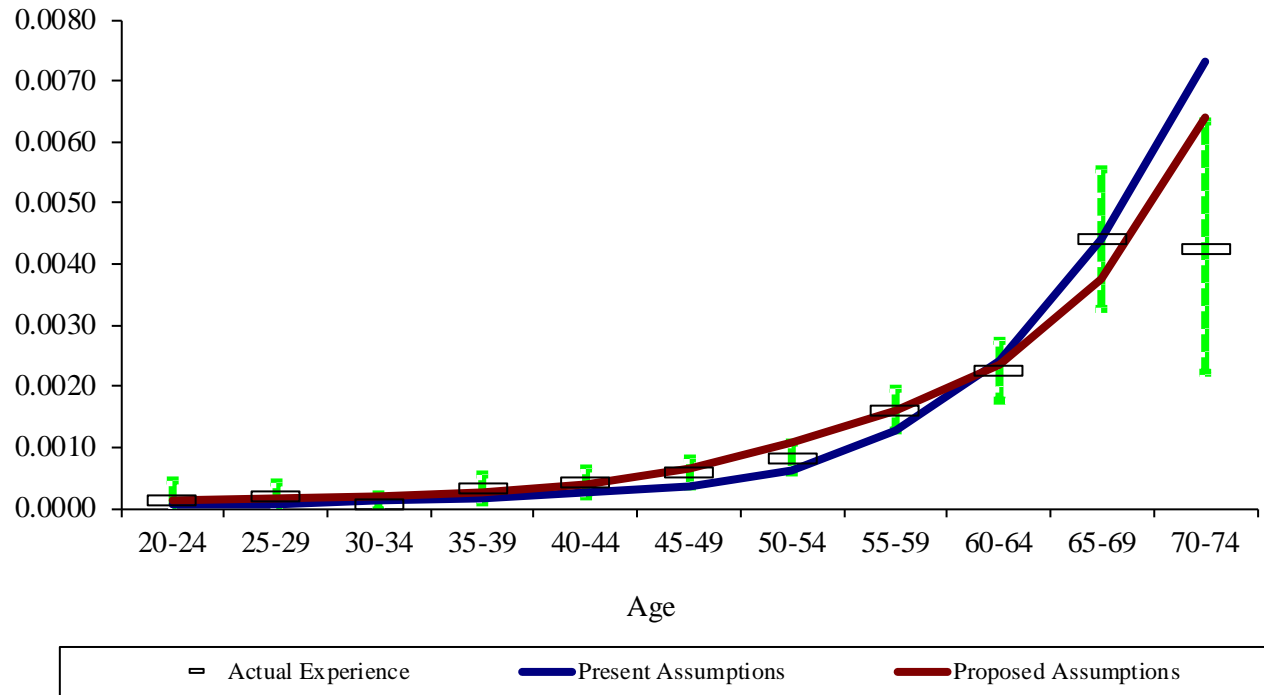
There were more deaths than expected among active Regular females. The current rates are based on static projection for future improvements in mortality. The proposed rates represent the recommended base table only. Margin for future improvements in mortality will be built into the ‘fully generational’ projection which cannot be displayed in a table with this format.

Age	Deaths	Exposure	Actual Rates Weighted by		Sample Rates*		Expected Deaths	
			Population	Liability	Present	Proposed	Present	Proposed
Under 20	-	210	0.0000	0.0000	0.0001	0.0001	-	-
20-24	1	6,721	0.0001	0.0007	0.0001	0.0001	-	1
25-29	4	19,171	0.0002	0.0001	0.0001	0.0002	1	3
30-34	2	20,950	0.0001	0.0000	0.0001	0.0002	2	4
35-39	8	23,945	0.0003	0.0003	0.0002	0.0003	4	6
40-44	15	35,021	0.0004	0.0007	0.0003	0.0004	9	14
45-49	29	48,842	0.0006	0.0007	0.0004	0.0007	18	32
50-54	51	60,983	0.0008	0.0008	0.0006	0.0011	37	64
55-59	91	56,089	0.0016	0.0018	0.0013	0.0016	67	86
60-64	83	36,722	0.0023	0.0022	0.0024	0.0023	84	82
65-69	59	13,364	0.0044	0.0056	0.0044	0.0038	54	46
70-74	17	3,978	0.0043	0.0028	0.0073	0.0064	27	24
75 & over	18	1,611	0.0112	0.0093	0.0119	0.0109	16	15
Totals	378	327,607	0.0012	0.0016	0.0010	0.0012	319	377

	<u>Actual</u>	<u>Liability</u>	<u>Proposed</u>
<b>Current</b>	0.0012	0.0016	0.0012
<b>Previous Investigation Results</b>	0.0010	0.0014	0.0009
<b>2002-2007</b>	0.0010	0.0016	0.0011
<b>2002-2004</b>	0.0011		0.0010

\* Sample values are selected from midpoint of age group.

# RATES OF PRE-RETIREMENT MORTALITY REGULAR FEMALES





## PRE-RETIREMENT MORTALITY - SLEP MALES

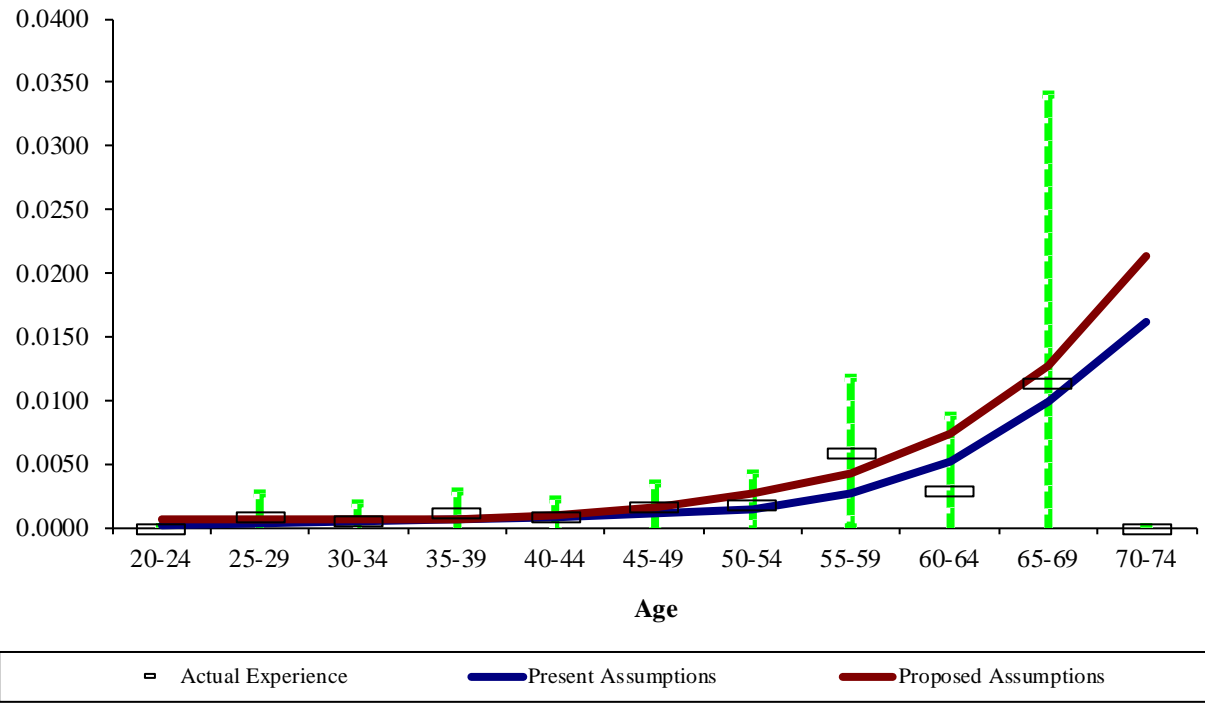
There were more deaths than expected among active SLEP males. The current rates are based on static projection for future improvements in mortality. The proposed rates represent the recommended base table only. Margin for future improvements in mortality will be built into the ‘fully generational’ projection which cannot be displayed in a table with this.

Age	Deaths	Exposure	Actual Rates Weighted by		Sample Rates*		Expected Deaths	
			Population	Liability	Present	Proposed	Present	Proposed
Under 20	-	-	0.0000	0.0000	0.0002	0.0004	-	-
20-24	-	82	0.0000	0.0000	0.0002	0.0006	-	0.1
25-29	1	1,155	0.0009	0.0006	0.0003	0.0006	0.3	0.7
30-34	1	1,658	0.0006	0.0004	0.0004	0.0006	0.7	1.0
35-39	2	1,671	0.0012	0.0013	0.0007	0.0007	1.1	1.2
40-44	2	2,183	0.0009	0.0007	0.0008	0.0009	1.7	2.0
45-49	3	1,843	0.0016	0.0008	0.0010	0.0015	1.9	2.8
50-54	2	1,124	0.0018	0.0006	0.0014	0.0026	1.6	2.9
55-59	4	675	0.0059	0.0105	0.0027	0.0043	1.8	2.9
60-64	1	340	0.0029	0.0043	0.0052	0.0073	1.7	2.5
65-69	1	88	0.0114	0.0074	0.0099	0.0127	0.8	1.0
70-74	-	-	0.0000	0.0000	0.0161	0.0213	-	-
75 & over	-	-	0.0000	0.0000	0.0289	0.0356	-	-
Totals	17	10,819	0.0016	0.0019	0.0011	0.0016	11.6	17.1

	<u>Actual</u>	<u>Liability</u>	<u>Proposed</u>
<b>Current</b>	0.0016	0.0019	0.0016
<b>Previous Investigation Results</b>	0.0009	0.0016	0.0010
<b>2005-2007</b>	0.0014	0.0018	0.0015
<b>2002-2004</b>	0.0013		0.0013

\* Sample values are selected from midpoint of age group.

# RATES OF PRE-RETIREMENT MORTALITY SLEP MALES



## PRE-RETIREMENT MORTALITY - SLEP FEMALES

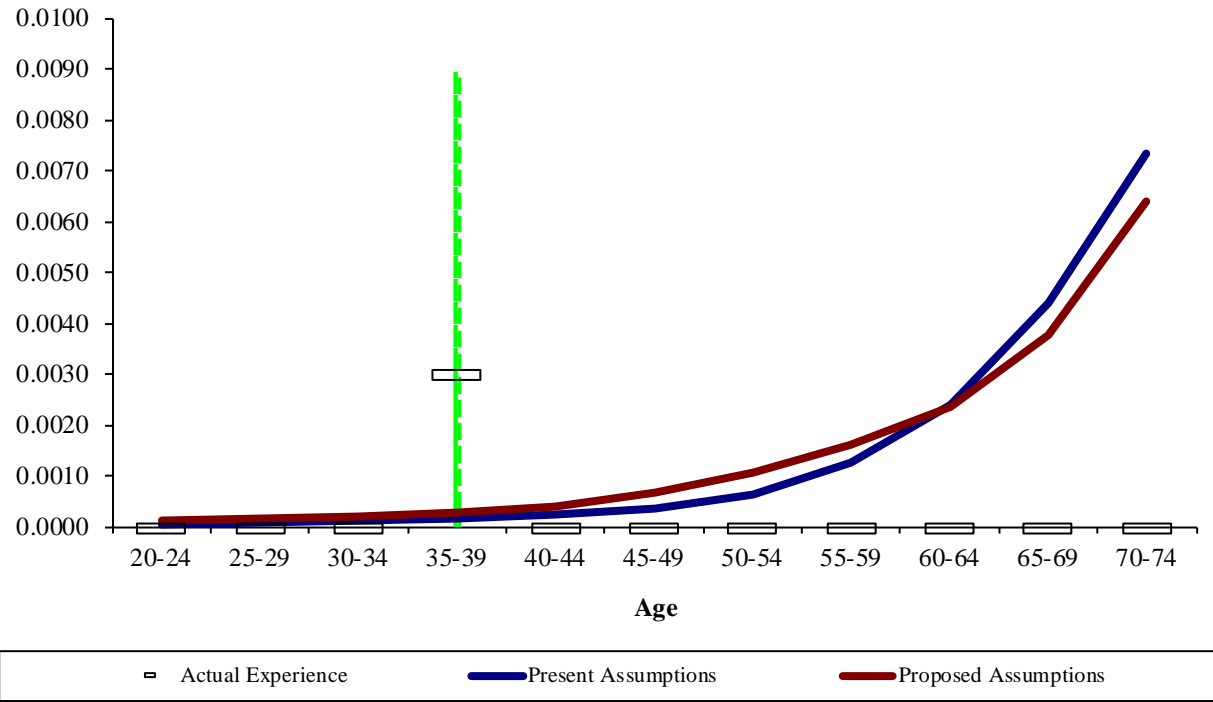
There were more deaths than expected among active SLEP females. The current rates are based on static projection for future improvements in mortality. The proposed rates represent the recommended base table only. Margin for future improvements in mortality will be built into the 'fully generational' projection which cannot be displayed in a table with this format.

Age	Deaths	Exposure	Actual Rates Weighted by		Sample Rates*		Expected Deaths	
			Population	Liability	Present	Proposed	Present	Proposed
Under 20	-	-	0.0000	0.0000	0.0001	0.0001	-	-
20-24	-	17	0.0000	0.0000	0.0001	0.0001	-	-
25-29	-	193	0.0000	0.0000	0.0001	0.0002	-	-
30-34	-	288	0.0000	0.0000	0.0001	0.0002	-	0.1
35-39	1	335	0.0030	0.0008	0.0002	0.0003	0.1	0.1
40-44	-	311	0.0000	0.0000	0.0003	0.0004	0.1	0.1
45-49	-	314	0.0000	0.0000	0.0004	0.0007	0.1	0.2
50-54	-	232	0.0000	0.0000	0.0006	0.0011	0.1	0.2
55-59	-	103	0.0000	0.0000	0.0013	0.0016	0.1	0.2
60-64	-	71	0.0000	0.0000	0.0024	0.0023	0.2	0.2
65-69	-	6	0.0000	0.0000	0.0044	0.0038	-	-
70-74	-	-	0.0000	0.0000	0.0073	0.0064	-	-
75 & over	-	-	0.0000	0.0000	0.0119	0.0109	-	-
Totals	1	1,870	0.0005	0.0001	0.0004	0.0006	0.7	1.1

	<u>Actual</u>	<u>Liability</u>	<u>Proposed</u>
<b>Current</b>	0.0005	0.0001	0.0006
<b>Previous Investigation Results</b>	0.0011	0.0018	0.0004
<b>2005-2007</b>	0.0000	0.0000	0.0008
<b>2002-2004</b>	0.0020		0.0008

\* Sample values are selected from midpoint of age group.

# RATES OF PRE-RETIREMENT MORTALITY SLEP FEMALES



**POST-RETIREMENT MORTALITY – MALES  
(ORIGINAL RETIREES; NON DISABLED CASES)**

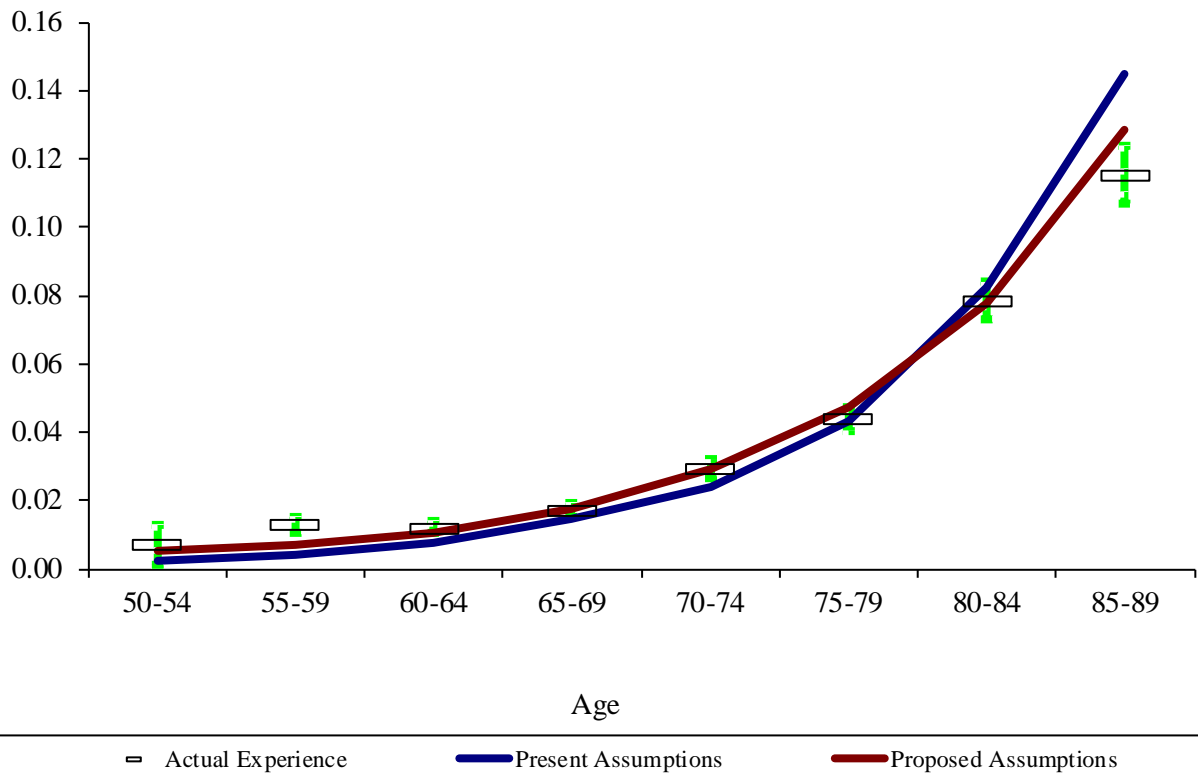
There were more deaths than expected among retired males. The current rates are based on static projection for future improvements in mortality. The proposed rates represent the recommended base table only. Margin for future improvements in mortality will be built into the ‘fully generational’ projection which cannot be displayed in a table with this format.

Age	Deaths	Exposure	Actual Rates Weighted by		Sample Rates*		Expected Deaths	
			Population	Liability	Present	Proposed	Present	Proposed
50-54	6	835	0.007186	0.002721	0.002137	0.005370	2	5
55-59	119	9,220	0.012907	0.009704	0.003997	0.007172	39	68
60-64	203	16,786	0.012093	0.009468	0.007768	0.010708	136	184
65-69	302	17,588	0.017171	0.015140	0.014849	0.017698	258	312
70-74	439	14,978	0.029310	0.026787	0.024197	0.028960	361	429
75-79	525	11,981	0.043819	0.041843	0.043326	0.047391	519	563
80-84	704	8,973	0.078458	0.069717	0.082250	0.077829	728	694
85-89	638	5,527	0.115433	0.105221	0.144739	0.128403	780	693
90-94	392	1,977	0.198280	0.194229	0.244768	0.207113	456	389
95-99	112	350	0.320000	0.299866	0.345700	0.291004	116	97
100-104	7	30	0.233333	0.225511	0.446022	0.384058	13	11
105 & over	-	-	0.000000	0.000000	0.480000	0.470810	-	-
Totals	3,447	88,245	0.039062	0.020607	0.038620	0.039039	3,408	3,445

	<u>Actual</u>	<u>Liability</u>	<u>Proposed</u>
<b>Current</b>	0.0391	0.0206	0.0390
<b>Previous Investigation Results</b>	0.0424	0.0226	0.0402
<b>2005-2007</b>	0.0461	0.0250	0.0426
<b>2002-2004</b>	0.0456		0.0428

\* Sample values are selected from midpoint of age group.

## RATES OF POST-RETIREMENT MORTALITY – MALES (ORIGINAL RETIREES; NON DISABLED CASES)



**POST-RETIREMENT MORTALITY – FEMALES  
(ORIGINAL RETIREES; NON DISABLED CASES)**

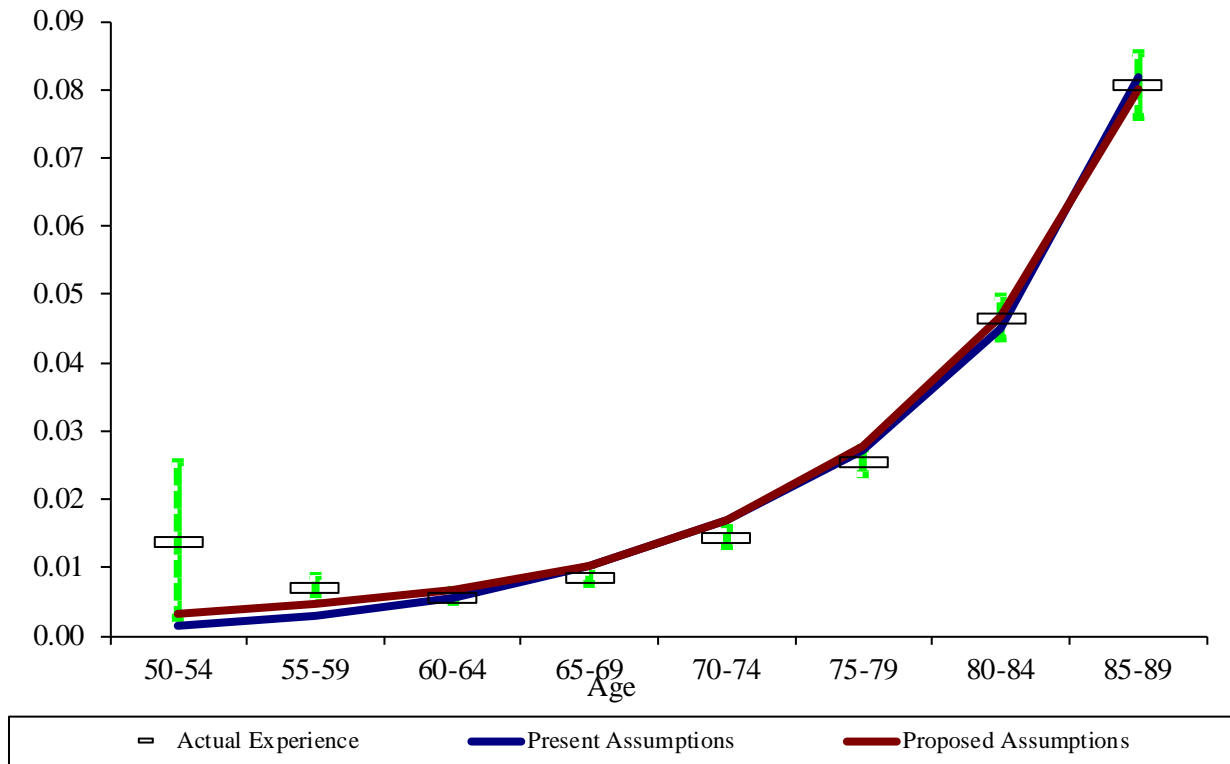
There were more deaths than expected among retired females. The current rates are based on static projection for future improvements in mortality. The proposed rates represent the recommended base table only. Margin for future improvements in mortality will be built into the ‘fully generational’ projection which cannot be displayed in a table with this format.

Age	Deaths	Exposure	Actual Rates Weighted by		Sample Rates*		Expected Deaths	
			Population	Liability	Present	Proposed	Present	Proposed
50-54	6	428	0.014019	0.003252	0.001400	0.003242	1	1
55-59	89	12,243	0.007269	0.006300	0.002894	0.004561	38	58
60-64	169	29,084	0.005811	0.006065	0.005540	0.006670	170	200
65-69	317	36,793	0.008616	0.007859	0.010123	0.010371	375	385
70-74	452	31,202	0.014486	0.013888	0.016856	0.016850	523	525
75-79	618	24,183	0.025555	0.023851	0.027264	0.027800	653	670
80-84	898	19,305	0.046516	0.045807	0.045003	0.046621	870	900
85-89	1,054	13,061	0.080698	0.078662	0.081803	0.079957	1,049	1,034
90-94	872	6,167	0.141398	0.139821	0.136552	0.136221	815	808
95-99	409	1,557	0.262685	0.279801	0.194098	0.211904	287	312
100-104	62	157	0.394904	0.387671	0.234138	0.308330	35	46
105 & over	3	9	0.333333	0.419524	0.296907	0.406741	2	3
Totals	4,949	174,189	0.028412	0.016350	0.027660	0.028371	4,818	4,942

	<u>Actual</u>	<u>Liability</u>	<u>Proposed</u>
<b>Current</b>	0.0284	0.0164	0.0284
<b>Previous Investigation Results</b>	0.0292	0.0175	0.0278
<b>2005-2007</b>	0.0301	0.0183	0.0269
<b>2002-2004</b>	0.0255		0.0238

\* Sample values are selected from midpoint of age group.

## RATES OF POST-RETIREMENT MORTALITY – FEMALES (ORIGINAL RETIREES; NON DISABLED CASES)





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COMPLETE LISTS OF PROPOSED DECREMENT  
ASSUMPTIONS

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## PROPOSED RETIREMENT RATES – TIER 1 ONLY

Age	Regular				SLEP		ECO Regular		ECO SLEP	
	Male		Female		Male	Female	Male	Female	Male	Female
	Normal	Early	Normal	Early	Normal		Normal		Normal	
50					0.2300	0.2300			0.2300	0.2300
51					0.1800	0.1800			0.1800	0.1800
52					0.1300	0.1300			0.1300	0.1300
53					0.0800	0.0800			0.0800	0.0800
54					0.2300	0.2300			0.2300	0.2300
55	0.3300	0.0725	0.2700	0.0575	0.2300	0.2300	0.2500	0.2500	0.2300	0.2300
56	0.2500	0.0725	0.2000	0.0575	0.1800	0.1800	0.2500	0.2500	0.1800	0.1800
57	0.2500	0.0725	0.2000	0.0575	0.2300	0.2300	0.2000	0.2000	0.2300	0.2300
58	0.2500	0.0725	0.2000	0.0575	0.3300	0.3300	0.2000	0.2000	0.3300	0.3300
59	0.2500	0.0725	0.2000	0.0575	0.1300	0.1300	0.2000	0.2000	0.1300	0.1300
60	0.1200		0.1000		0.0800	0.0800	0.0500	0.0500	0.0800	0.0800
61	0.1200		0.1000		0.0800	0.0800	0.0500	0.0500	0.0800	0.0800
62	0.2200		0.1800		0.2300	0.2300	0.1000	0.1000	0.2300	0.2300
63	0.2000		0.1800		0.1800	0.1800	0.1500	0.1500	0.1800	0.1800
64	0.2000		0.1800		0.1800	0.1800	0.1500	0.1500	0.1800	0.1800
65	0.2500		0.2500		0.2300	0.2300	0.1500	0.1500	0.2300	0.2300
66	0.3000		0.2500		0.2300	0.2300	0.1300	0.1300	0.2300	0.2300
67	0.2500		0.2500		0.2300	0.2300	0.1300	0.1300	0.2300	0.2300
68	0.2000		0.2000		0.2300	0.2300	0.1300	0.1300	0.2300	0.2300
69	0.2000		0.2000		0.2300	0.2300	0.1300	0.1300	0.2300	0.2300
70	0.2000		0.2000		1.0000	1.0000	0.1300	0.1300	1.0000	1.0000
71	0.2000		0.2000		1.0000	1.0000	0.1300	0.1300	1.0000	1.0000
72	0.2000		0.2000		1.0000	1.0000	0.1300	0.1300	1.0000	1.0000
73	0.2000		0.2000		1.0000	1.0000	0.1300	0.1300	1.0000	1.0000
74	0.2000		0.2000		1.0000	1.0000	0.1300	0.1300	1.0000	1.0000
75	0.2000		0.2000		1.0000	1.0000	0.1300	0.1300	1.0000	1.0000
76	0.2000		0.2000		1.0000	1.0000	0.1300	0.1300	1.0000	1.0000
77	0.2000		0.2000		1.0000	1.0000	0.1300	0.1300	1.0000	1.0000
78	0.2000		0.2000		1.0000	1.0000	0.1300	0.1300	1.0000	1.0000
79	0.2000		0.2000		1.0000	1.0000	0.1300	0.1300	1.0000	1.0000
80+	1.0000		1.0000		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

## PROPOSED RETIREMENT RATES – TIER 2 ONLY

Age	Regular						SLEP					
	Male			Female			Male			Female		
	Normal Service		Early	Normal Service		Early	Normal		Early	Normal		Early
	Service less than 30 years	Between 30 and 35 years	Service 35 years or more	Service less than 30 years	Between 30 and 35 years	Service 35 years or more	Service Less than 30 Years	Service 30 Years or More		Service Less than 30 Years	Service 30 Years or More	
50									0.1200			0.1200
51									0.0900			0.0900
52									0.0700			0.0700
53									0.0400			0.0400
54									0.1200			0.1200
55							0.6000	0.8000		0.6000	0.8000	
56							0.1800	0.5500		0.1800	0.5500	
57							0.2300	0.5500		0.2300	0.5500	
58							0.3300	0.5500		0.3300	0.5500	
59							0.1300	0.5500		0.1300	0.5500	
60							0.0800	0.5500		0.0800	0.5500	
61							0.0800	0.5500		0.0800	0.5500	
62			0.7500	0.1500		0.7500	0.1300	0.2300	0.5500	0.2300	0.5500	
63			0.7500	0.1500		0.7500	0.1300	0.1800	0.5500	0.1800	0.5500	
64			0.7500	0.1500		0.7500	0.1300	0.1800	0.5500	0.1800	0.5500	
65			0.7500	0.1500		0.7500	0.1300	0.2300	0.5500	0.2300	0.5500	
66			0.7500	0.1500		0.7500	0.1300	0.2300	0.5500	0.2300	0.5500	
67	0.3000	0.5000	0.7500		0.2500	0.5000	0.7500	0.2300	0.5500	0.2300	0.5500	
68	0.3000	0.5000	0.7500		0.2500	0.5000	0.7500	0.2300	0.5500	0.2300	0.5500	
69	0.2500	0.5000	0.7500		0.2000	0.5000	0.7500	0.2300	0.5500	0.2300	0.5500	
70	0.2000	0.5000	0.7500		0.1800	0.5000	0.7500	1.0000	1.0000	1.0000	1.0000	
71	0.2000	0.5000	0.7500		0.1800	0.5000	0.7500	1.0000	1.0000	1.0000	1.0000	
72	0.2000	0.5000	0.7500		0.1800	0.5000	0.7500	1.0000	1.0000	1.0000	1.0000	
73	0.1800	0.5000	0.7500		0.1800	0.5000	0.7500	1.0000	1.0000	1.0000	1.0000	
74	0.1800	0.5000	0.7500		0.1800	0.5000	0.7500	1.0000	1.0000	1.0000	1.0000	
75	0.1800	0.5000	0.7500		0.1800	0.5000	0.7500	1.0000	1.0000	1.0000	1.0000	
76	0.1800	0.5000	0.7500		0.1800	0.5000	0.7500	1.0000	1.0000	1.0000	1.0000	
77	0.1800	0.5000	0.7500		0.1800	0.5000	0.7500	1.0000	1.0000	1.0000	1.0000	
78	0.1800	0.5000	0.7500		0.1800	0.5000	0.7500	1.0000	1.0000	1.0000	1.0000	
79	0.1800	0.5000	0.7500		0.1800	0.5000	0.7500	1.0000	1.0000	1.0000	1.0000	
80+	1.0000	1.0000	1.0000		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	

## PROPOSED WITHDRAWAL RATES – TIER 1 & 2

Service	Regular Rates		SLEP Rates		ECO Rates		ECO-SLEP Rates	
	Less than		Less Than		Less Than		Less Than	
	8 Years of Service		7 Years of Service		8 Years of Service		7 Years of Service	
	Male	Female	Male	Female	Male	Female	Male	Female
1	0.2450	0.2900	0.1800	0.1800	0.2000	0.1500	0.1800	0.1800
2	0.1900	0.2200	0.1000	0.1000	0.1200	0.1000	0.1000	0.1000
3	0.1450	0.1700	0.0650	0.0650	0.1000	0.0800	0.0650	0.0650
4	0.1200	0.1300	0.0600	0.0600	0.0900	0.0700	0.0600	0.0600
5	0.0950	0.1100	0.0470	0.0470	0.0800	0.0600	0.0470	0.0470
6	0.0800	0.0900	0.0350	0.0350	0.0700	0.0500	0.0350	0.0350
7	0.0700	0.0750	0.0330	0.0330	0.0600	0.0400	0.0330	0.0330
8	0.0650	0.0700			0.0550	0.0350		

Age	8 or More		7 or More		8 or More		7or More	
	Years of Service		Years of Service		Years of Service		Years of Service	
	Male	Female	Male	Female	Male	Female	Male	Female
25 & under	0.0490	0.0620	0.0250	0.0250	0.0600	0.0320	0.0250	0.0250
26	0.0490	0.0620	0.0250	0.0250	0.0600	0.0320	0.0250	0.0250
27	0.0490	0.0620	0.0250	0.0250	0.0600	0.0320	0.0250	0.0250
28	0.0464	0.0616	0.0240	0.0240	0.0600	0.0320	0.0240	0.0240
29	0.0438	0.0612	0.0230	0.0230	0.0600	0.0320	0.0230	0.0230
30	0.0412	0.0608	0.0220	0.0220	0.0600	0.0320	0.0220	0.0220
31	0.0386	0.0604	0.0210	0.0210	0.0600	0.0320	0.0210	0.0210
32	0.0360	0.0600	0.0200	0.0200	0.0600	0.0320	0.0200	0.0200
33	0.0346	0.0570	0.0190	0.0190	0.0600	0.0320	0.0190	0.0190
34	0.0332	0.0540	0.0180	0.0180	0.0600	0.0320	0.0180	0.0180
35	0.0318	0.0510	0.0170	0.0170	0.0600	0.0320	0.0170	0.0170
36	0.0304	0.0480	0.0160	0.0160	0.0600	0.0320	0.0160	0.0160
37	0.0290	0.0450	0.0150	0.0150	0.0600	0.0320	0.0150	0.0150
38	0.0280	0.0430	0.0150	0.0150	0.0600	0.0320	0.0150	0.0150
39	0.0270	0.0410	0.0150	0.0150	0.0600	0.0320	0.0150	0.0150
40	0.0260	0.0390	0.0150	0.0150	0.0600	0.0320	0.0150	0.0150
41	0.0250	0.0370	0.0150	0.0150	0.0600	0.0320	0.0150	0.0150
42	0.0240	0.0350	0.0150	0.0150	0.0600	0.0320	0.0150	0.0150
43	0.0232	0.0344	0.0150	0.0150	0.0600	0.0320	0.0150	0.0150
44	0.0224	0.0338	0.0150	0.0150	0.0600	0.0320	0.0150	0.0150
45	0.0216	0.0332	0.0150	0.0150	0.0600	0.0320	0.0150	0.0150
46	0.0208	0.0326	0.0150	0.0150	0.0600	0.0320	0.0150	0.0150
47	0.0200	0.0320	0.0150	0.0150	0.0600	0.0320	0.0150	0.0150
48	0.0198	0.0308	0.0150	0.0150	0.0600	0.0320	0.0150	0.0150
49	0.0196	0.0296	0.0150	0.0150	0.0600	0.0320	0.0150	0.0150
50	0.0194	0.0284	0.0150	0.0150	0.0600	0.0320	0.0150	0.0150
51	0.0192	0.0272	0.0150	0.0150	0.0600	0.0320	0.0150	0.0150
52	0.0190	0.0260	0.0150	0.0150	0.0600	0.0320	0.0150	0.0150
53	0.0190	0.0260	0.0148	0.0148	0.0600	0.0320	0.0148	0.0148
54	0.0190	0.0260	0.0146	0.0146	0.0600	0.0320	0.0146	0.0146
55	0.0190	0.0260	0.0144	0.0144	0.0600	0.0320	0.0144	0.0144
56	0.0190	0.0260	0.0142	0.0142	0.0600	0.0320	0.0142	0.0142
57	0.0190	0.0260	0.0140	0.0140	0.0600	0.0320	0.0140	0.0140
58	0.0190	0.0260	0.0140	0.0140	0.0600	0.0320	0.0140	0.0140
59	0.0190	0.0260	0.0140	0.0140	0.0600	0.0320	0.0140	0.0140
60+	0.0190	0.0260	0.0140	0.0140	0.0600	0.0320	0.0140	0.0140

## PROPOSED DISABILITY RATES - REGULAR & SLEP- TIER 1 & 2

Age	Regular		SLEP		Age	Regular		SLEP	
	Male	Female	Male	Female		Male	Female	Male	Female
21	0.0000	0.0000	0.0001	0.0002	51	0.0006	0.0003	0.0009	0.0023
22	0.0000	0.0000	0.0001	0.0002	52	0.0006	0.0003	0.0010	0.0024
23	0.0000	0.0000	0.0001	0.0002	53	0.0007	0.0003	0.0010	0.0026
24	0.0000	0.0000	0.0001	0.0002	54	0.0007	0.0004	0.0011	0.0028
25	0.0000	0.0000	0.0001	0.0003	55	0.0008	0.0004	0.0012	0.0029
26	0.0000	0.0000	0.0001	0.0003	56	0.0009	0.0004	0.0013	0.0032
27	0.0000	0.0000	0.0002	0.0004	57	0.0009	0.0004	0.0013	0.0033
28	0.0000	0.0000	0.0002	0.0004	58	0.0010	0.0005	0.0012	0.0031
29	0.0000	0.0000	0.0002	0.0005	59	0.0010	0.0006	0.0011	0.0029
30	0.0001	0.0000	0.0002	0.0005	60	0.0010	0.0007	0.0011	0.0027
31	0.0001	0.0000	0.0002	0.0005	61	0.0011	0.0008	0.0010	0.0025
32	0.0001	0.0000	0.0002	0.0005	62	0.0011	0.0008	0.0009	0.0023
33	0.0001	0.0001	0.0002	0.0006	63	0.0011	0.0008	0.0008	0.0021
34	0.0001	0.0001	0.0002	0.0006	64	0.0011	0.0008	0.0008	0.0020
35	0.0001	0.0001	0.0003	0.0007	65	0.0011	0.0008	0.0007	0.0018
36	0.0001	0.0001	0.0003	0.0007	66	0.0011	0.0008	0.0007	0.0017
37	0.0002	0.0001	0.0003	0.0008	67	0.0011	0.0008	0.0006	0.0015
38	0.0002	0.0001	0.0003	0.0008	68	0.0010	0.0008	0.0005	0.0014
39	0.0002	0.0001	0.0004	0.0009	69	0.0010	0.0007	0.0005	0.0012
40	0.0002	0.0001	0.0004	0.0010	70	0.0009	0.0007	0.0004	0.0011
41	0.0002	0.0001	0.0004	0.0011	71	0.0009	0.0006	0.0004	0.0009
42	0.0003	0.0001	0.0005	0.0011	72	0.0008	0.0006	0.0003	0.0008
43	0.0003	0.0001	0.0005	0.0012	73	0.0008	0.0006	0.0002	0.0006
44	0.0003	0.0001	0.0005	0.0013	74	0.0007	0.0005	0.0002	0.0005
45	0.0003	0.0002	0.0006	0.0014	75	0.0007	0.0005	0.0001	0.0003
46	0.0004	0.0002	0.0006	0.0015	76	0.0006	0.0004	0.0001	0.0002
47	0.0004	0.0002	0.0006	0.0016	77	0.0006	0.0004	0.0000	0.0000
48	0.0004	0.0002	0.0007	0.0017	78	0.0006	0.0004	0.0000	0.0000
49	0.0005	0.0002	0.0008	0.0019	79	0.0006	0.0004	0.0000	0.0000
50	0.0005	0.0003	0.0008	0.0021	80	0.0006	0.0004	0.0000	0.0000

## PROPOSED DISABILITY RATES - ECO & ECO SLEP- TIER 1 & 2

Age	ECO		ECO-SLEP		Age	ECO		ECO-SLEP	
	Male	Female	Male	Female		Male	Female	Male	Female
21	0.0001	0.0001	0.0001	0.0001	51	0.0010	0.0007	0.0010	0.0007
22	0.0001	0.0001	0.0001	0.0001	52	0.0011	0.0008	0.0011	0.0008
23	0.0001	0.0001	0.0001	0.0001	53	0.0012	0.0008	0.0012	0.0008
24	0.0001	0.0001	0.0001	0.0001	54	0.0013	0.0009	0.0013	0.0009
25	0.0001	0.0001	0.0001	0.0001	55	0.0015	0.0010	0.0015	0.0010
26	0.0001	0.0001	0.0001	0.0001	56	0.0016	0.0010	0.0016	0.0010
27	0.0001	0.0001	0.0001	0.0001	57	0.0017	0.0011	0.0017	0.0011
28	0.0001	0.0001	0.0001	0.0001	58	0.0018	0.0013	0.0018	0.0013
29	0.0001	0.0001	0.0001	0.0001	59	0.0018	0.0015	0.0018	0.0015
30	0.0001	0.0001	0.0001	0.0001	60	0.0019	0.0017	0.0019	0.0017
31	0.0001	0.0001	0.0001	0.0001	61	0.0019	0.0019	0.0019	0.0019
32	0.0002	0.0001	0.0002	0.0001	62	0.0020	0.0020	0.0020	0.0020
33	0.0002	0.0001	0.0002	0.0001	63	0.0020	0.0020	0.0020	0.0020
34	0.0002	0.0001	0.0002	0.0001	64	0.0020	0.0020	0.0020	0.0020
35	0.0003	0.0002	0.0003	0.0002	65	0.0020	0.0020	0.0020	0.0020
36	0.0003	0.0002	0.0003	0.0002	66	0.0020	0.0020	0.0020	0.0020
37	0.0003	0.0002	0.0003	0.0002	67	0.0020	0.0020	0.0020	0.0020
38	0.0003	0.0002	0.0003	0.0002	68	0.0019	0.0019	0.0019	0.0019
39	0.0004	0.0002	0.0004	0.0002	69	0.0018	0.0018	0.0018	0.0018
40	0.0004	0.0003	0.0004	0.0003	70	0.0017	0.0017	0.0017	0.0017
41	0.0004	0.0003	0.0004	0.0003	71	0.0016	0.0016	0.0016	0.0016
42	0.0005	0.0003	0.0005	0.0003	72	0.0015	0.0015	0.0015	0.0015
43	0.0005	0.0003	0.0005	0.0003	73	0.0014	0.0014	0.0014	0.0014
44	0.0006	0.0004	0.0006	0.0004	74	0.0013	0.0013	0.0013	0.0013
45	0.0006	0.0004	0.0006	0.0004	75	0.0012	0.0012	0.0012	0.0012
46	0.0007	0.0004	0.0007	0.0004	76	0.0011	0.0011	0.0011	0.0011
47	0.0007	0.0004	0.0007	0.0004	77	0.0010	0.0010	0.0010	0.0010
48	0.0008	0.0005	0.0008	0.0005	78	0.0010	0.0010	0.0010	0.0010
49	0.0009	0.0006	0.0009	0.0006	79	0.0010	0.0010	0.0010	0.0010
50	0.0009	0.0006	0.0009	0.0006	80	0.0010	0.0010	0.0010	0.0010

## PROPOSED PAY INCREASES – REGULAR AND ECO– TIER 1 & 2

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<b>% Increase in Pay Next Year</b>					
<b>5 or More Years Service</b>				<b>Less Than 5 Years of Service</b>	
<b>Age</b>	<b>Merit &amp; Longevity</b>	<b>Economic</b>	<b>Total</b>	<b>Service</b>	<b>% Increase</b>
25	2.00%	3.50%	5.50%	0	7.00%
30	1.70%	3.50%	5.20%	1	5.50%
35	1.20%	3.50%	4.70%	2	3.25%
40	0.88%	3.50%	4.38%	3	2.50%
45	0.68%	3.50%	4.18%	4	2.00%
50	0.54%	3.50%	4.04%		
55	0.38%	3.50%	3.88%		
60	0.27%	3.50%	3.77%		

## PROPOSED PAY INCREASES - SLEP & ECO SLEP- TIER 1 & 2

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<b>% Increase in Pay Next Year</b>			
<b>Years of Service</b>			
<b>Service</b>	<b>Economic</b>	<b>Merit and Longevity</b>	<b>% Total Increase</b>
1	3.50%	11.00%	14.50%
2	3.50%	8.50%	12.00%
3	3.50%	4.00%	7.50%
4	3.50%	3.50%	7.00%
5	3.50%	3.00%	6.50%
6	3.50%	2.50%	6.00%
7	3.50%	2.00%	5.50%
8	3.50%	1.50%	5.00%
9	3.50%	1.25%	4.75%
10	3.50%	1.00%	4.50%
11	3.50%	0.75%	4.25%
12	3.50%	0.75%	4.25%
13	3.50%	0.50%	4.00%
14	3.50%	0.50%	4.00%
15	3.50%	0.50%	4.00%
16	3.50%	0.50%	4.00%
17	3.50%	0.50%	4.00%
18	3.50%	0.50%	4.00%
19	3.50%	0.50%	4.00%
20	3.50%	0.50%	4.00%
21	3.50%	0.50%	4.00%
22	3.50%	0.50%	4.00%
23	3.50%	0.50%	4.00%
24	3.50%	0.50%	4.00%
25	3.50%	0.50%	4.00%
26	3.50%	0.50%	4.00%
27	3.50%	0.50%	4.00%
28	3.50%	0.50%	4.00%
29	3.50%	0.50%	4.00%
30	3.50%	0.50%	4.00%



## PROPOSED PRE-RETIREMENT MORTALITY RATES – TIER 1 & 2

Sample Ages	% Dying				Sample Ages	% Dying			
	Regular & ECO		SLEP & ECO SLEP			Regular & ECO		SLEP & ECO SLEP	
	Male	Female	Male	Female		Male	Female	Male	Female
20	0.04%	0.01%	0.05%	0.01%	50	0.15%	0.09%	0.21%	0.09%
21	0.04%	0.01%	0.06%	0.01%	51	0.16%	0.10%	0.23%	0.10%
22	0.04%	0.01%	0.06%	0.01%	52	0.18%	0.11%	0.26%	0.11%
23	0.04%	0.01%	0.06%	0.01%	53	0.20%	0.12%	0.29%	0.12%
24	0.05%	0.01%	0.06%	0.01%	54	0.22%	0.13%	0.32%	0.13%
25	0.04%	0.01%	0.06%	0.01%	55	0.25%	0.14%	0.35%	0.14%
26	0.04%	0.01%	0.06%	0.01%	56	0.27%	0.15%	0.38%	0.15%
27	0.04%	0.02%	0.06%	0.02%	57	0.30%	0.16%	0.43%	0.16%
28	0.04%	0.02%	0.06%	0.02%	58	0.33%	0.17%	0.47%	0.17%
29	0.04%	0.02%	0.06%	0.02%	59	0.37%	0.19%	0.53%	0.19%
30	0.04%	0.02%	0.06%	0.02%	60	0.41%	0.20%	0.59%	0.20%
31	0.04%	0.02%	0.06%	0.02%	61	0.46%	0.22%	0.66%	0.22%
32	0.04%	0.02%	0.06%	0.02%	62	0.52%	0.23%	0.73%	0.23%
33	0.04%	0.02%	0.06%	0.02%	63	0.58%	0.26%	0.82%	0.26%
34	0.04%	0.02%	0.06%	0.02%	64	0.65%	0.28%	0.92%	0.28%
35	0.05%	0.02%	0.07%	0.02%	65	0.73%	0.30%	1.03%	0.30%
36	0.05%	0.02%	0.07%	0.02%	66	0.81%	0.34%	1.15%	0.34%
37	0.05%	0.03%	0.07%	0.03%	67	0.90%	0.38%	1.27%	0.38%
38	0.05%	0.03%	0.07%	0.03%	68	0.99%	0.42%	1.41%	0.42%
39	0.05%	0.03%	0.07%	0.03%	69	1.10%	0.46%	1.56%	0.46%
40	0.06%	0.03%	0.08%	0.03%	70	1.22%	0.52%	1.73%	0.52%
41	0.06%	0.04%	0.08%	0.04%	71	1.35%	0.58%	1.92%	0.58%
42	0.06%	0.04%	0.09%	0.04%	72	1.50%	0.64%	2.13%	0.64%
43	0.07%	0.04%	0.10%	0.04%	73	1.66%	0.71%	2.36%	0.71%
44	0.08%	0.05%	0.11%	0.05%	74	1.84%	0.79%	2.61%	0.79%
45	0.09%	0.05%	0.12%	0.05%	75	2.04%	0.88%	2.90%	0.88%
46	0.10%	0.06%	0.14%	0.06%	76	2.26%	0.98%	3.21%	0.98%
47	0.11%	0.07%	0.15%	0.07%	77	2.51%	1.09%	3.56%	1.09%
48	0.12%	0.07%	0.17%	0.07%	78	2.78%	1.22%	3.95%	1.22%
49	0.13%	0.08%	0.19%	0.08%	79	3.08%	1.35%	4.38%	1.35%

## PROPOSED MORTALITY RATES – TIER 1 & 2

Sample Ages	% Dying Next Year				Sample Ages	% Dying Next Year			
	Non-Disabled Lives		Disabled Lives			Non-Disabled Lives		Disabled Lives	
	Males	Females	Males	Females		Males	Females	Males	Females
40	0.2271%	0.1186%	1.5183%	0.6516%	70	2.3818%	1.3826%	4.8812%	2.7921%
41	0.2483%	0.1303%	1.6441%	0.7017%	71	2.6260%	1.5257%	5.1903%	2.9977%
42	0.2708%	0.1429%	1.7665%	0.7527%	72	2.8960%	1.6850%	5.5256%	3.2265%
43	0.2943%	0.1563%	1.8821%	0.8045%	73	3.1943%	1.8618%	5.8873%	3.4797%
44	0.3186%	0.1708%	1.9886%	0.8569%	74	3.5244%	2.0575%	6.2787%	3.7582%
45	0.3436%	0.1862%	2.0850%	0.9099%	75	3.8891%	2.2741%	6.7010%	4.0635%
46	0.3693%	0.2027%	2.1703%	0.9633%	76	4.2926%	2.5139%	7.1585%	4.3969%
47	0.3953%	0.2202%	2.2430%	1.0170%	77	4.7391%	2.7800%	7.6557%	4.7597%
48	0.4220%	0.2388%	2.3042%	1.0709%	78	5.2326%	3.0763%	8.1958%	5.1538%
49	0.4491%	0.2585%	2.3542%	1.1248%	79	5.7772%	3.4074%	8.7830%	5.5808%
50	0.4771%	0.2794%	2.3941%	1.1788%	80	6.3803%	3.7782%	9.4261%	6.0426%
51	0.5059%	0.3015%	2.4254%	1.2326%	81	7.0459%	4.1944%	10.1285%	6.5413%
52	0.5370%	0.3242%	2.4532%	1.2849%	82	7.7829%	4.6621%	10.9003%	7.0791%
53	0.5713%	0.3479%	2.4634%	1.3359%	83	8.5988%	5.1873%	11.7482%	7.6583%
54	0.6044%	0.3725%	2.4719%	1.3852%	84	9.5059%	5.7765%	12.6852%	8.2815%
55	0.6383%	0.3985%	2.4866%	1.4334%	85	10.5069%	6.4361%	13.7102%	8.9516%
56	0.6752%	0.4261%	2.5133%	1.4808%	86	11.6141%	7.1732%	14.8340%	9.6717%
57	0.7172%	0.4561%	2.5572%	1.5285%	87	12.8403%	7.9957%	16.0676%	10.4455%
58	0.7662%	0.4892%	2.6208%	1.5772%	88	14.1910%	8.9130%	17.4113%	11.2770%
59	0.8243%	0.5262%	2.7051%	1.6283%	89	15.6778%	9.9352%	18.8721%	12.1710%
60	0.8935%	0.5678%	2.8111%	1.6829%	90	17.3116%	11.0746%	20.4562%	13.1325%
61	0.9753%	0.6146%	2.9379%	1.7427%	91	19.0054%	12.3080%	22.0193%	14.1986%
62	1.0708%	0.6670%	3.0845%	1.8090%	92	20.7113%	13.6221%	23.5576%	15.3634%
63	1.1810%	0.7255%	3.2498%	1.8838%	93	22.3972%	15.0080%	25.0651%	16.6211%
64	1.3060%	0.7907%	3.4322%	1.9685%	94	24.0471%	16.4606%	26.5374%	17.9659%
65	1.4457%	0.8638%	3.6312%	2.0651%	95	25.6474%	17.9768%	27.9623%	19.3921%
66	1.6005%	0.9455%	3.8464%	2.1756%	96	27.3726%	19.5542%	29.5257%	20.8939%
67	1.7698%	1.0371%	4.0768%	2.3018%	97	29.1004%	21.1904%	31.0877%	22.4654%
68	1.9553%	1.1397%	4.3250%	2.4455%	98	30.8474%	22.9671%	32.6646%	24.1009%
69	2.1589%	1.2544%	4.5931%	2.6085%	99	32.5983%	24.8612%	34.2449%	25.7945%
					100	34.4364%	26.8149%	35.8324%	27.5407%
					101	36.4420%	28.8130%	37.4241%	29.3334%
					102	38.4058%	30.8330%	39.0242%	31.1671%
					103	40.3188%	32.8581%	40.6416%	33.0357%
					104	42.1533%	34.8710%	42.2650%	34.9336%
					105	43.8903%	36.8550%	43.8903%	36.8550%
					106	45.5492%	38.7941%	45.5492%	38.7941%
					107	47.0810%	40.6741%	47.0810%	40.6741%
					108	48.4965%	42.4821%	48.4965%	42.4821%
					109	49.8023%	44.2079%	49.8023%	44.2079%
					110	50.9768%	45.8430%	50.9768%	45.8430%

December 10, 2014

Mr. Mark Nannini  
Chief Financial Officer  
Illinois Municipal Retirement Fund  
2211 York Road - Suite 500  
Oak Brook, Illinois 60523-2374

**Re: Triennial Experience Study**

Dear Mark:

Enclosed are 5 copies of the 2011 – 2013 Experience Study.

Sincerely,

A handwritten signature in black ink that reads "Mark Buis". The signature is written in a cursive, slightly slanted style.

Mark Buis, FSA, EA, MAAA

MB:mr  
Enclosures