

REPORT ON THE RESULTS OF
AN EXPERIENCE STUDY OF THE
VERMONT STATE EMPLOYEES' RETIREMENT SYSTEM

Covering the period July 1, 2005, through June 30, 2010

May 11, 2011

Board of Trustees
Vermont State Employees' Retirement System
Montpelier, Vermont 05609

Dear Board Members:

Section 471, subsection (j), of Title 16, Chapter 3, of the Vermont Statutes Annotated provides in part that at least once in each five-year period, the actuary is to make a study of the System's recent experience to assist in setting assumptions. In accordance with this provision, the results of our experience study covering the five-year period from July 1, 2005, through June 30, 2010, are described in this report, along with our recommendations for certain modifications in the present assumptions. We have also included a brief section discussing the financial impact of the recommended changes.

This edition of the report is a revision of an earlier version presented to the Board on December 14, 2010. It has been updated to reflect 2011 capital market assumptions in the analysis of the expected rate of return on the System's assets.

The Table of Contents, which immediately follows, outlines the information contained in this report.

This study was prepared under the supervision of David L. Driscoll, with analysis of the rate-of-return and inflation assumptions performed under the supervision of Kai Petersen. We are Fellows of the Society of Actuaries and Members of the American Academy of Actuaries. We meet the Qualification Standards of the Academy to render the actuarial opinions contained herein, and we are available to answer questions concerning them. Additionally, Mr. Petersen is a Chartered Financial Analyst (CFA) Charter holder and has performed the analyses in accordance with the professional standards of the CFA Institute.

Respectfully submitted,



David L. Driscoll, F.S.A., E.A.
Principal and Consulting Actuary



Kai Petersen, F.S.A., C.F.A.
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VERMONT STATE EMPLOYEES' RETIREMENT SYSTEM
REPORT ON THE RESULTS OF AN INVESTIGATION
OF THE ACTUARIAL EXPERIENCE OF THE SYSTEM, 2005 - 2010.

I. INTRODUCTION

In order to accumulate funds to pay retirement benefits on a reasonable and relatively stable basis, the actuary prepares annual valuations of the System's assets and liabilities to measure the funded status and to ensure that the funding pace is adequate to meet the System's obligations.

The primary purpose of funding is to equitably allocate costs between generations of taxpayers and provide security to members, who view the funds set aside as assurance that their benefits will be paid.

While the ultimate cost of the System is not determinable until all benefits are paid and expenses provided for, each actuarial valuation attempts to estimate these costs based on assumptions selected to predict, as accurately as possible, future experience in order to produce stable contribution rates.

Overly conservative or aggressive assumptions will result in actuarial gains or losses each year. When translated into contributions, this will result in decreasing or increasing contribution rates and an inequitable allocation of costs.

The major actuarial assumptions are:

- (a) Active service demographic assumptions,
- (b) Compensation increase assumptions,
- (c) Post-retirement mortality rates,
- (d) Interest rate, and
- (e) Cost-of-living adjustment (COLA) rates.

Before presenting our analysis of the System's experience and discussion of the proposed assumptions, it is important to outline considerations that should govern the selection of actuarial assumptions. The recommendations made by the American Academy of Actuaries may be summarized as follows:

- (i) The actuarial assumptions selected should reflect the actuary's best judgment of future events. They should take into account actual experience to the extent possible, but they should also reflect long-term future trends and not give undue weight to recent past experience.
- (ii) The actuary should consider the impact of inflation in selecting the actuarial assumptions to be used.
- (iii) The actuary should give consideration to the reasonableness of each actuarial assumption independently, as well as to the combined impact of all the assumptions.
- (iv) The actuary should give careful attention to changes in plan design that may significantly alter expected future experience. For example, a liberalization of early retirement benefits may make advisable a revision to the retirement assumption.

- (v) The actuary, in choosing assumptions, should take into account general or specific information available from other sources, including the plan sponsor, plan administrator, investment managers, accountants, economists, etc.

The purpose of this report is to provide the information necessary to decide on the appropriate assumptions to be used in future valuations. It should be noted that these decisions cannot be made "in a vacuum," but must reflect the present and expected situation within the State and the System.

The balance of this report deals in detail with the various assumptions. In each area we have made recommendations as to what we believe are appropriate assumptions. These recommendations reflect our "best estimate" of the likely future experience based on:

- (a) recent past experience;
- (b) general economic views prevailing at this time; and
- (c) anticipated trends.

II. ACTIVE SERVICE DEMOGRAPHIC ASSUMPTIONS

The active service demographic assumptions include rates of:

- (a) Termination
- (b) Disability
- (c) Death before retirement, and
- (d) Retirement.

Our review of active service demographic assumptions are based on the actuarial valuation data for Groups A, D and F combined and separately for Group C. The basis for analysis of the System's experience is a comparison of the actual number of separations from service under each contingency with those anticipated by assumptions currently in use.

The "expected" values are calculated by applying the various rates or probabilities to the individuals exposed to each respective event. For example, active members not yet eligible for early retirement would be exposed to the probabilities of withdrawal, death and disability. A member eligible for early retirement would be exposed to disability, death and early retirement. A member eligible for normal retirement would be exposed to disability, death and normal retirement.

The numerical summaries of the System's experience from July 1, 2005, through June 30, 2010, are presented in Appendix I. The tables show the ratios of the actual experience of the System as compared to that anticipated by the present actuarial assumptions. The results are shown separately by assumption and, where appropriate, by gender.

The ratios of actual to expected experience indicate the extent of deviation from the assumptions. A ratio of 1.0 would mean the experience has been exactly as anticipated.

As an aid to the Trustees in analyzing these results, we have also prepared a series of graphs, which present the statistical data summarized in Appendix I in visual form. Our comments will refer to the graphs, which immediately follow each of the following subsections.

Termination

The graphs that follow present the withdrawal and vesting experience separately for male and female employees. Presently, the assumed probabilities of withdrawal in active service are the same for male and female members.

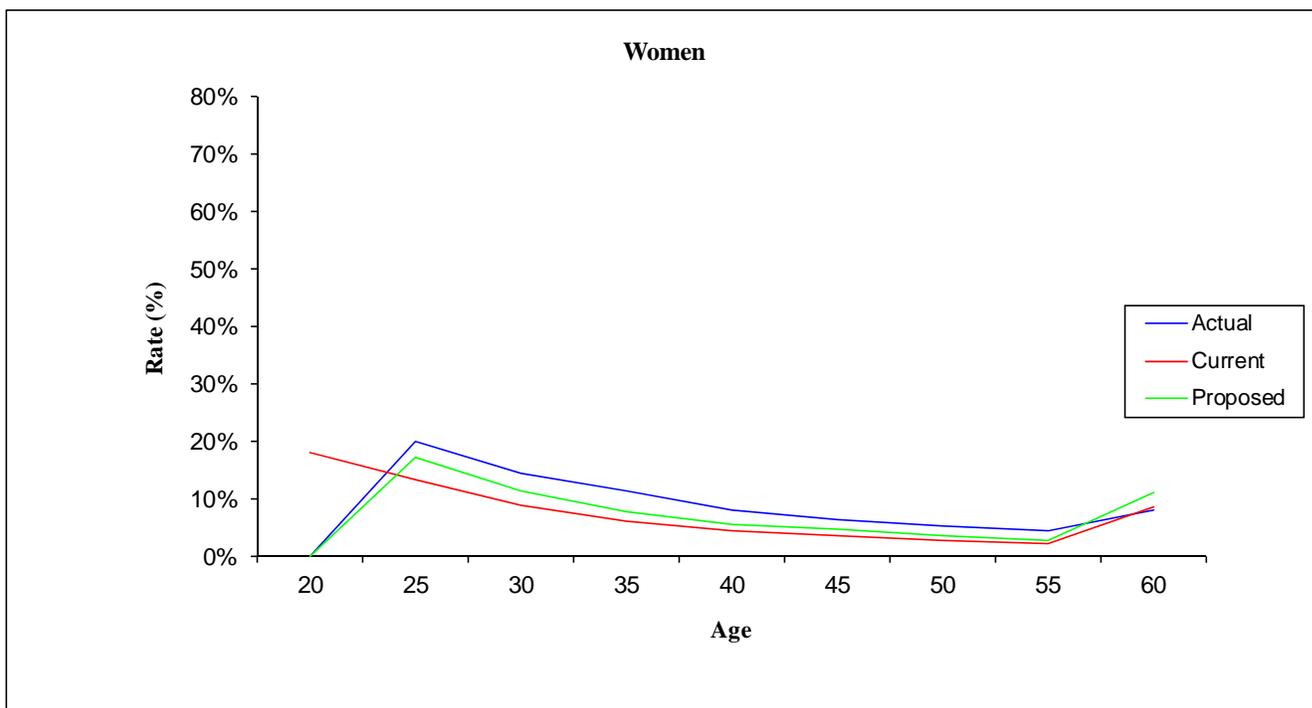
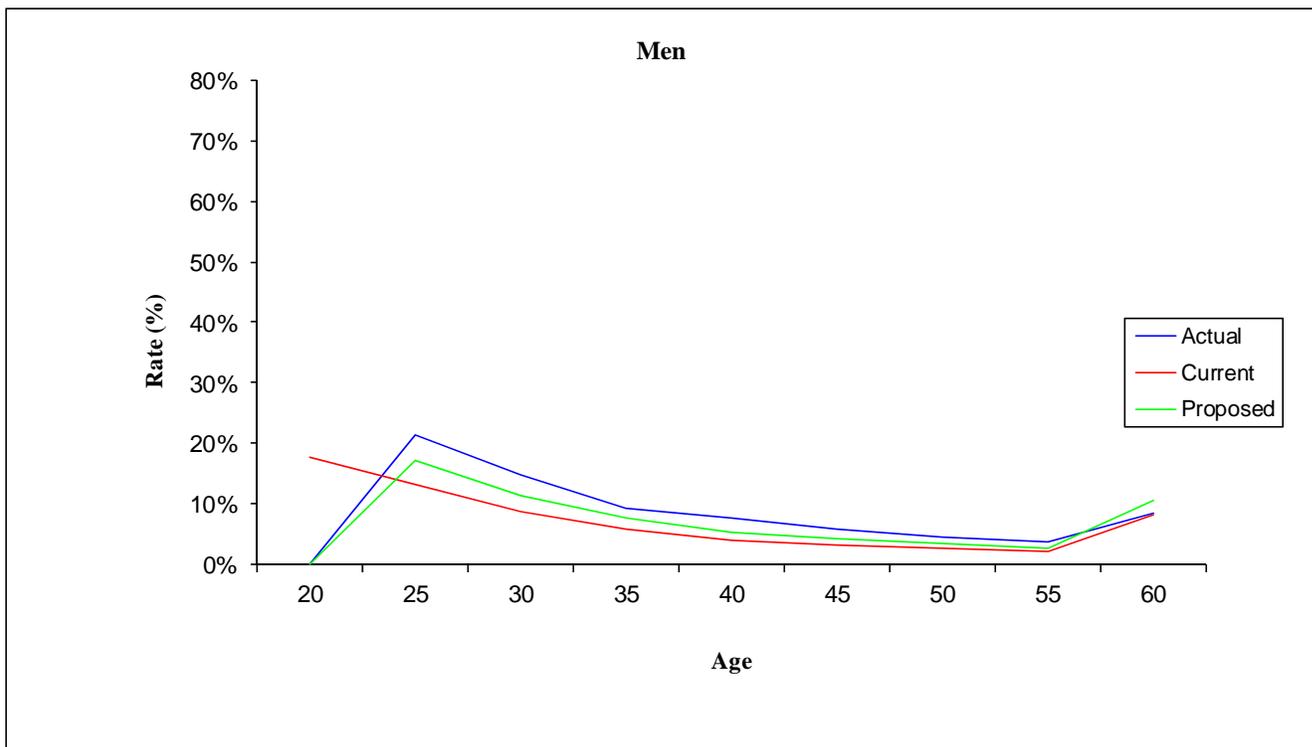
Reviewing the withdrawal and vesting experience for Groups A, D and F, it can be seen that, overall, there are more members leaving before service retirement than expected for both males and females, except for younger members age between 20 to 25. Our analysis also included examination of the incidence of terminations before and after the recent program of position eliminations. We found that the eliminations had a relatively small effect on the overall results of the study.

Since the overall numbers withdrawing prior to meeting eligibility for retirement are above those expected in Groups A, D and F, we recommend that the assumed rates of withdrawal for these groups be increased by 30%.

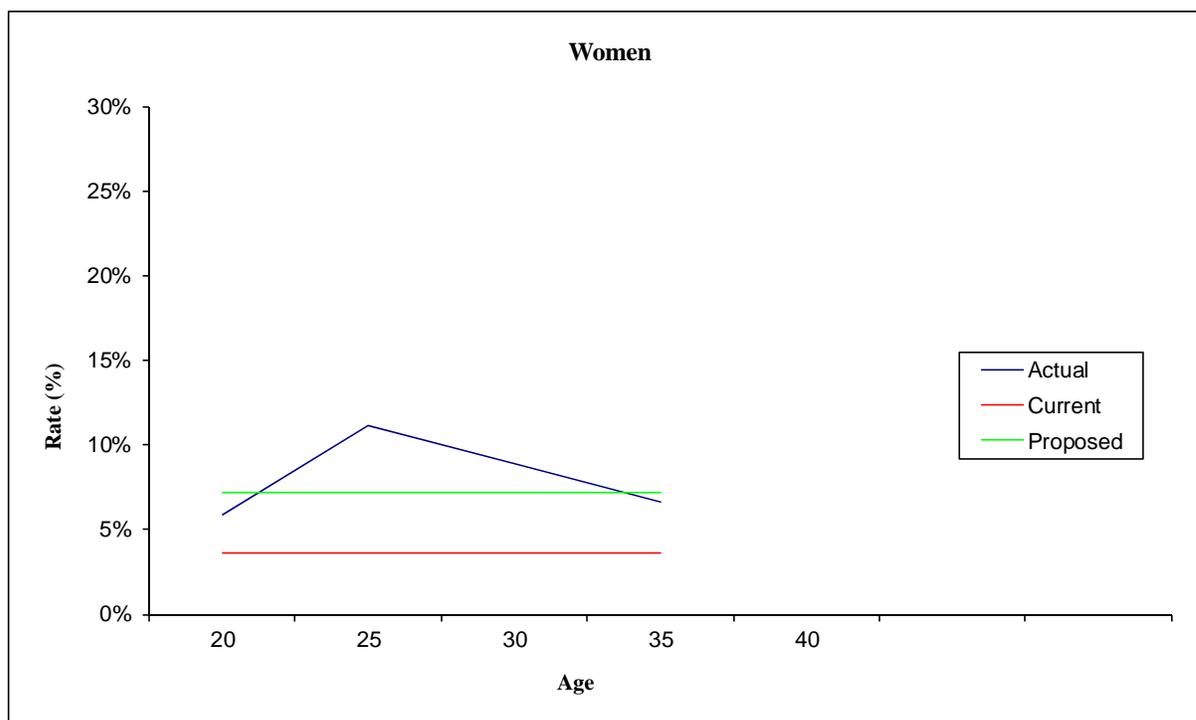
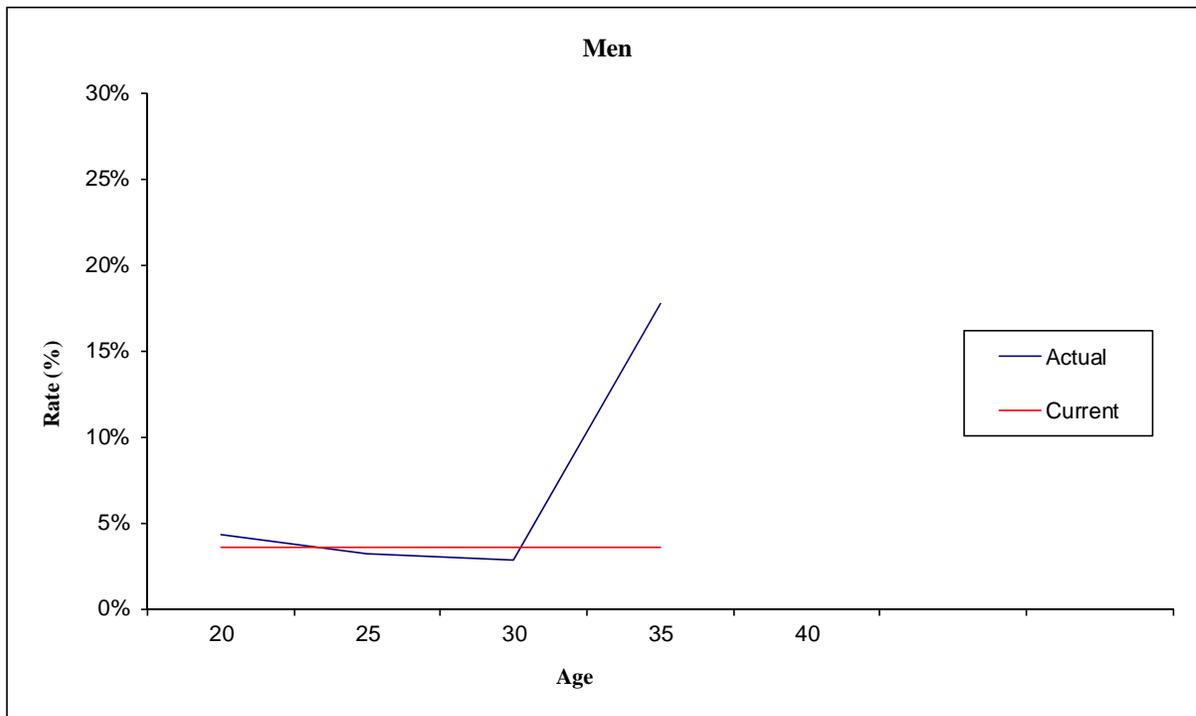
The experience of the last five years indicates that there have been more terminations among Group C female members than were expected under the present assumption. The limited exposure of this group might lead one to be reluctant to make a change in this assumption on the basis of the present evidence. Nonetheless, this is the third experience study to show that actual terminations among the members of this group exceed those assumed, and with the continued growth of this group over the past fifteen years it is prudent to make an upward adjustment in the assumed rates of turnover applied to this group. We recommend a doubling of the withdrawal probabilities applied to Group C female employees.

The following graphs show the current ultimate rate, the actual ultimate rate and (where applicable) the proposed new ultimate rate separately for males and females. The proposed rates are set forth in detail in Appendix II.

**Vermont State Employees' Retirement System
Groups A, D and F
Active Service Experience - Terminations
July 1, 2005 through June 30, 2010**



**Vermont State Employees' Retirement System
Group C
Active Service Experience - Terminations
July 1, 2005 through June 30, 2010**



Disability

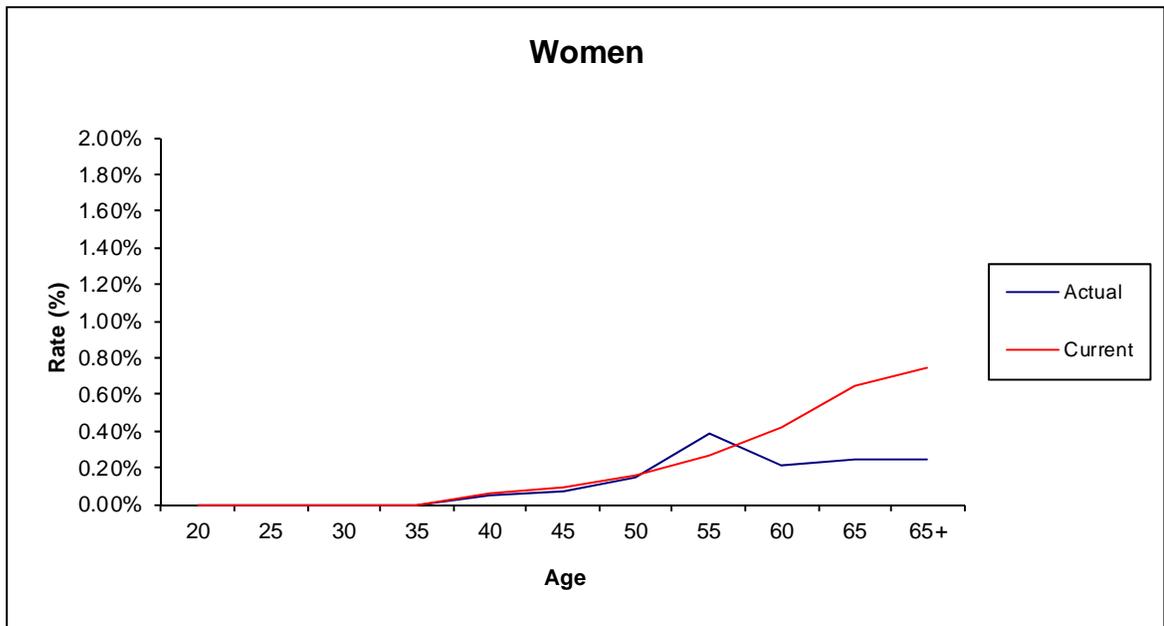
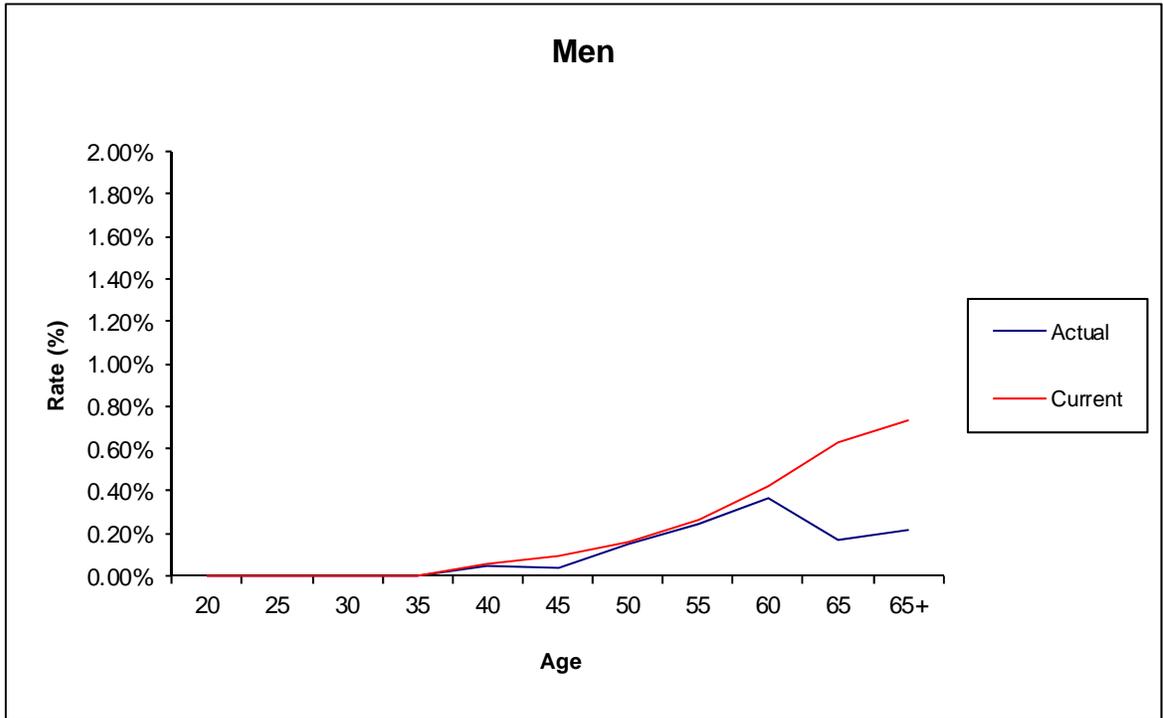
The graphs that follow show the incidence of disability among employees and the incidence of active service mortality. The financial impact on the funding of the System of this experience is relatively minor. It should be noted that the low incidence of actual disabilities makes this experience susceptible to rather large fluctuations from year to year.

The present assumed rates of disability produce expected disabilities that are not substantially different than the actual number. We therefore recommend no changes to the disability rates.

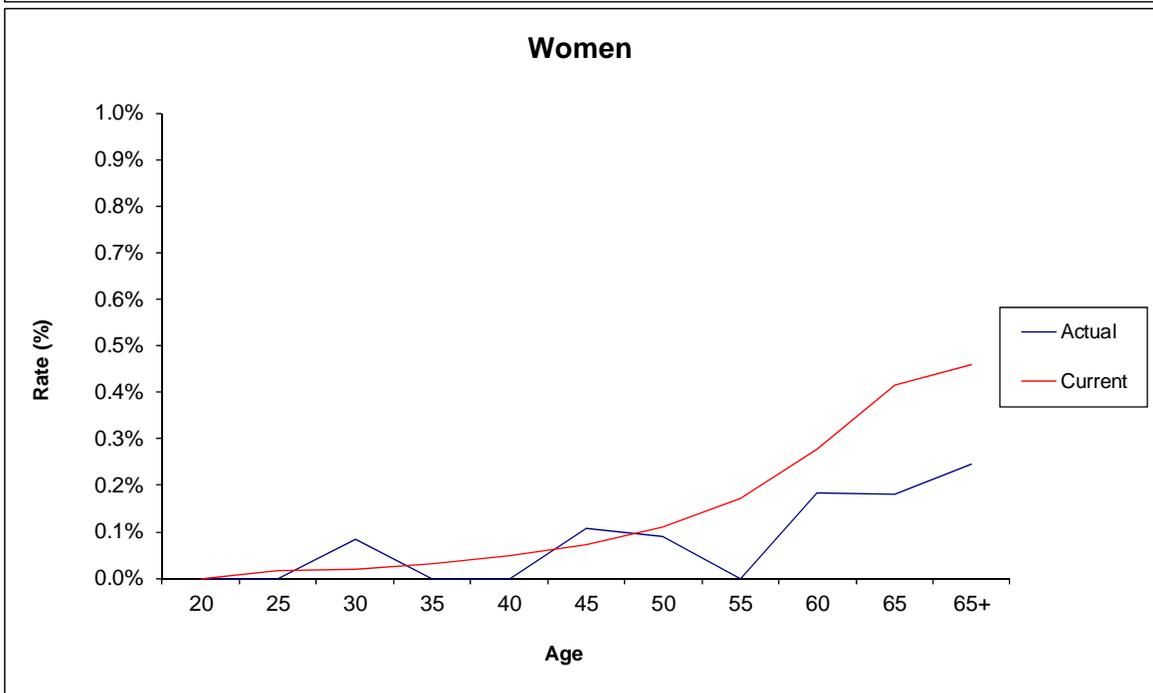
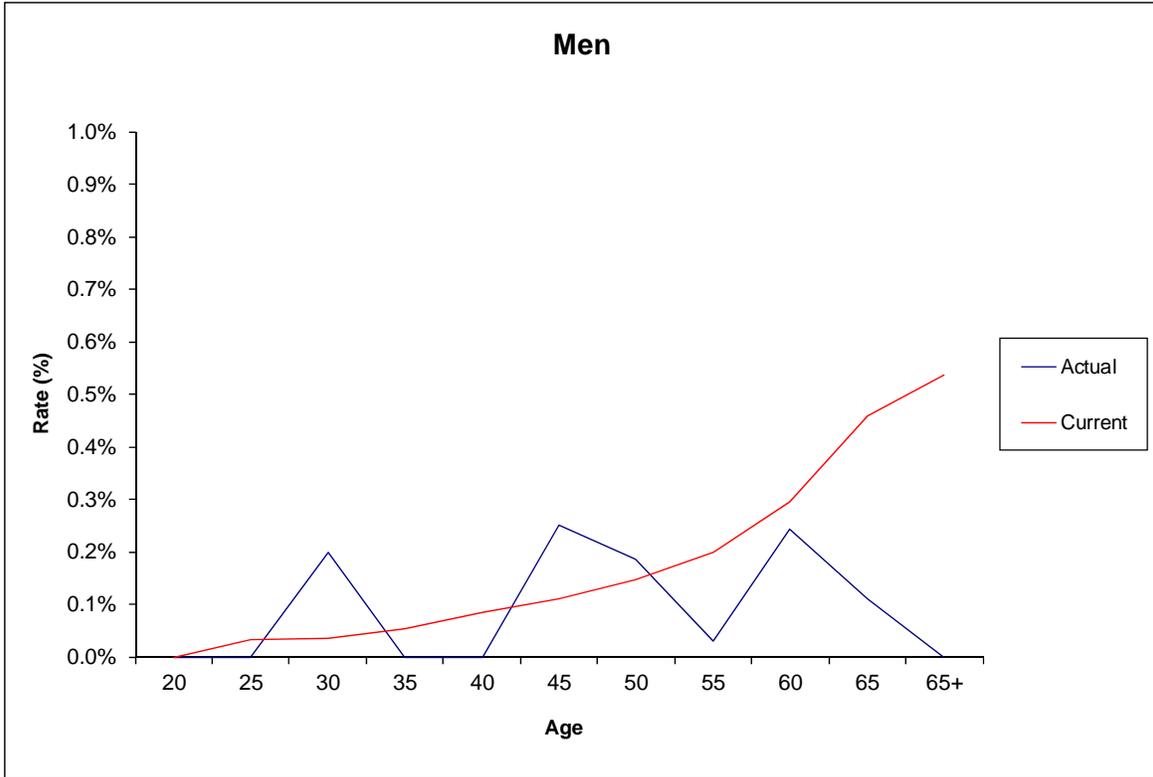
Death

Like disabilities, deaths among active members are a relatively small proportion of the overall incidence of departure from the active population. Overall active service mortality for both males and females was lower than what is expected. Therefore, we recommend the application of assumed mortality improvements based on projection of the RP-2000 Table for Employees using Scale AA to 2016, which is the year in which the valuation assumptions will next be adjusted to reflect the results of an experience study. Such an adjustment reflects both current and expected future improvements in in-service longevity prior to the next study.

**Vermont State Employees' Retirement System
Groups A, D and F
Active Service Experience - Disability Retirements
July 1, 2005 through June 30, 2010**



**Vermont State Employees' Retirement System
Groups A, D and F
Active Service Experience - Deaths
July 1, 2005 through June 30, 2010**

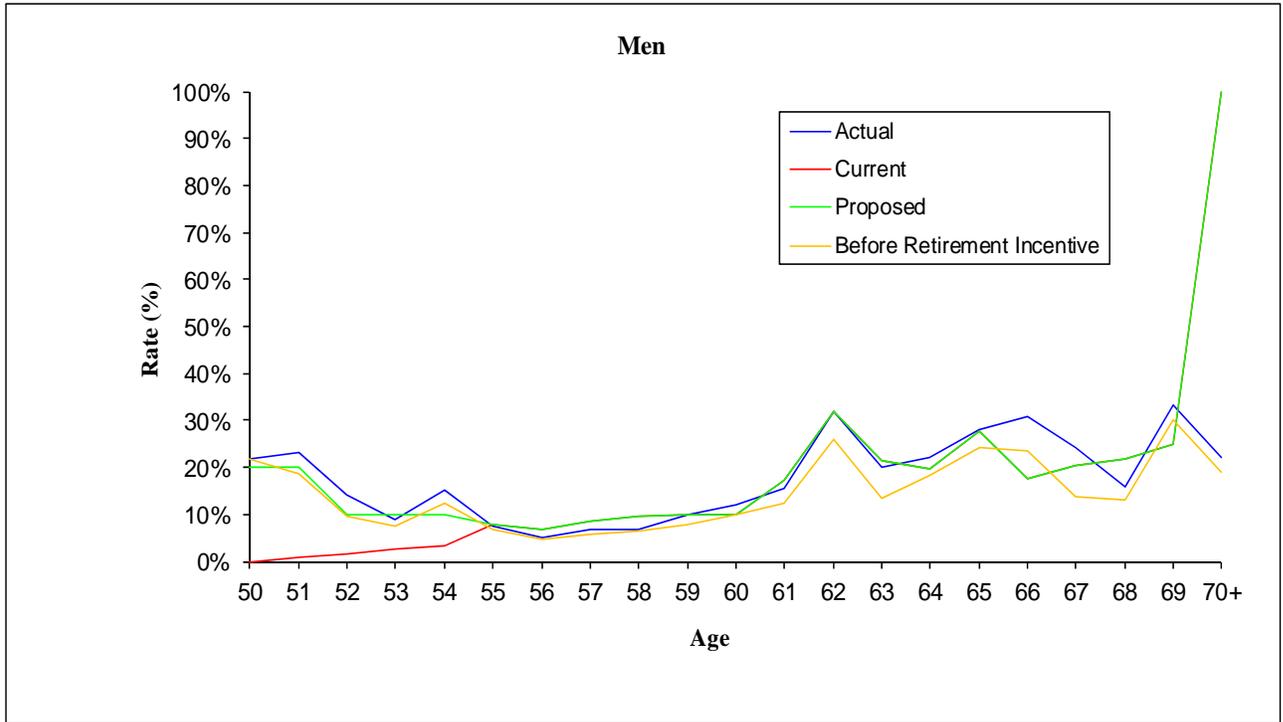


Service Retirement

Our study included an analysis of the System's service retirement experience both with and without adjustment for the recent retirement incentive program. Overall, retirements adjusted for the retirement incentive program were not substantially different in number from those expected, with the exception of higher-than-expected retirements among members between ages 50 to 55 of Groups A, D and F. As members of Groups A and D are already assumed to retire at the earliest possible date, the only question regarding the suitability of the retirement assumptions in use for these three groups concerns the present table of retirement probabilities applied to Group F. An examination of retirements among active Group F members in this age interval over the past five years indicates that probabilities of retirement are somewhat understated relative to experience at those ages. We therefore recommend that expected rates of retirement be raised to reflect actual experience among Group F members between ages 50 to 55.

Presently, active members of Group C are assumed to retire when first eligible. Examination of the relation of actual to expected retirements at various ages in this study leads us to recommend no change to this assumption.

**Vermont State Employees' Retirement System
Groups A, D and F
Active Service Experience - Service Retirements
July 1, 2005 through June 30, 2010**



III. POST-RETIREMENT MORTALITY RATES

A review of the statistics with regard to post-retirement mortality for all retired members, which are summarized in Tables 7, 8 and 9 of Appendix I, shows that actual mortality is about 2% below expected levels, except among disabled retirees. For Service Retirees and Beneficiaries, we are recommending the continued use of the RP-2000 Combined Mortality Tables for Employees and Healthy Annuitants, but with the application of Scale AA projected to 2010 to recognize the improved longevity experienced as well as that expected prior to the next review of assumptions.

We recommend that the mortality assumption applied to disabled retirees be changed from the RP-2000 Combined Mortality Tables for Employees and Healthy Annuitants to the RP-2000 Combined Mortality Tables for Employees and Healthy Annuitants with a three-year set-forward.

IV. MEMBERS IN INACTIVE STATUS

In the past, liabilities for members in inactive status have been maintained at 250% of their accumulated contributions with interest. We recommend that the percentage of contributions with interest used to estimate the liability for these participants remain at 250%.

V. ECONOMIC ASSUMPTIONS

Economic assumptions include rates of compensation increase, investment income and post-retirement adjustment in benefits on account of inflation. These assumptions have been analyzed by their components; i.e., the inflation level reflected in each assumption and the merit-promotion component of the compensation increase rates or the real rate of investment income component of the total return rate.

Inflation/Cost-of-Living

The System provides annual cost-of-living adjustments (COLAs). For the Group F, the annual adjustment is equal to one-half of the percentage increase in the CPI-U. For Groups A, C and D, the adjustment equals one-half of the percentage increase in the CPI-U, limited to 5%.

With regard to the inflation assumption, the U.S. Consumer Price Index indicates that annual rates of inflation have been as follows since 2006:

Fiscal Year End	Increase*
2006	4.3%
2007	2.7%
2008	5.0%
2009	-1.4%
2010	1.1%

*Based on CPI-U unadjusted 12 month ended June 30 for All items

Over the five-year period covered by this study, the U.S. Consumer Price Index (CPI-U) thus indicates that the inflation rate has averaged slightly above 2.3% annually.

Other economic data presently available (e.g., yields on inflation-indexed bonds) suggest that the financial markets presently anticipate a long-term average rate of inflation of 2.5% to 3.0%. The Survey of Professional Forecasters published by the Federal Reserve Bank of Philadelphia showed an uptick in inflation forecasts of about 0.1% in the survey data released in March 2011. Current economic assumptions used in the valuation of the system are based on an inflation rate of approximately 3% per year.

Currently, we assume that the annual adjustments to benefits of eligible retired members of Groups A, C and D are 3.0%, and the assumed annual adjustment for eligible retired members of Group F is 1.50% (beginning at age 62 for deferred retirements). For a Group F employee retiring after July 1, 2009, the cost-of-living-adjustment is assumed to increase from 1.5% to 3% per annum effective January 1, 2014. We recommend retention of these assumptions.

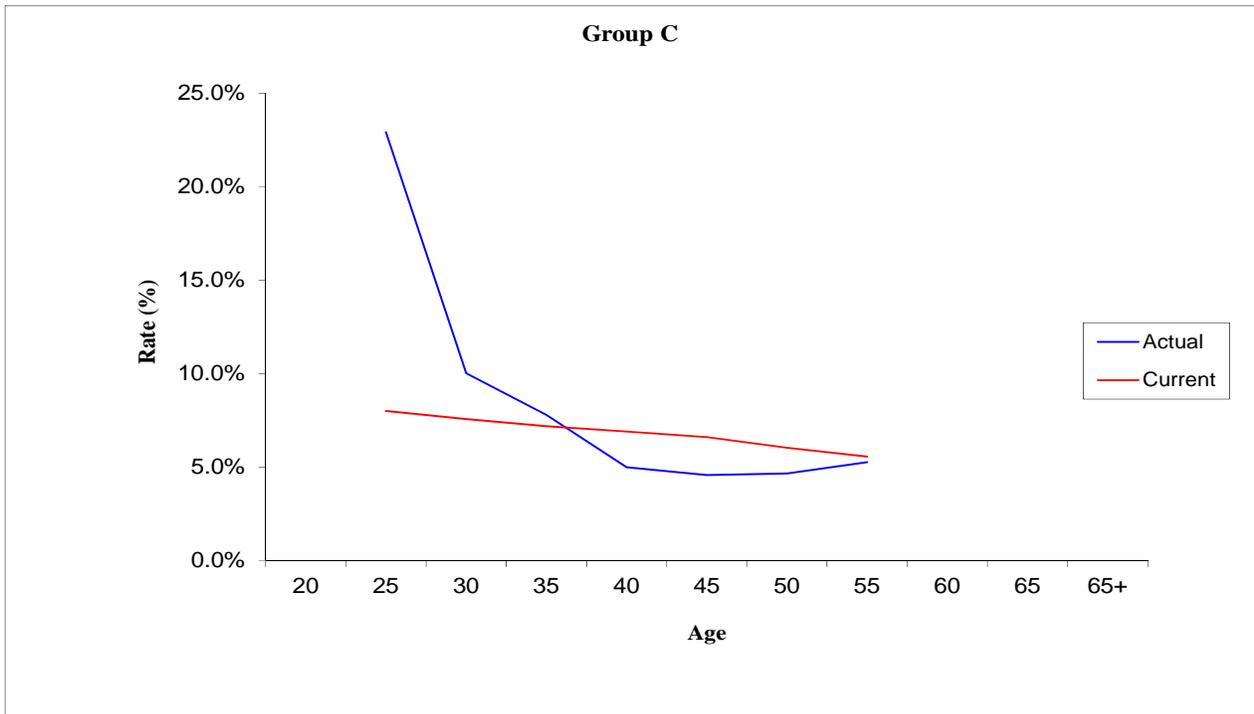
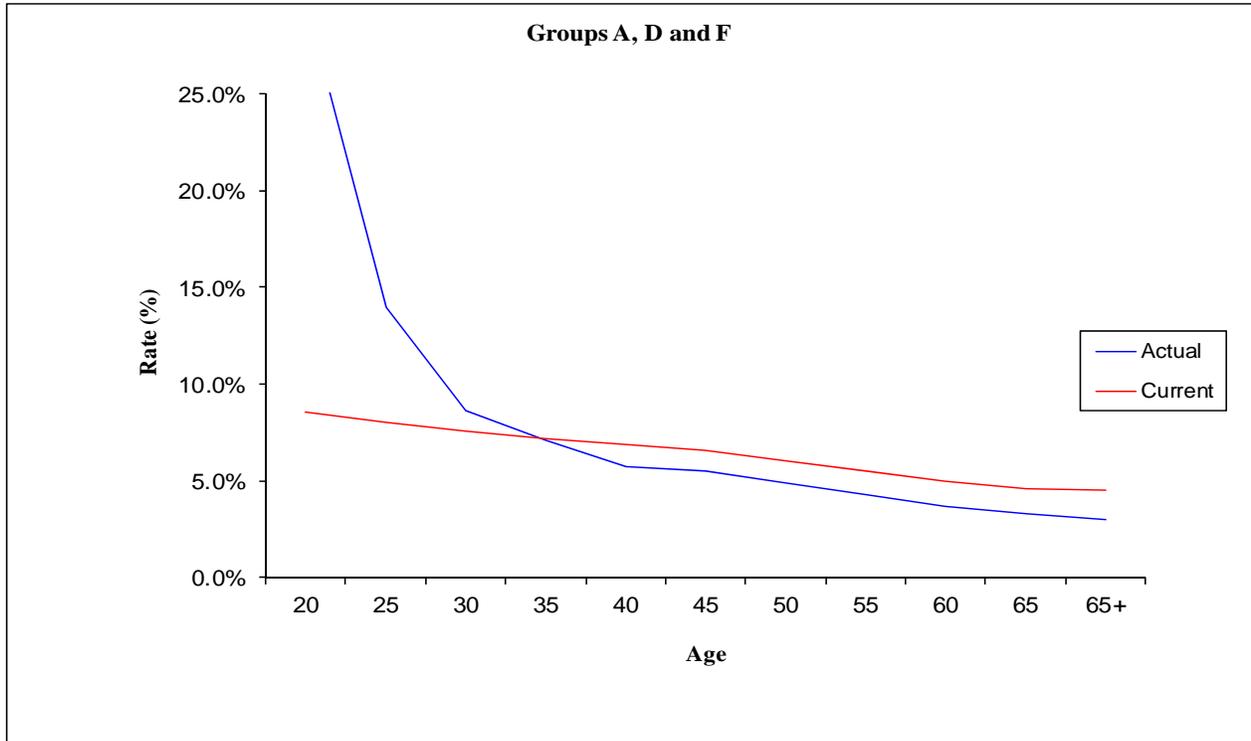
Merit-Promotion Salary Increases

The graphs on next page shown that the overall active service salary increases are not substantially different from those expected. The actual salary increases for member ages over 35 are slightly lower than expected. This is reasonable considering the recent salary reduction program in the State. We do not expect this to be a long-term trend. We recommend retention of the current assumptions.

Currently, it is assumed that the annual rates of future salary increase are as follows.

Age	Annual Rate of Salary Increase
25	7.79%
30	7.33
35	7.00
40	6.75
45	6.27
50	5.70
55	5.20
60	4.67

**Vermont State Employees' Retirement System
Active Service Experience - Salary Increases
July 1, 2005 through June 30, 2010**



Interest Rate

The estimated total rates of return earned on the System's assets are shown below.

Year Ending June 30	Rate of Return Based on Actuarial Asset Value	Rate of Return Based on Market Asset Value
2006	8.28%	10.74%
2007	9.93%	16.37%
2008	6.85%	-5.74%
2009	-9.55%	-18.80%
2010	6.71%	18.82%
2006-2010	4.19%	3.22%

The rate of return on the market value of assets has averaged approximately 3.22% annually during the past five years.

In an effort to forecast the expected long-term rate of return on System assets, we use a capital market model (described in more detail in the Appendix) in which individual asset class returns are estimated under a wide variety of simulated economic environments based on their underlying relationships to key economic variables, and then rolled up into a forecast of the performance of a portfolio invested in accordance with the target allocation established by the Vermont Pension Investment Committee (VPIC) at its August 24, 2010, meeting. The model is calibrated to current economic and market conditions, and trends to a state of equilibrium. Over a 20- year period, the 50th percentile rate of return forecast for such a portfolio is approximately 7.9%.

Differences between near-term and long-term expectations of rates of return on assets may be incorporated in the assumed rate of return by setting it on a select-and-ultimate basis. A select-and-

ultimate return assumption posits different rates for an initial number of years (called a select period) before stabilizing at an ultimate rate. A select-and-ultimate rate structure can be used to reflect expectations of unusually strong or weak returns in near-term years followed by a trending to a long-term equilibrium. In this sense, it is a more elaborate and complete specification of future return assumptions than is a single rate used in all future years.

We have developed a select-and-ultimate interest rate assumption on the basis of the current VPIC target asset allocation. Using the 50th percentile forecast results for each year over a 20-year horizon and applying an adjustment to reflect the five-year smoothing of asset returns generates the following select-and-ultimate interest rate set:

Year 1: 6.25%	Year 9: 8.50%
Year 2: 6.75%	Year 10: 8.50%
Year 3: 7.00%	Year 11: 8.50%
Year 4: 7.50%	Year 12: 8.50%
Year 5: 7.75%	Year 13: 8.50%
Year 6: 8.25%	Year 14: 8.50%
Year 7: 8.25%	Year 15: 8.50%
Year 8: 8.25%	Year 16: 8.75%
Year 17 and later: 9.00%	

Use of a select-and-ultimate interest rate assumptions as the investment return assumption is justifiable on the basis of the manner in which these assumptions have been established and on the

basis of relevant Actuarial Standards of Practice promulgated by the Actuarial Standards Board, which specifically label the select-and-ultimate approach to setting assumed rates of return on pension plan assets as acceptable. Conformity to Actuarial Standards of Practice makes this approach suitable for use in preparing calculations under current pension accounting standards of the Governmental Accounting Standards Board (GASB). However, for computational or administrative ease, it may be preferable to set the assumed interest rate equal to the single rate (perhaps constrained to be a multiple of 0.10% or 0.25%) that produces the same result as the select-and-ultimate rate set.

VI. COST ANALYSIS AND CONCLUSION

To assist the Board in selecting and approving the final package of valuation assumptions to be used prospectively from June 30, 2011, we have prepared a valuation of the System as of June 30, 2010, to reflect the potential impact of the revised assumptions.

Based on the demographic assumptions recommended in this report and various investment return assumptions, the total contribution calculated as of June 30, 2010, for the fiscal year ending June 30, 2012, are shown below. Additional details on these results are summarized in Appendix IV.

	<u>FYE 2012</u>
Current Assumptions	\$36,587,864
Recommended Assumptions:	
8.25% Return	\$38,174,772
8.10% Return	\$40,713,824
8.00% Return	\$42,442,870
Select and Ultimate Returns	\$41,455,594

This report discusses actuarial assumptions only. Methods such as the five-year average asset valuation procedure and the amortization period used for the unfunded accrued liability also affect the costs of System. These methods are not reviewed because they are not amenable to five-year experience analysis. We should note, however, that this experience study has not revealed any reasons to change any of the methods currently employed.

APPENDIX I

TABLES SHOWING ACTUAL AND EXPECTED EXPERIENCE

TABLE 1
COMPARISON OF ACTUAL AND EXPECTED SEPARATIONS
FROM ACTIVE SERVICE
TERMINATIONS

Central Age of Group	Men			Women		
	Actual	Expected	Ratio of Actual To Expected	Actual	Expected	Ratio of Actual To Expected
25	79	48.99	1.613	69	45.71	1.510
30	149	88.03	1.693	171	104.35	1.639
35	136	87.56	1.553	192	99.44	1.931
40	163	86.35	1.888	177	95.15	1.860
45	141	78.04	1.807	171	95.78	1.785
50	120	68.09	1.762	169	89.03	1.898
53 and 54	110	60.48	1.819	140	68.87	2.033
55 and over	37	35.80	1.034	45	42.88	1.049
Total	935	553.34	1.690	1,134	641.21	1.769
Grand Total Including Group C	1,011	586.22	1.725	1,150	645.59	1.781

TABLE 2
COMPARISON OF ACTUAL AND EXPECTED SEPARATIONS
FROM ACTIVE SERVICE
DISABILITY RETIREMENTS

Central Age of Group	Men			Women		
	Actual	Expected	Ratio of Actual To Expected	Actual	Expected	Ratio of Actual To Expected
25	0	0.10	0.000	0	0.09	0.000
30	0	0.33	0.000	0	0.40	0.000
35	0	0.65	0.000	0	0.73	0.000
40	1	1.29	0.775	1	1.38	0.725
45	1	2.26	0.442	2	2.65	0.755
50	4	4.22	0.948	5	5.22	0.958
55	8	8.49	0.942	14	9.56	1.464
60+	16	28.30	0.565	12	27.55	0.436
Total	30	45.64	0.657	34	47.58	0.715
Grand Total Including Group C	33	52.98	0.623	34	48.08	0.707

TABLE 3
COMPARISON OF ACTUAL AND EXPECTED SEPARATIONS
FROM ACTIVE SERVICE

DEATHS

Central Age of Group	Men			Women		
	Actual	Expected	Ratio of Actual To Expected	Actual	Expected	Ratio of Actual To Expected
25	0	0.12	0.000	0	0.06	0.000
30	2	0.36	5.556	1	0.24	4.167
35	0	0.81	0.000	0	0.54	0.000
40	0	1.80	0.000	0	1.10	0.000
45	6	2.63	2.281	3	2.05	1.463
50	5	3.97	1.259	3	3.64	0.824
55	1	6.38	0.157	0	6.20	0.000
60	8	9.65	0.829	6	9.12	0.658
65 and over	2	10.66	0.188	4	8.79	0.455
Total	24	36.38	0.660	17	31.74	0.536
Grand Total Including Group C	24	37.96	0.632	17	31.81	0.534

TABLE 4

**COMPARISON OF ACTUAL AND EXPECTED SEPARATIONS
FROM ACTIVE SERVICE**

SERVICE RETIREMENTS

Central Age of Group	Men			Women		
	Actual	Expected	Ratio of Actual To Expected	Actual	Expected	Ratio of Actual To Expected
50	28	1.27	22.047	28	1.83	15.301
53	7	1.95	3.590	6	2.07	2.899
54	16	3.40	4.706	14	3.80	3.684
55	44	45.60	0.965	53	38.35	1.382
56	29	40.14	0.722	34	32.86	1.035
57	40	50.42	0.793	40	38.41	1.041
58	40	55.66	0.719	51	42.01	1.214
59	57	56.57	1.008	41	45.37	0.904
60	60	50.11	1.197	34	39.47	0.861
61	64	72.02	0.889	51	58.54	0.871
62	115	114.76	1.002	106	103.72	1.022
63	48	51.25	0.937	53	43.90	1.207
64	40	35.63	1.123	39	30.13	1.294
65	38	37.75	1.007	28	32.00	0.875
66	30	17.10	1.754	25	14.60	1.712
67	14	11.80	1.186	14	10.98	1.275
68	6	8.30	0.723	6	5.25	1.143
69	11	8.20	1.341	5	5.40	0.926
70 and over	21	95.00	0.221	24	87.00	0.276
Total	708	756.93	0.935	652	635.69	1.026
Grand Total Including Group C	754	837.93	0.900	653	638.69	1.022

TABLE 5
COMPARISON OF ACTUAL AND EXPECTED
ANNUAL SALARIES OF MEMBERS

GROUPS A, D and F

Central Age of Group	Men			Women		
	Annual Salaries			Annual Salaries		
	Actual	Expected	Ratio of Actual To Expected	Actual	Expected	Ratio of Actual To Expected
Under 25	10,898,115	10,484,812	1.039	9,477,068	8,814,899	1.075
25 - 29	35,113,271	34,791,158	1.009	39,420,355	38,996,368	1.011
30 - 34	61,490,355	61,639,420	0.998	61,995,643	61,948,007	1.001
35 - 39	93,846,824	95,107,895	0.987	90,740,786	91,491,401	0.992
40 - 44	112,417,773	114,046,978	0.986	118,330,772	119,105,374	0.993
45 - 49	133,512,175	135,503,614	0.985	146,308,648	147,284,919	0.993
50 - 54	164,161,264	166,645,725	0.985	167,007,674	168,234,787	0.993
55 - 59	174,583,498	177,544,036	0.983	153,328,672	154,579,999	0.992
60 - 64	86,312,811	87,526,961	0.986	69,715,760	70,445,328	0.990
65 +	19,466,843	19,740,858	0.986	13,701,475	13,907,423	0.985
Total	891,802,929	903,031,457	0.988	870,026,853	874,808,505	0.995

TABLE 6
COMPARISON OF ACTUAL AND EXPECTED
ANNUAL SALARIES OF MEMBERS

GROUP C

Central Age of Group	Men			Women		
	Annual Salaries			Annual Salaries		
	Actual	Expected	Ratio of Actual To Expected	Actual	Expected	Ratio of Actual To Expected
Under 25	1,957,994	1,723,907	1.136	222,853	192,076	1.160
25 - 29	10,508,056	10,298,452	1.020	1,066,997	1,019,005	1.047
30 - 34	18,419,374	18,342,015	1.004	1,541,571	1,506,144	1.024
35 - 39	29,453,913	29,960,458	0.983	3,639,667	3,734,351	0.975
40 - 44	29,800,152	30,375,225	0.981	2,289,168	2,339,424	0.979
45 - 49	23,321,116	23,614,676	0.988	171,392	187,173	0.916
50 - 54	5,779,621	5,794,802	0.997	210,996	212,589	0.993
55 - 59	-	-	0.000	-	-	0.000
60 - 64	-	-	0.000	-	-	0.000
65+	-	-	0.000	-	-	0.000
Total	119,240,226	120,109,535	0.993	9,142,644	9,190,762	0.995

TABLE 7
SUMMARY OF MORTALITY EXPERIENCE
OF PENSIONERS
SERVICE RETIREES

Central Age of Group	Men			Women			Total		
	Actual	Expected	Ratio of Actual To Expected	Actual	Expected	Ratio of Actual To Expected	Actual	Expected	Ratio of Actual To Expected
< 48	0	0.00	0.000	0	0.00	0.000	0	0.00	0.000
50	0	1.74	0.000	2	0.40	5.000	2	2.14	0.935
55	7	5.61	1.248	8	2.90	2.759	15	8.51	1.763
60	22	17.44	1.261	11	9.71	1.133	33	27.15	1.215
65	37	32.8	1.128	21	19.25	1.091	58	52.05	1.114
70	36	42.84	0.840	19	24.77	0.767	55	67.61	0.813
75	31	42.31	0.733	22	25.47	0.864	53	67.78	0.782
80	24	27.51	0.872	16	15.91	1.006	40	43.42	0.921
85	24	27.02	0.888	22	27.01	0.815	46	54.03	0.851
90	37	33.72	1.097	37	35.20	1.051	74	68.92	1.074
92 +	8	6.84	1.170	20	17.70	1.130	28	21.09	1.328
Total	226	237.83	0.950	178	178.32	0.998	404	412.70	0.979

TABLE 8
SUMMARY OF MORTALITY EXPERIENCE
OF PENSIONERS

DISABILITY RETIREES

Central Age of Group	Men			Women			Total		
	Actual	Expected	Ratio of Actual To Expected	Actual	Expected	Ratio of Actual To Expected	Actual	Expected	Ratio of Actual To Expected
< 48	1	0.10	10.000	2	0.08	25.000	3	0.18	16.667
50	2	0.32	6.250	2	0.19	10.526	4	0.51	7.843
55	4	0.88	4.545	3	0.55	5.455	7	1.43	4.895
60	9	1.45	6.207	6	1.01	5.941	15	2.46	6.098
65	3	1.97	1.523	4	1.02	3.922	7	2.99	2.341
70	0	1.83	0.000	3	1.18	2.542	3	3.01	0.997
75	6	2.97	2.020	1	0.63	1.587	7	3.60	1.944
80	2	2.18	0.917	1	1.51	0.662	3	3.69	0.813
85	1	3.25	0.308	2	3.02	0.662	3	6.27	0.478
90	0	1.37	0.000	1	1.84	0.543	1	3.21	0.312
92 +	0	0.00	0.000	0	1.03	0.000	0	1.03	0.000
Total	28	16.32	1.716	25	12.06	2.073	53	28.38	1.868

TABLE 9
SUMMARY OF MORTALITY EXPERIENCE
OF PENSIONERS
DEPENDENTS OF DECEASED MEMBERS

Central Age of Group	Men			Women			Total		
	Actual	Expected	Ratio of Actual To Expected	Actual	Expected	Ratio of Actual To Expected	Actual	Expected	Ratio of Actual To Expected
< 48	2	0.00	0.000	0	0.00	0.000	2	0.00	0.000
50	0	0.14	0.000	0	0.16	0.000	0	0.30	0.000
55	2	0.11	18.182	1	0.32	3.125	3	0.43	6.977
60	2	0.32	6.250	0	0.92	0.000	2	1.24	1.613
65	3	0.56	5.357	2	1.69	1.183	5	2.25	2.222
70	0	0.52	0.000	3	2.98	1.007	3	3.50	0.857
75	0	2.93	0.000	12	4.7	2.553	12	7.63	1.573
80	0	2.53	0.000	6	6.69	0.897	6	9.22	0.651
85	0	2.55	0.000	12	12.46	0.963	12	15.01	0.799
90	1	6.09	0.164	13	11.87	1.095	14	17.96	0.780
92 +	7	11.31	0.619	4	4.09	0.978	11	15.40	0.714
Total	17	27.06	0.628	53	45.88	1.155	70	72.94	0.960

APPENDIX II

RECOMMENDED ACTIVE SERVICE TABLES

APPENDIX II

GROUPS A, D AND F

ACTIVE SERVICE TABLE

MALE EMPLOYEES

RECOMMENDED ASSUMED RATES OF:			RECOMMENDED ASSUMED RATES OF:		
AGE	Termination	Retirement	AGE	Termination	Retirement
19	0.000	0.000	46	0.022	0.000
20	0.054	0.000	47	0.021	0.000
21	0.050	0.000	48	0.020	0.000
22	0.048	0.000	49	0.019	0.000
23	0.045	0.000	50	0.019	0.200
24	0.043	0.000	51	0.018	0.200
25	0.041	0.000	52	0.017	0.100
26	0.039	0.000	53	0.016	0.100
27	0.038	0.000	54	0.016	0.100
28	0.036	0.000	55	0.015	0.050
29	0.034	0.000	56	0.033	0.042
30	0.033	0.000	57	0.033	0.056
31	0.031	0.000	58	0.033	0.063
32	0.030	0.000	59	0.033	0.070
33	0.029	0.000	60	0.033	0.070
34	0.028	0.000	61	0.032	0.140
35	0.027	0.000	62	0.032	0.280
36	0.027	0.000	63	0.032	0.175
37	0.027	0.000	64	0.032	0.175
38	0.026	0.000	65	0.032	0.250
39	0.026	0.000	66	0.032	0.150
40	0.025	0.000	67	0.032	0.175
41	0.025	0.000	68	0.032	0.175
42	0.025	0.000	69	0.032	0.200
43	0.024	0.000	70	0.032	1.000
44	0.023	0.000			
45	0.022	0.000			

APPENDIX II

GROUPS A, D AND F

ACTIVE SERVICE TABLE

FEMALE EMPLOYEES

RECOMMENDED ASSUMED RATES OF:			RECOMMENDED ASSUMED RATES OF:		
AGE	Termination	Retirement	AGE	Termination	Retirement
19	0.000	0.000	46	0.022	0.000
20	0.054	0.000	47	0.021	0.000
21	0.050	0.000	48	0.020	0.000
22	0.048	0.000	49	0.019	0.060
23	0.045	0.000	50	0.019	0.060
24	0.043	0.000	51	0.018	0.080
25	0.041	0.000	52	0.017	0.090
26	0.039	0.000	53	0.016	0.090
27	0.038	0.000	54	0.016	0.100
28	0.036	0.000	55	0.015	0.050
29	0.034	0.000	56	0.033	0.042
30	0.033	0.000	57	0.033	0.056
31	0.031	0.000	58	0.033	0.063
32	0.030	0.000	59	0.033	0.070
33	0.029	0.000	60	0.033	0.070
34	0.028	0.000	61	0.032	0.140
35	0.027	0.000	62	0.032	0.280
36	0.027	0.000	63	0.032	0.175
37	0.027	0.000	64	0.032	0.175
38	0.026	0.000	65	0.032	0.250
39	0.026	0.000	66	0.032	0.150
40	0.025	0.000	67	0.032	0.175
41	0.025	0.000	68	0.032	0.175
42	0.025	0.000	69	0.032	0.200
43	0.024	0.000	70	0.032	1.000
44	0.023	0.000			
45	0.022	0.000			

APPENDIX II

GROUP C

ACTIVE SERVICE TABLE

TERMINATION RATES

AGE	CURRENT		PROPOSED	
	MEN	WOMEN	MEN	WOMEN
19	0.036	0.0360	0.036	0.0720
20	0.036	0.0360	0.036	0.0720
21	0.036	0.0360	0.036	0.0720
22	0.036	0.0360	0.036	0.0720
23	0.036	0.0360	0.036	0.0720
24	0.036	0.0360	0.036	0.0720
25	0.036	0.0360	0.036	0.0720
26	0.036	0.0360	0.036	0.0720
27	0.036	0.0360	0.036	0.0720
28	0.036	0.0360	0.036	0.0720
29	0.036	0.0360	0.036	0.0720
30	0.036	0.0360	0.036	0.0720
31	0.036	0.0360	0.036	0.0720
32	0.036	0.0360	0.036	0.0720
33	0.036	0.0360	0.036	0.0720
34	0.036	0.0360	0.036	0.0720
35	0.036	0.0360	0.036	0.0720

APPENDIX III

RECOMMENDED POST-RETIREMENT MORTALITY TABLES

APPENDIX III**RECOMMENDED POST RETIREMENT MORTALITY TABLES**
PENSIONERS AND BENEFICIARIES

AGE	MALES	FEMALES	AGE	MALES	FEMALES
50	0.00446	0.00198	85	0.10324	0.07292
51	0.00456	0.00209	86	0.11447	0.08215
52	0.00461	0.00230	87	0.12810	0.09255
53	0.00468	0.00257	88	0.14323	0.10309
54	0.00474	0.00289	89	0.15828	0.11563
55	0.00487	0.00326	90	0.17620	0.12778
56	0.00511	0.00370	91	0.19192	0.14032
57	0.00543	0.00417	92	0.21019	0.15295
58	0.00587	0.00468	93	0.22675	0.16706
59	0.00637	0.00526	94	0.24327	0.17918
60	0.00698	0.00590	95	0.26219	0.19065
61	0.00774	0.00658	96	0.27828	0.20131
62	0.00852	0.00731	97	0.29391	0.21310
63	0.00951	0.00809	98	0.31216	0.22172
64	0.01052	0.00894	99	0.32692	0.22908
65	0.01165	0.00986	100	0.34113	0.23510
66	0.01304	0.01086	101	0.35863	0.24483
67	0.01444	0.01193	102	0.37169	0.25450
68	0.01581	0.01310	103	0.38304	0.26604
69	0.01746	0.01441	104	0.39200	0.27906
70	0.01909	0.01592	105	0.39789	0.29312
71	0.02112	0.01749	106	0.40000	0.30781
72	0.02345	0.01946	107	0.40000	0.32273
73	0.02613	0.02141	108	0.40000	0.33744
74	0.02915	0.02373	109	0.40000	0.35154
75	0.03286	0.02594	110	0.40000	0.36462
76	0.03662	0.02858	111	0.40000	0.37625
77	0.04115	0.03179	112	0.40000	0.38602
78	0.04620	0.03505	113	0.40000	0.39351
79	0.05186	0.03869	114	0.40000	0.39831
80	0.05821	0.04277	115	0.40000	0.40000
81	0.06581	0.04734	116	0.40000	0.40000
82	0.07427	0.05248	117	0.40000	0.40000
83	0.08279	0.05827	118	0.40000	0.40000
84	0.09301	0.06480	119	0.40000	0.40000
85	0.10324	0.07292	120	1.00000	1.00000

APPENDIX III

**RECOMMENDED POST RETIREMENT MORTALITY TABLES
DISABILITY PENSIONERS**

AGE	MALES	FEMALES	AGE	MALES	FEMALES
19	0.00037	0.00019	70	0.03039	0.02297
20	0.00037	0.00020	71	0.03390	0.02546
21	0.00038	0.00020	72	0.03783	0.02811
22	0.00038	0.00021	73	0.04217	0.03097
23	0.00038	0.00021	74	0.04691	0.03411
24	0.00038	0.00022	75	0.05212	0.03760
25	0.00039	0.00024	76	0.05793	0.04151
26	0.00041	0.00025	77	0.06437	0.04588
27	0.00044	0.00026	78	0.07204	0.05078
28	0.00050	0.00031	79	0.08049	0.05629
29	0.00056	0.00035	80	0.08972	0.06251
30	0.00063	0.00039	81	0.09978	0.06952
31	0.00070	0.00044	82	0.11076	0.07745
32	0.00077	0.00048	83	0.12280	0.08638
33	0.00084	0.00051	84	0.13604	0.09634
34	0.00090	0.00055	85	0.15059	0.10730
35	0.00096	0.00060	86	0.16642	0.11915
36	0.00102	0.00065	87	0.18341	0.13168
37	0.00108	0.00071	88	0.19977	0.14460
38	0.00114	0.00077	89	0.21661	0.15762
39	0.00122	0.00085	90	0.23366	0.17043
40	0.00130	0.00094	91	0.25069	0.18280
41	0.00140	0.00103	92	0.26749	0.19451
42	0.00151	0.00112	93	0.28391	0.20538
43	0.00162	0.00122	94	0.29985	0.21524
44	0.00173	0.00133	95	0.31530	0.22395
45	0.00186	0.00143	96	0.33021	0.23139
46	0.00200	0.00155	97	0.34456	0.23747
47	0.00214	0.00168	98	0.35863	0.24483
48	0.00245	0.00185	99	0.37169	0.25450
49	0.00267	0.00202	100	0.38304	0.26604
50	0.00292	0.00221	101	0.39200	0.27906
51	0.00320	0.00242	102	0.39789	0.29312
52	0.00362	0.00272	103	0.40000	0.30781
53	0.00420	0.00309	104	0.40000	0.32273
54	0.00469	0.00348	105	0.40000	0.33744
55	0.00527	0.00392	106	0.40000	0.35154
56	0.00595	0.00444	107	0.40000	0.36462
57	0.00675	0.00506	108	0.40000	0.37625
58	0.00768	0.00581	109	0.40000	0.38602
59	0.00876	0.00666	110	0.40000	0.39351
60	0.01001	0.00765	111	0.40000	0.39831
61	0.01128	0.00862	112	0.40000	0.40000
62	0.01274	0.00971	113	0.40000	0.40000
63	0.01441	0.01095	114	0.40000	0.40000
64	0.01608	0.01216	115	0.40000	0.40000
65	0.01787	0.01345	116	0.40000	0.40000
66	0.01980	0.01486	117	1.00000	1.00000
67	0.02221	0.01674	118	1.00000	1.00000
68	0.02457	0.01858	119	1.00000	1.00000
69	0.02728	0.02067	120	1.00000	1.00000

APPENDIX IV

DESCRIPTION OF CAPITAL MARKET MODEL USED IN ANALYSIS
OF EXPECTED RATE OF RETURN ON SYSTEM ASSETS

ABOUT GEMS (GENERAL ECONOMY AND MARKET SIMULATOR)

GEMS[®] is a cutting-edge Economic Scenario Generator (ESG) that enables users to simulate future states of the global economy and financial markets, including the pricing of derivatives and alternative assets. It uses financial models that are the most technologically advanced in the industry, ensuring that models perform consistently with history, provide a realistic representation of extreme events and support hedging strategies with market consistent pricing. GEMS includes comprehensive yield curve modeling and a multifactor arbitrage pricing model that develops asset-class return series based on asset-class relationships to underlying economic and capital market variables such as GDP, inflation, interest rates, credit spreads, and unemployment. The model is calibrated to current market conditions and trends the economic variables to longer-term historical norms – simulating a variety of economic environments and concomitant asset-class returns in the process.

Some of the other distinguishing features of GEMS are:

1. Many asset-class return distributions are non-normal even though many models historically have treated them as such. Asset classes exhibit non-normal return distribution characteristics such as skew and kurtosis. GEMS is more effective at capturing these characteristics. In doing so, it more effectively captures outlier fat-tail events (leptokurtosis) and positive or negative skew in a manner that more closely resembles what actually occurs.
2. Asset-class returns are linked to underlying economic conditions in the model so the user can relate a specific asset-class or portfolio return path to conditions that can be described in terms of economic variables.
3. Because GEMS is calibrated to current levels of economic activity and trends to a longer-term state of equilibrium, shorter-term asset returns forecasts in GEMS are more reflective of recent market activity and short-term characteristics and trends in economic and market variables, and longer-term returns reflect asset performance over complete market cycles.
4. There is empirical evidence that asset correlations are dynamic and move closer to unity when markets are volatile and under stress. GEMS models asset correlations dynamically.

APPENDIX V

COMPARATIVE VALUATION BALANCE SHEET

APPENDIX V

RESULTS OF THE ACTUARIAL VALUATION
 PREPARED AS OF JUNE 30, 2010, ON
 CURRENT AND RECOMMENDED ASSUMPTIONS

Item	Current Assumptions	Recommended Assumptions			
		8.25%	8.10%	8.00%	Select and Ultimate
1. Liabilities:					
Active and Inactive Members	696,056,203	721,563,418	736,942,137	747,433,687	699,842,921
Retired Members	863,268,086	874,181,244	885,401,155	893,031,231	893,378,762
Total	1,559,324,289	1,595,744,662	1,622,343,292	1,640,464,918	1,595,481,040
2. Assets	1,265,404,195	1,265,404,195	1,265,404,195	1,265,404,195	1,265,404,195
3. Unfunded Accrued Liability	293,920,094	330,340,467	356,939,097	375,060,723	330,076,845
4. Normal Contribution	19,795,614	19,301,753	20,659,872	21,606,440	22,388,387
5. Accrued Liability Contribution	16,792,250	18,873,020	20,053,952	20,836,430	19,067,207
6. Total FYE12 Contribution = (4) + (5)	36,587,864	38,174,772	40,713,824	42,442,870	41,455,594