1998-2003 SERS EXPERIENCE STUDY

SUMMARY OF RESULTS

1998-2003 SERS EXPERIENCE STUDY
SUMMARY OF RESULTS

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February 8, 2005

PERSONAL & CONFIDENTIAL

State of Connecticut
State Employees Retirement Commission
55 Elm Street
Hartford, CT 06106

Re: 1998-2003 SERS Experience Study

Members of the Commission:

We are pleased to present the results of the 1998-2003 SERS Experience Study. Section I contains a discussion of the economic assumptions used in the actuarial valuation. Details regarding demographic assumptions are found in Section II.

In preparing this study, we relied on employee census data and financial information as of each June 30 from 1998 through 2003, furnished by the State of Connecticut. We performed a limited review of the data used directly in our analysis for reasonableness and consistency and have found them to be reasonably consistent and comparable with data used for other purposes. If the underlying data or information is inaccurate or incomplete, the results of our analysis may likewise be inaccurate or incomplete and our calculations may need to be revised. If there are material defects in the data, it is possible that they would be uncovered by a detailed, systematic review and comparison of the data to search for data values that are questionable or for relationships that are materially inconsistent. Such a review was beyond the scope of our assignment.

This analysis is solely for the internal use of the State Employees Retirement Commission. Milliman does not intend to benefit any third party recipient of this analysis. If these results are distributed to other parties, we request that it be copied in its entirety and distributed along with a copy of the July 1, 2004 SERS valuation report in its entirety as well, because that document provides background information that is important in understanding the basis for these results.

Respectfully submitted,

[signature]   *[signature]*

Althea A. Schwartz, F.S.A.   Rebecca A. Sielman, F.S.A.
Consulting Actuary   Consulting Actuary

RAS:mwj   10   CSE020805ExperStudy2004.doc

SECTION I
ECONOMIC ASSUMPTIONS

A. OVERVIEW OF ECONOMIC ASSUMPTIONS

Actuarial Standard of Practice (ASOP) No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*, provides guidance to actuaries on selecting economic assumptions for measuring obligations under defined benefit plans. Because no one knows what the future holds, the best an actuary can do is to use professional judgment to estimate possible future economic outcomes. These estimates are based on a mixture of past experience, future expectations, and professional judgment. The actuary should consider a number of factors, including the purpose and nature of the measurement, and appropriate recent and long-term historical economic data. However, the Standard explicitly advises the actuary not to give undue weight to recent experience.

Recognizing that there is not one "right answer", the Standard calls for the actuary to develop a best estimate range for each economic assumption, and then recommend a specific point within that range. Each economic assumption should individually satisfy the Standard. Furthermore, with respect to any particular valuation, each economic assumption should be consistent with every other economic assumption over the measurement period.

In our opinion, the economic assumptions set forth in this report have been developed in accordance with ASOP No. 27.

The remainder of this report contains the study results for the following economic assumptions:

> Consumer Price Inflation
> Investment Return
> Wage Growth
> Cost of Living Adjustments

SECTION I
ECONOMIC ASSUMPTIONS

B. CONSUMER PRICE INFLATION

Use in the Valuation: Future price inflation has an indirect impact on the results of the actuarial valuation through the development of the assumptions for investment return, wage growth, and cost of living (COLA) increases.

The current assumption for price inflation is 3.75% per year.

Historical Perspective: We have used certain published economic statistics that have been accumulated on a monthly basis over the last 75 years. The data for price inflation is based on the Consumer Price Index, US City Average, All Urban Consumers (CPI). The data for periods ending in June of each year is shown graphically below.

History of National CPI-U
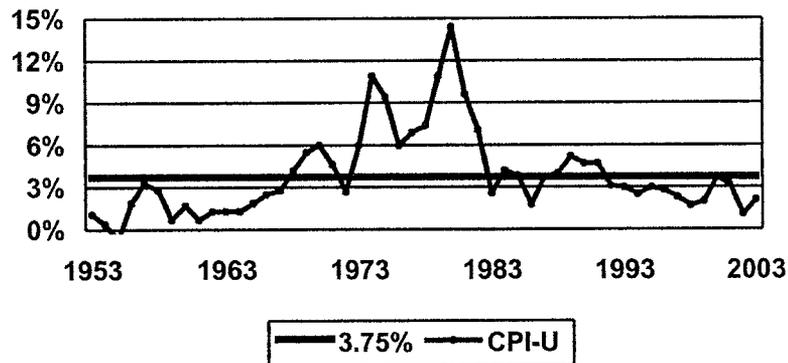
There are numerous ways to review this data. The tables below show the compounded annual price inflation rate for various 10 year periods and for longer periods ended in June of 2003.

Period	CPI
1993-2003	2.44%
1983-1993	3.79
1973-1983	8.45
1963-1973	3.75
1953-1963	1.33

Period	CPI
1993-2003	2.44%
1983-2003	3.11
1973-2003	4.86
1963-2003	4.58
1953-2003	3.92
75 Years	3.22%

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Many economists forecast price inflation lower than the current assumption of 3.75%, but they may be looking at shorter periods than are appropriate for a pension valuation. To find an economic forecast with a long enough time frame to suit our purpose, we looked at the expected increase in the CPI by the Office of the Chief Actuary for the Social Security Administration. In the 2003 Trustees Report, the projected average annual increase in the CPI over the next 30 years under the intermediate cost assumptions was 3.00%. The reasonable range was stated as 2.00% to 4.00%.

Reasonable Range and Recommendation: We believe that the current assumption of 3.75% per year is toward the high end of the reasonable range for the long-term future. Based on the history over the last 75 years, and future expectations, we recommend that the long-term assumed price inflation rate be lowered somewhat from 3.75% to 3.50%. This rate will be used to build the net investment return, wage growth, and COLA assumptions.

Price Inflation Rate	
Current Assumption	3.75%
Reasonable Range	2.00% - 4.00%
Recommended Assumption	3.50%

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ECONOMIC ASSUMPTIONS

C. INVESTMENT RETURN

Use in the Valuation: The investment return assumption is one of the primary determinants in the calculation of the expected cost of the System's benefits, providing a discount of the future benefit payments reflecting the time value of money.

The current investment return assumption is 8.50% per year, net of all administrative and investment-related expenses.

Historical Perspective: One of the inherent problems with analyzing historical data is that the results can look significantly different depending on the time frame used, since the year-to-year results tend to vary widely. For example, the unusually low equity returns over the last several years have had a remarkable impact on rolling ten-year period returns when compared to just a few years ago. Furthermore, the long-term approach we used to analyze price inflation does not necessarily reflect current expectations for the capital markets. Even though history provides a valuable perspective for setting this assumption, the economy of the past is not today's economy.

Projection Model using Capital Market Assumptions: In our opinion, a better approach builds upon the latest capital market assumptions adopted by the Treasurer's investment consultants. We used a model to predict future returns based on these capital market assumptions and the current SERS asset allocation policy, and assuming that the portfolio will be re-balanced annually to maintain the target asset allocation. The results are shown below.

| | | Capital Market Assumptions | |
Asset Class	SERS Asset Allocation	Real Rate of Return	Standard Deviation
US Equity	36%	5.70%	
International Equity	18	5.70	
Private Equity	11	10.00	
High Yield Bonds	5	3.90	
Real Estate	5	4.20	
Total Equity	75	5.48	18.1
Total Fixed Income	24	3.27	8.8
Cash Equivalents	1	1.30	3.0
Total Portfolio	100%	4.9%	14.5%
Source: email from CRA RogersCasey dated 8/16/2004			

SECTION I
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The expected real rate of return of a portfolio allocated according to the current SERS policy is 4.9% for one year, which is equivalent to a nominal return of 8.4% using the new assumed inflation rate of 3.5%. However, the rate of return is subject to significant year-to-year volatility as evidenced by the high standard deviation. Volatility over time will lower the mean rate of return, but diversification by asset class narrows the range of expected returns. Stochastic modeling provides a guide to see if it is reasonable to expect this return to compound over longer periods of time. The results are summarized below, showing expected real rates of return over time horizons of up to 50 years.

Horizon in Years	Mean	Std Dev	Percentile Results for Real Rate of Return				
			5th	25th	50th	75th	95th
1	4.9%	14.5%	-17.2%	-5.3%	3.9%	14.1%	30.4%
5	4.1	6.4	-6.1	-0.3	3.9	8.3	15.0
10	4.0	4.5	-3.3	0.9	3.9	7.0	11.6
20	4.0	3.2	-1.2	1.8	3.9	6.1	9.3
30	4.0	2.6	-0.3	**2.2**	3.9	**5.7**	8.3
50	3.9	2.0	0.6	2.6	3.9	5.3	7.3

In the first year, the mean real return is 4.9% but due to the volatility associated with the asset allocation, the range of probable outcomes is quite large. For example, in the first year there is a 5% chance the real rate of return will be less than −17.2% and a 5% chance it will be greater than 30.4%. As the time horizon lengthens, the range of cumulative average results narrows.

For example, over a 30-year time horizon, there is a 25% chance the real rate of return will be less than 2.2% and a 25% chance the return will be greater than 5.7% (bold numbers near the bottom of the table above). Therefore, we can say the real return is just as likely to be within the range from 2.2% to 5.7% as not. The median real return over 30 years is expected to be 3.9%. The expected nominal returns over the 30-year time horizon are between 5.7% and 9.2%.

Administrative and Investment-Related Expenses: The investment return is assumed to be net of all administrative and investment-related expenses. The following table below shows the ratio of administrative expenses to the System assets over the last five years. The expense ratio is calculated as the total administrative expense divided by the ending asset balance at fair market value. Investment-related expenses are not reported to us; it appears that they are netted out of the investment return.

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FYE June 30	System Assets	Administrative Expenses	Ratio
1999	$7,519,733,915	$261,329	0.003%
2000	8,284,499,079	265,326	0.003
2001	7,783,625,739	340,513	0.004
2002	7,088,897,412	271,967	0.004
2003	6,991,626,215	310,622	0.004

Based on this data, it appears the administrative expenses represent about 0.004% of System assets. The administrative expense ratios, measured in this way, have remained steady over this period even with the decline in the fair market value of assets.

Reasonable Range and Recommendations: Based on the ASOP No. 27 guidelines, we conclude that the reasonable range should be based on the expected real rates of return between the 25th and 75th percentile projected out 30 years, plus the assumed inflation rate, less administrative and investment-related expenses:

Components of Return	Percentile Results		
	25th	50th	75th
Real Rate of Return	2.2%	3.9%	5.7%
Assumed Inflation	3.5	3.5	3.5
Investment Expenses	n/a	n/a	n/a
Administrative Expenses	0.0	0.0	0.0
Net Investment Return	5.7%	7.4%	9.2%

We believe that an 8.25% assumption will reduce the likelihood of investment losses over the time horizon. However, the assumptions are the responsibility of the Retirement Commission and based on our analysis, an 8.5% return is still within the reasonable range. A net return of 8.5% is approximately at the 65th percentile for the System.

Investment Return	
Current Assumption	8.50%
Reasonable Range	5.7% - 9.2%
Recommended Assumption	8.50%

SECTION I
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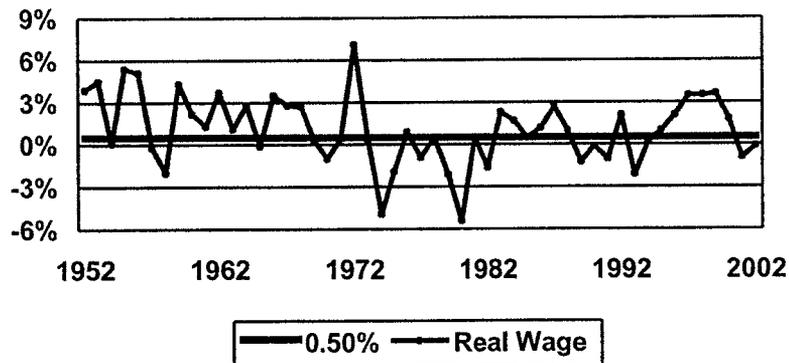### D. WAGE GROWTH

Use in the Valuation: Estimates of future salaries are based on two types of assumptions. Rates of increase in the general wage level of the membership are directly related to price inflation, while individual salary increases due to promotion and longevity occur even in the absence of price inflation. (The promotion and longevity assumptions, referred to as the merit scale, are discussed in Section II F.) The excess of wage growth over price inflation represents the increase in the standard of living, also called productivity, or real wage growth.

The current total wage growth assumption is 4.25%; coupled with the current price inflation assumption of 3.75% this yields a real wage growth assumption of 0.50%.

Historical Perspective: We have used statistics from the Social Security Administration on the National Average Wage back to 1951. For years prior to 1951, we studied the Total Private Nonagricultural Wages as published in *Historical Statistics of the U.S., Colonial Times to 1970.* The data for each year is shown graphically below.

History of National Real Wage Growth

SECTION I
ECONOMIC ASSUMPTIONS

There are numerous ways to review this data. The tables below shows the compounded annual rates of wage growth for various 10 year periods, and for longer periods ended in June of 2002. (At the time of our study, wage data for 2003 and 2004 was not yet available).

Decade	Wage Growth	CPI Incr.	Real Wages
1992-02	3.78%	2.52%	1.26%
1982-92	4.67	3.75	0.92
1972-82	7.37	8.81	(1.44)
1962-72	5.21	3.28	1.93
1952-62	3.74	1.32	2.42

Period	Wage Growth	CPI Incr.	Real Wages
1992-02	3.78%	2.52%	1.26%
1982-02	4.23	3.14	1.09
1972-02	5.26	4.99	0.27
1962-02	5.25	4.56	0.69
1952-02	4.95	3.90	1.05
75 Years	4.58	3.15	1.43

We also looked at the wage growth forecasts prepared by the Office of the Chief Actuary of the Social Security Administration. In the 2003 Trustees Report, the projected long-term annual increase in the National Average Wage was 1.1% higher than their price inflation assumption of 3.0%.

Reasonable Range and Recommendation: Based on our judgment, we believe that a range of between 3.75% and 5.25% is reasonable for the total wage growth rate. We recommend that the total wage growth rate remain unchanged at 4.25% per year. This reflects the combined impact of a decrease in the price inflation assumption from 3.75% to 3.50%, and an increase in the real wage growth rate from 0.50% to 0.75%.

Total Wage Growth Rate		
Current Assumption	4.25%	
Reasonable Range		
Real Wage Growth Rate	0.25% -	1.75%
Price Inflation	3.50 -	3.50
Total Wage Growth Rate	3.75% -	5.25%
Recommended Assumption	4.25%	

A "merit" scale is added to the wage growth assumption to obtain the total rate of salary increases assumed to be earned each year by active members. The merit scale results are contained in Section II F of this report.

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ECONOMIC ASSUMPTIONS

E. COST OF LIVING ADJUSTMENTS

Use in the Valuation: Retired members receive annual benefit increases known as Cost of Living Adjustments, or COLAs. The annual COLA rates depend on the date of retirement:

Retirements	COLA Formula	Current Assumption
Prior to July 1, 1980	CPI, but not less than 3% nor more than 5%	3.75%
July 1, 1980 – July 1, 1999 *	3.00%	3.00%
After July 1, 1999 *	60% of CPI up to 6% and 75% of CPI over 6%, but not less than 2.5% nor more than 6%	2.75%

* Members who retired between July 1, 1997 and July 1, 1999 made an irrevocable choice between the Pre-1999 fixed 3% COLA and the Post-1999 COLA formula.

Historical Perspective: The COLA assumption for Pre-1980 and Post-1999 retirees is a function of both price inflation and the extent to which price inflation causes the COLA formulas to be at their respective boundaries (3%-5% for Pre-1980 and 2.5%-6% for Post-1999). As discussed in Section I B, we are recommending that the price inflation assumption be lowered from 3.75% to 3.50%. To explore the impact of the formula boundaries, we used data on the Consumer Price Index, US City Average, All Urban Consumers (CPI). The data for periods ending in June of each year is shown in the CPI section of this report.

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The tables below show the volatility of price inflation, as measured by the standard deviation of yearly rates, for various 10 year periods and for longer periods ended in June of 2003.

Period	St Dev CPI
1993-2003	0.78%
1983-1993	1.00
1973-1983	3.28
1963-1973	1.71
1953-1963	1.20

Period	St Dev CPI
1993-2003	0.78%
1983-2003	1.12
1973-2003	3.29
1963-2003	3.00
1953-2003	3.02
75 Years	4.41%

The volatility is relatively low for most short time periods but is generally higher for longer time periods. We explored the impact of this volatility on the outcomes of the COLA formulas by using stochastic modeling techniques. We generated sets of 75,000 random price inflation scenarios having a mean of our recommended price inflation rate of 3.50% and various standard deviations. For each scenario we determined the Pre-1980 and Post-1999 COLAs based on their respective formulas. We then calculated the mean COLA for each set of 75,000 scenarios. The results are shown below:

	Mean for 75,000 Scenarios	
St Dev CPI	Pre-1980 COLA	Post-1999 COLA
1.00%	3.67%	2.59%
1.50	3.75	2.70
2.00	3.81	2.82
2.50	3.85	2.95
3.00	3.87	3.06
3.50	3.89	3.17

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Reasonable Range and Recommendation: Based on our judgment, we believe that a range of between 3.67% and 3.89% is reasonable for the Pre-1980 COLA and a range of between 2.59% and 3.17% is reasonable for the Post-1980 COLA. We recommend that the Pre-1980 COLA remain unchanged at 3.75% and the Post-1999 COLA remain unchanged at 2.75%.

	COLA Assumption	
	Pre-1980	**Post-1999**
Current Assumption	3.75%	2.75%
Reasonable Range	3.67% - 3.89%	2.59% - 3.17%
Recommended Assumption	3.75%	2.75%

SECTION II
DEMOGRAPHIC ASSUMPTIONS

A. TURNOVER AND PRE-RETIREMENT MORTALITY

As in the past, we have studied the combined forces of turnover and preretirement mortality. This is because the majority of terminating members and beneficiaries of members who die prior to retirement receive a refund of member contributions rather than a deferred benefit. Since we do not receive census data on members who have received refunds, we cannot distinguish between terminated and deceased members once they have left the System.

Current Assumption: Ten-year select and ultimate rates developed for nonhazardous duty members per the following table; rates are multiplied by 40% for hazardous duty members:

Service	Age							
	<=24	25-29	30-34	35-39	40-44	45-49	50-54	55+
0	40.0%	30.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
1	40.0%	30.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
2	30.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
3	20.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
4	20.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
5	15.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
6 - 9	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
10 +	5.0%	5.0%	4.2%	3.0%	2.6%	2.0%	1.2%	0.0%

Historical Perspective: The assumption prior to the 1998 experience study was a three-year select and ultimate table, but the 1998 experience study indicated that a ten-year select and ultimate table was more appropriate. We analyzed the SERS data for 1998 through 2003 and in addition to length of service, we also looked at the experience by 5-year age groups, by hazardous versus nonhazardous classification, and by gender.

SECTION II
DEMOGRAPHIC ASSUMPTIONS

Results: The graphs on the following pages show how the actual data during the study period compares to our current assumption. Please note that all graphs show the numbers of actual and expected withdrawals, not the rates. Actual experience is shown in black; results predicted by the current assumptions are shown in red. There is a separate exhibit for each combination of hazardous/nonhazardous and male/female. Each exhibit contains eight graphs corresponding to the different lengths of service underlying the structure of the current assumption.
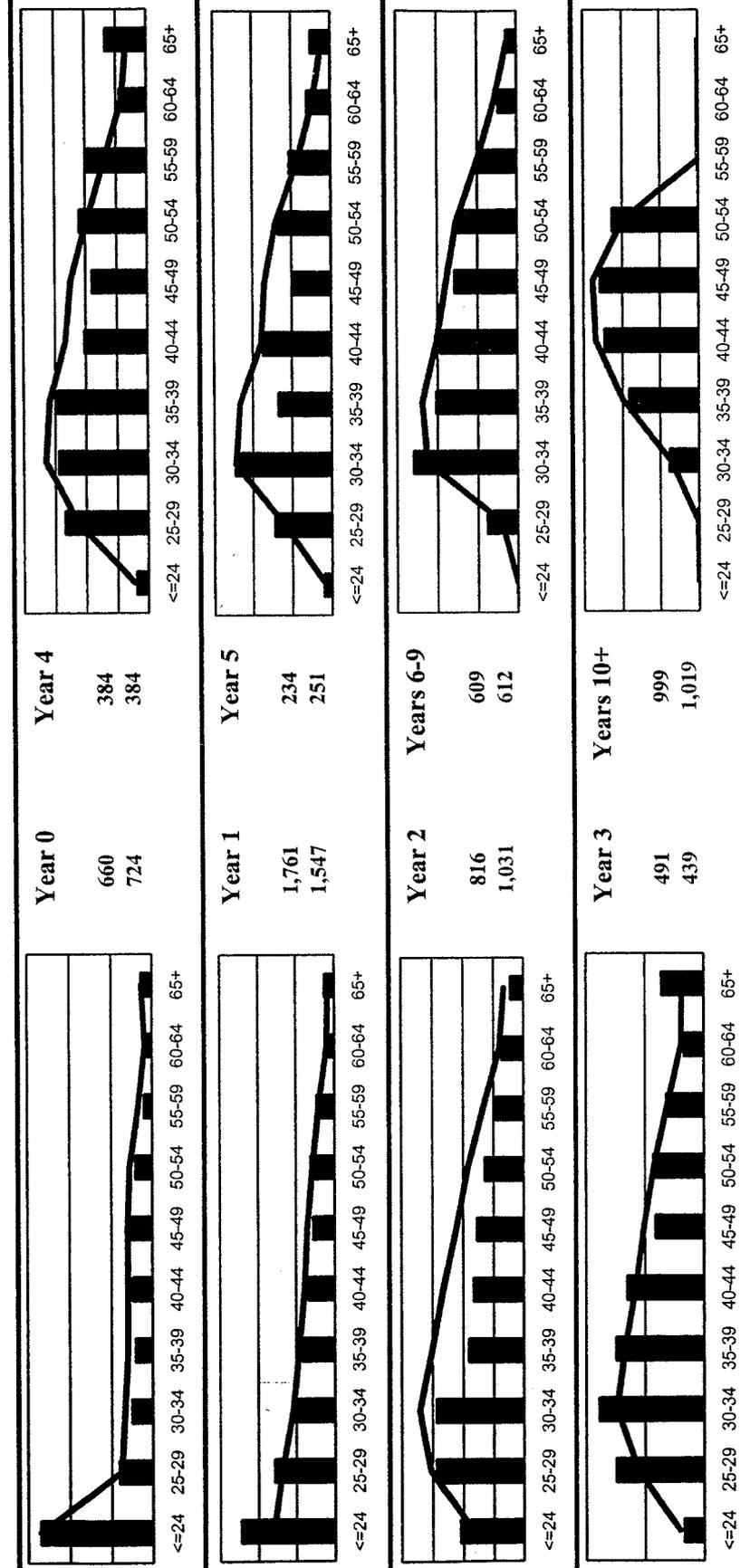
Actuary's Recommended Assumption: The current ten-year select and ultimate table is still appropriate. No changes should be made at this time.
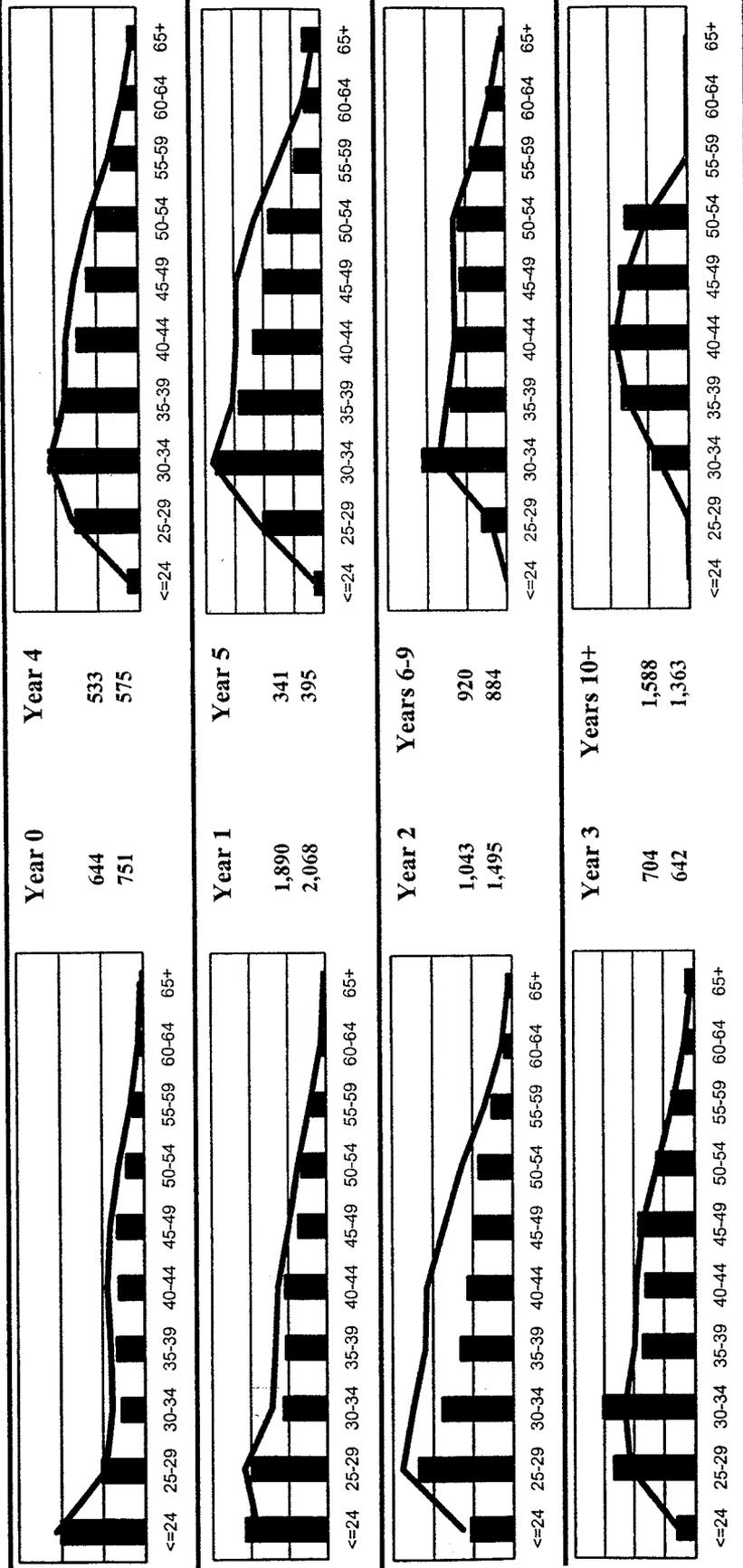
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Turnover Results: *Nonhazardous Males*

Actual Results / Results Predicted by Current Assumption

Year 0	**Year 4**
660	384
724	384

Year 1	**Year 5**
1,761	234
1,547	251

Year 2	**Years 6-9**
816	609
1,031	612

Year 3	**Years 10+**
491	999
439	1,019

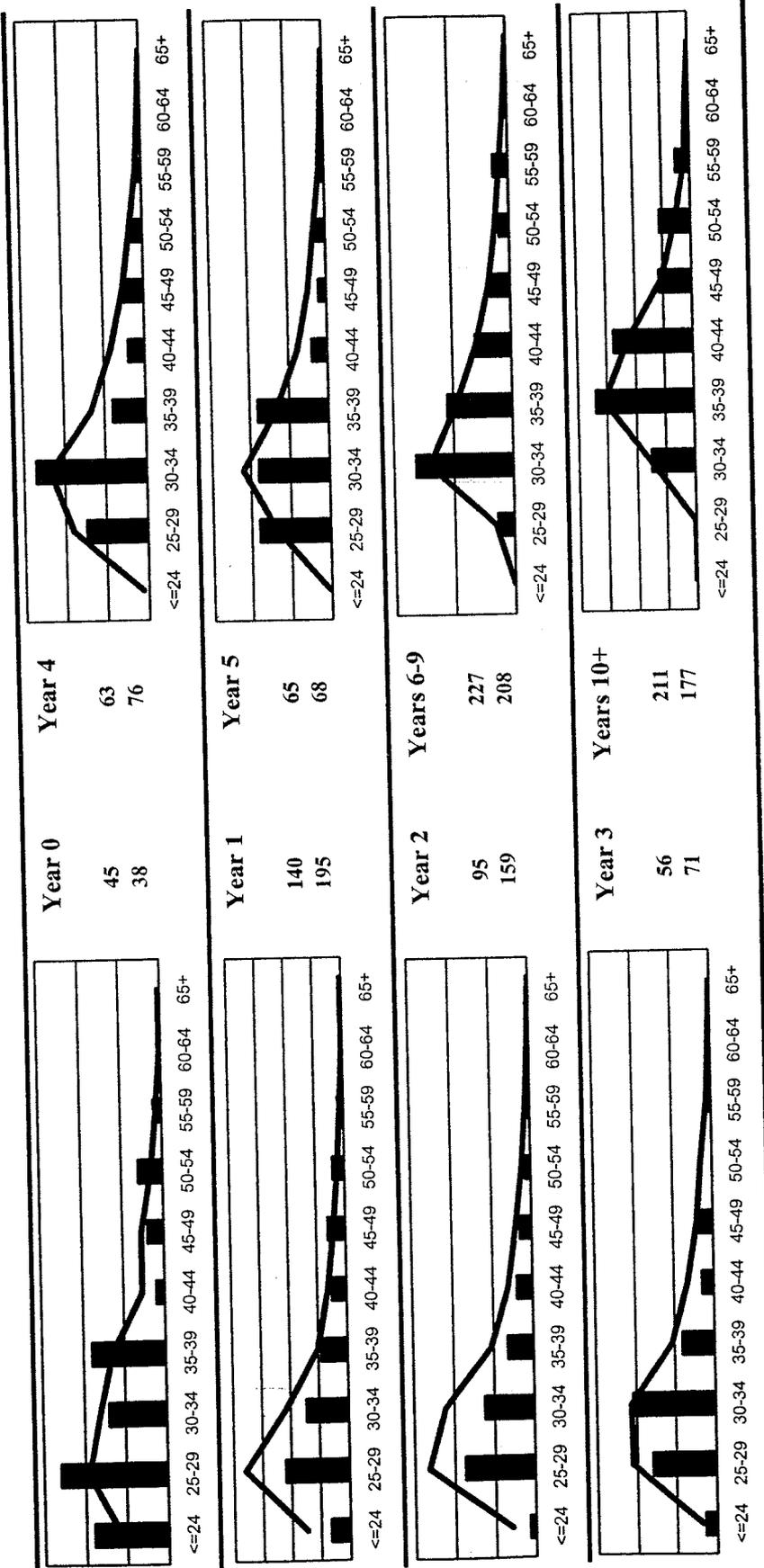**Results for entire group:**   5,954   6,007

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DEMOGRAPHIC ASSUMPTIONS

Turnover Results: Nonhazardous Females

Actual Results / Results Predicted by Current Assumption

	Year 0	Year 4
	644	533
	751	575

	Year 1	Year 5
	1,890	341
	2,068	395

	Year 2	Years 6-9
	1,043	920
	1,495	884

	Year 3	Years 10+
	704	1,588
	642	1,363

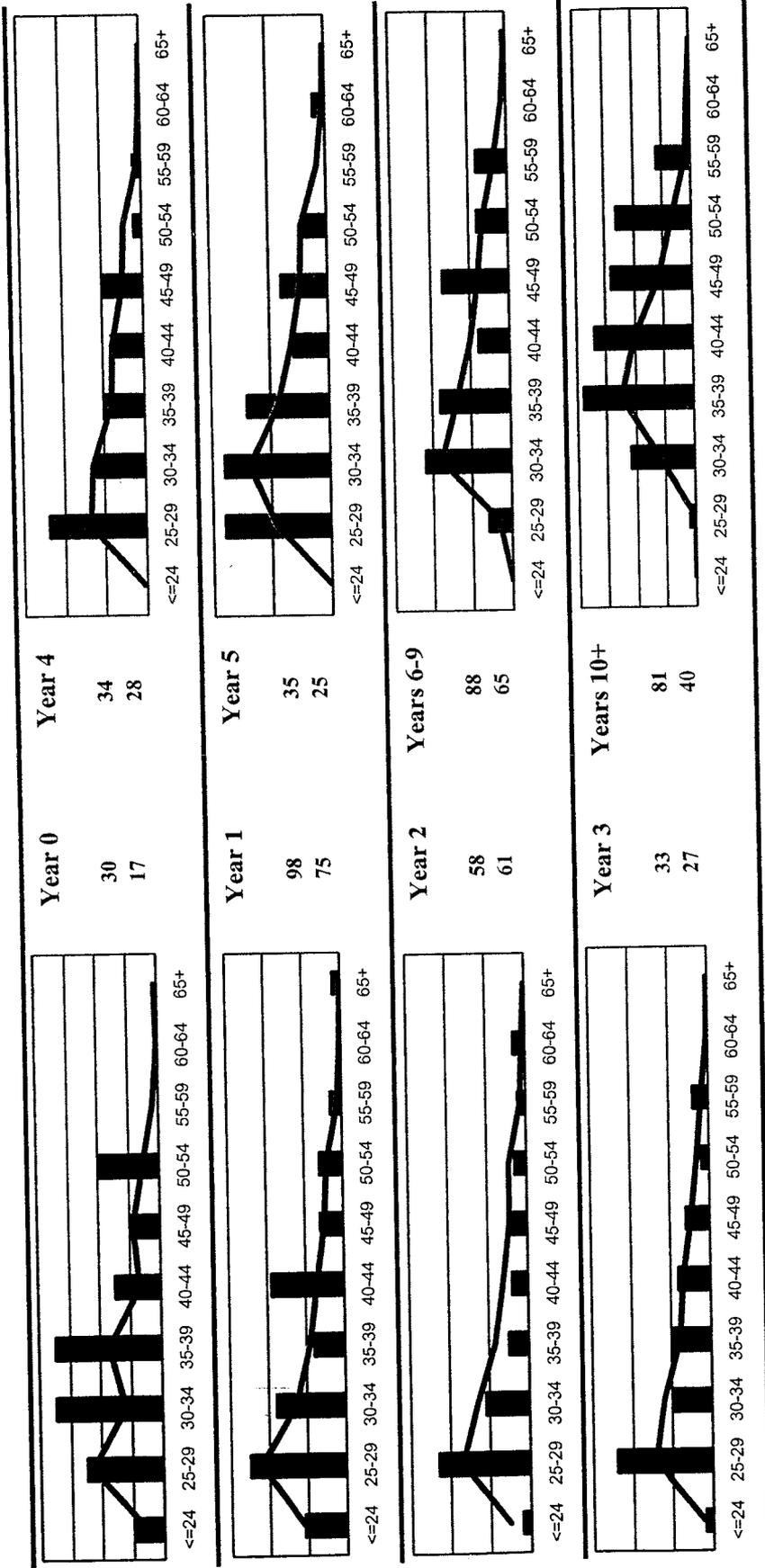**Results for entire group:**   7,663   8,172

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DEMOGRAPHIC ASSUMPTIONS

Turnover Results: Hazardous Males

Actual Results / Results Predicted by Current Assumption

Year 0	Year 4	
	45	63
	38	76

Year 1	Year 5	
	140	65
	195	68

Year 2	Years 6-9	
	95	227
	159	208

Year 3	Years 10+	
	56	211
	71	177

Results for entire group: 902   992

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Turnover Results: Hazardous Females

Actual Results / Results Predicted by Current Assumption

	Actual	Predicted
Year 0	30	17
Year 1	98	75
Year 2	58	61
Year 3	33	27
Year 4	34	28
Year 5	35	25
Years 6-9	88	65
Years 10+	81	40
Results for entire group:	**457**	**337**

SECTION II
DEMOGRAPHIC ASSUMPTIONS

B. DISABILITY

Current Assumption: Non-service connected disabilities are assumed to be 25% of the United Auto Workers Disability Table. Service connected disabilities are assumed to be 0.07% at all ages for hazardous members and 0.02% at all ages for nonhazardous members.

Study Design: We looked at the overall rates of disability by 5-year age groups and by hazardous versus nonhazardous classification. We also examined our assumption regarding service-connected disabilities.

Results: When we performed the 1998 study, we concluded that the incidence of service connected disabilities was not related to age. The data collected since then indicates that this hypothesis remains true. The graphs on the following page show how the recent experience compares to our current assumptions for each combination of hazardous/nonhazardous and with/without service disabilities. Please note that all graphs show the numbers of actual and expected disabilities, not the rates. Actual experience is shown in black; the results predicted by the current assumptions are shown in red. We concluded that a small change was warranted in the assumptions for service connected disabilities because there were more disabilities observed than we had predicted.

Actuary's Recommended Assumption: The assumption with respect to non-service connected disabilities should remain at 25% of the United Auto Workers Disability Table. The rates of service connected disabilities should to be increased to 0.11% at all ages for hazardous members and 0.03% at all ages for nonhazardous members.

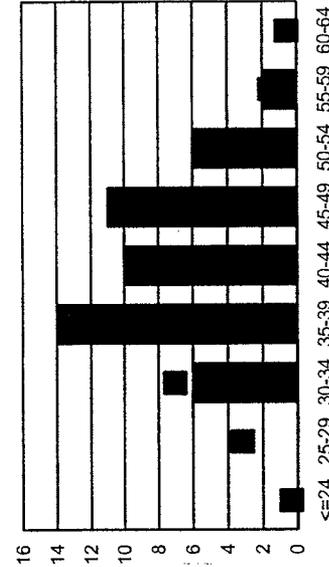# 1998-2003 SERS EXPERIENCE STUDY
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Disability Results

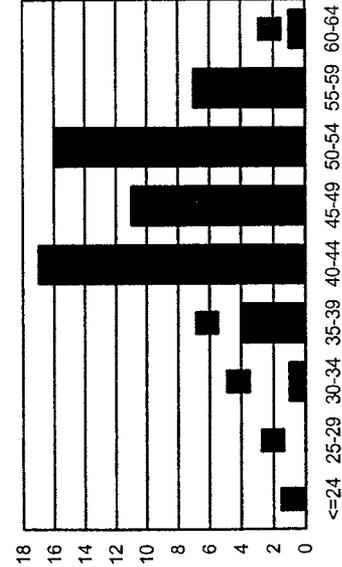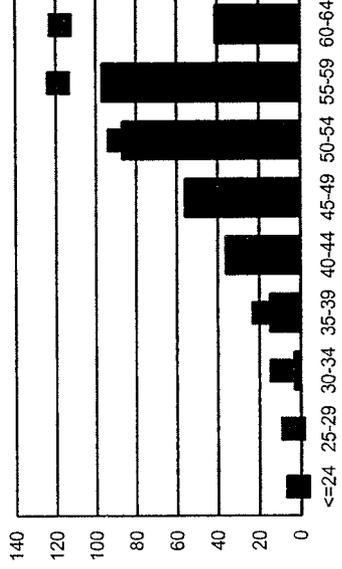### Actual Results / Results Predicted by Current Assumption

Service Related

Non Service Related
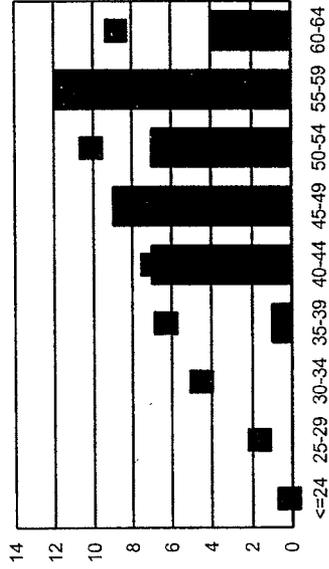
	Hazardous	Non Hazardous
	49 / 41	57 / 346
	34 / 61	44 / 489

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SECTION II
DEMOGRAPHIC ASSUMPTIONS

C. RETIREMENT

Current Assumption: Rates per the following table vary by age, separately for hazardous and nonhazardous members; there are different rates for the first year in which the member is eligible for a benefit and for ages thereafter.

	Nonhazardous Members		
	First Year Eligible For		
Age	**Reduced Benefits**	**Unreduced Benefits**	**Thereafter**
55	17.5%	15.0%	12.5%
56-60	15.0	15.0	12.5
61	25.0	25.0	15.0
62	40.0	30.0	30.0
63	35.0	35.0	25.0
64	45.0	45.0	25.0
65	65.0	65.0	40.0
66-69	60.0	65.0	40.0
70	100.0	100.0	100.0

	Hazardous Members	
Age	**First Year Eligible**	**Thereafter**
Through 48	0.0%	0.0%
49-53	20.0	0.0
54-55	20.0	15.0
56-59	40.0	40.0
60-69	80.0	60.0
70	100.0	100.0

SECTION II
DEMOGRAPHIC ASSUMPTIONS

Study Design: We looked at the rates of retirement separately for the first year in which the member is eligible for an early (reduced) retirement benefit and for a normal (unreduced) retirement benefit, as well as for all other ages. We also looked at the experience both with and without retirements that occurred during the 2003 fiscal year, since there was an early retirement incentive program during that period. The 2003 ERIP complicates the analysis of the retirement experience, both because an unusually high number of retirements took place that would not ordinarily have occurred, and because unusually low retirements can be expected to follow an incentive program.
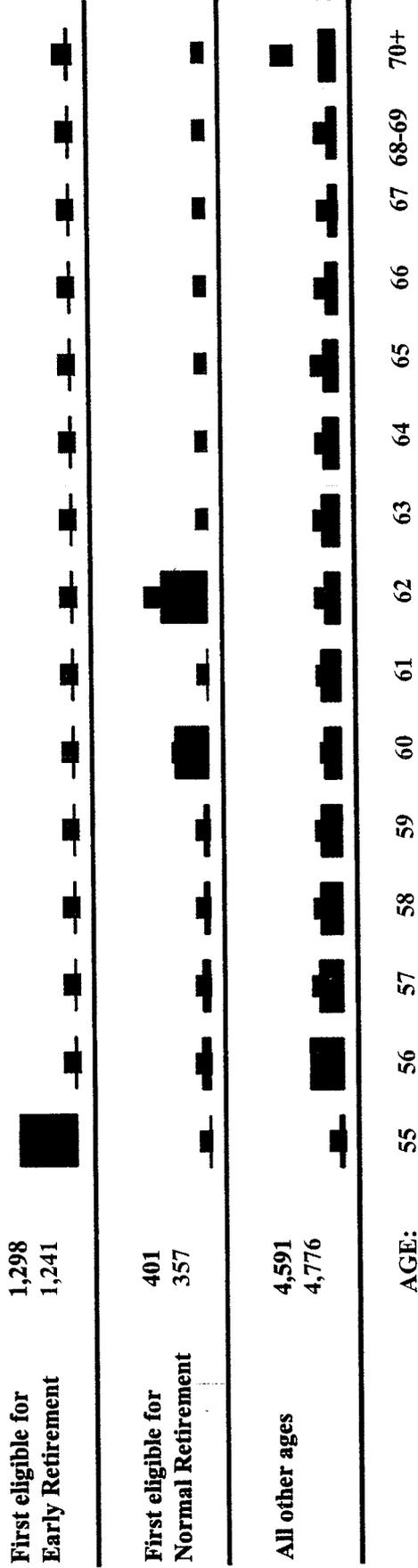
Results: The graphs on the following pages show the numbers of actual and expected retirements. Actual experience is shown in black; the results predicted by the current assumptions are shown in red; the results predicted by the actuary's recommended assumptions are shown in blue. There are graphs for each combination of hazardous/nonhazardous and include/exclude 2003 experience. The recent ERIP programs (1997 and 2003) have complicated the analysis of retirement behavior. After discussion with the actuaries on the Commission, we believe that our current assumption remains appropriate.

Actuary's Recommended Assumption: The current select and ultimate tables for the Hazardous and Non-hazardous groups are still appropriate. No changes should be made at this time.

1998-2003 SERS EXPERIENCE STUDY
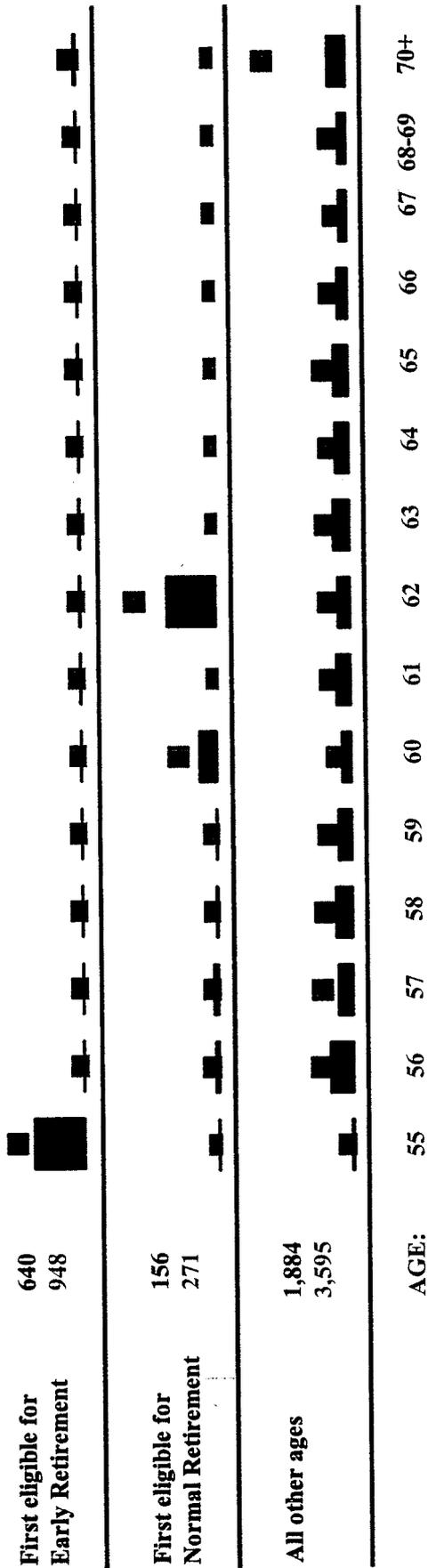SUMMARY OF RESULTS

SECTION II
DEMOGRAPHIC ASSUMPTIONS

Retirement Results: Nonhazardous, Including 2003 Experience

Actual Results / Results Predicted by Current Assumption

First eligible for
Early Retirement   1,298
                      1,241

First eligible for
Normal Retirement   401
                      357

All other ages   4,591
                      4,776

AGE: 55 56 57 58 59 60 61 62 63 64 65 66 67 68-69 70+

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1998-2003 SERS EXPERIENCE STUDY
SUMMARY OF RESULTS

SECTION II
DEMOGRAPHIC ASSUMPTIONS

Retirement Results: Nonhazardous, Excluding 2003 Experience

Actual Results / Results Predicted by Current Assumption

First eligible for
Early Retirement   640
                          948

First eligible for
Normal Retirement   156
                          271

All other ages   1,884
                        3,595

AGE: 55   56   57   58   59   60   61   62   63   64   65   66   67   68-69   70+

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SECTION II
DEMOGRAPHIC ASSUMPTIONS

Retirement Results: Hazardous, Including 2003 Experience
Actual Results / Results Predicted by Current Assumption

First eligible for
Retirement   239
159

0
0

All other ages   928
781

AGE: <=44   45   46   47   48   49   50   51   52   53   54   55   56-59   60-69   70+

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1998-2003 SERS EXPERIENCE STUDY
SUMMARY OF RESULTS

SECTION II
DEMOGRAPHIC ASSUMPTIONS

Retirement Results: Hazardous, Excluding 2003 Experience

Actual Results / Results Predicted by Current Assumption

		<=44	45	46	47	48	49	50	51	52	53	54	55	56-59	60-69	70+
First eligible for Retirement	138 113															
	0 0															
All other ages	498 582															
	AGE:															

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SECTION II
DEMOGRAPHIC ASSUMPTIONS

D. POST-RETIREMENT HEALTHY MORTALITY

Current Assumption: The 1994 Group Annuity Mortality Table, separately for males and females.

Study Design: We looked at the rates of mortality among non-disabled retirees and beneficiaries, separately for males and females.

Results: The graphs on the following page show the actual number of deaths during the study period along with the number of deaths predicted by the current mortality table. Please note that all graphs show the numbers of actual and expected deaths, not the rates. Actual experience is shown in black; the results predicted by the current assumptions are shown in red. There are separate graphs for males and females. The results show that there were more deaths than expected during the study period for both the male and female members. We expected to see fewer deaths due to mortality improvements. We concluded that the current table provides a margin for future mortality improvement.

Actuary's Recommended Assumption: The 1994 Group Annuity Mortality Table, separately for males and females, is still appropriate. No changes should be made at this time.

1998-2003 SERS EXPERIENCE STUDY
SUMMARY OF RESULTS

SECTION II
DEMOGRAPHIC ASSUMPTIONS

Post-Retirement Healthy Mortality Results

Actual Results / Results Predicted by Current Assumption
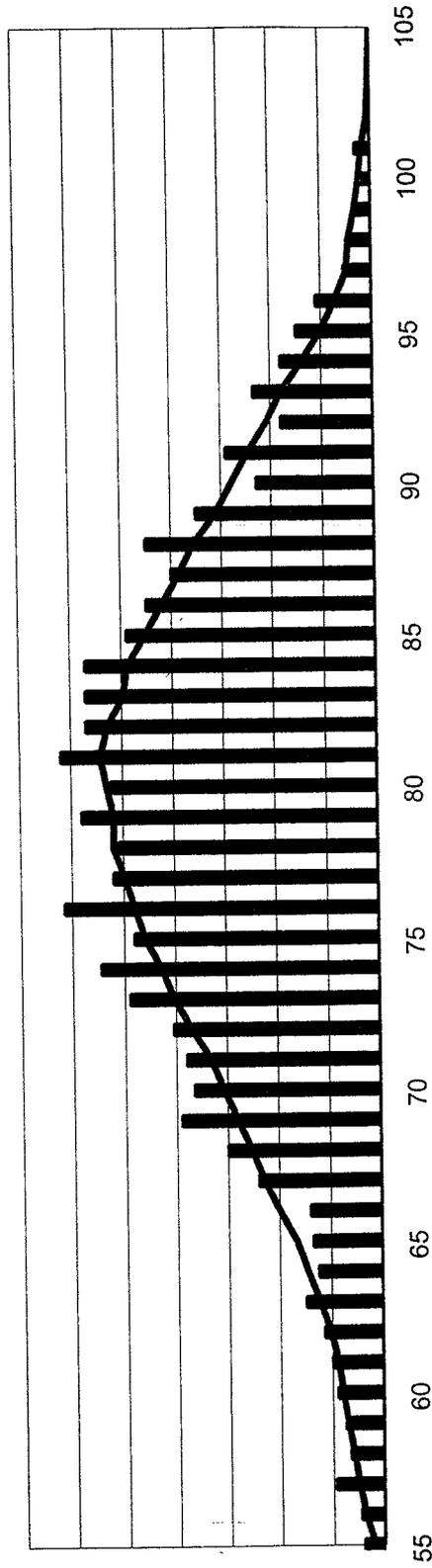
Males

2,711
2,428
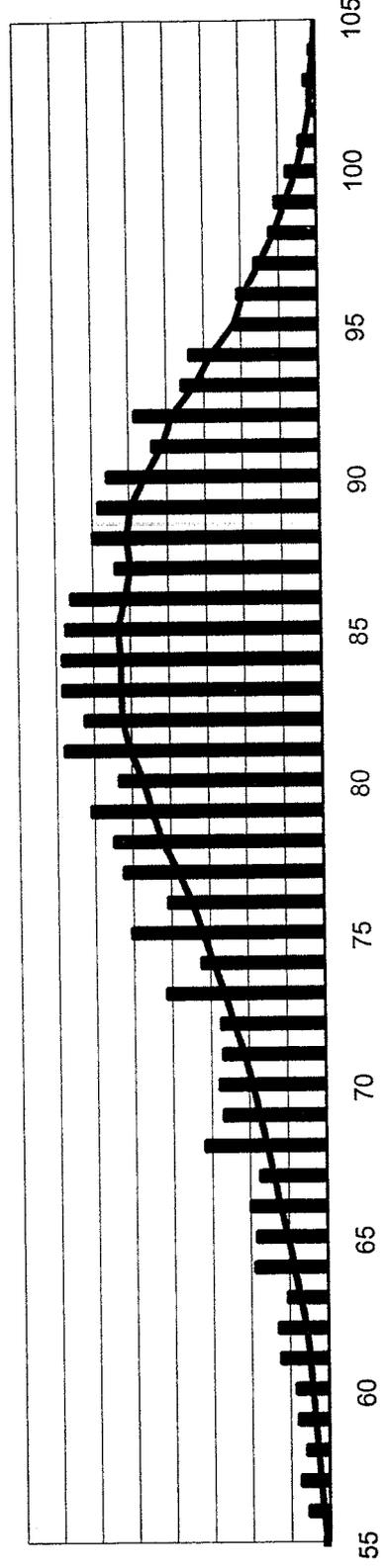
Females

3,142
2,414

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SECTION II
DEMOGRAPHIC ASSUMPTIONS

E. POST-RETIREMENT DISABLED MORTALITY

Current Assumption: 80% of PBGC Male Disabled Mortality with Social Security for Males and 60% of PBGC Female Disabled Mortality with Social Security for Females.

Study Design: We looked at the rates of deaths among disabled retirees, separately for males and females. Because the study population is relatively small, we used a chi-square test to determine how well various standard published tables of disabled mortality fit the SERS experience.

Results: The graphs on the following page show the numbers of actual and expected deaths, separately for males and females. Actual experience is shown in black; the results predicted by the current assumptions are shown in red. The current assumption predicted fewer disabled deaths than observed for both males and females. We concluded that the current table remains appropriate and provides a margin for future mortality improvement.

Actuary's Recommended Assumption: No change.

1998-2003 SERS EXPERIENCE STUDY
SUMMARY OF RESULTS

SECTION II
DEMOGRAPHIC ASSUMPTIONS

Post-Retirement Disabled Mortality Results

Actual Results / Results Predicted by Current Assumption

Males

306
258

Females

197
123

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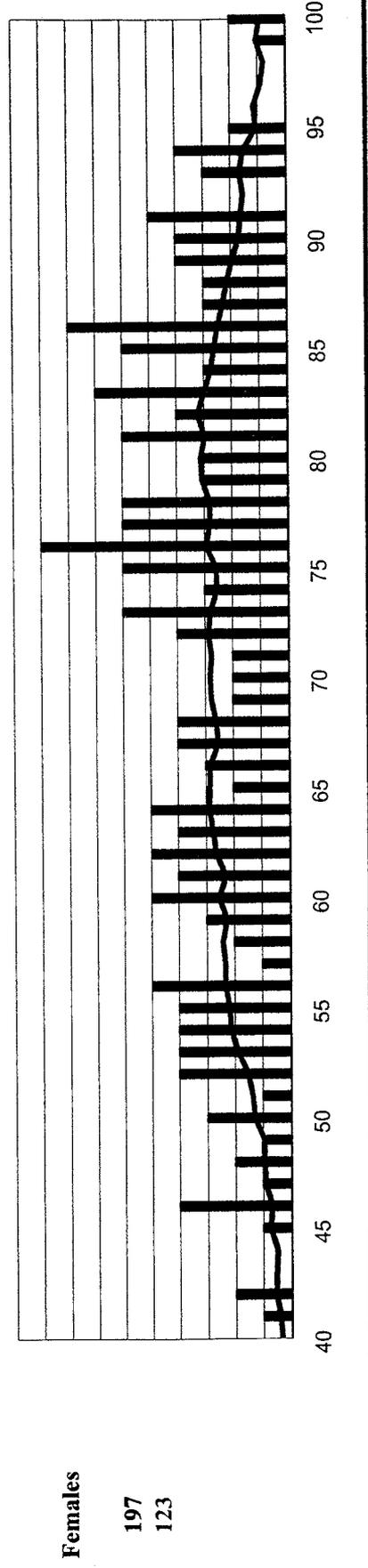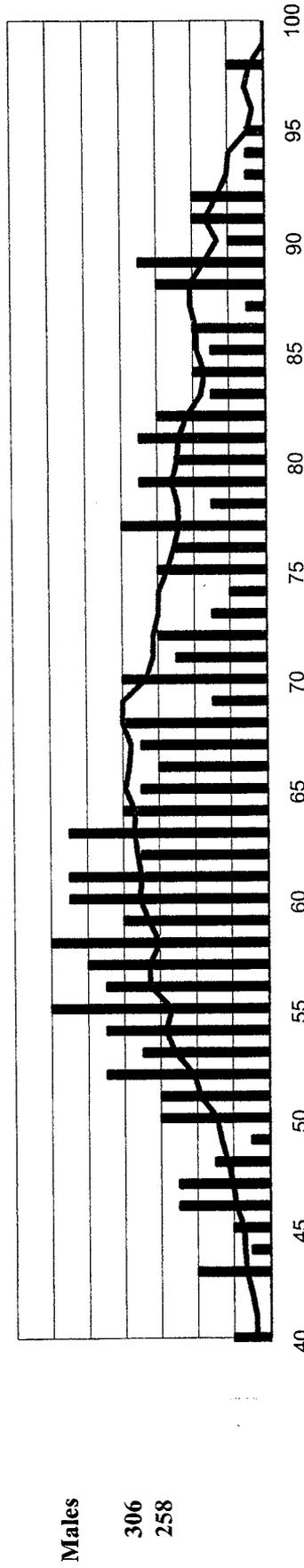
SECTION II
DEMOGRAPHIC ASSUMPTIONS

F. MERIT SCALE

Current Assumption: Overall pay increases (that is, both real wage growth and pay increases related to merit, longevity, promotions, etc.) are assumed to vary by length of service per the following table:

Service	Rate
0	15.00%
1	15.00%
2	10.00%
3	7.00%
4	6.50%
5	6.00%
6	6.00%
7	6.00%
8	6.00%
9	5.50%
10	5.50%
11	5.00%
12	5.00%
13	4.50%
14	4.50%
15+	4.25%

Study Design: We looked at the impact of both service and age on annual salary increases for each individual in our study. The results indicate the combined impact of general wage growth, merit increases, and longevity increases. There were a number of individual annual salary increases that we identified as "outliers" (increases of more than 50% or decreases of more than 20%) particularly in the first two years of service. We suspect that many of these reflect breaks in service due to terminations and rehires, leaves of absence, periods out on workers compensation, periods of part time employment, and so forth. In order to avoid distortion, we removed such outliers from our study results.

SECTION II
DEMOGRAPHIC ASSUMPTIONS

Results: The following page contains eight graphs, corresponding to different lengths of service. Each graph shows the results by age group, with the clear bar to the left indicating the experience across all age groups. Actual experience is shown in black; the results predicted by the current assumptions are shown in red. Note that the figures graphed are **not** net of wage inflation.
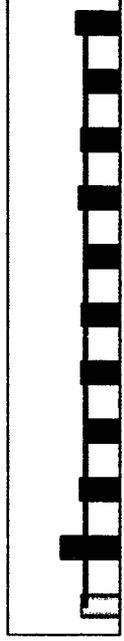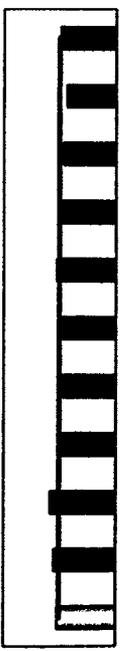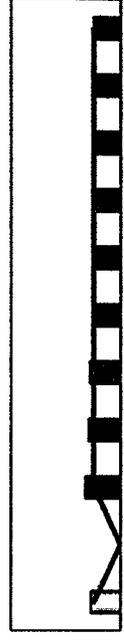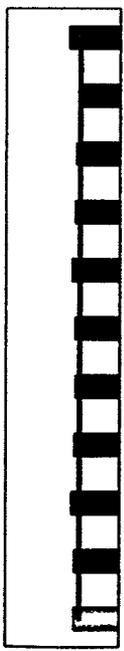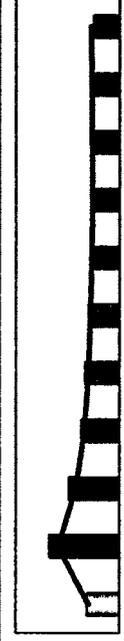
Actuary's Recommended Assumption: No change.

1998-2003 SERS EXPERIENCE STUDY
SUMMARY OF RESULTS

SECTION II
DEMOGRAPHIC ASSUMPTIONS

Merit Scale Results

Actual Results / Results Predicted by Current Assumption

Year 0	**Year 5**
11.33%	6.63%
15.00%	6.00%
Year 1	**Years 6-9**
18.64%	5.84%
15.00%	5.88%
Year 2	**Years 10-14**
10.39%	5.34%
10.00%	4.90%
Year 3	**Years 15+**
7.87%	4.54%
7.00%	4.25%
Year 4	**All Years**
7.10%	6.21%
6.50%	5.80%

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