

**ACTUARIAL VALUATION**

**South Carolina Police Officers  
Retirement System  
(PORS)**

**As of July 1, 1999**

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March 16, 2000

State Budget and Control Board  
South Carolina Police Officers Retirement System  
Columbia, South Carolina 29211

Gentlemen:

This report constitutes the July<sup>#1</sup>, 1999 actuarial valuation for the South Carolina Police Officers Retirement System (PORS). The report includes this commentary and a series of actuarial tables and summaries of the plan provisions and methods and assumptions.

#### **Basic Contribution Requirements**

Our valuation finds the PORS in excellent actuarial condition. The current plan benefits, including the COLA of 2.7% that may be granted as of July 1, 2000, are adequately funded by the current contribution levels which consist of employee contributions of 6.5% and employer contributions of 10.30% for Class II members.

The employer contribution rates are also reasonably split between 8.43% for normal cost contributions and the remainder for amortization of the unfunded liability for Class II members. With these amortization payments, the current unfunded liability will be eliminated in 5 years. Based on the previous actuarial valuation, the unfunded liability was also expected to be eliminated in 5 years.

We have also determined that the Group Life Insurance employer contribution of 0.20% and the accidental death benefit employer contribution of 0.20% are both reasonable and will adequately fund the expected benefit payments. The separate funds for these benefits have built sufficient reserves.

#### **Changes in System Benefits, Actuarial Assumptions and Methods**

This actuarial valuation reflects the current provisions of the System as outlined on Table X. The provisions have remained the same since the last actuarial valuation. However, our report does contain provisions for a 2.7% COLA which may be granted effective July 1, 2000.

The actuarial assumptions and methods are outlined on Table IX. These assumptions and methods have been revised as a result of the Five - Year Experience Study mandated for the period July 1, 1993 through June 30, 1998. The revised assumptions are outlined in Table IX. An outline of the prior assumptions and methods can be found in the Appendix.



### Valuation Data

This valuation was based on approximately 23,100 active members with a payroll of \$638.1 million. This represents an increase in the number of active members of about 1.1% and an increase of 5.2% in covered payroll since the previous year's valuation.

The number of people receiving benefits increased since the last valuation by about 6.6%. The annual benefits being paid increased by about 9.1%. This takes into account the 1.6% COLA that was effective July 1, 1999.

### Valuation Assets

The market value of the PORS assets as of July 1, 1999 was \$1.89 billion. The comparable figure one-year before was \$1.81 billion. The market value rate of investment return on assets for the 1998/99 year was 2.9%.

For purposes of the actuarial valuation, we are using an actuarial value of assets that phases-in investment return different than the assumed 7.25% rate over a 5-year period. This actuarial value as of July 1, 1999 was \$1.84 billion as compared to \$1.68 billion the previous year. The estimated rate of return on an actuarial value basis was 7.9%.

### Unfunded Liability and Experience Factors

As mandated by the South Carolina Code, a Five -Year Experience study was performed for the plan years July 1, 1993 through June 30, 1998. Assumptions on salary increases, rates of retirement, in-service mortality rates, disability rates, withdrawal rates, and post disability mortality rates were revised as a result.

After recognizing the actuarial value of assets and the change in assumptions, the unfunded liability as of July 1, 1999 was \$53.7 million. There was an increase in unfunded liability of \$4.8 million. The factors causing the decrease (in millions) are:

Required amortization payment	\$ (7.8)
Asset experience	(11.5)
Salary experience	10.8
Other experience	(11.6)
COLA effective July 1, 2000	20.5
Assumptions change	<u>4.4</u>
Net change	\$ 4.8



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**Governmental Accounting Standards Board (GASB) Calculations**

Our report includes information that is required by GASB. As of the last valuation the funded ratio was 97.2%. The current value is also 97.2%. In addition, the unfunded liability as a percentage of covered payroll has increased from 8.1% to 8.4%.

**Census Data and System Assets**

The Retirement System staff provided the demographic data that was used for this valuation. The System assets that were used for this valuation were supplied in the June 30, 1999 Retirement System Comprehensive Annual Financial Report.

**Conclusions**

In our opinion, the information contained in this actuarial report fairly represents the actuarial condition of the South Carolina Police Officers Retirement System.

We look forward to review this report with the State Budget and Control Board and the Director and staff of the Retirement System.

Sincerely,

Wallace W. Wilson, F.S.A.  
Consulting Actuary

Donald A. DuLaney, Jr., A.S.A.  
Actuary

WWW/DAD:ni

Table I

South Carolina Police Officers Retirement System (PORS)

Summary of Actuarial Valuation Results

	Revised Assumptions July 1, 1999	Prior Assumptions July 1, 1999	July 1, 1998
<b>1. <u>Number of Active Members and Compensation</u></b>			
a. Total number of active members	23,127	23,127	22,883
b. Total compensation	\$ 638,086	\$ 638,086	\$ 606,426
<b>2. <u>Number of Persons Receiving Benefits and Benefits</u></b>			
a. Total number receiving benefits	5,925	5,925	5,557
b. Total amount of benefits	\$ 80,749	\$ 80,749	\$ 73,989
<b>3. <u>Trust Fund Assets</u></b>			
a. Market value	\$1,890,526	\$ 1,890,526	\$ 1,814,065
b. Actuarial value	\$1,844,517	\$ 1,844,517	\$ 1,684,641
<b>4. <u>Unfunded Actuarial Accrued Liability (UAAL)</u></b>	\$ 53,720	\$ 49,276	\$ 48,937
<b>5. <u>Remaining Liquidation Period (Years)</u></b>	5	5	5
<b>6. <u>Required Contribution as a Percent of Compensation (Class II)</u></b>			
a. Normal cost contribution	8.43%	8.43%	8.43%
b. UAAL contribution	1.87%	1.87%	1.87%
c. Pre-retirement death contribution	0.20%	0.20%	0.20%
d. Accidental death contribution	0.20%	0.20%	0.20%
e. Total	10.70%	10.70%	10.70%

All dollar amounts in thousands



Table II

South Carolina Police Officers Retirement System (PORS)

Determination and Amortization of Unfunded Liability

	<u>Revised Assumptions</u>	<u>Prior Assumptions</u>
<b>1. <u>Actuarial Present Value of Future Benefits</u></b>		
a. Present retired members and beneficiaries	\$ 783,042	\$ 777,941
b. Present active and inactive members	<u>1,989,200</u>	<u>2,003,358</u>
c. Total actuarial present value	\$ 2,772,242	\$ 2,781,299
<b>2. <u>Present Value of Future Normal Contributions</u></b>		
<i>PV of Future Salaries 5,854,015,384</i>		
a. Employee at 6.50%	\$ 380,511	\$ 386,389
b. Employer at 8.43%	<u>493,494</u>	<u>501,117</u>
c. Total future normal contributions	\$ 874,005	\$ 887,506
<b>3. <u>Actuarial Accrued Liability = 1.c. - 2.c.</u></b>	\$ 1,898,237	\$ 1,893,793
<b>4. <u>Current Actuarial Value of Assets</u></b>	\$ 1,844,517	\$ 1,844,517
<b>5. <u>Unfunded Actuarial Accrued Liability = 3. - 4.</u></b>	\$ 53,720	\$ 49,276
<b>6. <u>Unfunded Accrued Liability Rates (Class II)</u></b>	1.87%	1.87%
<b>7. <u>Unfunded Accrued Liability Liquidation Period</u></b>	5 years	5 years

All dollar amounts in thousands



Table III

**South Carolina Police Officers Retirement System (PORS)**

**Development of Actuarial Value of Assets**

<b>1. <u>Actuarial Value of Assets on July 1, 1998</u></b>	\$ 1,684,641
<b>2. <u>1998/1999 Net Cash Flow</u></b>	
a. Contributions	114,049
b. Disbursements	<u>88,729</u>
c. Net Cash Flow	\$ 25,320
<b>3. <u>Expected Investment Return</u></b> [1. x .0725] + [2.c. x .03625]	\$ 123,054
<b>4. <u>Expected Actuarial Value of Assets on July 1, 1999</u></b> (1. + 2.c. + 3.)	\$ 1,833,015
<b>5. <u>Market Value of Assets on July 1, 1999</u></b>	\$ 1,890,526
<b>6. <u>Excess of Market Value over Expected Actuarial Value</u></b> (5. - 4.)	\$ 57,511
<b>7. <u>20% Adjustment towards Market</u></b> (.20 x 6.)	\$ 11,502
<b>8. <u>Actuarial Value of Assets on July 1, 1999</u></b> (4. + 7.)	<u>\$ 1,844,517</u>

*All dollar amounts in thousands*



Table IV

South Carolina Police Officers Retirement System (PORS)

Accounting Information

1. Number of Active and Retired Members as of July 1, 1999

<u>Group</u>	<u>Number</u>
Retiree and Beneficiaries Currently Receiving Benefits	5,925
Terminated Employees Entitled to Benefits But not yet Receiving Benefits	6,724
Active Members	<u>23,127</u>
Total	<u><u>35,776</u></u>

2. Schedule of Funding Progress

<u>Actuarial Valuation Date</u>	(a) <u>Actuarial Value of Assets</u>	(b) <u>Actuarial Accrued Liability (AAL)</u>	(c) <u>Unfunded AAL (UAAL) (b - a)</u>	(d) <u>Funded Ratio (a / b)</u>	(e) <u>Covered Payroll</u>	(f) <u>UAAL as a Percentage of Covered Payroll (c / e)</u>
07/01/99 <sup>1</sup>	\$1,844,517	\$ 1,898,237	\$53,720	97.2%	\$ 638,086	8.4%
07/01/98	1,684,641	1,733,578	48,937	97.2%	606,426	8.1%
07/01/97	1,512,390	1,570,816	58,426	96.3%	562,553	10.4%
07/01/96	1,367,549	1,427,785	60,236	95.8%	505,516	11.9%
07/01/95	1,236,610	1,299,119	62,509	95.2%	475,176	13.2%

*All dollar amounts in thousands*

<sup>1</sup> Under the prior assumptions: UAAL = \$49,276, Funded Rate = 97.4%, UAAL as Percentage of Covered Payroll = 7.7%.



**Table IV**  
**(continued two)**

**3. Assumptions and Methods**

Valuation date	July 1, 1999
Actuarial cost method	Entry-Age-Normal
Amortization method	Level percent open
Remaining amortization period	5 years
Asset valuation method	5 year smoothed market
Actuarial assumptions	
Investment rate of return*	7.25%
Projected salary increases*	5.25% - 9.00% (changed from prior assumptions of 5.05% - 11.15%)
*Including inflation at	3.75% (changed from prior assumption of 4.25%)
Cost-of-living adjustments	None



Table V

South Carolina Police Officers Retirement System (PORS)

Valuation Balance Sheet

	<u>July 1, 1999</u>	<u>July 1, 1998</u>
<b>1. <u>Assets</u></b>		
a. <u>Current Assets</u>		
i) Employee Annuity Savings Fund	\$ 389,456	\$ 352,424
ii) Employer Annuity Accumulation Fund	<u>1,455,061</u>	<u>1,332,217</u>
iii) Total Current Assets*	\$ 1,844,517	\$ 1,684,641
b. <u>Future Member Contributions to Employee Annuity Savings Fund</u>	\$ 380,511	\$ 368,892
c. <u>Prospective Contributions to Employer Annuity Accumulation Fund</u>		
i) Normal Contributions	\$ 493,494	\$ 478,424
ii) Accrued Liability Contributions	<u>53,720</u>	<u>48,937</u>
iii) Total Prospective Employer Contributions	\$ 547,214	\$ 527,361
d. <u>Total Assets</u>	<u>\$ 2,772,242</u>	<u>\$ 2,580,894</u>
<b>2. <u>Liabilities</u></b>		
a. <u>Employee Annuity Savings Fund</u>		
i) Past Member Contributions	\$ 389,456	\$ 352,424
ii) Future Member Contributions	<u>380,511</u>	<u>368,892</u>
iii) Total Contributions to Employee Annuity Savings Fund	\$ 769,967	\$ 721,316
b. <u>Employer Annuity Accumulation Fund</u>		
i) Benefits Currently in Payment	\$ 783,042	\$ 702,155
ii) Benefits to be Paid to Current Active Members	<u>1,219,233</u>	<u>1,157,423</u>
iii) Total Benefits Payable from Employer Annuity Accumulation Fund	\$ 2,002,275	\$ 1,859,578
c. <u>Total Liabilities</u>	<u>\$ 2,772,242</u>	<u>\$ 2,580,894</u>

All dollar amounts in thousands



Table VI

**South Carolina Police Officers Retirement System (PORS)**

**Number and Annual Retirement Allowances of Benefit Recipients as of July 1, 1999**

	<u>Number</u>	<u>Annual Retirement Allowances</u>
<b>1. <u>Service Retirement</u></b>		
Life Annuity	1,801	\$ 20,492,928
100% J & S	276	3,136,572
100 % Pop-Up	237	3,009,192
50% J & S	230	4,166,700
50% Pop-Up	351	6,510,120
Level Off	3	24,144,960
	<u>1,306</u>	<u>24,144,960</u>
	4,201	\$ 61,460,472
<b>2. <u>Disability Retirement</u></b>		
Life Annuity	721	\$ 10,133,627
100% J & S	88	794,233
100 % Pop-Up	39	413,707
50% J & S	47	608,141
50% Pop-Up	58	979,313
	<u>58</u>	<u>979,313</u>
	953	\$ 12,929,021
<b>3. <u>Beneficiaries of Deceased Retired Members and Active Members</u></b>		
Total	771	\$ 6,359,148
<b>4. <u>Grand Total</u></b>		
	<u><u>5,925</u></u>	<u><u>\$ 80,748,641</u></u>



Table VII

South Carolina Police Officers Retirement System (PORS)

Distribution of Active Members by Age Groups and Service Groups as of July 1, 1999

Age Group	Years of Service							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30 & Over	
Under 25	1,359	1	.	.	.	.	.	1,360
25-29	3,233	913	10	.	.	.	.	4,156
30-34	1,796	1,681	683	12	.	.	.	4,172
35-39	1,187	891	1,275	400	11	.	.	3,764
40-44	944	662	717	522	340	14	.	3,199
45-49	710	541	529	314	420	201	7	2,722
50-54	445	415	479	221	239	238	56	2,093
55-59	243	225	267	119	101	66	58	1,079
60-64	92	96	100	76	40	26	35	465
65 & Up	16	26	26	16	9	5	6	104
Total	10,025	5,451	4,086	1,680	1,160	550	162	23,114

Average Age  
Average Service  
Average Pay  
Percent Female

	Prior Year	Current Year
Average Age	38.08 years	38.21 years
Average Service	7.48 years	7.67 years
Average Pay	\$26,501	\$27,591
Percent Female	22.5%	23.3%



Table VIII

South Carolina Police Officers Retirement System (PORS)

Distribution of Participants Receiving Benefits

1. Service Retirement

<u>Current Age Group</u>	<u>Number</u>	<u>Total Annual Benefit</u>	<u>Average Annual Benefit</u>
Under 50	167	\$ 3,067,236	\$ 18,367
50 - 54	402	8,839,404	21,989
55 - 59	641	11,427,000	17,827
60 - 64	859	12,376,548	14,408
65 - 69	887	10,705,128	12,069
70 - 74	595	7,373,700	12,393
75 - 79	364	4,715,700	12,955
80 & Over	286	2,955,756	10,335
Total	4,201	\$ 61,460,472	\$ 14,630

2. Disability Retirement

<u>Current Age Group</u>	<u>Number</u>	<u>Total Annual Benefit</u>	<u>Average Annual Benefit</u>
Under 50	390	\$ 5,873,437	\$ 15,060
50 - 54	212	2,908,494	13,719
55 - 59	160	1,900,509	11,878
60 - 64	77	982,656	12,762
65 - 69	49	561,192	11,453
70 - 74	31	363,242	11,717
75 - 79	23	207,637	9,028
80 & Over	11	131,854	11,987
Total	953	\$ 12,929,021	\$ 13,567

3. Beneficiaries

<u>Current Age Group</u>	<u>Number</u>	<u>Total Annual Benefit</u>	<u>Average Annual Benefit</u>
Under 50	87	\$ 664,284	\$ 7,635
50 - 54	61	530,976	8,705
55 - 59	64	627,600	9,806
60 - 64	84	811,572	9,662
65 - 69	100	915,096	9,151
70 - 74	118	945,504	8,013
75 - 79	101	729,096	7,219
80 & Over	156	1,135,020	7,276
Total	771	\$ 6,359,148	\$ 8,248



**Table IX**

**South Carolina Police Officers Retirement System (PORS)**

**Outline of Actuarial Assumptions and Methods**

**1. Interest to be Earned by Fund**

7.25% per annum, compounded annually, composed of an assumed 3.75% inflation rate and a 3.50% real rate of return.

**2. Salary Increases**

Salary increases are assumed in accordance with the following representative rates:

<u>Age</u>	<u>Annual Increases</u>	<u>Age</u>	<u>Annual Increases</u>
20	9.00%	45	5.25%
25	8.00%	50	5.25%
30	6.85%	55	5.25%
35	6.10%	60 & Up	5.25%
40	5.75%		

**3. Decrement Rates**

The following are representative values of the assumed annual rates of withdrawal, in-service mortality, disability and service retirement

<u>Age</u>	<u>Annual Rate of</u>				
	<u>Service Retirement*</u>	<u>Mortality</u>	<u>Disability</u>	<u>Withdrawal</u>	
				<u>Years of Service</u>	
				<u>0-4</u>	<u>5 or more</u>
20		0.05%	0.10%	13.00%	7.00%
25		0.07%	0.12%	12.00%	7.00%
30		0.08%	0.16%	11.00%	4.25%
35		0.10%	0.30%	10.00%	4.00%
40		0.14%	0.40%	9.50%	2.90%
45	10.00%	0.20%	0.60%	9.00%	2.80%
50	10.00%	0.32%	0.75%	8.00%	2.00%
55	10.00%	0.50%			
60	15.00%	0.71%			
64	25.00%	1.02%			

\*Plus an additional 15% in year when first become eligible for unreduced service retirement.

In addition, 25% of disabilities are assumed to be duty related, and 5% of pre-retirement deaths are assumed to be accidental.



**Table IX**  
(continued two)

**4. Mortality After Retirement**

For healthy retirees and beneficiaries, the 1983 Group Annuity Mortality Table rates set forward two years. A separate table of mortality rates is used for disabled retirees. The following are sample rates for the retirees and beneficiaries:

<u>Age</u>	<u>Healthy</u>		<u>Disabled</u>	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
50	0.48%	0.19%	2.46%	2.46%
55	0.71%	0.31%	2.80%	2.80%
60	1.11%	0.52%	3.32%	3.32%
65	1.98%	0.87%	4.17%	4.17%
70	3.34%	1.62%	5.48%	5.48%
75	5.48%	3.07%	7.52%	7.52%
80	8.93%	5.27%	10.65%	10.65%
85	13.39%	8.39%	15.36%	15.36%

**5. Marriage Assumption**

100% of all active members are assumed to be married, with female spouses being 4 years younger.

**6. Asset Valuation Method**

Actuarial value of assets recognizes a portion of the difference between the market value of assets and the expected value of assets, based on the assumed investment rate of return. The amount recognized each year is 20% of the difference between market and expected value. The actuarial value of assets is limited to a range between 80% and 120% of market value.

**7. Cost Methods**

a. Normal Retirement, Termination, Death and Disability Benefits

Projected benefit with level percentage entry age normal cost and open-end unfunded actuarial accrued liability. Gains and losses are reflected in the period remaining to liquidate the unfunded actuarial accrued liability.

b. Group Life Insurance and Accidental Death Benefits

One-year term cost method.



**Table IX**  
**(continued three)**

**8. Additional Assumptions and Methods**

There are certain other assumption made that have a relatively minor effect on liabilities. These assumptions are available upon request.

**9. Cost-of-Living Increases**

None assumed.

**10. Changes from Prior Valuation**

The following assumptions/methods had been revised as a result of the Five (5) Experience Study:

- Inflation and real return components of investment return rate.
- Salary increases.
- The additional service retirement rate in year when first eligible for unreduced retirement.
- In-service mortality rates.
- Disability rates.
- Withdrawal rates.
- Post disability retirement mortality rates.

The Appendix at the end of this report contains an outline of the prior assumptions and methods.



Table X

South Carolina Police Officers Retirement System (PORS)

Outline of Principal Plan Provisions

1. Effective Date

July 1, 1962.

2. Eligibility Requirements

A police officer or firefighter who works at least 1,600 hours as a police officer or firefighter and whose compensation is at least \$2,000 during the fiscal year.

3. Creditable Service

Creditable service means service during which contributions have been made. This is counted in years, months, and days.

There are a number of different types of service that may be purchased by an employee under special rules, including educational leave, medical leave, federal service, maternity leave, military leave, municipality service, non-member service, out-of-state service, transfer of service for one system to another, and others.

4. Average Final Compensation

The total of the highest 12 consecutive quarters of compensation earned divided by 3. Denoted AFC. Compensation generally includes gross salary or wages, overtime, sick pay, wage deferrals, and termination pay for unused annual leave. For member who joined the system on or after January 1, 1997, compensation for benefit and contribution purposes is limited to \$150,000, subject to annual index.

5. Normal Retirement

- a. Eligibility                      Attainment of age 55 and the completion of 5 years of creditable service or completion of 25 years of creditable service.
- b. Benefit                              2.14% of AFC times creditable service (Class II).



**Table X**  
**(continued two)**

**6. Early Retirement**

- a. Eligibility Completion of 5 years of creditable service.
- b. Benefit Retirement benefit based upon creditable service and AFC as of date of early retirement, commencing at age 55.

**7. Disability Retirement**

- a. Eligibility Disability prior to normal retirement age with at least 5 years of creditable service. The service requirement is waived for duty related disability.
- b. Benefit Benefit equal to the amount of retirement benefit that would have been payable assuming continued employment to age 55 and AFC at date of disability.

**8. Death Benefits**

a. Death prior to age 55

- i) Prior to completion of 15 years of creditable service

Refund of employee contributions with interest plus Group Life Insurance in a lump sum equal to annual compensation. Group Life Insurance only payable to those with at least 1 year of creditable service, unless death is job related and whose employer participates.

- ii) After completion of 15 years of creditable service

Same as above, however, instead of the refund of employee contributions with interest, the beneficiary may elect to receive an annuity equal to the amount that would have been payable had the member retired the day before death and elected payment to commence at age 55 under option 1 described below.

b. Death after age 55

Same as Item a.(ii) above.

**9. Accidental Death Benefit**

If death occurs and is duty related, then a monthly annuity equal to 50% of the member's compensation at the time of death is paid to the statutory beneficiary until the beneficiary's death.



**Table X**  
(continued three)

**10. Member Contributions**

6.5% of compensation.

**11. Vested Benefit upon Termination**

- a. Eligibility                      100% vesting upon completion of 5 years of creditable service.
- b. Benefit                              Accrued service retirement benefit as of date of termination payable as of age 55.

**12. Termination Benefit**

- a. Eligibility                      Elect return of accumulated employee contributions.
- b. Benefit                              Return of employee contributions plus interest.

**13. Normal Form of Retirement Income**

Monthly life annuity with guaranteed return of employee contributions plus interest.

**14. Optional Forms of Retirement Income**

- a. Option 1.                      Monthly life annuity with 100% of reduced benefit continued to beneficiary upon death.
- b. Option 1(a).                      Same as option 1 with revert to maximum option if beneficiary predeceases retiree.
- c. Option 2.                      Monthly life annuity with 50% of reduced benefit continued to beneficiary upon death.
- d. Option 2(a).                      Same as option 2 with revert to maximum option if beneficiary predeceases retiree.

**15. Cost of Living Adjustment**

Granted upon approval of State Budget and Control Board if funding objectives are met. The amount is the increase in the calendar year CPI, unless the CPI increases greater than 3%. If this occurs, a 4% increase is granted.



## Appendix

### South Carolina Police Officers Retirement System (PORS)

#### Outline of Prior Actuarial Assumptions and Methods

1. **Interest to be Earned by Fund**

7.25% per annum, compounded annually, composed of an assumed 4.25% inflation rate and a 3.00% real rate of return.

2. **Salary Increases**

Salary increases are assumed in accordance with the following representative rates:

<u>Age</u>	<u>Annual Increases</u>	<u>Age</u>	<u>Annual Increases</u>
20	11.15%	45	5.05%
25	10.25%	50	5.05%
30	6.85%	55	5.05%
35	6.05%	60 & Up	5.05%
40	5.45%		

3. **Decrement Rates**

The following are representative values of the assumed annual rates of withdrawal, in-service mortality, disability and service retirement

<u>Age</u>	<u>Annual Rate of</u>				
	<u>Service Retirement*</u>	<u>Mortality</u>	<u>Disability</u>	<u>Withdrawal</u>	
				<u>Years of Service</u>	
				<u>0 - 4</u>	<u>5 or more</u>
20		0.10%	0.14%	9.72%	6.96%
25		0.13%	0.16%	8.70%	6.96%
30		0.16%	0.20%	7.98%	4.20%
35		0.20%	0.26%	7.74%	3.42%
40		0.27%	0.34%	7.38%	2.64%
45	10.00%	0.40%	0.50%	6.90%	2.82%
50	10.00%	0.57%	0.84%	5.82%	2.94%
55	10.00%	0.88%			
60	15.00%	1.42%			
64	25.00%	2.03%			

\*Plus an additional 20% in year when first become eligible for unreduced service retirement.

In addition, 25% of disabilities are assumed to be duty related, and 5% of pre-retirement deaths are assumed to be accidental.



**Appendix  
(continued two)**

**4. Mortality After Retirement**

For healthy retirees and beneficiaries, the 1983 Group Annuity Mortality Table rates set forward two years. A separate table of mortality rates is used for disabled retirees. The following are sample rates for the retirees and beneficiaries:

<u>Age</u>	<u>Healthy</u>		<u>Disabled</u>	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
50	0.48%	0.19%	2.89%	2.89%
55	0.71%	0.31%	3.29%	3.29%
60	1.11%	0.52%	3.91%	3.91%
65	1.98%	0.87%	4.90%	4.90%
70	3.34%	1.62%	6.45%	6.45%
75	5.48%	3.07%	8.85%	8.85%
80	8.93%	5.27%	12.53%	12.53%
85	13.39%	8.39%	18.07%	18.07%

**5. Marriage Assumption**

100% of all active members are assumed to be married, with female spouses being 4 years younger.

**6. Asset Valuation Method**

Actuarial value of assets recognizes a portion of the difference between the market value of assets and the expected value of assets, based on the assumed investment rate of return. The amount recognized each year is 20% of the difference between market and expected value. The actuarial value of assets is limited to a range between 80% and 120% of market value.

**7. Cost Methods**

a. Normal Retirement, Termination, Death and Disability Benefits

Projected benefit with level percentage entry age normal cost and open-end unfunded actuarial accrued liability. Gains and losses are reflected in the period remaining to liquidate the unfunded actuarial accrued liability.

b. Group Life Insurance and Accidental Death Benefits

One-year term cost method.



**Appendix  
(continued three)**

**8. Additional Assumptions and Methods**

There are certain other assumption made that have a relatively minor effect on liabilities. These assumptions are available upon request.

**9. Cost-of-Living Increases**

None assumed.

