

STATE EMPLOYES' RETIREMENT SYSTEM

1988 ACTUARIAL REPORT

1500 K Street, NW
Suite 1000
Washington, DC 20005
(202) 637-6600
Fax: (202) 637-0244

April 24, 1989

Hay/Huggins
Company

Mr. Dale Everhart
Assistant Executive Director
Pennsylvania State Employees'
Retirement System
909 Green Street
Harrisburg, PA 17102-2999

Dear Dale,

We have completed the work on the December 31, 1988 valuation of the Pennsylvania State Employees' Retirement System (SERS) and the pages that show the calculation of the employer cost are attached.

The total employer cost, using the same assumptions as were used in the 1987 valuation, is 12.97% of salary. This includes the cost of the supplement that was added to annuities as of January 1, 1989. The details of the calculation are shown in Schedule B.

This cost is different from the 1987 cost of 13.09% for several reasons. First, the cost increased because of the supplement. Second, there was a substantial gain from investment income which reduced the cost. In 1988, a total of \$410 million in excess income was added to the assets. The details of this calculation are on Schedule K. As in past years, the investment gain was partially offset by salary increases, but the net effect was a reduction in employer cost.

We have also calculated the employer cost if recent changes in the method of determining longevity pay were to be recognized. In 1988, there was a significant change in the method of setting pay. Two features of the revisions in the pay scale would increase the retirement system cost. First, current employees will now receive longevity increases until their 35th year of employment. Previously, the increases stopped at the seventh year. The new procedure will increase the unfunded actuarial accrued liability because the high-three salary for most current employees will increase.

Second, new entrants will not be eligible for any longevity increases until they have been employed for seven years. This will not significantly change the expected high-three salary for new entrants.

HayGroup

However, it will lower their average career salary and, therefore, increase the normal cost.

If the new salary scale features were to be incorporated in the actuarial prediction of salaries, the employer cost would increase from 12.97% to 14.20% of payroll.


Hay/Huggins
Company

Since we know that the salary structure has been changed, we could introduce that information in determining the 1989/90 contribution. On the other hand, this change could be viewed as one of the many changes that will be recognized at the time of the next evaluation of experience under SERS. We conduct an evaluation every five years in which all demographic and economic experience are considered. The next evaluation will be produced in 1991.

The traditional approach in SERS, as with many other plans, is to recognize actions that affect the retirement liabilities after they have occurred but not to recognize evolving trends that might, if they came to fruition, affect the cost of the system. For example, the cost of the 1989 supplement was included when it occurred but we do not include the cost of possible future supplements in the valuation. Other factors, such as an unexpected number of retirements, are not used to change predictions until we perform the evaluation every fifth year.

The changes in the salary scale could be viewed as either type. The changes have occurred and the effect on SERS can be measured. Therefore, they could be incorporated on the same basis as the 1989 supplement. On the other hand, the salary schedule changes could be viewed as one of many such unexpected changes that will be considered at the time of the next evaluation.

Sincerely,


Edwin C. Hustead
Senior Vice President

ECH/bml

STATE EMPLOYES' RETIREMENT SYSTEM

I. UNFUNDED ACTUARIAL ACCRUED LIABILITY DECEMBER 31, 1988

1) Present Value of Benefits:

(a) Active and Inactive Participants	
Superannuation and Withdrawal	\$ 7,208,880,787
Disability	382,084,088
Death	605,705,287
Refunds	54,521,744
Special Police and Enforcement	
Officer Benefits	94,325,356
(b) Annuitants and Beneficiaries	<u>4,089,253,858</u>
(c) Total\$12,434,771,120

2) Present Value of Member and Employer Contributions:

(a) Employer portion of Normal Cost	\$ 1,041,979,029
(b) Supplemental Annuity Amortization	596,098,186
(c) Member Contributions	1,370,142,933
(d) Special Police and Enforcement	
Officer Contributions	<u>66,044,670</u>
(e) Total\$ 3,074,264,818

3) Actuarial Accrued Liability: (1) - (2) \$ 9,360,506,302

4) Actuarial Value of Assets \$ 7,510,933,374

5) Unfunded Actuarial Accrued Liability: (3) - (4) \$ 1,849,572,928

II. AMORTIZATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY

<u>Funding Period</u> 30 Years from July 1	<u>Amount of</u> <u>Liability</u>	<u>Annual Payment to Fund</u>	
		<u>Amount</u>	<u>Percent*</u>
1969	\$1,250,744,970	\$131,984,065	4.77%
1974	<u>598,827,958</u>	<u>44,360,913</u>	<u>1.60</u>
	\$1,849,572,928	\$176,344,978	6.37%

*Payment for 1989 expressed as a percentage of the estimated total payroll for active members in 1989 of \$2,767,628,181. The estimate was obtained by multiplying the 1987 salary for each active employee by the salary growth assumption for one year.

STATE EMPLOYES' RETIREMENT SYSTEM

I. DEVELOPMENT OF EMPLOYER NORMAL COST RATE
(Fiscal Year 1989-90)

1) Normal Cost Rate for new active members to fund:	
(a) Superannuation and Withdrawal	8.15%
(b) Disability68
(c) Death56
(d) Refunds	<u>.93</u>
(e) Total	10.32%
2) Member Deductions	6.25%
3) Employer Normal Cost (1)(e) - (2)	4.07%

II. AMORTIZATION OF SUPPLEMENTAL ANNUITIES

<u>Funding Period:</u> <u>20 Years from</u>	<u>Amount of</u> <u>Liability</u>	<u>Annual Payment to Fund</u> <u>Amount</u>	<u>Percent*</u>
July 1, 1969	\$ 307,808	\$ 307,808	.01%
July 1, 1974	34,928,389	7,146,473	.26
July 1, 1979	148,811,639	18,048,713	.65
July 1, 1984	159,911,227	14,787,426	.54
January 1, 1989	<u>252,139,123</u>	<u>19,998,344</u>	<u>.72</u>
	\$ 596,098,186	\$ 60,288,764	2.18%

*Payment for 1989 expressed as a percentage of the estimated total payroll for active members in 1989 of \$2,767,628,181. The estimate was obtained by multiplying the 1988 salary for each active employee by the salary growth assumption for one year.

III. DEVELOPMENT OF TOTAL EMPLOYER CONTRIBUTION RATE
(Fiscal Year 1989-90)

	<u>Payable</u> <u>January 1</u>	<u>Payable</u> <u>Quarterly**</u>
1) Employer Normal Cost	4.07%	4.18%
2) Payment on Unfunded Actuarial Accrued Liability	6.37	6.55
3) Payment on Supplemental Annuities	<u>2.18</u>	<u>2.24</u>
4) Total	12.62%	12.97%

**Equals the Employer contribution payable January 1 plus 2.75% interest.

STATE EMPLOYEES' RETIREMENT SYSTEM

ACTUARIAL VALUE OF ASSETS

I. Development of 12/31/88 Expected Actuarial Value:

1) Actuarial Value as of 12/31/87	\$6,716,513,070
2) Contributions in 1988	535,544,207
3) Benefits and Expenses in 1987	520,534,040
4) Interest @ 5.5% to 12/31/88 on (1)	369,408,219
5) Interest @ 5.5% to 12/31/88 on .5 x ((2) - (3))	<u>412,780</u>
6) Expected Actuarial Value as of 12/31/88: (1) + (2) - (3) + (4) + (5)	\$7,101,344,236

II. Previous Differences Not Yet Amortized:

1) Unrecognized Amount of 12/31/84 Difference: .2 x \$129,746,917	\$ 25,949,383
2) Unrecognized Amount of 12/31/85 Difference: .4 x \$846,693,525	338,677,410
3) Unrecognized Amount of 12/31/86 Difference: .6 x \$616,681,305	370,008,783
4) Unrecognized amount of 12/31/87 Difference: .8 x \$(105,132,816)	<u>(84,106,253)</u>
5) Total	\$ 650,529,323

III. Gain or Loss from 1988

1) Market Value of Assets on 12/31/88	\$8,311,830,320
2) Expected Market Value II(5) + I(6)	<u>7,751,873,559</u>
3) Gain (loss) from 1988 Investments (1) - (2)	\$ 559,956,761

IV Development of Actuarial Value of Assets as of 12/31/88:

1) 20% of \$129,746,917 (12/31/84 Difference):	\$ 25,949,383
2) 20% of \$846,693,525 (12/31/85 Difference):	169,338,705
3) 20% of \$616,681,305 (12/31/86 Difference):	123,336,261
4) 20% of \$(105,132,816) (12/31/87 Difference):	(21,026,563)
5) 20% of \$559,956,761 (12/31/88 Difference):	<u>111,991,352</u>
6) Total Difference: (1) + (2) + (3) + (4) + (5)	\$ 409,589,138
7) Actuarial Value at 12/31/88: I(6) + IV(6)	<u>\$ 7,510,933,374</u>

Hay/Huggins Company, Inc.
Actuarial and Benefits Consultants
229 South 18th Street
Rittenhouse Square
Philadelphia, PA 19103
(215) 875-2300

Hay/Huggins
Company

June 28, 1989

Mr. John Brosius, Executive Director
State Employees' Retirement System
BOAS School Building
909 Green Street
Harrisburg, PA 17102

Dear Mr. Brosius:

This report presents the results of our actuarial valuation of the Pennsylvania State Employees' Retirement System (SERS) as of December 31, 1988. Highlights of the valuation are presented on page 1, followed by a general discussion and comments on the various schedules included in the report. These schedules summarize the underlying calculations, asset information, participant data, plan benefits and actuarial assumptions.

Purpose

The main purposes of this report are:

- to indicate the pension contribution rates which will be the basis for the Fiscal Year 1989-90 appropriation request;
- to disclose the financial condition of the Plan;
- to provide information relating to the disclosure and reporting requirements of Statement No. 5 of the Governmental Accounting Standards Board.

Certification

To the best of our knowledge, this report is complete and accurate and all costs and liabilities have been determined in conformance with generally accepted actuarial principles and on the basis of actuarial assumptions and methods which, in the aggregate, are reasonable (taking into account past experience under the SERS and reasonable expectations) and which in combination represent our best estimate of anticipated experience under the plan.

Respectfully submitted,
HAY/HUGGINS COMPANY, INC.



By
EDWIN C. HUSTEAD, F.S.A.
Member American Academy of Actuaries
Enrolled Actuary No. 1499



By
ANN M. PALAITIS, F.S.A.
Member American Academy of Actuaries
Enrolled Actuary No. 3574

ECH:AMP:kk

HayGroup

STATE EMPLOYES' RETIREMENT SYSTEM

TABLE OF CONTENTS

	<u>Schedule</u>	<u>Page</u>
<u>Valuation Highlights</u>	-	1
<u>Comments on Schedules</u>	-	4
<u>Current Costs and Valuation</u>		
Unfunded Actuarial Accrued Liability and Amortization	A	8
Normal Cost, Amortization of Supplemental Annuities and Total Employer Contribution	B	9
Total Contribution Rate By Group	C	10
Employer Contribution Rate by Group	D	11
State Police and Enforcement Officers Additional Annuity Rate	E	12
Air and Army National Guard Contribution Rate	F	13
Analysis of Change in Employer Contribution Rate and Unfunded Actuarial Accrued Liability	G	14
Actuarial Balance Sheet	H	15
Required Transfers Within SERS Accounts	I	16
Funding Status of Projected Benefit Obligation	J	17
Actuarial Value of Assets	K	18
<u>Participant Data</u>		
Profile of Plan Participants	L	19
<u>Reference Data</u>		
Summary of Benefit and Contribution Provisions	M	26
Actuarial Assumptions	N	31
Asset Valuation Method, Funding and Contribution Policy	O	33
Technical Terms	P	35

STATE EMPLOYES' RETIREMENT SYSTEM

VALUATION HIGHLIGHTS

	<u>December 31, 1988</u>	<u>December 31, 1987</u>
	<u>Valuation</u>	<u>Valuation</u>
Summary of Contributions: (Percent of Members' Compensation)		
Normal Cost	4.68%	4.73%
Amortization of Unfunded Actuarial Accrued Liability . .	6.11	6.79
Amortization of Supplemental Annuities	<u>2.24</u>	<u>1.57</u>
Total	13.03%	13.09%
Contribution Rate for:		
Class A Members: Age 60 Superannuation	12.70%	12.77%
Class A Members: Age 50 Superannuation	15.45	15.56
Class C: State Police	23.53	23.11
Enforcement Officers	15.45	15.56
Class D Members	57.94	58.35
Class E Members	19.05	19.16
Market Value of Assets	\$8,311,830,320	\$7,367,042,394
Projected Benefit Obligation	\$8,074,138,162	\$7,384,307,121
Active Participants:		
Number	109,611	109,499
Average Projected compensation . .	\$ 25,250	\$ 24,321
Total Projected compensation . .	\$2,767,628,181	\$2,663,080,000
Annuitants and Beneficiaries:		
Number	71,316	69,515
Total annual pension	\$ 415,526,918*	\$ 371,274,432
Inactive Participants:		
Number	3,243	2,871

*Including 1/1/89 Supplement

STATE EMPLOYEES' RETIREMENT SYSTEM

General Discussion

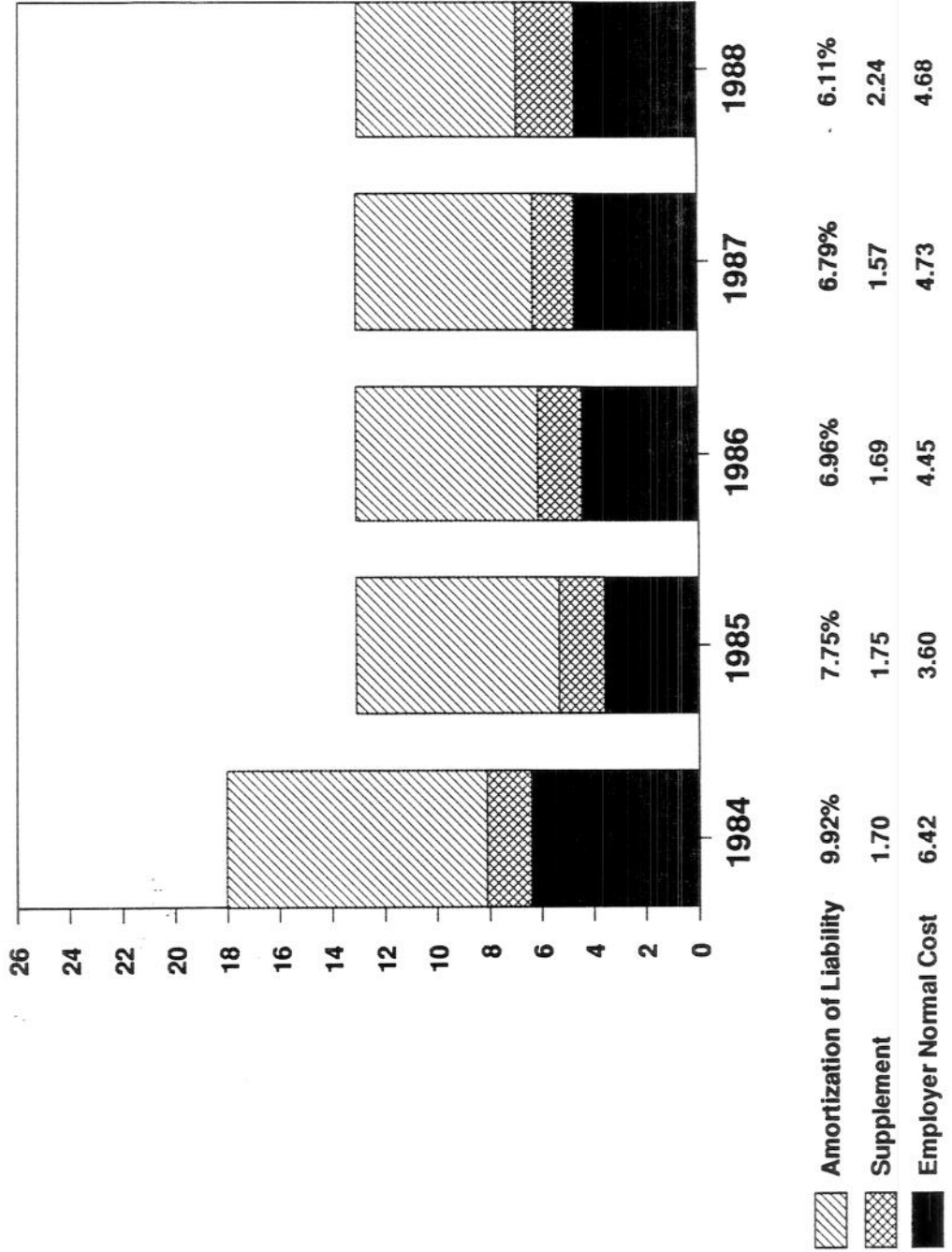
The liabilities and costs in this report were calculated using demographic assumptions based on plan experience, an interest rate of 5.5%, and a career salary growth that ranges from 4.45% a year at age 20 to .25% a year for new employees after age 44. The actuarial assumptions are summarized in Schedule N.

The assumptions were selected to produce a realistic employer cost considering the legislative requirement that the valuation be based on an annual investment return of 5.5 percent. For the 1987 and 1988 valuations, the 5.5 percent interest rate and associated salary scale produced an aggregate employer cost approximately equal to the cost on the following rates of investment return and salary increases:

<u>Years</u>	<u>Salary Increases</u>			<u>Investment Return</u>
	<u>General</u>	<u>Average Career</u>	<u>Total</u>	
1989 to 1995	4.0%	2.0%	6.0%	9.8%
1996 to 2000	4.0	2.0	6.0	9.0
2001 to 2005	4.0	2.0	6.0	8.0
2006 to 2010	4.0	2.0	6.0	7.0
After 2010	4.0	2.0	6.0	6.0

The assumptions are the same as those used for the December 31, 1987 valuation. Page 3 shows the history of the employer cost since 1984. The cost was lowered in 1985 as a result of the five-year evaluation of experience under SERS. While the components of the cost have shifted since 1984, the total cost has held steady through 1988.

Pennsylvania State Employees' Retirement System Total Employer Cost



STATE EMPLOYES' RETIREMENT SYSTEM

COMMENTS ON SCHEDULES

Contribution Rate

Schedules A and B summarize the development of the Employer Contribution Rate before allocation by group. The Employer Contribution Rate comprises three pieces: the Normal Cost; the amortization of the Unfunded Actuarial Accrued Liability; and, the amortization of the liability for the Supplemental Annuities.

The Employer Contribution Rate calculated as a result of the December 31, 1988 actuarial valuation is 13.03%. The 1987 valuation had produced an Employer Contribution Rate of 13.09%. The three pieces composing the rate are as shown in the following table:

	1988 <u>Valuation</u>	1987 <u>Valuation</u>
Normal Cost Rate	4.68%	4.73%
Unfunded Actuarial Accrued Liability Rate	6.11	6.79
Supplemental Annuity Amortization Rate	<u>2.24</u>	<u>1.57</u>
TOTAL	13.03%	13.09%

The normal cost rate is the level percentage of compensation which would be required for new active members over their period of active service to fund the liability for any prospective benefits earned by these members. In making this calculation we used data for all active members who had not yet completed one year of credited service.

The unfunded actuarial accrued liability of \$1,726,685,966 is composed of two parts: one part is to be funded over 30 years from July 1, 1969 and the other part over 30 years from July 1, 1974. To the extent the unfunded actuarial accrued liability increases (decreases) due to changes in assumptions or due to gains or losses because actual experience differs from the actuarial assumptions, those increases (decreases) are prorated between the two parts based on the expected outstanding balances.

The accrued liability for supplemental annuities is composed of five parts to be funded in level payments over 20 years from July 1, 1969; July 1, 1974; July 1, 1979; July 1, 1984; and January 1, 1989.

STATE EMPLOYES' RETIREMENT SYSTEM

Employer Contribution Rates by Group

Schedule C summarizes the employer contribution rate for each group of members with different benefits. The basic employer contribution rate for general benefits is 12.70% of salary. There is an additional employer contribution required to pay for the added liability for members entitled to full benefits at age 50; for those entitled to an annual benefit rate that is a multiple of the basic 2% rate; and for additional annuities for Class C members. The complete schedule of contributions is as follows:

Class A with age 60 benefit	12.70%
Class A with age 50 benefit	15.45
Class C - State Police	23.53
Class C - Enforcement Officers	15.45
Class D	57.94
Class E	19.05

Schedule D shows the development of the contribution rate for the cost of additional benefits payable at age 50 and the higher multipliers paid to Class D and Class E members. Full benefits are available at age 50 for all Class C and Class D members and some Class A members. The effect of the adjustments is to produce an aggregate employer contribution rate that is equal to the required rate of 13.03% of total payroll.

The benefit multipliers used are 3.75 for Class D and 1.5 for Class E members. These are the ratios of the next year's credited accrual rate for Class D and Class E to the general 2% accrual rate.

Schedule E shows the development of the contribution rates for additional annuities for certain State Police and Enforcement Officers. These members receive an additional annuity that is equal to the accumulated member contributions and interest at retirement determined as if the members were at least age 60 at retirement. The State Police benefit requires contributions equal to 8.08% of the payroll to fully fund the additional benefit over the working life of the members. The Enforcement Officer benefits have been fully funded by past contributions.

A special contribution is developed for members of the Air and Army National Guard on Schedule F. It consists of the Employer Contribution Rate plus a contribution sufficient to amortize the deficiency in the Air and Army National Guard Account over 20 years from July 1, 1980.

Schedule G contains an analysis of the change in the Employer Contribution Rate and Unfunded Accrued Liability from the 1987 to 1988 valuation. The excess interest earnings of \$410,000,000 brought into the assets in 1988 reduced the employer cost by 1.45% of payroll. The 1989 supplement increased the cost by .74% of payroll and other changes increased the cost by a net of .65% of payroll. The total decrease was .06% of payroll.

STATE EMPLOYES' RETIREMENT SYSTEM

The net result of all changes was to decrease the aggregate employer contribution from 13.09% of compensation to 13.03%.

The amortization payments on the Unfunded Actuarial Accrued Liability would have reduced the liability to \$1,912,446,929 as of December 31, 1988. The combined result of other changes resulted in a liability of \$1,726,685,966.

Actuarial Balance Sheet and Account Balance Transfers

Schedule H contains an actuarial balance sheet. It illustrates that the excess of actuarial present value of plan benefits (Total Liabilities) over the present assets is fully funded by future contributions. These future contributions consist of Normal Cost payments, amounts to fund the Unfunded Actuarial Accrued Liability and Supplemental Annuities, special contributions for State Police and Enforcement Officers and Member Contributions.

Each year it is necessary to compare the account balance in the Annuity Reserve Account with the actuarial liability of that account and make the necessary transfer to bring the account into balance with the liability. There was a transfer to the Annuity Reserve Account of \$25,091,116. This transfer and the transfer for the supplement have been reflected in the account balances shown in Schedule H. Schedule I shows the details of the required account transfer.

Funding Status of Projected Benefit Obligation

Schedule J provides information required by the Governmental Accounting Standards Board (GASB).

The GASB liability for credited projected benefits is a standardized disclosure measure of the present value of pension benefits estimated to be payable in the future as a result of employe service to December 31, 1988. The liability was determined to be \$8,074,138,162. The market value of assets was, therefore, 102.9% of the Projected Benefit Obligation.

Plan Assets

Schedule K summarizes the development of the actuarial value of assets as of December 31, 1988. The assets are based on the unaudited financial statements prepared by SERS.

The asset valuation method smooths out year-to-year fluctuations in the market value. The approach gradually recognizes, over a 5 year period, the differences between total investment returns and the assumed rate of 5-1/2%. This smoothing method includes 20% of the 1988 asset gain of \$559,956,761 this year, with the remainder to be recognized over the next four years.

A detailed description of the asset valuation method is contained in Schedule O.

STATE EMPLOYEES' RETIREMENT SYSTEM

Participant Data

Section I of Schedule L provides a distribution of the active participants as of December 31, 1988 by benefit class, sex, age, and length of service. It also shows the average projected salary by age group and sex. Section II of the schedule includes a breakdown of the retired participants, beneficiaries, and terminated vested participants by age, sex, and benefit amounts.

Although we have made tests to check for reasonableness and consistency, we have not independently audited the data which were submitted by SERS.

Plan Provisions

Schedule M contains a summary of the principal permanent provisions of the plan in effect as of December 31, 1988. There were no major changes in the provisions since the prior valuation except a cost-of-living adjustment for annuitants. Special early retirement provisions are available for members who retire before September 30, 1991. This temporary provision is not described in Schedule M but the liability was included in the valuation.

Actuarial Assumptions

Schedule N summarizes the actuarial assumptions used for the valuation. The assumptions are the same as those used in the 1987 valuation.

Funding Methods

Schedule O explains the funding methods used in the valuation. The asset valuation method smooths investment gains and losses over five years. The funding and contribution policy provide for reasonable levels of contribution that will amortize all existing liabilities by June 30, 2004. The section explains the calculation of the Projected Benefit Obligation used for the accountant reports.

Definitions

Schedule P defines certain technical terms used in the valuation.

STATE EMPLOYES' RETIREMENT SYSTEM

I. UNFUNDED ACTUARIAL ACCRUED LIABILITY DECEMBER 31, 1988

1) Present Value of Benefits:

(a) Active and Inactive Participants	
Superannuation and Withdrawal	\$ 7,208,880,787
Disability	382,084,088
Death	605,705,287
Refunds	54,521,744
Special Police and Enforcement Officer Benefits	94,325,356
(b) Annuitants and Beneficiaries	<u>4,089,253,858</u>
(c) Total	\$12,434,771,120

2) Present Value of Member and Employer Contributions:

(a) Employer portion of Normal Cost	\$ 1,164,865,991
(b) Supplemental Annuity Amortization	596,098,186
(c) Member Contributions	1,370,142,933
(d) Special Police and Enforcement Officer Contributions	<u>66,044,670</u>
(e) Total	\$ 3,197,151,780

3) Actuarial Accrued Liability: (1) - (2)	\$ 9,237,619,340
4) Actuarial Value of Assets	\$ 7,510,933,374
5) Unfunded Actuarial Accrued Liability: (3) - (4) . . .	\$ 1,726,685,966

II. AMORTIZATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY

<u>Funding Period</u> 30 Years from July 1	<u>Amount of</u> <u>Liability</u>	<u>Annual Payment to Fund</u>	
		<u>Amount</u>	<u>Percent*</u>
1969	\$1,167,644,570	\$123,195,249	4.45%
1974	<u>559,041,396</u>	<u>41,413,541</u>	<u>1.50</u>
	\$1,726,685,966	\$164,608,790	5.95%

*Payment for 1989 expressed as a percentage of the estimated total payroll for active members in 1989 of \$2,767,628,181. The estimate was obtained by multiplying the 1988 salary for each active employe by the salary growth assumption for one year.

STATE EMPLOYES' RETIREMENT SYSTEM

I. DEVELOPMENT OF EMPLOYER NORMAL COST RATE
(Fiscal Year 1989-90)

1) Normal Cost Rate for new active members to fund:	
(a) Superannuation and Withdrawal	8.63%
(b) Disability68
(c) Death56
(d) Refunds	<u>.93</u>
(e) Total	10.80%
2) Member Deductions	6.25%
3) Employer Normal Cost (1)(e) - (2)	4.55%

II. AMORTIZATION OF SUPPLEMENTAL ANNUITIES

<u>Funding Period</u> <u>20 Years from</u>	<u>Amount of</u> <u>Liability</u>	<u>Annual Payment to Fund</u>	
		<u>Amount</u>	<u>Percent*</u>
July 1, 1969	\$ 307,808	\$ 307,808	.01%
July 1, 1974	34,928,389	7,146,473	.26
July 1, 1979	148,811,639	18,048,713	.65
July 1, 1984	159,911,227	14,787,426	.54
January 1, 1989	<u>252,139,123</u>	<u>19,998,344</u>	<u>.72</u>
	\$ 596,098,186	\$ 60,288,764	2.18%

* Payment for 1989 expressed as a percentage of the estimated total payroll for active members in 1989 of \$2,767,628,181. The estimate was obtained by multiplying the 1988 salary for each active employe by the salary growth assumption for one year.

III. DEVELOPMENT OF TOTAL EMPLOYER CONTRIBUTION RATE
(Fiscal Year 1989-90)

	<u>Payable</u> <u>January 1</u>	<u>Payable</u> <u>Quarterly**</u>
1) Employer Normal Cost	4.55%	4.68%
2) Payment on Unfunded Actuarial Accrued Liability	5.95	6.11
3) Payment on Supplemental Annuities	<u>2.18</u>	<u>2.24</u>
4) Total	12.68%	13.03%

** Equals the Employer contribution payable January 1 plus 2.75% interest.

STATE EMPLOYEES' RETIREMENT SYSTEM

TOTAL CONTRIBUTION RATE BY GROUP
(Fiscal Year 1989-90)

		<u>Basic</u>	<u>Additional</u>	<u>Service</u>	<u>Additional</u>	
		<u>Rate</u>	<u>for</u>	<u>Multiplier</u>	<u>for</u>	<u>Total</u>
			<u>Age 50</u>		<u>Class C</u>	
			<u>Retirement</u>		<u>Benefit</u>	
1)	Class A (age 60 superannuation)	12.70%	-	-	-	12.70%
2)	Class A (age 50 superannuation)	12.70	2.75%	-	-	15.45
3)	Class C					
	State Police	12.70	2.75	-	8.08%	23.53
	Enforcement Officers	12.70	2.75	-	0.00	15.45
4)	Class D	12.70	2.75	42.49%	-	57.94
5)	Class E	12.70	-	6.35	-	19.05

STATE EMPLOYEES' RETIREMENT SYSTEM

EMPLOYER CONTRIBUTION RATE BY GROUP

	<u>Class A</u> (Age 60 Super- annuation)	<u>Class A</u> (Age 50 Super- annuation) and <u>Class C*</u>	<u>Class D</u>	<u>Class E</u>	<u>Total</u>
1. Basic Contribution Rate	12.70%	12.70%	12.70%	12.70%	N/A
2. Additional Contribution Rate for Age 50 Superannuation	-	2.75%	2.75%	-	N/A
3. Service Multiplier Adjustment for Class D and Class E	1.0	1.0	3.75	1.5	N/A
4. Adjusted Contribution Rates: [(1) + (2)] x (3)	12.70%	15.45%	57.94%	19.05%	13.03%
5. Projected 1989 Payroll	\$2,483,190,000	\$269,617,000	\$1,978,000	\$12,843,000	\$2,767,628,000
6. Employer Contribution Amount	\$ 315,365,130	\$ 41,655,827	\$1,146,053	\$ 2,446,592	\$ 360,613,602

The basic contribution rate is determined algebraically such that the sum of the adjusted contribution rate for each class times the payroll for each class equals the product of the total contribution rate and total payroll. The sum of the employer contribution amount by class differs slightly from the total salary times the total rate as a result of rounding.

* Before adding the cost of the additional Class C benefits.

STATE EMPLOYES' RETIREMENT SYSTEM

STATE POLICE AND ENFORCEMENT OFFICERS - ADDITIONAL ANNUITY RATE
(Fiscal Year 1989-90)

	<u>State Police</u>	<u>Enforcement Officers</u>
1) Balance in Benefit Account as of December 31, 1988	\$268,845,760	\$23,191,093
2) Present Value of Benefits for Annuitants and Beneficiaries	243,811,611	15,656,405
3) Assets available for additional annuities for Active Members: (1) - (2)	25,034,149	7,534,688
4) Present Value of additional annuities for Active Members	91,078,819	3,246,537
5) Present Value of Future Contribution to fund additional annuities: (4) - (3)	66,044,670	0
6) Present Value of Future Compensation for eligible Active Members	840,232,451	*
7) Contribution Rate as a percentage of payroll payable January 1: (5) / (6)	7.86%	0.00%
8) Contribution Rate as a percent of payroll payable quarterly:	<u>8.08%</u>	<u>0.00%</u>

* Not calculated because additional annuity is fully funded.

STATE EMPLOYEES' RETIREMENT SYSTEM

AIR AND ARMY NATIONAL GUARD ACCOUNT CONTRIBUTION RATE
(Fiscal Year 1989-90)

1. Estimated Account Balance @ July 1, 1989	\$4,241,190
2. Contribution Required to Amortize (1) over 20 years from July 1, 1980	510,064
3. Estimated Fiscal year 1989-90 payroll for Air and Army National Guard Members	1,275,000
4. Employer Contribution Rate	12.70%
5. Total Required Contribution: (2) + ((3) x (4))	671,989

STATE EMPLOYEES' RETIREMENT SYSTEM

I. ANALYSIS OF CHANGE IN EMPLOYER CONTRIBUTION RATE

	<u>Normal Cost</u>	<u>Accrued Liability</u>	<u>Supplemental Annuities</u>	<u>Total</u>
1. December 31, 1987 Valuation	4.73%	6.79%	1.57%	13.09%
2. Changes - 12/31/88 Valuation:				
a) Excess Investment Earnings		(1.45)%		(1.45)%
b) Change in Demographic Profile of New Entrants	(0.05)%	0.04%		(0.01)%
c) 1989 Supplement			0.74%	0.74%
d) Salary Increase Over Assumed Rates and Miscellaneous Changes	<u> </u>	<u>0.73%</u>	<u>(0.07)%</u>	<u>0.66%</u>
e) Total Change	(0.05)%	(0.68)%	0.67%	(0.06)%
3. December 31, 1988 Valuation:				
(1) + (2e)	4.68%	6.11%	2.24%	13.03%

II. ANALYSIS OF CHANGE IN UNFUNDED ACTUARIAL ACCRUED LIABILITY

1. December 31, 1987 Unfunded Actuarial Accrued Liability	\$ 1,988,710,150
2. Expected amortization payment	175,964,246
3. Expected liability as of December 31, 1988 [((1) - (2)) x 1.055]	1,912,446,929
4. Change in Liability due to:	
a) Excess Investment Earnings	(409,589,138)
b) Change in demographic profile of new entrants	(12,106,768)
c) Salary Increases Over Assumed Rates and Miscellaneous Changes	<u>235,934,943</u>
d) Total Change	\$ (185,760,963)
5. December 31, 1988 Unfunded Actuarial Accrued Liability:	
(3) + (4d)	\$ 1,726,685,966

STATE EMPLOYEES' RETIREMENT SYSTEM

ACTUARIAL BALANCE SHEET

A S S E T S

L I A B I L I T I E S

<u>Present Assets:</u>		<u>Present Value of Benefits Payable to Annuitants and Beneficiaries from:</u>	
Members' Savings Account	\$ 1,602,385,626	Annuity Reserve Account	\$ 3,829,785,842
Annuity Reserve Account	3,829,785,842	State Police Benefit Account	243,811,611
State Police Benefit Account	268,845,760	Enforcement Officers Benefit Account	15,656,405
Enforcement Officers Benefit Account	23,191,093	Total for Annuitants and Beneficiaries	\$ 4,089,253,858
State Accumulation Account	3,183,720,185		
Supplemental Annuity Account	(596,098,186)		
Total Present Assets (Market Value)	\$ 8,311,830,320		
Adjustment to smooth market fluctuations	(800,896,946)		
Total Present Assets (Actuarial Value)	\$ 7,510,933,374		
<u>Present Value of Future Contributions</u>		<u>Member Savings Account and State Accumulation Account</u>	
Members' Savings Account (Employer)	\$ 1,370,142,933	Superannuation and Withdrawal	\$ 7,208,880,787
Normal Cost Contributions (Employer)	1,164,865,991	Disability	382,084,088
Accrued Liability Amortization (Employer)	1,726,685,966	Death	605,705,287
Supplemental Annuity Amortization (Employer)	596,098,186	Refunds	54,521,744
Special State Police Contributions (Employer)	66,044,670	Sub Total	\$ 8,251,191,906
Special Enforcement Officer Contributions (Employer)	0	State Police Benefit Account	91,078,819
Total Future Contributions	\$ 4,923,837,746	Enforcement Officers Benefit Account	3,246,537
TOTAL ASSETS	\$ 12,434,771,120	Total	\$ 8,345,517,262
		TOTAL LIABILITIES	\$ 12,434,771,120

STATE EMPLOYES' RETIREMENT SYSTEM

REQUIRED TRANSFERS WITHIN SERS ACCOUNTS

1. Annuity Reserve Account	
Balance as reported by SERS	\$ 3,564,742,912
Transfer from Supplemental Annuity Account	239,951,814
Transfer from State Accumulation Account	<u>25,091,116</u>
December 31, 1988 balance after transfers	\$ 3,829,785,842
2. Supplemental Annuity Account	
Balance as reported by SERS	\$ (343,959,063)
Transfer to Annuity Reserve Account	(239,951,814)
Transfer to State Police Benefit Account	(11,489,970)
Transfer to Enforcement Officers Benefit Account	<u>(697,339)</u>
December 31, 1988 balance after transfers	\$ (596,098,186)
3. State Accumulation Account	
Balance as reported by SERS	\$ 3,208,811,301
Transfer to Annuity Reserve Account	<u>(25,091,116)</u>
December 31, 1988 Balance after transfers	\$ 3,183,720,185
4. State Police Benefit Account	
Balance as reported by SERS	\$ 257,355,790
Transfer from Supplemental Annuity Account	<u>11,489,970</u>
December 31, 1988 Balance after transfers	\$ 268,845,760
5. Enforcement Officers Benefit Account	
Balance as reported by SERS	\$ 22,493,754
Transfer from Supplemental Annuity Account	<u>697,339</u>
December 31, 1988 Balance after transfers	\$ 23,191,093

STATE EMPLOYES' RETIREMENT SYSTEM

FUNDING STATUS OF PROJECTED BENEFIT OBLIGATION AS OF DECEMBER 31, 1988

	<u>Number of</u>	
	<u>Members</u>	
I. Projected benefit obligation		
(a) Retirees and beneficiaries		
1. Superannuation retirements	45,244	\$2,295,910,942
2. Early retirements	16,465	668,139,878
3. Disabled	3,946	160,843,752
4. Beneficiaries	<u>5,661</u>	<u>136,066,591</u>
5. Total	71,316	\$3,260,961,163
(b) Inactive participants	3,243	\$ 67,762,364
(c) Active members		
1. Employee contributions and interest		\$1,602,385,626
2. Employer-financed liability - vested	65,789	2,844,150,275
3. Employer-financed liability - nonvested	<u>43,822</u>	<u>298,878,734</u>
4. Total		\$4,745,414,635
(d) Total obligation for all members . .	184,170	\$8,074,138,162
II. Market value of assets available for benefits		\$8,311,830,320
III. Unfunded projected benefit obligation . . .		\$(237,692,158)
IV. Assets as a percent of projected benefit obligation		102.9%

The amount shown above as the projected benefit obligation (PBO) is a standardized disclosure measure of the present value of pension benefits estimated to be payable in the future as a result of employee service to December 31, 1988. The PBO was calculated in conformance with the requirements of Statement No. 5 of the Governmental Accounting Standards Board (GASB) - "Disclosure of Pension Information by Public Employees' Retirement Systems and State and Local Governmental Employers." The calculation assumes salaries will increase as stated in Schedule N. No post-retirement increases are assumed.

STATE EMPLOYES' RETIREMENT SYSTEM

ACTUARIAL VALUE OF ASSETS

I. Development of 12/31/88 Expected Actuarial Value:	
1) Actuarial Value as of 12/31/87	\$6,716,513,070
2) Contributions in 1988	535,544,207
3) Benefits and Expenses in 1988	520,534,040
4) Interest @ 5.5% to 12/31/88 on (1)	369,408,219
5) Interest @ 5.5% to 12/31/88 on .5 x ((2) - (3))	<u>412,780</u>
6) Expected Actuarial Value as of 12/31/88: (1) + (2) - (3) + (4) + (5)	\$7,101,344,236
II. Previous Differences Not Yet Amortized:	
1) Unrecognized Amount of 12/31/84 Difference: .2 x \$129,746,917	\$ 25,949,383
2) Unrecognized Amount of 12/31/85 Difference: .4 x \$846,693,525	338,677,410
3) Unrecognized Amount of 12/31/86 Difference: .6 x \$616,681,305	370,008,783
4) Unrecognized amount of 12/31/87 Difference: .8 x \$(105,132,816)	<u>(84,106,253)</u>
5) Total	\$ 650,529,323
III. Gain or Loss from 1988	
1) Market Value of Assets on 12/31/88	\$8,311,830,320
2) Expected Market Value II(5) + I(6)	<u>7,751,873,559</u>
3) Gain (loss) from 1988 Investments (1) - (2)	\$ 559,956,761
IV. Development of Actuarial Value of Assets as of 12/31/88:	
1) 20% of \$129,746,917 (12/31/84 Difference):	\$ 25,949,383
2) 20% of \$846,693,525 (12/31/85 Difference):	169,338,705
3) 20% of \$616,681,305 (12/31/86 Difference):	123,336,261
4) 20% of \$(105,132,816) (12/31/87 Difference):	(21,026,563)
5) 20% of \$559,956,761 (12/31/88 Difference):	<u>111,991,352</u>
6) Total Difference: (1) + (2) + (3) + (4) + (5)	\$ 409,589,138
7) Actuarial Value at 12/31/88: I(6) + IV(6)	<u>\$7,510,933,374</u>

STATE EMPLOYES' RETIREMENT SYSTEM

I. AGE, SERVICE AND SALARY PROFILE OF ACTIVE PARTICIPANTS DECEMBER 31, 1988

ACTIVE EMPLOYES*

<u>Age</u>	<u>Males - Full Years of Service to December 31, 1988</u>							<u>Total</u>	<u>Average Salary</u>
	<u>0-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25-29</u>	<u>30+</u>		
0-19	20	0	0	0	0	0	0	20	\$16,919
20-24	768	54	0	0	0	0	0	822	18,994
25-29	2,000	1,205	175	0	0	0	0	3,380	20,757
30-34	1,903	2,000	1,407	264	0	0	0	5,574	22,643
35-39	1,680	1,897	2,327	2,549	231	0	0	8,684	25,053
40-44	1,198	1,400	1,694	3,535	1,830	90	0	9,747	27,359
45-49	782	835	961	1,816	1,978	932	67	7,371	29,222
50-54	611	708	712	1,203	1,325	1,081	627	6,267	30,403
55-59	556	620	713	1,089	1,101	869	1,024	5,972	29,847
60-64	321	445	590	783	658	517	589	3,903	29,307
65+	102	171	189	216	178	135	163	1,154	32,054
Total	9,941	9,335	8,768	11,455	7,301	3,624	2,470	52,894	\$27,075

Average age 44.4
Average service 13.8

<u>Age</u>	<u>Females - Full Years of Service to December 31, 1988</u>							<u>Total</u>	<u>Average Salary</u>
	<u>0-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25-29</u>	<u>30+</u>		
0-19	71	0	0	0	0	0	0	71	\$17,365
20-24	1,318	207	0	0	0	0	0	1,525	17,427
25-29	1,917	1,796	360	0	0	0	0	4,073	19,208
30-34	1,760	1,925	2,045	628	0	0	0	6,358	20,683
35-39	1,735	1,551	1,970	2,744	508	0	0	8,508	21,679
40-44	1,415	1,229	1,459	1,786	1,393	131	0	7,413	22,059
45-49	878	1,022	1,192	1,164	867	513	71	5,707	22,354
50-54	575	865	1,006	1,164	662	459	266	4,997	22,603
55-59	358	654	763	1,153	812	492	291	4,523	22,316
60-64	141	381	576	734	501	282	224	2,839	22,248
65+	23	96	166	189	184	75	98	831	22,306
Total	10,191	9,726	9,537	9,562	4,927	1,952	950	46,845	\$21,532

Average age 42.5
Average service 11.9

* Information for members in special categories are on the following three pages. These include selected hazardous duty members, legislators, judges and district judges. The above information is for all other active members. The fourth page includes the total of all categories and inactive employes.

STATE EMPLOYES' RETIREMENT SYSTEM

I. AGE, SERVICE AND SALARY PROFILE OF ACTIVE PARTICIPANTS DECEMBER 31, 1988

SELECTED HAZARDOUS DUTY*

Age	Males - Full Years of Service to December 31, 1988							Total	Average Salary
	0-4	5-9	10-14	15-19	20-24	25-29	30+		
0-19	0	0	0	0	0	0	0	0	\$ 0
20-24	178	1	0	0	0	0	0	179	21,336
25-29	719	292	6	0	0	0	0	1,017	25,117
30-34	375	558	177	3	0	0	0	1,113	28,068
35-39	260	277	353	142	7	0	0	1,039	29,269
40-44	282	218	207	778	579	10	0	2,074	31,467
45-49	139	109	72	218	644	311	36	1,529	32,768
50-54	106	80	52	45	125	186	162	756	31,663
55-59	63	30	30	31	31	64	166	415	31,967
60-64	13	14	13	14	16	21	32	123	29,986
65+	<u>1</u>	<u>3</u>	<u>3</u>	<u>2</u>	<u>4</u>	<u>1</u>	<u>3</u>	<u>17</u>	24,279
Total	<u>2,136</u>	<u>1,582</u>	<u>913</u>	<u>1,233</u>	<u>1,406</u>	<u>593</u>	<u>399</u>	<u>8,262</u>	<u>\$29,978</u>

Average age 40.7
Average service 13.1

Age	Females - Full Years of Service to December 31, 1988							Total	Average Salary
	0-4	5-9	10-14	15-19	20-24	25-29	30+		
0-19	0	0	0	0	0	0	0	0	\$ 0
20-24	9	0	0	0	0	0	0	9	17,181
25-29	60	47	2	0	0	0	0	109	24,276
30-34	38	57	12	4	0	0	0	111	26,026
35-39	39	29	20	16	2	0	0	103	25,863
40-44	12	14	9	6	4	0	0	47	26,848
45-49	10	13	9	3	3	1	1	40	25,319
50-54	6	3	4	2	3	0	2	21	26,605
55-59	3	3	3	2	1	1	2	15	26,765
60-64	0	1	1	4	2	0	0	5	22,231
65+	<u>0</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>2</u>	31,801
Total	<u>177</u>	<u>168</u>	<u>60</u>	<u>37</u>	<u>15</u>	<u>2</u>	<u>5</u>	<u>462</u>	<u>\$25,461</u>

Average age 36.3
Average service 7.3

*Enforcement officers, correction officers, psychiatric security aides, and officers of the Pennsylvania State Police and Delaware River Port Authority.

STATE EMPLOYES' RETIREMENT SYSTEM

I. AGE, SERVICE AND SALARY PROFILE OF ACTIVE PARTICIPANTS DECEMBER 31, 1988

LEGISLATORS

<u>Age</u>	<u>Males - Full Years of Service to December 31, 1988</u>							<u>Total</u>	<u>Average Salary</u>
	<u>0-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25-29</u>	<u>30+</u>		
0-19	0	0	0	0	0	0	0	0	\$ 0
20-24	0	0	0	0	0	0	0	0	0
25-29	2	0	1	0	0	0	0	3	38,999
30-34	5	14	1	0	0	0	0	20	43,953
35-39	7	18	10	1	0	0	0	36	44,107
40-44	9	19	9	8	1	0	0	46	45,532
45-49	5	5	9	6	4	2	0	31	47,807
50-54	3	8	4	9	1	2	0	27	49,927
55-59	3	4	9	3	3	2	4	28	47,494
60-64	1	6	3	5	3	3	2	23	47,814
65+	<u>1</u>	<u>2</u>	<u>2</u>	<u>1</u>	<u>3</u>	<u>4</u>	<u>4</u>	<u>17</u>	48,069
Total	<u>36</u>	<u>76</u>	<u>48</u>	<u>33</u>	<u>15</u>	<u>13</u>	<u>10</u>	<u>231</u>	<u>\$46,559</u>

Average age 47.9
Average service 12.0

<u>Age</u>	<u>Females - Full Years of Service to December 31, 1988</u>							<u>Total</u>	<u>Average Salary</u>
	<u>0-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25-29</u>	<u>30+</u>		
0-19	0	0	0	0	0	0	0	0	\$ 0
20-24	0	0	0	0	0	0	0	0	0
25-29	0	0	0	0	0	0	0	0	0
30-34	0	1	0	0	0	0	0	1	46,999
35-39	1	0	2	0	1	0	0	2	46,999
40-44	0	0	0	1	0	0	0	1	46,999
45-49	1	1	0	0	0	0	0	2	46,999
50-54	1	1	0	0	0	0	0	2	46,999
55-59	3	1	0	0	0	0	0	4	37,999
60-64	1	1	1	0	0	0	0	2	40,999
65+	<u>0</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>3</u>	46,999
Total	<u>7</u>	<u>5</u>	<u>4</u>	<u>2</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>17</u>	<u>\$44,175</u>

Average age 53.0
Average service 9.5

STATE EMPLOYES' RETIREMENT SYSTEM

I. AGE, SERVICE AND SALARY PROFILE OF ACTIVE PARTICIPANTS DECEMBER 31, 1988

JUDGES AND DISTRICT JUSTICES

Age	Males - Full Years of Service to December 31, 1988							Total	Average Salary
	0-4	5-9	10-14	15-19	20-24	25-29	30+		
0-19	0	0	0	0	0	0	0	0	\$ 0
20-24	0	0	0	0	0	0	0	0	0
25-29	3	0	0	0	0	0	0	3	31,249
30-34	12	4	2	0	0	0	0	18	38,318
35-39	32	26	10	3	0	0	0	71	57,086
40-44	43	34	11	7	2	0	0	97	57,916
45-49	44	25	17	7	4	1	0	98	54,334
50-54	19	22	29	13	17	1	0	101	59,817
55-59	18	25	29	28	27	3	3	133	60,075
60-64	13	23	23	29	36	9	11	144	59,611
65+	<u>3</u>	<u>9</u>	<u>18</u>	<u>18</u>	<u>23</u>	<u>7</u>	<u>12</u>	<u>90</u>	62,540
Total	<u>187</u>	<u>168</u>	<u>139</u>	<u>105</u>	<u>109</u>	<u>21</u>	<u>26</u>	<u>755</u>	<u>\$58,309</u>

Average age 52.7
Average service 11.9

Age	Females - Full Years of Service to December 31, 1988							Total	Average Salary
	0-4	5-9	10-14	15-19	20-24	25-29	30+		
0-19	0	0	0	0	0	0	0	0	0
20-24	0	0	0	0	0	0	0	0	0
25-29	1	0	0	0	0	0	0	1	35,168
30-34	9	2	0	0	0	0	0	11	56,578
35-39	13	2	3	0	0	0	0	18	49,196
40-44	11	4	1	1	0	0	0	17	69,268
45-49	8	5	3	1	1	0	0	18	43,830
50-54	5	6	7	3	3	0	0	24	44,507
55-59	3	6	3	5	3	0	0	20	39,819
60-64	2	5	2	4	10	0	0	23	44,661
65+	<u>2</u>	<u>3</u>	<u>2</u>	<u>4</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>13</u>	51,727
Total	<u>54</u>	<u>33</u>	<u>21</u>	<u>18</u>	<u>18</u>	<u>0</u>	<u>1</u>	<u>145</u>	<u>\$48,784</u>

Average age 50.4
Average service 9.3

STATE EMPLOYEES' RETIREMENT SYSTEM

I. AGE, SERVICE AND SALARY PROFILE OF ACTIVE PARTICIPANTS DECEMBER 31, 1988

ALL EMPLOYES*

Age	Males - Full Years of Service to December 31, 1988							Total	Average Salary
	0-4	5-9	10-14	15-19	20-24	25-29	30+		
0-19	20	0	0	0	0	0	0	20	\$16,919
20-24	981	56	0	0	0	0	0	1,037	19,439
25-29	2,785	1,502	183	0	0	0	0	4,470	21,758
30-34	2,349	2,604	1,598	267	0	0	0	6,818	23,598
35-39	2,048	2,240	2,736	2,715	238	0	0	9,977	25,718
40-44	1,600	1,697	1,960	4,369	2,415	100	0	12,141	28,269
45-49	1,048	1,005	1,098	2,080	2,641	1,249	104	9,225	29,955
50-54	843	849	835	1,300	1,479	1,279	801	7,386	30,697
55-59	735	717	826	1,184	1,181	943	1,209	6,795	30,325
60-64	424	529	670	866	733	572	663	4,457	29,899
65+	131	202	232	247	234	149	189	1,384	33,386
Total	12,964	11,401	10,138	13,028	8,921	4,292	2,966	63,710	\$27,736

Average age 44.2
Average service 13.5

Age	Females - Full Years of Service to December 31, 1988							Total	Average Salary
	0-4	5-9	10-14	15-19	20-24	25-29	30+		
0-19	72	0	0	0	0	0	0	72	\$17,391
20-24	1,360	210	0	0	0	0	0	1,570	17,488
25-29	2,033	1,858	366	0	0	0	0	4,257	19,357
30-34	1,854	2,008	2,088	634	0	0	0	6,584	20,828
35-39	1,868	1,612	2,037	2,799	510	0	0	8,826	21,762
40-44	1,553	1,298	1,505	1,821	1,403	132	0	7,712	22,155
45-49	1,000	1,086	1,238	1,188	876	515	72	5,975	22,389
50-54	692	917	1,060	1,194	677	460	271	5,271	22,649
55-59	467	709	800	1,183	828	497	300	4,784	21,342
60-64	262	437	619	768	536	296	231	3,149	22,272
65+	60	118	185	208	191	77	105	944	22,635
Total	11,221	10,253	9,898	9,795	5,021	1,977	979	49,144	\$21,624

Average age 42.7
Average service 11.7

* Includes Active and Inactive (Departments 710, 712, 714 and 758) Employees.
The average salary is for active employees.

STATE EMPLOYES' RETIREMENT SYSTEM

II. AGE AND BENEFIT PROFILE OF ANNUITANTS AND BENEFICIARIES DECEMBER 31, 1988

SUPERANNUATION ANNUITANTS

<u>Age</u>	<u>Male</u>		<u>Female</u>		<u>Total</u>	
	<u>Number</u>	<u>Annual Pension*</u>	<u>Number</u>	<u>Annual Pension*</u>	<u>Number</u>	<u>Annual Pension*</u>
Under 50	1	\$ 11,213	0	\$ 0	1	\$ 11,213
50-54	116	1,803,297	1	20,835	117	1,824,132
55-59	367	5,439,904	47	586,704	414	6,026,608
60-64	3,267	35,396,155	2,228	15,302,594	5,495	50,698,749
65-69	6,616	52,788,561	5,032	27,997,183	11,648	80,785,744
70-74	6,206	37,381,399	4,826	22,478,249	11,032	59,859,648
75-79	5,156	28,673,339	3,956	18,359,659	9,112	47,032,998
80-84	2,769	14,578,235	2,121	9,240,619	4,890	23,818,854
85-89	969	5,320,778	930	3,847,500	1,899	9,168,278
90 & Over	311	1,722,335	325	1,356,623	636	3,078,958
Total	25,778	\$183,115,216	19,466	\$99,189,966	45,244	\$282,305,182

Average age 72.3
Average annual pension . \$6,240

EARLY RETIREMENT ANNUITANTS

<u>Age</u>	<u>Male</u>		<u>Female</u>		<u>Total</u>	
	<u>Number</u>	<u>Annual Pension*</u>	<u>Number</u>	<u>Annual Pension*</u>	<u>Number</u>	<u>Annual Pension*</u>
Under 30	0	\$ 0	5	\$ 4,224	5	\$ 4,224
30-34	102	86,658	394	326,855	496	413,513
35-39	623	606,621	1,286	1,247,940	1,909	1,854,561
40-44	1,272	1,694,685	963	1,193,379	2,235	2,888,064
45-49	1,098	2,236,562	655	1,139,575	1,753	3,376,137
50-54	957	4,279,146	725	2,204,028	1,682	6,483,174
55-59	1,555	12,361,744	1,108	5,726,554	2,663	18,088,298
60-64	1,375	11,316,740	1,282	6,730,330	2,657	18,047,070
65 & Over	1,554	8,812,902	1,511	6,917,778	3,065	15,730,680
Total	8,536	\$ 41,395,058	7,929	\$25,490,663	16,465	\$ 66,885,721

Average age 53.7
Average annual pension . \$4,062

*Does not include 1/1/89 Supplement.

STATE EMPLOYES' RETIREMENT SYSTEM

II. AGE AND BENEFIT PROFILE OF ANNUITANTS AND BENEFICIARIES AND SURVIVOR ANNUITANTS

DECEMBER 31, 1988

DISABLED ANNUITANTS

<u>Age</u>	<u>Male</u>		<u>Female</u>		<u>Total</u>	
	<u>Number</u>	<u>Annual Pension*</u>	<u>Number</u>	<u>Annual Pension*</u>	<u>Number</u>	<u>Annual Pension*</u>
Under 30	0	\$ 0	3	\$ 15,892	3	\$ 15,892
30-34	17	100,061	25	129,642	42	229,703
35-39	62	347,525	75	391,578	137	739,103
40-44	157	938,729	107	591,668	264	1,530,397
45-49	200	1,284,852	129	705,898	329	1,990,750
50-54	239	1,560,034	172	1,055,697	411	2,615,731
55-59	368	2,421,370	270	1,452,092	638	3,873,462
60-64	500	2,946,221	357	1,680,381	857	4,626,602
65 & over	626	2,823,205	639	2,324,437	1,265	5,147,642
Total	2,169	\$12,421,997	1,777	\$ 8,347,285	3,946	\$20,769,282

Average age 59.0

Average annual pension . . \$5,263

BENEFICIARIES AND SURVIVOR ANNUITANTS

<u>Age</u>	<u>Male</u>		<u>Female</u>		<u>Total</u>	
	<u>Number</u>	<u>Annual Pension*</u>	<u>Number</u>	<u>Annual Pension*</u>	<u>Number</u>	<u>Annual Pension*</u>
Under 25	0	\$ 0	3	\$ 5,203	3	\$ 5,203
25-29	8	41,634	3	13,848	11	55,482
30-34	6	27,075	7	19,098	13	46,173
35-39	13	60,267	12	76,087	25	136,354
40-44	21	74,759	27	87,171	48	161,930
45-49	26	63,496	46	144,926	72	208,422
50-54	23	76,335	93	286,348	116	362,683
55-59	24	125,532	181	851,817	205	977,349
60-64	25	123,905	456	2,124,076	481	2,247,981
65-69	46	183,776	779	3,050,868	825	3,234,644
70-74	66	199,127	1,143	4,087,604	1,209	4,286,731
75-79	36	120,550	1,121	4,021,486	1,157	4,142,036
80-84	28	86,496	814	2,701,351	842	2,787,847
85-89	7	19,107	435	1,182,834	442	1,201,941
90 & Over	2	3,970	210	455,540	212	459,510
Total	331	\$ 1,206,029	5,330	\$19,108,257	5,661	\$20,314,286

Average age 73.0

Average annual pension . . \$3,588

*Does not include 1/1/89 Supplement.

STATE EMPLOYES' RETIREMENT SYSTEM

BENEFIT AND CONTRIBUTION PROVISIONS as of DECEMBER 31, 1988
(as embodied in Act 31, approved March 1, 1974)

The State Employees' Retirement System of Pennsylvania makes provision for retirement, disability, and death benefits for all State employes and certain other eligible groups. The major provisions may be summarized as follows:

Eligibility Employes

- Class A - All regular State employes as well as employes of certain Commissions and Authorities and all employes of state-owned educational institutions and the Pennsylvania State University (unless such employes have joined the Public School Employes' Retirement System of Pennsylvania or TIAA-CREF). All employes who become members (or who rejoin the Retirement System) on and after March 1, 1974.
- Class C - Enforcement officers and other officers and certain employes of the Pennsylvania State Police who have been members and employes continuously since March 1, 1974.
- Class D-3 - Members of the General Assembly who have been members and employes continuously since March 1, 1974.
- Class E-1 - Members of the Judiciary who have been members and employes continuously since March 1, 1974.
- Class E-2 - District Justices paid by the Commonwealth who have been members and employes continuously since March 1, 1974.

Age Requirements for Superannuation Retirement (full formula benefits)

- Class A - Age 60, except for members of the General Assembly, enforcement officers, correction officers, psychiatric security aides; and officers of the Pennsylvania State Police and Delaware River Port Authority; for whom the requirement is age 50. Members of Class A with 35 or more years of credited service are entitled to at least full formula benefits regardless of age.
- Classes C and D-3 - Age 50.
- Class E-1 - Age 60.
- Class E-2 - Age 60.

STATE EMPLOYES' RETIREMENT SYSTEM

BENEFIT AND CONTRIBUTION PROVISIONS as of DECEMBER 31, 1988
(as embodied in Act 31, approved March 1, 1974)

Formula for Superannuation Retirement Annuity

The standard single-life annuity applicable to members of Class A, is equal to 2% of the high 3-year average salary ("F.A.S.") of the member multiplied by the years and fractions of credited service.

The annuity for other classes of members is obtained by multiplying the standard single-life annuity by a class multiplier as follows:

<u>Class</u>	<u>Multiplier</u>	
C	1.0	
D-3	3.75	
E-1	2.0	for each of the first 10 years of judicial service plus 1.5 for each subsequent year of judicial service.
E-2	1.5	for each year of judicial service.

NOTE: There are conditions under which long-service members or members retiring at advanced ages may receive somewhat larger benefits than those described above.

In addition to the standard single-life annuity as determined above, a member of Class C receives a "member's annuity" actuarially equivalent to the regular accumulated member contributions and interest at retirement but not less than such annuity determined as if the member were age 60 at retirement.

In addition to the above benefits, a member who, prior to March 1, 1974, has elected "Social Security Integration Credits" is entitled to a single-life annuity of 2% of his "Average Non-Covered Salary" for each year of Social Security Integration credit. "Average Non-Covered Salary" is the average annual salary received while covered by the Retirement System since January 1, 1956 in excess of the maximum covered wages under Social Security.

Age and Service Requirements for Early Retirement

In the case of withdrawal, a member of Class D-3 is eligible for early retirement after 6 years of legislative service and members of other classes are eligible after 10 years of service.

STATE EMPLOYES' RETIREMENT SYSTEM

BENEFIT AND CONTRIBUTION PROVISIONS as of DECEMBER 31, 1988 (as embodied in Act 31, approved March 1, 1974)

Adjustment for Early Retirement Benefit

A member receives the actuarial equivalent of the annuity payable at superannuation retirement age earned to the date of early retirement.

Age and Service Requirements for Disability Retirement

A member is eligible for disability retirement if the member is unable to perform his or her current job prior to superannuation retirement age and has at least 5 years of service. An officer of the State Police or an enforcement officer does not have a service requirement.

Formula for Disability Benefit

The disability benefit is equal to the benefit calculated as for superannuation retirement, based on years of credited service at disability, if the result is greater than or equal to 33-1/3% of F.A.S. at time of disability. If the benefit so calculated is less than 33-1/3% of F.A.S., the disability benefit is equal to the smaller of:

- (a) the benefit calculated as for superannuation retirement based on service projected to superannuation date, or
- (b) 33-1/3% of F.A.S. at time of disability.

Eligibility for Vested Benefit

A member is eligible for a vested benefit after 10 years of service, except for members of Class D-3 who are eligible after 6 years of credited service.

Vested Benefit

The vested benefit is calculated as for superannuation retirement but deferred until superannuation retirement age.

Eligibility for Death Benefit Prior to Retirement

A member is eligible if the member has 10 years of credited service, except for a member of Class D-3 who is eligible after 6 years of credited service, or upon attainment of superannuation age with 3 years of credited service.

Amount of Death Benefit Prior to Retirement

An eligible beneficiary receives the full reserve value of the benefits to which the member would have been entitled had the member retired the day before he or she died, assuming the member had elected Option 1 if no other option had been elected.

STATE EMPLOYES' RETIREMENT SYSTEM

BENEFIT AND CONTRIBUTION PROVISIONS as of DECEMBER 31, 1988
(as embodied in Act 31, approved March 1, 1974)

Death Benefits After Retirement

A member may elect one of several optional reduced pensions in lieu of the single-life annuity provided by the formula. However, if the member elects the single-life annuity, there is a provision for a modified cash refund without actuarial reduction of the unpaid balance of the member accumulated contributions and interest at time of retirement.

Supplemental Allowances

Any superannuation or disability annuitant is entitled to a supplemental allowance sufficient to build the amount of the total single-life allowance, including any cost-of-living supplements, up to the rate of \$84.50 for each year of credited service. An annuitant who retired early is entitled to the supplemental allowance upon attaining superannuation age.

Supplemental annuities applying cost-of-living increases to the benefits of annuitants have been instituted from time to time. The most recent of these became effective as of January 1, 1989.

Rate of Member Contribution

(i) Regular member contributions, excluding Social Security Integration contributions

Class A - 5.00% of total salary for those who became members prior to July 22, 1983 and have been in continuous membership since July 22, 1983.

6.25% of total salary for other members.

For other classes of members, the class of service multiplier is applied to the 5% rate to produce the following:

Class C - 5.00%

Class D-3 - 18.75%

Class E-1 - 10.00% during the first 10 years of judicial service and 7.5% thereafter.

Class E-2 - 7.50%

STATE EMPLOYES' RETIREMENT SYSTEM

BENEFIT AND CONTRIBUTION PROVISIONS as of DECEMBER 31, 1988 (as embodied in Act 31, approved March 1, 1974)

(ii) Additional contribution for Social Security Integration Credit

A member of any class who elected before March 1, 1974 Social Security Integration Credit pays 5% of any salary in excess of the amount of salary covered by Social Security during the year for which contributions are being made. A member electing to end additional contributions is ineligible to make future contributions or accrue future benefits.

Interest Credited on Member Contribution

A rate of 4% stipulated as the statutory rate of interest, has been credited on the member contributions since the inception of the system.

Refund of Accumulated Member Contributions

On the death of a member not qualifying for death benefits, the accumulated member contributions are paid the beneficiary; also, any member terminating service when not eligible for another form of benefit is paid a refund of the accumulated contributions and interest; any other terminating member may elect the refund of accumulated contributions and interest in lieu of a retirement allowance.

Employer Contributions

The Employer pays the balance of the required contributions in excess of the members' contributions in accordance with the law. The employer contribution is the employer share of the normal cost plus an accrued liability contribution funded over 30 years, assuming the accrued liability contribution increases at least 4% each year. In addition, contributions are required to fund each of the Supplemental Allowances over a 20-year period in level dollars.

STATE EMPLOYEES' RETIREMENT SYSTEM

ACTUARIAL ASSUMPTIONS

Interest Rate: 5-1/2% per annum, compounded annually.

Service Tables: Service tables for active members based on the experience of the Retirement System in 1981-85, with values at specimen ages in four separate classes* as follows:

		Rates of Separation Due To						
		<u>Withdrawal after</u> <u>Years of Service</u>			<u>Death</u>	<u>Dis-</u> <u>ability</u>	<u>Early</u> <u>Retire-</u> <u>ment**</u>	<u>Super</u> <u>Annua-</u> <u>tion</u> <u>Retire-</u> <u>ment**</u>
	<u>Age</u>	<u>1</u>	<u>5</u>	<u>11</u>				
A	25	.125	.038	.003	.0008	.0006	-	-
(Male)	35	.105	.036	.002	.0009	.0012	.019	-
	45	.072	.024	.002	.0026	.0025	.015	-
	55	.064	.016	.002	.0074	.0081	.022	.143
	65	-	-	-	.0131	-	-	.537
A	25	.148	.061	.005	.0003	.0004	-	-
(FEMALE)	35	.094	.043	.004	.0004	.0014	.029	-
	45	.067	.030	.003	.0014	.0030	.019	-
	55	.051	.024	.003	.0028	.0071	.035	.117
	65	-	-	-	.0042	-	-	.481
C	45	.025	.025	.003	***	***	.010	-
(MALE	55	-	-	-			-	.080
and	65	-	-	-			-	.350
FEMALE)								
D	45	.030	.030	.002	***	***	.045	-
(MALE	55	-	-	-			-	.030
and	65	-	-	-			-	.150
FEMALE)								
E	45	.040	.020	.002	***	***	.020	-
(MALE	55	.040	.020	.002			.020	-
and	65	-	-	-			-	.250
FEMALE)								

Superannuation and Early Retirement Allowances: The mortality table used for those receiving superannuation and early retirement allowance is the 1971 Group Annuity Mortality Table.

Disability Allowances: The mortality tables used for those receiving disability allowances are modifications based on sex of 1965 Railroad Retirement Board Mortality among Totally Disabled Annuitants.

* As defined in Retirement Law prior to March 1, 1974 amendment (Act 31).

** Retirement Rates are assumed to decrease and withdrawal rates to increase by 20% after 1990.

*** Same as Class A.

STATE EMPLOYES' RETIREMENT SYSTEM

ACTUARIAL ASSUMPTIONS (continued)

Career Salary Scale for SERS Members in Classes A and C

<u>Age</u>	<u>Realistic Salary Scale</u>	<u>Valuation Salary Scale</u>
20	5.7*	4.45
21	5.2	3.95
22	5.0	3.75
23	4.6	3.35
24	4.4	3.15
25	4.1	2.85
26	3.8	2.55
27	3.6	2.35
28	3.4	2.15
29	3.2	1.95
30	3.2	1.95
31	3.0	1.75
32	3.0	1.75
33	2.8	1.55
34	2.8	1.55
35	2.8	1.55
36	2.6	1.35
37	2.4	1.15
38	2.2	0.95
39	2.1	0.85
40	2.0	0.75
41	1.8	0.55
42	1.8	0.55
43	1.6	0.35
44	1.6	0.35
Over 44	1.5	0.25

No career salary scale is used for members in Classes D and E.

STATE EMPLOYES' RETIREMENT SYSTEM

I. ASSET VALUATION METHOD

The actuarial value of assets is developed by recognizing the difference between the expected actuarial value of assets and the market value of assets over a five-year period. The expected actuarial value is last year's actuarial value brought forward to reflect actual contributions, benefit payments and expenses, and assumed investment income (@ 5.5%). Each year twenty (20) percent of the difference between this expected value and the market value is recognized in determining the current actuarial value of assets with the remaining eighty (80) percent to be recognized over the next four years. This asset valuation method began with the December 31, 1982 valuation. To begin this process, the actuarial value of assets was set equal to the book value of assets as of December 31, 1981 and carried forward.

II. FUNDING AND CONTRIBUTION POLICY

The Pennsylvania State Employees' Retirement System funding policy provides for periodic employer contributions at actuarially determined rates that will amortize the Unfunded Actuarial Accrued Liability by June 30, 2004. This policy assures that the SERS is appropriately funded and also that the fund will accumulate sufficient assets to pay benefits when they are due. The policy is set by the State Employees' Retirement Board in conformance with specific legal requirements as to the method of funding.

A variation of the Entry-Age Actuarial Cost Method is used to determine the liabilities and costs related to all SERS benefits including superannuation, withdrawal, death and disability benefits. The significant difference between the method used for SERS and the typical Entry-Age Actuarial Cost Method is that the normal cost is based on the benefits and contributions for new employes rather than for all current employes from their date of entry. The SERS variation should produce approximately the same results as the typical method over the long run.

The annual contribution is equal to the sum of:

The employer share of the normal cost.

The amortization of the unfunded liability attributable to the plan as in effect on July 1, 1969 over a period ending on June 30, 1999.

The amortization of the unfunded liability attributable to the 1974 amendments over a period ending on June 30, 2004.

The amortization of liabilities for supplemental annuities over 20 year periods following their effective dates. There are currently five such liabilities being amortized over 20 year periods beginning July 1, 1969, 1974, 1979, 1984 and January 1, 1989.

The total employer cost is determined as a percent of payroll and the employer contributes that percent of the payroll of all covered members during each fiscal year. The beginning year costs, as determined in the valuation, are adjusted by a half-year's interest to reflect the fact that the payments are made by the employer each quarter.

STATE EMPLOYES' RETIREMENT SYSTEM

The assumptions used in determining the actuarial cost are stated in Schedule N, and the employer cost, as a percent of payroll, is determined in Schedules A and B.

The SERS pension legislation limits the assumed interest rate to 5.5 percent a year. However, the policy of the SERB is that the employer contribution rate will be reasonable based on realistic assumptions. This goal is achieved by conducting periodic valuations based on realistic assumptions and then adopting a set of assumptions that will, when combined with a 5.5 percent interest assumption, result in the same employer contribution rate.

The realistic assumptions used to set the basis for the current valuation were adopted after a review of all assumptions for the 1985 valuation. In 1987, the salary growth assumption was increased by .25 percent per year to provide a safety margin in the assumptions. The assumptions shown in Schedule N were selected to reproduce the employer contribution rate determined using these realistic assumptions. The current set of realistic assumptions is:

<u>Years</u>	<u>Salary Increases</u>			<u>Investment Return</u>
	<u>General</u>	<u>Average Career</u>	<u>Total</u>	
1989 to 1995	4.0%	2.0%	6.0%	9.8%
1996 to 2000	4.0	2.0	6.0	9.0
2001 to 2005	4.0	2.0	6.0	8.0
2006 to 2010	4.0	2.0	6.0	7.0
After 2010	4.0	2.0	6.0	6.0

The salary growth was then revised downward so that, in combination with the 5.5 percent interest rate, the employer contribution would be approximately the same as for the realistic valuation.

III. PROJECTED BENEFIT OBLIGATION

The Projected Benefit Obligation (PBO) was calculated using the withdrawal, death and retirement assumptions set forth in Schedule N.

The career salary growth was set equal to the realistic salary growth before the reduction of 1.25 percent as shown in Schedule N. In addition, it was assumed that the salary schedules would increase by 4 percent per year, compounded annually.

The rate of interest was 8.75 percent per year, compounded annually. The rate of 8.75 percent is approximately equal to the realistic investment return rates averaged over the period during which obligations to current employees and annuitants will be paid.

The result of the use of the above salary scales and interest rate is to determine a PBO that is the best estimate of the actual obligations of the fund using the procedures established by the Governmental Accounting Standards Board. These assumptions are the same as those used to establish the PBO in 1987.

STATE EMPLOYES' RETIREMENT SYSTEM

DEFINITIONS OF TECHNICAL TERMS

Accrued Service. Service credited under the system which was rendered before the date of the actuarial valuation.

Actuarial Accrued Liability. The portion of the actuarial present value of benefits which is not provided for by the actuarial present value of future normal costs. Also referred to as Past Service Liability.

Actuarial Assumptions. Estimates of future experience with respect to rates of mortality, disability, turnover, retirement, investment income and salary growth. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

Actuarial Cost Method. A mathematical budgeting procedure for allocating the actuarial present value of future benefits between future normal costs and the actuarial accrued liability.

Actuarial Present Value. The amount of funds currently required to provide a payment or series of payments in the future. It is determined by discounting projected future payments at assumed rates of interest and probabilities of payment.

Amortization. Paying off an amount with periodic payments of interest and principle -- as opposed to paying off with a lump sum payment.

Normal Cost. The portion of the actuarial present value of future benefits that is allocated to the current year by the actuarial cost method.

Projected Benefit Obligation. The present value of pension benefits estimated to be payable in the future as a result of employe service to the date of the valuation. The projection includes expected increases in salary.

Unfunded Actuarial Accrued Liabilities. The difference between actuarial accrued liabilities and valuation assets.