

Hay/Huggins
Company

STATE EMPLOYES' RETIREMENT SYSTEM

1987 ACTUARIAL REPORT

June 7, 1988

Hay/Huggins
Company

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, 1987. 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 1988-89 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.

State Employees' Retirement System
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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

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STATE EMPLOYES' RETIREMENT SYSTEM

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STATE EMPLOYES' RETIREMENT SYSTEM

VALUATION HIGHLIGHTS

	<u>December 31, 1987</u>	<u>December 31, 1986</u>
	<u>Valuation</u>	<u>Valuation</u>
Summary of Contributions: (Percent of Participants' Compensation)		
Normal Cost	4.73%	4.45%
Amortization of Unfunded Actuarial Accrued Liability	6.79	6.96
Amortization of Supplemental Annuities	<u>1.57</u>	<u>1.68</u>
Total	13.09%	13.09%
Contribution Rate for:		
Class A Members: Age 60 Superannuation	12.77%	12.78%
Class A Members: Age 50 Superannuation	15.56	15.57
Class C: State Police	23.11	23.25
Enforcement Officers	15.56	15.57
Class D Members	58.35	58.39
Class E Members	19.16	19.17
Market Value of Assets	\$7,367,042,394	\$7,117,572,134
Projected Benefit Obligation	\$7,384,307,121	\$6,983,974,574
Active Participants:		
Number	109,499	109,454
Average Projected compensation. \$	24,321	\$ 23,007
Total Projected compensation	\$2,663,080,000	\$2,518,206,000
Annuitants and Beneficiaries:		
Number	69,515	67,488
Total annual pension \$	\$ 371,274,432	\$ 352,978,810
Inactive Participants:		
Number	2,871	3,178

STATE EMPLOYES' 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 salary growth that ranges from 4.45% a year at age 20 to 0.25% a year after age 40. 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%. For the 1987 valuation, 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>	
1988 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 1985 valuation was performed using a set of assumptions, including the mandated 5.5% interest rate, that would produce a total employer cost approximately equal to the employer cost based on the above assumptions. The 1986 valuation was performed using the same set of assumptions. Both valuations produced an aggregate employer cost of 13.09% of payroll.

Use of the 1985/1986 assumptions would have produced an employer cost lower than 13.09 percent of compensation. The State Employees' Retirement Board expressed concern that a reduced employer cost would not provide enough margin of safety against possible adverse experience. The Board was concerned about the uncertainty of the value of equities, the potential liability of proposed cost-of-living allowances, and the possibility of salary increases higher than those expected in the valuation.

To incorporate a margin for safety, the Board modified the assumptions to produce the same employer cost in the 1987 valuation as in the 1986 valuation. The 13.09 percent employer cost was produced by increasing the salary growth assumption by .25 percent of pay per year.

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, 1987 actuarial valuation is 13.09%. The 1986 valuation had produced an Employer Contribution Rate of 13.09%. The three pieces composing the rate changed as shown in the following table:

	<u>1987</u> <u>Valuation</u>	<u>1986</u> <u>Valuation</u>
Normal Cost Rate	4.73%	4.45%
Unfunded Actuarial Accrued Liability Rate	6.79	6.96
Supplemental Annuity Amortization Rate	<u>1.57</u>	<u>1.68</u>
TOTAL	13.09%	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 \$1,988,710,150 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 four parts to be funded in level payments over 20 years from July 1, 1969; July 1, 1974; July 1, 1979; and July 1, 1984.

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 12.77% 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	12.77%
Class A with age 50 benefit	15.56
Class C - State Police	23.11
Class C - Enforcement Officers	15.56
Class D	58.35
Class E	19.16

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 13.09% 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 years' 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 7.55% 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 Actuarial Accrued Liability from the 1986 to 1987 valuation. The interest earnings in 1987 were less than the assumed 5.5% rate but when this actuarial loss was combined with excess earnings from the previous four years the result was a total reduction in employer contribution of 1.21% of compensation from excess investment earnings.

STATE EMPLOYES' RETIREMENT SYSTEM

The gain from excess investment earnings was offset by an actuarial loss from the salary increase and an increase attributable to the change in the assumed rate of salary growth. The net result of all changes was to leave the aggregate employer contribution at 13.09% of compensation.

The amortization payments on the Unfunded Actuarial Accrued Liability would have reduced the liability to \$1,996,260,152 as of December 31, 1987. The combined result of other changes resulted in a liability of \$1,988,710,150.

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 \$17,848,537. This transfer has 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

Page 1 of 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, 1987. The liability was determined to be \$7,384,307,121. The market value of assets was, therefore, 99.8% of the Projected Benefit Obligation.

Plan Assets

Schedule K summarizes the development of the actuarial value of assets as of December 31, 1987. 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 1987 asset loss of \$105,132,816 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 N.

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Participant Data

Section I of Schedule L provides a distribution of the active participants as of December 31, 1987 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, 1987. There were no major changes in the provisions since the prior valuation. Special early retirement provisions are available for members who retire before June 30, 1989. This temporary provision is not described in Schedule M but the liability was included in the valuation.

Actuarial Assumptions and Methods

Schedule N summarizes the actuarial assumptions, the asset valuation method and cost methods used for the valuation. The only change in these assumptions and methods was to increase the assumed salary growth rate by 0.25% per year.

STATE EMPLOYES' RETIREMENT SYSTEM

I. UNFUNDED ACTUARIAL ACCRUED LIABILITY DECEMBER 31, 1987

1) Present Value of Benefits:

(a) Active and Inactive Participants	
Superannuation and Withdrawal	\$ 6,837,750,448
Disability	364,637,021
Death	569,189,490
Refunds	51,481,771
Special Police and Enforcement Officer Benefits	89,681,470
(b) Annuitants and Beneficiaries	<u>3,666,886,194</u>
(c) Total	\$11,579,626,394

2) Present Value of Member and Employer Contributions:

(a) Employer portion of Normal Cost	\$ 1,136,665,968
(b) Supplemental Annuity Amortization	369,366,994
(c) Member Contributions	1,305,834,041
(d) Special Police and Enforcement Officer Contributions	<u>62,536,171</u>
(e) Total	\$ 2,874,403,174

3) Actuarial Accrued Liability: (1) - (2)	\$ 8,705,223,220
4) Actuarial Value of Assets	\$ 6,716,513,070
5) Unfunded Actuarial Accrued Liability: (3) - (4)	\$ 1,988,710,150

II. AMORTIZATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY

<u>Funding Period</u> <u>30 Years from July 1</u>	<u>Amount of</u> <u>Liability</u>	<u>Annual Payment to Fund</u>	
		<u>Amount</u>	<u>Percent*</u>
1969	\$1,357,574,249	\$131,732,982	4.95%
1974	<u>631,135,901</u>	<u>44,231,264</u>	<u>1.66</u>
	\$1,988,710,150	\$175,964,246	6.61%

*Payment for 1988 expressed as a percentage of the estimated total payroll for active members in 1988 of \$2,663,080,229. 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 1988-89)

1) Normal Cost Rate for new active members to fund:	
(a) Superannuation and Withdrawal	8.70%
(b) Disability68
(c) Death57
(d) Refunds	<u>.90</u>
(e) Total	10.85%
2) Member Deductions	6.25%
3) Employer Normal Cost (1)(e) - (2)	4.60%

II. AMORTIZATION OF SUPPLEMENTAL ANNUITIES

<u>Funding Period:</u> <u>20 Years from July 1</u>	<u>Amount of</u> <u>Liability</u>	<u>Annual Payment to Fund</u>	
		<u>Amount</u>	<u>Percent*</u>
1969	\$ 914,163	\$ 620,221	.02%
1974	40,554,555	7,199,574	.27
1979	160,292,011	18,183,841	.68
1984	<u>167,606,265</u>	<u>14,898,507</u>	<u>.56</u>
	\$369,366,994	\$40,902,143	1.53%

*Payment for 1988 expressed as a percentage of the estimated total payroll for active members in 1988 of \$2,663,080,229. The estimate was obtained by multiplying the 1987 salary for each active employee by the salary growth assumption for one year.

III. DEVELOPMENT OF TOTAL EMPLOYER CONTRIBUTION RATE

(Fiscal Year 1988-89)

	<u>Payable</u> <u>January 1</u>	<u>Payable</u> <u>Quarterly**</u>
1) Employer Normal Cost	4.60%	4.73%
2) Payment on Unfunded Actuarial Accrued Liability	6.61	6.79
3) Payment on Supplemental Annuities	<u>1.53</u>	<u>1.57</u>
4) Total	12.74%	13.09%

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

STATE EMPLOYES' RETIREMENT SYSTEM

TOTAL CONTRIBUTION RATE BY GROUP
(Fiscal Year 1988-89)

	<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)	12.77%	-	-	-	12.77%
2) Class A (age 50 superannuation)	12.77	2.79%	-	-	15.56
3) Class C					
State Police	12.77	2.79	-	7.55%	23.11
Enforcement Officers	12.77	2.79	-	0.00	15.56
4) Class D	12.77	2.79	42.79%	-	58.35
5) Class E	12.77	-	6.39	-	19.16

STATE EMPLOYEES' RETIREMENT SYSTEM

EMPLOYER CONTRIBUTION RATE BY GROUP

	<u>Class A (Age 60 Super- annuation)</u>	<u>Class A (Age 50 Super- annuation) and Class C*</u>	<u>Class D</u>	<u>Class E</u>	<u>Total</u>
1. Basic Contribution Rate	12.77%	12.77%	12.77%	12.77%	N/A
2. Additional Contribution Rate for Age 50 Superannuation	-	2.79%	2.79%	-	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)	12.77%	15.56%	58.35%	19.16%	13.09%
5. Projected 1988 Payroll	\$2,402,360,000	\$245,763,000	\$2,213,000	\$12,744,000	\$2,663,080,000
6. Employer Contribution Amount	\$ 306,781,372	\$ 38,240,723	\$1,291,286	\$ 2,441,750	\$ 348,597,172

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 1988-89)

	<u>State Police</u>	<u>Enforcement Officers</u>
1) Balance in Benefit Account as of December 31, 1987.	\$253,462,815	\$21,827,880
2) Present Value of Benefits for Annuitants and Beneficiaries	228,193,271	14,908,767
3) Assets available for additional annuities for Active Members: (1) - (2).	25,269,544	6,919,113
4) Present Value of additional annuities for Active Members	87,805,715	1,875,755
5) Present Value of Future Contribution to fund additional annuities: (4) - (3). . .	62,536,171	0
6) Present Value of Future Compensation for eligible Active Members.	850,424,057	*
7) Contribution Rate as a percentage of payroll payable January 1: (5) / (6)	7.35%	0.00%
8) Contribution Rate as a percent of payroll payable quarterly:	<u>7.55%</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 1988-89)

1. Estimated Account Balance @ July 1, 1988	\$4,516,854
2. Contribution Required to Amortize (1) over 20 years from July 1, 1980	510,064
3. Estimated Fiscal year 1988-89 payroll for Air and Army National Guard Members	1,540,000
4. Employer Contribution Rate	12.53%
5. Total Required Contribution: (2) + ((3) x (4)).	703,026

STATE EMPLOYES' 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, 1986 Valuation.	4.45%	6.96%	1.68%	13.09%
2. Changes - 12/31/87 Valuation:				
a) Excess Investment Earnings		(1.21)%		(1.21)%
b) Change in Demographic Profile of New Entrants	0.02%	(0.02)%		0.00%
c) Change in Salary Growth Assumption.	0.26%	0.30%		0.56%
d) Salary Increase Over Assumed Rates and Miscellaneous Changes	_____	<u>0.76%</u>	<u>(0.11)%</u>	<u>0.65%</u>
e) Total Change.	0.28%	(0.17)%	(0.11)%	0.00%
4. December 31, 1987 Valuation:				
(1) + (2e)	4.73%	6.79%	1.57%	13.09%

II. ANALYSIS OF CHANGE IN UNFUNDED ACTUARIAL ACCRUED LIABILITY

1. December 31, 1986 Unfunded Actuarial Accrued Liability . . .	\$ 2,062,621,556
2. Expected amortization payment.	170,431,838
3. Expected liability as of December 31, 1987 [$((1) - (2)) \times 1.055$].	1,996,260,152
4. Change in Liability due to:	
a) Excess Investment Earnings.	(352,544,730)
b) Change in Normal Cost Rate.	(4,843,071)
c) Change in Salary Growth Assumption	91,184,328
d) Salary Increases Over Assumed Rates and Miscellaneous Changes	<u>258,653,471</u>
e) Total Change.	\$ (7,550,002)
5. December 31, 1987 Unfunded Actuarial Accrued Liability:	
(3) + (4e)	\$ 1,988,710,150

STATE EMPLOYEES' RETIREMENT SYSTEM

ACTUARIAL BALANCE SHEET

L I A B I L I T I E S

A S S E T S

<u>Present Assets:</u>		<u>Present Value of Benefits Payable to Annuitants and Beneficiaries from:</u>	
Members' Savings Account	\$ 1,491,286,363	Annuity Reserve Account	\$ 3,423,784,156
Annuity Reserve Account	3,423,784,156	State Police Benefit Account	228,193,271
State Police Benefit Account	253,462,815	Enforcement Officers Benefit Account	<u>14,908,767</u>
Enforcement Officers Benefit Account	21,827,880	Total for Annuitants and Beneficiaries	\$ 3,666,886,194
State Accumulation Account	2,546,048,174		
Supplemental Annuity Account	<u>(369,366,994)</u>	<u>Present Value of Benefits to Active and Inactive Members from:</u>	
Total Present Assets (Market Value)	\$ 7,367,042,394	Member Savings Account and State Accumulation Account	
Adjustment to smooth market fluctuations	<u>(650,529,324)</u>	Superannuation and	
Total Present Assets (Actuarial Value)	\$ 6,716,513,070	Withdrawal	\$ 6,837,750,448
		Disability	364,637,021
<u>Present Value of Future Contributions</u>		Death	569,189,490
Members' Savings Account (Employee)	\$ 1,305,834,041	Refunds	<u>51,481,771</u>
Normal Cost Contributions (Employer)	1,136,665,968	Sub Total	\$ 7,823,058,730
Accrued Liability Amortization (Employer)	1,988,710,150	State Police Benefit Account	87,805,715
Supplemental Annuity Amortization (Employer)	369,366,994	Enforcement Officers Benefit Account	<u>1,875,755</u>
Special State Police Contributions (Employer)	62,536,171	Total	\$ 7,912,740,200
Special Enforcement Officer Contributions (Employer)	<u>0</u>	TOTAL LIABILITIES	<u>\$11,579,626,394</u>
Total Future Contributions	\$ 4,863,113,324		
TOTAL ASSETS	<u>\$11,579,626,394</u>		

STATE EMPLOYEES' RETIREMENT SYSTEM

REQUIRED TRANSFERS WITHIN SERS ACCOUNTS

1. Annuity Reserve Account	
Balance as reported by SERS.	\$ 3,405,935,619
Transfer from State Accumulation Account	<u>17,848,537</u>
December 31, 1987 balance after transfers.	\$ 3,423,784,156
2. State Accumulation Account	
Balance as reported by SERS.	\$ 2,563,896,711
Transfer to Annuity Reserve Account.	<u>(17,848,537)</u>
December 31, 1987 Balance after transfers.	\$ 2,546,048,174

STATE EMPLOYES' RETIREMENT SYSTEM

FUNDING STATUS OF PROJECTED BENEFIT OBLIGATION AS OF DECEMBER 31, 1987

	<u>Number of Members</u>	
I. Projected benefit obligation		
(a) Retirees and beneficiaries		
1. Superannuation retirements	44,746	\$2,064,152,475
2. Early retirements	15,509	588,663,692
3. Disabled	3,831	141,670,069
4. Beneficiaries	<u>5,429</u>	<u>127,440,433</u>
5. Total	69,515	\$2,921,926,669
(b) Inactive participants	2,871	\$ 58,180,391
(c) Active members		
1. Employee contributions and interest		\$1,491,286,363
2. Employer-financed liability - vested	64,996	2,612,732,811
3. Employer-financed liability - nonvested	<u>44,503</u>	<u>300,180,887</u>
4. Total		\$4,404,200,061
(d) Total obligation for all members	181,885	\$7,384,307,121
II. Market value of assets available for benefits		\$7,367,042,394
III. Unfunded projected benefit obligation		\$ 17,264,727
IV. Assets as a percent of projected benefit obligation		99.8%

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 employe service to December 31, 1987. 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 Employes' Retirement Systems and State and Local Governmental Employers." The calculation assumes salaries will increase as stated in Schedule N. No postretirement increases are assumed.

STATE EMPLOYEES' RETIREMENT SYSTEM

ACTUARIAL VALUE OF ASSETS

I. Development of 12/31/87 Expected Actuarial Value:

1) Actuarial Value as of 12/31/86	\$6,009,365,263
2) Contributions in 1987	513,524,158
3) Benefits and Expenses in 1987.	490,080,861
4) Interest @ 5.5% to 12/31/87 on (1)	330,515,089
5) Interest @ 5.5% to 12/31/87 on .5 x ((2) - (3))	<u>644,691</u>
6) Expected Actuarial Value as of 12/31/87: (1) + (2) - (3) + (4) + (5)	\$6,363,968,340

II. Previous Differences Not Yet Amortized:

1) Unrecognized Amount of 12/31/83 Difference: .2 x \$274,734,721	\$ 54,946,944
2) Unrecognized Amount of 12/31/84 Difference: .4 x \$129,746,917	51,898,767
3) Unrecognized Amount of 12/31/85 Difference: .6 x \$846,693,525	508,016,115
4) Unrecognized amount of 12/31/86 Difference: .8 x \$616,681,305	<u>493,345,044</u>
5) Total	\$1,108,206,870

III. Gain or Loss from 1987

1) Market Value of Assets on 12/31/87	\$7,367,042,394
2) Expected Market Value II(5) + I(6)	<u>7,472,175,210</u>
3) Gain (loss) from 1987 Investments (1) - (2) . . .	\$ (105,132,816)

IV Development of Actuarial Value of Assets as of 12/31/87:

1) 20% of \$274,734,721 (12/31/83 Difference):	\$ 54,946,944
2) 20% of \$129,746,917 (12/31/84 Difference):	25,949,383
3) 20% of \$846,693,525 (12/31/85 Difference):	169,338,705
4) 20% of \$616,681,305 (12/31/86 Difference):	123,336,261
5) 20% of (\$105,132,816) (12/31/87 Difference):	<u>(21,026,563)</u>
6) Total Difference: (1) + (2) + (3) + (4) + (5)	\$ 352,544,730
7) Actuarial Value at 12/31/87: I(6) + IV(6)	<u>\$6,716,513,070</u>

STATE EMPLOYEES' RETIREMENT SYSTEM

I. AGE, SERVICE AND SALARY PROFILE OF ACTIVE PARTICIPANTS DECEMBER 31, 1987

GENERAL EMPLOYEES

<u>Age</u>	<u>Males - Full Years of Service to December 31, 1987</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	17	0	0	0	0	0	0	17	\$18,687
20-24	808	85	0	0	0	0	0	893	17,908
25-29	2,071	1,392	145	0	0	0	0	3,608	20,157
30-34	1,862	2,133	1,602	281	0	0	0	5,878	22,151
35-39	1,596	1,914	2,601	2,706	201	0	0	9,018	24,539
40-44	1,316	1,290	1,786	3,297	1,582	87	0	9,358	26,599
45-49	769	857	907	1,860	1,749	807	84	7,033	28,608
50-54	551	721	728	1,319	1,289	977	592	6,177	29,353
55-59	553	671	778	1,175	1,159	886	781	6,003	28,556
60-64	317	468	639	873	745	516	504	4,062	28,292
65+	89	165	184	205	234	92	145	1,114	30,472
Total	9,949	9,696	9,370	11,716	6,959	3,365	2,106	53,161	\$26,189

Average age 44.3
Average service 13.5

<u>Age</u>	<u>Females - Full Years of Service to December 31, 1987</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	98	0	0	0	0	0	0	98	\$18,290
20-24	1,377	273	0	0	0	0	0	1,650	16,985
25-29	1,971	1,978	391	0	0	0	0	4,340	18,516
30-34	1,728	2,055	2,313	760	0	0	0	6,856	20,174
35-39	1,653	1,666	2,010	2,697	400	0	0	8,426	21,057
40-44	1,270	1,319	1,419	1,576	1,092	108	0	6,784	21,438
45-49	841	1,179	1,121	1,110	712	452	85	5,500	21,707
50-54	561	898	984	1,184	628	354	225	4,834	21,860
55-59	338	731	908	1,122	952	373	243	4,667	21,383
60-64	141	450	572	834	518	259	198	2,972	21,328
65+	30	117	156	158	156	72	100	789	21,451
Total	10,008	10,666	9,874	9,441	4,458	1,618	851	46,916	\$20,814

Average age 42.3
Average service 11.6

STATE EMPLOYES' RETIREMENT SYSTEM

I. AGE, SERVICE AND SALARY PROFILE OF ACTIVE PARTICIPANTS DECEMBER 31, 1987

STATE POLICE, CORRECTION OFFICERS,
ENFORCEMENT OFFICERS, AND PSYCHIATRIC SECURITY AIDES

Age	<u>Males - Full Years of Service to December 31, 1987</u>							Total	Average Salary
	<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	168	1	0	0	0	0	0	169	20,518
25-29	678	277	3	0	0	0	0	958	24,497
30-34	352	460	190	3	0	0	0	1,005	26,320
35-39	307	230	353	273	10	0	0	1,173	27,718
40-44	269	142	185	912	543	15	0	2,066	30,267
45-49	143	89	70	226	517	287	21	1,353	30,930
50-54	99	57	58	43	103	138	163	661	30,035
55-59	56	21	33	24	41	66	137	378	30,241
60-64	16	9	18	16	19	24	43	145	28,658
65+	<u>0</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>3</u>	<u>0</u>	<u>5</u>	<u>11</u>	26,691
Total	<u>2,088</u>	<u>1,287</u>	<u>911</u>	<u>1,498</u>	<u>1,236</u>	<u>530</u>	<u>369</u>	<u>7,919</u>	<u>\$28,541</u>

Average age 40.5
Average service 13.0

Age	<u>Females - Full Years of Service to December 31, 1987</u>							Total	Average Salary
	<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	11	1	0	0	0	0	0	12	23,943
25-29	70	38	0	0	0	0	0	108	23,624
30-34	48	48	10	4	0	0	0	110	24,159
35-39	39	20	17	16	1	0	0	93	25,067
40-44	21	13	8	6	2	1	0	51	24,263
45-49	12	6	6	3	3	0	2	32	23,990
50-54	5	3	6	2	2	1	1	20	24,969
55-59	3	1	1	2	1	1	1	10	25,990
60-64	1	1	2	4	1	0	0	9	25,815
65+	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	0
Total	<u>210</u>	<u>131</u>	<u>50</u>	<u>37</u>	<u>10</u>	<u>3</u>	<u>4</u>	<u>445</u>	<u>\$24,324</u>

Average age 35.9
Average service 6.8

STATE EMPLOYES' RETIREMENT SYSTEM

I. AGE, SERVICE AND SALARY PROFILE OF ACTIVE PARTICIPANTS DECEMBER 31, 1987

LEGISLATORS

<u>Age</u>	<u>Males - Full Years of Service to December 31, 1987</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	1	1	1	0	0	0	0	3	40,999
30-34	10	7	2	0	0	0	0	19	39,736
35-39	4	16	11	2	0	0	0	33	40,635
40-44	6	16	16	4	1	0	0	43	41,571
45-49	2	3	9	9	4	2	0	29	43,022
50-54	6	5	5	6	1	1	1	25	43,635
55-59	4	6	11	8	5	4	2	40	42,336
60-64	1	3	6	3	3	4	4	24	42,759
65+	<u>0</u>	<u>2</u>	<u>3</u>	<u>0</u>	<u>6</u>	<u>3</u>	<u>4</u>	<u>18</u>	<u>44,048</u>
Total	<u>34</u>	<u>59</u>	<u>64</u>	<u>32</u>	<u>20</u>	<u>14</u>	<u>11</u>	<u>234</u>	<u>\$42,126</u>

Average age 48.7

Average service 12.7

<u>Age</u>	<u>Females - Full Years of Service to December 31, 1987</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	40,999
35-39	1	0	2	0	0	0	0	3	40,999
40-44	1	0	0	0	0	0	0	1	40,999
45-49	1	1	0	0	0	0	0	2	40,999
50-54	1	1	0	0	0	0	0	2	40,999
55-59	1	0	0	0	0	0	0	1	40,999
60-64	1	0	1	0	0	0	0	2	40,999
65+	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>3</u>	<u>5</u>	<u>40,999</u>
Total	<u>6</u>	<u>3</u>	<u>4</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>3</u>	<u>17</u>	<u>\$40,999</u>

Average age 52.4

Average service 13.2

STATE EMPLOYES' RETIREMENT SYSTEM

I. AGE, SERVICE AND SALARY PROFILE OF ACTIVE PARTICIPANTS DECEMBER 31, 1987

JUDGES AND DISTRICT JUSTICES

<u>Age</u>	<u>Males - Full Years of Service to December 31, 1987</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	1	1	0	0	0	0	0	2	34,653
30-34	10	5	2	0	0	0	0	17	33,928
35-39	20	26	10	3	1	0	0	60	40,236
40-44	29	32	13	9	0	0	0	83	49,078
45-49	23	28	19	7	5	0	0	82	53,388
50-54	7	32	21	24	3	1	0	88	54,682
55-59	11	27	30	27	16	15	5	131	56,168
60-64	10	23	28	43	20	7	9	140	55,520
65+	<u>2</u>	<u>11</u>	<u>16</u>	<u>24</u>	<u>11</u>	<u>6</u>	<u>14</u>	<u>84</u>	<u>59,758</u>
Total	<u>113</u>	<u>185</u>	<u>139</u>	<u>137</u>	<u>56</u>	<u>29</u>	<u>28</u>	<u>687</u>	<u>\$53,092</u>

Average age 53.1

Average service 12.7

<u>Age</u>	<u>Females - Full Years of Service to December 31, 1987</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	1	1	0	0	0	0	0	2	35,671
30-34	3	1	0	0	0	0	0	4	34,771
35-39	5	3	1	0	0	0	0	9	45,366
40-44	9	5	1	1	0	0	0	16	50,142
45-49	5	6	4	2	0	0	0	17	42,813
50-54	1	7	3	7	0	0	0	18	39,321
55-59	3	8	1	10	1	0	0	23	37,715
60-64	3	7	6	8	1	0	1	26	42,641
65+	<u>0</u>	<u>0</u>	<u>2</u>	<u>2</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>5</u>	<u>48,451</u>
Total	<u>30</u>	<u>38</u>	<u>18</u>	<u>30</u>	<u>2</u>	<u>0</u>	<u>2</u>	<u>120</u>	<u>\$42,291</u>

Average age 51.7

Average service 10.1

STATE EMPLOYES' RETIREMENT SYSTEM

I. AGE, SERVICE AND SALARY PROFILE OF ACTIVE PARTICIPANTS DECEMBER 31, 1987

ALL EMPLOYES*

<u>Age</u>	<u>Males - Full Years of Service to December 31, 1987</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	17	0	0	0	0	0	0	17	\$18,687
20-24	996	86	0	0	0	0	0	1,082	18,357
25-29	2,800	1,680	149	0	0	0	0	4,629	21,073
30-34	2,280	2,623	1,810	285	0	0	0	6,998	22,806
35-39	1,978	2,200	3,008	3,000	213	0	0	10,399	24,992
40-44	1,688	1,509	2,018	4,250	2,129	102	0	11,706	27,380
45-49	1,021	1,006	1,038	2,131	2,284	1,099	105	8,684	29,099
50-54	754	839	845	1,413	1,404	1,119	761	7,135	29,560
55-59	721	767	889	1,271	1,234	974	935	6,791	29,003
60-64	422	545	716	963	826	568	582	4,622	28,839
65+	107	190	216	248	267	105	170	1,303	32,187
Total	12,784	11,445	10,699	13,561	8,357	3,967	2,553	63,366	\$26,726

Average age 44.0
Average service 13.3

<u>Age</u>	<u>Females - Full Years of Service to December 31, 1987</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	99	0	0	0	0	0	0	99	\$18,299
20-24	1,409	276	0	0	0	0	0	1,685	17,077
25-29	2,082	2,030	394	0	0	0	0	4,506	18,664
30-34	1,826	2,120	2,361	765	0	0	0	7,072	20,250
35-39	1,762	1,719	2,067	2,734	403	0	0	8,685	21,131
40-44	1,387	1,382	1,447	1,601	1,100	109	0	7,026	21,508
45-49	947	1,226	1,164	1,130	719	456	87	5,729	21,760
50-54	658	947	1,035	1,213	639	361	230	5,083	21,905
55-59	463	791	947	1,155	967	375	250	4,948	21,453
60-64	262	511	609	890	536	264	207	3,279	21,490
65+	262	139	172	176	164	76	104	892	21,774
Total	10,956	11,141	10,196	9,664	4,528	1,641	878	49,004	\$20,908

Average age 42.5
Average service 11.4

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

STATE EMPLOYES' RETIREMENT SYSTEM

II. AGE AND BENEFIT PROFILE OF ANNUITANTS AND BENEFICIARIES DECEMBER 31, 1987

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	0	\$ 0	0	\$ 0	0	\$ 0
50-54	106	1,602,415	1	3,921	107	1,606,336
55-59	407	5,843,575	63	785,615	470	6,629,190
60-64	3,357	34,747,099	2,325	15,295,951	5,682	50,043,050
65-69	6,514	47,530,214	5,021	26,671,675	11,535	74,201,889
70-74	6,504	38,511,229	4,872	22,473,374	11,376	60,984,603
75-79	4,979	26,916,117	3,693	16,847,908	8,672	43,764,025
80-84	2,615	13,651,633	1,990	8,446,032	4,605	22,097,665
85-89	918	4,877,323	795	3,264,192	1,713	8,141,515
90 & Over	285	1,693,256	301	1,196,506	586	2,889,762
Total	25,685	\$175,372,861	19,061	\$94,985,174	44,746	\$270,358,035

Average age 72.0
 Average annual pension . . \$6,042

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	1	\$ 621	11	\$ 8,058	12	\$ 8,679
30-34	116	87,977	477	387,927	593	475,904
35-39	667	651,419	1,148	1,052,885	1,815	1,704,304
40-44	1,189	1,598,758	802	952,985	1,991	2,551,743
45-49	1,010	2,104,232	581	1,031,017	1,591	3,135,249
50-54	936	4,521,556	674	2,138,910	1,610	6,660,466
55-59	1,531	12,381,993	1,115	5,737,163	2,646	18,119,156
60-64	1,268	9,663,122	1,235	6,194,351	2,503	15,857,473
65 & Over	1,420	7,771,266	1,328	6,081,360	2,748	13,852,626
Total	8,138	\$ 38,780,944	7,371	\$23,584,656	15,509	\$ 62,365,600

Average age 53.5
 Average annual pension . . \$4,021

STATE EMPLOYES' RETIREMENT SYSTEM

II. AGE AND BENEFIT PROFILE OF ANNUITANTS AND BENEFICIARIES DECEMBER 31, 1987

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	1	\$ 5,744	6	\$ 31,481	7	\$ 37,225
30-34	17	88,970	27	132,783	44	221,753
35-39	72	377,545	65	332,407	137	709,952
40-44	141	833,569	91	469,288	232	1,302,857
45-49	181	1,122,609	112	609,086	293	1,731,695
50-54	227	1,434,818	158	903,851	385	2,338,669
55-59	383	2,395,578	278	1,455,971	661	3,851,549
60-64	525	2,987,312	364	1,648,238	889	4,635,550
65 & over	593	2,601,726	590	2,072,471	1,183	4,674,197
Total	2,140	\$11,847,871	1,691	\$ 7,655,576	3,831	\$19,503,447

Average age 58.9
Average annual pension . . \$5,091

BENEFICIARIES

<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	1	\$ 26,052	3	\$ 4,483	4	\$ 30,535
25-29	5	17,279	4	18,031	9	35,310
30-34	2	3,933	9	41,235	11	45,168
35-39	12	62,556	20	103,552	32	166,108
40-44	21	88,332	21	88,437	42	176,769
45-49	21	44,919	50	121,674	71	166,593
50-54	19	66,488	86	281,125	105	347,613
55-59	24	124,326	177	780,232	201	904,558
60-64	21	105,600	460	2,154,699	481	2,260,299
65-69	53	170,973	772	2,859,260	825	3,030,233
70-74	53	161,077	1,136	4,009,723	1,189	4,170,800
75-79	33	97,484	1,033	3,784,910	1,066	3,882,394
80-84	22	58,936	743	2,255,006	765	2,313,942
85-89	7	22,186	411	1,087,478	418	1,109,664
90 & Over	4	8,707	206	398,657	210	407,364
Total	298	\$ 1,058,848	5,131	\$17,988,502	5,429	\$19,047,350

Average age 72.7
Average annual pension . . \$3,508

STATE EMPLOYES' RETIREMENT SYSTEM

BENEFIT AND CONTRIBUTION PROVISIONS as of DECEMBER 31, 1987
(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 employees and certain other eligible groups. The major provisions may be summarized as follows:

Eligibility Employees

- 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 Employees' 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 (with 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 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.

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(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. In effect, the years of Social Security Integration Credit are the same as total credited service unless the member did not elect coverage when first eligible.

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.

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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.

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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 July 1, 1984 for annuitants who had retired on or prior to July 1, 1982. The increases varied according to year of retirement and years of service and were determined as the total of (a) 2% of the annuity in effect on July 1, 1984 plus (b) \$1 times full years of credited service, plus (c) \$2 times full years of retirement through July 1, 1983 with certain maximums. Other supplemental annuities became effective as of July 1, 1968, July 1, 1974, and July 1, 1979.

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, and employment 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%

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(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 EMPLOYES' RETIREMENT SYSTEM

I. 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 five separate classes as follows:

CLASS*	AGE	Rates of Separation Due To							Salary Scale
		Withdrawal after Years of Service			Death	Dis- ability	Early Retire- ment**	Super- annuation Retire- ment**	
		1	5	11					
A (MALE)	25	.125	.038	.003	.0008	.0006	-	-	2.85 %
	35	.105	.036	.002	.0009	.0012	.019	-	1.55
	45	.072	.024	.002	.0026	.0025	.015	-	0.25
	55	.064	.016	.002	.0074	.0081	.022	.143	0.25
	65	-	-	-	.0131	-	-	.537	0.25
A (FEMALE)	25	.148	.061	.005	.0003	.0004	-	-	2.85 %
	35	.094	.043	.004	.0004	.0014	.029	-	1.55
	45	.067	.030	.003	.0014	.0030	.019	-	0.25
	55	.051	.024	.003	.0028	.0071	.035	.117	0.25
	65	-	-	-	.0042	-	-	.481	0.25
C (MALE and FEMALE)	45	.025	.025	.003	***	***	.010	-	0.25 %
	55	-	-	-			-	.080	0.25
	65	-	-	-			-	.350	0.25
D (MALE and FEMALE)	45	.030	.030	.002	***	***	.045	-	0
	55	-	-	-			-	.030	0
	65	-	-	-			-	.150	0
E (MALE and FEMALE)	45	.040	.020	.002	***	***	.020	-	0
	55	.040	.020	.002			.020	-	0
	65	-	-	-			-	.250	0

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

II. 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.

III. FUNDING AND CONTRIBUTION POLICY

The Pennsylvania State Employees' Retirement System funding policy provides for periodic employer contributions at actuarially determined rates that will amortize all existing liabilities 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 employees 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 from the July 1 following their effective dates. There are currently four such liabilities being amortized over 20 year periods beginning July 1, 1969, 1974, 1979, and 1984.

STATE EMPLOYES' RETIREMENT SYSTEM

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.

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 Increase</u>			<u>Investment Return</u>
	<u>General</u>	<u>Average Career</u>	<u>Total</u>	
1988 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.

IV. PROJECTED BENEFIT OBLIGATION

The Projected Benefit Obligation was calculated using the withdrawal, disability, death and retirement as set forth in Schedule N.

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 assumed salary increases for individuals attributable to merit and promotions were the rates set forth in Schedule N plus 1.25% a year. In addition, it was assumed that salary schedules would increase by 4 percent per year compounded annually.

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.