ACTUARIAL VALUATION
CONNECTICUT STATE EMPLOYEES RETIREMENT SYSTEM

AT

JUNE 30, 1991

MILLIMAN & ROBERTSON, INC.

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APPENDICES

MILLIMAN & ROBERTSON, INC.
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November 12, 1991

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

Re: Connecticut State Employees Retirement System

Members of the Commission:

At your request, we have made an actuarial valuation of the Connecticut State Employees Retirement System as of June 30, 1991. The results of the valuation are contained in the following report.

Section I contains an Executive Summary in which we present the principal results of this valuation. Details regarding System assets, liabilities, and costs are found in Sections II, III, and IV, respectively. Section V contains the disclosure information required by GASB #5. The Appendices contain information regarding System membership, an outline of the benefit provisions, a description of the actuarial methods and assumptions employed in this valuation, details on the Actuarial Surplus as of June 30, 1991, and Entry Age Normal Results.

As developed in Section IV, the recommended contribution for the fiscal year beginning July 1, 1992, including Federal reimbursements, is $444,243,379.

In our opinion, this report fairly presents the financial and actuarial position of the Connecticut State Employees Retirement System at June 30, 1991. On the basis of the foregoing, we hereby certify that, to the best of our knowledge, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices set forth by the American Academy of Actuaries.

Respectfully submitted,

MILLIMAN & ROBERTSON, INC.

Eugene M. Kalwarski, F.S.A.
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SECTION I

EXECUTIVE SUMMARY

SECTION I

EXECUTIVE SUMMARY

Purpose of Report

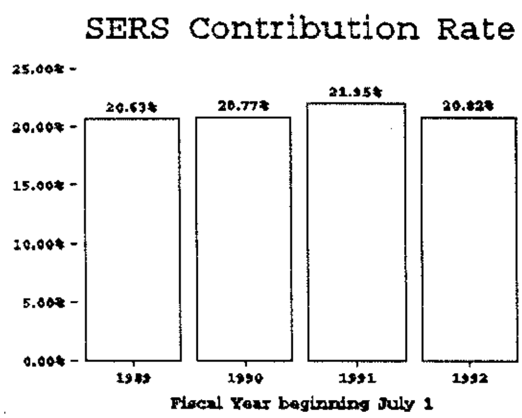
This report presents the results of the June 30, 1991 actuarial valuation of the Connecticut State Employees Retirement System (SERS). The primary purposes of performing the valuation are as follows:

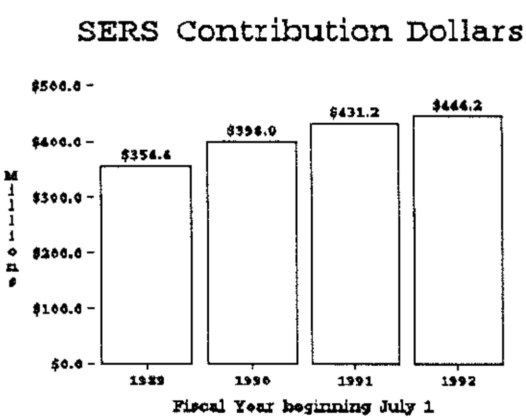
- to determine the contributions to be paid by the State for Fiscal Year beginning July 1, 1992
- to disclose asset and liability measures as of June 30, 1991, and
- to analyze and report on trends in System contributions, assets, and liabilities over the past several years.

Major Findings

The major findings of the 1991 valuation are summarized and compared in the following charts:

Over the past several years, the System contribution rate has increased slightly. (The 1991 contribution rate stands out due to several unusual events discussed in the prior valuation report.)

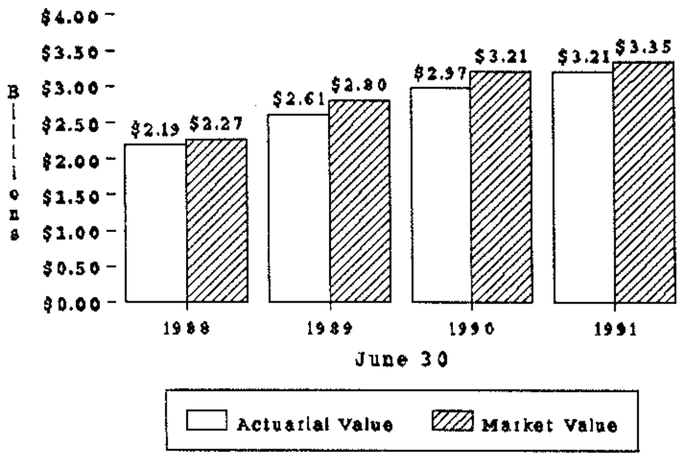




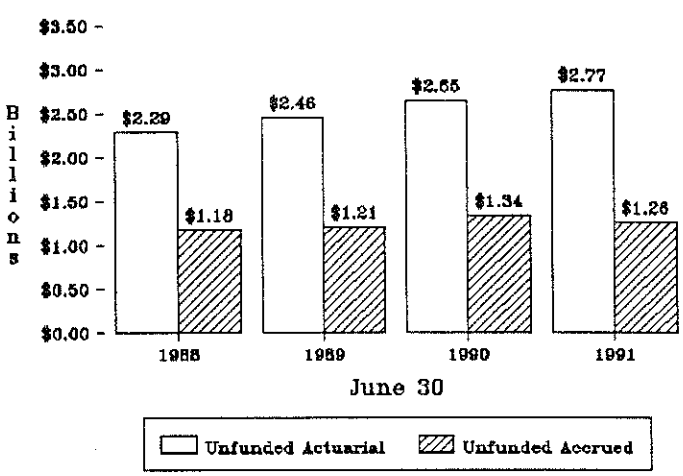
The dollar amount of the State's contribution equals the contribution rate shown above times the projected payroll. The dollar amount has grown over the last four years due primarily to growth in payroll.

System Assets

The System's assets have grown considerably in recent years due to investment performance and the contributions to the System.



Unfunded Liabilities



Unfunded "actuarial" liabilities (projected) have generally increased each year for many reasons. Contributing factors include liability losses (arising from experience less favorable than expected), benefit improvements, early retirement incentives, and contribution shortfalls. Unfunded "accrued" liabilities (based on service and pay on June 30) have remained relatively stable during the period.

System Experience July 1, 1990 to June 30, 1991

There were several unusual circumstances which have been reflected in the development of costs and liabilities for the Fiscal Year beginning July 1, 1992. They are described below:

- The valuation process normally incorporates pay raises effective on the valuation date. Since salary negotiations between the collective bargaining units and the State are currently ongoing, we do not know the level of pay raises as of July 1, 1991. Our calculations assume all members receive an 8% salary increase (cost of living plus merit) effective July 1, 1991.

- The ongoing negotiations also involve the amount of the State's contribution for the 1991-92 fiscal year. Our calculations assume that the full $431.2 million contribution will be made.

- The active employees of Newington Children's Hospital are no longer covered by SERS effective July 1, 1991. Former employees remain covered by SERS. System assets have been reduced to reflect transfer of funds to the new Newington pension plan. The transfer amount is the funded portion of the Newington Accumulated Benefit Obligation, where the funded percentage is that determined for the System as a whole.

- Issue #57 of the 1989 Arbitrator's Award requires a change in the Past Service amortization period to 30 years effective for the Fiscal Year beginning July 1, 1992. Under the prior schedule, the amortization period would have been 34 years.

- The Early Retirement Incentive Program continues to be funded at an annual rate of $11.9 million, payable over three years. Fiscal Year beginning July 1, 1992 is the second year for which this program cost is recognized.

Each year, the primary factors which contribute to changes in the System's assets, unfunded liabilities, and contributions are: (1) expected changes due to the passage of time (eg. new employees) and (2) unexpected changes due to experience gains and losses. In the absence of performing a formal experience review of the System we estimate the source of changes as follows.

Assets

Between June 30, 1990 and June 30, 1991, the actuarial value of assets (measured on a five year smoothing basis) increased by $235 million. This change was attributable to the following:

		($million)
June 30, 1990 actuarial value of assets		$2,973
Change in Assets		
• Employer and Member Contribution	298	
• Benefits and Expenses	(274)	
• Expected Investment Earnings	253	
• Investment Gain/(Loss)	(32)	
• Assets allocated to Newington Children's Hospital	(10)	
Total Changes	235	
June 30, 1991 actuarial value of assets		$3,208

The expected investment earnings shown above are based on an assumed rate of return of 8.5%. However, the effective investment return on the actuarial value of assets was 7.43%, resulting in an actuarial loss of $32 million. More details on the System assets are presented in Section II of this report.

Unfunded Liabilities

Two different measurements of unfunded liabilities are shown in the following chart.

- Actuarial Liability is used for determining contribution levels. It is based on future payroll projections with service credits as of June 30, 1991.

- Liability for Accrued Benefits is used for informational purposes and is based on service **and payroll** as of June 30, 1991. The liability for accrued benefits can be used as a measure of the funded status of the System, since it represents the asset requirements on a shutdown basis.

The unfunded portion of the two liability measures is determined by subtracting the actuarial value of assets from the appropriate liability. The net changes in System unfunded liabilities between June 30, 1990 and June 30, 1991 are summarized below:

	June 30 ($ million)		
	1991	1990	Change
Unfunded Actuarial Liability	2,775	2,652	123
Unfunded Liability for Accrued Benefits	1,258	1,341	(83)

The unfunded actuarial liability of the System increased during the past year. Assuming future experience is exactly as assumed and the State makes the required contribution, the unfunded actuarial liability is expected to decrease each year. This is because the unfunded actuarial liability is being amortized on a level dollar basis over a decreasing number of years. Effective for the Fiscal Year beginning July 1, 1992, the amortization period is 30 years.

Because of the shortfall in the State's contribution, for Fiscal Year 1990-91, the unfunded actuarial liability was expected to increase by $104 million to a level of $2,756 million as of June 30, 1991. On that date, the actual unfunded actuarial liability was $2,775 million, or $19 million higher than expected ($2,775 minus $2,756). The components of this $19 million net actuarial loss are summarized as follows:

• increase due to asset losses	$ 32 million
• decrease due to the removal of Newington Children's Hospital	(17) million
• increase due to liability losses	4 million
Net Actuarial Loss	$19 million

System Contributions

System contributions projected to the Fiscal Year beginning July 1, 1992 are $444.2 million. This exceeds the prior year's projection of $431.2 million by $13.0 million.

The sources of this increase are as follows:

Prior year's contribution (projected to 1991)	$431.2 million
• increase due to expected payroll growth and changes in membership profile	6.9
• increase due to asset losses	3.0
• increase due to liability losses	0.4
• decrease due to removal of Newington Children's Hospital	(3.5)
• increase due to change in amortization period	6.2
Contribution projected to July 1, 1992	$444.2 million

Actuarial Surplus

There is no actuarial surplus as defined in Section 5-162h(b) of the Statute.

SUMMARY

During the past year, the System experienced various events which resulted in both decreases and increases in System costs. This is to be expected in future years as well since the anticipated accuracy of the actuarial assumptions are over the long term and not from year to year. Furthermore, the Projected Unit Credit actuarial funding method employed by the State tends to have some inherent instabilities and sensitivity to annual experience, given the two tier benefit levels of this System.

The overall System experience was mixed. On the one hand, the normal cost as a percent of pay decreased from 9.16% to 8.86%. This is the result of the change in the membership from the more costly Tier I to Tier II. This is the first year that the Tier II members outnumber the Tier I members.

On the other hand, the unfunded actuarial liability, and therefore the amortization payment, increased again this year. The increase was due primarily to unfavorable investment experience.

In concluding this executive summary, we present on the following page comparative statistics and actuarial information on both the June 30, 1991 and June 30, 1990 valuations.

CONNECTICUT STATE EMPLOYEES RETIREMENT SYSTEM
PRINCIPAL RESULTS

	June 30, 1991	June 30, 1990	% Chg
SYSTEM MEMBERSHIP			
1. Active Membership			
- Number of Participants	55,046	54,926	0.22
- Payroll	1,956,585,318	1,802,808,993	8.53
- Average Pay	35,545	32,823	8.29
2. Inactive Membership			
- Number of Vested Deferred Members	727	658	10.49
- Number of Retired Members	23,779	23,718	.26
- Annual Retired Members Benefits	262,970,516	249,834,621	5.26
- Average Annual Retired Member Benefit	11,059	10,534	4.98
ASSETS AND LIABILITIES			
1. Assets			
- Market Value	3,351,681,110	3,212,789,521	4.32
- Actuarial Value	3,207,958,056	2,972,748,082	7.91
2. Liabilities			
- Retired and Deferred Vested*	2,795,890,494	2,657,370,442	5.21
- Active Members	3,186,796,701	2,967,291,638	7.40
- Total Liability	5,982,687,195	5,624,662,080	6.37
- Unfunded Liability	2,774,729,139	2,651,913,998	4.63
EMPLOYER CONTRIBUTIONS			
1. Contributions as a Percent of Projected Payroll			
- Normal Cost	8.86%	9.16%	
- Unfunded Liability	11.96%	12.78%	
- Total Contribution %	20.82%	21.95%	
2. Contribution Dollars Projected to the following FY			
- Normal Cost	189,127,218	180,005,022	5.07
- Unfunded Liability**	255,116,161	251,231,824	1.55
- Total State Contribution	444,243,379	431,236,846	3.02

* Does not include Liability for Retirement Incentive Bonuses.

** Includes payment for Retirement Incentive Bonuses.

SECTION II

SYSTEM ASSETS

SECTION II

SYSTEM ASSETS

In this section we present the values assigned to the assets held by the System. These assets are valued on two different bases: the actuarial value and the market value.

Actuarial Value of Assets

For purposes of determining ongoing costs, the recognition of gains and losses are spread over five years. The resulting value is called the actuarial value of assets and is further adjusted as necessary so that the final actuarial value is within 20% (plus or minus) of the market value of assets.

Market Value of Assets

For certain accounting statement purposes, System assets are valued at current market rates. These values represent the "snapshot" or "cash-out" value of System assets as of the valuation date. In addition, the market value of assets provides a reference point to compare to current accrued liabilities.

The following tables present information regarding the actuarial and market values of System assets as of June 30, 1991.

Table	Contents
II-1	Market Value - Summary of Fund Transactions
II-2	Market Value - Breakdown on June 30, 1991
II-3	Actuarial Value of Assets
II-4	Historical Summary (Actuarial and Market)

Table II-1

MARKET VALUE OF ASSETS
SUMMARY OF FUND TRANSACTIONS

Market Value July 1, 1990		$3,212,789,521
Contributions		
State	$208,816,908	
Federal	55,001,699	
Employee	33,809,952	
		$297,628,559
Investment Income		
Interest and Dividends	$154,910,390	
Realized Gains	16,110,453	
Change in Unrealized Gains	(45,666,489)	
		$125,354,354
Disbursements		
Benefit Payments	$271,032,268	
Employee Refunds	2,948,175	
Expenses	174,520	
		$274,154,963
Market Value June 30, 1991		$3,361,617,471
Assets Allocated to Newington Children's Hospital		9,936,361
Net Market Value June 30, 1991		3,351,681,110
Estimated Rate of Return as of June 30, 199~~1~~		3.89%
Rate of Return as of June 30, 1990		10.29%
Change		Down 6.40%

MARKET VALUE OF ASSETS BREAKDOWN ON JUNE 30, 1991

The following is the Market Value of the State Employees Retirement Fund assets as reported to us by the Retirement Division:

	Amount	% of Total
Cash	$ 7,998,841	.24%
Accrued Interest	0	.00%
Investments		
• Cash Reserve Account	$ 139,500,260	4.15%
• Fixed Income	791,819,465	23.55%
• Equity	1,241,864,643	36.94%
• Contract	0	.00%
• Mortgage	12,366,110	.37%
• Real Estate	479,418,938	14.26%
• International Funds	548,641,547	16.32%
• Commercial Mortgage Fund	102,365,694	3.05%
• Venture Capital Fund	31,458,688	.94%
• Connecticut Programs Fund	6,183,285	.18%
	$3,353,618,630	99.76%
Total Market Value of Assets June 30, 1991	$3,361,617,471	100.00%
Assets allocated to Newington Children's Hospital	9,936,361	
Net Total Value of Assets June 30, 1991	$3,351,681,110	

ACTUARIAL VALUE OF ASSETS

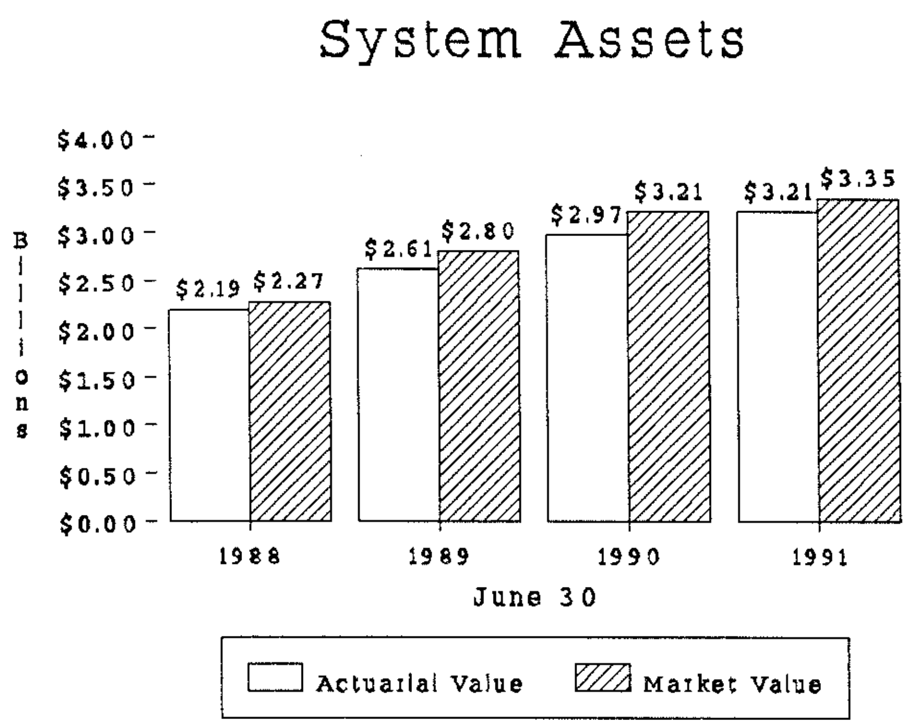
Ending	Realized Gains/Losses	Change in Unrealized Gains/Losses	Total Gains/Losses
6-30-91	$ 16,110,453	$ (45,666,489)	$ (29,556,036)
6-30-90	17,558,291	145,435,286	162,993,577
6-30-89	(38,287,173)	240,205,288	201,918,115
6-30-88	205,394,743	(261,372,286)	(55,977,543)
6-30-87	2,414,092	52,019,533	54,433,625

Actuarial Value of Assets as of June 30, 1991 is derived as follows:

1.	Market Value of Assets 6-30-91:		$3,361,617,471
2.	Five-Year Gains and Losses Not Yet Recognized:		
	80% of FY 91	(23,644,829)	
	60% of FY 90	97,796,146	
	40% of FY 89	80,767,246	
	20% of FY 88	(11,195,509)	
			143,723,054
3.	20% of (1)		672,323,494
4.	Actuarial Value of Assets 6-30-91 (1) - (2), within (1) +/- (3)		3,217,894,417
5.	Assets Allocated to Newington's Children Hospital		9,936,361
6.	Net Actuarial Value of Assets 6-30-91: (4) - (5)		3,207,958,056

Rate of Return on Actuarial Value of Assets as of June 30, 1991	7.43%
Rate of Return on Actuarial Value of Assets as of June 30, 1990	9.04%
Change	Down 1.61%

HISTORICAL SUMMARY OF SYSTEM ASSETS
(dollars in billions)



SECTION III

SYSTEM LIABILITIES AND ACCOUNTING INFORMATION

SECTION III

SYSTEM LIABILITIES

In this section we present values assigned to the liabilities of the System and then compare these liabilities to System assets.

The actuarial funding method used to determine System costs is based on the Projected Unit Credit method. This method is also used to determine the Projected Benefit Obligation (PBO) required by the Government Accounting Standards (GASB). A more detailed description of this method can be found in Appendix C.

The tables in this section present System liabilities as follows:

Table	**Contents**
III-1	System Liabilities
III-2	Active Liabilities by Tier and Plan
III-3	Historical Summary of System Liabilities

SYSTEM LIABILITIES

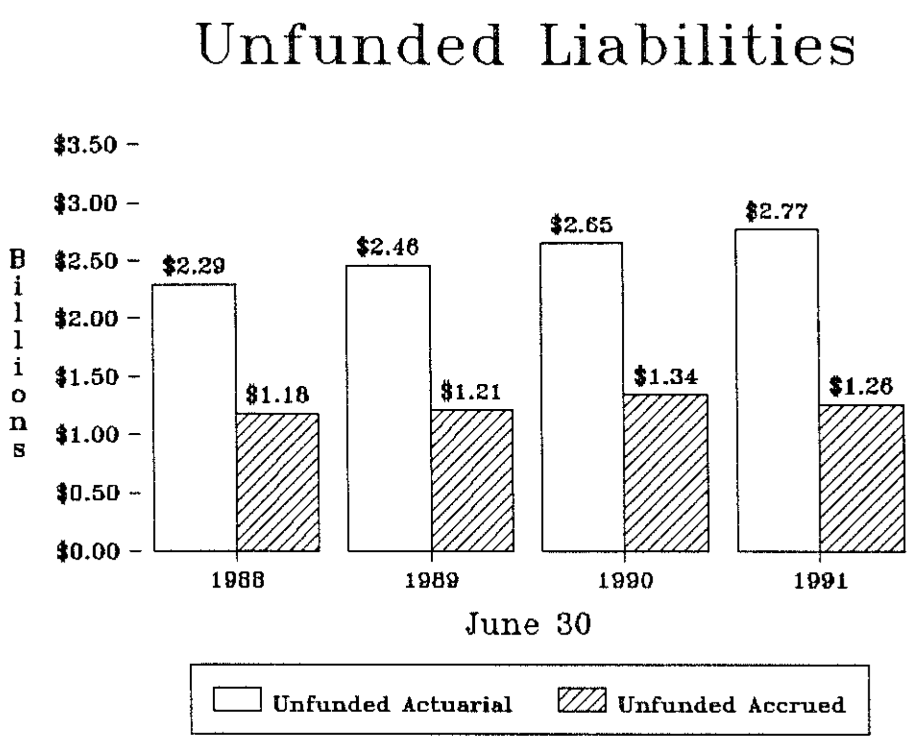
		JUNE 30, 1991	JUNE 30, 1990
1.	Liability for Retired Members	$2,780,344,628*	$2,645,802,734*
2.	Liability for Deferred Vested Members	15,545,866	11,567,708
3.	Total Inactive Liability	$2,795,890,494	$2,657,370,442
4.	Active Members Actuarial Liability	3,186,796,701	2,967,291,638
5.	Total System Actuarial Liability	$5,982,687,195*	$5,624,662,080*
6.	Actuarial Value of Assets	3,207,958,056	2,972,748,082
7.	Total System Unfunded Actuarial Liability	$2,774,729,139*	$2,651,913,998*

* Does not reflect liability for Retirement Incentive Bonuses. (These monthly payments of $988,221 will be paid for a three year period with a total outlay of about $35.6 million or $11.9 million on an annual basis).

ACTIVE LIABILITIES BY TIER AND PLAN

	ACTUARIAL LIABILITY	
	JUNE 30, 1991	JUNE 30, 1990
TIER I		
Hazardous Duty	426,005,739	354,300,569
Plan B	2,180,580,834	2,117,923,258
Plan C	213,843,371	215,632,864
Total	2,820,429,944	2,687,856,691
TIER II		
Hazardous Duty	92,991,120	58,950,927
All Others	273,375,637	220,484,020
Total	366,366,757	279,434,947
GRAND TOTAL	3,186,796,701	2,967,291,638

HISTORICAL SUMMARY OF UNFUNDED PAST SERVICE LIABILITIES
(dollars in billions)



SECTION IV

SYSTEM CONTRIBUTIONS

SECTION IV

SYSTEM CONTRIBUTIONS

In this section we present the contributions required of the State in the upcoming fiscal year. Due to the timing of both the actuarial valuation process and the State's budget cycle, valuation results each June 30 must be projected to the following fiscal year in order to determine the State's required contribution.

In the following pages we present information on System contributions as follows:

PROJECTED UNIT CREDIT NORMAL COST PROJECTIONS TO JULY 1, 1991

PLAN	7-1-91 NORMAL COST	7-1-91 EARNINGS	NORMAL COST %	7-1-92 PROJECTED EARNINGS	7-1-92 NORMAL COST
TIER I					
1. Hazardous Duty	$21,412,836	$119,359,821	17.9397%	$123,418,055	$ 22,140,872
2. Plan B	96,787,255	927,582,119	10.4344	959,119,911	100,078,022
3. Plan C	7,957,462	79,845,441	9.9661	82,560,186	8,228,016
Total	$126,157,553	$1,126,787,381		$1,165,098,152	$130,446,910
TIER II					
1. Hazardous Duty	$14,763,610	$144,080,426	10.2468%	$164,396,780	$16,845,383
2. All Others	35,672,389	685,717,511	5.2023	804,156,926	41,834,925
Total	$50,435,999	$829,797,937		$968,553,706	$58,680,308

System Normal Cost Projected to 7/1/92: $189,127,218

System Projected Earnings 7/1/92: $2,133,651,858

System Projected Normal Cost % at 7/1/92: 8.8646%

PROJECTED UNIT CREDIT UNFUNDED LIABILITY TO JULY 1, 1992

1.	Unfunded Actuarial Liability 7-1-91	$2,774,729,139*
2.	One Year's Interest at 8½%	235,851,977
3.	Normal Cost (FY 1991-92)	180,005,022
4.	Interest on Normal Cost	6,909,493
5.	Less State Payments	(376,236,846)**
6.	Less Federal Payments (expected)	(55,000,000)
7.	Less Employee Contributions	(33,809,953)
8.	Less Interest on Contributions	(17,850,821)
9.	Unfunded Actuarial Liability 7-1-92	$2,714,598,011*

* Does not reflect liability for Retirement Incentive Bonuses. (These monthly payments of $988,211 will be paid for a three year period with a total outlay of about $35.6 million or $11.9 million on an annual basis.)

** Assumes the full FY 1991-92 contribution will be made.

PROJECTED UNIT CREDIT TOTAL COSTS
TO JULY 1, 1992

1.	Unfunded Actuarial Liability 7-1-92	$2,714,598,011
2.	Amortization Period	30 Years
3.	Amortization Payment	243,257,509
4.	Employer Normal Cost	189,127,218
5.	Adjustment for Retirement Incentive Bonus	11,858,852
6.	Total Required Employer Contribution for Fiscal Year beginning 7-1-92	444,243,379
7.	Projected Payroll	$2,133,651,858
8.	Total Employer Cost %	20.82%

COMPARISON OF NORMAL COST RATES

	VALUATION DATE	
	JULY 1, 1991	JULY 1, 1990
TIER I		
Hazardous Duty	17.94%	18.87%
Plan B	10.43	10.63
Plan C	9.97	7.64
Total	11.20%	11.15%
TIER II		
Hazardous Duty	10.25%	12.23%
All Others	5.20	5.12
Total	6.06%	6.10%
GRAND TOTAL	9.03%	9.16%

NOTE: The aggregate normal cost rate projected to July 1, 1992 is 8.86%. This is less than the July 1, 1991 rate of 9.03% due to the assumed movement of members out of Tier I with replacement members entering Tier II.

SECTION V

GASB #5 INFORMATION

SECTION V

GASB #5 INFORMATION

Government Accounting Standards Board Statement No. 5, "Disclosure of Pension Information by Public Employee Retirement Systems and State and Local Government Employers", requires that SERS disclosure certain information on an annual basis regarding the funding of the System. In this section we present this information. Additional information regarding System Assets, a Summary of Plan Provisions and the Actuarial Method and Assumptions can be found in Section II and Appendices B and C, respectively.

The following tables present the information required for compliance with GASB #5:

Table	Contents
V-1	Summary of Membership
V-2	Standardized Measures
V-3	Historical Contribution Information
V-4	Historical Analysis of Funding Progress

Background Information

The Connecticut State Employee Retirement System was created by the State of Connecticut to provide defined benefit pensions to its employees. The System is described in Chapter 66, State Employees Retirement Act, in Sections 5-152 to 5-192 to Title 5 of the General Statutes of Connecticut.

The State's funding policy has been to contribute each year an amount equal to the normal cost plus an amount representing amortization of the unfunded actuarial accrued liability over thirty years (ending June 30, 2022), less amounts reimbursed by the Federal Government. The actuarial assumptions used to calculate the figures reported herein are the same as those used to calculate the contribution level.

SUMMARY OF MEMBERSHIP

	JUNE 30,1991	JUNE 30, 1990
Current employees:		
Vested:		
Hazardous Duty	1,883	1,544
Plan B	18,140	17,937
Plan C	1,864	1,923
Tier II	615	518
Not yet vested:		
Hazardous Duty	4,627	3,744
Plan B	3,642	5,085
Plan C	289	425
Tier II	23,986	23,750
Total current employees	55,046	54,926
Retirees and beneficiaries currently receiving benefits:	23,779	23,718
Terminated employees entitled to benefits but not yet receiving them:	727	658
Total Members	79,552	79,302

STANDARDIZED MEASURES

	JUNE 30,1991	JUNE 30, 1990
Pension Benefit Obligation		
Retired Members	$2,780,344,628*	$2,645,802,734*
Terminated Vested Members	15,545,866	11,567,708
Active Members		
- Accumulated employee contributions with interest	285,117,598	256,785,734
- Employer-financed vested portion	2,409,260,456	2,286,724,127
- Employer-financed non-vested portion	492,418,647	423,781,777
- Total	3,186,796,701	2,967,291,638
Total System Obligation	5,982,687,195*	5,624,662,080*
Market Value of Assets	3,351,681,110	3,212,789,521
Unfunded Pension Benefit Obligation	2,631,006,085	2,411,872,559

* Does not reflect liability for Retirement Incentive Bonuses. (These monthly payments of $988,221 will be paid for a three year period with a total outlay of about $35.6 million or $11.9 million on an annual basis.)

HISTORICAL CONTRIBUTION INFORMATION

	FISCAL YEAR 1987-1988	FISCAL YEAR 1988-1989*	FISCAL YEAR 1989-1990	FISCAL YEAR 1990-1991	FISCAL YEAR 1991-1992	FISCAL YEAR 1992-1993
Employer Normal Cost	$120,804,026	$125,118,568	$137,531,541	$179,549,626	$180,005,022	$189,127,218
Past Service Cost	200,793,967	249,196,138	258,836,930	218,467,282	251,231,824***	255,116,161***
Total Employer Cost	$321,597,993	$374,314,706	$396,368,471	$398,016,908**	$431,236,846	$444,243,379
Total Employer Cost as a percent of payroll	23.45%	24.16%	23.07%	20.77%	21.95%	20.82%
Employee Contributions	$ 28,025,025	$ 28,710,609	$ 29,198,019	$ 33,809,953	N/A	N/A
Employer Contributions	321,550,108	324,314,706	288,368,471	263,818,607	N/A	N/A
Total Contributions	$349,575,133	$353,025,315	$317,566,490	$297,628,560	N/A	N/A

* The changes in assumptions made effective July 1, 1987 increased the cost for Fiscal Year 1988-1989 by approximately $5 million.

** Includes an additional contribution of $10,241,000 ($3,381,000 Normal Cost + $6,860,000 Past Service Cost) needed to fund benefit improvements resulting from negotiations with the State Employees Bargaining Agent Coalition.

*** Includes $11,858,652 payment of Retirement Incentive Bonus.

HISTORICAL ANALYSIS OF FUNDING PROGRESS
(millions)

FISCAL YEAR	(1) NET ASSETS AVAILABLE FOR BENEFITS*	(2) PENSION BENEFIT OBLIGATION	(3) PERCENTAGE FUNDED (1)/(2)	(4) UNFUNDED OBLIGATION (2) - (1)	(5) ANNUAL COVERED PAYROLL	(6) UNFUNDED OBLIGATION AS A % OF PAY (4)/(5)
1987 - 1988**	$2,006.9	$4,089.3	49.1%	$2,082.4	$1,429.1	145.7%
1988 - 1989	2,273.2	4,550.7	50.0%	2,277.5	1,583.0	143.9%
1989 - 1990	2,798.9	5,071.5	55.2%	2,272.6	1,759.5	129.2%
1990 - 1991	3,212.8	5,624.7	57.1%	2,411.9	1,802.8	133.8%
1991 - 1992	3,351.7	5,982.7	56.0%	2,631.0	1,956.6	134.5%

* Market Value

** First period for which pension benefit obligations have been calculated in accordance with GASB Statement No. 5.

APPENDIX A

SUMMARY STATISTICS ON SYSTEM MEMBERSHIP

APPENDIX A

SUMMARY STATISTICS ON SYSTEM MEMBERSHIP

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SUMMARY OF ACTIVE MEMBERSHIP DATA

We received data on a total of 56,002 members, including employees of State Aided Institutions. Of the active records submitted to us, 188 (.3%) were rejected due to missing or invalid dates of birth and/or hire. Cost calculations were not revised to reflect these records. We also removed 768 members who are no longer covered because they are part of Newington Children's Hospital. The following analysis compares this data with the July 1, 1990 data (see Exhibit A-4 for distribution by age and service).

	7/1/91	7/1/90	CHANGE	PERCENT CHANGE
Total Employees	55,046	54,926	+120	+.2%
Total Earnings (millions)	$1,956.6	$1,802.9	+$153.7	+8.5%
Average Earnings	$32,545	$32,823	+$2,722	+8.3%

Earnings figures as of July 1 are actual amounts paid during the previous July 1 to June 30 period, adjusted for negotiated increases and merit adjustments effective through and including July 1; new entrant earnings are annualized.

These figures are broken down by Plan in the following exhibit.

SUMMARY OF ACTIVE MEMBERSHIP DATA

	7/1/91	7/1/90	CHANGE	PERCENT CHANGE
Number of Members				
Tier I Hazardous Duty	2,503	2,211	+292	+13.2%
Tier I Plan B	21,782	23,022	-1,240	-5.4%
Tier I Plan C	2,153	2,348	-195	-8.3%
Tier II Hazardous Duty	4,007	3,077	+930	+30.2%
Tier II Others	24,601	24,268	+333	+1.4%
Total	55,046	54,926	+120	+0.2%
Total Annual Compensation (millions)				
Tier I Hazardous Duty	119.4	97.9	+21.5	+22.0%
Tier I Plan B	927.6	913.5	+14.1	+1.5%
Tier I Plan C	79.8	80.6	-0.8	-1.0%
Tier II Hazardous Duty	144.1	98.7	+45.4	+46.0%
Tier II Others	685.7	612.2	+73.5	+12.0%
Total	1,956.6	1,802.9	+153.7	+8.5%
Average Compensation				
Tier I Hazardous Duty	47,687	44,272	+3,415	+7.7%
Tier I Plan B	42,585	39,678	+2,907	+7.3%
Tier I Plan C	37,086	34,330	+2,756	+8.0%
Tier II Hazardous Duty	35,957	32,064	+3,893	+12.1%
Tier II Others	27,874	25,226	+2,648	+10.5%
Total	35,545	32,823	+2,722	+8.3%
Average Age				
Tier I Hazardous Duty	42.2	41.5	+.7	+1.7%
Tier I Plan B	45.9	45.1	+.8	+1.8%
Tier I Plan C	53.1	52.6	+.5	+1.0%
Tier II Hazardous Duty	32.8	31.9	+.9	+2.8%
Tier II Others	37.4	36.6	+.8	+2.2%
Total	41.3	40.8	+.5	+1.2%
Average Service				
Tier I Hazardous Duty	14.5	14.0	+.5	+3.6%
Tier I Plan B	15.8	14.9	+.9	+6.0%
Tier I Plan C	16.1	15.2	+.9	+5.9%
Tier II Hazardous Duty	3.3	2.8	+.5	+17.9%
Tier II Others	4.2	3.4	+.8	+23.5%
Total	9.7	9.1	+.6	+6.6%

SUMMARY OF INACTIVE MEMBERSHIP DATA

	7/1/91	7/1/90	CHANGE	PERCENT CHANGE
Retirees				
Number	23,779	23,718	+61	+.3%
Total Annual Benefit	$262,970,516	$249,834,621	+13,135,895	+5.3%
Average Annual Benefit	11,059	10,534	+525	+5.0%
Terminated Vested				
Number	727	658	+69	+10.5%

ACTIVE MEMBERS

YEARS OF SERVICE

AGE	UNDER 5	5 TO 10	10 TO 15	15 TO 20	20 TO 25	25 TO 30	30 TO 35	35 TO 40	40 TO 45	45 TO 50	50 & UP	ALL YEARS
Under 20	0	0	0	0	0	0	0	0	0	0	0	0
20 TO 24	0	0	0	0	0	0	0	0	0	0	0	0
25 TO 29	3	37	3	0	0	0	0	0	0	0	0	43
30 TO 34	4	229	112	4	0	0	0	0	0	0	0	349
35 TO 39	8	168	269	160	0	0	0	0	0	0	0	605
40 TO 44	5	102	140	277	115	4	0	0	0	0	0	643
45 TO 49	3	49	64	111	168	75	2	0	0	0	0	472
50 TO 54	4	27	33	45	43	35	11	2	0	0	0	200
55 TO 59	3	14	31	34	21	16	8	2	0	0	0	129
60 TO 64	2	6	8	17	9	1	2	1	0	0	0	46
65 & UP	0	4	2	5	3	0	0	2	0	0	0	16
TOTALS	32	636	662	653	359	131	23	7	0	0	0	2,503

AVERAGE SALARIES

AGE	UNDER 5	5 TO 10	10 TO 15	15 TO 20	20 TO 25	25 TO 30	30 TO 35	35 TO 40	40 TO 45	45 TO 50	50 & UP	ALL YEARS
Under 20	0	0	0	0	0	0	0	0	0	0	0	0
20 TO 24	0	0	0	0	0	0	0	0	0	0	0	0
25 TO 29	41,669	44,358	45,595	0	0	0	0	0	0	0	0	44,257
30 TO 34	39,418	43,500	45,938	42,457	0	0	0	0	0	0	0	44,223
35 TO 39	45,537	43,852	46,250	48,499	0	0	0	0	0	0	0	46,169
40 TO 44	48,566	44,113	46,566	49,962	51,249	47,059	0	0	0	0	0	48,496
45 TO 49	44,812	42,452	48,028	48,599	51,366	55,028	67,469	0	0	0	0	49,946
50 TO 54	53,297	49,254	43,557	49,069	50,021	53,580	56,261	60,713	0	0	0	49,775
55 TO 59	46,213	41,288	47,956	44,455	55,628	49,491	57,085	64,560	0	0	0	48,532
60 TO 64	56,776	70,625	40,756	50,418	50,078	49,014	62,896	58,500	0	0	0	52,271
65 & UP	0	44,679	47,841	41,188	57,568	0	0	29,989	0	0	0	44,564
TOTALS	46,550	44,119	46,317	48,922	51,436	53,675	58,099	52,717	0	0	0	47,687

ACTIVE MEMBERS
YEARS OF SERVICE

AGE	UNDER 5	5 TO 10	10 TO 15	15 TO 20	20 TO 25	25 TO 30	30 TO 35	35 TO 40	40 TO 45	45 TO 50	50 & UP	ALL YEARS
Under 20	0	0	0	0	0	0	0	0	0	0	0	0
20 TO 24	0	0	0	0	0	0	0	0	0	0	0	0
25 TO 29	5	266	74	0	0	0	0	0	0	0	0	345
30 TO 34	36	801	1,214	77	0	0	0	0	0	0	0	2,128
35 TO 39	71	664	1,938	876	41	0	0	0	0	0	0	3,590
40 TO 44	48	532	1,456	1,351	686	55	0	0	0	0	0	4,128
45 TO 49	41	411	1,005	914	926	545	56	0	0	0	0	3,898
50 TO 54	19	314	829	587	626	594	335	49	0	0	0	3,353
55 TO 59	23	221	646	455	403	332	263	109	3	0	0	2,455
60 TO 64	6	135	368	282	278	164	110	59	4	2	0	1,408
65 & UP	1	55	123	84	73	71	29	30	8	3	0	477
TOTALS	250	3,399	7,653	4,626	3,033	1,761	793	247	15	5	0	21,782

AVERAGE SALARIES

AGE	UNDER 5	5 TO 10	10 TO 15	15 TO 20	20 TO 25	25 TO 30	30 TO 35	35 TO 40	40 TO 45	45 TO 50	50 & UP	ALL YEARS
Under 20	0	0	0	0	0	0	0	0	0	0	0	0
20 TO 24	0	0	0	0	0	0	0	0	0	0	0	0
25 TO 29	29,152	28,347	28,439	0	0	0	0	0	0	0	0	28,379
30 TO 34	27,246	35,000	32,994	33,563	0	0	0	0	0	0	0	33,673
35 TO 39	31,620	37,414	38,856	39,656	38,761	0	0	0	0	0	0	38,640
40 TO 44	35,239	38,452	41,706	45,964	43,786	39,661	0	0	0	0	0	42,923
45 TO 49	38,059	39,360	40,853	46,411	51,522	47,352	42,679	0	0	0	0	45,439
50 TO 54	32,648	37,193	39,652	43,495	50,780	51,849	48,082	48,208	0	0	0	45,260
55 TO 59	36,958	36,474	39,624	43,003	48,454	55,027	57,184	50,281	47,264	0	0	45,838
60 TO 64	48,450	34,252	37,226	44,818	50,151	54,094	63,493	64,744	31,080	70,123	0	46,259
65 & UP	20,844	29,690	41,586	49,626	53,304	61,466	58,163	66,603	73,999	81,241	0	49,714
TOTALS	33,622	36,194	38,746	44,043	48,955	51,273	53,225	55,307	57,207	76,794	0	42,585

ACTIVE MEMBERS
YEARS OF SERVICE

AGE	UNDER 5	5 TO 10	10 TO 15	15 TO 20	20 TO 25	25 TO 30	30 TO 35	35 TO 40	40 TO 45	45 TO 50	50 & UP	ALL YEARS
Under 20	0	0	0	0	0	0	0	0	0	0	0	0
20 TO 24	0	0	0	0	0	0	0	0	0	0	0	0
25 TO 29	0	8	2	0	0	0	0	0	0	0	0	10
30 TO 34	2	21	49	6	0	0	0	0	0	0	0	78
35 TO 39	5	31	89	46	4	0	0	0	0	0	0	175
40 TO 44	6	32	75	64	43	3	0	0	0	0	0	223
45 TO 49	3	29	78	66	60	12	1	0	0	0	0	249
50 TO 54	2	42	104	73	58	23	13	6	0	0	0	321
55 TO 59	6	43	141	98	72	24	19	23	1	0	0	427
60 TO 64	1	44	151	105	100	27	5	12	2	1	0	448
65 & UP	2	19	71	51	45	12	4	5	5	7	1	222
TOTALS	27	269	760	509	382	101	42	46	8	8	1	2,153

AVERAGE SALARIES

AGE	UNDER 5	5 TO 10	10 TO 15	15 TO 20	20 TO 25	25 TO 30	30 TO 35	35 TO 40	40 TO 45	45 TO 50	50 & UP	ALL YEARS
Under 20	0	0	0	0	0	0	0	0	0	0	0	0
20 TO 24	0	0	0	0	0	0	0	0	0	0	0	0
25 TO 29	0	30,585	35,853	0	0	0	0	0	0	0	0	31,639
30 TO 34	29,734	31,878	34,961	29,697	0	0	0	0	0	0	0	33,592
35 TO 39	24,347	32,649	34,782	34,579	29,825	0	0	0	0	0	0	33,939
40 TO 44	25,372	36,941	36,859	38,793	35,742	27,493	0	0	0	0	0	36,775
45 TO 49	56,574	38,079	38,035	39,957	39,320	39,944	26,364	0	0	0	0	39,128
50 TO 54	34,574	29,350	33,310	39,118	40,795	42,850	43,373	37,341	0	0	0	36,639
55 TO 59	32,962	34,222	32,491	38,072	41,918	42,025	49,634	41,047	35,178	0	0	37,308
60 TO 64	29,433	31,713	33,975	37,052	42,108	43,516	46,952	52,636	39,960	46,118	0	37,553
65 & UP	54,324	30,091	35,634	38,286	38,929	48,146	36,403	51,624	47,801	46,501	49,470	38,334
TOTALS	33,635	33,026	34,628	37,954	40,215	42,660	45,563	44,736	44,263	46,453	49,470	37,086

ACTIVE MEMBERS
YEARS OF SERVICE

AGE	UNDER 5	5 TO 10	10 TO 15	15 TO 20	20 TO 25	25 TO 30	30 TO 35	35 TO 40	40 TO 45	45 TO 50	50 & UP	ALL YEARS
Under 20	2	0	0	0	0	0	0	0	0	0	0	2
20 TO 24	417	14	0	0	0	0	0	0	0	0	0	431
25 TO 29	1,048	309	1	0	0	0	0	0	0	0	0	1,358
30 TO 34	587	323	4	0	0	0	0	0	0	0	0	914
35 TO 39	322	195	11	1	0	0	0	0	0	0	0	529
40 TO 44	207	132	7	2	2	0	0	0	0	0	0	350
45 TO 49	124	83	3	3	2	1	0	0	0	0	0	216
50 TO 54	73	42	2	1	0	0	0	0	0	0	0	118
55 TO 59	38	19	1	0	0	0	0	0	0	0	0	58
60 TO 64	8	11	3	0	0	0	0	0	0	0	0	22
65 & UP	5	4	0	0	0	0	0	0	0	0	0	9
TOTALS	2,831	1,132	32	7	4	1	0	0	0	0	0	4,007

AVERAGE SALARIES

AGE	UNDER 5	5 TO 10	10 TO 15	15 TO 20	20 TO 25	25 TO 30	30 TO 35	35 TO 40	40 TO 45	45 TO 50	50 & UP	ALL YEARS
Under 20	24,068	0	0	0	0	0	0	0	0	0	0	24,068
20 TO 24	30,571	32,737	0	0	0	0	0	0	0	0	0	30,641
25 TO 29	33,898	39,369	25,560	0	0	0	0	0	0	0	0	35,137
30 TO 34	35,478	39,498	39,428	0	0	0	0	0	0	0	0	36,916
35 TO 39	35,432	40,700	34,150	41,859	0	0	0	0	0	0	0	37,359
40 TO 44	35,811	40,005	38,801	40,212	46,317	0	0	0	0	0	0	37,538
45 TO 49	34,601	39,933	29,687	40,494	55,131	45,970	0	0	0	0	0	36,906
50 TO 54	37,919	40,463	36,481	25,965	0	0	0	0	0	0	0	38,699
55 TO 59	38,055	43,979	38,163	0	0	0	0	0	0	0	0	39,997
60 TO 64	33,428	44,876	49,400	0	0	0	0	0	0	0	0	41,330
65 & UP	73,644	83,126	0	0	0	0	0	0	0	0	0	77,858
TOTALS	34,302	39,995	36,841	38,533	50,724	45,970	0	0	0	0	0	35,957

ACTIVE MEMBERS
YEARS OF SERVICE

AGE	UNDER 5	5 TO 10	10 TO 15	15 TO 20	20 TO 25	25 TO 30	30 TO 35	35 TO 40	40 TO 45	45 TO 50	50 & UP	ALL YEARS
Under 20	125	0	0	0	0	0	0	0	0	0	0	125
20 TO 24	1,738	231	0	0	0	0	0	0	0	0	0	1,969
25 TO 29	3,160	1,695	4	0	0	0	0	0	0	0	0	4,859
30 TO 34	2,549	1,922	26	1	0	0	0	0	0	0	0	4,498
35 TO 39	2,067	1,553	56	13	2	0	0	0	0	0	0	3,691
40 TO 44	1,743	1,408	61	47	39	1	0	0	0	0	0	3,299
45 TO 49	1,337	1,049	53	19	25	2	1	0	0	0	0	2,486
50 TO 54	772	705	32	14	17	1	0	0	0	0	0	1,541
55 TO 59	502	556	26	10	15	1	0	0	0	0	0	1,110
60 TO 64	285	358	19	2	6	2	0	1	0	0	0	673
65 & UP	119	199	26	3	2	0	0	1	0	0	0	350
TOTALS	14,397	9,676	303	109	106	7	1	2	0	0	0	24,601

AVERAGE SALARIES

AGE	UNDER 5	5 TO 10	10 TO 15	15 TO 20	20 TO 25	25 TO 30	30 TO 35	35 TO 40	40 TO 45	45 TO 50	50 & UP	ALL YEARS
Under 20	3,323	0	0	0	0	0	0	0	0	0	0	3,323
20 TO 24	17,579	21,081	0	0	0	0	0	0	0	0	0	17,990
25 TO 29	25,804	28,962	25,317	0	0	0	0	0	0	0	0	26,905
30 TO 34	26,713	31,826	28,484	18,264	0	0	0	0	0	0	0	28,906
35 TO 39	27,494	32,784	34,195	30,065	27,911	0	0	0	0	0	0	29,831
40 TO 44	27,360	33,465	34,707	47,570	43,074	46,832	0	0	0	0	0	30,581
45 TO 49	27,325	31,379	42,957	43,970	41,939	51,361	23,054	0	0	0	0	29,661
50 TO 54	27,527	30,578	31,923	45,395	48,156	5,031	0	0	0	0	0	29,389
55 TO 59	26,416	30,330	35,732	35,336	37,762	38,420	0	0	0	0	0	28,839
60 TO 64	26,524	28,497	30,048	38,466	33,225	40,584	0	31,244	0	0	0	27,817
65 & UP	19,132	25,478	33,523	39,516	17,959	0	0	3,742	0	0	0	23,933
TOTALS	25,422	30,981	34,798	42,795	41,552	39,167	23,054	17,493	0	0	0	27,874

Retirement Year	NUMBER OF RETIREES: Service Retirement	NUMBER OF RETIREES: Service Connected Disability	NUMBER OF RETIREES: Non-Service Connected Disability	NUMBER OF RETIREES: Hazardous Duty Retirement	NUMBER OF RETIREES: Other Retirement	AVERAGE BENEFIT: Service Retirement	AVERAGE BENEFIT: Service Connected Disability	AVERAGE BENEFIT: Non-Service Connected Disability	AVERAGE BENEFIT: Hazardous Duty Retirement	AVERAGE BENEFIT: Other Retirement
Pre-1960	137	14	35	13	74	6,751	4,600	4,773	7,691	6,286
1960	32	6	3	2	12	5,922	4,323	4,892	9,022	5,973
1961	41	2	5	4	8	7,074	6,723	5,246	8,195	6,100
1962	64	3	2	0	24	7,283	5,261	4,966	0	5,254
1963	71	8	10	0	22	7,702	5,805	5,640	0	6,685
1964	75	9	7	2	16	6,712	6,168	5,466	9,181	5,361
1965	67	2	5	2	23	7,498	4,962	6,230	8,911	4,956
1966	103	8	16	0	17	6,950	5,661	5,504	0	6,404
1967	110	4	17	0	21	6,519	4,187	6,801	0	5,642
1968	157	10	13	2	22	7,706	6,493	6,035	7,906	5,798
1969	245	12	20	2	36	7,931	6,783	7,209	10,011	7,333
1970	251	11	43	3	38	9,009	6,975	7,467	9,668	7,034
1971	392	15	55	6	34	9,799	7,848	7,240	12,504	8,443
1972	463	25	59	22	74	9,658	8,562	8,267	13,200	8,294
1973	545	27	57	21	57	10,085	10,368	8,459	14,80	6,317
1974	452	23	39	22	94	9,193	10,075	9,096	17,177	7,348
1975	727	44	60	18	70	9,651	9,779	8,227	18,329	7,582
1976	773	13	43	23	73	9,009	8,421	8,308	16,008	5,804
1977	623	11	25	12	71	8,596	6,879	7,341	15,137	6,885
1978	691	9	38	25	60	8,249	7,569	5,999	17,022	5,968
1979	1,329	11	36	40	86	8,741	9,143	6,699	17,283	6,051
1980	858	18	35	31	78	7,770	6,347	5,837	15,810	5,843
1981	704	21	31	52	41	8,595	7,306	5,928	15,625	7,990
1982	615	16	25	34	42	8,910	8,848	7,231	16,967	7,028
1983	631	15	37	42	72	10,333	9,459	8,460	18,086	8,014
1984	793	33	40	61	95	10,741	9,714	8,836	18,769	8,692
1985	899	35	36	68	117	11,560	9,623	10,431	20,013	9,074
1986	987	47	42	56	149	13,048	9,239	12,394	22,870	6,945
1987	960	36	45	79	180	13,893	10,830	9,048	22,695	8,378
1988	1,123	59	45	95	150	14,662	11,253	9,228	24,463	8,090
1989	3,210	59	42	256	257	14,434	13,690	10,676	25,968	11,208
1990	256	8	15	90	150	13,071	14,832	11,692	24,599	9,666
1991	303	1	11	60	79	16,805	22,080	18,621	27,498	11,435

Current Age	NUMBER OF RETIREES					AVERAGE BENEFIT				
	Service Retirement	Service Connected Disability	Non-Service Connected Disability	Hazardous Duty Retirement	Other Retirement	Service Retirement	Service Connected Disability	Non-Service Connected Disability	Hazardous Duty Retirement	Other Retirement
Less than 40	2	35	12	0	47	9,902	12,028	6,302	0	11,808
40 to 44	1	43	18	13	57	16,550	11,302	9,646	23,110	11,138
45 to 49	2	72	41	110	95	13,231	12,172	9,369	26,136	13,361
50 to 54	3	76	64	222	105	27,576	12,665	11,654	24,653	11,865
55 to 59	1,018	97	151	251	426	16,920	9,044	10,618	22,464	8,203
60 to 64	2,943	95	168	224	417	14,146	8,079	7,721	20,258	7,093
65 to 69	4,435	75	157	178	344	11,585	6,488	7,335	19,082	7,528
70 to 74	4,211	57	142	93	310	10,166	6,837	6,565	15,847	6,904
75 to 79	3,059	34	94	30	221	8,965	8,422	7,923	13,205	7,622
80 to 84	1,799	19	88	19	163	8,819	8,610	7,396	12,518	7,048
85 to 89	858	10	42	2	110	8,487	6,253	6,149	10,870	6,583
90 to 94	288	1	15	1	38	6,562	7,337	5,498	6,184	5,122
95 to 99	68	1	0	0	9	4,539	2,341	0	0	5,115
Final Totals	18,687	615	992	1,143	2,342	11,022	9,413	8,165	21,309	7,998

APPENDIX B

SUMMARY OF PLAN PROVISIONS

APPENDIX B

SUMMARY OF PLAN PROVISIONS

CONNECTICUT STATE EMPLOYEES RETIREMENT SYSTEM

Established September 1, 1939

Reflects Arbitrator's Award

1. **Membership**

Tier I [Sec. 5-160]: Each state employee appointed to classified service shall become a member on the first day of the pay period following permanent appointment.

Each officer elected by the people and each appointee of such officer exempt from classified service may elect to become a member, effective on the first day of the pay period following receipt of such election.

Each other state employee exempt from classified service shall become a member on the first day of the pay period following six months of employment.

Except as noted below employees hired prior to January 1, 1984 could elect (no later than January 2, 1984) to be covered under either Plan B or Plan C. Employees under contracts with Union Independent and CSEA unions hired prior to October 1, 1982 had until October 1, 1984 to make such election.

Tier II [Sec. 5-192e]: Tier II consists of employees first joining the retirement system on or after January 1, 1984 plus employees hired between July 1, 1982 and January 1, 1984 who elected Tier II. Each state employee becomes a member on the first day of employment.

2. **Normal Retirement Eligibility**

Tier I - Hazardous Duty [Sec. 5-173]: 20 years of service.

Tier I - Plans B and C [Sec. 5-162]: Age 55 and 25 years of service, age 60 and 10 years of service, or age 70.

Tier II [Sec. 5-192l]: Age 62 and 10 years of service (effective 7/1/92) or age 60 and 25 years of service or age 70 and 5 years of service, except hazardous duty members may retire after 20 years.

3. Normal Retirement Benefit

Tier I - Hazardous Duty [Sec. 5-173]: 50% of Final Average Earnings plus 2% for each year in excess of 20.

Tier I Plan B [Sec. 5-162]: Same as Plan C up to age 65; thereafter 1% of Final Average Earnings up to $4,800 plus 2% of Final Average Earnings in excess of $4,800 times years, reduced for retirement prior to age 65 with less than 25 years. Minimum benefit with 25 years, $300 per month.

Tier I Plan C [Sec. 5-162]: 2% of Final Average Earnings times years of service, reduced for retirement prior to age 65 with less than 25 years. Minimum with 25 years, $300 per month.

Tier II Hazardous Duty Members [Sec. 5-192n]: 2½% of Final Average Earnings times up to 20 years of service plus 2% of Final Average Earnings times years of service in excess of 20 years, if any. Minimum with 25 years, $300 per month (or less if retirement before 7-1-87).

Tier II All Other [Sec. 5-192l]: 1 1/3% of Final Average Earnings plus ½% of Final Average Earnings in excess of the year's breakpoint*, times up to 35 years of service from 10-1-82 plus 1 5/8% of Final Average Earnings times years of service in excess of 35 years, if any. Minimum with 25 years, $300 per month (or less if retirement before 7-1-87).

* $10,700 increased by 6% each year after 1982, rounded to the nearest $100, but not greater than Social Security Covered Compensation.

4. Early Retirement

Tier I - Hazardous Duty: None.

Tier I [Sec. 5-162]: Age 55 and 10 years of service; Normal Retirement Benefit reduced actuarially for retirement prior to age 60.

Tier II [Sec. 5-192m]: Age 55 and 10 years of service; Normal Retirement Benefit reduced ¼% (effective 7/1/91) for each month prior to age 65; Minimum benefit with 25 years, $300 per month (or less if retirement prior to 7-1-87).

5. **Deferred Retirement**

Tier I [Sec. 5-162]: May be deferred but not beyond age 70.

Tier II [Sec. 5-192l]: May be deferred but not beyond age 70. Benefit is based on salary and service to actual retirement.

6. **Vesting**

Tier I [Sec. 5-166]: Ten years of service; actuarially reduced benefit payable at age 55; in addition employees are always fully vested in their own contributions (after 1-1-83, Tier I, contributions with 5% interest from 1-1-82).

Tier I - Hazardous Duty [Sec. 5-173(f)]: As above.

Tier II [Sec. 5-192o]: Ten years of service or age 70 and 5 years; benefit payable at Normal Retirement Age or early retirement benefit payable at age 55; minimum benefit with 25 years, payable after age 55, $300 per month (or less if retirement before 7-1-87).

7. **Member Contributions**

Tier I - Hazardous Duty [Sec. 5-161]: 4% of earnings up to Social Security Taxable Wage Base plus 5% above that level.

Tier I - Plan B [Sec. 5-161]: 2% of earnings up to Social Security Taxable Wage Base plus 5% above that level.

Tier I - Plan C [Sec. 5-161]: 5% of earnings.

Tier II - All Other [Sec. 5-192u]: None.

Tier II - Hazardous Duty [Sec. 5-192u]: 4% of earnings

8. Cost of Living

[Sec. 5-162b, 5-162d]: Annual adjustment each July 1 of up to 5% for retirements prior to 7-1-80; 3% for retirements after 7-1-80. For members (or beneficiaries) not covered by Social Security and age 62 and over, the maximum increase is 6%. If an actuarial surplus (as defined in the law) exists, the Commission may further increase retired benefits.

9. Death Benefits

Tier I - State Police [Sec. 5-146]: Survivor benefits to spouse of $670 per month plus $300 to a surviving dependent child (or $700 to surviving dependent children).

Tier I [Sec. 5-165a]: If eligible for early or normal retirement, spouse benefit equal to 50% of average of Life Benefit and 50% J&S benefit member would have received. If not eligible to retire but 25 years, same benefit calculated as though age 55 using service and earnings at death.

[Sec. 5-168]: If not eligible for retirement, return of contributions (after 10-1-82, Tier I, with interest from 1-1-82 at 5%).

Tier II [Sec. 5-192r]: If eligible for early or normal retirement, spouse benefit equal to 50% of member's benefit under a 50% J&S. If not eligible to retire but 25 years, same benefit calculated as though age 55 using service and earnings at death.

[Sec. 5-192t]: If death is due to employment, a spouse with dependent children under 18 will be paid $7,500 in not less than 60 installments while living and not remarried; also $20 per month per child under 18. If no children under 18, spouse [or dependent parent(s), if no spouse] will be paid $4,000 in not less than 60 installments.

10. Disability Benefits

Tier I [Sec. 5-142, 5-169, 5-173]: For non-service disabilities occurring prior to age 60 and after 5 years of service, benefit equals 3% times base salary times years of service (Maximum 1 2/3% times service to 65). If disability occurs prior to age 60 and is due to service, benefit equals 1 2/3% of salary times service projected to 65 (maximum 30 years) and is payable regardless of length of service. Exception: State Police benefit is accrued benefit if more than 20 years of service. State Police receive an additional benefit of $360 per month plus $300 to spouse plus $300 to a surviving dependent child (or $700 to surviving dependent children).

Maximum disability benefit is lesser of: 100% of salary less Workers Compensation and Social Security and less non-rehabilitation earnings, or 80% of salary less Workers Compensation and Social Security. Social Security is primary plus family.

Tier II [5-192p]: Prior to age 65 and due to service or after 10 years of service, benefit is 1 1/3% of final average earnings, plus ½% of excess earnings times service projected to 65 (maximum 30 years of service to Date of Disability if greater than 30 years). Same maximum as Tier I.

Minimum disability benefit including Workers Compensation and Social Security is 60% of salary.

11. Optional Forms of Payment

Tier I [Sec. 5-165]: 50% Qualified Joint and Survivor (Normal Form if married at least 12 months).

Tier II [Sec. 5-192q]: 50% or 100% Joint and Survivor (Normal Form if married at least 12 months). Ten years certain and life. Twenty years certain and life. Life (Normal Form if not married at least 12 months).

12. Part-Time Employment

[Sec. 5-162g & Sec. 5-192k]: Service treated as if full-time for eligibility. If consistent part-time for all periods, treat as full-time. If varying schedule or some part-time, some full-time, service and salary proportionately adjusted.

APPENDIX C

ACTUARIAL METHOD AND ASSUMPTIONS

APPENDIX C

ACTUARIAL METHOD AND ASSUMPTIONS

A. Funding Method

1. The actuarial valuation method used is the Projected Unit Credit Cost Method. Recommended annual contributions until the accrued liability is completely funded will consist of two pieces: Normal Cost plus a payment towards the Unfunded Accrued Liability.

    a. The Accrued Liability is determined directly as the present value of benefits accrued to date, where the accrued benefits for each Member is the pro-rata portion (based on service to date) of the projected benefit payable at death, disability, retirement or termination.

    b. The Normal Cost is then similarly determined as the present value of the portion of the projected benefit attributable to the current year.

2. The Unfunded Accrued Liability is the Accrued Liability less Current Assets.

3. Since the valuation was done as of June 30, 1991, costs have been projected to July 1, 1992 in order to correspond to the fiscal year as follows:

    a. Normal Costs were determined as a percentage of earnings, by Tier, as of July 1, 1991. Earnings were projected to July 1, 1992, separately for each Tier because of the shifting Tier populations, and the projected earnings were then multiplied by each Tier's normal cost factor.

    b. The Unfunded Accrued Liability was determined as of June 30, 1991, and brought forward to June 30, 1992 by adding the Normal Cost plus interest and subtracting expected employee, State, and Federal contributions, also with interest. This amount was amortized over the 30 years specified in the Arbitrator's Award.

    c. Normal Cost and Past Service Amortization payments were adjusted to reflect payment in twelve equal installments at the end of each month.

B. Actuarial Assumptions

Mortality: 1983 Group Annuity Mortality Table with ages set back 4 years for females.

Service connected deaths are assumed to comprise 20% of total Death for Hazardous Duty employees and 0% for all other employees.

Investment Return: 8½%. According to Memorandum of Understanding between the State of Connecticut and the State Employees Bargaining Agent Coalition (SEBAC). See Page C-5 of this Appendix.

Salary Scale:

Age	Annual Rate of Increase
20	10.2%
25	9.2
30	8.1
35	7.1
40	6.5
45	6.0
50	6.0
55	6.0
60	6.0

Disability:

Age	Annual Rate of Disability (Per 1000 lives)
20	0.75
25	0.85
30	0.97
35	1.21
40	1.70
45	2.79
50	5.09
55	9.25
60	14.42

Service connected disabilities are assumed to comprise 50% of total Disability for Hazardous Duty employees and 20% for all other employees.

B. Actuarial Assumptions (cont'd)

Social Security Wage Base Increases: 6½% compounded annually.

Retirement Ages:

Hazardous Duty:

Age	First Year Eligible	Thereafter
47-50	50%	10%
51	48	10
52	46	10
53	44	10
54	42	10
55	40	10
56	38	10
57	36	10
58	34	10
59	30	10
60	50	30
61	50	30
62-70	100	100

All Others:

Age	First Year Eligible	Thereafter
55-60	20%	5%
61	40	5
62	40	30
63	40	30
64	60	30
65	80	60
66	80	60
67	80	60
68	80	60
69	80	60
70	100	100

B. Actuarial Assumptions (cont'd)

Turnover: Five year select and ultimate rates as shown in the Turnover Table below for non-hazardous duty males; the same table with rates increased 10% for females; the same table with rates reduced 50% for hazardous duty.

Turnover Table
Years of Participation

Age	0	1	2	3	4	5 & Over
20	50%	45%	30%	25%	20%	15%
25	45	35	30	25	20	10
30	40	30	25	20	15	8
35	35	28	20	15	10	6
40	30	20	10	8	6	4
45	20	10	8	6	4	2
50	10	8	6	4	2	0
55	10	7	5	2	0	0
60	10	0	0	0	0	0

Cost of Living Increases: 3% per year for retirees on or after 1-1-80.
4½% per year for retirees prior to 1-1-80.

Asset Valuation: Adjusted market value: assets are written up (or down) by spreading recognition of gains and losses over five years, plus an additional write-up (or write-down) as necessary so that the final adjusted value is within 20% of market value.

C. Memorandum of Understanding

The Memorandum of Understanding sets forth the procedure to be used to determine the interest rate assumption for the June 30, 1990 through June 30, 1992 valuations:

	9 Year Average of Actual Rates of Return		Rate of Return for FY ending on Valuation Date		Interest Rate Assumption
If	at least 13.5%	and	at least 13.5%	then use	9.5%
If	between 13.0% and 13.5%	and	between 13.0% and 13.5%	then use	9.0%
If	less than 13.0%	and	less than 13.0%	then use	8.5%

For the June 30, 1991 valuation, this leads to the following result:

9 Year Average of Actual Rates of Return	Rate of Return for FY ending on June 30, 1991	Interest Rate Assumption
13.5%	3.9%	8.5%

Supporting Data

Fiscal Year End	Rate of Return*
1983	31.3
1984	3.3
1985	21.6
1986	21.6
1987	10.9
1988	3.2
1989	15.0
1990	10.3
1991	3.9
Average	13.5%

* Provided by the Office of the Treasurer and used by us without audit.

APPENDIX D

ACTUARIAL SURPLUS TEST
AS OF JUNE 30, 1990

APPENDIX D

ACTUARIAL SURPLUS TEST AS OF JUNE 30, 1991

Section 5-162h(b) of the General Statutes of Connecticut provides that the Retirement Commission may grant additional cost of living adjustments for retired employees if an actuarial surplus exists. An actuarial surplus is deemed to exist if three criteria are met:

I. **Investment Income**: actual rate of return for the Fiscal Year ending June 30, 1991 must exceed the actuarial assumption of 8.5%.

A.	Market Value of Assets July 1, 1990	$3,212,798,521
B.	Market Value of Assets June 30, 1991	3,351,681,110
I.	Investment Income for FY 90-91	125,354,354

$$\text{Actual Rate of Return for FY90-91} = \frac{2I}{A+B-I} = 3.89\%$$

Actual Rate of Return of 3.89% is less than the assumption of 8.5%, so first criteria is not met and there is no actuarial surplus. We are showing criteria II and III for informational purposes.

II. **Assets Versus Liabilities**: Market value of assets must exceed 50% of specified liabilities.

A.	Market Value of Assets June 30, 1991	$3,351,681,110
B.	Specified Liabilities June 30, 1991	
	Liability for Retired Members	$2,780,344,628
	Liability for Terminated Vested Members	15,545,866
	Active Member Contributions	245,035,085
	Interest on Active Member Contributions	57,905,640
	Total	$3,098,831,219
C.	50% of Specified Liabilities	$1,549,415,610

Market Value of Assets exceeds 50% of Specified Liabilities, so second criteria is met.

III. **Unfunded Liability:** actual unfunded liability must be less than the projected unfunded liability five years from determination date.

A.	Actual Unfunded Liability June 30, 1991	$2,774,729,139
B.	Projected Unfunded Liability June 30, 1996	1,850,320,000

Actual Unfunded Liability exceeds Projected Unfunded Liability so third criteria is not met.

Projection of Unfunded Liability

Section 5-162-h(b)(2) of the General Statutes of Connecticut specifies the means of calculating the Projected Unfunded Liability used in the third criteria of the Actuarial Surplus Test. The Projection reflects the actual unfunded liability as of December 31, 1983 adjusted for changes in actuarial assumptions and cost methods through the determination date. The following Projection reflects the following changes: data correction (June 30, 1987), change in actuarial assumptions (June 30, 1987), change in actuarial cost method (June 30, 1988), change in actuarial assumptions - interest rate only (June 30, 1989), change in actuarial cost method -amortization period only (June 30, 1992).

Year	(000) June 30 Unfunded Liability	Year	(000) June 30 Unfunded Liability	Year	(000) June 30 Unfunded Liability
1984	2,155,459	1999	1,780,421	2014	1,007,747
1985	2,201,605	2000	1,753,053	2015	914,701
1986	2,206,090	2001	1,723,359	2016	813,746
1987	2,524,556	2002	1,691,140	2017	704,209
1988	1,954,257	2003	1,656,182	2018	585,363
1989	1,432,333	2004	1,618,254	2019	456,415
1990	1,939,758	2005	1,577,101	2020	316,505
1991	1,930,524	2006	1,532,450	2021	164,704
1992	1,920,505	2007	1,484,003	2022	0
1993	1,905,044	2008	1,431,439		
1994	1,888,269	2009	1,374,407		
1995	1,870,068	2010	1,312,528		
1996	1,850,320	2011	1,245,388		
1997	1,828,893	2012	1,172,542		
1998	1,805,645	2013	1,093,503		

APPENDIX E

ENTRY AGE NORMAL
VALUATION RESULTS

APPENDIX E

ENTRY AGE NORMAL VALUATION RESULTS

		JUNE 30, 1991	JUNE 30, 1990
A. Current Results			
1.	Present Value of Future Benefits		
	- Active Members	$5,750,739,368	$5,469,590,164
	- Retired and Beneficiaries	2,780,344,628	2,645,802,734
	- Deferred Vested Members	15,545,866	11,567,708
	- Total Present Value	8,546,629,862	8,126,960,606
2.	Present Value Future Normal Cost Contributions	1,830,769,756	1,758,094,970
3.	Total Actuarial Liability: (1)-(2)	6,715,860,106	6,368,865,636
4.	Actuarial Value of Assets	3,207,958,056	2,972,748,082
5.	Unfunded Actuarial Liability: (3)-(4)	3,507,902,050	3,396,117,554
6.	Total Normal Cost	179,732,531	174,371,501
7.	Expected Employee Contributions	32,243,520	31,729,498
8.	Employer Normal Cost: (6)-(7)	147,489,011	142,642,003
B. Projections to Following Year			
1.	Employer Normal Cost	$ 168,125,314	$ 162,657,469
2.	Unfunded Actuarial Liability	3,471,293,420	3,536,356,917
3.	Total Cost*	479,190,962	469,809,296
4.	Total Cost as a Percent of Pay	22.46%	23.91%

* The values above reflect the Arbitrator's Award, but do not reflect the Early Retirement Incentives