

REPORT ON
ACTUARIAL VALUATION
MINNESOTA STATE RETIREMENT SYSTEM
JUNE 30, 1973

November 9, 1973



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COATES AND CRAWFORD

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November 9, 1973

Board of Directors
Minnesota State Retirement System
529 Jackson Street
St. Paul, Minnesota 55101

Gentlemen:

We are pleased to transmit herewith our report on the actuarial valuation of your Retirement System made as of June 30, 1973.

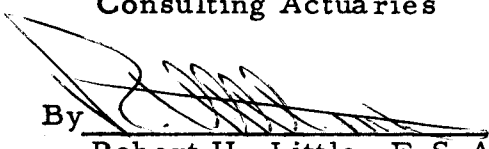
Pursuant to the Contract under which this valuation was authorized, the actuarial valuation was carried out on the basis of a 5% interest rate assumption, a 3-1/2% salary scale, and on the basis of certain other specified actuarial assumptions. Also, in accordance with the above noted contract, we utilized the entry age normal cost method of funding to determine the unfunded accrued liability of the System.

We hereby certify that the actuarial valuation of the Minnesota State Retirement System made as of June 30, 1973 was carried out on the basis of accepted actuarial methods and procedures and in accordance with the provisions of Minnesota Statutes 1971, Chapter 356. The results of that valuation indicate that the contributions required from the employees and from the State under Minnesota Statutes 1971, Chapter 352, as amended by Laws 1973 are adequate to provide the benefits that will be paid from the System.

We look forward to the opportunity of discussing this report with you at your convenience.

Very truly yours,

COATES AND CRAWFORD
Consulting Actuaries

By 

Robert H. Little, F.S.A.

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REPORT ON
ACTUARIAL VALUATION
OF THE
MINNESOTA STATE RETIREMENT SYSTEM
AS OF
JUNE 30, 1973

SECTION I
INTRODUCTION

In accordance with the Contract between the State of Minnesota and this firm, we have completed the actuarial valuation of the Minnesota State Retirement System as of June 30, 1973.

The Executive Director of the System furnished us with detailed employee information on all active members, inactive members and retired members of the System as of June 30, 1973. The Executive Director and his staff are to be complimented on the accuracy and completeness of the aforementioned data.

The Executive Director also furnished us with a Financial Report setting forth the assets and liabilities of the Fund as of June 30, 1973. No

physical audit of these assets was made by us and our calculations are based upon the Financial Report as submitted.

This valuation is based on the System as it was constituted on July 1, 1973 and reflects the major amendments which became effective on that date including the following:

1. Special service retirement benefits and contributions for certain "Correctional Employees". There are 677 such employees.
2. Increased service retirement benefits and contributions for "General Employees".
3. Increased allowances to persons receiving benefits from the MAFB Fund including the increase that will become payable January 1, 1974.

The following Section II sets forth the results of the actuarial valuation and Section III contains the exhibits required by Chapter 356 of the Statutes. The schedules attached at the end of the report show the actuarial assumptions used in the current valuation which were developed during the course of the actuarial investigation carried out as of June 30, 1971.

SECTION II

RESULTS OF ACTUARIAL VALUATION

The Contract under which this valuation was authorized specifies that the actuarial valuation be carried out on the basis of a 5% interest rate assumption, a 3-1/2% salary scale, the 1951 Group Annuity Mortality Table with ages set back one year for Male retirees and set back two years for Female retirees, and upon other actuarial assumptions developed during the course of the actuarial investigation carried out as of June 30, 1971. We modified the assumptions to reflect compulsory retirement age 65 for General Employees and we assumed Correctional Employees will retire upon attaining age 55. We were also instructed to carry out the actuarial valuation on the basis of an entry age normal cost method of funding. The current valuation was carried out in accordance with the stipulations contained in the aforementioned Contract. Also, we reflected the 6% average salary increase that became effective July 11, 1973.

The entry age normal cost method of funding requires the determination of the level contribution rate which, if contributed on behalf of all new employees from the dates of employment to the dates of separation from service, will be adequate to provide all of their benefits. Under this funding method, the unfunded accrued liability is taken as the total liability of the System for benefits earned in the past as well as those earnable in the future, less the assets on hand, less the present value of future employee

contributions and less the present value of future State entry age normal cost contributions.

In order to develop the entry age normal cost contribution rate for new General Employees, we carried out a complete valuation of active members as of June 30, 1973 who were employed during the preceding four and one-half year period. The results of these calculations indicate that the total entry age normal cost rate under the new scale of benefits for General Employees amounts to 6.85% of salary. General Employees are required by law to contribute 4% and, accordingly, the State's share of the entry age normal cost contribution rate for General Employees amounts to 2.85%.

On the assumption that new male Correctional Employees will be employed at age 30 and that new female Correctional Employees will be employed at age 34, we calculated the total entry age normal cost rate for Correctional Employees to be 11.92% of salary. Correctional Employees are required by law to contribute 6% and, accordingly, the State's share of the entry age normal cost contribution for Correctional Employees amounts to 5.92%.

The law requires that the State make the following contributions to the Fund:

- (1) A "matching" contribution equal to 4% of General Employees' salaries and 9% of Correctional Employees' salaries.
- (2) An "additional" contribution equal to 2% of General Employees' salaries and 5% of Correctional Employees' salaries.

We have been advised that it is the intent of the Minnesota Legislature to pay the "additional" contributions referred to above for a limited time only.

We assigned the State Contribution Reserve to Correctional and General Employees in proportion to their accumulated contributions as follows:

	<u>State Contribution Reserve</u>
General Employees	\$88,415,080.93
Correctional Employees	<u>2,080,214.35</u>
Total	\$90,495,295.28

The Accounting Balance Sheet shown on the following page was furnished by the Executive Director.

The Actuarial Balance Sheet shown on the page following the Accounting Balance Sheet summarizes the results of the valuation. In the current valuation we have made provision for administrative expenses amounting to .19% of salaries.

MINNESOTA STATE RETIREMENT SYSTEM

ACCOUNTING BALANCE SHEET
AS OF
JUNE 30, 1973

ASSETS

Cash in office	\$ 25.00
Deposits in banks	236,944.11
Short term investments (at cost)	6,555,099.19
Accounts receivable:	
a) Accrued employee contributions	370,151.21
b) Accrued employer contributions	494,088.74
c) Employee back payments	170,079.35
d) Investment maturities and sales	339,826.84
e) Other	7,980.74
Accrued interest in investments	1,203,458.84
Dividends declared and payable, but not yet received	9,732.71
Investment in debt securities at amortized cost	68,725,299.66
Investment in equities at cost	61,565,762.27
Recognized unrealized appreciation in equities	1,674,284.00
Equipment at depreciated cost	7,504.30
Prepaid postage	.00
Deferred yield adjustment account	1,610,262.17
Annuity stabilization account	.00
Participation in the MAFB Fund	61,723,910.42
Total Assets	<u>\$204,694,409.55</u>

LIABILITIES AND RESERVES

LIABILITIES

Accounts payable:	
a) Due to MAFB Fund	\$.00
b) Security purchases	399,740.40
c) Annuities	1,445.66
d) Survivor benefits	2,478.97
e) Annuitant deposits	5,421.43
f) Accrued expenses	32,214.69
g) Overpaid dividends and prepaid postage	1,452.50
h) Transfer to unclassified employee retirement	16,648.82
Suspense item - Unredeemed 6 Year Old Warrants	4,013.74
Total Liabilities	<u>\$ 463,416.21</u>

RESERVES

Employee contribution reserve	\$ 51,746,932.64
Survivor Benefit Reserve	264,855.00
Reserve for participation in MAFB Fund	61,723,910.42
Annuity Stabilization Reserve	.00
State Contribution Reserve	90,495,295.28
Total Reserves	<u>\$204,230,993.34</u>
Total Liabilities and Reserves	<u>\$204,694,409.55</u>

MINNESOTA STATE RETIREMENT SYSTEM

ACTUARIAL BALANCE SHEET
AS OF
JUNE 30, 1973

ASSETS

1. Assets on Hand from Accounting Balance Sheet:		
a) Participation in MAFB Fund	\$ 61,723,910.42	
b) All other assets	<u>142,970,499.13</u>	\$204,694,409.55
2. Present Value of Employees' Future Contributions		101,867,608.00
3. Present Value of State Future Contributions Applicable to:		
a) Entry Age Normal Cost	\$ 73,156,594.00	
b) Unfunded Accrued Liability (Balance of "Matching" Contribution less .19% for Operating Expenses)	<u>24,955,878.00</u>	
c) Unfunded Accrued Liability (Portion to be funded by "Additional" Contribution)	<u>134,097,588.66</u>	<u>232,210,060.66</u>
4. TOTAL ASSETS		<u><u>\$538,772,078.21</u></u>

LIABILITIES

5. Current Liabilities from Accounting Balance Sheet		\$ 463,416.21
6. Present Value of Earned and Earnable Benefits Payable to Presently Active Members:		
a) Retirement Benefits	\$389,824,609.00	
b) Disability Benefits	19,860,054.00	
c) Refundments due to death or withdrawal	52,580,903.00	
d) Surviving Spouse Benefits	<u>10,202,873.00</u>	472,468,439.00
7. Present Value of Benefits for Deferred Annuitants:		
a) Retirement Benefits	\$ 2,310,752.00	
b) Refundments due to death or withdrawal	123,690.00	
c) Benefits already authorized	<u>1,360.00</u>	2,435,802.00
8. Present Value of Refundments to former members without vested rights		273,614.00
9. Present Value of Benefits Payable from MAFB Fund		62,865,952.00
10. Present Value of Survivor Benefits		<u>264,855.00</u>
11. TOTAL LIABILITIES		<u><u>\$538,772,078.21</u></u>

The Actuarial Balance Sheet is a convenient device to present the results of an actuarial valuation. The following comments are intended to assist you in your understanding of the items contained in the Actuarial Balance Sheet.

Item 1 shows the assets on hand and was taken directly from the Accounting Balance Sheet.

Item 2 shows the present value of members' future contributions required by law.

Item 3 shows the present value of the State's future contributions to the System. We have divided the present value applicable to the State's contributions as follows:

Item 3(a) The portion attributable to the State's share of the total entry age normal cost contribution of 2.85% of General Employees' salaries and 5.92% of Correctional Employees' salaries.

Item 3(b) The portion attributable to the balance of the State's "matching" contribution less .19% which is allocated for operating expenses. This amounts to .96% of General Employees' salaries and 2.89% of Correctional Employees' salaries.

Item 3(c) The portion attributable to the State's "additional" contribution. The following table shows the required information for Correctional Employees and for General Employees:

	<u>Correctional Employees</u>	<u>General Employees</u>	<u>Total</u>
1. Annualized Salaries July 1, 1973	\$6,426,050	\$315,073,566	\$321,499,616
2. State "Additional" con- tribution rate	5%	2%	
3. Annual State "Additional" contribution	321,303	6,301,471	6,622,774
4. Item 3(c) Actuarial Balance Sheet	6,305,547.01	127,792,041.65	134,097,588.66
5. Years (to nearest year) re- quired to amortize Item 3(c) of Actuarial Balance Sheet by "Additional" State Con- tributions which increase in accordance with salary scale	23	24	24
6. First year annual contribu- tion with subsequent salary scale increases required to amortize Item 3(c) of Act- uarial Balance Sheet over Period Ending June 30, 1997	312,461	6,332,529	6,644,990
7. Total Unfunded Accrued Liability (Item 3(b) plus Item 3(c) of Actuarial Balance Sheet)	\$7,313,186.01	\$151,740,280.65	\$159,053,466.66

Item 5 shows the current liabilities and was taken directly from the Accounting Balance Sheet.

Item 6 shows the actuarially computed present value of all benefits earned to June 30, 1973 and earnable after that date that will be paid from the System to presently active members.

Item 7 shows the actuarially computed present value of all benefits payable from the System to members who have terminated service with vested benefits.

Item 8 shows the actuarially computed present value of refundments that will be paid from the System to members who have terminated service without vested benefits.

The total of \$62,865,952.00 shown for Item 9 represents the value of benefits payable from the MAFB to MSRS retirees and reflects the increases to become effective July 1, 1973 and January 1, 1974.

CONCLUSIONS

In a retirement system such as yours where both the benefits and contributions are specified in the Retirement Law, the major purpose of an actuarial valuation is to determine whether or not the prescribed contributions are adequate to provide the benefits that will ultimately be paid under the system. The results of the current valuation show that the benefits to be provided under the System can be financed by the members' contributions and the State's "matching" contributions plus the State's "additional" contribution for approximately twenty-four years.

SECTION III

REQUIRED EXHIBITS

Minnesota Statutes 1971, Chapter 356, requires, in Section 356.20, Subdivision 4(1), that the actuary of the System prepare an exhibit setting forth certain specified information with regard to the System as of the valuation date, including "Reserves Required" under the System. In an earlier conference with representatives of the State's Employee Retirement System's Interim Commission, we were advised that "Reserve Required", as contemplated in the aforementioned statute, may be defined as the actuarially computed present value applicable to a specified benefit reduced by the actuarially computed present value of any portion of the total entry age normal cost contribution under the System which is applicable to the specified benefit.

The exhibit required by Section 356.20, Subdivision 4(1) of Minnesota Statutes 1971, Chapter 356, is presented on the following pages of this Section III and we hereby certify that the Reserves Required set forth therein have been computed in accordance with the Entry Age Normal Cost (level Normal Cost) basis in the manner outlined in the definition referred to above.

MINNESOTA STATE RETIREMENT SYSTEM

EXHIBIT REQUIRED BY MINNESOTA STATUTES 1971, CHAPTER 356,
SECTION 356.20, SUBDIVISION 4(1)
AS OF JUNE 30, 1973

ASSETS AND UNFUNDED ACCRUED LIABILITY

Assets

1. Cash in office	\$ 25.00
2. Deposits in banks	236,944.11
3. Short term investments (at cost)	6,555,099.19
4. Accounts receivable:	
a) Accrued employee contributions	370,151.21
b) Accrued employer contributions	494,088.74
c) Employee back payments	170,079.35
d) Investment maturities and sales	339,826.84
e) Other	7,980.74
5. Accrued interest in investments	1,203,458.84
6. Dividends declared and payable, but not yet received	9,732.71
7. Investment in debt securities at amortized cost	68,725,299.66
8. Investment in equities at cost	61,565,762.27
9. Recognized unrealized appreciation in equities	1,674,284.00
10. Equipment at depreciated cost	7,504.30
11. Prepaid postage	.00
12. Deferred yield adjustment account	1,610,262.17
13. Annuity stabilization account	.00
14. Participation in the MAFB Fund	61,723,910.42
15. Total Assets	<u>\$204,694,409.55</u>

Unfunded Accrued Liability

16. Unfunded Accrued Liability to be funded by portion of State's "Matching Contribution" in excess of State's share of entry age normal cost contribution and Operating Expenses	\$ 24,955,878.00
17. Unfunded Accrued Liability to be funded by State's "Additional" contribution	134,097,588.66
18. Total Unfunded Accrued Liability	<u>\$159,053,466.66</u>
19. TOTAL ASSETS AND UNFUNDED ACCRUED LIABILITY	<u>\$363,747,876.21</u>

CURRENT LIABILITIES AND RESERVES REQUIRED

Current Liabilities

20. Accounts payable:	
a) Due to MAFB Fund	\$.00
b) Security purchases	399,740.40
c) Annuities	1,445.66
d) Survivor benefits	2,478.97
e) Annuitant deposits	5,421.43
f) Accrued expenses	32,214.69
g) Overpaid dividends and prepaid postage	1,452.50
h) Transfer to unclassified employee retirement	16,648.82
21. Suspense item - Unredeemed 6 year old Warrants	4,013.74
22. Total Current Liabilities	\$ 463,416.21

Reserves Required

23. Total Reserves Required per attached schedule	\$363,284,460.00
24. TOTAL CURRENT LIABILITIES AND RESERVES REQUIRED	<u>\$363,747,876.21</u>

Note: Accumulated contributions, without interest, of members not yet retired amounted to \$51,746,932.64 as of June 30, 1973.

MINNESOTA STATE RETIREMENT SYSTEM

DETERMINATION OF RESERVES REQUIRED
AS OF
JUNE 30, 1973

	(1)	(2)	(3)
		Present Value of Applicable Portion of Normal Cost Contribution	Reserves Required (1) - (2)
<u>Benefits For:</u>	<u>Present Value of Benefits</u>		
1. Active Members:			
a) Retirement Benefits	\$389,824,609.00	\$105,538,979.00	\$284,285,630.00
b) Disability Benefits	19,860,054.00	10,285,633.00	9,574,421.00
c) Refundments due to death or withdrawal	52,580,903.00	53,961,824.00	(1,380,921.00)
d) Surviving Spouse Benefits	10,202,873.00	5,237,766.00	4,965,107.00
2. Deferred Annuitants	2,435,802.00	-	2,435,802.00
3. Former Members Without Vested Rights	273,614.00	-	273,614.00
4. Survivors	264,855.00	-	264,855.00
5. Benefits Payable from MAFB Fund	<u>62,865,952.00</u>	<u>-</u>	<u>62,865,952.00</u>
6. Total	\$538,308,662.00	\$175,024,202.00	\$363,284,460.00

Minnesota Statutes 1971, Chapter 356, requires, in Section 356.20, Subdivision 4(2) and (3), that there be submitted annually an analysis of the System's income and deductions from income with increases in total reserves required being specifically referred to as a deduction from income. The exhibit required by Section 356.20, Subdivision 4(2) and (3) is presented on the following page of this Section III. Items of income and deductions from income with the exception of increases in total reserves required were taken directly from statements prepared by the Executive Director.

Inasmuch as any excess of "income" over "deductions from income" must be equal to the reduction in the Unfunded Accrued Liability of the System over the period covered by the analysis, we have confirmed that fact in Item 13 of the exhibit.

MINNESOTA STATE RETIREMENT SYSTEM

EXHIBIT REQUIRED BY MINNESOTA STATUTES 1971, CHAPTER 356,
SECTION 356.20, SUBDIVISION 4(2) and (3)
FISCAL YEAR ENDING JUNE 30, 1973

ANALYSIS OF INCOME AND DEDUCTIONS FROM INCOME

INCOME

1.	<u>From Employees</u>	
	Employee contributions	\$ 8,255,648.20
	Employee accrued contributions receivable	370,231.21
	Employee contributions, accounts receivable	96,144.70
2.	<u>From Employers</u>	
	Employer contributions	8,270,668.39
	Employer additional contributions	2,830,535.63
	Employer accrued contributions receivable	494,088.74
3.	<u>From Investments</u>	
	Interest on debt securities and short term investments	4,261,773.86
	Dividends on corporate stock	1,784,914.15
	Income from recognition of unrealized appreciation in stock	1,674,284.00
	Premium on bonds called	5,416.30
	Participation in MAFB Fund income	7,031,648.22
4.	<u>Other Revenues</u>	
	Interest on back payments by employees	74,385.24
	Employer contributions from unclassified employee retirement	9,331.51
	Administrative cost assessment, deferred compensation plan	10,233.68
	Miscellaneous revenues	723.32
	Gain on sales of stock	108,313.79
5.	<u>TOTAL INCOME</u>	<u>\$35,278,340.94</u>

DEDUCTIONS FROM INCOME

6.	<u>Benefits</u>	
	Service retirement benefits	\$ 5,872,321.98
	Disability retirement benefits	222,040.82
	Survivor benefits (spouses)	28,967.64
	Interest paid - deceased employees	64,630.53
	Interest paid - compulsory retirees	2,912.00
7.	<u>Refundments</u>	
	Left service	2,136,792.61
	Left coverage	72,386.87
	Employee deaths	198,690.20
	Annuitant deaths	53,639.68
	Erroneous deductions	8,205.36
8.	<u>Unclassified Employee Retirement Account</u>	
	Transfer of employee contributions	73,465.22
	Transfer of employer contributions	73,465.22
	Transfer of interest on initial assets	.00
9.	<u>Operating Expenses</u>	451,726.78
10.	<u>Increase in Total Reserves Required</u>	
	Reserves Required 6-30-72	\$197,163,140.21
	Reserves Required 6-30-73	363,284,460.00
11.	<u>TOTAL DEDUCTIONS FROM INCOME</u>	<u>\$175,380,564.70</u>
12.	<u>EXCESS OF INCOME OVER DEDUCTIONS FROM INCOME</u>	<u>(140,102,223.76)</u>
13.	<u>REDUCTION IN UNFUNDED ACCRUED LIABILITY:</u>	
	Unfunded Accrued Liability 6-30-72	\$ 18,951,242.90
	Unfunded Accrued Liability 6-30-73	159,053,466.66
		<u>\$ (140,102,223.76)</u>

Minnesota Statutes 1971, Chapter 356, requires, in Section 356.20, Subdivision 4(4), that there be submitted annually an analysis of changes in the membership of the System. Section 356.21, Subdivisions 4 and 5, requires information with respect to the annual payroll and annual annuities of the members of the System as well as certain information with respect to average ages. The exhibit required by Section 356.20, Subdivision 4(4), Section 356.21, Subdivision 4(6), and Section 356.21, Subdivision 5(9) and (10) is presented on the following pages of this Section III. All of the information was taken directly from an exhibit prepared by the Executive Director.

MINNESOTA STATE RETIREMENT SYSTEM

EXHIBIT REQUIRED BY MINNESOTA STATUTES 1971, CHAPTER 356,
SECTION 356.20, SUBDIVISION 4(4), SECTION 356.21, SUBDIVISION 4(6) AND
SECTION 356.21, SUBDIVISION 5(9) AND (10)
FISCAL YEAR ENDING JUNE 30, 1973

COVERED EMPLOYEE STATEMENT

ACTIVE EMPLOYEES:

	<u>NUMBER</u>	<u>ANNUAL PAYROLL</u>
Active at July 1, 1972	36,962	\$286,119,677.92
New Entrants, 7/1/72 - 6/30/73*	<u>7,579</u>	41,562,439.58
TOTAL	44,541	

Less Separations from Active Service:

Refundments*	5,275	29,423,609.28
Separation with a Vested Right to a deferred Annuity	60	532,239.38
Separation with neither refundment nor right to a deferred Annuity	1,182	4,730,467.76
Disability	39	314,068.72
Death*	99	814,272.62
Service Retirement	409	3,684,525.97
Death While Eligible Annuity	<u>8</u>	100,039.74
TOTAL SEPARATIONS	7,072	

Active at June 30, 1973:

Regular Retirement Plan	36,792	297,239,365.93
Correctional Retirement Plan	<u>677</u>	6,062,310.82
Total	<u>37,469</u>	<u>\$303,301,676.75</u>

Average Entry Age of New Employees

<u>For the Year</u>	<u>Male</u>	<u>Female</u>	<u>Average of Total</u>
1/1/68 - 12/31/68	31 yrs. 6 mos.	27 yrs. 5 mos.	28 yrs. 11 mos.
1/1/69 - 12/31/69	31 yrs. 1 mo.	26 yrs. 10 mos.	28 yrs. 2 mos.
1/1/70 - 6/30/71	32 yrs. 8 mos.	28 yrs. 1 mo.	29 yrs. 8 mos.
7/1/71 - 6/30/72	30 yrs. 9 mos.	27 yrs. 9 mos.	28 yrs. 11 mos.
7/1/72 - 6/30/73	30 yrs. 4 mos.	27 yrs. 7 mos.	28 yrs. 6 mos.

Average age at entry into State service for all active employees at June 30, 1973:

Average Male	31 yrs. 2 mos.
Average Female	29 yrs. 6 mos.
Total Average	30 yrs. 4 mos.

*Includes new and separated same year.

ANNUITANT STATEMENT

	<u>Number</u>	<u>Annual Annuity Benefit Payable</u>
(1) SERVICE RETIREMENT ANNUITANTS:		
Receiving at June 30, 1972	3,993	\$4,983,360.84
New	<u>383</u> 4,376	<u>547,721.52</u> \$5,531,082.36
Deaths	<u>211</u> 4,165	<u>268,485.00</u> \$5,262,597.36
4-1/2% benefit increase	<u>0</u> 4,165	<u>182,406.48</u> \$5,445,003.84
Adjustments - Net Result	<u>1</u>	<u>547.92</u>
Receiving at June 30, 1973	4,164	\$5,445,551.76
(2) DISABLED EMPLOYEES:		
Receiving at June 30, 1972	222	\$ 202,879.44
New	<u>40</u> 262	<u>42,230.28</u> \$ 245,109.72
Deaths	<u>25</u> 237	<u>19,323.60</u> \$ 225,786.12
4-1/2% benefit increase	<u>0</u>	<u>6,838.92</u>
Receiving at June 30, 1973	237	\$ 232,625.04
(3) WIDOWS RECEIVING AN ANNUITY OR SURVIVOR BENEFIT:		
A. BENEFICIARIES RECEIVING AN OPTIONAL OR REVERSIONARY ANNUITY:		
Receiving at June 30, 1972	149	\$ 120,651.84
New	<u>23</u> 172	<u>22,725.00</u> \$ 143,376.84
Deaths	<u>1</u> 171	<u>1,197.60</u> \$ 142,179.24
4-1/2% benefit increase	<u>0</u> 171	<u>5,829.72</u> \$ 148,008.96
Adjustments - Net Result	<u>1</u>	<u>2,133.24</u>
Receiving at June 30, 1973	170	\$ 145,875.72

ANNUITANT STATEMENT
(Continued)

	<u>Number</u>	<u>Annual Annuity Benefit Payable</u>
B. SPOUSES RECEIVING A SURVIVOR BENEFIT:		
Receiving at June 30, 1972	32	\$ 28,967.64
Deaths	<u>0</u>	<u>00</u>
Receiving at June 30, 1973	32	\$ 28,967.64
(4) CHILDREN RECEIVING A SURVIVOR BENEFIT:		
Receiving at June 30, 1972	0	\$.00
No new additions		
(5) DEFERRED ANNUITANTS:		
Receiving at June 30, 1972	590	\$ 377,980.68
New	<u>73</u>	<u>53,747.04</u>
	663	\$ 431,727.72
Deaths	<u>13</u>	<u>8,706.72</u>
	650	\$ 423,021.00
4-1/2% benefit increase	<u>0</u>	<u>15,364.80</u>
	650	\$ 438,385.80
Adjustments - Net Result	<u>2</u>	<u>1,585.32</u>
Receiving at June 30, 1973	652	\$ 439,971.12

Average Age at Retirement of New Service Annuitants

<u>YEAR</u>	<u>AVERAGE RETIREMENT AGE</u>
1/1/68 - 12/31/68	67 years, 4 months
1/1/69 - 12/31/69	66 years, 2 months
1/1/70 - 6/30/70	66 years, 0 months
7/1/70 - 6/30/71	65 years, 11 months
7/1/71 - 6/30/72	66 years, 3 months
7/1/72 - 6/30/73	65 years, 11 months

Average Age at Retirement of all Existing Annuitants

66 years, 1 month

Section 356.21, Subdivision 4 of the Minnesota Statutes 1971 requires an analysis of the increase or decrease in the unfunded liability that occurred since the last valuation. The exhibit shown on the following pages of this Section III contains the information required by Section 356.21, Subdivision 4(1), (2), (3), (4) and (5).

MINNESOTA STATE RETIREMENT SYSTEM

EXHIBIT REQUIRED BY MINNESOTA STATUTES 1971, CHAPTER 356
SECTION 356.21, SUBDIVISION 4(1), (2), (3), (4) and (5)
FISCAL YEAR ENDING JUNE 30, 1973

1.	Unfunded Accrued Liability June 30, 1972		\$ 18,951,243
2.	Change due to current rate of funding and interest requirement (Subdivision 4(4)):		
	(a) 1972-73 Past Service Contribution	- \$ 2,940,809	
	(b) 3-1/2% interest requirement	+ <u>663,294</u>	- 2,277,515
3.	Change due to actuarial gains (-) or losses (+) because of 1972-73 experience deviations from expected (Subdivision 4(3)):		
	(a) Excess interest earnings	- 1,454,278	
	(b) Recognized Unrealized Appreciation	- 1,674,284	
	(c) Withdrawals	- 1,096,829	
	(d) Age and Service retirements	+ 386,618	
	(e) Disability retirements	+ 36,005	
	(f) Deaths in active service	+ 122,439	
	(g) Salary increases	+ <u>2,150,489</u>	-\$ 1,529,840
4.	Change due to 1972-73 entrants (Subdivision 4(5))		- 2,168,142
5.	Unfunded Accrued Liability June 30, 1973 Old Plan - Old Assumptions		\$ 12,975,746
6.	Change due to new assumptions:		
	(a) Interest	- 34,474,900	
	(b) Mortality after Age and Service Retirement	+ <u>5,334,698</u>	-\$ 29,140,202
7.	Unfunded Accrued Liability June 30, 1973 Old Plan - New Assumptions		(16,164,456)
8.	Change due to Plan amendments		+ 175,217,923
9.	Unfunded Accrued Liability June 30, 1973 New Plan - New Assumptions		\$159,053,467

SCHEDULE 1

Male General Members

Probabilities of Separation from Active Service

(Number Separating at Each Age Per 10,000 Working at That Age)

<u>Age</u>	<u>Withdrawal</u>	<u>Death</u>	<u>Disability</u>	<u>Age and Service Retirement</u>
20	2,400	6		
21	2,250	6		
22	2,080	7		
23	1,920	7		
24	1,760	7		
25	1,600	7		
26	1,470	7		
27	1,340	7		
28	1,230	8		
29	1,130	8		
30	1,040	8	2	
31	950	9	2	
32	890	10	2	
33	830	11	2	
34	770	12	2	
35	720	13	2	
36	680	15	2	
37	640	16	2	
38	600	18	2	
39	560	20	2	
40	530	22	2	
41	500	25	2	
42	480	27	2	
43	460	29	2	
44	430	32	2	
45	410	35	2	
46	390	38	3	
47	370	41	4	
48	350	44	5	
49	340	48	6	

SCHEDULE 1

Male General Members
(Continued)

Probabilities of Separation from Active Service

(Number Separating at Each Age Per 10,000 Working at That Age)

<u>Age</u>	<u>Withdrawal</u>	<u>Death</u>	<u>Disability</u>	<u>Age and Service Retirement</u>
50	320	52	7	
51	300	57	8	
52	280	63	10	
53	260	70	12	
54	240	77	14	
55	210	85	17	
56	170	93	20	
57	140	102	23	
58	90	111	28	30
59	40	120	33	30
60		130	38	40
61		140	45	150
62		150	55	150
63		160	68	250
64		170	87	1,350
65				10,000

SCHEDULE 2

Female General Members

Probabilities of Separation from Active Service

(Number Separating at Each Age Per 10,000 Working at That Age)

<u>Age</u>	<u>Withdrawal</u>	<u>Death</u>	<u>Disability</u>	<u>Age and Service Retirement</u>
20	3,700	1		
21	3,550	2		
22	3,390	2		
23	3,230	2		
24	3,070	3		
25	2,910	3		
26	2,750	4		
27	2,600	4		
28	2,430	4		
29	2,270	4		
30	2,120	4		
31	1,970	4		
32	1,820	4		
33	1,680	4		
34	1,540	4		
35	1,410	4	1	
36	1,300	5	1	
37	1,190	5	1	
38	1,090	6	1	
39	1,000	7	2	
40	920	8	2	
41	850	8	2	
42	780	9	3	
43	720	11	3	
44	680	13	3	
45	630	15	3	
46	590	17	4	
47	560	19	4	
48	530	21	4	
49	500	23	5	

SCHEDULE 2

Female General Members
(Continued)

Probabilities of Separation from Active Service

(Number Separating at Each Age Per 10,000 Working at That Age)

<u>Age</u>	<u>Withdrawal</u>	<u>Death</u>	<u>Disability</u>	<u>Age and Service Retirement</u>
50	470	25	5	
51	440	27	6	
52	410	30	7	
53	390	33	8	
54	360	36	10	
55	330	39	12	
56	290	43	15	
57	230	47	18	
58	170	51	22	50
59	90	56	26	50
60		61	31	150
61		66	37	150
62		72	44	200
63		78	52	350
64		83	61	1,100
65				10,000

SCHEDULE 3

Male Correctional Members

Probabilities of Separation from Active Service

(Number Separating at Each Age Per 10,000 Working at That Age)

<u>Age</u>	<u>Withdrawal</u>	<u>Death</u>	<u>Disability</u>	<u>Age and Service Retirement</u>
20	2,400	6		
21	2,250	6		
22	2,080	7		
23	1,920	7		
24	1,760	7		
25	1,600	7		
26	1,470	7		
27	1,340	7		
28	1,230	8		
29	1,130	8		
30	1,040	8	2	
31	950	9	2	
32	890	10	2	
33	830	11	2	
34	770	12	2	
35	720	13	2	
36	680	15	2	
37	640	16	2	
38	600	18	2	
39	560	20	2	
40	530	22	2	
41	500	25	2	
42	480	27	2	
43	460	29	2	
44	430	32	2	
45	410	35	2	
46	390	38	3	
47	370	41	4	
48	350	44	5	
49	340	48	6	

SCHEDULE 3

Male Correctional Members
(Continued)

Probabilities of Separation from Active Service

(Number Separating at Each Age Per 10,000 Working at That Age)

<u>Age</u>	<u>Withdrawal</u>	<u>Death</u>	<u>Disability</u>	<u>Age and Service Retirement</u>
50	320	52	7	
51	300	57	8	
52	280	63	10	
53	260	70	12	
54	240	77	14	
55				10,000

SCHEDULE 4

Female Correctional Members

Probabilities of Separation from Active Service

(Number Separating at Each Age Per 10,000 Working at That Age)

<u>Age</u>	<u>Withdrawal</u>	<u>Death</u>	<u>Disability</u>	<u>Age and Service Retirement</u>
20	3,700	1		
21	3,550	2		
22	3,390	2		
23	3,230	2		
24	3,070	3		
25	2,910	3		
26	2,750	4		
27	2,600	4		
28	2,430	4		
29	2,270	4		
30	2,120	4		
31	1,970	4		
32	1,820	4		
33	1,680	4		
34	1,540	4		
35	1,410	4	1	
36	1,300	5	1	
37	1,190	5	1	
38	1,090	6	1	
39	1,000	7	2	
40	920	8	2	
41	850	8	2	
42	780	9	3	
43	720	11	3	
44	680	13	3	
45	630	15	3	
46	590	17	4	
47	560	19	4	
48	530	21	4	
49	500	23	5	

SCHEDULE 4

Female Correctional Members
(Continued)

Probabilities of Separation from Active Service

(Number Separating at Each Age Per 10,000 Working at That Age)

<u>Age</u>	<u>Withdrawal</u>	<u>Death</u>	<u>Disability</u>	<u>Age and Service Retirement</u>
50	470	25	5	
51	440	27	6	
52	410	30	7	
53	390	33	8	
54	360	36	10	
55				10,000

MSRS VALUATION AS OF JUNE 30, 1973

The purpose of this memorandum is to discuss the valuation report of the Minnesota State Retirement System dated December 11, 1973 which was submitted to the Commission in accordance with Chapter 249 of Minnesota Laws 1967. The valuation was made using the entry age normal cost method and assuming 5% interest. The report was prepared by Robert H. Little of Coates and Crawford, Consulting Actuaries.

This memo contains the following:

1. Statistical and Valuation Data
2. Discussion of Valuation Results
3. Conclusion

1. Statistical and Valuation Data

Results of the valuation reports as of June 30, 1972 and June 30, 1973 are shown for comparative purposes. Figures are rounded where necessary for simplicity of presentation.

	As of <u>June 30, 1972</u>	As of <u>June 30, 1973</u>
(1) <u>Membership</u>		
Active Members	36,962	37,469 *
Inactive Members	5,465	4,592
Retired Members	4,732	4,986
Disabled Members	222	237
Survivors of Deceased Members	32	32
* Including 677 correctional employees.		
(2) <u>Payroll and Annuities Payable</u>		
Total Annualized Payroll	\$ 286.1 Million	\$ 303.3 Million
Annuities (annual)	5.7 Million	6.3 Million
(3) <u>Valuation Balance Sheet</u>		
Accrued Liability	\$ 197.1 Million	\$ 363.3 Million
Assets	<u>178.2 Million</u>	<u>204.2 Million</u>
Unfunded Accrued Liability (Deficit)	18.9 Million	159.1 Million *
Funding Ratio (Ratio of Assets to Accrued Liability)	90.4%	56.2%

* \$151.7 Million for regular employees and \$7.3 Million for correctional employees.

Percent of Covered Payroll			
	As of	As of	
	June 30, 1972	June 30, 1973	
		Regular	Correctional
(4) <u>Normal Cost and Funding Costs</u>			
Normal Cost	5.77%	6.85%	11.92%
Expenses	<u>0.19</u>	<u>0.19</u>	<u>0.19</u>
Normal Cost plus Expenses	5.96%	7.04%	12.11%
Normal Cost plus Expenses	5.96%	7.04%	12.11%
Interest on Deficit	<u>0.23</u>	<u>2.41</u>	<u>5.69</u>
Total ("Minimum Contribution")	6.19%	9.45%	17.80%
Normal Cost plus Expenses	5.96%	7.04%	12.11%
Amortization by 1997	<u>0.39</u>	<u>3.32</u>	<u>7.85</u>
Total ("Required Contribution")	6.35%	10.36%	19.96%
(5) <u>Statutory Contributions</u>			
Employee	3.0%	4.0%	6.0%
Employer Regular	3.0	4.0	9.0
Employer Additional	<u>1.0</u>	<u>2.0</u>	<u>5.0</u>
Total Contributions	7.0%	10.0%	20.0%
(6) Investment Yield (A)	4.68% *	5.95% *	

(A) Ratio of investment income (on an accrual basis) to mean assets.

* Excluding assets in Minnesota Adjustable Fixed Benefit Fund;
including increase in recognized unrealized appreciation.

2. Discussion of Valuation Results

The MSRS valuation this year includes information about a small group of employees called correctional employees whose benefits, contributions and normal retirement ages differ from those of the main group. This requires the presentation of a separate funding analysis which adds to the complications resulting from the improvement in benefits and the change in the assumed interest rate.

The net result of the improvement in benefits and the change in the assumed interest rate from 3.5% to 5% is a slight deficiency in the actuarial balance for the main group. However, so long as the assets continue to earn in excess of 5%, the deficiency will be covered. Even with 5% earnings, the time for full funding would be extended only to 2002.

We wish to direct attention to the fact that the report does not present the funding picture in exactly the above manner. One of the deviations from the above is in the conservative direction and the other is not.

The total deficit is separated into two portions: (a) the present value of the excess of the regular contributions over the normal cost plus expenses; (b) the total deficit minus (a). Since the period for determining the present value of contributions is the remaining active service period based upon the assumed deaths and terminations, the average such period is substantially less than the 24 years to 1997. Thus, this approach provides for funding the (a) portion of the deficit in a relatively short period which is a conservative approach.

However, this leaves a large part of the deficit in the (b) portion which must be amortized with the employer's additional 2% contribution. With a payroll at the present level, this would require 70 years. The report shows 24 years based upon an assumption that the total payroll will increase at the rate of 3 1/2% per year.

During the year, the unfunded accrued liability increased from \$18,951,243 to \$159,053,467, an increase of \$140,102,224. The MSRS Actuary gives the following analysis of this increase.

Increases:

Change in Benefits	\$ 175,217,923	
Deviations in Salary Rates	2,150,489	
Deviations in Retirement Rates	386,618	
Deviations in Disability Rates	36,005	
Deviations in Death Rates - Actives	122,439	
Deviations in Death Rates - Retirees	<u>5,334,698</u>	
Total Increases		\$ 183,248,172

Decreases:

Change in Assumed Interest Rate	\$ 34,474,900	
Amortization Contribution	2,277,515	
Excess Interest Earnings	3,128,562	
Excess Terminations	1,096,829	
New Entrants	<u>2,168,142</u>	
Total Decreases		<u>43,145,948</u>

Net Increase		\$ 140,102,224
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3. Conclusion

The 1973 Valuation Report filed by MSRS conforms with the requirements of Chapter 249. However, we think the concluding statement on page 11 relative to the adequacy of support should have pointed out that it is based on the assumption that the employer's additional contribution will be applied to an increasing total payroll.

Franklin C. Smith
Associate, Society of Actuaries
GEORGE V. STENNES AND ASSOCIATES
Commission Actuaries