

REPORT ON
ACTUARIAL VALUATION
STATE EMPLOYEES'
RETIREMENT ASSOCIATION
OF
MINNESOTA
DECEMBER 31, 1964

October 18, 1965

OFFICES IN
SAN FRANCISCO
DENVER
PASADENA

COATES, HERFURTH & ENGLAND

CONSULTING ACTUARIES
~~325 NORTH LAKE AVENUE~~
PASADENA, CALIFORNIA 91101
301 EAST COLORADO BOULEVARD

TELEPHONE
MURRAY 1-4455

October 18, 1965

Board of Trustees
State Employees' Retirement
Association of Minnesota
Centennial Office Building
St. Paul, Minnesota 55101

Gentlemen:

We are pleased to transmit herewith our report on the actuarial valuation of your Retirement System made as of December 31, 1964.

Pursuant to Contract No. E-9211, under which this valuation was authorized, the actuarial valuation was carried out on the basis of a 3% interest rate assumption and on the basis of the other actuarial assumptions set forth in the report submitted to the Board on May 29, 1964 by the Association's previous actuary. 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.

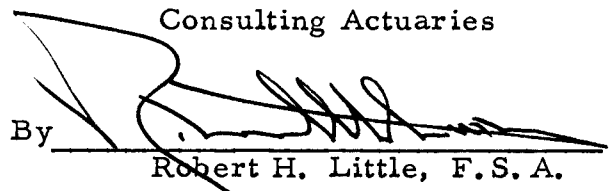
We hereby certify that the actuarial valuation of the State Employees' Retirement Association of Minnesota made as of December 31, 1964 was carried out on the basis of accepted actuarial methods and procedures and that the results of that valuation indicate that the contributions required from the employees and from the State under Minnesota Statute 1961, Chapter 352, as presently constituted 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, HERFURTH & ENGLAND
Consulting Actuaries

By


Robert H. Little, F.S.A.

RHL:th

REPORT ON
ACTUARIAL VALUATION
OF THE
STATE EMPLOYEES' RETIREMENT ASSOCIATION
OF
MINNESOTA
AS OF
DECEMBER 31, 1964

SECTION I

INTRODUCTION

In accordance with Contract No. E-9211 between the State of Minnesota and this firm, we have completed the actuarial valuation of the State Employees' Retirement Association of Minnesota as of December 31, 1964.

The Executive Secretary of the Association furnished us with detailed employee information on all active members, inactive members and retired members of the Association as of December 31, 1964. The following schedule shows a summary of the membership on which the valuation was based:

SUMMARY OF MEMBERSHIP

DECEMBER 31, 1964

ACTIVE MEMBERS

	<u>Number</u>	<u>Annual Salary</u>
Male	16,008	\$ 82,625,303
Female	<u>13,509</u>	<u>43,507,472</u>
Total	29,517	\$126,132,775

INACTIVE MEMBERS

	<u>Number</u>	<u>Accumulated Contributions</u>
With Vested Rights	315	\$528,671.41
Without Vested Rights	<u>6,323</u>	<u>397,380.79</u>
Total	6,638	\$926,052.20

RETIRED MEMBERS

	<u>Number</u>	<u>Annual Allowance</u>
Age and Service Retirement	3,030	\$3,078,388.44
Disability Retirement	93	73,068.24
Survivors	42	36,011.28
Deferred Retirements	<u>7</u>	<u>1,872.84</u>
Total	3,172	\$3,189,340.80

The Executive Secretary and his staff are to be complimented on the accuracy and completeness of the aforementioned data.

The Executive Secretary also furnished us with a Financial Report setting forth the assets and liabilities of the Fund as of December 31, 1964. No physical audit of these assets was made by us and our calculations are based upon the Financial Report as submitted.

The following Section II sets forth the results of the actuarial valuation and Section III contains our comments and conclusions. The schedule attached at the end of the report shows a summary of the active members of the System by sex and attained age.

SECTION II

RESULTS OF ACTUARIAL VALUATION

The contract under which this valuation was authorized specified that the actuarial valuation be carried out on the basis of a 3% interest rate assumption and upon the actuarial assumptions developed by the Association's previous actuary. The actuarial assumptions developed by the Association's previous actuary are set forth in his report to the Board of Trustees dated May 29, 1964. 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.

The valuation was carried out on the basis of the \$4,800 maximum annual participating salary that was in effect as of the date of the valuation.

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 their dates of employment to their 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

employees, we carried out a complete valuation of presently active members who were employed during the preceding five-year period. The results of these calculations indicate that the total entry age normal cost rate amounts to 5.12% of participating salary. The employees are required by law to contribute 3% and, accordingly, the State's share of the entry age normal cost contribution rate amounts to 2.12%. We expect the entry age normal cost rate to remain fairly stable unless there is a change in employment practices or unless there is a change in the Retirement Law.

The law requires that the State make the following contributions to the Fund with respect to members contributing at a 3% rate:

- (1) A "matching" contribution equal to 3% of the members' participating salaries, and
- (2) An "additional" contribution equal to two-thirds of members' contributions, or 2% of participating salary.

In the case of members contributing at a 6% rate, the required contributions by the State are:

- (1) A "matching" contribution equal to 6% of the members' participating salaries, and
- (2) An "additional" contribution equal to one-sixth of members' contributions, or 1% of participating salary.

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. Inasmuch as there were only 44 active employees who were contributing at the 6% level as of December 31, 1964, we will hereinafter refer only to the

State's contribution totaling 5% of participating salary which apply to members contributing at the 3% rate.

The Accounting Balance Sheet shown on the following page was prepared by us from financial reports submitted by the Executive Secretary. It is our opinion that the Accounting Balance Sheet should show the disposition of funds currently held by the Fund and that it should not reflect any contingent actuarial assets and liabilities. The "Reserve for Benefits Already Granted" in the amount of \$29, 279, 436.17 reflects the balance shown on the System records before making the adjustments which will result from the current valuation.

The Actuarial Balance Sheet shown on the page following the Accounting Balance Sheet summarizes the results of the valuation.

STATE EMPLOYEES' RETIREMENT ASSOCIATION
OF
MINNESOTA

ACCOUNTING BALANCE SHEET
AS OF
DECEMBER 31, 1964

ASSETS

1.	Cash in Office		\$	742.92
2.	Deposits in Banks			244,830.47
3.	Treasury Bills at cost			1,006,956.23
4.	Accounts Receivable:			
	(a) Accrued Members' Contributions	\$ 18,083.37		
	(b) Accrued Employer Contributions	798,326.92		
	(c) Other	<u>953.14</u>		817,363.43
5.	Accrued Interest on Investments			674,901.25
6.	Dividends declared but not received			1,944.00
7.	Bonds at Amortized Cost			61,330,268.28
8.	Stocks at Cost (Market Value 12/31/64 - \$15,255,409.76)			13,141,666.77
9.	Equipment at Cost, less depreciation			12,362.19
10.	Other - Prepaid Postage			<u>1,000.00</u>
11.	TOTAL ASSETS			<u><u>\$77,232,035.54</u></u>

CURRENT LIABILITIES AND RESERVES

Current Liabilities

12.	Accounts Payable:			
	(a) Annuity Payments	\$ 3,635.57		
	(b) Survivor Payments	7,321.47		
	(c) Refunds to Members	18,992.45		
	(d) Accrued Expenses	<u>14,277.19</u>	\$	44,226.68
13.	Suspense Items:			
	(a) Withdrawals Account (Undelivered Refund Warrants canceled)	\$ 664.36		
	(b) Unredeemed 6-Yr. Warrants canceled by State Auditor	<u>2,449.69</u>		3,114.05
14.	Total Current Liabilities		\$	<u>47,340.73</u>

Reserves

15.	Employee Accumulated Contributions	\$29,428,864.24
16.	Reserve for Benefits Already Granted	29,279,436.17
17.	State Contribution Reserve	<u>18,476,394.40</u>
18.	Total Reserves	<u>\$77,184,694.81</u>
19.	TOTAL CURRENT LIABILITIES AND RESERVES	<u><u>\$77,232,035.54</u></u>

STATE EMPLOYEES' RETIREMENT ASSOCIATION
OF
MINNESOTA

ACTUARIAL BALANCE SHEET
AS OF
DECEMBER 31, 1964

ASSETS

1.	Assets on Hand from Accounting Balance Sheet		\$ 77,232,035.54
2.	Present Value of Employees' Future Contributions (3% of Participating Salary)		28,463,578.00
3.	Present Value of State Future Contributions Applicable to:		
	(a) Entry Age Normal Cost (2.12% of Participating Salary)	\$20,114,262.00	
	(b) Unfunded Accrued Liability (Balance of 3% "Matching" Con- tribution or .88% of Participat- ing Salary)	8,349,316.00	
	(c) Unfunded Accrued Liability (Portion to be funded by 2% "Addi- tional" Contribution)	<u>12,422,833.19</u>	<u>40,886,411.19</u>
4.	TOTAL ASSETS		<u><u>\$146,582,024.73</u></u>

LIABILITIES

5.	Current Liabilities from Accounting Balance Sheet		\$ 47,340.73
6.	Present Value of Earned and Earnable Benefits Payable to Presently Active Members:		
	(a) Retirement Benefits	\$91,683,392.00	
	(b) Disability Benefits	2,162,448.00	
	(c) Refundments due to death or withdrawal	<u>21,410,461.00</u>	<u>115,256,301.00</u>
7.	Present Value of Benefits for Deferred Annuitants:		
	(a) Retirement Benefits	\$ 1,777,235.00	
	(b) Refundments due to death or withdrawal	72,517.00	
	(c) Benefits already Authorized	<u>22,846.00</u>	<u>1,872,598.00</u>
8.	Present Value of Refundments to former members without vested rights		397,381.00
9.	Present Value of Benefits Payable to Annuitants:		
	(a) Retirement Benefits	\$27,740,302.00	
	(b) Disability Benefits	821,196.00	
	(c) Survivors' Benefits	<u>446,906.00</u>	<u>29,008,404.00</u>
10.	TOTAL LIABILITIES		<u><u>\$146,582,024.73</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 equal to 3% of the members' participating salary.

Item 3 shows the present value of State 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 5.12% of members' participating salaries. After deducting the members' share of 3%, the State's share of the entry age normal cost contribution amounts to 2.12% of members' participating salaries.

Item 3(b) The portion attributable to the balance of the State's "matching" 3% contribution (.88% of members' participating salaries) which is being used to pay a portion of the State's share of the cost.

Item 3(c) The portion attributable to the State's "additional" 2% contribution. On the basis of present levels of participating salaries, this 2% "additional" contribution amounts to

approximately \$2,064,000 per year and the full amount of the contribution will amortize the \$12,422,833.19 shown in Item 3(c) in about 6-2/3 years. The level annual contribution required to amortize \$12,422,833.19 over the 33 year period ending on December 31, 1997 is \$589,437.00

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 December 31, 1964 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.

Item 9 shows the actuarially computed present value of all benefits payable from the System with respect to members who have retired. The System's account "Reserve for Benefits Already Granted" should be adjusted to \$29,031,250.00 as of January 1, 1965. This is the sum of Item 7(c) and Item 9.

Minnesota Statutes 1965, Chapter 359 require, in Section 1, 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 a conference with Senator Harmon T. Ogdahl and Representative Edward J. Tomczyk, members of the State's Employee Retirement Systems Interim Commission and with Mr. Frank V. Moulton, the Commission's Executive Secretary and Mr. Gerald G. Toy, the Commission's Consulting Actuary, 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 1, Subdivision 4(1) of Minnesota Statutes 1965, Chapter 359, is presented on the following pages of this Section II 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.

STATE EMPLOYEES' RETIREMENT ASSOCIATION
OF
MINNESOTA

EXHIBIT REQUIRED BY MINNESOTA STATUTES 1965, CHAPTER 359
AS OF
DECEMBER 31, 1964

ASSETS AND UNFUNDED ACCRUED LIABILITY

Assets

1.	Cash in Office		\$	742.92
2.	Deposits in Banks			244,830.47
3.	Treasury Bills at cost			1,006,956.23
4.	Accounts Receivable:			
	(a) Accrued Members' Contributions	\$ 18,083.37		
	(b) Accrued Employer Contributions	798,326.92		
	(c) Other	953.14		817,363.43
5.	Accrued Interest on Investments			674,901.25
6.	Dividends declared but not received			1,944.00
7.	Bonds at Amortized Cost			61,330,268.28
8.	Stocks at Cost (Market Value 12/31/64 - \$15,255,409.76)			13,141,666.77
9.	Equipment at Cost, less depreciation			12,362.19
10.	Other - Prepaid Postage			1,000.00
11.	TOTAL ASSETS			\$77,232,035.54

Unfunded Accrued Liability

12.	Unfunded Accrued Liability to be funded by portion of State's 3% "Matching Contribu- tion" in excess of State's share of entry age normal cost contribution		\$	8,349,316.00
13.	Unfunded Accrued Liability to be funded by State's 2% "Additional" contribution			12,422,833.19
14.	Total Unfunded Accrued Liability			\$20,772,149.19
15.	TOTAL ASSETS AND UNFUNDED ACCRUED LIABILITY			\$98,004,184.73

CURRENT LIABILITIES AND RESERVES REQUIRED

Current Liabilities

16.	Accounts payable:			
	(a) Annuity Payments	\$ 3,635.57		
	(b) Survivor Payments	7,321.47		
	(c) Refunds to members	18,992.45		
	(d) Accrued expenses	14,277.19		44,226.68
17.	Suspense items			3,114.05
18.	Total Current Liabilities			\$ 47,340.73

Reserves Required

19.	Total Reserves Required per attached schedule			97,956,844.00
20.	TOTAL CURRENT LIABILITIES AND RESERVES REQUIRED			\$98,004,184.73

Note: Accumulated contributions, without interest, of members not yet
retired amounted to \$29,428,864.24 as of December 31, 1964.

STATE EMPLOYEES' RETIREMENT ASSOCIATION
OF
MINNESOTA

DETERMINATION OF RESERVES REQUIRED
AS OF
DECEMBER 31, 1964

	(1)	(2)	(3)
	Present Value of Benefits	Present Value of Applicable Portion of Normal Cost Contribution	Reserves Required (1) - (2)
<u>Benefits For:</u>			
1. Active Members			
(a) Retirement Benefits	\$ 91,683,392.00	\$32,258,722.00	\$59,424,670.00
(b) Disability Benefits	2,162,448.00	2,087,329.00	75,119.00
(c) Refundments due to death or withdrawal	21,410,461.00	14,231,789.00	7,178,672.00
2. Deferred Annuitants	1,872,598.00	-	1,872,598.00
3. Former Members Without Vested Rights	397,381.00	-	397,381.00
4. Annuitants			
(a) Retirement Benefits	27,740,302.00	-	27,740,302.00
(b) Disability Benefits	821,196.00	-	821,196.00
(c) Survivors' Benefits	446,906.00	-	446,906.00
5. TOTAL	\$146,534,684.00	\$48,577,840.00	\$97,956,844.00

SECTION III

CONCLUSIONS AND COMMENTS

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 3% members' contributions and the State's "matching" 3% contributions plus the State's "additional" 2% contribution for approximately 6-2/3 years.

Section 2, Subdivision 5(3) of Minnesota Statutes 1965, Chapter 359, requires that actuarial valuations be carried out on the basis of a 3% interest rate assumption. We believe that the interest rate assumption should reflect a conservative estimate of the investment earnings that will be realized on the fund over the next fifty or sixty years. We further believe that such estimate should be made by the Board of Trustees with the advice of their investment counsel and should be subject to change from time to time to reflect changes in the long range investment return expectations. The fact that a 3% interest assumption is fixed by law would seem to deny the System this flexibility.

Finally, we would like to remind the Trustees that the next valuation to be made as of December 31, 1965 will make use of new actuarial assump-

tions developed on the basis of an investigation into the experience of the System for the four-year period ending December 31, 1964 and, in addition, will reflect the recent change in the maximum salary considered under the Plan from \$4,800 to \$7,200 per year. For these reasons, it is reasonable to expect that the results of the December 31, 1965 valuation will differ significantly from the results of the valuation covered by this report.

STATE EMPLOYEES' RETIREMENT ASSOCIATION
OF
MINNESOTA

NUMBER OF ACTIVE MEMBERS AND ANNUAL SALARIES
BY SEX AND ATTAINED AGE

Age	MALE		FEMALE		TOTAL	
	Number	Annual Salary	Number	Annual Salary	Number	Annual Salary
20 and Under	592	\$ 911,888	1,726	\$ 2,911,618	2,318	\$ 3,823,506
21	262	589,298	673	1,544,489	935	2,133,787
22	357	922,469	701	1,786,914	1,058	2,709,383
23	388	1,168,773	579	1,579,916	967	2,748,689
24	345	1,194,969	474	1,451,722	819	2,646,691
25	351	1,433,434	349	1,131,561	700	2,564,995
26	397	1,713,524	306	971,491	703	2,685,015
27	364	1,625,720	233	721,599	597	2,347,319
28	365	1,776,139	208	675,526	573	2,451,665
29	356	1,755,481	163	547,672	519	2,303,153
30	376	1,905,190	168	528,743	544	2,433,933
31	327	1,756,271	144	483,247	471	2,239,518
32	381	2,005,535	147	487,366	528	2,492,901
33	376	2,106,423	134	461,495	510	2,567,918
34	336	1,903,592	134	488,918	470	2,392,510
35	343	1,904,596	142	479,793	485	2,384,389
36	325	1,817,712	136	422,997	461	2,240,709
37	289	1,642,109	182	596,481	471	2,238,590
38	340	2,028,356	171	572,803	511	2,601,159
39	355	2,045,680	191	645,897	546	2,691,577
40	358	2,080,942	194	693,861	552	2,774,803
41	342	2,010,517	181	603,978	523	2,614,495
42	330	1,796,307	216	711,487	546	2,507,794
43	379	2,076,972	238	837,493	617	2,914,465
44	392	2,211,303	236	844,984	628	3,056,287
45	332	1,907,425	214	768,361	546	2,675,786
46	360	2,095,561	250	856,127	610	2,951,688
47	363	2,110,754	268	972,419	631	3,083,173
48	326	1,732,584	260	891,793	586	2,624,377
49	315	1,663,091	291	1,046,433	606	2,709,524
50	316	1,781,180	313	1,132,645	629	2,913,825
51	337	1,823,542	304	1,149,093	641	2,972,635
52	330	1,841,736	322	1,268,350	652	3,110,086
53	345	1,932,406	299	1,141,699	644	3,074,105
54	337	1,941,553	301	1,172,537	638	3,114,090

STATE EMPLOYEES' RETIREMENT ASSOCIATION
OF
MINNESOTA

NUMBER OF ACTIVE MEMBERS AND ANNUAL SALARIES
BY SEX AND ATTAINED AGE

Age	MALE		FEMALE		TOTAL	
	Number	Annual Salary	Number	Annual Salary	Number	Annual Salary
55	345	\$ 1,964,928	284	\$ 1,062,989	629	\$ 3,027,917
56	342	1,971,438	282	1,132,774	624	3,104,212
57	313	1,796,297	282	1,167,448	595	2,963,745
58	349	2,065,000	292	1,177,683	641	3,242,683
59	327	1,833,352	232	931,410	559	2,764,762
60	305	1,722,443	234	994,571	539	2,717,014
61	287	1,646,997	207	854,029	494	2,501,026
62	241	1,429,039	179	749,056	420	2,178,095
63	259	1,575,242	170	728,447	429	2,303,689
64	235	1,370,814	143	587,290	378	1,958,104
65	158	997,721	111	479,898	269	1,477,619
66	109	681,622	77	311,494	186	993,116
67	110	768,010	66	309,070	176	1,077,080
68	74	527,792	39	170,496	113	698,288
69	55	332,472	34	134,638	89	467,110
70	27	145,198	9	44,550	36	189,748
71	27	177,909	6	20,180	33	198,089
72	17	114,392	4	13,848	21	128,240
73	14	80,815	2	11,211	16	92,026
74	7	52,631	2	14,656	9	67,287
75	0	0	1	3,576	1	3,576
76	7	40,999	3	18,983	10	59,982
77	5	46,487	1	1,614	6	48,101
78	2	16,970	0	0	2	16,970
79	3	11,973	1	6,053	4	18,026
80	1	11,814	0	0	1	11,814
84	1	8,623	0	0	1	8,623
85	1	21,293	0	0	1	21,293
Total	16,008	\$82,625,303	13,509	\$43,507,472	29,517	\$126,132,775

SERA ACTUARIAL VALUATION AS OF DECEMBER 31, 1964

In our Memo #2 dated October 22, we discussed Chapter 359 and the status of reports to be made under it. We stated that the SERA valuation report was to be given to the Commission, and it was received at that meeting.

The purpose of this memorandum is to discuss this "Report on Actuarial Valuation, State Employees' Retirement Association of Minnesota, December 31, 1964," especially in the following two respects:

1. Conformity with Chapter 359.
2. Valuation Results.

1. Conformity with Chapter 359.

(All references are to Section 1, "Financial Reports Required" unless otherwise noted.)

Each annual Financial Report incorporates the results of an actuarial valuation.

Page 12 of the SERA report is entitled "Exhibit Required by Minnesota Statutes 1965, Chapter 359." This Exhibit contains the three principal financial items required by Chapter 359 under Section 1, Subdivision 4(1):

(1) Accrued Assets	\$ 77.2 Million
(2) Accrued Liabilities	98.0 "
(3) Unfunded Accrued Liability	20.8 "

- (1) Accrued Assets: the listing of Assets is given in lines 1-11 of the Exhibit in accordance with the law, Subdivision 4 (1) (a).
- (2) Accrued Liabilities: the listing of Current Liabilities is given in lines 16-18 of the Exhibit in accordance with the law, Subdivision 4 (1)(d).

The "Total Reserves Required per Attached Schedule" is given in line 19. These are the actuarially computed reserves shown on page 13 and are in accordance with the law, Subdivision 4 (1)(e).

The Report contains a certification by an approved actuary (as defined in Section 2, "Actuarial Surveys", that the required reserves are calculated in accordance with the Entry Age Normal Cost method of funding. This is in accordance with the law, Subdivision 4 (1).

- (3) Unfunded Accrued Liability: the unfunded accrued liability is shown in line 14 and is found by subtracting the Accrued Assets from the Accrued Liabilities (line 20 minus line 14). This is in accordance with the law, Subdivision 4 (1)(b).

In addition, the accumulated contributions of members not yet retired is shown in a Note at the bottom of the page. This is in accordance with the law, Subdivision 4 (1)(c).

Subdivision 4 (2) calls for an Income Statement on an accrual basis, and Subdivision 4 (3) calls for a Statement of Deductions from Income. These have not been furnished as part of the SERA Report. It is to be noted again that this Report is a voluntary one and is not furnished as an example of the complete report which will be submitted to the Legislature. Such a statement could not have been included for 1964, presumably because one of the principal items of a Deduction Statement was not available, this being the "Increase in Total Reserves Required." The latter for the December 1965 Report under the law will be available since the December 1964 Reserves Required and the December 1965 Reserves Required will be available.

As an example of how the Income and Deductions from Income Statements will be useful, reference should be made to page 9 of the 1965 Commission Report. This simplified version of a funding problem can be used to illustrate how the Income and Deductions Statements will be extremely helpful in analyzing the progress of the Unfunded Accrued Liability. This example shows how a "funding method" establishes a schedule of Accrued Liabilities (or required reserves) needed to meet a given financial goal at some point in the future. We can use this to illustrate the objective in requiring the Income and Deductions Statements set forth in Chapter 359.

Assume that for three years you have been making the required contribution (analogous to Normal Cost in pension funding) of \$427.09 each year and that your Assets at the end of that period total \$1,320 (with interest at 3% accumulated each year). Your Balance Sheet would show Assets of \$1,320 and an Accrued Liability of \$1,320, with no Unfunded Accrued Liability (deficit = zero). In the fourth year, we will consider two separate Cases:

- (1) Normal progress with regular contribution of \$427.09.
- (2) Because of other commitments, your contribution is only \$100.

Under Case (1), your Fund's Income Statement and Deductions Statement would appear as follows:

Income:

Contribution	\$ 427.09 (made at the end of the fiscal year)
Interest Income	39.60 (3% interest on \$1,320)
Total Income	\$ 466.69

Deductions from Income:

Increase in Accrued Liability(Increase in Required Reserves) \$467.00
(This is the difference between the fourth year accrued
liability of \$1,787 and the third year accrued liability of \$1,320.)

Excess of Income over Deductions:

- \$ 0.31

(If the Accrued Liability column had been carried out to cents,
the results would be identical.)

In Case (1), therefore, you are "on schedule" and have Assets of \$1,787
(\$1,320 plus \$467 of Income) as against an Accrued Liability of \$1,787.
There is still no Deficit.

In Case (2), the following result would be obtained:

Income:

Contribution	\$ 100.00
Interest	39.60
Total Income	\$ 139.60

Deductions from Income:

Increase in Accrued Liability	\$ 467.00
-------------------------------	-----------

Excess of Income over Deductions: - \$ 327.40

Your Balance Sheet would show the following:

Total Accrued Assets	\$ 1,460.00 (\$1,320 + \$140)
Total Accrued Liabilities	1,787.00
Unfunded Accrued Liability	\$ 327.00

In summary, the Income Statements (Income and Deductions therefrom)
answer this question: "How are you doing in following the schedule of
Accrued Liabilities?" In this simple illustration, there was an increase in
deficit because total income was \$327 less than it had to be to stay "on
schedule."

Subdivision 4 (4) requires "appropriate statistics as to membership and
beneficiaries of the Fund, with indications of changes in such statistical data
which may result from the current year's operation." Page 2 of the SERA
Report contains a "summary of membership" which meets the requirement
of the law regarding statistical data. There are no comments in the SERA
Report, however, on "changes which may result from the current year's
operation." This is a somewhat ambiguous provision in the law. The words

"have resulted" might be better than "may result" in the law, since the real intention here is to answer this question: "Were there any significant developments in the membership or beneficiary categories that had a material effect on the financial condition of the Fund during the fiscal year for which the Report is submitted?" For example, the Executive Secretary of SERA has stated that there has been an increase in the number of disability claimants.

A revision of this section of the law might well be considered by the Commission. In addition to the absolute censuses of membership and beneficiary categories, as given in the SERA Report, other items which would be important in judging the experience of the Fund could be found more readily by having schedules set up for each of the main categories of membership and beneficiaries, tracing the number in each category from year to year. The following tables are shown as illustrations of what might be recommended by the Commission:

Active Members

Number Active, December 31, 1964

New Entrants during 1964 _____

Total

Separations from Active Service in 1965

- (a) Refundment of Contributions
- (b) Separation with Deferred Annuity
- (c) Separation with Neither Refundment nor
Deferred Annuity
- (d) Disability
- (e) Death
- (f) Retirement with Service Annuity
- (g) Other (specify) _____

Total Separations

Number Active, December 31, 1965

A similar table for "Beneficiaries and Annuitants" could be constructed as follows for each of the categories:

Service Retirements
Disabilities
Widows
Orphans
Deferred Annuitants

Number as of December 31, 1964

New Entrants _____

Total

Terminations (those ceasing to draw annuities)

(a) Death

(b) Other _____

Total Terminations

Number Receiving Benefits, December 31, 1965

It would also be well to have the Annual Allowance payable for each of the categories and in grand total as of each fiscal year-end. Similarly, for the "Active Members" table, the Total Payroll and Covered Payroll figures should be requested. The average retirement age for Service Retirements should also be obtained.

Although there is no provision for these statistical reports in Chapter 359, we feel that the Commission should consider requesting them from the Funds for the fiscal year ending 1965 and 1966, and further (as previously stated) the Commission may wish to consider amending the law to require such statistical reports for subsequent years also.

Payroll (annual salaries): the costs, contributions and benefits of the Funds are related to covered payroll rather than total payroll. Therefore, the Commission should request that Funds report at least the covered payroll of active members and, if it is available, also the total payroll. For example, on page 2 of the SERA Report, the column headed "Annual Salaries" is presumably total payroll (\$126 million as of December 31, 1964; it was \$123 million as of January 1, 1964). The covered payroll (\$4,800 limit) was \$109 million as of December 31, 1964; it was \$104 million as of January 1, 1964.

Amortization of Deficit: Chapter 359 does not require as part of the Financial Report (Section 1) any finding as to amounts or rates of support required to amortize any deficits. Such requirement is found under "Actuarial Surveys" (Section 2). Surveys are required every four years beginning at the end of 1967. Subdivision 5 ("Actuarial Surveys; Contents"), paragraph (6) requires "in addition to the level normal cost, such additional rate of support as is required to amortize any deficit in the Fund by the end of the fiscal year occurring in 1997."

Although such amortization finding is not specified in the law for the annual financial report, the 1964 SERA Report contains the amortization findings; on pages 9 and 10, this item is discussed. The \$12.4 million deficit is

stated to be amortizable by level payments of \$589,000 per year for the 33 years from 1964 to 1997. (Note: the additional \$8.3 million of "unfunded accrued liability," as shown on page 8, is covered by the excess of total regular contributions over normal costs; that is, total contributions of 6% exceeds the normal cost of 5.12% by .88% of covered payroll. This excess of .88% of payroll has a Present Value of \$8.3 million.)

Actuarial Survey Information: we have reviewed the "Report on Actuarial Investigation SERA" which is referred to above as the report showing experience for the four years 1961-64.

We feel that this report supplies the necessary information substantiating the assumptions made for future valuations of SERA. This is consistent with the requirements of Chapter 359, Section 2, Subdivision 5 (4), which requires: "other assumptions as to mortality, disability, withdrawal, and salary scale that we appropriate to the Fund, which shall be set forth in the survey report." (There is further reference to this report in the final paragraph of this memo.)

2. Valuation Results.

Our office performed an actuarial valuation of SERA as of December 31, 1963 for the Commission, with results as shown in the 1965 Commission Report, page 18. These are shown below in summary form with the December 31, 1964 results as given on page 12 of the SERA Report for comparison:

<u>Item</u>	<u>December 31, 1963</u> <u>(Commission Actuaries)</u>	<u>December 31, 1964</u> <u>(SERA Actuaries)</u>
Normal Cost	\$ 5.54 million (5.33% of covered payroll of \$104 million)	\$ 5.58 million (5.12% of covered payroll of \$109 million)
Accrued Assets	\$ 71 million	\$ 77 million
Accrued Liabilities	111 million	98 million
Unfunded Accrued Liability (Deficit)	41 million	21 million

The Normal Costs resulting from the two valuations are quite close, 5.33% as compared to 5.12% of covered payroll.

With regard to the Deficit, there are two principal factors which result in the difference between the deficits found in the two valuations, \$41 million as compared to \$21 million. These factors are:

- (1) Valuation Dates.
- (2) Difference in Assumptions as to Retirement Age.

(1) Valuation Dates

One full year of operations separated the valuations. Although the exact amounts of actuarial gains from the year of operations are not ascertainable, there are several sources of such gains:

- (a) Excess of Contributions over Normal Cost: the 6% total Contribution produces a significant actuarial gain to the Fund, since it exceeds the Normal Cost of 5+%.
- (b) Excess Interest: the Fund has an investment yield in excess of the valuation rate of 3%. The Executive Secretary of SERA states that the approximate investment yield rate in 1964 was 3.98%.
- (c) Turnover: the Fund has experienced considerably greater turnover than was assumed in the valuation. This is shown in a study of SERA's experience in the last four years (1961-64). The result of this higher turnover is an actuarial gain to the Fund.
- (d) Other Actuarial Gains and Losses: the actual mortality experience on retired members appears from the 1961-64 study to show somewhat greater rates of mortality (resulting in a gain to the Fund) than the valuation rates of mortality.

An actuarial loss to the Fund (probably of minor amount compared with the gains listed above) has been incurred due to greater rates of disability having been experienced than were assumed in the valuation.

(2) Difference in Assumptions as to Retirement Age

The SERA actuaries, in accordance with their agreement with the SERA Board of Trustees, used throughout their valuation the assumptions derived from the experience of the Fund from 1957 to 1962, as reported in the Actuarial Survey for that period.

In our valuation as of December 31, 1963, we used the same assumptions with one major exception: instead of the Retirement Table given in the actuarial survey on page 15, which would produce a retirement age of approximately 67, we used age 65. In our opinion, the use of the retirement table based on 1957-62 experience would not adequately take into account the changes in the SERA pension formula which granted significantly higher pensions, and other important factors including liberalizations of Social Security. These considerations led to our use of the lower retirement age assumption, which in our opinion is more realistic.

The difference in retirement age assumptions results in large differences in Accrued Liability for Active Members, the largest accrued liability on the Balance Sheet. Page 13 of the SERA Valuation Report as of December 31, 1964, shows this Accrued Liability to be \$59 million. The corresponding Accrued Liability resulting from our office's valuation as of December 31, 1963 was \$74 million.

If we had used age 67 as the retirement age in our valuation, the approximate age used in the SERA Report, we would have produced a substantially lower Accrued Liability for Active Members.

Conclusion: in our opinion, the results of the two valuations are such that the differences between them are explainable, based upon the above reasoning.

The final paragraph of the SERA actuary's report, as shown on pages 14 and 15, is important. He states:

"Finally, we would like to remind the Trustees that the next valuation to be made as of December 31, 1965 will make use of new actuarial assumptions developed on the basis of an investigation into the experience of the System for the four-year period ending December 31, 1964 and, in addition, will reflect the recent change in the maximum salary considered under the Plan from \$4,800 to \$7,200 per year. For these reasons, it is reasonable to expect that the results of the December 31, 1965 valuation will differ significantly from the results of the valuation covered by this report."

Both changes in benefits and changes in assumptions introduce changes in valuation results (Normal Costs and Accrued Liabilities). There are three separate cases to be considered:

Case 1: Change in Benefit Plan Only.

Two valuations should be made:

- (1) A valuation on the "old" benefit plan.
- (2) A valuation on the "new" benefit plan.

The difference between these valuations shows the estimated cost of changes in the benefit plan.

Case 2: Changes in Assumptions Only.

Here again two valuations should be made:

- (1) A valuation on the basis of the "old" assumptions.
- (2) A valuation on the basis of the "new" assumptions.

The difference between the valuation results will show the effect on estimated costs of changes in the assumptions.

Case 3: Changes in both Benefit Plan and Assumptions.

In this case, three valuations are in order:

- (1) A valuation using the "old" benefits and "old" assumptions.
- (2) A valuation based on "old" benefit plan and "new" assumptions.

The difference between this valuation and valuation (1) will reflect the effect on estimated costs of changes in assumptions.

- (3) A valuation based on both "new" benefits and "new" assumptions.

The difference between this valuation (3) and valuation (2) will show the estimated cost of changes in the benefit plan.

The valuations to be completed for 1965 by Funds under Chapter 359 are of the type (3) under Case 3, which will reflect the financial status of the Funds under the new benefit plans after 1965 legislation. The Commission may wish to consider requesting from the Funds the additional valuations indicated above, to be furnished within a reasonable time after submission of the required valuations under the law.

We feel that SERA and its actuaries are to be commended for voluntary submission of reports which have proved invaluable to the Commission.

Gerald G. Toy
Fellow, Society of Actuaries
George V. Stennes and Associates
Commission Actuaries