1987 Actuarial Valuations

Section 1 - State Employees (General)

Section 2 - State Employees (Correctional)

Section 3 - State Patrol

Section 4 - Judges

Section 5 - Legislators

Section 6 - Elective State Officers

STATE EMPLOYEES RETIREMENT FUND
(GENERAL)

ACTUARIAL VALUATION REPORT

JULY 1, 1987

December 8, 1987

Legislative Commission on
Pensions and Retirement
55 State Office Building
St. Paul, Minnesota 55155

RE: STATE EMPLOYEES RETIREMENT FUND (GENERAL)

Commission Members:

We have prepared an actuarial valuation of the Fund as of July 1, 1987 based on membership and financial data supplied by the Fund.

We certify that to the best of our knowledge and belief this actuarial valuation was performed in accordance with the requirements of Section 356.215, Minnesota Statutes, and the requirements of the Standards for Actuarial Work, adopted by the Commission on August 26, 1987.

Respectfully submitted,

THE WYATT COMPANY

Robert E. Perkins

Robert E. Perkins, FSA
Consulting Actuary

Michael C. Gunvalson

Michael C. Gunvalson, ASA
Associate Actuary

STATE EMPLOYEES RETIREMENT FUND (GENERAL)

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STATE EMPLOYEES RETIREMENT FUND (GENERAL)

REPORT HIGHLIGHTS
(DOLLARS IN THOUSANDS)

	07/01/86 VALUATION	07/01/87 VALUATION
A. CONTRIBUTIONS (TABLE 11)		
1. Statutory Contributions - Chapter 352 % of Payroll	7.63%	7.63%
2. Required Contributions - Chapter 356 % of Payroll	6.96%	7.30%
3. Sufficiency (Deficiency) (A1-A2)	0.67%	0.33%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 2)	$1,313,155	$1,518,483
b. Current Benefit Obligations (Table 8)	$1,388,785	$1,589,505
c. Funding Ratio (a/b)	94.55%	95.53%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 2)	$1,313,155	$1,518,483
b. Actuarial Accrued Liability (Table 9)	$1,656,860	$1,894,142
c. Funding Ratio (a/b)	79.26%	80.17%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	$2,373,711	$2,610,849
b. Current and Expected Future Benefit Obligations	$2,223,246	$2,532,039
c. Funding Ratio (a/b)	106.77%	103.11%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	45,172	45,707
b. Projected Annual Earnings	$1,135,260	$1,208,043
c. Average Annual Earnings (Actual $)	$25,132	$26,430
d. Average Age	39.9	40.1
e. Average Service	9.1	9.3
2. Others		
a. Service Retirements (Table 4)	10,601	10,994
b. Disability Retirements (Table 5)	670	676
c. Survivors (Table 6)	599	671
d. Deferred Retirements (Table 7)	957	1,014
e. Terminated Other Non-vested (Table 7)	4,402	4,496
f. Total	17,229	17,851

STATE EMPLOYEES RETIREMENT FUND (GENERAL)

COMMENTARY

Purpose

The purpose of this valuation is to determine the financial status of the Fund. In order to achieve this purpose, an actuarial valuation is made at the beginning of each fiscal year as required by Section 356.215 of Minnesota Statutes.

Report Highlights

The statutory contributions for the State Employees Retirement Fund (General) are sufficient for 1987 by an amount of 0.33% of payroll. According to this valuation a contribution rate of 7.30% is required to comply with Minnesota Law.

The financial status of the Fund can be measured by three different funding ratios:

- The Accrued Benefit Funding Ratio is a measure of current funding status, and when viewed over a period of years, presents a view of the funding progress. This ratio is based on Statement No. 5 of the Governmental Accounting Standards Board. This year's ratio is 95.53%. The corresponding ratio for the prior year was 94.55%.

- The Accrued Liability Funding Ratio is also a measure of funding status and funding progress. It is based on the actuarial cost method that has historically been used. For 1987 the ratio is 80.17%, which is an increase from the 1986 value of 79.26%.

- The Projected Benefit Funding Ratio is a measure of the adequacy or deficiency in the contribution level. This ratio, which is more than 100%, verifies that the current statutory contributions are adequate.

Asset Information

Beginning in 1984, changes in Section 356.215 of Minnesota Statutes require that the asset value used for actuarial purposes reflect a portion of the unrealized gains and losses. Only a portion of these gains and losses are considered because market values are typically volatile and could produce erratic changes in the contribution requirements from year to year.

The calculation of assets for actuarial purposes begins with the reporting of Total Assets by the Fund (Table 1, line B). These Total Assets, reduced by any Amounts Currently Payable (line C), produce the Assets Available for Benefits (line D5), which is the starting value for determining the Actuarial Value of Assets.

The calculation of the Actuarial Value of Assets is shown in Table 1 on lines F1 to F6. It combines the cost value and one-third of the difference between market value and cost value.

The term "Actuarial Value of Assets" is used to indicate that the value was determined for use in this actuarial valuation. Since Minnesota Statutes refer to this value as "Current Assets", the latter phrase will be used in the remainder of this report.

Since this Fund participates in the Minnesota Post Retirement Investment Fund, referred to as MPRIF, the asset value shown on line A3 is initially calculated by the State Board of Investment(SBI), and is the expected amount of MPRIF participation assuming the Fund earns 5% interest. The actual amount is determined by calculating the liability based on annuitant information supplied by the Fund. If the actual liability is larger than expected, the difference is labeled a mortality loss and if smaller a gain.

Investment performance by SBI above the 5% level is not shown in the assets but will be added in on January 1, 1988 when benefits will be increased for those annuitants who have been receiving payments for 18 months. Next year's valuation will include the 1988 benefit increase in determining the MPRIF value.

After the MPRIF liability has been calculated for each participating Fund, SBI will determine each Fund's portion of the excess earnings for the January benefit increase as well as the Fund's allocated market share of MPRIF. An approximation of those values on June 30, 1987 provides the following relative comparison.

MPRIF Reserves	$564,015,000
Reserves Plus Excess Earnings	601,000,000
MPRIF Market Value	637,000,000

Membership Data

Tables 3 through 6 summarize statistical information on members by category. Active members are grouped by age and completed years of service in Table 3. The earnings shown for these members are for the prior fiscal year.

The service retirements are shown in Table 4 and disabled members are shown in Table 5. The survivors category (Table 6) includes spouses and children of deceased members.

Actuarial Balance Sheet

An actuarial balance sheet is required by Section 356.215, Subdivision 4f of Minnesota Law. This balance sheet (Table 8) establishes a method for evaluating both current and future levels of funding.

Current funding levels are evaluated by comparing Current Assets on line A to Current Benefit Obligations on line D5. The difference between the obligations and the assets is shown as Current Unfunded Actuarial Liability on line G.

The Current Benefit Obligation amounts in Table 8 are required to be disclosed by Statement No. 5 of Governmental Accounting Standards Board (GASB). However, Statement No. 5 uses the terms "Actuarial Present Value of Credited Projected Benefits" and "Pension Benefit Obligation" rather than "Current Benefit Obligation".

The first step in the calculation for active members involves projecting salaries and service to determine future benefits payable under the plan and then discounting those projected benefits to the date of the valuation. The second step is to determine the discounted value of benefits for the non-active members. For those non-active members whose benefits have not commenced, the liability includes augmentation of benefits to date of commencement. The result of the first two steps is shown on line F, Total Current and Expected Future

Benefit Obligations.

The third step is to determine the portion that represents Current Benefit Obligations. In the case of active members the Current Benefit Obligation is computed by attributing an equal benefit amount to each year of credited and expected future employee service. For all others, their entire liability is considered a Current Benefit Obligation.

Current and future funding levels are evaluated by comparing Current and Future Expected Assets on line C to Current and Expected Future Benefit Obligations on line F. The difference between the obligations and the assets is shown as the Current and Future Unfunded Actuarial Liability on line H.

Since line F has already been calculated, the remaining step is to determine the Expected Future Assets . The statutory contribution rate in excess of the combined normal cost rate and expense rate is first calculated. The amount of assets for line B1 can be determined by projecting from the valuation date to the amortization date (the date for paying off all unfunded liabilities) on the assumption that total payroll is increasing at 6.5% annually and then discounted to the date of the valuation.

The Current Unfunded Actuarial Liability, line G, is a measurement of the status of the funding to the date of the valuation. The Current and Future Unfunded Actuarial Liability is a measurement of the adequacy of the current statutory contribution level.

GASB Disclosure

Table 8 shows that on July 1, 1987, the Pension Benefit Obligation consisted of the following components:

Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$582,630,000
Current Employees -	
Accumulated employee contributions including allocated investment income	325,851,000 *
Employer-financed vested	541,697,000
Employer-financed nonvested	139,327,000
Total Pension Benefit Obligation	$1,589,505,000

* Estimated

Contribution Sufficiency

The approach used by the State of Minnesota to determine contribution sufficiency is the Entry Age Normal Cost Method. The primary characteristic of this method is that it allocates costs as a level percentage of payroll.

A comparison of this actuarial method (Table 9) to the actuarial balance sheet (Table 8) shows similarities and differences. The similarity is that both approaches calculate the value of all future benefits the same way. This can be verified by comparing line F of Table 8 to line A6, column 1, of Table 9. The difference arises from the technique for allocating liabilities of active members to past and future. As noted in the prior section, the balance sheet allocates benefits and the corresponding liabilities, on the basis of service. The method used in Table 9 allocates liabilities so that the cost each year will be a constant percentage of payroll.

An Unfunded Actuarial Accrued Liability is computed under the Entry Age Normal Cost Method by comparing the liabilities allocated to past service (Actuarial Accrued Liability) to the Current Assets. This amount, line B3, is funded over the remaining years to the amortization date by a series of payments. Prior to 1984 these payments were calculated to be a level dollar amount similar to a fixed interest rate mortgage. The method of funding was changed in 1984 to produce a series of payments that remain a constant percentage of payroll each year.

Under this new approach the payments will increase 6.5% each year since that is the assumed rate of increase in payroll. Although the payment schedule will be adequate to amortize the existing unfunded, the lower payments in the earlier years will not be sufficient to cover the interest on the unfunded liability. After a few years the annual payment will cover the interest and also repay a portion of the unfunded.

Projected Cash Flow

Table 12 illustrates the anticipated cash flow over the amortization period. The cash flow begins with the Non-MPRIF Assets, which are the Current Assets reduced by the MPRIF Reserves. Contributions are then added based on the present statutory rates for employers and employees. As members become eligible for payments from MPRIF an amount of reserve is transferred to MPRIF. The other disbursements represent benefit payments and expenses made directly by the Fund.

This projected cash flow assumes that future payrolls increase by 6.5%. For purposes of this table only, new members are assumed to be hired in order to replace those who terminate from the active group. This open group method provides a more realistic picture of future cash flow. The statutory interest rate of 8% is used to project future investment return.

The amounts transferred to MPRIF will be affected by the number of members who reach the assumed retirement age during a given year. The amount for 1989 is large because it includes those already over age 65 who are assumed to retire a year from the valuation date.

Plan Provisions

Vesting eligibility has been reduced from 10 years to 5 years. This change applies to the Deferred Annuity, the Normal Retirement Benefit, the Early Retirement Benefit, the Disability Benefit and the Surviving Spouse Benefit. Coincident with this eligibility change, a different calculation technique was adopted which assumes that the terminating vested member takes the larger of contributions with interest or a deferred annuity. Previously, the technique assumed that a deferred annuity was selected by 40% of the terminating vested members.

Prior to the changes in technique and eligibility there was an Unfunded Actuarial Accrued Liability of $285,743,000, (see Table 10, line E). This liability was amortized to July 1, 2010. The increase in Unfunded Actuarial Accrued Liability because of the technique and eligibility changes requires that the funding period be increased to July 1, 2011 (see Table 11, line B2).

	Impact Due to Change In	
	Technique	Eligibility
Actuarial Accrued Liability	$ 84,993,000	$ 4,923,000
Normal Cost	.27%	.13%
Supplemental Contribution	.31%	.02%
Required Contribution	.58%	.15%

General and Correctional

Table 2 allocates the Current Assets between the General and Correctional Plans. This allocation is performed by separating the assets between MPRIF and Non-MPRIF. The MPRIF portion is allocated automatically as a result of the liability calculations at the beginning of the year.

The Non-MPRIF portion, referred to in Table 2 as the Allocable Assets, is determined by starting with last year's allocation and projecting to the current valuation date based on the receipts and disbursements by Plan. Numbers marked with an asterisk represent approximations based on the following assumptions:

- o Line H2 - Places all of the State appropriation and the Non-MPRIF payouts in the General Plan.
- o Line H4 - Assumes expenses in proportion to prior fiscal year salary.
- o Line H5 - Allocates the MPRIF mortality loss in proportion to the MPRIF reserves at the end of the year.

TABLE 1

STATE EMPLOYEES RETIREMENT FUND

ACCOUNTING BALANCE SHEET
(DOLLARS IN THOUSANDS)

July 1, 1987

	MARKET VALUE	COST VALUE
A. ASSETS		
1. Cash, Equivalents, Short-Term Securities	$67,078	$67,078
2. Investments		
a. Fixed Income	235,456	242,447
b. Equity	724,197	552,410
c. Real Estate	87,464	75,424
3. Equity in Minnesota Post-Retirement Investment Fund (MPRIF)	586,695	586,695
4. Other	4,773	4,773
B. TOTAL ASSETS	$1,705,663	$1,528,827
C. AMOUNTS CURRENTLY PAYABLE	$1,801	$1,801
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	$271,658	$271,658
2. Employer Reserves	845,509	668,673
3. MPRIF Reserves	586,695	586,695
4. Non-MPRIF Reserves	0	0
5. Total Assets Available for Benefits	$1,703,862	$1,527,026
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	$1,705,663	$1,528,827

F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS		
1. Cost Value of Assets Available for Benefits (D5)		$1,527,026
2. Market Value (D5)	$1,703,862	
3. Cost Value (D5)	1,527,026	
4. Market Over Cost (F2-F3)	$176,836	
5. 1/3 of Market Over Cost(F4)/3		58,945
6. Actuarial Value of Assets (F1+F5) (Same as "Current Assets")		$1,585,971

TABLE 2

STATE EMPLOYEES RETIREMENT FUND

CHANGES IN ASSETS AVAILABLE FOR BENEFITS AND ASSET ALLOCATION
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1987

	MARKET VALUE	COST VALUE
A. ASSETS AVAILABLE AT BEGINNING OF YEAR	$1,473,359	$1,318,394
B. OPERATING REVENUES		
1. Member Contributions	$40,625	$40,625
2. Employer Contributions	42,911	42,911
3. Investment Income	101,960	101,960
4. MPRIF Income	70,114	70,114
5. Net Realized Gain (Loss)	20,104	20,104
6. Other (Includes State Appropriation)	1,245	1,245
7. Net Change in Unrealized Gain (Loss)	21,871	0
8. Total Revenue	$298,830	$276,959
C. OPERATING EXPENSES		
1. Service Retirements	$54,593	$54,593
2. Disability Benefits	2,464	2,464
3. Survivor Benefits	0	0
4. Refunds	7,996	7,996
5. Expenses	2,867	2,867
6. Other	57	57
7. Total Disbursements	$67,977	$67,977
D. OTHER CHANGES IN RESERVES	(350)	(350)
E. ASSETS AVAILABLE AT END OF YEAR	$1,703,862	$1,527,026

TABLE 2
(cont)

STATE EMPLOYEES RETIREMENT FUND

CHANGES IN ASSETS AVAILABLE FOR BENEFITS AND ASSET ALLOCATION
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1987

	GENERAL	CORRECTIONAL	TOTAL
F. BEGINNING OF YEAR			
1. Current Assets	$1,313,155	$56,894	$1,370,049
2. MPRIF Reserves	477,287	20,058	497,345
3. Allocable Assets(F1-F2)	835,868	36,836	872,704
G. RECEIPTS			
1. Member Contributions	39,078	1,547	40,625
2. Employer Contributions	40,151	2,760	42,911
3. Other	1,245	0	1,245
4. Total	80,474	4,307	84,781
H. DISBURSEMENTS			
1. MPRIF New Annuitants	71,975	1,580	73,555
2. Non-MPRIF Benefits	1,242 *	0 *	1,242
3. Refunds	7,746	250	7,996
4. Expenses	2,781 *	86 *	2,867
5. Other	1,845 *	58 *	1,903
6. Total	85,589	1,974	87,563
I. EXPECTED INVESTMENT RETURN 8% OF (F3+.5XG4-.5X(H6-H5))	66,739	3,042	69,781
J. ALLOCATION OF REMAINING ASSETS IN PROPORTION TO LINE I	56,976	2,597	59,573
K. END OF YEAR			
1. Allocable Assets	954,468	44,808	999,276
2. MPRIF Reserves	564,015	22,680	586,695
3. Current Assets	1,518,483	67,488	1,585,971

* Allocated by Wyatt

TABLE 3

STATE EMPLOYEES RETIREMENT FUND (GENERAL)

ACTIVE MEMBERS AS OF JUNE 30, 1987

AGE	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
<25	1,200	723	79						2,002
25-29	1,888	2,752	1,471	42					6,153
30-34	1,436	2,460	2,960	1,210	73				8,139
35-39	998	1,919	2,549	2,067	984	95			8,612
40-44	612	1,227	1,412	1,281	1,318	560	13		6,423
45-49	345	734	987	781	698	661	304	35	4,545
50-54	186	507	665	668	517	451	314	295	3,603
55-59	114	326	594	528	550	396	337	344	3,189
60-64	53	186	407	488	548	313	139	297	2,431
65+	7	30	109	146	136	83	37	62	610
TOTAL	6,839	10,864	11,233	7,211	4,824	2,559	1,144	1,033	45,707

AVERAGE ANNUAL EARNINGS

AGE	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25	7,888	15,354	15,849						10,899
25-29	10,577	18,763	20,373	21,116					16,652
30-34	11,013	19,810	22,697	23,214	22,986				19,842
35-39	10,706	20,128	24,218	26,552	26,300	25,447			22,552
40-44	10,968	20,680	24,520	27,861	29,935	29,094	31,946		24,686
45-49	9,346	20,370	23,759	27,620	28,917	31,031	30,778	32,586	25,168
50-54	7,113	19,134	23,225	25,382	27,357	29,380	32,703	31,677	25,099
55-59	8,912	18,219	22,586	24,999	25,905	27,496	33,015	32,451	25,399
60-64	5,978	17,159	22,133	24,452	25,545	26,737	27,926	32,151	24,783
65+	1,355	13,027	17,034	22,806	25,536	26,388	25,845	28,682	22,925
ALL	10,022	19,297	22,962	25,868	27,583	28,886	31,472	31,922	21,848

PRIOR FISCAL YEAR EARNINGS (IN THOUSANDS) BY YEARS OF SERVICE

≤1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
68,538	209,643	257,933	186,537	133,059	73,919	36,004	32,976	998,609

TABLE 4

STATE EMPLOYEES RETIREMENT FUND (GENERAL)

SERVICE RETIREMENTS AS OF JUNE 30, 1987

AGE	YEARS RETIRED <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50								0
50-54	1							1
55-59	96	173						269
60-64	329	978	46					1,353
65-69	160	1,573	1,056	12				2,801
70-74	11	310	1,819	563	11	1		2,715
75-79		14	153	1,587	142	14		1,910
80-84		1	2	369	675	82	17	1,146
85+	1		1	10	251	323	213	799
TOTAL	598	3,049	3,077	2,541	1,079	420	230	10,994

AVERAGE ANNUAL ANNUITY

AGE	YEARS RETIRED <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50								0
50-54	5,044							5,044
55-59	8,638	7,321						7,791
60-64	6,170	6,761	5,145					6,562
65-69	5,267	5,013	6,171	3,428				5,458
70-74	4,227	4,564	4,559	4,437	2,332	1,085		4,523
75-79		4,492	4,006	4,057	2,831	1,795		3,948
80-84		3,240	3,582	4,131	2,767	2,637	2,286	3,192
85+	13,204		1,075	5,105	3,076	2,428	2,690	2,747
ALL	6,299	5,656	5,092	4,153	2,843	2,444	2,660	4,724

TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
3,767	17,245	15,668	10,552	3,068	1,027	612	51,939

TABLE 5

STATE EMPLOYEES RETIREMENT FUND (GENERAL)

DISABILITY RETIREMENTS AS OF JUNE 30, 1987

AGE	YEARS DISABLED <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50	7	13	7	2				29
50-54	3	15	7	3				28
55-59	8	28	18	1	1	1		57
60-64	10	64	58	25	4	3		164
65-69		25	103	32	7	2	1	170
70-74			43	80	15	3		141
75-79			1	18	19	7	3	48
80-84					10	14	3	27
85+						3	9	12
TOTAL	28	145	237	161	56	33	16	676

AVERAGE ANNUAL BENEFIT

AGE	YEARS DISABLED <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50	4,346	3,320	3,263	2,438				3,493
50-54	7,104	4,210	3,709	1,572				4,112
55-59	3,707	3,812	4,469	3,915	2,859	1,639		3,952
60-64	3,512	3,607	4,461	2,894	2,363	2,502		3,744
65-69		3,015	4,060	3,270	2,347	761	3,000	3,642
70-74			2,532	3,267	2,135	2,482		2,906
75-79			854	3,471	2,441	2,772	2,964	2,875
80-84					2,441	1,658	2,283	2,017
85+						2,035	2,875	2,665
TOTAL	4,161	3,581	3,865	3,194	2,349	2,025	2,788	3,416

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS OF DISABILITY

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
117	519	915	514	132	67	45	2,309

TABLE 6

STATE EMPLOYEES RETIREMENT FUND (GENERAL)

SURVIVORS AS OF JUNE 30, 1987

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50	7	9	1	1				18
50-54	6	10	1					17
55-59	8	21	5	1				35
60-64	20	76	20	3			1	120
65-69	24	63	30	8		1		126
70-74	15	39	35	26		1	3	119
75-79	7	24	36	32			2	101
80-84	2	13	14	34	1	1	2	67
85+	2	8	9	47			2	68
TOTAL	91	263	151	152	1	3	10	671

AVERAGE ANNUAL BENEFIT

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50	2,700	3,232	2,190	1,902				2,893
50-54	5,215	3,667	2,100					4,121
55-59	3,344	4,149	5,417	1,202				4,062
60-64	5,974	4,727	3,939	1,669			1,794	4,702
65-69	4,466	3,969	4,105	2,461		1,779		3,983
70-74	4,065	3,702	4,246	3,327		1,752	1,790	3,761
75-79	2,096	3,473	3,561	2,784			1,813	3,158
80-84	1,062	2,245	2,586	2,310	467	1,756	1,834	2,268
85+	2,392	1,504	2,376	2,004			1,811	2,000
ALL	4,243	3,920	3,760	2,475	467	1,762	1,808	3,554

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
386	1,032	568	376	0	5	18	2,385

TABLE 7

STATE EMPLOYEES RETIREMENT FUND (GENERAL)

RECONCILIATION OF MEMBERS

	ACTIVES	TERMINATED: DEFERRED RETIREMENT	TERMINATED: OTHER NON-VESTED
A. On June 30, 1986	45,172	957	4,402
B. Additions	5,325	200	1,485
C. Deletions:			
1. Service Retirement	(753)	(93)	(5)
2. Disability	(37)		(1)
3. Death	(70)	(2)	(6)
4. Terminated-Deferred	(103)		(11)
5. Terminated-Refund	(2,616)	(14)	(434)
6. Terminated-Other Non-vested	(1,085)	(1)	
7. Returned as Active		(17)	(213)
D. Data Adjustments	(126)	(16)	(721)
Vested	28,004		
Non-Vested	17,703		
E. Total on June 30, 1987	45,707	1,014	4,496

	RECIPIENTS: RETIREMENT ANNUITANTS	RECIPIENTS: DISABLED	RECIPIENTS: SURVIVORS
A. On June 30, 1986	10,601	670	599
B. Additions	835	48	84
C. Deletions:			
1. Service Retirement		0	
2. Death	(444)	(38)	(19)
3. Annuity Expired	0	0	0
4. Returned as Active	0	0	
D. Data Adjustments	2	(4)	7
E. Total on June 30, 1987	10,994	676	671

TABLE 8

STATE EMPLOYEES RETIREMENT FUND (GENERAL)

ACTUARIAL BALANCE SHEET (DOLLARS IN THOUSANDS)

JULY 1, 1987

A. CURRENT ASSETS (TABLE 2, K3)			$1,518,483
B. EXPECTED FUTURE ASSETS			
1. Present Value of Expected Future Statutory Supplemental Contributions			454,469
2. Present Value of Future Normal Costs			637,897
3. Total Expected Future Assets			1,092,366
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS			$2,610,849

D. CURRENT BENEFIT OBLIGATIONS	Non-Vested	Vested	Total
1. Benefit Recipients			
a. Retirement Annuities		$516,900	$516,900
b. Disability Benefits		21,137	21,137
c. Surviving Spouse and Child Benefits		25,978	25,978
2. Deferred Retirements with Future Augmentation		16,174	16,174
3. Former Members without Vested Rights		2,441	2,441
4. Active Members			
a. Retirement Annuities	16,556	644,297	660,853
b. Disability Benefits	51,387	0	51,387
c. Survivors' Benefits	63,489	0	63,489
d. Deferred Retirements	7,895	186,687	194,582
e. Refund Liability Due to Death or Withdrawal	0	36,564	36,564
5. Total Current Benefit Obligations	$139,327	$1,450,178	$1,589,505

E. EXPECTED FUTURE BENEFIT OBLIGATIONS	$942,534
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS	$2,532,039
G. CURRENT UNFUNDED ACTUARIAL LIABILITY (D5-A)	$71,022
H. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F-C)	($78,810)

TABLE 9

STATE EMPLOYEES RETIREMENT FUND (GENERAL)

**DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)
AND SUPPLEMENTAL CONTRIBUTION RATE
(DOLLARS IN THOUSANDS)**

JULY 1, 1987

	ACTUARIAL PRESENT VALUE OF PROJECTED BENEFITS (1)	ACTUARIAL PRESENT VALUE OF FUTURE NORMAL COSTS (2)	ACTUARIAL ACCRUED LIABILITY (3)=(1)-(2)
A. DETERMINATION OF ACTUARIAL ACCRUED LIABILITY (AAL)			
1. Active Members			
a. Retirement Annuities	$1,344,758	$371,000	$973,758
b. Disability Benefits	97,471	30,052	67,419
c. Survivors Benefits	118,890	35,212	83,678
d. Deferred Retirements	328,223	116,937	211,286
e. Refunds Due to Death or Withdrawal	60,067	84,696	(24,629)
f. Total	$1,949,409	$637,897	$1,311,512
2. Deferred Retirements with Future Augmentation	$16,174		$16,174
3. Former Members Without Vested Rights	2,441		2,441
4. Annuitants in MPRIF	564,015		564,015
5. Recipients Not in MPRIF	0		0
6. Total AAL	$2,532,039	$637,897	$1,894,142
B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)			
1. AAL (A6)			$1,894,142
2. Current Assets (Table 2, K3)			1,518,483
3. UAAL (B1-B2)			$375,659
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE			
1. Present Value of Future Payrolls through the Amortization Date of July 1, 2011			$23,794,189
2. Supplemental Contribution Rate (B3/C1)			1.58%

TABLE 10

STATE EMPLOYEES RETIREMENT FUND (GENERAL)

CHANGES IN UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1987

A. UAAL AT BEGINNING OF YEAR	$343,705
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	$56,784
2. Contribution	(79,229)
3. Interest on A, B1, and B2	26,599
4. Total (B1+B2+B3)	$4,154
C. EXPECTED UAAL AT END OF YEAR (A+B4)	$347,859
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	($14,312)
2. Investment Return	(56,976)
3. MPRIF Mortality	$1,438
4. Mortality of Other Benefit Recipients	0
5. Other Items	7,734
6. Total	($62,116)
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D6)	$285,743
F. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO PLAN AMENDMENTS	$4,923
G. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS	$84,993
H. UAAL AT END OF YEAR (E+F+G)	$375,659

TABLE 11

STATE EMPLOYEES RETIREMENT FUND (GENERAL)

DETERMINATION OF CONTRIBUTION SUFFICIENCY
(DOLLARS IN THOUSANDS)

JULY 1, 1987

	% OF PAYROLL	$ AMOUNT
A. STATUTORY CONTRIBUTIONS - CHAPTER 352		
1. Employee Contributions	3.73%	$45,060
2. Employer Contributions	3.90%	47,114
3. Total	7.63%	$92,174
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	3.22%	$38,786
b. Disability Benefits	0.24%	2,954
c. Survivors	0.28%	3,393
d. Deferred Retirement Benefits	0.95%	11,431
e. Refunds Due to Death or Withdrawal	0.76%	9,237
f. Total	5.45%	$65,801
2. Supplemental Contribution Amortization by July 1, 2011 of UAAL of $375,659	1.58%	$19,087
3. Allowance for Expenses	0.27%	$3,262
4. Total	7.30%	$88,150
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) (A3-B4)	0.33%	$4,024

Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1987 is $1,208,043

TABLE 12

STATE EMPLOYEES RETIREMENT FUND (GENERAL)

PROJECTED CASH FLOW
(DOLLARS IN THOUSANDS)

FISCAL YEAR	STATUTORY CONTRIBUTIONS	TRANSFERS TO MPRIF	OTHER DISBURSEMENTS	INVESTMENT RETURN	NON-MPRIF ASSETS YEAR END
1987					$954,468
1988	$92,174	$14,881	$13,181	$78,922	1,097,502
1989	98,165	69,273	28,288	87,824	1,185,930
1990	104,546	44,594	38,425	95,735	1,303,192
1991	111,341	59,715	46,424	104,463	1,412,857
1992	118,578	72,063	53,366	112,755	1,518,761
1993	126,286	79,141	59,248	121,017	1,627,675
1994	134,494	86,616	64,630	129,544	1,740,467
1995	143,237	94,516	69,441	138,409	1,858,156
1996	152,547	106,488	74,023	147,534	1,977,726
1997	162,463	129,382	79,126	156,376	2,088,057
1998	173,023	145,423	84,045	164,787	2,196,399
1999	184,269	151,613	88,800	173,466	2,313,721
2000	196,247	162,915	93,655	182,685	2,436,083
2001	209,003	179,504	98,533	192,125	2,559,174
2002	222,588	214,221	103,557	200,926	2,664,910
2003	237,056	241,501	108,651	208,669	2,760,483
2004	252,465	258,797	113,217	216,057	2,856,991
2005	268,875	277,586	117,608	223,507	2,954,179
2006	286,352	297,427	122,215	231,003	3,051,892
2007	304,965	365,153	126,688	236,676	3,101,692
2008	324,787	398,054	131,671	239,938	3,136,692
2009	345,898	403,938	135,316	243,201	3,186,537
2010	368,382	415,239	140,646	247,423	3,246,457
2011	392,327	446,821	144,932	251,740	3,298,771
2012	417,828	571,958	150,971	251,698	3,245,368

TABLE 13

STATE EMPLOYEES RETIREMENT FUND (GENERAL)

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

Interest:	Pre-Retirement: 8% per annum Post-Retirement: 5% per annum
Salary Increases:	Reported salary at valuation date increased 6.5% to current fiscal year and 6.5% annually for each future year. Prior fiscal year salary is annualized for new Members.
Mortality:	Pre-Retirement: Male - 1971 Group Annuity Mortality Table Female - 1971 Group Annuity Mortality Table male rates set back 8 years Post-Retirement: Male - Same as above Female - Same as above Post-Disability: Male - Combined Annuity Mortality Table Female - Combined Annuity Mortality Table
Retirement Age:	Graded rates beginning at age 58 as shown in rate table. Members who have attained the highest assumed retirement age will retire in one year.
Separation:	Graded rates based on actual experience developed by the June 30, 1971 experience analysis. Rates are shown in rate table.
Disability:	Rates adopted by MSRS as shown in rate table.
Expenses:	Prior year expenses expressed as a percentage of prior year payroll. (0.27% of payroll)
Return Contributions:	60% of vested Members separating before retirement of elect return of contributions in lieu of deferred benefit. Effective July 1, 1987, all employees withdrawing after becoming eligible for a deferred benefit were assumed to take the larger of their contributions accumulated with interest or the value of their deferred benefit.

TABLE 13
(cont)

Family Composition:	85% of Members are married. Female is three years younger than male. Married families have 1 child.
Social Security:	NA
Benefit Increases after Retirement:	Payment of earnings on retired reserves in excess of 5% accounted for by 5% post-retirement assumptions.
Special Consideration:	NA
Actuarial Cost Method:	Entry Age Normal Cost Method with normal costs expressed as a level percentage of earnings. Under this method Actuarial Gains(Losses) reduce(increase) the Unfunded Actuarial Accrued Liability.
Asset Valuation Method:	Cost Value plus one-third Unrealized Gains or Losses.
Payment on the Unfunded Actuarial Accrued Liability:	A level percentage of payroll each year to the statutory amortization date assuming payroll increases of 6.5% per annum.
Projected Cash Flow Method:	Cash flows from the Non-MPRIF portion of the Fund were projected based on the current plan benefits, participant data, and actuarial assumptions. In addition, new entrants were assumed so that the total payroll would increase by 6.5% per annum.

TABLE 13
(cont)

SEPARATIONS EXPRESSED AS THE NUMBER OF OCCURRENCES PER 10,000

Age	Death Male	Death Female	Withdrawal Male	Withdrawal Female	Disability Male	Disability Female	Retirement Male	Retirement Female
20	5	4	2,400	3,700	0	0	0	0
21	5	4	2,250	3,550	0	0	0	0
22	5	4	2,080	3,390	0	0	0	0
23	6	4	1,920	3,230	0	0	0	0
24	6	4	1,760	3,070	0	0	0	0
25	6	5	1,600	2,910	0	0	0	0
26	7	5	1,470	2,750	0	0	0	0
27	7	5	1,340	2,600	0	0	0	0
28	7	5	1,230	2,430	0	0	0	0
29	8	5	1,130	2,270	0	0	0	0
30	8	5	1,040	2,120	2	0	0	0
31	9	6	950	1,970	2	0	0	0
32	9	6	890	1,820	2	0	0	0
33	10	6	830	1,680	2	0	0	0
34	10	7	770	1,540	2	0	0	0
35	11	7	720	1,410	2	1	0	0
36	12	7	680	1,300	2	1	0	0
37	13	8	640	1,190	2	1	0	0
38	14	8	600	1,090	2	1	0	0
39	15	9	560	1,000	2	2	0	0
40	16	9	530	920	2	2	0	0
41	18	10	500	850	2	2	0	0
42	20	10	480	780	2	4	0	0
43	23	11	460	720	3	4	0	0
44	26	12	430	680	3	4	0	0
45	29	13	410	630	3	5	0	0
46	33	14	390	590	5	6	0	0
47	38	15	370	560	7	7	0	0
48	42	16	350	530	9	7	0	0
49	47	18	340	500	11	10	0	0
50	53	20	320	470	14	10	0	0
51	59	23	300	440	16	12	0	0
52	65	26	280	410	20	14	0	0
53	71	29	260	390	24	16	0	0
54	78	33	240	360	28	20	0	0

TABLE 13
(cont)

Age	Death Male	Death Female	Withdrawal Male	Withdrawal Female	Disability Male	Disability Female	Retirement Male	Retirement Female
55	85	38	210	330	34	24	0	0
56	93	42	170	290	40	30	0	0
57	100	47	140	230	46	36	0	0
58	109	53	90	170	56	44	30	50
59	119	59	40	90	66	52	30	50
60	131	65	0	0	76	62	40	150
61	144	71	0	0	90	74	150	150
62	159	78	0	0	110	88	500	200
63	174	85	0	0	136	104	500	350
64	192	93	0	0	174	122	2,000	1,100
65	213	100	0	0	0	0	10,000	10,000
66	236	109	0	0	0	0	0	0
67	263	119	0	0	0	0	0	0
68	292	131	0	0	0	0	0	0
69	324	144	0	0	0	0	0	0
70	361	159	0	0	0	0	0	0

TABLE 14

STATE EMPLOYEES RETIREMENT FUND (GENERAL)

SUMMARY OF PLAN PROVISIONS

Eligibility	State employees, non-academic staff of the University of Minnesota, and employees of certain Metro level governmental units, unless excluded by law.
Contributions	
Member	3.73% of Salary.
Employer	3.90% of Salary.
Allowable Service	Service during which Member contributions were made. May also include certain leaves of absence, military service, and periods while temporary Worker's Compensation is paid.
Salary	Includes wages, allowances, and fees. Excludes lump sum payments at separation.
Average Salary	Average of the 5 highest successive years (60 successive months) of Salary.
RETIREMENT	
Normal Retirement Benefit	
Eligibility	Age 65 and 5 years of Allowable Service. <u>(Amended 1987)</u> Age 62 and 30 years of Allowable Service.
Amount	1% of Average Salary for the first 10 years of Allowable Service and 1.5% of Average Salary for each subsequent year.
Early Retirement Benefit	
Eligibility	Age 55 and 5 years of Allowable Service. <u>(Amended 1987)</u> Any age with 30 years of Allowable Service.
Amount	Normal Retirement Benefit based on Allowable Service and Average Salary at retirement date with augmentation to age 65 (or age 62 if 30 years of Allowable Service) and actuarial reduction for each month the Member is under age 65 (or age 62 if 30 years of Allowable Service) at the time of retirement.
Form of Payment	Life annuity. Actuarially equivalent options are: 50% or 100% joint and survivor 15 year certain and life thereafter.
Benefit Increases	Benefits may be increased each January 1 depending on the investment performance of the Minnesota Post Retirement Investment Fund (MPRIF).

TABLE 14

(cont)

DISABILITY	
Disability Benefit	
Eligibility	Total and permanent disability before age 65 with 5 years of Allowable Service. (Amended 1987)
Amount	Normal Retirement Benefit based on Allowable Service and Average Salary at disability without reduction for commencement before age 65. Payments stop at age 65, or earlier if disability ceases or death occurs. Benefits may be reduced on resumption of partial employment.
Form of Payment	Same as for retirement.
Benefit Increases	Same as for retirement.
Retirement After Disability	
Eligibility	Age 65 with continued disability.
Amount	Any optional annuity continues. Otherwise a normal retirement benefit equal to the disability benefit paid before age 65 or an actuarially equivalent optional annuity.
Benefit Increases	Same as for retirement.
DEATH	
Surviving Spouse Benefit	
Eligibility	Member or former Member who dies before retirement or disability benefits commence if age 50 with 5 years of Allowable Service or any age with 30 years of Allowable Service. If the Member dies before age 55 and has less than 30 years of Allowable Service, benefits commence when Member would have been age 55. (Amended 1987)
Amount	Surviving spouse receives the 100% joint and survivor benefit the Member could have elected if terminated. In lieu of this benefit the surviving spouse may elect a refund of contributions with interest.
Benefit Increases	Same as for retirement.

TABLE 14

(cont)

Refund of Contributions

Eligibility	Active employee dies and survivor benefits are not payable, or a former employee dies before annuity begins, or a former employee who is not entitled to an annuity dies.
Amount	The Member's contributions with 5% interest.
Eligibility	Retired or disabled annuitant who did not select an optional annuity dies, or the remaining recipient of an option dies.
Amount	The excess of the Member's contributions with 5% interest over all benefits paid.

TERMINATION

Refund of Member's Contributions

Eligibility	Termination of state service.
Amount	Member's contributions with 5% interest. A deferred annuity may be elected in lieu of a refund.

Deferred Benefit

Eligibility	5 years of Allowable Service. (Amended 1987)
Amount	Benefit computed under law in effect at termination and increased by the following annual percentage: 0% before 7/1/71, 5% from 7/1/71 to 1/1/81, and 3% thereafter until the annuity begins. Amount is payable as a normal or early retirement.

TABLE 15

STATE EMPLOYEES RETIREMENT FUND (GENERAL)

MILITARY AFFAIRS CALCULATION

Section 352.85 of Chapter 352 of Minnesota Statutes provides that certain military affairs personnel may retire, with an unreduced benefit, at age 60. In addition, they may receive disability benefits upon being found disqualified for retention in active military duty. To fund these special benefits, employees and employer contribute an extra 1.6% of payroll.

To recognize the effect of the unreduced early retirement benefit available at age 60, we have assumed that all military affairs personnel will retire at age 60, or if over age 60, one year from the valuation date.

The results of our calculations are as follows:

1.	Number of Active Members	5
2.	Projected Annual Earnings	$175,288
3.	Normal Cost	
	a. Dollar Amount	$ 12,623
	b. Percent of Payroll	7.21%

TABLE 16

STATE EMPLOYEES RETIREMENT FUND (GENERAL)

PILOTS CALCULATION

Section 352.86 of Chapter 352 of Minnesota Statutes provides that certain transportation department pilots may retire, with an unreduced benefit, at age 62. In addition, they may receive disability benefits upon being found disqualified for retention as pilots. To fund these special benefits, employees and employer contribute an extra 1.6% of payroll.

To recognize the effect of the unreduced early retirement benefit available at age 62, we have assumed that all pilots will retire at age 62, or if over age 62, one year from the valuation date.

The results of our calculations are as follows:

1.	Number of Active Members	2
2.	Projected Annual Earnings	$ 93,966
3.	Normal Cost	
	a. Dollar Amount	$ 7,515
	b. Percent of Payroll	8.00%

STATE EMPLOYEES RETIREMENT FUND
(CORRECTIONAL)

ACTUARIAL VALUATION REPORT

JULY 1, 1987

December 4, 1987

Legislative Commission on
Pensions and Retirement
55 State Office Building
St. Paul, Minnesota 55155

RE: STATE EMPLOYEES RETIREMENT FUND (CORRECTIONAL)

Commission Members:

We have prepared an actuarial valuation of the Fund as of July 1, 1987 based on membership and financial data supplied by the Fund.

We certify that to the best of our knowledge and belief this actuarial valuation was performed in accordance with the requirements of Section 356.215, Minnesota Statutes, and the requirements of the Standards for Actuarial Work, adopted by the Commission on August 26, 1987.

Respectfully submitted,

THE WYATT COMPANY

Robert E. Perkins

Robert E. Perkins, FSA
Consulting Actuary

Michael C. Gunvalson

Michael C. Gunvalson, ASA
Associate Actuary

STATE EMPLOYEES RETIREMENT FUND (CORRECTIONAL)

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STATE EMPLOYEES RETIREMENT FUND (CORRECTIONAL)

REPORT HIGHLIGHTS
(DOLLARS IN THOUSANDS)

	07/01/86 VALUATION	07/01/87 VALUATION
A. CONTRIBUTIONS (TABLE 11)		
1. Statutory Contributions - Chapter 352 % of Payroll	13.60%	13.60%
2. Required Contributions - Chapter 356 % of Payroll	8.57%	10.08%
3. Sufficiency (Deficiency) (A1-A2)	5.03%	3.52%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 2)	$56,894	$67,488
b. Current Benefit Obligations (Table 8)	$50,349	$61,488
c. Funding Ratio (a/b)	113.00%	109.76%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 2)	$56,894	$67,488
b. Actuarial Accrued Liability (Table 9)	$59,042	$72,081
c. Funding Ratio (a/b)	96.36%	93.63%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	$117,094	$131,111
b. Current and Expected Future Benefit Obligations	$83,876	$101,839
c. Funding Ratio (a/b)	139.60%	128.74%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	1,220	1,232
b. Projected Annual Earnings	$33,561	$35,155
c. Average Annual Earnings (Actual $)	$27,509	$28,535
d. Average Age	36.7	37.1
e. Average Service	7.4	7.8
2. Others		
a. Service Retirements (Table 4)	309	313
b. Disability Retirements (Table 5)	11	11
c. Survivors (Table 6)	8	9
d. Deferred Retirements (Table 7)	35	43
e. Terminated Other Non-vested (Table 7)	83	84
f. Total	446	460

STATE EMPLOYEES RETIREMENT FUND (CORRECTIONAL)

COMMENTARY

Purpose

The purpose of this valuation is to determine the financial status of the Fund. In order to achieve this purpose, an actuarial valuation is made at the beginning of each fiscal year as required by Section 356.215 of Minnesota Statutes.

Report Highlights

The statutory contributions for the State Employees Retirement Fund (Correctional) are sufficient for 1987 by an amount of 3.52% of payroll. According to this valuation a contribution rate of 10.08% is required to comply with Minnesota Law.

The financial status of the Fund can be measured by three different funding ratios:

- The Accrued Benefit Funding Ratio is a measure of current funding status, and when viewed over a period of years, presents a view of the funding progress. This ratio is based on Statement No. 5 of the Governmental Accounting Standards Board. This year's ratio is 109.76%. The corresponding ratio for the prior year was 113.00%.

- The Accrued Liability Funding Ratio is also a measure of funding status and funding progress. It is based on the actuarial cost method that has historically been used. For 1987 the ratio is 93.63%, which is a decrease from the 1986 value of 96.36%.

- The Projected Benefit Funding Ratio is a measure of the adequacy or deficiency in the contribution level. This ratio, which is more than 100%, verifies that the current statutory contributions are adequate.

<u>Asset Information</u>

Beginning in 1984, changes in Section 356.215 of Minnesota Statutes require that the asset value used for actuarial purposes reflect a portion of the unrealized gains and losses. Only a portion of these gains and losses are considered because market values are typically volatile and could produce erratic changes in the contribution requirements from year to year.

The calculation of assets for actuarial purposes begins with the reporting of Total Assets by the Fund (Table 1, line B). These Total Assets, reduced by any Amounts Currently Payable (line C), produce the Assets Available for Benefits (line D5), which is the starting value for determining the Actuarial Value of Assets.

The calculation of the Actuarial Value of Assets is shown in Table 1 on lines F1 to F6. It combines the cost value and one-third of the difference between market value and cost value.

The term "Actuarial Value of Assets" is used to indicate that the value was determined for use in this actuarial valuation. Since Minnesota Statutes refer to this value as "Current Assets", the latter phrase will be used in the remainder of this report.

Since this Fund participates in the Minnesota Post Retirement Investment Fund, referred to as MPRIF, the asset value shown on line A3 is initially calculated by the State Board of Investment(SBI), and is the expected amount of MPRIF participation assuming the Fund earns 5% interest. The actual amount is determined by calculating the liability based on annuitant information supplied by the Fund. If the actual liability is larger than expected, the difference is labeled a mortality loss and if smaller a gain.

Investment performance by SBI above the 5% level is not shown in the assets but will be added in on January 1, 1988 when benefits will be increased for those annuitants who have been receiving payments for 18 months. Next year's valuation will include the 1988 benefit increase in determining the MPRIF value.

After the MPRIF liability has been calculated for each participating Fund, SBI will determine each Fund's portion of the excess earnings for the January benefit increase as well as the Fund's allocated market share of MPRIF. An approximation of those values on June 30, 1987 provides the following relative comparison.

MPRIF Reserves	$ 22,680,000
Reserves Plus Excess Earnings	24,200,000
MPRIF Market Value	25,600,000

Membership Data

Tables 3 through 6 summarize statistical information on members by category. Active members are grouped by age and completed years of service in Table 3.

The earnings shown for these members are for the prior fiscal year.

The service retirements are shown in Table 4 and disabled members are shown in Table 5. The survivors category (Table 6) includes spouses and children of deceased members. The annual annuities shown in Table 4 and Table 6 represent the amount that is payable after 84 months, or age 65 if earlier.

<u>**Actuarial Balance Sheet**</u>

An actuarial balance sheet is required by Section 356.215, Subdivision 4f of Minnesota Law. This balance sheet (Table 8) establishes a method for evaluating both current and future levels of funding.

Current funding levels are evaluated by comparing Current Assets on line A to Current Benefit Obligations on line D5. The difference between the obligations and the assets is shown as Current Unfunded Actuarial Liability on line G.

The Current Benefit Obligation amounts in Table 8 are required to be disclosed by Statement No. 5 of Governmental Accounting Standards Board (GASB). However, Statement No. 5 uses the terms "Actuarial Present Value of Credited Projected Benefits" and "Pension Benefit Obligation" rather than "Current Benefit Obligation".

The first step in the calculation for active members involves projecting salaries and service to determine future benefits payable under the plan and then discounting those projected benefits to the date of the valuation. The second step is to determine the discounted value of benefits for the non-active members. For those non-active members whose benefits have not commenced, the liability includes augmentation of benefits to date of commencement. The result of the first two steps is shown on line F, Total Current and Expected Future Benefit Obligations.

The third step is to determine the portion that represents Current Benefit Obligations. In the case of active members the Current Benefit Obligation is computed by attributing an equal benefit amount to each year of credited and expected future employee service. For all others, their entire liability is considered a Current Benefit Obligation.

Current and future funding levels are evaluated by comparing Current and Future Expected Assets on line C to Current and Expected Future Benefit Obligations on line F. The difference between the obligations and the assets is shown as the Current and Future Unfunded Actuarial Liability on line H.

Since line F has already been calculated, the remaining step is to determine the Expected Future Assets . The statutory contribution rate in excess of the combined normal cost rate and expense rate is first calculated. The amount of assets for line B1 can be determined by projecting from the valuation date to the amortization date (the date for paying off all unfunded liabilities) on the assumption that total payroll is increasing at 6.5% annually and then discounted to the date of the valuation.

The Current Unfunded Actuarial Liability, line G, is a measurement of the status of the funding to the date of the valuation. The Current and Future Unfunded Actuarial Liability is a measurement of the adequacy of the current statutory contribution level.

GASB Disclosure

Table 8 shows that on July 1, 1987, the Pension Benefit Obligation consisted of the following components:

Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$ 25,348,000
Current Employees -	
Accumulated employee contributions including allocated investment income	11,418,000 *
Employer-financed vested	21,264,000
Employer-financed nonvested	3,458,000
Total Pension Benefit Obligation	$ 61,488,000

* Estimated

Contribution Sufficiency

The approach used by the State of Minnesota to determine contribution sufficiency is the Entry Age Normal Cost Method. The primary characteristic of this method is that it allocates costs as a level percentage of payroll.

A comparison of this actuarial method (Table 9) to the actuarial balance sheet (Table 8) shows similarities and differences. The similarity is that both approaches calculate the value of all future benefits the same way. This can be verified by comparing line F of Table 8 to line A6, column 1, of Table 9. The difference arises from the technique for allocating liabilities of active members to past and future. As noted in the prior section, the balance sheet allocates benefits and the corresponding liabilities, on the basis of service. The method used in Table 9 allocates liabilities so that the cost each year will be a constant percentage of payroll.

An Unfunded Actuarial Accrued Liability is computed under the Entry Age Normal Cost Method by comparing the liabilities allocated to past service (Actuarial Accrued Liability) to the Current Assets. This amount, line B3, is funded over the remaining years to the amortization date by a series of payments. Prior to 1984 these payments were calculated to be a level dollar amount similar to a fixed interest rate mortgage. The method of funding was changed in 1984 to produce a series of payments that remain a constant percentage of payroll each year.

Under this new approach the payments will increase 6.5% each year since that is the assumed rate of increase in payroll. Although the payment schedule will be adequate to amortize the existing unfunded, the lower payments in the earlier years will not be sufficient to cover the interest on the unfunded actuarial liability. After a few years the annual payment will cover the interest and also repay a portion of the unfunded.

Projected Cash Flow

Table 12 illustrates the anticipated cash flow over the amortization period. The cash flow begins with the Non-MPRIF Assets, which are the Current Assets reduced by the MPRIF Reserves. Contributions are then added based on the present statutory rates for employers and employees. As members become eligible for payments from MPRIF an amount of reserve is transferred to MPRIF. The other disbursements represent benefit payments and expenses made directly by the Fund.

This projected cash flow assumes that future payrolls increase by 6.5%. For purposes of this table only, new members are assumed to be hired in order to replace those who terminate from the active group. This open group method provides a more realistic picture of future cash flow. The statutory interest rate of 8% is used to project future investment return.

The amounts transferred to MPRIF will be affected by the number of members who reach the assumed retirement age during a given year. The amount for 1989 is large because it includes those already over age 58 who are assumed to retire a year from the valuation date.

Plan Provisions

Vesting eligibility has been reduced from 10 years to 5 years. This change applies to the Deferred Annuity, the Normal Retirement Benefit and the Surviving Spouse Benefit. Coincident with this eligibility change, a different calculation technique was adopted which assumes that the terminating vested member takes the larger of contributions with interest or a deferred annuity. Previously, the technique assumed that return of contributions was selected by 100% of the terminating vested members. The technique change also incorporates the cost of a survivor annuity since the assumption that all who terminate before retirement receive refunds has been deleted. Prior to the changes in technique and eligibility the Fund is in a surplus position (see Table 10, line E). Therefore, a new 30 year funding period is created to amortize the Unfunded Actuarial Accrued Liability resulting from these changes (see Table 11, line B2).

	Impact Due to Change In	
	Technique	Eligibility
Actuarial Accrued Liability	$ 5,785,000	$ 305,000
Normal Cost	1.03%	.27%
Supplemental Contribution	.70%	.04%
Required Contribution	1.73%	.31%

General and Correctional

Table 2 allocates the Current Assets between the General and Correctional Plans. This allocation is performed by separating the assets between MPRIF and Non-MPRIF. The MPRIF portion is allocated automatically as a result of the liability calculations at the beginning of the year.

The Non-MPRIF portion, referred to in Table 2 as the Allocable Assets, is determined by starting with last year's allocation and projecting to the current valuation date based on the receipts and disbursements by Plan. Numbers marked with an asterisk represent approximations based on the following assumptions:

- o Line H2 - Places all of the State appropriation and the Non-MPRIF payouts in the General Plan.

- o Line H4 - Assumes expenses in proportion to prior fiscal year salary.

- o Line H5 - Allocates the MPRIF mortality loss in proportion to the MPRIF reserves at the end of the year.

TABLE 1

STATE EMPLOYEES RETIREMENT FUND

ACCOUNTING BALANCE SHEET
(DOLLARS IN THOUSANDS)

July 1, 1987

	MARKET VALUE	COST VALUE
A. ASSETS		
1. Cash, Equivalents, Short-Term Securities	$67,078	$67,078
2. Investments		
a. Fixed Income	235,456	242,447
b. Equity	724,197	552,410
c. Real Estate	87,464	75,424
3. Equity in Minnesota Post-Retirement Investment Fund (MPRIF)	586,695	586,695
4. Other	4,773	4,773
B. TOTAL ASSETS	$1,705,663	$1,528,827
C. AMOUNTS CURRENTLY PAYABLE	$1,801	$1,801
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	$271,658	$271,658
2. Employer Reserves	845,509	668,673
3. MPRIF Reserves	586,695	586,695
4. Non-MPRIF Reserves	0	0
5. Total Assets Available for Benefits	$1,703,862	$1,527,026
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	$1,705,663	$1,528,827

F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS		
1. Cost Value of Assets Available for Benefits (D5)		$1,527,026
2. Market Value (D5)	$1,703,862	
3. Cost Value (D5)	1,527,026	
4. Market Over Cost (F2-F3)	$176,836	
5. 1/3 of Market Over Cost(F4)/3		58,945
6. Actuarial Value of Assets (F1+F5) (Same as "Current Assets")		$1,585,971

TABLE 2

STATE EMPLOYEES RETIREMENT FUND

CHANGES IN ASSETS AVAILABLE FOR BENEFITS AND ASSET ALLOCATION (DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1987

	MARKET VALUE	COST VALUE
A. ASSETS AVAILABLE AT BEGINNING OF YEAR	$1,473,359	$1,318,394
B. OPERATING REVENUES		
1. Member Contributions	$40,625	$40,625
2. Employer Contributions	42,911	42,911
3. Investment Income	101,960	101,960
4. MPRIF Income	70,114	70,114
5. Net Realized Gain (Loss)	20,104	20,104
6. Other	1,245	1,245
7. Net Change in Unrealized Gain (Loss)	21,871	0
8. Total Revenue	$298,830	$276,959
C. OPERATING EXPENSES		
1. Service Retirements	$54,593	$54,593
2. Disability Benefits	2,464	2,464
3. Survivor Benefits	0	0
4. Refunds	7,996	7,996
5. Expenses	2,867	2,867
6. Other	57	57
7. Total Disbursements	$67,977	$67,977
D. OTHER CHANGES IN RESERVES	(350)	(350)
E. ASSETS AVAILABLE AT END OF YEAR	$1,703,862	$1,527,026

TABLE 2
(cont)

STATE EMPLOYEES RETIREMENT FUND

CHANGES IN ASSETS AVAILABLE FOR BENEFITS AND ASSET ALLOCATION
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1987

	GENERAL	CORRECTIONAL	TOTAL
F. BEGINNING OF YEAR			
1. Current Assets	$1,313,155	$56,894	$1,370,049
2. MPRIF Reserves	477,287	20,058	497,345
3. Allocable Assets(A1-A2)	835,868	36,836	872,704
G. RECEIPTS			
1. Member Contributions	39,078	1,547	40,625
2. Employer Contributions	40,151	2,760	42,911
3. Other	1,245	0	1,245
4. Total	80,474	4,307	84,781
H. DISBURSEMENTS			
1. MPRIF New Annuitants	71,975	1,580	73,555
2. Non-MPRIF Benefits	1,242 *	0 *	1,242
3. Refunds	7,746	250	7,996
4. Expenses	2,781 *	86 *	2,867
5. Other	1,845 *	58 *	1,903
6. Total	85,589	1,974	87,563
I. EXPECTED INVESTMENT RETURN 8% OF (F3+.5XG4-.5X(H6-H5))	66,739	3,042	69,781
J. ALLOCATION OF REMAINING ASSETS IN PROPORTION TO LINE I	56,976	2,597	59,573
K. END OF YEAR			
1. Allocable Assets	954,468	44,808	999,276
2. MPRIF Reserves	564,015	22,680	586,695
3. Current Assets	1,518,483	67,488	1,585,971

* Allocated by Wyatt

TABLE 3

STATE EMPLOYEES RETIREMENT FUND (CORRECTIONAL)

ACTIVE MEMBERS AS OF JUNE 30, 1987

AGE	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
<25	32	38	1						71
25-29	34	134	56	3					227
30-34	11	102	118	35					266
35-39	12	67	69	90	15				253
40-44	7	33	49	56	22	9	1		177
45-49	5	13	27	23	19	12	2	1	102
50-54	1	10	14	29	11	11	14	3	93
55-59	1	2	7	10	7	6	2	1	36
60-64			2	1	3	1			7
65+									0
TOTAL	103	399	343	247	77	39	19	5	1,232

AVERAGE ANNUAL EARNINGS

AGE	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25	12,520	18,164	24,199						15,705
25-29	11,441	21,505	25,004	28,960					20,959
30-34	14,428	22,661	26,621	29,622					24,993
35-39	16,555	23,384	26,577	28,820	30,787				26,303
40-44	14,963	24,240	27,625	30,151	31,146	29,060	23,731		27,781
45-49	24,720	20,294	27,936	30,748	32,588	30,265	23,288	24,108	28,450
50-54	3,636	25,562	28,586	28,360	30,284	29,521	34,143	24,943	28,953
55-59	19,044	28,329	29,380	30,445	34,911	31,430	35,060	42,281	31,421
60-64			26,510	29,637	29,569	29,944			28,758
65+									0
ALL	13,573	22,120	26,724	29,432	31,590	29,948	32,549	28,244	25,179

PRIOR FISCAL YEAR EARNINGS (IN THOUSANDS) BY YEARS OF SERVICE

<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
1,398	8,826	9,167	7,270	2,432	1,168	618	141	31,020

TABLE 4

STATE EMPLOYEES RETIREMENT FUND (CORRECTIONAL)

SERVICE RETIREMENTS AS OF JUNE 30, 1987

AGE	YEARS RETIRED ≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50								0
50-54	3							3
55-59	8	32	2					42
60-64	1	28	56					85
65-69		3	25	62				90
70-74			10	56				66
75-79				27				27
80-84								0
85+								0
TOTAL	12	63	93	145	0	0	0	313

AVERAGE ANNUAL ANNUITY

AGE	YEARS RETIRED ≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50								0
50-54	8,798							8,798
55-59	10,891	7,241	9,975					8,066
60-64	10,441	7,133	6,999					7,084
65-69		4,554	5,486	4,901				5,052
70-74			4,916	4,063				4,192
75-79				4,547				4,547
80-84								0
85+								0
ALL	10,331	7,065	6,432	4,511	0	0	0	5,819

TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT

≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
124	445	598	654	0	0	0	1,821

TABLE 5

STATE EMPLOYEES RETIREMENT FUND (CORRECTIONAL)

DISABILITY RETIREMENTS AS OF JUNE 30, 1987

AGE	YEARS DISABLED <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50			1					1
50-54		3	1					4
55-59			1					1
60-64			3	2				5
65-69								0
70-74								0
75-79								0
80-84								0
85+								0
TOTAL	0	3	6	2	0	0	0	11

AVERAGE ANNUAL BENEFIT

AGE	YEARS DISABLED <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50			6,744					6,744
50-54		9,019	3,717					7,693
55-59			9,012					9,012
60-64			9,100	2,239				6,355
65-69								0
70-74								0
75-79								0
80-84								0
85+								0
TOTAL	0	9,019	7,796	2,239	0	0	0	7,119

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS OF DISABILITY <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
0	27	47	4	0	0	0	78

TABLE 6

STATE EMPLOYEES RETIREMENT FUND (CORRECTIONAL)

SURVIVORS AS OF JUNE 30, 1987

	YEARS SINCE DEATH							
AGE	≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50		1						1
50-54		3						3
55-59	1							1
60-64								0
65-69			2					2
70-74		1						1
75-79				1				1
80-84								0
85+								0
TOTAL	1	5	2	1	0	0	0	9

AVERAGE ANNUAL BENEFIT

	YEARS SINCE DEATH							
AGE	≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50		8,029						8,029
50-54		8,340						8,340
55-59	3,953							3,953
60-64								0
65-69			3,991					3,991
70-74		3,087						3,087
75-79				4,104				4,104
80-84								0
85+								0
ALL	3,953	7,227	3,991	4,104	0	0	0	5,797

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH							
≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
4	36	8	4	0	0	0	52

TABLE 7

STATE EMPLOYEES RETIREMENT FUND (CORRECTIONAL)

RECONCILIATION OF MEMBERS

	ACTIVES	TERMINATED: DEFERRED RETIREMENT	TERMINATED: OTHER NON-VESTED
A. On June 30, 1986	1,220	35	83
B. Additions	106	10	18
C. Deletions:			
1. Service Retirement	(13)	(2)	
2. Disability	0		
3. Death	(1)	(1)	(1)
4. Terminated-Deferred	(3)		
5. Terminated-Refund	(54)	0	(8)
6. Terminated-Other Non-vested	(12)		
7. Returned as Active		0	(1)
D. Data Adjustments	(11)	1	(7)
Vested	730		
Non-Vested	502		
E. Total on June 30, 1987	1,232	43	84

	RECIPIENTS: RETIREMENT ANNUITANTS	RECIPIENTS: DISABLED	RECIPIENTS: SURVIVORS
A. On June 30, 1986	309	11	8
B. Additions	13	0	1
C. Deletions:			
1. Service Retirement		0	
2. Death	(11)	0	0
3. Annuity Expired	0	0	0
4. Returned as Active	0	0	
D. Data Adjustments	2	0	0
E. Total on June 30, 1987	313	11	9

TABLE 8

STATE EMPLOYEES RETIREMENT FUND (CORRECTIONAL)

ACTUARIAL BALANCE SHEET
(DOLLARS IN THOUSANDS)

JULY 1, 1987

A. CURRENT ASSETS (TABLE 2, K3)			$67,488
B. EXPECTED FUTURE ASSETS			
1. Present Value of Expected Future Statutory Supplemental Contributions			33,865
2. Present Value of Future Normal Costs			29,758
3. Total Expected Future Assets			63,623
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS			$131,111
D. CURRENT BENEFIT OBLIGATIONS	Non-Vested	Vested	Total
1. Benefit Recipients			
a. Retirement Annuities		$20,938	$20,938
b. Disability Benefits		975	975
c. Surviving Spouse and Child Benefits		767	767
2. Deferred Retirements with Future Augmentation		2,444	2,444
3. Former Members without Vested Rights		224	224
4. Active Members			
a. Retirement Annuities	1,205	24,140	25,345
b. Disability Benefits	710	0	710
c. Survivors' Benefits	929	0	929
d. Deferred Retirements	614	7,204	7,818
e. Refund Liability Due to Death or Withdrawal	0	1,338	1,338
5. Total Current Benefit Obligations	$3,458	$58,030	$61,488
E. EXPECTED FUTURE BENEFIT OBLIGATIONS			$40,351
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS			$101,839
G. CURRENT UNFUNDED ACTUARIAL LIABILITY (D5-A)			($6,000)
H. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F-C)			($29,272)

TABLE 9

STATE EMPLOYEES RETIREMENT FUND (CORRECTIONAL)

DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL) AND SUPPLEMENTAL CONTRIBUTION RATE (DOLLARS IN THOUSANDS)

JULY 1, 1987

	ACTUARIAL PRESENT VALUE OF PROJECTED BENEFITS (1)	ACTUARIAL PRESENT VALUE OF FUTURE NORMAL COSTS (2)	ACTUARIAL ACCRUED LIABILITY (3)=(1)-(2)
A. DETERMINATION OF ACTUARIAL ACCRUED LIABILITY (AAL)			
1. Active Members			
a. Retirement Annuities	$55,925	$19,185	$36,740
b. Disability Benefits	1,441	600	841
c. Survivors Benefits	1,954	719	1,235
d. Deferred Retirements	14,935	6,438	8,497
e. Refunds Due to Death or Withdrawal	2,236	2,816	(580)
f. Total	$76,491	$29,758	$46,733
2. Deferred Retirements with Future Augmentation	$2,444		$2,444
3. Former Members Without Vested Rights	224		224
4. Annuitants in MPRIF	22,680		22,680
5. Recipients Not in MPRIF	0		0
6. Total AAL	$101,839	$29,758	$72,081

B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)	
1. AAL (A6)	$72,081
2. Current Assets (Table 1, F6)	67,488
3. UAAL (B1-B2)	$4,593
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE	
1. Present Value of Future Payrolls through the Amortization Date of July 1, 2017	$832,073
2. Supplemental Contribution Rate (B3/C1)	0.55%

TABLE 10

STATE EMPLOYEES RETIREMENT FUND (CORRECTIONAL)

CHANGES IN UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1987

A. UAAL AT BEGINNING OF YEAR	$2,148
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	$2,604
2. Contribution	(4,307)
3. Interest on A, B1, and B2	104
4. Total (B1+B2+B3)	($1,599)
C. EXPECTED UAAL AT END OF YEAR (A+B4)	$549
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	($595)
2. Investment Return	(2,597)
3. MPRIF Mortality	58
4. Mortality of Other Benefit Recipients	0
5. Other Items	1,088
6. Total	($2,046)
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D6)	($1,497)
F. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO PLAN AMENDMENTS	$305
G. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS	$5,785
H. UAAL AT END OF YEAR (E+F+G)	$4,593

TABLE 11

STATE EMPLOYEES RETIREMENT FUND (CORRECTIONAL)

DETERMINATION OF CONTRIBUTION SUFFICIENCY
(DOLLARS IN THOUSANDS)

JULY 1, 1987

	% OF PAYROLL	$ AMOUNT
A. STATUTORY CONTRIBUTIONS - CHAPTER 352		
1. Employee Contributions	4.90%	$1,723
2. Employer Contributions	8.70%	3,059
3. Total	13.60%	$4,782
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	6.10%	$2,144
b. Disability Benefits	0.19%	66
c. Survivors	0.22%	77
d. Deferred Retirement Benefits	1.91%	673
e. Refunds Due to Death or Withdrawal	0.84%	297
f. Total	9.26%	$3,257
2. Supplemental Contribution Amortization by July 1, 2017 of UAAL of $4,593	0.55%	$193
3. Allowance for Expenses	0.27%	$95
4. Total	10.08%	$3,545
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) (A3-B4)	3.52%	$1,237

Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1987 is $35,155

TABLE 12

STATE EMPLOYEES RETIREMENT FUND (CORRECTIONAL)

PROJECTED CASH FLOW
(DOLLARS IN THOUSANDS)

FISCAL YEAR	STATUTORY CONTRIBUTIONS	TRANSFERS TO MPRIF	OTHER DISBURSEMENTS	INVESTMENT RETURN	NON-MPRIF ASSETS YEAR END
1987					$44,808
1988	$4,782	$872	$429	$3,724	52,013
1989	5,092	3,934	435	4,190	56,926
1990	5,423	815	443	4,721	65,812
1991	5,775	1,792	453	5,406	74,748
1992	6,151	2,527	472	6,106	84,006
1993	6,551	3,501	499	6,823	93,380
1994	6,976	3,659	519	7,582	103,760
1995	7,430	3,035	561	8,454	116,048
1996	7,913	4,423	586	9,400	128,352
1997	8,427	3,984	627	10,421	142,589
1998	8,975	3,366	672	11,605	159,131
1999	9,558	4,818	729	12,891	176,033
2000	10,180	4,715	767	14,271	195,002
2001	10,841	5,990	816	15,762	214,799
2002	11,546	7,470	877	17,312	235,310
2003	12,296	8,032	934	18,958	257,598
2004	13,096	7,720	996	20,783	282,761
2005	13,947	13,701	1,067	22,588	304,528
2006	14,853	13,082	1,142	24,387	329,544
2007	15,819	11,672	1,227	26,480	358,944
2008	16,847	14,964	1,313	28,738	388,252
2009	17,942	13,671	1,405	31,175	422,293
2010	19,108	18,779	1,502	33,737	454,857
2011	20,350	20,471	1,606	36,319	489,449
2012	21,673	15,975	1,714	39,315	532,748
2013	23,082	18,623	1,830	42,725	578,102
2014	24,582	16,561	1,951	46,491	630,663
2015	26,180	24,720	2,080	50,428	680,471
2016	27,882	23,177	2,205	54,538	737,509
2017	29,694	22,805	2,343	59,183	801,238

TABLE 13

STATE EMPLOYEES RETIREMENT FUND (CORRECTIONAL)

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

Interest:	Pre-Retirement: 8% per annum Post-Retirement: 5% per annum
Salary Increases:	Reported salary at valuation date increased 6.5% to current fiscal year and 6.5% annually for each future year. Prior fiscal year salary is annualized for new Members.
Mortality:	Pre-Retirement: Male - 1971 Group Annuity Mortality Table Female - 1971 Group Annuity Mortality Table male rates set back 8 years Post-Retirement: Male - Same as above Female - Same as above Post-Disability: Male - Combined Annuity Mortality Table Female - Combined Annuity Mortality Table
Retirement Age:	Age 58, or if over age 58, one year from the valuation date.
Separation:	Graded rates based on actual experience developed by the June 30, 1971 experience analysis. Rates are shown in rate table.
Disability:	Rates adopted by MSRS as shown in rate table.
Expenses:	Prior year expenses expressed as a percentage of prior year payroll. (0.27% of payroll)
Return of Contributions:	100% of Members separating before retirement elect return of contributions in lieu of deferred benefit. Effective July 1, 1987, all employees withdrawing after becoming eligible for a deferred benefit were assumed to take the larger of their contributions accumulated with interest or the value of their deferred benefit.
Family Composition:	85% of Members are married. Female is three years younger than male. Married families have 1 child.

TABLE 13 (cont)

Social Security:	Based on the present law and 6.5% salary scale. Only earnings history while in state service is used. Future Social Security benefits replace the same proportion of salary as at present.
Benefit Increases after Retirement:	Payment of earnings on retired reserves in excess of 5% accounted for by 5% post-retirement assumptions.
Special Consideration:	NA
Actuarial Cost Method:	Entry Age Normal Cost Method with normal costs expressed as a level percentage of earnings. Under this method Actuarial Gains(Losses) reduce(increase) the Unfunded Actuarial Accrued Liability.
Asset Valuation Method:	Cost Value plus one-third Unrealized Gains or Losses.
Payment on the Unfunded Actuarial Accrued Liability:	A level percentage of payroll each year to the statutory amortization date assuming payroll increases of 6.5% per annum.
Projected Cash Flow Method:	Cash flows from the Non-MPRIF portion of the Fund were projected based on the current plan benefits, participant data, and actuarial assumptions. In addition, new entrants were assumed so that the total payroll would increase by 6.5% per annum.

TABLE 13
(cont)

SEPARATIONS EXPRESSED AS THE NUMBER OF OCCURRENCES PER 10,000

Age	Death Male	Death Female	Withdrawal Male	Withdrawal Female	Disability Male	Disability Female	Retirement Male	Retirement Female
20	5	4	2,400	3,700	0	0	0	0
21	5	4	2,250	3,550	0	0	0	0
22	5	4	2,080	3,390	0	0	0	0
23	6	4	1,920	3,230	0	0	0	0
24	6	4	1,760	3,070	0	0	0	0
25	6	5	1,600	2,910	0	0	0	0
26	7	5	1,470	2,750	0	0	0	0
27	7	5	1,340	2,600	0	0	0	0
28	7	5	1,230	2,430	0	0	0	0
29	8	5	1,130	2,270	0	0	0	0
30	8	5	1,040	2,120	2	0	0	0
31	9	6	950	1,970	2	0	0	0
32	9	6	890	1,820	2	0	0	0
33	10	6	830	1,680	2	0	0	0
34	10	7	770	1,540	2	0	0	0
35	11	7	720	1,410	2	1	0	0
36	12	7	680	1,300	2	1	0	0
37	13	8	640	1,190	2	1	0	0
38	14	8	600	1,090	2	1	0	0
39	15	9	560	1,000	2	2	0	0
40	16	9	530	920	2	2	0	0
41	18	10	500	850	2	2	0	0
42	20	10	480	780	2	4	0	0
43	23	11	460	720	3	4	0	0
44	26	12	430	680	3	4	0	0
45	29	13	410	630	3	5	0	0
46	33	14	390	590	5	6	0	0
47	38	15	370	560	7	7	0	0
48	42	16	350	530	9	7	0	0
49	47	18	340	500	11	10	0	0
50	53	20	320	470	14	10	0	0
51	59	23	300	440	16	12	0	0
52	65	26	280	410	20	14	0	0
53	71	29	260	390	24	16	0	0
54	78	33	240	360	28	20	0	0

TABLE 13
(cont)

Age	Death		Withdrawal		Disability		Retirement	
	Male	Female	Male	Female	Male	Female	Male	Female
55	85	38	210	330	34	24	0	0
56	93	42	170	290	40	30	0	0
57	100	47	140	230	46	36	0	0
58	109	53	90	170	56	44	10,000	10,000
59	119	59	40	90	66	52	0	0
60	131	65	0	0	76	62	0	0
61	144	71	0	0	90	74	0	0
62	159	78	0	0	110	88	0	0
63	174	85	0	0	136	104	0	0
64	192	93	0	0	174	122	0	0
65	213	100	0	0	0	0	0	0
66	236	109	0	0	0	0	0	0
67	263	119	0	0	0	0	0	0
68	292	131	0	0	0	0	0	0
69	324	144	0	0	0	0	0	0
70	361	159	0	0	0	0	0	0

TABLE 14

STATE EMPLOYEES RETIREMENT FUND (CORRECTIONAL)

SUMMARY OF PLAN PROVISIONS

Eligibility	State employees in covered correctional service.
Contributions	
Member	4.90% of Salary.
Employer	8.70% of Salary.
Allowable Service	Service during which Member contributions were made. May also include certain leaves of absence, military service, and periods while temporary Worker's Compensation is paid.
Salary	Includes wages, allowances, and fees. Excludes lump sum payments at separation and reduced Salary while receiving Worker's Compensation benefits.
Average Salary	Average of the 5 highest successive years of Salary.
RETIREMENT	
Normal Retirement Benefit	
Eligibility	Age 55 and 5 years of Allowable Service under the Correctional and General plans. <u>(Amended 1987)</u>
Amount	2.5% of Average Salary for the first 25 years of Allowable Service and 2.0% of Average Salary for each subsequent year, pro rata for completed months. Maximum of 75% of Average Salary. After 84 months, or age 65 if earlier, benefit changes to unreduced General Plan benefit. If combined General Plan benefit and Social Security (based on State service) are less than the Correctional benefit then an additional benefit will be paid to prevent a decrease.
Form of Payment	Life annuity with return on death of any balance of contributions over aggregate monthly payments. Actuarially equivalent options are: 50% or 100% joint and survivor 15 year certain and life thereafter.
Benefit Increases	Benefits may be increased each January 1 depending on the investment performance of the Minnesota Post Retirement Investment Fund (MPRIF).

TABLE 14

(cont)

DISABILITY	
Occupational Disability Benefit	
Eligibility	Member under age 55 who cannot perform his duties as a direct result of disabiliy related to an act of duty.
Amount	50% of Average Salary plus 2.5% of Average Salary for the first 5 years after 20 years of Allowable Service and 2.0% of Average Salary for each subsequent year, pro rata for completed months. Maximum of 75% Average Salary. Payment begins at disability and stops at age 62 or earlier if disability ceases or death occurs. Benefits may be paid upon reemployment in order to attain previous salary level.
Form of Payment	Same as for retirement.
Benefit Increases	Adjusted by MSRS to provide same increase as MPRIF.
Normal Disability Benefit	
Eligibility	Under age 55 with at least 5 years of Correctional service and disability not related to covered employment.
Amount	Normal Retirement Benefit based on Allowable Service (minimum 10 years) and Average Salary at disability. Payment begins at disability and stops at age 62 or earlier if disability ceases or death occurs. Benefits may be paid upon reemployment in order to attain previous salary level.
Form of Payment	Same as for retirement.
Benefit Increases	Adjusted by MSRS to provide same increase as MPRIF.
Retirement Benefits	
Eligibility	Age 62 if still disabled.
Amount	Benefit computed as a normal retirement benefit under General Plan based on same Allowable Service and without reduction for age.
Form of Payment	Same as for retirement.
Benefit Increases	Same as for retirement.

TABLE 14

(cont)

DEATH	
Surviving Spouse Benefit	
Eligibility	Member or former Member who dies before retirement or disability benefits commence, if age 50 with 5 years of Allowable Service or any age with 30 years of Allowable Service. If the Member dies before age 55, benefits commence when Member would have been age 55. (Amended 1987)
Amount	Surviving spouse receives the General Plan 100% joint and survivor benefit the Member could have elected if terminated. In lieu of this benefit the surviving spouse may elect a refund of contributions with interest.
Benefit Increases	Adjusted by MSRS to provide same increase as MPRIF.
Refund of Contributions With Interest	
Eligibility	Active employee dies and survivor benefits are not payable, or a former employee dies before annuity begins.
Amount	The Member's contributions with 5% interest.
TERMINATION	
Refund of Member's Contributions	
Eligibility	Termination of state service.
Amount	Member's contributions with 5% interest. A deferred annuity may be elected in lieu of a refund.
Deferred Benefit	
Eligibility	5 years of Correctional and General Service. (Amended 1987)
Amount	Benefit computed under law in effect at termination.

STATE PATROL RETIREMENT FUND

ACTUARIAL VALUATION REPORT

JULY 1, 1987

November 25, 1987

Legislative Commission on
Pensions and Retirement
55 State Office Building
St. Paul, Minnesota 55155

RE: STATE PATROL RETIREMENT FUND

Commission Members:

We have prepared an actuarial valuation of the Fund as of July 1, 1987 based on membership and financial data supplied by the Fund.

We certify that to the best of our knowledge and belief this actuarial valuation was performed in accordance with the requirements of Section 356.215, Minnesota Statutes, and the requirements of the Standards for Actuarial Work, adopted by the Commission on August 26, 1987.

Respectfully submitted,

THE WYATT COMPANY

Robert E. Perkins

Rober E. Perkins, FSA
Consulting Actuary

Michael C. Gunvalson

Michael C. Gunvalson, ASA
Associate Actuary

STATE PATROL RETIREMENT FUND

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STATE PATROL RETIREMENT FUND

REPORT HIGHLIGHTS
(DOLLARS IN THOUSANDS)

	07/01/86 VALUATION	07/01/87 VALUATION
A. CONTRIBUTIONS (TABLE 11)		
1. Statutory Contributions - Chapter 352B % of Payroll	27.40%	27.40%
2. Required Contributions - Chapter 356 % of Payroll	25.00%	23.39%
3. Sufficiency (Deficiency) (A1-A2)	2.40%	4.01%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 1)	$118,174	$136,397
b. Current Benefit Obligations (Table 8)	$142,626	$153,107
c. Funding Ratio (a/b)	82.86%	89.09%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 1)	$118,174	$136,397
b. Actuarial Accrued Liability (Table 9)	$149,064	$160,628
c. Funding Ratio (a/b)	79.28%	84.91%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	$225,623	$246,237
b. Current and Expected Future Benefit Obligations	$213,091	$225,285
c. Funding Ratio (a/b)	105.88%	109.30%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	769	771
b. Projected Annual Earnings	$27,474	$28,583
c. Average Annual Earnings (Actual $)	$35,727	$37,072
d. Average Age	40.2	40.4
e. Average Service	13.5	13.8
2. Others		
a. Service Retirements (Table 4)	306	318
b. Disability Retirements (Table 5)	13	13
c. Survivors (Table 6)	106	99
d. Deferred Retirements (Table 7)	18	16
e. Terminated Other Non-vested (Table 7)	9	8
f. Total	452	454

STATE PATROL RETIREMENT FUND

COMMENTARY

Purpose

The purpose of this valuation is to determine the financial status of the Fund. In order to achieve this purpose, an actuarial valuation is made at the beginning of each fiscal year as required by Section 356.215 of Minnesota Statutes.

Report Highlights

The statutory contributions for the State Patrol Retirement Fund continue to be sufficient. The margin of sufficiency has increased from 2.40% in 1986 to 4.01% in 1987. According to this valuation a contribution rate of 23.39% is required to comply with Minnesota Law.

The financial status of the Fund can be measured by three different funding ratios:

- The Accrued Benefit Funding Ratio is a measure of current funding status, and when viewed over a period of years, presents a view of the funding progress. This ratio is based on Statement No. 5 of the Governmental Accounting Standards Board. This year's ratio is 89.09%. The corresponding ratio for the prior year was 82.86%.

- The Accrued Liability Funding Ratio is also a measure of funding status and funding progress. It is based on the actuarial cost method that has historically been used. For 1987 the ratio is 84.91%, which is an increase from the 1986 value of 79.28%.

- The Projected Benefit Funding Ratio is a measure of the adequacy or deficiency in the contribution level. This ratio exceeds 100% and verifies that the current statutory contributions are adequate.

Asset Information

Beginning in 1984, changes in Section 356.215 of Minnesota Statutes require that the asset value used for actuarial purposes reflect a portion of the unrealized gains and losses. Only a portion of these gains and losses are considered because market values are typically volatile and could produce erratic changes in the contribution requirements from year to year.

The calculation of assets for actuarial purposes begins with the reporting of Total Assets by the Fund (Table 1, line B). These Total Assets, reduced by any Amounts Currently Payable (line C), produce the Assets Available for Benefits (line D5), which is the starting value for determining the Actuarial Value of Assets.

The calculation of the Actuarial Value of Assets is shown in Table 1 on lines F1 to F6. It combines the cost value and one-third of the difference between market value and cost value.

The term "Actuarial Value of Assets" is used to indicate that the value was determined for use in this actuarial valuation. Since Minnesota Statutes refer to this value as "Current Assets", the latter phrase will be used in the remainder of this report.

Since this Fund participates in the Minnesota Post Retirement Investment Fund, referred to as MPRIF, the asset value shown on line A3 is initially calculated by the State Board of Investment(SBI), and is the expected amount of MPRIF participation assuming the Fund earns 5% interest. The actual amount is determined by calculating the liability based on annuitant information supplied by the Fund. If the actual liability is larger than expected, the difference is labeled a mortality loss and if smaller a gain.

Investment performance by SBI above the 5% level is not shown in the assets but will be added in on January 1, 1988 when benefits will be increased for those annuitants who have been receiving payments for 18 months. Next year's valuation will include the 1988 benefit increase in determining the MPRIF value.

After the MPRIF liability has been calculated for each participating Fund, SBI will determine each Fund's portion of the excess earnings for the January benefit increase as well as the Fund's allocated market share of MPRIF. An approximation of those values on June 30, 1987 provides the following relative comparison.

MPRIF Reserves	$ 60,771,000
Reserves Plus Excess Earnings	65,000,000
MPRIF Market Value	69,000,000

The non-MPRIF Reserves amount of $1,002,000 on line D4 of Table 1 represents the liability for disability and survivor benefits that are paid directly by the

Fund. The liability on line A5 of Table 9 would normally show the same $1,002,000 for recipients not in MPRIF. But this report displays a larger liability of $7,686,000 which contains an amount of $6,684,000 for the 6% supplement provided pre-1973 retirees. MSRS classifies this liability as part of the State Reserves in Table 1.

Membership Data

Tables 3 through 6 summarize statistical information on members by category. Active members are grouped by age and completed years of service in Table 3. The earnings shown for these members are for the prior fiscal year.

The service retirements in Table 4 include not only those retiring from active status but also disabled members who have attained retirement age. Disabled members under retirement age are shown in Table 5. The survivors category (Table 6) includes spouses and children of deceased members.

Actuarial Balance Sheet

An actuarial balance sheet is required by Section 356.215, Subdivision 4f of Minnesota Law. This balance sheet (Table 8) establishes a method for evaluating both current and future levels of funding.

Current funding levels are evaluated by comparing Current Assets on line A to Current Benefit Obligations on line D5. The difference between the obligations and the assets is shown as Current Unfunded Actuarial Liability on line G.

The Current Benefit Obligation amounts in Table 8 are required to be disclosed by Statement No. 5 of Governmental Accounting Standards Board (GASB). However, Statement No. 5 uses the terms "Actuarial Present Value of Credited Projected Benefits" and "Pension Benefit Obligation" rather than "Current Benefit Obligation".

The first step in the calculation for active members involves projecting salaries and service to determine future benefits payable under the plan and then discounting those projected benefits to the date of the valuation. The second step is to determine the discounted value of benefits for the non-active members. For those non-active members whose benefits have not commenced, the liability includes augmentation of benefits to date of commencement. The result of the first two steps is shown on line F, Total Current and Expected Future Benefit Obligations.

The third step is to determine the portion that represents Current Benefit Obligations. In the case of active members the Current Benefit Obligation is computed by attributing an equal benefit amount to each year of credited and expected future employee service. For all others, their entire liability is considered a Current Benefit Obligation.

Current and future funding levels are evaluated by comparing Current and Future Expected Assets on line C to Current and Expected Future Benefit Obligations on line F. The difference between the obligations and the assets is shown as the Current and Future Unfunded Actuarial Liability on line H.

Since line F has already been calculated, the remaining step is to determine the Expected Future Assets . The statutory contribution rate in excess of the combined normal cost rate and expense rate is first calculated. The amount of assets for line B1 can be determined by projecting from the valuation date to the amortization date (the date for paying off all unfunded liabilities) on the assumption that total payroll is increasing at 6.5% annually and then discounted to the date of the valuation.

The Current Unfunded Actuarial Liability, line G, is a measurement of the status of the funding to the date of the valuation. The Current and Future Unfunded Actuarial Liability is a measurement of the adequacy of the current statutory contribution level.

GASB Disclosure

Table 8 shows that on July 1, 1987, the Pension Benefit Obligation consisted of the following components:

Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$ 70,002,000
Current Employees -	
Accumulated employee contributions including allocated investment income	21,970,000 *
Employer-financed vested	49,967,000
Employer-financed nonvested	11,168,000
Total Pension Benefit Obligation	$153,107,000

* Estimated

Contribution Sufficiency

The approach used by the State of Minnesota to determine contribution sufficiency is the Entry Age Normal Cost Method. The primary characteristic of this method is that it allocates costs as a level percentage of payroll.

A comparison of this actuarial method (Table 9) to the actuarial balance sheet (Table 8) shows similarities and differences. The similarity is that both approaches calculate the value of all future benefits the same way. This can be verified by comparing line F of Table 8 to line A6, column 1, of Table 9. The difference arises from the technique for allocating liabilities of active members to past and future. As noted in the prior section, the balance sheet allocates benefits and the corresponding liabilities, on the basis of service. The method used in Table 9 allocates liabilities so that the cost each year will be a constant percentage of payroll.

An Unfunded Actuarial Accrued Liability is computed under the Entry Age Normal Cost Method by comparing the liabilities allocated to past service (Actuarial Accrued Liability) to the Current Assets. This amount, line B3, is funded over the remaining years to the amortization date by a series of payments. Prior to 1984 these payments were calculated to be a level dollar amount similar to a fixed interest rate mortgage. The method of funding was changed in 1984 to produce a series of payments that remain a constant percentage of payroll each year.

Under this new approach the payments will increase 6.5% each year since that is the assumed rate of increase in payroll. Although the payment schedule will be adequate to amortize the existing unfunded, the lower payments in the earlier years will not be sufficient to cover the interest on the unfunded liability. After a few years the annual payment will cover the interest and also repay a portion of the unfunded.

Projected Cash Flow

Table 12 illustrates the anticipated cash flow over the amortization period. The cash flow begins with the Non-MPRIF Assets, which are the Current Assets reduced by the MPRIF Reserves. Contributions are then added based on the present statutory rates for employers and employees. As members become eligible for payments from MPRIF an amount of reserve is transferred to SBI. The other disbursements represent benefit payments and expenses made directly by the Fund.

This projected cash flow assumes that future payrolls increase by 6.5%. For purposes of this table only, new members are assumed to be hired in order to replace those who terminate from the active group. This open group method provides a more realistic picture of future cash flow. The statutory interest rate of 8% is used to project future investment return.

The amounts transferred to MPRIF will be affected by the number of members who reach the assumed retirement age during a given year. The amount for 1989 is large because it includes those already over age 58 who are assumed to retire a year from the valuation date.

Plan Provisions

Vesting eligibility has been reduced from 10 years to 5 years. This change applies to the Deferred Annuity, the Normal Retirement Benefit and the Surviving Spouse Benefit. Coincident with this eligibility change, a different calculation technique was adopted which assumes that the terminating vested member takes the larger of contributions with interest or a deferred annuity. Previously, the technique assumed that a deferred annuity was selected by the terminating vested member.

	Impact Due to Change In	
	Technique	Eligibility
Actuarial Accrued Liability	$0	($148,000)
Normal Cost	.00%	.07%
Supplemental Contribution	.00	(.03)
Required Contribution	.00%	.04%

TABLE 1

STATE PATROL RETIREMENT FUND

ACCOUNTING BALANCE SHEET (DOLLARS IN THOUSANDS)

July 1, 1987

	MARKET VALUE	COST VALUE
A. ASSETS		
1. Cash, Equivalents, Short-Term Securities	$6,399	$6,399
2. Investments		
a. Fixed Income	17,302	17,859
b. Equity	53,221	41,286
c. Real Estate	6,427	5,584
3. Equity in Minnesota Post-Retirement Investment Fund (MPRIF)	60,771	60,771
4. Other	492	492
B. TOTAL ASSETS	$144,612	$132,391
C. AMOUNTS CURRENTLY PAYABLE	$68	$68
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	$16,856	$16,856
2. State Reserves	65,915	53,694
3. MPRIF Reserves	60,771	60,771
4. Non-MPRIF Reserves	1,002	1,002
5. Total Assets Available for Benefits	$144,544	$132,323
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	$144,612	$132,391

F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS

1. Cost Value of Assets Available for Benefits (D5)		$132,323
2. Market Value (D5)	$144,544	
3. Cost Value (D5)	132,323	
4. Market Over Cost (F2-F3)	$12,221	
5. 1/3 of Market Over Cost(F4)/3		4,074
6. Actuarial Value of Assets (F1+F5) (Same as "Current Assets")		$136,397

TABLE 2

STATE PATROL RETIREMENT FUND

CHANGES IN ASSETS AVAILABLE FOR BENEFITS (DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1987

	MARKET VALUE	COST VALUE
A. ASSETS AVAILABLE AT BEGINNING OF PERIOD	$125,417	$114,553
B. OPERATING REVENUES		
1. Member Contributions	$2,164	$2,164
2. Employer Contributions	4,777	4,777
3. Investment Income	7,504	7,504
4. MPRIF Income	7,283	7,283
5. Net Realized Gain (Loss)	1,675	1,675
6. Other (Includes State Appropriation)	64	64
7. Net Change in Unrealized Gain (Loss)	1,357	0
8. Total Revenue	$24,824	$23,467
C. OPERATING EXPENSES		
1. Service Retirements	$5,357	$5,357
2. Disability Benefits	57	57
3. Survivor Benefits	17	17
4. Refunds	99	99
5. Expenses	167	167
6. Other	0	0
7. Total Disbursements	$5,697	$5,697
D. OTHER CHANGES IN RESERVES	0	0
E. ASSETS AVAILABLE AT END OF PERIOD	$144,544	$132,323

TABLE 3

STATE PATROL RETIREMENT FUND

ACTIVE MEMBERS AS OF JUNE 30, 1987

	YEARS OF SERVICE								
AGE	≤1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
<25	12	12							24
25-29	11	61	20	1					93
30-34	3	46	57	25	1				132
35-39	2	13	26	52	34				127
40-44		5	9	28	107	12			161
45-49		1	5	2	56	32	12		108
50-54				1	11	15	39	11	77
55-59				1	3	3	16	14	37
60-64				1	2	2	6		11
65+								1	1
TOTAL	28	138	117	111	214	64	73	26	771

AVERAGE ANNUAL EARNINGS

	YEARS OF SERVICE								
AGE	≤1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25	21,774	25,713							23,743
25-29	21,530	27,116	30,915	33,799					27,344
30-34	21,795	28,097	30,382	32,249	32,810				29,763
35-39	20,403	27,099	31,448	33,640	35,339				32,768
40-44		27,074	32,143	35,405	34,310	35,169			34,219
45-49		26,450	31,795	32,359	34,689	35,055	34,680		34,543
50-54				34,214	38,819	34,176	35,648	37,436	36,051
55-59				32,662	34,964	34,084	36,168	37,402	36,274
60-64				36,118	43,048	32,839	33,639		35,429
65+								32,659	32,659
ALL	21,582	27,313	30,906	33,769	34,888	34,756	35,438	37,234	32,404

PRIOR FISCAL YEAR EARNINGS (IN THOUSANDS) BY YEARS OF SERVICE

≤1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
604	3,769	3,616	3,749	7,466	2,224	2,587	968	24,983

TABLE 4

STATE PATROL RETIREMENT FUND

SERVICE RETIREMENTS AS OF JUNE 30, 1987

AGE	YEARS RETIRED							
	≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50								0
50-54	2							2
55-59	15	45						60
60-64		56	40	2				98
65-69		13	33	16	1			63
70-74		1	12	22	13			48
75-79				2	10	10		22
80-84				3	2	9	8	22
85+					3			3
TOTAL	17	115	85	45	29	19	8	318

AVERAGE ANNUAL ANNUITY

AGE	YEARS RETIRED							
	≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50								0
50-54	14,859							14,859
55-59	17,462	17,100						17,191
60-64		18,702	15,738	8,526				17,284
65-69		17,657	16,586	11,735	3,948			15,374
70-74		14,784	12,818	13,659	7,621			11,837
75-79				12,616	8,518	5,956		7,726
80-84				11,517	8,879	7,334	5,823	7,496
85+					8,161			8,161
ALL	17,156	17,923	15,655	12,558	7,946	6,609	5,823	14,626

TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT

≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
292	2,060	1,331	565	230	126	47	4,651

TABLE 5

STATE PATROL RETIREMENT FUND

DISABILITY RETIREMENTS AS OF JUNE 30, 1987

AGE	YEARS DISABLED <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50		1	1					2
50-54		1						1
55-59			1	3				4
60-64			3	3				6
65-69								0
70-74								0
75-79								0
80-84								0
85+								0
TOTAL	0	2	5	6	0	0	0	13

AVERAGE ANNUAL BENEFIT

AGE	YEARS DISABLED <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50		13,998	11,039					12,519
50-54		21,754						21,754
55-59			12,896	8,950				9,936
60-64			14,963	7,846				11,404
65-69								0
70-74								0
75-79								0
80-84								0
85+								0
TOTAL	0	17,876	13,765	8,398	0	0	0	11,920

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS OF DISABILITY

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
0	36	69	50	0	0	0	155

TABLE 6

STATE PATROL RETIREMENT FUND

SURVIVORS AS OF JUNE 30, 1987

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50			3	4				7
50-54		1	2					3
55-59	1	2	4	3		1		11
60-64		2	4	1	1			8
65-69	3	3	3	3	1		1	14
70-74		2	2	5		3	1	13
75-79		6	3	1	2	2	2	16
80-84		1	5	1	1	4	2	14
85+			4	2	1		6	13
TOTAL	4	17	30	20	6	10	12	99

AVERAGE ANNUAL BENEFIT

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50			2,863	2,245				2,510
50-54		14,951	15,513					15,325
55-59	19,819	12,079	12,713	6,490		3,247		10,686
60-64		15,327	11,754	4,800	4,924			10,924
65-69	12,193	9,750	4,625	7,920	7,479		3,372	8,165
70-74		6,687	4,281	7,304		3,329	3,367	5,524
75-79		3,803	5,953	3,292	6,568	3,374	3,370	4,412
80-84		5,545	3,281	3,379	4,581	3,565	3,347	3,633
85+			3,368	3,396	3,372		3,372	3,374
ALL	14,099	8,279	6,922	5,350	5,582	3,424	3,367	6,262

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
56	141	209	107	33	34	40	620

TABLE 7

STATE PATROL RETIREMENT FUND

RECONCILIATION OF MEMBERS

	ACTIVES	TERMINATED: DEFERRED RETIREMENT	TERMINATED: OTHER NON-VESTED
A. On June 30, 1986	769	18	9
B. Additions	29	2	0
C. Deletions:			
1. Service Retirement	(17)	(3)	
2. Disability	0	0	
3. Death	0	0	0
4. Terminated-Deferred	(1)		
5. Terminated-Refund	(8)	0	(1)
6. Terminated-Other Non-vested	0		
7. Returned as Active		0	0
D. Data Adjustments	(1)	(1)	0
Vested	605		
Non-Vested	166		
E. Total on June 30, 1987	771	16	8

	RECIPIENTS: RETIREMENT ANNUITANTS	RECIPIENTS: DISABLED	RECIPIENTS: SURVIVORS
A. On June 30, 1986	306	13	106
B. Additions	21	0	2
C. Deletions:			
1. Service Retirement		0	
2. Death	(8)	0	(8)
3. Annuity Expired	0	0	(3)
4. Returned as Active	0	0	
D. Data Adjustments	(1)	0	2
E. Total on June 30, 1987	318	13	99

TABLE 8

STATE PATROL RETIREMENT FUND

ACTUARIAL BALANCE SHEET (DOLLARS IN THOUSANDS)

JULY 1, 1987

A. CURRENT ASSETS (TABLE 1, F6)	$136,397
B. EXPECTED FUTURE ASSETS	
1. Present Value of Expected Future Statutory Supplemental Contributions	45,183
2. Present Value of Future Normal Costs	64,657
3. Total Expected Future Assets	109,840
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS	$246,237

D. CURRENT BENEFIT OBLIGATIONS	Non-Vested	Vested	Total
1. Benefit Recipients			
a. Retirement Annuities		$56,845	$56,845
b. Disability Benefits		2,328	2,328
c. Surviving Spouse and Child Benefits		9,284	9,284
2. Deferred Retirements with Future Augmentation		1,499	1,499
3. Former Members without Vested Rights		46	46
4. Active Members			
a. Retirement Annuities	1,434	64,586	66,020
b. Disability Benefits	6,933	0	6,933
c. Survivors' Benefits	2,415	0	2,415
d. Deferred Retirements	386	7,238	7,624
e. Refund Liability Due to Death or Withdrawal	0	113	113
5. Total Current Benefit Obligations	$11,168	$141,939	$153,107

E. EXPECTED FUTURE BENEFIT OBLIGATIONS	$72,178
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS	$225,285
G. CURRENT UNFUNDED ACTUARIAL LIABILITY (D5-A)	$16,710
H. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F-C)	($20,952)

TABLE 9

STATE PATROL RETIREMENT FUND

DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL) AND SUPPLEMENTAL CONTRIBUTION RATE (DOLLARS IN THOUSANDS)

JULY 1, 1987

	ACTUARIAL PRESENT VALUE OF PROJECTED BENEFITS (1)	ACTUARIAL PRESENT VALUE OF FUTURE NORMAL COSTS (2)	ACTUARIAL ACCRUED LIABILITY (3)=(1)-(2)
A. DETERMINATION OF ACTUARIAL ACCRUED LIABILITY (AAL)			
1. Active Members			
a. Retirement Annuities	$124,367	$47,359	$77,008
b. Disability Benefits	12,327	6,361	5,966
c. Survivors Benefits	4,836	2,761	2,075
d. Deferred Retirements	13,551	7,794	5,757
e. Refunds Due to Death or Withdrawal	202	382	(180)
f. Total	$155,283	$64,657	$90,626
2. Deferred Retirements with Future Augmentation	$1,499		$1,499
3. Former Members Without Vested Rights	46		46
4. Annuitants in MPRIF	60,771		60,771
5. Recipients Not in MPRIF	7,686		7,686
6. Total AAL	$225,285	$64,657	$160,628

B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)	
1. AAL (A6)	$160,628
2. Current Assets (Table 1,F6)	136,397
3. UAAL (B1-B2)	$24,231
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE	
1. Present Value of Future Payrolls through the Amortization Date of July 1, 2009	$522,946
2. Supplemental Contribution Rate (B3/C1)	4.63%

TABLE 10

STATE PATROL RETIREMENT FUND

CHANGES IN UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1987

A. UAAL AT BEGINNING OF YEAR	$30,890
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	$4,858
2. Contribution	(6,941)
3. Interest on A, B1, and B2	2,388
4. Total (B1+B2+B3)	$305
C. EXPECTED UAAL AT END OF YEAR (A+B4)	$31,195
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	($3,444)
2. Investment Return	(4,142)
3. MPRIF Mortality	(65)
4. Mortality of Other Benefit Recipients	(724)
5. Other Items	1,559
6. Total	($6,816)
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D6)	$24,379
F. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO PLAN AMENDMENTS	($148)
G. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS	$0
H. UAAL AT END OF YEAR (E+F+G)	$24,231

TABLE 11

STATE PATROL RETIREMENT FUND

DETERMINATION OF CONTRIBUTION SUFFICIENCY
(DOLLARS IN THOUSANDS)

JULY 1, 1987

	% OF PAYROLL	$ AMOUNT
A. STATUTORY CONTRIBUTIONS - CHAPTER 352B		
1. Employee Contributions	8.50%	$2,430
2. Employer Contributions	18.90%	5,402
3. Total	27.40%	$7,832
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	13.28%	$3,794
b. Disability Benefits	1.79%	513
c. Survivors	0.80%	230
d. Deferred Retirement Benefits	2.13%	608
e. Refunds Due to Death or Withdrawal	0.10%	28
f. Total	18.10%	$5,173
2. Supplemental Contribution Amortization by July 1, 2009 of UAAL of $24,231	4.63%	$1,323
3. Allowance for Expenses	0.66%	$189
4. Total	23.39%	$6,685
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) (A3-B4)	4.01%	$1,147

Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1987 is $28,583

TABLE 12

STATE PATROL RETIREMENT FUND

PROJECTED CASH FLOW
(DOLLARS IN THOUSANDS)

FISCAL YEAR	STATUTORY CONTRIBUTIONS	TRANSFERS TO MPRIF	OTHER DISBURSEMENTS	INVESTMENT RETURN	NON-MPRIF ASSETS YEAR END
1987					$75,626
1988	$7,832	$664	$600	$6,313	88,507
1989	8,341	10,984	1,090	6,931	91,705
1990	8,883	2,382	1,610	7,532	104,128
1991	9,460	4,627	2,167	8,437	115,231
1992	10,075	6,869	2,756	9,236	124,917
1993	10,730	6,020	3,384	10,046	136,289
1994	11,428	7,037	4,040	10,917	147,557
1995	12,170	6,681	4,729	11,835	160,152
1996	12,961	7,629	5,460	12,807	172,831
1997	13,804	11,228	6,245	13,680	182,842
1998	14,701	12,130	7,054	14,448	192,807
1999	15,657	13,911	7,902	15,178	201,829
2000	16,674	10,537	8,796	16,040	215,210
2001	17,758	18,439	9,740	16,800	221,589
2002	18,913	21,865	10,747	17,179	225,069
2003	20,142	22,049	11,804	17,457	228,815
2004	21,451	23,717	12,913	17,698	231,334
2005	22,845	19,539	14,086	18,076	238,630
2006	24,330	21,308	15,368	18,597	244,881
2007	25,912	26,405	16,715	18,902	246,575
2008	27,596	25,594	18,142	19,080	249,515
2009	29,390	16,628	19,661	19,685	262,301
2010	31,300	23,067	21,287	20,462	269,709
2011	33,335	26,414	23,007	20,933	274,556
2012	35,502	27,341	24,802	21,299	279,214

TABLE 13

STATE PATROL RETIREMENT FUND

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

Interest:	Pre-Retirement: 8% per annum Post-Retirement: 5% per annum
Salary Increases:	Reported salary at valuation date increased 6.5% to current fiscal year and 6.5% annually for each future year.
Mortality:	Pre-Retirement: Male - 1971 Group Annuity Mortality Table Female - 1971 Group Annuity Mortality Table male rates set back 8 years Post-Retirement: Male - Same as above Female - Same as above Post-Disability: Male - Same as above Female - Same as above
Retirement Age:	Age 58 for State Troopers and for State Police Officers hired after June 30, 1961, or Age 63 for State Police Officers hired before July 1, 1961. If over assumed retirement age, one year from the valuation date.
Separation:	Graded rates starting at .03 at age 20 and decreasing to .005 at age 45-49 and .02 for ages 50-54. Adopted 1984.
Disability:	Rates adopted by MSRS as shown in rate table.
Expenses:	Prior year expenses expressed as percentage of prior year payroll. (0.66% of payroll)
Return of Contributions:	All employees withdrawing after 10 years of service were assumed to leave their contributions on deposit and receive a deferred annuitant benefit. Effective July 1, 1987, all employees withdrawing after becoming eligible for a deferred benefit were assumed to take the larger of their contributions accumulated with interest or the value of their deferred benefit.

TABLE 13
(cont)

Family Composition:	100% of members are married. Female is three years younger than male. 15% load on spouse benefits for children's benefits.
Social Security:	NA
Benefit Increases After Retirement:	Payment of earnings on retired reserves in excess of 5% accounted for by 5% post-retirement assumptions.
Special Consideration:	NA
Actuarial Cost Method:	Entry Age Actuarial Cost Method based on earnings and the date the employee entered the plan is applied to all plan benefits. Under this method Actuarial Gains(Losses) reduce(increase) the Unfunded Actuarial Accrued Liability.
Asset Valuation Method:	Cost Value plus one-third Unrealized Gains or Losses.
Payment on the Unfunded Actuarial Accrued Liability:	A level percentage of payroll each year to the statutory amortization date assuming payroll increases 6.5% per annum.
Projected Cash Flow Method:	Cash flows for the non-MPRIF portion of the Fund were projected based on the current plan benefits, participant data, and actuarial assumptions. In addition new entrants were assumed so that the total payroll would increase by 6.5% per annum.

TABLE 13
(cont)

SEPARATIONS EXPRESSED AS THE NUMBER OF OCCURRENCES PER 10,000

	Death		Withdrawal		Disability		Retirement	
Age	Male	Female	Male	Female	Male	Female	Male	Female
20	5	4	300	300	4	4	0	0
21	5	4	290	290	4	4	0	0
22	5	4	280	280	5	5	0	0
23	6	4	270	270	5	5	0	0
24	6	4	260	260	6	6	0	0
25	6	5	250	250	6	6	0	0
26	7	5	240	240	6	6	0	0
27	7	5	230	230	7	7	0	0
28	7	5	220	220	7	7	0	0
29	8	5	210	210	8	8	0	0
30	8	5	200	200	8	8	0	0
31	9	6	190	190	9	9	0	0
32	9	6	180	180	9	9	0	0
33	10	6	170	170	10	10	0	0
34	10	7	160	160	10	10	0	0
35	11	7	150	150	11	11	0	0
36	12	7	140	140	12	12	0	0
37	13	8	130	130	13	13	0	0
38	14	8	120	120	15	15	0	0
39	15	9	110	110	16	16	0	0
40	16	9	100	100	18	18	0	0
41	18	10	90	90	20	20	0	0
42	20	10	80	80	22	22	0	0
43	23	11	70	70	24	24	0	0
44	26	12	60	60	26	26	0	0
45	29	13	50	50	29	29	0	0
46	33	14	50	50	32	32	0	0
47	38	15	50	50	36	36	0	0
48	42	16	50	50	41	41	0	0
49	47	18	50	50	46	46	0	0
50	53	20	200	200	50	50	0	0
51	59	23	200	200	57	57	0	0
52	65	26	200	200	64	64	0	0
53	71	29	200	200	72	72	0	0
54	78	33	200	200	80	80	0	0

TABLE 13
(cont)

Age	Death		Withdrawal		Disability		Retirement	
	Male	Female	Male	Female	Male	Female	Male	Female
55	85	38	0	0	88	88	0	0
56	93	42	0	0	98	98	0	0
57	100	47	0	0	108	108	0	0
58	109	53	0	0	118	118	10,000	10,000
59	119	59	0	0	129	129	0	0
60	131	65	0	0	141	141	0	0
61	144	71	0	0	154	154	0	0
62	159	78	0	0	167	167	0	0
63	174	85	0	0	0	0	0	0
64	192	93	0	0	0	0	0	0
65	213	100	0	0	0	0	0	0
66	236	109	0	0	0	0	0	0
67	263	119	0	0	0	0	0	0
68	292	131	0	0	0	0	0	0
69	324	144	0	0	0	0	0	0
70	361	159	0	0	0	0	0	0

TABLE 14

STATE PATROL RETIREMENT FUND

SUMMARY OF PLAN PROVISIONS

Eligibility	State troopers, conservation officers, and certain crime bureau officers.
Contributions	
Member	8.50% of Salary.
Employer	18.90% of Salary.
Allowable Service	Service during which member contributions were deducted. Includes period receiving temporary Worker's Compensation. Allowable Service for benefit purposes stops at age 60 for new members and most of the current members.
Salary	Salaries excluding lump sum payments at separation.
Average Salary	Average of the 5 highest successive years of Salary.

RETIREMENT

Normal Retirement Benefit	
Eligibility	Age 55 and 5 years of Allowable Service. (Amended 1987)
Amount	2.5% of Average Salary for the first 25 years of Allowable Service and 2.0% of Average Salary for each subsequent year.
Form of Payment	Life annuity. Actuarially equivalent options are: 50% or 100% joint and survivor 50% or 100% bounceback joint and survivor (option is cancelled if member is pre-deceased by beneficiary).
Benefit Increases	Benefits may be increased each January 1 depending on the investment performance of the Minnesota Post Retirement Investment Fund (MPRIF). Members retired under laws in effect as of May 30, 1973 receive an additional 6% supplement. Each year the supplement increases by 6% of the total annuity, which includes both MPRIF and supplemental amounts.

TABLE 14
(cont)

DISABILITY	
Occupational Disability Benefit	
Eligibility	Member under age 55 who cannot perform his duties because of a disability directly resulting from an act of duty.
Amount	Normal Retirement Benefit based on Allowable Service (minimum of 20 years) and Average Salary at disability without reduction for commencement before age 55. Payments cease at age 55 or earlier if disability ceases or death occurs. Benefits may be paid upon reemployment in order to attain previous salary.
Form of Payment	Same as for retirement.
Benefit Increases	Adjusted by MSRS to provide same increase as MPRIF.
Normal Disability Benefit	
Eligibility	Under age 55 with at least 5 years of Allowable Service and disability not related to covered employment.
Amount	Normal Retirement Benefit based on Allowable Service (minimum of 10 years) and Average Salary at disability without reduction for commencement before age 55. Payments cease at age 55 or earlier if disability ceases or death occurs. Benefits may be paid upon reemployment in order to attain previous salary.
Form of Payment	Same as for retirement.
Benefit Increases	Adjusted by MSRS to provide same increase as MPRIF.
Retirement After Disability	
Eligibility	Age 55 with continued disability.
Amount	Optional annuity continues. Otherwise a normal retirement annuity equal to disability benefit paid, or an actuarially equivalent option.
Form of Payment	Same as for retirement.
Benefit Increases	Same as for retirement.

TABLE 14
(cont)

DEATH	
Surviving Spouse Benefit	
Eligibility	Member who is active or receiving a disability benefit.
Amount	20% Annual Salary if member was active or occupational disability and either had less than 5 years of Allowable Service or was under age 55. Payment for life or until remarriage. (Amended 1987) Surviving spouse receives the 100% joint and survivor benefit commencing on the member's 55th birthday if Member was active or occupational disability with 5 years of Allowable Service or normal disability with 20 years of Allowable Service. A spouse who had been receiving the 20% benefit shall be entitled to the larger of the two. Payment for life or until remarriage. (Amended 1987)
Benefit Increases	Adjusted by MSRS to provide same increase as MPRIF.
Surviving Dependent Children's Benefit	
Eligibility	Member who is active or receiving a disability benefit. Child must be unmarried, under age 18 (or 22 if full time student), and dependent upon the member.
Amount	10% of Average Salary for each child and $20 per month prorated among all dependent children. Maximum benefit of 40% Average Salary.
Refund of Contributions	
Eligibility	Member dies before receiving any retirement benefits and survivor benefits are not payable.
Amount	Member's contributions with 5% interest.
TERMINATION	
Refund of Contributions	
Eligibility	Termination of state service.
Amount	Member's contributions with 5% interest.
Deferred Benefit	
Eligibility	5 years of Allowable Service. (Amended 1987)
Amount	Benefit computed under law in effect at termination and increased by the following annual percentage: 0% before 7/1/71, 5% from 7/1/71 to 1/1/81, and 3% thereafter until the annuity begins. Amount is payable as a normal retirement.

JUDGES RETIREMENT FUND

ACTUARIAL VALUATION REPORT

JULY 1, 1987

Revised January 8, 1987

JAN 12 1988 LCP&R

THE *Wyatt* COMPANY

ACTUARIES AND CONSULTANTS

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OFFICES IN PRINCIPAL CITIES
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January 8, 1987

Legislative Commission on
Pensions and Retirement
55 State Office Building
St. Paul, Minnesota 55155

RE: JUDGES RETIREMENT FUND

Commission Members:

We have prepared an actuarial valuation of the Fund as of July 1, 1987 based on membership and financial data supplied by the Fund.

We certify that to the best of our knowledge and belief this actuarial valuation was performed in accordance with the requirements of Section 356.215, Minnesota Statutes, and the requirements of the Standards for Actuarial Work, adopted by the Commission on August 26, 1987.

Respectfully submitted,

THE WYATT COMPANY

Robert E. Perkins

Robert E. Perkins, FSA
Consulting Actuary

Michael C. Gunvalson

Michael C. Gunvalson, ASA
Associate Actuary

JUDGES RETIREMENT FUND

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JUDGES RETIREMENT FUND

REPORT HIGHLIGHTS
(DOLLARS IN THOUSANDS)

	07/01/86 VALUATION	07/01/87 VALUATION
A. CONTRIBUTIONS (TABLE 11)		
1. Statutory Contributions - Chapter 490 % of Payroll	4.11%	3.76%
2. Required Contributions - Chapter 356 % of Payroll	25.32%	25.96%
3. Sufficiency (Deficiency) (A1-A2)	-21.21%	-22.20%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 1)	$15,982	$18,781
b. Current Benefit Obligations (Table 8)	$51,178	$53,677
c. Funding Ratio (a/b)	31.23%	34.99%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 1)	$15,982	$18,781
b. Actuarial Accrued Liability (Table 9)	$51,360	$54,034
c. Funding Ratio (a/b)	31.12%	34.76%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	$23,279	$25,135
b. Current and Expected Future Benefit Obligations	$77,843	$78,446
c. Funding Ratio (a/b)	29.91%	32.04%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	243	238
b. Projected Annual Earnings	$16,718	$15,999
c. Average Annual Earnings (Actual $)	$68,800	$67,221
d. Average Age	53.6	53.5
e. Average Service	11.8	11.5
2. Others		
a. Service Retirements (Table 4)	83	87
b. Disability Retirements (Table 5)	5	5
c. Survivors (Table 6)	50	60
d. Deferred Retirements (Table 7)	7	7
e. Terminated Other Non-vested (Table 7)	0	1
f. Total	145	160

JUDGES RETIREMENT FUND

COMMENTARY

Purpose

The purpose of this valuation is to determine the financial status of the Fund. In order to achieve this purpose, an actuarial valuation is made at the beginning of each fiscal year as required by Section 356.215 of Minnesota Statutes.

Report Highlights

The statutory contributions, representing only member contributions, for the Judges Retirement Fund are 3.76%. The remaining 22.20% needed to reach the required contribution level of 25.96% will be paid by the State as needed in future years according to Chapter 490 of Minnesota Statutes.

The financial status of the Fund can be measured by three different funding ratios:

- The Accrued Benefit Funding Ratio is a measure of current funding status, and when viewed over a period of years, presents a view of the funding progress. This ratio is based on Statement No. 5 of the Governmental Accounting Standards Board. This year's ratio is 34.99%. The corresponding ratio for the prior year was 31.23%.

- The Accrued Liability Funding Ratio is also a measure of funding status and funding progress. It is based on the actuarial cost method that has historically been used. For 1987 the ratio is 34.76%, which is an increase from the 1986 value of 31.12%.

- The Projected Benefit Funding Ratio is a measure of the adequacy or deficiency in the contribution level. This year's ratio of 32.04% verifies that the current statutory contributions by members are going to cover only a portion of the plan benefits. Since the State will make the neccessary payments to fund annuities payable from MPRIF and to pay other benefits as they come due, this Funding Ratio may be considered to be 100%.

Asset Information

Beginning in 1984, changes in Section 356.215 of Minnesota Statutes require that the asset value used for actuarial purposes reflect a portion of the unrealized gains and losses. Only a portion of these gains and losses are considered because market values are typically volatile and could produce erratic changes in the contribution requirements from year to year.

The calculation of assets for actuarial purposes begins with the reporting of Total Assets by the Fund (Table 1, line B). These Total Assets reduced by any Amounts Currently Payable (line C) produces the Assets Available for Benefits (line D5), which is the starting value for determining the Actuarial Value of Assets.

The calculation of the Actuarial Value of Assets is shown in Table 1 on lines F1 to F6. It combines the cost value and one-third of the difference between market value and cost value.

The term "Actuarial Value of Assets" is used to indicate that the value was determined for use in this actuarial valuation. Since Minnesota Statutes refer to this value as "Current Assets", the latter phrase will be used in the remainder of this report.

Since this Fund participates in the Minnesota Post Retirement Investment Fund, referred to as MPRIF, the asset value shown on line A3 is initially calculated by the State Board of Investment(SBI), and is the expected amount of MPRIF participation assuming the Fund earns 5% interest. The actual amount is determined by calculating the liability based on annuitant information supplied by the Fund. If the actual liability is larger than expected, the difference is labeled a mortality loss and if smaller a gain.

Investment performance by SBI above the 5% level is not shown in the assets but will be added in on January 1, 1988 when benefits will be increased for those annuitants who have been receiving payments for 18 months. Next year's valuation will include the 1988 benefit increase in determining the MPRIF value.

After the MPRIF liability has been calculated for each participating Fund, SBI will determine each Fund's portion of the January benefit increase as well as the Fund's market share of MPRIF. An approximation of these values on June 30, 1987 provides the following relative comparison.

MPRIF Reserves	$ 14,327,000
Reserves Plus Excess Earnings	15,300,000
MPRIF Market Value	16,200,000

The non-MPRIF Reserves amount of $12,269,000 on line D4 of Table 1 represents the liability for benefits that are paid directly by the Fund.

Membership Data

Tables 3 through 6 summarize statistical information on members by category. Active members are grouped by age and completed years of service in Table 3. The earnings shown for these members are for the prior fiscal year.

The service retirements in Table 4 include not only those retiring from active status but also disabled members who have attained retirement age. Disabled members under retirement age are shown in Table 5. The survivors category (Table 6) includes spouses and children of deceased members.

Actuarial Balance Sheet

An actuarial balance sheet is required by Section 356.215, Subdivision 4f of Minnesota Law. This balance sheet (Table 8) establishes a method for evaluating both current and future levels of funding.

Current funding levels are evaluated by comparing Current Assets on line A to Current Benefit Obligations on line D5. The difference between the obligations and the assets is shown as Current Unfunded Actuarial Liability on line G.

The Current Benefit Obligation amounts in Table 8 are required to be disclosed by Statement No. 5 of Governmental Accounting Standards Board (GASB). However, Statement No. 5 uses the terms "Actuarial Present Value of Credited Projected Benefits" and "Pension Benefit Obligation" rather than "Current Benefit Obligation".

The first step in the GASB calculation for active members involves projecting salaries and service to determine future benefits payable under the plan and then discounting those projected benefits to the date of the valuation. The second step is to determine the discounted value of benefits for the non-active members. For those non-active members whose benefits have not commenced, the liability includes augmentation of benefits to date of commencement. The result of the first two steps is shown on line F, Total Current and Expected Future Benefit Obligations.

The third step is to determine the portion that represents Current Benefit Obligations. In the case of active members the Current Benefit Obligation is computed by attributing an equal benefit amount to each year of credited and expected future employee service. For all others, their entire liability is considered a Current Benefit Obligation.

Current and future funding levels are evaluated by comparing Current and Future Expected Assets on line C to Current and Expected Future Benefit Obligations on line F. The difference between the obligations and the assets is shown as the Current and Future Unfunded Actuarial Liability on line H.

Since line F has already been calculated, the remaining step is to determine the Expected Future Assets. Since the State does not have a set statutory contribution rate, only future member contributions (net of expenses) are included in Expected Future Assets on line B2.

The Current Unfunded Actuarial Liability, line G, is a measurement of the status of the funding to the date of the valuation. The Current and Future Unfunded Actuarial Liability is a measurement of the adequacy of the current statutory contribution level.

GASB Disclosure

Table 8 shows that on July 1, 1987, the Pension Benefit Obligation consisted of the following components:

Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$27,446,000
Current Employees -	
Accumulated employee contributions including allocated investment income	4,891,000 *
Employer-financed vested	13,368,000
Employer-financed nonvested	7,972,000
Total Pension Benefit Obligation	$53,677,000

* Estimated

Contribution Sufficiency

The approach used by the State of Minnesota to determine contribution sufficiency is the Entry Age Normal Cost Method. The primary characteristic of this method is that it allocates costs as a level percentage of payroll.

A comparison of this actuarial method (Table 9) to the actuarial balance sheet (Table 8) shows similarities and differences. The similarity is that both approaches calculate the value of all future benefits the same way. This can be verified by comparing line F of Table 8 to line A6, column 1, of Table 9. The difference arises from the technique for allocating liabilities of active members to past and future. As noted in the prior section, the balance sheet allocates benefits and the corresponding liabilities, on the basis of service. The method used in Table 9 allocates liabilities so that the cost each year will be a constant percentage of payroll.

An Unfunded Actuarial Accrued Liability is computed under the Entry Age Normal Cost Method by comparing the liabilities allocated to past service (Actuarial Accrued Liability) to the Current Assets. This amount, line B3, is funded over the remaining years to the amortization date by a series of payments. Prior to 1984 these payments were calculated to be a level dollar amount similar to a fixed interest rate mortgage. The method of funding was changed in 1984 to produce a series of payments that remain a constant percentage of payroll each year.

Under this new approach the payments will increase 6.5% each year since that is the assumed rate of increase in payroll. Although the payment schedule will be adequate to amortize the existing unfunded, the lower payments in the earlier years will not be sufficient to cover the interest on the unfunded liability. After a few years the annual payment will cover the interest and also repay a portion of the unfunded.

<u>Projected Cash Flow</u>

Table 12 illustrates the anticipated cash flow over the amortization period. The cash flow begins with the Non-MPRIF Assets, which are the Current Assets reduced by the MPRIF Reserves. Contributions are then added based on the present statutory rates for employees. As members become eligible for payments from MPRIF an amount of reserve is transferred to SBI. The other disbursements represent benefit payments made directly by the Fund. Future payments required by the State may be approximated from Table 12 by assuming that the State pays 90% of the amount transferred to MPRIF(the remaining 10% coming from member contributions) and 100% of the other disbursements.

This projected cash flow assumes that future payrolls increase by 6.5%. For purposes of this table only, new members are assumed to be hired in order to replace those who terminate from the active group. This open group method provides a more realistic picture of future cash flow. The statutory interest rate of 8% is used to project future investment return.

The amounts transferred to MPRIF will be affected by the number of members who reach the assumed retirement age during a given year. The amount for 1989 is large because it includes those already over age 68 who are assumed to retire a year from the valuation date.

TABLE 1

JUDGES RETIREMENT FUND

ACCOUNTING BALANCE SHEET
(DOLLARS IN THOUSANDS)

July 1, 1987

	MARKET VALUE	COST VALUE
A. ASSETS		
1. Cash, Equivalents, Short-Term Securities	$335	$335
2. Investments		
a. Fixed Income	941	999
b. Equity	2,915	2,638
c. Real Estate	350	300
3. Equity in Minnesota Post-Retirement Investment Fund (MPRIF)	14,327	14,327
4. Other	179	179
B. TOTAL ASSETS	$19,047	$18,778
C. AMOUNTS CURRENTLY PAYABLE	$87	$87
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	$3,829	$3,829
2. State Reserves	(11,465)	(11,734)
3. MPRIF Reserves	14,327	14,327
4. Non-MPRIF Reserves	12,269	12,269
5. Total Assets Available for Benefits	$18,960	$18,691
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	$19,047	$18,778

F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS

1. Cost Value of Assets Available for Benefits (D5)		$18,691
2. Market Value (D5)	$18,960	
3. Cost Value (D5)	18,691	
4. Market Over Cost (F2-F3)	$269	
5. 1/3 of Market Over Cost(F4)/3		90
6. Actuarial Value of Assets (F1+F5) (Same as "Current Assets")		$18,781

TABLE 2

JUDGES RETIREMENT FUND

CHANGES IN ASSETS AVAILABLE FOR BENEFITS (DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1987

	MARKET VALUE	COST VALUE
A. ASSETS AVAILABLE AT BEGINNING OF PERIOD	$16,491	$15,728
B. OPERATING REVENUES		
1. Member Contributions	$563	$563
2. Employer Contributions	2,405	2,405
3. Investment Income	484	484
4. MPRIF Income	1,530	1,530
5. Net Realized Gain (Loss)	685	685
6. Other	62	62
7. Net Change in Unrealized Gain (Loss)	(494)	0
8. Total Revenue	$5,235	$5,729
C. OPERATING EXPENSES		
1. Service Retirements	$2,047	$2,047
2. Disability Benefits	85	85
3. Survivor Benefits	593	593
4. Refunds	0	0
5. Expenses	40	40
6. Other	1	1
7. Total Disbursements	$2,766	$2,766
D. OTHER CHANGES IN RESERVES	0	0
E. ASSETS AVAILABLE AT END OF PERIOD	$18,960	$18,691

TABLE 3

JUDGES RETIREMENT FUND

ACTIVE MEMBERS AS OF JUNE 30, 1987

AGE	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
<25									0
25-29									0
30-34		1							1
35-39	1	15	3						19
40-44	5	19	5	2					31
45-49	2	13	11	11	6				43
50-54		5	5	13	4	2			29
55-59	3		8	15	11	4	1		42
60-64		5	2	15	9	10	6	4	51
65+		2	2	4	2	7	4	1	22
TOTAL	11	60	36	60	32	23	11	5	238

AVERAGE ANNUAL EARNINGS

AGE	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25									0
25-29									0
30-34		64,178							64,178
35-39	62,373	64,391	64,262						64,264
40-44	59,405	64,175	64,730	64,179					63,496
45-49	62,210	64,634	64,206	64,374	64,178				64,282
50-54		63,702	64,178	64,391	64,704	64,179			64,264
55-59	62,535		64,523	64,208	64,698	64,179	64,178		64,273
60-64		67,280	72,559	64,737	65,110	64,454	64,178	64,968	65,256
65+		66,990	64,179	64,179	68,369	65,770	68,035	64,178	66,022
ALL	61,038	64,642	64,812	64,407	64,946	64,783	65,581	64,810	64,543

PRIOR FISCAL YEAR EARNINGS (IN THOUSANDS) BY YEARS OF SERVICE

<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
671	3,880	2,333	3,864	2,078	1,490	721	324	15,361

TABLE 4

JUDGES RETIREMENT FUND

SERVICE RETIREMENTS AS OF JUNE 30, 1987

AGE	YEARS RETIRED <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50								0
50-54								0
55-59								0
60-64	3							3
65-69	5	6	1					12
70-74	3	15	13	1				32
75-79		2	8	7				17
80-84			3	7	1			11
85+				7	3	2		12
TOTAL	11	23	25	22	4	2	0	87

AVERAGE ANNUAL ANNUITY

AGE	YEARS RETIRED <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50								0
50-54								0
55-59								0
60-64	20,183							20,183
65-69	19,235	24,116	15,479					21,362
70-74	21,477	28,284	30,354	21,074				28,261
75-79		22,727	22,448	17,060				20,262
80-84			22,202	22,645	26,837			22,906
85+				19,281	10,318	26,837		18,300
ALL	20,105	26,713	26,251	19,726	14,448	26,837	0	23,417

TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
221	614	656	434	58	54	0	2,037

TABLE 5

JUDGES RETIREMENT FUND

DISABILITY RETIREMENTS AS OF JUNE 30, 1987

AGE	YEARS DISABLED ≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50								0
50-54								0
55-59								0
60-64						1		1
65-69		2						2
70-74		1	1					2
75-79								0
80-84								0
85+								0
TOTAL	0	3	1	0	0	1	0	5

AVERAGE ANNUAL BENEFIT

AGE	YEARS DISABLED ≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50								0
50-54								0
55-59								0
60-64						19,680		19,680
65-69		28,517						28,517
70-74		19,962	15,032					17,497
75-79								0
80-84								0
85+								0
TOTAL	0	25,665	15,032	0	0	19,680	0	22,342

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS OF DISABILITY

≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
0	77	15	0	0	20	0	112

TABLE 6

JUDGES RETIREMENT FUND

SURVIVORS AS OF JUNE 30, 1987

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50	5							5
50-54								0
55-59	1		1	1				3
60-64		2	1	2	1			6
65-69	1	2			1			4
70-74	2	2		2	2	1		9
75-79		3	3	3	1		1	11
80-84	1	1	4	1	1	2		10
85+	2		3	1	1	4	1	12
TOTAL	12	10	12	10	7	7	2	60

AVERAGE ANNUAL BENEFIT

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50	17,554							17,554
50-54								0
55-59	13,160		12,277	8,564				11,334
60-64		14,387	14,940	6,532	13,419			11,699
65-69	20,049	12,240			13,419			14,487
70-74	13,260	21,568		11,447	8,524	6,290		12,876
75-79		9,789	17,542	9,952	3,629		6,080	11,051
80-84	13,201	13,419	9,754	14,048	13,419	6,080		10,526
85+	10,847		15,068	13,419	13,419	11,584	13,419	12,791
ALL	15,199	13,918	13,672	10,185	10,622	9,255	9,750	12,435

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
183	139	164	102	74	65	19	746

TABLE 7

JUDGES RETIREMENT FUND

RECONCILIATION OF MEMBERS

	ACTIVES	TERMINATED DEFERRED RETIREMENT	TERMINATED OTHER NON-VESTED
A. On June 30, 1986	243	7	0
B. Additions	14	1	1
C. Deletions:			
1. Service Retirement	(17)	(1)	0
2. Disability	0		
3. Death	0	0	0
4. Terminated-Deferred	(1)		
5. Terminated-Refund	0	0	0
6. Terminated-Other Non-vested	(1)		
7. Returned as Active		0	0
D. Data Adjustments	0	0	0
Vested	131		
Non-Vested	107		
E. Total on June 30, 1987	238	7	1

	RECIPIENTS RETIREMENT ANNUITANTS	RECIPIENTS DISABLED	RECIPIENTS SURVIVORS
A. On June 30, 1986	83	5	50
B. Additions	12	0	12
C. Deletions:			
1. Service Retirement		0	
2. Death	(9)	0	(2)
3. Annuity Expired	0		0
4. Returned as Active	0	0	
D. Data Adjustments	1	0	0
E. Total on June 30, 1987	87	5	60

TABLE 8

JUDGES RETIREMENT FUND

ACTUARIAL BALANCE SHEET
(DOLLARS IN THOUSANDS)

JULY 1, 1987

A. CURRENT ASSETS (TABLE 1, F6)			$18,781
B. EXPECTED FUTURE ASSETS			
1. Present Value of Expected Future Statutory Supplemental Contributions			0
2. Present Value of Future Normal Costs			6,354
3. Total Expected Future Assets			6,354
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS			$25,135
D. CURRENT BENEFIT OBLIGATIONS	Non-Vested	Vested	Total
1. Benefit Recipients			
a. Retirement Annuities		$18,295	$18,295
b. Disability Benefits		1,204	1,204
c. Surviving Spouse and Child Benefits		7,096	7,096
2. Deferred Retirements		846	846
3. Former Members without Vested Rights		5	5
4. Active Members			
a. Retirement Annuities	2,595	18,152	20,747
b. Disability Benefits	1,546	0	1,546
c. Survivors' Benefits	3,831	0	3,831
d. Deferred Retirements	0	0	0
e. Refund Liability Due to Death or Withdrawal	0	107	107
5. Total Current Benefit Obligations	$7,972	$45,705	$53,677
E. EXPECTED FUTURE BENEFIT OBLIGATIONS			$24,769
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS			$78,446
G. CURRENT UNFUNDED ACTUARIAL LIABILITY (D5-A)			$34,896
H. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F-C)			$53,311

TABLE 9

JUDGES RETIREMENT FUND

DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL) AND SUPPLEMENTAL CONTRIBUTION RATE (DOLLARS IN THOUSANDS)

JULY 1, 1987

	ACTUARIAL PRESENT VALUE OF PROJECTED BENEFITS (1)	ACTUARIAL PRESENT VALUE OF FUTURE NORMAL COSTS (2)	ACTUARIAL ACCRUED LIABILITY (3)=(1)-(2)
A. DETERMINATION OF ACTUARIAL ACCRUED LIABILITY (AAL)			
1. Active Members			
a. Retirement Annuities	$40,784	$17,668	$23,116
b. Disability Benefits	2,995	1,844	1,151
c. Survivors Benefits	7,022	4,801	2,221
d. Deferred Retirements	0	0	0
e. Refunds Due to Death or Withdrawal	199	99	100
f. Total	$51,000	$24,412	$26,588
2. Deferred Retirements	$846		$846
3. Former Members Without Vested Rights	5		5
4. Annuitants in MPRIF	14,327		14,327
5. Recipients Not in MPRIF	12,268		12,268
6. Total AAL	$78,446	$24,412	$54,034

B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)	
1. AAL (A6)	$54,034
2. Current Assets (Table 1,F6)	18,781
3. UAAL (B1-B2)	$35,253
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE	
1. Present Value of Future Payrolls through the Amortization Date of July 1, 2009	$292,708
2. Supplemental Contribution Rate (B3/C1)	12.04%

TABLE 10

JUDGES RETIREMENT FUND

CHANGES IN UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1987

A. UAAL AT BEGINNING OF YEAR	$35,378
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	$1,942
2. Contribution	(2,968)
3. Interest on A, B1, and B2	2,789
4. Total (B1+B2+B3)	$1,763
C. EXPECTED UAAL AT END OF YEAR (A+B4)	$37,141
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	($2,748)
2. Investment Return	(658)
3. MPRIF Mortality	(163)
4. Mortality of Other Benefit Recipients	158
5. Other Items	1,523
6. Total	($1,888)
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D6)	$35,253
F. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO PLAN AMENDMENTS	$0
G. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS	$0
H. UAAL AT END OF YEAR (E+F+G)	$35,253

TABLE 11

JUDGES RETIREMENT FUND

DETERMINATION OF CONTRIBUTION SUFFICIENCY
(DOLLARS IN THOUSANDS)

JULY 1, 1987

	% OF PAYROLL	$ AMOUNT
A. STATUTORY CONTRIBUTIONS - CHAPTER 490		
1. Employee Contributions	3.76%	$601
2. Employer Contributions	0.00%	0
3. Total	3.76%	$601
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	9.71%	$1,553
b. Disability Benefits	0.99%	159
c. Survivors	2.87%	459
d. Deferred Retirement Benefits	0.00%	0
e. Refunds Due to Death or Withdrawal	0.06%	9
f. Total	13.63%	$2,180
2. Supplemental Contribution Amortization by July 1, 2009 of UAAL of $35,253	12.04%	$1,926
3. Allowance for Expenses	0.29%	$46
4. Total	25.96%	$4,152
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) (A3-B4)	-22.20%	($3,551)

Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1987 is $15,999

TABLE 12

JUDGES RETIREMENT FUND

PROJECTED CASH FLOW
(DOLLARS IN THOUSANDS)

FISCAL YEAR	STATUTORY CONTRIBUTIONS	TRANSFERS TO MPRIF	OTHER DISBURSEMENTS	INVESTMENT RETURN	NON-MPRIF ASSETS YEAR END
1987					$4,454
1988	$601	$975	$1,307	$289	3,062
1989	625	3,142	1,259	94	(620)
1990	640	2,705	1,205	(180)	(4,070)
1991	684	2,674	1,140	(451)	(7,651)
1992	726	3,229	1,090	(756)	(12,000)
1993	776	7,027	1,039	(1,252)	(20,542)
1994	832	2,763	987	(1,760)	(25,220)
1995	897	3,835	936	(2,173)	(31,267)
1996	970	4,120	886	(2,663)	(37,966)
1997	1,048	5,716	833	(3,257)	(46,724)
1998	1,133	2,987	784	(3,843)	(53,205)
1999	1,238	4,990	733	(4,436)	(62,126)
2000	1,334	4,950	687	(5,142)	(71,571)
2001	1,455	3,812	641	(5,846)	(80,415)
2002	1,568	2,016	599	(6,475)	(87,937)
2003	1,705	4,416	557	(7,166)	(98,371)
2004	1,870	8,867	517	(8,170)	(114,055)
2005	2,040	7,803	471	(9,374)	(129,663)
2006	2,233	7,054	435	(10,583)	(145,502)
2007	2,459	10,276	391	(11,968)	(165,678)
2008	2,697	8,603	359	(13,505)	(185,448)
2009	2,951	9,252	330	(15,101)	(207,180)
2010	3,255	13,368	301	(16,991)	(234,585)
2011	3,546	9,112	277	(19,001)	(259,429)
2012	3,858	10,042	255	(21,012)	(286,880)

TABLE 13

JUDGES RETIREMENT FUND

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

Interest:	Pre-Retirement: 8% per annum Post-Retirement: 5% per annum
Salary Increases:	Reported salary at valuation date increased 2% to current fiscal year, 5% annually for the next 2 years and 6.5% annually for each future year.
Mortality:	Pre-Retirement: Male - 1971 Group Annuity Mortality Table Female - 1971 Group Annuity Mortality Table male rates set back 8 years Post-Retirement: Male - Same as above Female - Same as above Post-Disability: Male - Same as above Female - Same as above
Retirement Age:	Judges: Age 68, or if over age 68, one year from the valuation date. Supreme Court Justices in Pre-1974 Plan: Latest of Age 70, 12 years of service, or one year from valuation date.
Separation:	None.
Disability:	Rates adopted by MSRS based on actual experience, most recently adjusted in 1979, as shown in rate table.
Expenses:	Prior year expenses expressed as percentage of prior year payroll. (0.29% of payroll)
Return of Contributions:	NA
Family Composition:	Marital status as indicated by data. Female is three years younger than male.
Social Security:	Maximum Current Primary amount ($789/month for 1987), increasing with salary scale. Covered annual wages: $43,800 Contribution rate: 7.15% for 1987, 7.51% for 1988-89, 7.65% for 1990 and later.

TABLE 13
(cont)

Benefit Increases After Retirement:	Payment of earnings on retired reserves in excess of 5% accounted for by 5% post-retirement assumptions.
Special Consideration:	NA
Actuarial Cost Method:	Entry Age Actuarial Cost Method based on earnings and the date the employee entered the plan is applied to all plan benefits. Under this method Actuarial Gains(Losses) reduce(increase) the Unfunded Actuarial Accrued Liability.
Asset Valuation Method:	Cost Value plus one-third Unrealized Gains or Losses.
Payment on the Unfunded Actuarial Accrued Liability:	A level percentage of payroll each year to the statutory amortization date assuming payroll increases 6.5% per annum.
Projected Cash Flow Method:	Cash flows for the non-MPRIF portion of the Fund were projected based on the current plan benefits, participant data, and actuarial assumptions. In addition new entrants were assumed so that the total payroll would increase by 6.5% per annum.

TABLE 13
(cont)

SEPARATIONS EXPRESSED AS THE NUMBER OF OCCURRENCES PER 10,000

	Death		Withdrawal		Disability		Retirement	
Age	Male	Female	Male	Female	Male	Female	Male	Female
20	5	4	0	0	0	0	0	0
21	5	4	0	0	0	0	0	0
22	5	4	0	0	0	0	0	0
23	6	4	0	0	0	0	0	0
24	6	4	0	0	0	0	0	0
25	6	5	0	0	0	0	0	0
26	7	5	0	0	0	0	0	0
27	7	5	0	0	0	0	0	0
28	7	5	0	0	0	0	0	0
29	8	5	0	0	0	0	0	0
30	8	5	0	0	2	0	0	0
31	9	6	0	0	2	0	0	0
32	9	6	0	0	2	0	0	0
33	10	6	0	0	2	0	0	0
34	10	7	0	0	2	0	0	0
35	11	7	0	0	2	1	0	0
36	12	7	0	0	2	1	0	0
37	13	8	0	0	2	1	0	0
38	14	8	0	0	2	1	0	0
39	15	9	0	0	2	2	0	0
40	16	9	0	0	2	2	0	0
41	18	10	0	0	2	2	0	0
42	20	10	0	0	2	4	0	0
43	23	11	0	0	3	4	0	0
44	26	12	0	0	3	4	0	0
45	29	13	0	0	3	5	0	0
46	33	14	0	0	5	6	0	0
47	38	15	0	0	7	7	0	0
48	42	16	0	0	9	7	0	0
49	47	18	0	0	11	10	0	0
50	53	20	0	0	14	10	0	0
51	59	23	0	0	16	12	0	0
52	65	26	0	0	20	14	0	0
53	71	29	0	0	24	16	0	0
54	78	33	0	0	28	20	0	0

TABLE 13
(cont)

Age	Death Male	Death Female	Withdrawal Male	Withdrawal Female	Disability Male	Disability Female	Retirement Male	Retirement Female
55	85	38	0	0	34	24	0	0
56	93	42	0	0	40	30	0	0
57	100	47	0	0	46	36	0	0
58	109	53	0	0	56	44	0	0
59	119	59	0	0	66	52	0	0
60	131	65	0	0	76	62	0	0
61	144	71	0	0	90	74	0	0
62	159	78	0	0	110	88	0	0
63	174	85	0	0	136	104	0	0
64	192	93	0	0	174	122	0	0
65	213	100	0	0	0	0	0	0
66	236	109	0	0	0	0	0	0
67	263	119	0	0	0	0	0	0
68	292	131	0	0	0	0	10,000	10,000
69	324	144	0	0	0	0	0	0
70	361	159	0	0	0	0	0	0

JUDGES RETIREMENT FUND

SUMMARY OF PLAN PROVISIONS

Eligibility	A judge or justice of any court who is not covered under the Social Security Act. If the Member was active prior to 1/1/74, benefits may be computed according to provisions of the prior plan.
Contributions	
Member	0.5% of Salary plus the Social Security tax rate. Members who were active prior to 1/1/74 may contribute 4% to a special survivor retirement account.
Employer	Terminal funding basis.
Allowable Service	Service as a judge. Half credit is received for service not compensated at an annual salary or for service while entitled to practice law. Credit may also be earned for uncredited judicial service if the appropriate employee contributions, with interest, are made.
Salary	Salary set by law
Average Salary	Average of the 5 highest years of Salary of the last 10 years prior to retirement.
RETIREMENT	
Normal Retirement Benefit	
Eligibility	Age 65 and 10 years of Allowable Service. Age 70.
Amount	2.5% of Average Salary for each year of Allowable Service prior to 7/1/80 and 3% of Average Salary for each year of Allowable Service after 6/30/80. Maximum benefit of 65% of salary for the 12 months preceding retirement.
Early Retirement Benefit	
Eligibility	Age 62 and 10 years of Allowable Service.
Amount	Normal Retirement Benefit based on Allowable Service and Average Salary at retirement date with reduction of 0.5% for each month the Member is under age 65 at time of retirement.
Form of Payment	Life annuity. Actuarially equivalent options are: 50% or 100% joint and survivor 10 or 15 year certain and life.

TABLE 14
BASIC
(cont)

Benefit Increases	Benefits may be increased each January 1 depending on the investment performance of the Minnesota Post Retirement Investment Fund (MPRIF).
DISABILITY	
Disability Benefit	
Eligibility	Permanent inability to perform the functions of judge.
Amount	No benefit is paid by the Fund. Instead salary is continued for 2 years, but not beyond age 70. Employee contributions continue and Allowable Service is earned.
Retirement After Disability	
Eligibility	Member is still disabled after salary payments cease after 2 years, or at age 70, if earlier.
Amount	Larger of 25% of Average Salary or the Normal Retirement Benefit, without reduction.
Benefit Increases	Same as for retirement.
DEATH	
Survivors' Benefit	
Eligibility	Active or disabled Member dies before retirement or a former Member eligible for a deferred annuity dies.
Amount	Larger of 25% of Average Salary or 60% of Normal Retirement Benefit had the Member retired at date of death. Benefit paid to spouse for life. If no spouse, benefit is paid to surviving dependent children until child marries, dies, or attains age 18 (age 22 if full time student).
Benefit Increases	Same as for retirement.
Prior Survivors' Benefit	
Eligibility	Retired Member dies who did not elect an optional annuity and such Member retired prior to 1/1/74 or was in office prior to 1/1/74 and continued contributing 4% of pay to provide this post-retirement death benefit.
Amount	50% of the retired Member's benefit continues to the surviving spouse if married 3 years. Benefit begins immediately unless spouse is not yet age 40 and continues to the earlier of remarriage or death.

TABLE 14
BASIC
(cont)

Benefit Increases	Adjusted by MSRS to provide same increase as MPRIF.
Refund of Contributions	
Eligibility	Member dies prior to retirement or former Member eligible for a deferred annuity dies and survivors' benefits are not payable.
Amount	Member's contributions with 5% interest.
TERMINATION	
Refund of Contributions	
Eligibility	Termination of service as a judge.
Amount	Member's contributions with 5% interest. A deferred annuity may be elected in lieu of a refund.
Deferred Benefit	
Eligibility	10 years of Allowable Service.
Amount	Benefit computed under law in effect at termination. Amount is payable as a normal or early retirement annuity.

JUDGES RETIREMENT FUND

SUMMARY OF PLAN PROVISIONS

Eligibility	A judge or justice of any court who is covered under the Social Security Act.
Contributions	
Member	0.5% of Salary plus the Social Security tax rate reduced by the Member's Social Security tax.
Employer	Terminal funding basis.
Allowable Service	Service as a judge. Half credit is received for service not compensated at an annual salary or for service while entitled to practice law. Credit may also be earned for uncredited judicial service if the appropriate employee contributions, with interest, are made.
Salary	Salary set by law
Average Salary	Average of the 5 highest years of Salary of the last 10 years prior to retirement.
RETIREMENT	
Normal Retirement Benefit	
Eligibility	Age 65 and 10 years of Allowable Service. Age 70.
Amount	2.5% of Average Salary for each year of Allowable Service prior to 7/1/80 and 3% of Average Salary for each year of Allowable Service after 6/30/80 reduced by 75% of the member's primary Social Security. Maximum benefit of 65% of salary for the 12 months preceding retirement.
Early Retirement Benefit	
Eligibility	Age 62 and 10 years of Allowable Service.
Amount	Normal Retirement Benefit based on Allowable Service and Average Salary at retirement date with reduction of 0.5% for each month the Member is under age 65 at time of retirement.
Form of Payment	Life annuity. Actuarially equivalent options are: 50% or 100% joint and survivor 10 or 15 year certain and life.

TABLE 14
COORDINATED
(cont)

Benefit Increases	Benefits may be increased each January 1 depending on the investment performance of the Minnesota Post Retirement Investment Fund (MPRIF).
DISABILITY	
Disability Benefit	
Eligibility	Permanent inability to perform the functions of judge.
Amount	No benefit is paid by the Fund. Instead salary is continued for 2 years, but not beyond age 70. Employee contributions continue and Allowable Service is earned.
Retirement After Disability	
Eligibility	Member is still disabled after salary payments cease after 2 years, or at age 70, if earlier.
Amount	Larger of 25% of Average Salary reduced by 75% of the Member's primary Social Security or the Normal Retirement Benefit, without reduction for age.
Benefit Increases	Same as for retirement.
DEATH	
Survivors' Benefit	
Eligibility	Active or disabled Member dies before retirement or a former Member eligible for a deferred annuity dies.
Amount	Larger of 25% of Average Salary or 60% of Normal Retirement Benefit had the Member retired at date of death. The primary Social Security is the amount upon which Social Security survivors' benefits are based. Benefit paid to spouse for life. If no spouse, benefit is paid to surviving dependent children until child marries, dies, or attains age 18 (age 22 if full time student).
Benefit Increases	Same as for retirement.
Refund of Contributions	
Eligibility	Member dies prior to retirement or former Member eligible for a deferred annuity dies and survivors' benefits are not payable.

TABLE 14
COORDINATED
(cont)

Amount	Member's contributions with 5% interest.
TERMINATION	
Refund of Contributions	
Eligibility	Termination of service as a judge.
Amount	Member's contributions with 5% interest. A deferred annuity may be elected in lieu of a refund.
Deferred Benefit	
Eligibility	10 years of Allowable Service.
Amount	Benefit computed under law in effect at termination. Amount is payable as a normal or early retirement annuity.

LEGISLATORS RETIREMENT FUND

ACTUARIAL VALUATION REPORT

JULY 1, 1987

November 23, 1987

Legislative Commission on
Pensions and Retirement
55 State Office Building
St. Paul, Minnesota 55155

RE: LEGISLATORS RETIREMENT FUND

Commission Members:

We have prepared an actuarial valuation of the Fund as of July 1, 1987 based on membership and financial data supplied by the Fund.

We certify that to the best of our knowledge and belief this actuarial valuation was performed in accordance with the requirements of Section 356.215, Minnesota Statutes, and the requirements of the Standards for Actuarial Work, adopted by the Commission on August 26, 1987.

Respectfully submitted,

THE WYATT COMPANY

Robert E. Perkins

Robert E. Perkins, FSA
Consulting Actuary

Michael C. Gunvalson

Michael C. Gunvalson, ASA
Associate Actuary

LEGISLATORS RETIREMENT FUND

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LEGISLATORS RETIREMENT FUND

REPORT HIGHLIGHTS
(DOLLARS IN THOUSANDS)

	07/01/86 VALUATION	07/01/87 VALUATION
A. CONTRIBUTIONS (TABLE 11)		
1. Statutory Contributions - Chapter 3A % of Payroll	9.00%	9.00%
2. Required Contributions - Chapter 356 % of Payroll	31.77%	32.14%
3. Sufficiency (Deficiency) (A1-A2)	-22.77%	-23.14%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 1)	$9,535	$11,158
b. Current Benefit Obligations (Table 8)	$20,532	$21,950
c. Funding Ratio (a/b)	46.44%	50.83%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 1)	$9,535	$11,158
b. Actuarial Accrued Liability (Table 9)	$21,591	$23,083
c. Funding Ratio (a/b)	44.16%	48.34%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	$13,656	$15,526
b. Current and Expected Future Benefit Obligations	$30,540	$31,570
c. Funding Ratio (a/b)	44.72%	49.18%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	201	201
b. Projected Annual Earnings	$4,880	$4,765
c. Average Annual Earnings (Actual $)	$24,279	$23,709
d. Average Age	46.6	46.9
e. Average Service	6.9	6.6
2. Others		
a. Service Retirements (Table 4)	115	124
b. Disability Retirements (Table 5)	NA	NA
c. Survivors (Table 6)	41	42
d. Deferred Retirements (Table 7)	101	100
e. Terminated Other Non-vested (Table 7)	12	17
f. Total	269	283

LEGISLATORS RETIREMENT FUND

COMMENTARY

Purpose

The purpose of this valuation is to determine the financial status of the Fund. In order to achieve this purpose, an actuarial valuation is made at the beginning of each fiscal year as required by Section 356.215 of Minnesota Statutes.

Report Highlights

The statutory contributions, representing only member contributions, for the Legislators Retirement Fund are 9.00% for the first 20 years of service. The remaining 23.14% needed to reach the required contribution level of 32.14% will be paid by the State as needed in future years according to Chapter 3A of Minnesota Statutes.

The financial status of the Fund can be measured by three different funding ratios:

- The Accrued Benefit Funding Ratio is a measure of current funding status, and when viewed over a period of years, presents a view of the funding progress. This ratio is based on Statement No. 5 of the Governmental Accounting Standards Board. This year's ratio is 50.83%. The corresponding ratio for the prior year was 46.44%.

- The Accrued Liability Funding Ratio is also a measure of funding status and funding progress. It is based on the actuarial cost method that has historically been used by the State. For 1987 the ratio is 48.34%, which is an increase from the 1986 value of 44.16%.

- o The Projected Benefit Funding Ratio is a measure of the adequacy or deficiency in the contribution level. This year's ratio of 49.18% verifies that the current statutory contributions by members are going to cover only a portion of the plan benefits. Since the State will make the neccessary payments to fund annuities payable from MPRIF and to pay other benefits as they come due, this Funding Ratio may be considered to be 100%.

Asset Information

Beginning in 1984, changes in Section 356.215 of Minnesota Statutes require that the asset value used for actuarial purposes reflect a portion of the unrealized gains and losses. Only a portion of these gains and losses are considered because market values are typically volatile and could produce erratic changes in the contribution requirements from year to year.

The calculation of assets for actuarial purposes begins with the reporting of Total Assets by the Fund (Table 1, line B). These Total Assets reduced by any Amounts Currently Payable (line C) produces the Assets Available for Benefits (line D5), which is the starting value for determining the Actuarial Value of Assets.

The calculation of the Actuarial Value of Assets is shown in Table 1 on lines F1 to F6. It combines the cost value and one-third of the difference between market value and cost value.

The term "Actuarial Value of Assets" is used to indicate that the value was determined for use in this actuarial valuation. Since Minnesota Statutes refer to this value as "Current Assets", the latter phrase will be used in the remainder of this report.

Since this Fund participates in the Minnesota Post Retirement Investment Fund, referred to as MPRIF, the asset value shown on line A3 is initially calculated by the State Board of Investment(SBI), and is the expected amount of MPRIF participation assuming the Fund earns 5% interest. The actual amount is determined by calculating the liability based on annuitant information supplied by the Fund. If the actual liability is larger than expected, the difference is labeled a mortality loss and if smaller a gain.

Investment performance by SBI above the 5% level is not shown in the assets but will be added in on January 1, 1988 when benefits will be increased for those annuitants who have been receiving payments for 18 months. Next year's valuation will include the 1988 benefit increase in determining the MPRIF value.

After the MPRIF liability has been calculated for each participating Fund, SBI will determine each Fund's portion of the January benefit increase as well as the Fund's market share of MPRIF. An approximation of these values on June 30, 1987 provides the following relative comparison.

MPRIF Reserves	$ 8,318,000
Reserves Plus Excess Earnings	8,860,000
MPRIF Market Value	9,400,000

Membership Data

Tables 3 through 6 summarize statistical information on members by category. Active members are grouped by age and completed years of service in Table 3. The earnings shown for these members are for the prior fiscal year.

The service retirements in Table 4 include not only those retiring from active status but also members with deferred benefits who have attained retirement age and started receiving benefits.

The survivors category (Table 6) includes spouses and children of deceased members.

Actuarial Balance Sheet

An actuarial balance sheet is required by Section 356.215, Subdivision 4f of Minnesota Law. This balance sheet (Table 8) establishes a method for evaluating both current and future levels of funding.

Current funding levels are evaluated by comparing Current Assets on line A to Current Benefit Obligations on line D5. The difference between the obligations and the assets is shown as Current Unfunded Actuarial Liability on line G.

The Current Benefit Obligation amounts in Table 8 are required to be disclosed by Statement No. 5 of Governmental Accounting Standards Board (GASB). However, Statement No. 5 uses the terms "Actuarial Present Value of Credited Projected Benefits" and "Pension Benefit Obligation" rather than "Current Benefit Obligation".

The first step in the calculation for active members involves projecting salaries and service to determine future benefits payable under the plan and then discounting those projected benefits to the date of the valuation. The second step is to determine the discounted value of benefits for the non-active members. For those non-active members whose benefits have not commenced, the liability includes augmentation of benefits to date of commencement. The result of the first two steps is shown on line F, Total Current and Expected Future Benefit Obligations.

The third step is to determine the portion that represents Current Benefit Obligations. In the case of active members the Current Benefit Obligation is computed by attributing an equal benefit amount to each year of credited and expected future employee service. For all others, their entire liability is considered a Current Benefit Obligation.

Current and future funding levels are evaluated by comparing Current and Future Expected Assets on line C to Current and Expected Future Benefit Obligations on line F. The difference between the obligations and the assets is shown as the Current and Future Unfunded Actuarial Liability on line H.

Since line F has already been calculated, the remaining step is to determine the Expected Future Assets. Since the State does not have a set statutory contribution rate, only future member contributions (net of expenses) are included in Expected Future Assets on line B2.

The Current Unfunded Actuarial Liability, line G, is a measurement of the status of the funding to the date of the valuation. The Current and Future Unfunded

Actuarial Liability is a measurement of the adequacy of the current statutory contribution level.

GASB Disclosure

Table 8 shows that on July 1, 1987, the Pension Benefit Obligation consisted of the following components:

Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$15,385,000
Current Employees -	
Accumulated employee contributions including allocated investment income	2,513,000 *
Employer-financed vested	2,489,000
Employer-financed nonvested	1,563,000
Total Pension Benefit Obligation	$21,950,000

* Estimated

Contribution Sufficiency

The approach used by the State of Minnesota to determine contribution sufficiency is the Entry Age Normal Cost Method. The primary characteristic of this method is that it allocates costs as a level percentage of payroll.

A comparison of this actuarial method (Table 9) to the actuarial balance sheet (Table 8) shows similarities and differences. The similarity is that both approaches calculate the value of all future benefits the same way. This can be verified by comparing line F of Table 8 to line A6, column 1, of Table 9. The difference arises from the technique for allocating liabilities of active members to past and future. As noted in the prior section, the balance sheet allocates benefits and the corresponding liabilities, on the basis of service. The method used in Table 9 allocates liabilities so that the cost each year will be a constant percentage of payroll.

An Unfunded Actuarial Accrued Liability is computed under the Entry Age Normal Cost Method by comparing the liabilities allocated to past service (Actuarial Accrued Liability) to the Current Assets. This amount, line B3, is funded over the remaining years to the amortization date by a series of payments, representing a constant percentage of payroll each year.

Under this new approach the payments will increase 6.5% each year since that is the assumed rate of increase in payroll. Although the payment schedule will be adequate to amortize the existing unfunded, the lower payments in the earlier years will not be sufficient to cover the interest on the unfunded liability. After a few years the annual payment will cover the interest and also repay a portion of the unfunded.

<u>Projected Cash Flow</u>

Table 12 illustrates the anticipated cash flow over the amortization period. The cash flow begins with the Non-MPRIF Assets, which are the Current Assets reduced by the MPRIF Reserves. Contributions are then added based on the present statutory rates for employees. As members become eligible for payments from MPRIF an amount of reserve is transferred to SBI. The other disbursements represent benefit payments made directly by the Fund. Future payments required by the State may be approximated from Table 12 by assuming that the State pays 85% of the amount transferred to MPRIF(the remaining 15% coming from member contributions) and 100% of the other disbursements. In future years the member contributions will provide a larger portion of the benefit as the pre-1979 benefit formula phases out.

This projected cash flow assumes that future payrolls increase by 6.5%. For purposes of this table only, new members are assumed to be hired in order to replace those who terminate from the active group. This open group method provides a more realistic picture of future cash flow. The statutory interest rate of 8% is used to project future investment return.

The amounts transferred to MPRIF will be affected by the number of members who reach the assumed retirement age during a given year.

Actuarial Assumptions and Methods

A new calculation technique was adopted which assumes that the terminating vested member takes the larger of contributions with interest or a deferred annuity. Previously, the technique assumed that a deferred annuity was selected by the terminating vested member. This change in technique had no effect on the required contribution.

TABLE 1

LEGISLATORS RETIREMENT FUND

ACCOUNTING BALANCE SHEET
(DOLLARS IN THOUSANDS)

July 1, 1987

	MARKET VALUE	COST VALUE
A. ASSETS		
1. Cash, Equivalents, Short-Term Securities	$0	$0
2. Investments		
a. Fixed Income	0	0
b. Equity	0	0
c. Real Estate	0	0
3. Equity in Minnesota Post-Retirement Investment Fund (MPRIF)	8,318	8,318
4. Other	2,971	2,971
B. TOTAL ASSETS	$11,289	$11,289
C. AMOUNTS CURRENTLY PAYABLE	$131	$131
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	$2,937	$2,937
2. State Reserves	(97)	(97)
3. MPRIF Reserves	8,318	8,318
4. Non-MPRIF Reserves	0	0
5. Total Assets Available for Benefits	$11,158	$11,158
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	$11,289	$11,289

F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS

1. Cost Value of Assets Available for Benefits (D5)		$11,158
2. Market Value (D5)	$11,158	
3. Cost Value (D5)	11,158	
4. Market Over Cost (F2-F3)	$0	
5. 1/3 of Market Over Cost(F4)/3		0
6. Actuarial Value of Assets (F1+F5) (Same as "Current Assets")		$11,158

TABLE 2

LEGISLATORS RETIREMENT FUND

CHANGES IN ASSETS AVAILABLE FOR BENEFITS (DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1987

	MARKET VALUE	COST VALUE
A. ASSETS AVAILABLE AT BEGINNING OF PERIOD	$9,535	$9,535
B. OPERATING REVENUES		
1. Member Contributions	$430	$430
2. Employer Contributions	1,847	1,847
3. Investment Income	0	0
4. MPRIF Income	979	979
5. Net Realized Gain (Loss)	0	0
6. Other	0	0
7. Net Change in Unrealized Gain (Loss)	0	0
8. Total Revenue	$3,256	$3,256
C. OPERATING EXPENSES		
1. Service Retirements	$921	$921
2. Disability Benefits	0	0
3. Survivor Benefits	117	117
4. Refunds	130	130
5. Expenses	34	34
6. Other	0	0
7. Total Disbursements	$1,202	$1,202
D. OTHER CHANGES IN RESERVES	(431)	(431)
E. ASSETS AVAILABLE AT END OF PERIOD	$11,158	$11,158

TABLE 3

LEGISLATORS RETIREMENT FUND

ACTIVE MEMBERS AS OF JUNE 30, 1987

AGE	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
<25	1								1
25-29	2	2	1						5
30-34	4	4	5						13
35-39	7	12	7	5					31
40-44	11	10	12	7	3				43
45-49	3	10	13	6					32
50-54	1	10	6	7	3				27
55-59	4	9	10	5	7				35
60-64	2	4	1	1	2				10
65+		1		2			1		4
TOTAL	35	62	55	33	15	0	1	0	201

AVERAGE ANNUAL EARNINGS

AGE	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25	22,797								22,797
25-29	22,797	22,797	22,797						22,797
30-34	22,797	22,797	22,797						22,797
35-39	22,797	22,797	22,797	22,797					22,797
40-44	22,797	22,797	22,797	22,797	22,797				22,797
45-49	22,797	22,797	22,797	22,797					22,797
50-54	22,797	22,797	22,797	22,797	22,797				22,797
55-59	22,797	22,797	22,797	22,797	22,797				22,797
60-64	22,797	22,797	22,797	22,797	22,797				22,797
65+		22,797		22,797			22,797		22,797
ALL	22,797	22,797	22,797	22,797	22,797	0	22,797	0	22,797

PRIOR FISCAL YEAR EARNINGS (IN THOUSANDS) BY YEARS OF SERVICE

<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
798	1,413	1,254	752	342	0	23	0	4,582

TABLE 4

LEGISLATORS RETIREMENT FUND

SERVICE RETIREMENTS AS OF JUNE 30, 1987

AGE	YEARS RETIRED <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50								0
50-54								0
55-59								0
60-64	9	27	1					37
65-69	2	9	20	1				32
70-74	1	2	8	15				26
75-79			3	9				12
80-84		1		7	5			13
85+					3	1		4
TOTAL	12	39	32	32	8	1	0	124

AVERAGE ANNUAL ANNUITY

AGE	YEARS RETIRED <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50								0
50-54								0
55-59								0
60-64	6,402	6,879	5,744					6,732
65-69	18,892	8,605	9,696	6,147				9,853
70-74	13,859	8,724	11,651	6,490				8,533
75-79			6,322	6,580				6,516
80-84		12,884		8,020	4,187			6,920
85+					8,154	4,555		7,254
ALL	9,105	7,526	9,745	6,839	5,674	4,555	0	7,931

TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
109	294	311	219	45	5	0	983

TABLE 6

LEGISLATORS RETIREMENT FUND

SURVIVORS AS OF JUNE 30, 1987

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50			5	3	1			9
50-54								0
55-59	1	1			1			3
60-64		1	1	1				3
65-69	1	3			1			5
70-74		1	3	3	2			9
75-79	1	5	2	1				9
80-84	1		1					2
85+				2				2
TOTAL	4	11	12	10	5	0	0	42

AVERAGE ANNUAL BENEFIT

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50			4,117	939	735			2,682
50-54								0
55-59	3,875	2,031			1,932			2,613
60-64		1,183	4,512	3,522				3,072
65-69	2,509	3,589			2,088			3,073
70-74		5,059	4,990	3,474	2,166			3,865
75-79	2,818	2,607	3,012	2,359				2,693
80-84	1,507		1,447					1,477
85+				1,958				1,958
ALL	2,677	2,916	3,961	2,304	1,817	0	0	2,915

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
11	32	47	23	9	0	0	122

TABLE 7

LEGISLATORS RETIREMENT FUND

RECONCILIATION OF MEMBERS

	ACTIVES	TERMINATED: DEFERRED RETIREMENT	TERMINATED: OTHER NON-VESTED
A. On June 30, 1986	201	101	12
B. Additions	38	12	5
C. Deletions:			
1. Service Retirement	(7)	(6)	
2. Disability	0		
3. Death	0	0	0
4. Terminated-Deferred	(12)		
5. Terminated-Refund	(14)	(2)	0
6. Terminated-Other Non-vested	(5)		
7. Returned as Active		(4)	0
D. Data Adjustments	0	(1)	0
Vested	80		
Non-Vested	121		
E. Total on June 30, 1987	201	100	17

	RECIPIENTS: RETIREMENT ANNUITANTS	RECIPIENTS: DISABLED	RECIPIENTS: SURVIVORS
A. On June 30, 1986	115	NA	41
B. Additions	13		4
C. Deletions:			
1. Service Retirement			
2. Death	(4)		(1)
3. Annuity Expired	0		(2)
4. Returned as Active	0		
D. Data Adjustments	0		0
E. Total on June 30, 1987	124	NA	42

TABLE 8

LEGISLATORS RETIREMENT FUND

ACTUARIAL BALANCE SHEET
(DOLLARS IN THOUSANDS)

JULY 1, 1987

A. CURRENT ASSETS (TABLE 1, F6)			$11,158
B. EXPECTED FUTURE ASSETS			
1. Present Value of Expected Future Statutory Supplemental Contributions			0
2. Present Value of Future Normal Costs			$4,368
3. Total Expected Future Assets			4,368
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS			$15,526
D. CURRENT BENEFIT OBLIGATIONS	Non-Vested	Vested	Total
1. Benefit Recipients			
a. Retirement Annuities		$10,095	$10,095
b. Disability Benefits		0	0
c. Surviving Spouse and Child Benefits		1,259	1,259
2. Deferred Retirements with Future Augmentation		3,956	3,956
3. Former Members without Vested Rights		75	75
4. Active Members			
a. Retirement Annuities	1,184	4,866	6,050
b. Disability Benefits	0	0	0
c. Survivors' Benefits	359	0	359
d. Deferred Retirements	20	3	23
e. Refund Liability Due to Death or Withdrawal	0	133	133
5. Total Current Benefit Obligations	$1,563	$20,387	$21,950
E. EXPECTED FUTURE BENEFIT OBLIGATIONS			$9,620
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS			$31,570
G. CURRENT UNFUNDED ACTUARIAL LIABILITY (D5-A)			$10,792
H. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F-C)			$16,044

TABLE 9

LEGISLATORS RETIREMENT FUND

DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL) AND SUPPLEMENTAL CONTRIBUTION RATE (DOLLARS IN THOUSANDS)

JULY 1, 1987

	ACTUARIAL PRESENT VALUE OF PROJECTED BENEFITS (1)	ACTUARIAL PRESENT VALUE OF FUTURE NORMAL COSTS (2)	ACTUARIAL ACCRUED LIABILITY (3)=(1)-(2)
A. DETERMINATION OF ACTUARIAL ACCRUED LIABILITY (AAL)			
1. Active Members			
a. Retirement Annuities	$15,017	$7,467	$7,550
b. Disability Benefits	0	0	0
c. Survivors Benefits	817	492	325
d. Deferred Retirements	51	67	(16)
e. Refunds Due to Death or Withdrawal	300	461	(161)
f. Total	$16,185	$8,487	$7,698
2. Deferred Retirements with Future Augmentation	$3,956		$3,956
3. Former Members Without Vested Rights	75		75
4. Annuitants in MPRIF	8,318		8,318
5. Recipients Not in MPRIF	3,036		3,036
6. Total AAL	$31,570	$8,487	$23,083

B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)	
1. AAL (A6)	$23,083
2. Current Assets (Table 1,F6)	11,158
3. UAAL (B1-B2)	$11,925
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE	
1. Present Value of Future Payrolls through the Amortization Date of July 1, 2009	$87,188
2. Supplemental Contribution Rate (B3/C1)	13.68%

TABLE 10

LEGISLATORS RETIREMENT FUND

CHANGES IN UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1987

A. UAAL AT BEGINNING OF YEAR	$12,056
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	$896
2. Contribution	(2,277)
3. Interest on A, B1, and B2	909
4. Total (B1+B2+B3)	($472)
C. EXPECTED UAAL AT END OF YEAR (A+B4)	$11,584
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	($680)
2. Investment Return	221
3. MPRIF Mortality	97
4. Mortality of Other Benefit Recipients	20
5. Other Items	683
6. Total	$341
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D7)	$11,925
F. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO PLAN AMENDMENTS	$0
G. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS	$0
H. UAAL AT END OF YEAR (E+F+G)	$11,925

TABLE 11

LEGISLATORS RETIREMENT FUND

DETERMINATION OF CONTRIBUTION SUFFICIENCY (DOLLARS IN THOUSANDS)

JULY 1, 1987

	% OF PAYROLL	$ AMOUNT
A. STATUTORY CONTRIBUTIONS - CHAPTER 3A		
1. Employee Contributions	9.00%	$429
2. Employer Contributions	0.00%	0
3. Total	9.00%	$429
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	15.65%	$746
b. Disability Benefits	0.00%	0
c. Survivors	0.86%	41
d. Deferred Retirement Benefits	0.21%	10
e. Refunds Due to Death or Withdrawal	1.03%	49
f. Total	17.75%	$846
2. Supplemental Contribution Amortization by July 1, 2009 of UAAL of $11,925	13.68%	$652
3. Allowance for Expenses	0.71%	$34
4. Total	32.14%	$1,532
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) (A3-B4)	-23.14%	($1,103)

Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1987 is $4,765

TABLE 12

LEGISLATORS RETIREMENT FUND

PROJECTED CASH FLOW
(DOLLARS IN THOUSANDS)

FISCAL YEAR	STATUTORY CONTRIBUTIONS	TRANSFERS TO MPRIF	OTHER DISBURSEMENTS	INVESTMENT RETURN	NON-MPRIF ASSETS YEAR END
1987					$2,840
1988	$429	$94	$144	$235	3,266
1989	448	583	261	$245	3,115
1990	477	648	184	$235	2,995
1991	511	1,742	302	$178	1,640
1992	549	1,048	232	$102	1,011
1993	568	886	307	$56	442
1994	608	1,594	275	($15)	(834)
1995	607	1,415	336	($112)	(2,090)
1996	647	811	315	($186)	(2,755)
1997	662	2,053	358	($290)	(4,794)
1998	709	1,009	348	($409)	(5,851)
1999	747	1,675	381	($520)	(7,680)
2000	805	2,289	381	($689)	(10,234)
2001	839	2,568	408	($904)	(13,275)
2002	904	1,886	414	($1,118)	(15,789)
2003	884	1,279	435	($1,296)	(17,915)
2004	959	2,641	440	($1,518)	(21,555)
2005	955	3,838	464	($1,858)	(26,760)
2006	1,006	2,948	467	($2,237)	(31,406)
2007	1,121	4,496	485	($2,667)	(37,933)
2008	1,202	5,291	493	($3,218)	(45,733)
2009	1,315	3,328	510	($3,760)	(52,016)
2010	1,419	3,439	520	($4,263)	(58,819)
2011	1,514	3,605	537	($4,811)	(66,258)
2012	1,657	6,208	535	($5,504)	(76,848)

TABLE 13

LEGISLATORS RETIREMENT FUND

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

Interest:	Pre-Retirement: 8% per annum Post-Retirement: 5% per annum
Salary Increases:	Reported salary at valuation date increased 2% to current fiscal year, 5% annually for the next 2 years and 6.5% annually for each future year.
Mortality:	Pre-Retirement: Male - 1971 Group Annuity Mortality Table Female - 1971 Group Annuity Mortality Table male rates set back 8 years Post-Retirement: Male - Same as above Female - Same as above Post-Disability: Male - NA Female - NA
Retirement Age:	Age 62, or if over age 62, one year from the valuation date.
Separation:	Rates based on years of service:

Year	House	Senate
1	0%	0%
2	30	0
3	0	0
4	20	25
5	0	0
6	10	0
7	0	0
8	5	10

Disability:	None
Expenses:	Prior year expenses expressed as percentage of prior year payroll. (0.71% of payroll)
Return of Contributions:	All employees withdrawing after 6 years of service were assumed to leave their contributions on deposit and receive a deferred annuitant benefit. Effective July 1, 1987, all employees withdrawing after becoming eligible for a deferred benefit were

	assumed to take the larger of their contributions accumulated with interest or the value of their deferred benefit.
Family Composition:	85% of Members are married. Female is three years younger than male. Each Member may have up to two dependent children depending on Member's age.
Social Security:	NA
Benefit Increases After Retirement:	Payment of earnings on retired reserves in excess of 5% accounted for by 5% post-retirement assumptions.
Special Consideration:	NA
Actuarial Cost Method:	Entry Age Actuarial Cost Method based on earnings and the date the employee entered the plan is applied to all plan benefits. Under this method Actuarial Gains(Losses) reduce(increase) the Unfunded Actuarial Accrued Liability.
Asset Valuation Method:	Cost Value plus one-third Unrealized Gains or Losses.
Payment on the Unfunded Actuarial Accrued Liability:	A level percentage of payroll each year to the statutory amortization date assuming payroll increases 6.5% per annum.
Projected Cash Flow Method:	Cash flows for the non-MPRIF portion of the Fund were projected based on the current plan benefits, participant data, and actuarial assumptions. In addition new entrants were assumed so that the total payroll would increase by 6.5% per annum.

TABLE 14

LEGISLATORS RETIREMENT FUND

SUMMARY OF PLAN PROVISIONS

Eligibility	Members of the State Legislature. A Member of PERA who is elected to the Legislature may elect to remain a Member of PERA and receive credit under PERA for service as a legislator.
Contributions	
Member	9% of Salary during the first 20 years.
Employer	No statutory contributions.
Service	Granted for the full term unless termination occurs before the end of the term, to a maximum of 20 years of Service. Service during all or part of 4 regular legislative sessions is deemed to be 8 years of Service.
Salary	Compensation received for service as a Member of the legislature.
Average Salary	Average of the 5 highest successive years of Salary.
RETIREMENT	
Normal Retirement Benefit	
Eligibility	Age 62 and either 6 full years of Service or Service during all or part of 4 regular legislative sessions. For eligibility purposes, Service does not include credit for time not served when a Member does not serve a full term of office.
Amount	A percentage of Average Salary for each year of service as follows: Prior to 1/1/79 - 5% for the first 8 years - 2.5% for subsequent years After 12/31/78 - 2.5%.
Early Retirement Benefit	
Eligibility	Age 60 and either 6 full years of Service or Service during all or part of 4 regular legislative sessions.
Amount	Normal Retirement Benefit based on Service and Average Salary at retirement date with reduction of 0.5% for each month the Member is under age 62 at time of retirement.
Form of Payment	Paid as a joint and survivor annuity to Member, spouse, and dependent children.

TABLE 14
(cont)

Benefit Increases	Benefits may be increased each January 1 depending on the investment performance of the Minnesota Post Retirement Investment Fund (MPRIF).
DISABILITY	None.
DEATH BENEFITS	
Surviving Spouse Benefit	
Eligibility	Death while active, or after termination if Service requirements for a Normal Retirement Benefit are met but payments have not begun.
Amount	Survivor's payment of 50% of the retirement benefit of the Member assuming the Member had attained normal retirement age and had a minimum of 8 years of Service. Benefit is paid for life or until remarriage. A former Member's benefit is augmented as a Deferred Annuity to date of death before determining the portion payable to the spouse.
Surviving Dependent Children's Benefit	
Eligibility	Same as spouse's benefit.
Amount	Benefit for first child is 25% of the retirement benefit (computed as for surviving spouse) with 12.5% for each additional child. Maximum payable (including spouse) is 100% of the retirement benefit. Benefits cease when a child marries or attains age 18 (22 if a full time student).
Benefit Increases	Adjusted by MSRS to provide same increase as MPRIF.
Refund of Contributions	
Eligibility	Member dies before receiving any retirement benefits and survivor benefits are not payable.
Amount	Member's contributions without interest.
TERMINATION	
Refund of Contributions	
Eligibility	Termination of Service.
Amount	Member's contributions with 5% interest. A deferred annuity may be elected in lieu of a refund.
Deferred Annuity	
Eligibility	Same Service requirement as for Normal Retirement.

TABLE 14
(cont)

Amount	Benefit computed under law in effect at termination and increased by the following annual percentage: 0% before 7/1/73, 5% from 7/1/73 to 1/1/81, and 3% thereafter until the annuity begins. Amount is payable as a normal or early retirement.

ELECTIVE STATE OFFICERS RETIREMENT FUND

ACTUARIAL VALUATION REPORT

JULY 1, 1987

November 23, 1987

Legislative Commission on
Pensions and Retirement
55 State Office Building
St. Paul, Minnesota 55155

RE: ELECTIVE STATE OFFICERS RETIREMENT FUND

Commission Members:

We have prepared an actuarial valuation of the Fund as of July 1, 1987 based on membership and financial data supplied by the Fund.

We certify that to the best of our knowledge and belief this actuarial valuation was performed in accordance with the requirements of Section 356.215, Minnesota Statutes, and the requirements of the Standards for Actuarial Work, adopted by the Commission on August 26, 1987.

Respectfully submitted,

THE WYATT COMPANY

Robert E. Perkins

Robert E. Perkins, FSA
Consulting Actuary

Michael C. Gunvalson

Michael C. Gunvalson, ASA
Associate Actuary

ELECTIVE STATE OFFICERS RETIREMENT FUND

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ELECTIVE STATE OFFICERS RETIREMENT FUND

REPORT HIGHLIGHTS
(DOLLARS IN THOUSANDS)

	07/01/86 VALUATION	07/01/87 VALUATION
A. CONTRIBUTIONS (TABLE 11)		
1. Statutory Contributions - Chapter 352C % of Payroll	9.00%	9.00%
2. Required Contributions - Chapter 356 % of Payroll	35.06%	37.93%
3. Sufficiency (Deficiency) (A1-A2)	-26.06%	-28.93%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 1)	$230	$246
b. Current Benefit Obligations (Table 8)	$1,555	$1,619
c. Funding Ratio (a/b)	14.79%	15.19%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 1)	$230	$246
b. Actuarial Accrued Liability (Table 9)	$1,706	$1,800
c. Funding Ratio (a/b)	13.48%	13.67%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	$430	$482
b. Current and Expected Future Benefit Obligations	$2,054	$2,210
c. Funding Ratio (a/b)	20.93%	21.81%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	6	6
b. Projected Annual Earnings	$392	$373
c. Average Annual Earnings (Actual $)	$65,373	$62,219
d. Average Age	47.2	49.1
e. Average Service	6.9	7.2
2. Others		
a. Service Retirements (Table 4)	4	3
b. Disability Retirements (Table 5)	NA	NA
c. Survivors (Table 6)	4	5
d. Deferred Retirements (Table 7)	5	5
e. Terminated Other Non-vested (Table 7)	1	1
f. Total	14	14

ELECTIVE STATE OFFICERS RETIREMENT FUND

COMMENTARY

Purpose

The purpose of this valuation is to determine the financial status of the Fund. In order to achieve this purpose, an actuarial valuation is made at the beginning of each fiscal year as required by Section 356.215 of Minnesota Statutes.

Report Highlights

The statutory contributions, representing only member contributions, for the Elective State Officers Retirement Fund are 9.00%. The remaining 28.93% needed to reach the required contribution level of 37.93% will be paid by the State as needed in future years according to Chapter 352C of Minnesota Statutes.

The financial status of the Fund can be measured by three different funding ratios. These ratios are lower than the corresponding ratios for funds that include both member contributions and employer contributions in the assets.

- o The Accrued Benefit Funding Ratio is a measure of current funding status, and when viewed over a period of years, presents a view of the funding progress. This ratio is based on Statement No. 5 of the Governmental Accounting Standards Board. This year's ratio is 15.19%. The corresponding ratio for the prior year was 14.79%.

- o The Accrued Liability Funding Ratio is also a measure of funding status and funding progress. It is based on the actuarial cost method that has historically been used by the State. For 1987 the ratio is 13.67%, which is an increase from the 1986 value of 13.48%.

- The Projected Benefit Funding Ratio is a measure of the adequacy or deficiency in the contribution level. This year's ratio of 21.81% verifies that the current statutory contributions by members are going to cover only a portion of the plan benefits. Since the State will make the necessary payments to pay other benefits as they come due, this Funding Ratio may be considered to be 100%.

Asset Information

Beginning in 1984, changes in Section 356.215 of Minnesota Statutes require that the asset value used for actuarial purposes reflect a portion of the unrealized gains and losses. Only a portion of these gains and losses are considered because market values are typically volatile and could produce erratic changes in the contribution requirements from year to year.

The calculation of assets for actuarial purposes begins with the reporting of Total Assets by the Fund (Table 1, line B). These Total Assets reduced by any Amounts Currently Payable (line C) produces the Assets Available for Benefits (line D5), which is the starting value for determining the Actuarial Value of Assets.

The calculation of the Actuarial Value of Assets is shown in Table 1 on lines F1 to F6. It combines the cost value and one-third of the difference between market value and cost value.

The term "Actuarial Value of Assets" is used to indicate that the value was determined for use in this actuarial valuation. Since Minnesota Statutes refer to this value as "Current Assets", the latter phrase will be used in the remainder of this report.

The term MPRIF appears on some of the tables with a corresponding value of zero. MPRIF stands for Minnesota Post Retirement Investment Fund, which is used by many of the public funds. For purposes of consistency all of the actuarial reports follow the same format.

Membership Data

Tables 3 through 6 summarize statistical information on members by category. Active members are grouped by age and completed years of service in Table 3. The earnings shown for these members are for the prior fiscal year.

The service retirements in Table 4 include not only those retiring from active status but also members with deferred benefits who have attained retirement age and started receiving benefits. The survivors category (Table 6) includes spouses and children of deceased members.

Actuarial Balance Sheet

An actuarial balance sheet is required by Section 356.215, Subdivision 4f of Minnesota Law. This balance sheet (Table 8) establishes a method for evaluating both current and future levels of funding.

Current funding levels are evaluated by comparing Current Assets on line A to

Current Benefit Obligations on line D5. The difference between the obligations and the assets is shown as Current Unfunded Actuarial Liability on line G.

The Current Benefit Obligation amounts in Table 8 are required to be disclosed by Statement No. 5 of Governmental Accounting Standards Board (GASB). However, Statement No. 5 uses the terms "Actuarial Present Value of Credited Projected Benefits" and "Pension Benefit Obligation" rather than "Current Benefit Obligation".

The first step in the calculation for active members involves projecting salaries and service to determine future benefits payable under the plan and then discounting those projected benefits to the date of the valuation. The second step is to determine the discounted value of benefits for the non-active members. For those non-active members whose benefits have not commenced, the liability includes augmentation of benefits to date of commencement. The result of the first two steps is shown on line F, Total Current and Expected Future Benefit Obligations.

The third step is to determine the portion that represents Current Benefit Obligations. In the case of active members the Current Benefit Obligation is computed by attributing an equal benefit amount to each year of credited and expected future employee service. For all others, their entire liability is considered a Current Benefit Obligation.

Current and future funding levels are evaluated by comparing Current and Future Expected Assets on line C to Current and Expected Future Benefit Obligations on line F. The difference between the obligations and the assets is shown as the

Current and Future Unfunded Actuarial Liability on line H.

Since line F has already been calculated, the remaining step is to determine the Expected Future Assets. Since the State does not have a set statutory contribution rate, only future member contributions (net of expenses) are included in Expected Future Assets on line B2.

The Current Unfunded Actuarial Liability, line G, is a measurement of the status of the funding to the date of the valuation. The Current and Future Unfunded Actuarial Liability is a measurement of the adequacy of the current statutory contribution level.

GASB Disclosure

Table 8 shows that on July 1, 1987, the Pension Benefit Obligation consisted of the following components:

Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$ 980,000
Current Employees -	
Accumulated employee contributions including allocated investment income	199,000 *
Employer-financed vested	365,000
Employer-financed nonvested	75,000
Total Pension Benefit Obligation	$1,619,000

* Estimated

Contribution Sufficiency

The approach used by the State of Minnesota to determine contribution sufficiency is the Entry Age Normal Cost Method. The primary characteristic of this method is that it allocates costs as a level percentage of payroll.

A comparison of this actuarial method (Table 9) to the actuarial balance sheet (Table 8) shows similarities and differences. The similarity is that both approaches calculate the value of all future benefits the same way. This can be verified by comparing line F of Table 8 to line A6, column 1, of Table 9. The difference arises from the technique for allocating liabilities of active members to past and future. As noted in the prior section, the balance sheet allocates benefits and the corresponding liabilities, on the basis of service. The method used in Table 9 allocates liabilities so that the cost each year will be a constant percentage of payroll.

An Unfunded Actuarial Accrued Liability is computed under the Entry Age Normal Cost Method by comparing the liabilities allocated to past service (Actuarial Accrued Liability) to the Current Assets. This amount, line B3, is funded over the remaining years to the amortization date by a series of payments, representing a constant percentage of payroll each year.

Under this new approach the payments will increase 6.5% each year since that is the assumed rate of increase in payroll. Although the payment schedule will be adequate to amortize the existing unfunded, the lower payments in the earlier years will not be sufficient to cover the interest on the unfunded liability. After a few years the annual payment will cover the interest and also repay a portion of the unfunded.

Projected Cash Flow

Table 12 illustrates the anticipated cash flow over the amortization period. The cash flow begins with the Current Assets. Contributions are then added based on the present statutory rates for employees. As members become eligible for payments, disbursements are made from the Fund.

This projected cash flow assumes that future payrolls increase by 6.5%. For purposes of this table only, new members are assumed to be hired in order to replace those who terminate from the active group. This open group method provides a more realistic picture of future cash flow. The statutory interest rate of 8% is used to project future investment return.

TABLE 1

ELECTIVE STATE OFFICERS RETIREMENT FUND

ACCOUNTING BALANCE SHEET
(DOLLARS IN THOUSANDS)

July 1, 1987

	MARKET VALUE	COST VALUE
A. ASSETS		
1. Cash, Equivalents, Short-Term Securities	$0	$0
2. Investments		
a. Fixed Income	0	0
b. Equity	0	0
c. Real Estate	0	0
3. Equity in Minnesota Post-Retirement Investment Fund (MPRIF)	0	0
4. Other	248	248
B. TOTAL ASSETS	$248	$248
C. AMOUNTS CURRENTLY PAYABLE	$2	$2
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	$245	$245
2. State Reserves	1	1
3. MPRIF Reserves	0	0
4. Non-MPRIF Reserves	0	0
5. Total Assets Available for Benefits	$246	$246
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	$248	$248

F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS

1. Cost Value of Assets Available for Benefits (D5)		$246
2. Market Value (D5)	$246	
3. Cost Value (D5)	246	
4. Market Over Cost (F2-F3)	$0	
5. 1/3 of Market Over Cost(F4)/3		0
6. Actuarial Value of Assets (F1+F5) (Same as "Current Assets")		$246

TABLE 2

ELECTIVE STATE OFFICERS RETIREMENT FUND

CHANGES IN ASSETS AVAILABLE FOR BENEFITS (DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1987

	MARKET VALUE	COST VALUE
A. ASSETS AVAILABLE AT BEGINNING OF PERIOD	$230	$230
B. OPERATING REVENUES		
1. Member Contributions	$32	$32
2. Employer Contributions	132	132
3. Investment Income	0	0
4. MPRIF Income	0	0
5. Net Realized Gain (Loss)	0	0
6. Other	0	0
7. Net Change in Unrealized Gain (Loss)	0	0
8. Total Revenue	$164	$164
C. OPERATING EXPENSES		
1. Service Retirements	$66	$66
2. Disability Benefits	0	0
3. Survivor Benefits	31	31
4. Refunds	17	17
5. Expenses	2	2
6. Other	0	0
7. Total Disbursements	$116	$116
D. OTHER CHANGES IN RESERVES	(32)	(32)
E. ASSETS AVAILABLE AT END OF PERIOD	$246	$246

TABLE 3

ELECTIVE STATE OFFICERS RETIREMENT FUND

ACTIVE MEMBERS AS OF JUNE 30, 1987

	YEARS OF SERVICE								
AGE	≤1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
<25									0
25-29									0
30-34									0
35-39									0
40-44	1	1							2
45-49		1							1
50-54			1	1					2
55-59				1					1
60-64									0
65+									0
TOTAL	1	2	1	2	0	0	0	0	6

AVERAGE ANNUAL EARNINGS

	YEARS OF SERVICE								
AGE	≤1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25									0
25-29									0
30-34									0
35-39									0
40-44	40,840	49,018							44,929
45-49		69,615							69,615
50-54			52,439	48,068					50,254
55-59				89,115					89,115
60-64									0
65+									0
ALL	40,840	59,317	52,439	68,592	0	0	0	0	58,183

PRIOR FISCAL YEAR EARNINGS (IN THOUSANDS) BY YEARS OF SERVICE

≤1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
41	119	52	137	0	0	0	0	349

TABLE 4

ELECTIVE STATE OFFICERS RETIREMENT FUND

SERVICE RETIREMENTS AS OF JUNE 30, 1987

AGE	YEARS RETIRED ≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50								0
50-54								0
55-59								0
60-64								0
65-69								0
70-74			2	1				3
75-79								0
80-84								0
85+								0
TOTAL	0	0	2	1	0	0	0	3

AVERAGE ANNUAL ANNUITY

AGE	YEARS RETIRED ≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50								0
50-54								0
55-59								0
60-64								0
65-69								0
70-74			20,328	11,782				17,479
75-79								0
80-84								0
85+								0
ALL	0	0	20,328	11,782	0	0	0	17,479

TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT

≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
0	0	40	12	0	0	0	52

TABLE 6

ELECTIVE STATE OFFICERS RETIREMENT FUND

SURVIVORS AS OF JUNE 30, 1987

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50								0
50-54								0
55-59								0
60-64								0
65-69								0
70-74	1	1						2
75-79								0
80-84								0
85+					3			3
TOTAL	1	1	0	0	3	0	0	5

AVERAGE ANNUAL BENEFIT

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50								0
50-54								0
55-59								0
60-64								0
65-69								0
70-74	11,273	3,324						7,299
75-79								0
80-84								0
85+					8,826			8,826
ALL	11,273	3,324	0	0	8,826	0	0	8,215

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
11	3	0	0	27	0	0	41

TABLE 7

ELECTIVE STATE OFFICERS RETIREMENT FUND

RECONCILIATION OF MEMBERS

	ACTIVES	TERMINATED DEFERRED RETIREMENT	TERMINATED OTHER NON-VESTED
A. On June 30, 1986	6	5	1
B. Additions	1	0	0
C. Deletions:			
1. Service Retirement	0	0	
2. Disability	0		
3. Death	0	0	0
4. Terminated-Deferred	0		
5. Terminated-Refund	(1)	0	0
6. Terminated-Other Non-vested	0		
7. Returned as Active		0	0
D. Data Adjustments	0	0	0
Vested	3		
Non-Vested	3		
E. Total on June 30, 1987	6	5	1

	RECIPIENTS RETIREMENT ANNUITANTS	RECIPIENTS DISABLED	RECIPIENTS SURVIVORS
A. On June 30, 1986	4	NA	4
B. Additions	0		1
C. Deletions:			
1. Service Retirement			
2. Death	(1)		0
3. Annuity Expired	0		0
4. Returned as Active	0		
D. Data Adjustments	0		0
E. Total on June 30, 1987	3	NA	5

TABLE 8

ELECTIVE STATE OFFICERS RETIREMENT FUND

ACTUARIAL BALANCE SHEET
(DOLLARS IN THOUSANDS)

JULY 1, 1987

A. CURRENT ASSETS (TABLE 1, F6)			$246
B. EXPECTED FUTURE ASSETS			
1. Present Value of Expected Future Statutory Supplemental Contributions			0
2. Present Value of Future Normal Costs			236
3. Total Expected Future Assets			$236
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS			$482
D. CURRENT BENEFIT OBLIGATIONS	Non-Vested	Vested	Total
1. Benefit Recipients			
a. Retirement Annuities		$436	$436
b. Disability Benefits		0	0
c. Surviving Spouse and Child Benefits		282	282
2. Deferred Retirements with Future Augmentation		247	247
3. Former Members without Vested Rights		15	15
4. Active Members			
a. Retirement Annuities	53	537	590
b. Disability Benefits	0	0	0
c. Survivors' Benefits	22	0	22
d. Deferred Retirements	0	0	0
e. Refund Liability Due to Death or Withdrawal	0	27	27
5. Total Current Benefit Obligations	$75	$1,544	$1,619
E. EXPECTED FUTURE BENEFIT OBLIGATIONS			$591
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS			$2,210
G. CURRENT UNFUNDED ACTUARIAL LIABILITY (D5-A)			$1,373
H. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F-C)			$1,728

TABLE 9

ELECTIVE STATE OFFICERS RETIREMENT FUND

DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL) AND SUPPLEMENTAL CONTRIBUTION RATE (DOLLARS IN THOUSANDS)

JULY 1, 1987

	ACTUARIAL PRESENT VALUE OF PROJECTED BENEFITS (1)	ACTUARIAL PRESENT VALUE OF FUTURE NORMAL COSTS (2)	ACTUARIAL ACCRUED LIABILITY (3)=(1)-(2)
A. DETERMINATION OF ACTUARIAL ACCRUED LIABILITY (AAL)			
1. Active Members			
a. Retirement Annuities	$1,134	$300	$834
b. Disability Benefits	0	0	0
c. Survivors Benefits	39	21	18
d. Deferred Retirements	0	0	0
e. Refunds Due to Death or Withdrawal	57	89	(32)
f. Total	$1,230	$410	$820
2. Deferred Retirements with Future Augmentation	$247		$247
3. Former Members Without Vested Rights	15		15
4. Annuitants in MPRIF	0		0
5. Recipients Not in MPRIF	718		718
6. Total AAL	$2,210	$410	$1,800

B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)	
1. AAL (A6)	$1,800
2. Current Assets (Table 1,F6)	246
3. UAAL (B1-B2)	$1,554
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE	
1. Present Value of Future Payrolls through the Amortization Date of July 1, 2009	$6,830
2. Supplemental Contribution Rate (B3/C1)	22.75%

TABLE 10

ELECTIVE STATE OFFICERS RETIREMENT FUND

CHANGES IN UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1987

A. UAAL AT BEGINNING OF YEAR	$1,476
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	$54
2. Contribution	(164)
3. Interest on A, B1, and B2	114
4. Total (B1+B2+B3)	$4
C. EXPECTED UAAL AT END OF YEAR (A+B4)	$1,480
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	($114)
2. Investment Return	19
3. MPRIF Mortality	0
4. Mortality of Other Benefit Recipients	(31)
5. Other Items	200
6. Total	$74
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D7)	$1,554
F. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO PLAN AMENDMENTS	$0
G. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS	$0
H. UAAL AT END OF YEAR (E+F+G)	$1,554

TABLE 11

ELECTIVE STATE OFFICERS RETIREMENT FUND

DETERMINATION OF CONTRIBUTION SUFFICIENCY (DOLLARS IN THOUSANDS)

JULY 1, 1987

	% OF PAYROLL	$ AMOUNT
A. STATUTORY CONTRIBUTIONS - CHAPTER 352C		
1. Employee Contributions	9.00%	$34
2. Employer Contributions	0.00%	0
3. Total	9.00%	$34
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	10.73%	$40
b. Disability Benefits	0.00%	0
c. Survivors	0.80%	3
d. Deferred Retirement Benefits	0.00%	0
e. Refunds Due to Death or Withdrawal	3.22%	12
f. Total	14.75%	$55
2. Supplemental Contribution Amortization by July 1, 2009 of UAAL of $1,554	22.75%	$85
3. Allowance for Expenses	0.43%	$2
4. Total	37.93%	$142
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) (A3-B4)	-28.93%	($108)

Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1987 is $373

TABLE 12

ELECTIVE STATE OFFICERS RETIREMENT FUND

PROJECTED CASH FLOW
(DOLLARS IN THOUSANDS)

FISCAL YEAR	STATUTORY CONTRIBUTIONS	TRANSFERS TO MPRIF	OTHER DISBURSEMENTS	INVESTMENT RETURN	CURRENT ASSETS YEAR END
1987					$246
1988	$34	$0	$93	$17	204
1989	36	0	88	14	166
1990	38	0	84	11	131
1991	41	0	170	5	7
1992	43	0	111	(2)	(63)
1993	46	0	122	(8)	(147)
1994	49	0	136	(15)	(249)
1995	52	0	143	(24)	(364)
1996	56	0	117	(32)	(457)
1997	59	0	147	(40)	(585)
1998	63	0	218	(53)	(793)
1999	67	0	217	(69)	(1,012)
2000	72	0	188	(86)	(1,214)
2001	76	0	184	(101)	(1,423)
2002	81	0	192	(118)	(1,652)
2003	86	0	194	(136)	(1,896)
2004	92	0	186	(155)	(2,145)
2005	98	0	234	(177)	(2,458)
2006	104	0	240	(202)	(2,796)
2007	111	0	251	(229)	(3,165)
2008	118	0	254	(259)	(3,560)
2009	126	0	282	(291)	(4,007)
2010	134	0	290	(327)	(4,490)
2011	143	0	302	(366)	(5,015)
2012	152	0	359	(409)	(5,631)

TABLE 13

ELECTIVE STATE OFFICERS RETIREMENT FUND

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

Interest:	Pre-Retirement: 8% per annum Post-Retirement: 5% per annum
Salary Increases:	Reported salary at valuation date increased 2% to current fiscal year, 5% annually for the next two years and 6.5% annually for each future year.
Mortality:	Pre-Retirement: Male - 1971 Group Annuity Mortality Table Female - 1971 Group Annuity Mortality Table male rates set back 8 years Post-Retirement: Male - Same as above Female - Same as above Post-Disability: Male - NA Female - NA
Retirement Age:	Age 62, or if over age 62, one year from the valuation date.
Separation:	Rates based on years of service:

Year	Rate
1	0%
2	0
3	0
4	50
5	0
6	0
7	0
8	50

Disability:	None
Expenses:	Prior year expenses expressed as percentage of prior year payroll. (0.43% of payroll)
Return of Contributions:	All employees withdrawing after 8 years of service were assumed to leave their contributions on deposit and receive a deferred annuitant benefit.

TABLE 13
(cont)

Family Composition:	85% of Members are married. Female is three years younger than male. Each Member may have up to two dependent children depending on the Member's age.
Social Security:	NA
Benefit Increases After Retirement:	Payment of earnings on retired reserves in excess of 5% accounted for by 5% post-retirement assumptions.
Special Considerations:	NA
Actuarial Cost Method:	Entry Age Actuarial Cost Method based on earnings and the date the employee entered the plan is applied to all plan benefits. Under this method Actuarial Gains(Losses) reduce(increase) the Unfunded Actuarial Accrued Liability.
Asset Valuation Method:	Cost Value plus one-third Unrealized Gains or Losses.
Payment on the Unfunded Actuarial Accrued Liability:	A level percentage of payroll each year to the statutory amortization date assuming payroll increases 6.5% per annum.
Projected Cash Flow Method:	Cash flows for the Fund were projected based on the current plan benefits, participant data, and actuarial assumptions. In addition new entrants were assumed so that the total payroll would increase by 6.5% per annum.

TABLE 14

ELECTIVE STATE OFFICERS RETIREMENT FUND

SUMMARY OF PLAN PROVISIONS

Eligibility	Employment as a "Constitutional Officer".
Contributions	
Member	9% of Salary.
Employer	No statutory contributions.
Allowable Service	Service while in an eligible position.
Salary	Salary upon which Elective State Officers Retirement Plan contributions have been made.
Average Salary	Average of the 5 highest successive years of Salary.
RETIREMENT	
Normal Retirement Benefit	
Eligibility	Age 62 and 8 years of Allowable Service.
Amount	2.5% of Average Salary per year of Allowable Service.
Early Retirement Benefit	
Eligibility	Age 60 and 8 years of Allowable Service.
Amount	Normal Retirement Benefit based on Allowable Service and Average Salary at retirement date with reduction of 0.5% for each month the Member is under age 62 at time of retirement.
Form of Payment	Life annuity.
Benefit Increases	Adjusted by MSRS to provide same increase as MPRIF.
DISABILITY	None.
DEATH	
Surviving Spouse Benefit	
Eligibility	Death while active or after retirement or with at least 8 years of Allowable Service.
Amount	Survivor's payment of 50% of the retirement benefit of the Member assuming the Member had attained age 62 and had a minimum of 8 years of Allowable Service. Benefit is paid for life or until remarriage. A former Member's benefit is augmented the same as a Deferred Annuity to date of death before determining the portion payable to the spouse.

Surviving Dependent Children's Benefit	
Eligibility	Same as spouse's benefit.
Amount	Benefit for first child is 25% of the retirement benefit (computed as for surviving spouse) with 12.5% for each additional child. Maximum payable (including spouse) is 100% of the retirement benefit. Benefits cease when a child marries or attains age 18 (22 if a full time student).
Benefit Increases	Adjusted by MSRS to provide same increase as MPRIF.
TERMINATION	
Refund of Contributions	
Eligibility	Termination of Service.
Amount	Member's contributions with 5% interest. A deferred annuity may be elected in lieu of a refund.
Deferred Benefit	
Eligibility	8 years of Allowable Service.
Amount	Benefit computed under law in effect at termination and increased by the following annual percentage: 0% before 7/1/79, 5% from 7/1/79 to 1/1/81, and 3% thereafter until the annuity begins. Amount is payable as a normal or early retirement.