1988 Actuarial Valuations

STATE EMPLOYEES RETIREMENT FUND

ACTUARIAL VALUATION REPORT

JULY 1, 1988

THE Wyatt COMPANY

AN INDEPENDENT WORLDWIDE BENEFITS
AND COMPENSATION CONSULTING FIRM

ACTUARIAL SERVICES
COMPENSATION PROGRAMS
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EMPLOYEE BENEFITS
EMPLOYEE COMMUNICATIONS
RISK MANAGEMENT
INSURANCE CONSULTING
HEALTH CARE CONSULTING

December 2, 1988

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

RE: STATE EMPLOYEES RETIREMENT FUND

Commission Members:

We have prepared an actuarial valuation of the Fund as of July 1, 1988 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 22, 1988.

Respectfully submitted,

THE WYATT COMPANY

Robert E. Perkins

Robert E. Perkins, FSA
Consulting Actuary

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STATE EMPLOYEES RETIREMENT FUND

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STATE EMPLOYEES RETIREMENT FUND

REPORT HIGHLIGHTS
(DOLLARS IN THOUSANDS)

	07/01/87 VALUATION	07/01/88 VALUATION
A. CONTRIBUTIONS (TABLE 11)		
1. Statutory Contributions - Chapter 352 % of Payroll	7.63%	7.63%
2. Required Contributions - Chapter 356 % of Payroll	7.30%	7.61%
3. Sufficiency (Deficiency) (A1-A2)	0.33%	0.02%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 2)	$1,518,483	$1,644,145
b. Current Benefit Obligations (Table 8)	$1,589,505	$1,775,445
c. Funding Ratio (a/b)	95.53%	92.60%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 2)	$1,518,483	$1,644,145
b. Actuarial Accrued Liability (Table 9)	$1,894,142	$2,115,476
c. Funding Ratio (a/b)	80.17%	77.72%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	$2,610,849	$2,824,501
b. Current and Expected Future Benefit Obligations	$2,532,039	$2,820,611
c. Funding Ratio (a/b)	103.11%	100.14%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	45,707	47,040
b. Projected Annual Earnings	$1,208,043	$1,316,671
c. Average Annual Earnings (Actual $)	$26,430	$27,990
d. Average Age	40.1	40.2
e. Average Service	9.3	9.3
2. Others		
a. Service Retirements (Table 4)	10,994	11,455
b. Disability Retirements (Table 5)	676	669
c. Survivors (Table 6)	671	753
d. Deferred Retirements (Table 7)	1,014	1,162
e. Terminated Other Non-vested (Table 7)	4,496	4,084
f. Total	17,851	18,123

STATE EMPLOYEES 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 Employees Retirement Fund are sufficient for 1988 by an amount of 0.02% of payroll. According to this valuation a contribution rate of 7.61% 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 92.60%. The corresponding ratio for the prior year was 95.53%.

- 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 1988 the ratio is 77.72%, which is a decrease from the 1987 value of 80.17%.

- 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 (Tables 1 and 2)</u>

Minnesota Statutes require that the asset value used for actuarial purposes recognize only a third of the unrealized gains and losses. This requirement exists because market values (which include all unrealized gains and losses) are typically volatile and can produce erratic changes in the contribution requirements from year to year.

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

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.

This Fund participates in the MPRIF (i.e. Minnesota Post Retirement Investment Fund). The asset value shown for MPRIF on line A3 is set equal to the MPRIF Reserves reported on line D3 for both market and cost value purposes. This reserve is based on a 5% interest assumption.

Investment performance by SBI (i.e. State Board of Investment) above the 5% level is not shown in the assets but will be added in on January 1, 1989 when benefits will be increased for those annuitants who have been receiving payments for 18 months. Next year's valuation will include the 1989 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, 1988 is provided below:

MPRIF Reserves	$649,064,000
Reserves Plus Excess Earnings	692,000,000
MPRIF Market Value	699,000,000

Membership Data (Tables 3, 4, 5, 6 and 7)

Tables 3 through 6 summarize statistical information about 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 except in the case of new hires whose earnings have been annualized.

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.

A reconciliation of members in Table 7 provides a method for tracking what happened to members during the past year.

Actuarial Balance Sheet (Table 8)

An actuarial balance sheet provides a method for evaluating 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. Current and future funding levels are evaluated by comparing the Total Current and Expected Future Assets on line C to the Total Current and Expected Future Benefit Obligations on line F.

The Current Benefit Obligation used to measure current funding levels is calculated in accordance with Statement No. 5 of the Governmental Accounting Standards Board (GASB). Those requirements are:

- For active members - salary and service are projected to retirement to determine benefits for each member and the ratio of credited service to total service establishes the portion of the projected benefit to be used in calculating the current funding level.

- For non-active members - the discounted value of benefits, including augmentation in cases where benefits have not commenced.

GASB Disclosure

The Current Benefit Obligation amounts in Table 8 are required to be disclosed by Statement No. 5 of the 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 July 1, 1988 Pension Benefit Obligation reported in Table 8 is reformatted for GASB reporting purposes in the table on the next page.

Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$669,694,000
Current Employees -	
Accumulated employee contributions including allocated investment income	359,590,000 *
Employer-financed vested	588,594,000
Employer-financed nonvested	157,567,000
Total Pension Benefit Obligation	$1,775,445,000

* Estimated

Actuarial Cost Method (Table 9)

The approach used by the State of Minnesota to determine contribution sufficiency is the Entry Age Normal Actuarial 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) illustrates the two techniques 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. Both approaches, however, calculate the value of all future benefits the same way (see line F of Table 8 and line A6, column 1, of Table 9).

An Unfunded Actuarial Accrued Liability is computed under the Entry Age Normal Actuarial 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 that remain a constant percentage of payroll each year.

The payments will increase 6.5% each year because 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>Sources of Actuarial Gains and Losses (Table 10)</u>

The assumptions used in making the calculations using the Entry Age Normal Actuarial Cost Method are based on long-term expectations. Each year the actual experience will deviate from the long-term expectation. The major sources of gain and loss, which have been identified, are:

- A gain from salaries even though the average increase of 6.9% was higher than the assumed 6.5% increase. This gain occurred because most of the increases above 6.5% were for the younger members whose liabilities are much lower than the liabilities for the older members, who had salary increases under 6.5%.

- A loss from Current Assets because the return was 4.8% instead of the assumed 8%.

- A loss of $53,927,000 (reported on line D5) due to fewer active members terminating than anticipated.

Contribution Sufficiency (Table 11)

This report answers the question of "How adequate are the Statutory Contributions?" by comparing the Statutory Contributions to the Required Contributions.

The Required Contributions, set forth in Chapter 356, consist of:

- o Normal Costs based on the Entry Age Normal Actuarial Cost Method

- o A Supplemental Contribution for amortizing any Unfunded Actuarial Accrued Liability

- o An Allowance for Expenses

Table 11 shows the Fund has a contribution sufficiency since the Statutory Contribution Rate is 7.63% compared to the Required Contribution Rate of 7.61%.

Projected Cash Flow (Table 12)

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.

This projected cash flow assumes that future payrolls increase by 6.5%. This is the only table in the report where 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 1990 is large because it includes those already over age 65 who are assumed to retire a year from the valuation date.

<u>Changes in Actuarial Assumptions</u>

This valuation does not reflect any changes in actuarial assumptions since the prior valuation.

<u>Changes in Plan Provisions</u>

This valuation does not reflect any changes in plan provisions since the prior valuation.

TABLE 1

STATE EMPLOYEES RETIREMENT FUND

ACCOUNTING BALANCE SHEET
(DOLLARS IN THOUSANDS)

July 1, 1988

	MARKET VALUE	COST VALUE
A. ASSETS		
1. Cash, Equivalents, Short-Term Securities	$50,676	$50,676
2. Investments		
a. Fixed Income	237,159	242,865
b. Equity	681,784	587,002
c. Real Estate	93,820	78,603
3. Equity in Minnesota Post-Retirement Investment Fund (MPRIF)	649,064	649,064
4. Other	5,321	5,321
B. TOTAL ASSETS	$1,717,824	$1,613,531
C. AMOUNTS CURRENTLY PAYABLE	$4,150	$4,150
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	$286,714	$286,714
2. Employer Reserves	777,896	673,603
3. MPRIF Reserves	649,064	649,064
4. Non-MPRIF Reserves	0	0
5. Total Assets Available for Benefits	$1,713,674	$1,609,381
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	$1,717,824	$1,613,531

F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS

1. Cost Value of Assets Available for Benefits (D5)		$1,609,381
2. Market Value (D5)	$1,713,674	
3. Cost Value (D5)	1,609,381	
4. Market Over Cost (F2-F3)	$104,293	
5. 1/3 of Market Over Cost(F4)/3		34,764
6. Actuarial Value of Assets (F1+F5) (Same as "Current Assets")		$1,644,145

TABLE 2

STATE EMPLOYEES RETIREMENT FUND

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

YEAR ENDING JUNE 30, 1988

	MARKET VALUE	COST VALUE
A. ASSETS AVAILABLE AT BEGINNING OF YEAR	$1,631,088	$1,462,181
B. OPERATING REVENUES		
1. Member Contributions	$41,632	$41,632
2. Employer Contributions	42,951	42,951
3. Investment Income	58,072	58,072
4. MPRIF Income	70,140	70,140
5. Net Realized Gain (Loss)	8,184	8,184
6. Other (Includes State Appropriation)	1,201	1,201
7. Net Change in Unrealized Gain (Loss)	(64,614)	0
8. Total Revenue	$157,566	$222,180
C. OPERATING EXPENSES		
1. Service Retirements	$61,113	$61,113
2. Disability Benefits	2,585	2,585
3. Survivor Benefits	0	0
4. Refunds	7,491	7,491
5. Expenses	2,878	2,878
6. Other	629	629
7. Total Disbursements	$74,696	$74,696
D. OTHER CHANGES IN RESERVES	(284)	(284)
E. ASSETS AVAILABLE AT END OF YEAR	$1,713,674	$1,609,381

TABLE 3

STATE EMPLOYEES RETIREMENT FUND

ACTIVE MEMBERS AS OF JUNE 30, 1988

	YEARS OF SERVICE								
AGE	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
<25	1,175	1,134	102						2,411
25-29	1,323	3,190	1,638	142					6,293
30-34	1,121	2,783	2,764	1,539	129				8,336
35-39	890	2,174	2,192	2,357	1,132	139			8,884
40-44	526	1,414	1,376	1,478	1,283	689	40		6,806
45-49	334	845	895	882	675	803	349	53	4,836
50-54	187	503	604	691	526	476	340	350	3,677
55-59	105	352	483	554	479	491	305	379	3,148
60-64	34	177	339	447	419	350	156	242	2,164
65+	16	31	75	116	100	82	27	38	485
TOTAL	5,711	12,603	10,468	8,206	4,743	3,030	1,217	1,062	47,040

AVERAGE ANNUAL EARNINGS

	YEARS OF SERVICE								
AGE	<1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25	11,913	16,515	17,437						14,311
25-29	14,745	19,766	21,103	21,755					19,103
30-34	15,382	20,903	23,487	24,480	25,025				21,741
35-39	16,047	21,538	24,580	27,384	27,310	26,301			24,099
40-44	16,391	21,857	24,835	28,732	31,162	30,035	31,249		26,167
45-49	15,922	21,183	24,291	28,085	30,219	31,676	33,037	32,400	26,636
50-54	14,423	19,945	23,443	26,630	28,066	30,265	32,714	33,187	26,434
55-59	12,749	19,271	23,223	25,893	26,891	28,123	32,439	33,772	26,387
60-64	14,188	18,525	22,509	25,353	26,268	27,340	28,433	33,668	25,824
65+	6,684	18,152	16,307	23,200	24,772	27,399	25,419	29,706	22,934
ALL	14,637	20,332	23,432	26,726	28,600	29,642	31,979	33,342	23,474

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
83,595	256,240	245,285	219,315	135,649	89,816	38,918	35,409	1,104,227

TABLE 4

STATE EMPLOYEES RETIREMENT FUND

SERVICE RETIREMENTS AS OF JUNE 30, 1988

	YEARS RETIRED							
AGE	≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50		1						1
50-54	2	1						3
55-59	30	275						305
60-64	232	1,133	59					1,424
65-69	172	1,672	1,029	15				2,888
70-74	9	290	1,810	634	6	1		2,750
75-79		8	163	1,670	151	12		2,004
80-84		1	2	420	697	87	16	1,223
85+		1	1	9	248	373	225	857
TOTAL	445	3,382	3,064	2,748	1,102	473	241	11,455

AVERAGE ANNUAL ANNUITY

	YEARS RETIRED							
AGE	≤1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50		14,417						14,417
50-54	3,114	5,044						3,757
55-59	3,293	8,528						8,013
60-64	4,843	7,607	6,418					7,107
65-69	5,506	5,584	6,527	6,569				5,920
70-74	4,142	4,819	5,334	4,853	2,800	1,867		5,158
75-79		2,382	4,694	4,382	3,280	1,897		4,302
80-84		3,501	4,422	5,239	3,006	2,816	2,405	3,754
85+		13,204	1,162	6,965	3,110	2,794	2,788	2,938
ALL	4,973	6,432	5,720	4,642	3,066	2,774	2,763	5,203

TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT							
≤1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
2,213	21,752	17,525	12,756	3,379	1,312	666	59,603

TABLE 5

STATE EMPLOYEES RETIREMENT FUND

DISABILITY RETIREMENTS AS OF JUNE 30, 1988

AGE	YEARS DISABLED <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50	4	19	8	1				32
50-54	7	15	8	4				34
55-59	5	22	19	2		1		49
60-64	10	51	42	24	5	3		135
65-69	2	22	97	40	10	4	1	176
70-74			33	96	14	4		147
75-79				25	20	7	3	55
80-84					10	11	1	22
85+						5	14	19
TOTAL	28	129	207	192	59	35	19	669

AVERAGE ANNUAL BENEFIT

AGE	YEARS DISABLED <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50	2,198	3,754	3,959	2,623				3,575
50-54	4,346	4,825	3,578	1,935				4,093
55-59	3,717	4,516	4,014	2,102		1,771		4,085
60-64	5,418	3,312	5,413	3,307	2,022	2,704		4,059
65-69	1,665	3,644	4,438	3,660	2,747	2,183	3,241	3,976
70-74			3,009	3,647	2,084	2,523		3,324
75-79				3,227	2,382	3,008	3,203	2,891
80-84					3,268	1,973	3,241	2,619
85+						2,038	2,769	2,576
TOTAL	4,118	3,815	4,317	3,495	2,493	2,333	2,887	3,671

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS OF DISABILITY

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
115	492	894	671	147	82	55	2,456

TABLE 6

STATE EMPLOYEES RETIREMENT FUND

SURVIVORS AS OF JUNE 30, 1988

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50	6	12	1		1			20
50-54	7	13	1					21
55-59	18	26	4		1			49
60-64	26	66	23	3			1	119
65-69	15	89	42	7	1	1		155
70-74	20	45	36	21	6	1	2	131
75-79	15	34	28	27	15		2	121
80-84	2	9	19	17	14	1	2	64
85+	2	11	10	12	36		2	73
TOTAL	111	305	164	87	74	3	9	753

AVERAGE ANNUAL BENEFIT

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50	5,025	3,051	2,367		2,056			3,559
50-54	3,521	4,742	5,577					4,375
55-59	3,355	3,899	1,956		1,299			3,487
60-64	4,016	5,346	5,259	2,716			1,938	4,943
65-69	5,712	4,722	4,262	2,632	1,415	1,922		4,559
70-74	5,628	4,398	4,499	4,001	1,684	1,893	1,935	4,369
75-79	4,403	3,355	3,684	4,457	1,890		1,959	3,602
80-84	1,830	2,479	3,675	2,678	2,000	1,897	1,982	2,737
85+	2,035	2,032	2,257	2,669	2,029		1,957	2,164
ALL	4,429	4,358	4,105	3,546	1,949	1,904	1,956	3,944

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
492	1,329	673	308	144	6	18	2,970

TABLE 7

STATE EMPLOYEES RETIREMENT FUND

RECONCILIATION OF MEMBERS

	ACTIVES	TERMINATED: DEFERRED RETIREMENT	TERMINATED: OTHER NON-VESTED
A. On June 30, 1987	45,707	1,014	4,496
B. Additions	5,950	278	1,344
C. Deletions:			
1. Service Retirement	(734)	(96)	(7)
2. Disability	(33)		(2)
3. Death	(60)	(5)	(1)
4. Terminated-Deferred	(237)		(11)
5. Terminated-Refund	(2,565)	(10)	(560)
6. Terminated-Other Non-vested	(927)	0	
7. Returned as Active		(19)	(243)
D. Data Adjustments	(61)	0	(932)
Vested	28,726		
Non-Vested	18,314		
E. Total on June 30, 1988	47,040	1,162	4,084

	RECIPIENTS: RETIREMENT ANNUITANTS	RECIPIENTS: DISABLED	RECIPIENTS: SURVIVORS
A. On June 30, 1987	10,994	676	671
B. Additions	863	46	112
C. Deletions:			
1. Service Retirement		0	
2. Death	(400)	(51)	(23)
3. Annuity Expired	0	0	0
4. Returned as Active	0	0	
D. Data Adjustments	(2)	(2)	(7)
E. Total on June 30, 1988	11,455	669	753

TABLE 8

STATE EMPLOYEES RETIREMENT FUND

ACTUARIAL BALANCE SHEET
(DOLLARS IN THOUSANDS)

JULY 1, 1988

A. CURRENT ASSETS (TABLE 1, F6)			$1,644,145
B. EXPECTED FUTURE ASSETS			
1. Present Value of Expected Future Statutory Supplemental Contributions			475,221
2. Present Value of Future Normal Costs			705,135
3. Total Expected Future Assets			1,180,356
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS			$2,824,501
D. CURRENT BENEFIT OBLIGATIONS	Non-Vested	Vested	Total
1. Benefit Recipients			
a. Retirement Annuities		$594,544	$594,544
b. Disability Benefits		22,238	22,238
c. Surviving Spouse and Child Benefits		32,282	32,282
2. Deferred Retirements with Future Augmentation		18,321	18,321
3. Former Members without Vested Rights		2,309	2,309
4. Active Members			
a. Retirement Annuities	21,060	700,099	721,159
b. Disability Benefits	56,761	0	56,761
c. Survivors' Benefits	69,846	0	69,846
d. Deferred Retirements	9,900	210,223	220,123
e. Refund Liability Due to Death or Withdrawal	0	37,862	37,862
5. Total Current Benefit Obligations	$157,567	$1,617,878	$1,775,445
E. EXPECTED FUTURE BENEFIT OBLIGATIONS			$1,045,166
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS			$2,820,611
G. CURRENT UNFUNDED ACTUARIAL LIABILITY (D5-A)			$131,300
H. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F-C)			($3,890)

TABLE 9

STATE EMPLOYEES RETIREMENT FUND

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

JULY 1, 1988

	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	$1,482,183	$411,417	$1,070,766
b. Disability Benefits	107,713	33,086	74,627
c. Survivors Benefits	130,699	38,519	92,180
d. Deferred Retirements	367,709	129,597	238,112
e. Refunds Due to Death or Withdrawal	62,613	92,516	(29,903)
f. Total	$2,150,917	$705,135	$1,445,782
2. Deferred Retirements with Future Augmentation	$18,321		$18,321
3. Former Members Without Vested Rights	2,309		2,309
4. Annuitants in MPRIF	649,064		649,064
5. Recipients Not in MPRIF	0		0
6. Total	$2,820,611	$705,135	$2,115,476

B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)	
1. AAL (A6)	$2,115,476
2. Current Assets (Table 2, K3)	1,644,145
3. UAAL (B1-B2)	$471,331
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE	
1. Present Value of Future Payrolls through the Amortization Date of July 1, 2011	$25,011,640
2. Supplemental Contribution Rate (B3/C1)	1.88%

TABLE 10

STATE EMPLOYEES RETIREMENT FUND

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

YEAR ENDING JUNE 30, 1988

A. UAAL AT BEGINNING OF YEAR	$375,659
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	$63,843
2. Contribution	(84,583)
3. Interest on A, B1, and B2	29,223
4. Total (B1+B2+B3)	$8,483
C. EXPECTED UAAL AT END OF YEAR (A+B4)	$384,142
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	($2,410)
2. Investment Return	31,460
3. MPRIF Mortality	3,850
4. Mortality of Other Benefit Recipients	0
5. Other Items	54,289
6. Total	$87,189
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D6)	$471,331
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)	$471,331

TABLE 11

STATE EMPLOYEES RETIREMENT FUND

DETERMINATION OF CONTRIBUTION SUFFICIENCY
(DOLLARS IN THOUSANDS)

JULY 1, 1988

	% OF PAYROLL	$ AMOUNT
A. STATUTORY CONTRIBUTIONS - CHAPTER 352		
1. Employee Contributions	3.73%	$49,112
2. Employer Contributions	3.90%	51,350
3. Total	7.63%	$100,462
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	3.22%	$42,577
b. Disability Benefits	0.25%	3,230
c. Survivors	0.28%	3,686
d. Deferred Retirement Benefits	0.96%	12,617
e. Refunds Due to Death or Withdrawal	0.76%	9,976
f. Total	5.47%	$72,086
2. Supplemental Contribution Amortization by July 1, 2011 of UAAL of $471,331	1.88%	$24,753
3. Allowance for Expenses	0.26%	$3,423
4. Total	7.61%	$100,262
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) (A3-B4)	0.02%	$200

Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1988 is $1,316,671

TABLE 12

STATE EMPLOYEES RETIREMENT FUND

PROJECTED CASH FLOW
(DOLLARS IN THOUSANDS)

FISCAL YEAR	STATUTORY CONTRIBUTIONS	TRANSFERS TO MPRIF	OTHER DISBURSEMENTS	INVESTMENT RETURN	NON-MPRIF ASSETS YEAR END
1988					$995,081
1989	$100,462	$15,711	$13,722	$82,448	1,148,558
1990	106,992	71,210	13,743	92,766	1,263,363
1991	113,947	46,025	14,117	103,221	1,420,389
1992	121,353	64,186	14,483	115,338	1,578,411
1993	129,241	72,121	15,139	127,952	1,748,344
1994	137,642	80,691	15,919	141,509	1,930,885
1995	146,588	90,123	16,621	156,065	2,126,794
1996	156,117	104,195	17,725	171,511	2,332,502
1997	166,264	121,933	18,882	187,618	2,545,569
1998	177,071	148,023	20,176	204,000	2,758,441
1999	188,581	155,641	21,409	221,137	2,991,109
2000	200,839	166,523	22,868	239,747	3,242,304
2001	213,893	183,409	24,360	259,629	3,508,057
2002	227,796	211,007	25,993	280,276	3,779,129
2003	242,603	252,501	27,829	300,821	4,042,223
2004	258,372	270,511	29,626	321,707	4,322,165
2005	275,166	291,378	31,651	343,859	4,618,161
2006	293,052	311,975	33,870	367,341	4,932,709
2007	312,101	357,992	36,225	391,332	5,241,925
2008	332,387	433,162	38,762	413,773	5,516,161
2009	353,992	435,955	41,473	436,355	5,829,080
2010	377,002	444,882	44,421	461,834	6,178,613
2011	401,507	478,914	47,600	489,289	6,542,895
2012	427,605	558,718	50,963	516,149	6,876,968
2013	455,399	666,485	54,460	539,536	7,150,958

TABLE 13

STATE EMPLOYEES 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. 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. (0.26% of payroll)
Return Contributions:	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.
Social Security:	NA

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 Normal Actuarial 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

	Death		Withdrawal		Disability		Retirement	
Age	Male	Female	Male	Female	Male	Female	Male	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

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. Age 62 and 30 years of Allowable Service. Proportionate Retirement Annuity is available at age 65 and 1 year 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. 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 50% or 100% bounce back joint and survivor (option is cancelled if Member is pre-deceased by beneficiary). 15 year certain and life thereafter.

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	
Disability Benefit	
Eligibility	Total and permanent disability before age 65 with 5 years of Allowable Service.
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.
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.

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 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.
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

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	4
2.	Projected Annual Earnings	$159,216
3.	Normal Cost	
	a. Dollar Amount	$ 8,947
	b. Percent of Payroll	5.62%

TABLE 16

STATE EMPLOYEES RETIREMENT FUND

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	1
2. Projected Annual Earnings	$ 46,468
3. Normal Cost	
a. Dollar Amount	$ 2,935
b. Percent of Payroll	6.32%

CORRECTIONAL EMPLOYEES RETIREMENT FUND

ACTUARIAL VALUATION REPORT

JULY 1, 1988

THE Wyatt COMPANY

AN INDEPENDENT WORLDWIDE BENEFITS
AND COMPENSATION CONSULTING FIRM

ACTUARIAL SERVICES
COMPENSATION PROGRAMS
ADMINISTRATIVE SYSTEMS
INTERNATIONAL SERVICES
ORGANIZATION SURVEYS

SUITE 1525
8400 NORMANDALE LAKE BOULEVARD
MINNEAPOLIS, MINNESOTA 55437

(612) 921-8700

EMPLOYEE BENEFITS
EMPLOYEE COMMUNICATIONS
RISK MANAGEMENT
INSURANCE CONSULTING
HEALTH CARE CONSULTING

December 2, 1988

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

RE: CORRECTIONAL EMPLOYEES RETIREMENT FUND

Commission Members:

We have prepared an actuarial valuation of the Fund as of July 1, 1988 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 22, 1988.

Respectfully submitted,

THE WYATT COMPANY

Robert E. Perkins

Robert E. Perkins, FSA
Consulting Actuary

Michael C. Gunvalson

Michael C. Gunvalson, ASA
Associate Actuary

CORRECTIONAL EMPLOYEES RETIREMENT FUND

TABLE OF CONTENTS

CORRECTIONAL EMPLOYEES RETIREMENT FUND

REPORT HIGHLIGHTS
(DOLLARS IN THOUSANDS)

	07/01/87 VALUATION	07/01/88 VALUATION
A. CONTRIBUTIONS (TABLE 11)		
1. Statutory Contributions - Chapter 352 % of Payroll	13.60%	13.60%
2. Required Contributions - Chapter 356 % of Payroll	10.08%	10.37%
3. Sufficiency (Deficiency) (A1-A2)	3.52%	3.23%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 2)	$67,488	$74,065
b. Current Benefit Obligations (Table 8)	$61,488	$69,142
c. Funding Ratio (a/b)	109.76%	107.12%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 2)	$67,488	$74,065
b. Actuarial Accrued Liability (Table 9)	$72,081	$81,454
c. Funding Ratio (a/b)	93.63%	90.93%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	$131,111	$143,306
b. Current and Expected Future Benefit Obligations	$101,839	$114,417
c. Funding Ratio (a/b)	128.74%	125.25%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	1,232	1,267
b. Projected Annual Earnings	$35,155	$38,807
c. Average Annual Earnings (Actual $)	$28,535	$30,629
d. Average Age	37.1	37.4
e. Average Service	7.8	8.0
2. Others		
a. Service Retirements (Table 4)	313	328
b. Disability Retirements (Table 5)	11	6
c. Survivors (Table 6)	9	12
d. Deferred Retirements (Table 7)	43	47
e. Terminated Other Non-vested (Table 7)	84	80
f. Total	460	473

CORRECTIONAL EMPLOYEES 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 Correctional Employees Retirement Fund are sufficient for 1988 by an amount of 3.23% of payroll. According to this valuation a contribution rate of 10.37% 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 107.12%. The corresponding ratio for the prior year was 109.76%.

- 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 1988 the ratio is 90.93%, which is a decrease from the 1987 value of 96.63%.

- o 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 (Tables 1 and 2)</u>

Minnesota Statutes require that the asset value used for actuarial purposes recognize only a third of the unrealized gains and losses. This requirement exists because market values (which include all unrealized gains and losses) are typically volatile and can produce erratic changes in the contribution requirements from year to year.

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

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.

This Fund participates in the MPRIF (i.e. Minnesota Post Retirement Investment Fund). The asset value shown for MPRIF on line A3 is set equal to the MPRIF Reserves reported on line D3 for both market and cost value purposes. This reserve is based on a 5% interest assumption.

Investment performance by SBI (i.e. State Board of Investment) above the 5% level is not shown in the assets but will be added in on January 1, 1989 when benefits will be increased for those annuitants who have been receiving payments for 18 months. Next year's valuation will include the 1989 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, 1988 is provided below:

MPRIF Reserves	$25,435,000
Reserves Plus Excess Earnings	27,200,000
MPRIF Market Value	27,400,000

Membership Data (Tables 3, 4, 5, 6 and 7)

Tables 3 through 6 summarize statistical information about 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 except in the case of new hires whose earnings have been annualized.

The service retirements in Table 4 include not only those retiring from active status but also disabled members who have attained age 62. Disabled members under age 62 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.

A reconciliation of members in Table 7 provides a method for tracking what happened to members during the past year.

Actuarial Balance Sheet (Table 8)

An actuarial balance sheet provides a method for evaluating 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. Current and future funding levels are evaluated by comparing the Total Current and Expected Future Assets on line C to the Total Current and Expected Future Benefit Obligations on line F.

The Current Benefit Obligation used to measure current funding levels is calculated in accordance with Statement No. 5 of the Governmental Accounting Standards Board (GASB). Those requirements are:

- o For active members - salary and service are projected to retirement to determine benefits for each member and the ratio of credited service to total service establishes the portion of the projected benefit to be used in calculating the current funding level.

- o For non-active members - the discounted value of benefits, including augmentation in cases where benefits have not commenced.

GASB Disclosure

The Current Benefit Obligation amounts in Table 8 are required to be disclosed by Statement No. 5 of the 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 July 1, 1988 Pension Benefit Obligation reported in Table 8 is reformatted for GASB reporting purposes in the following table.

Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$28,309,000
Current Employees -	
Accumulated employee contributions including allocated investment income	12,818,000 *
Employer-financed vested	24,311,000
Employer-financed nonvested	3,704,000
Total Pension Benefit Obligation	$69,142,000

* Estimated

Actuarial Cost Method (Table 9)

The approach used by the State of Minnesota to determine contribution sufficiency is the Entry Age Normal Actuarial 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) illustrates the two techniques 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. Both approaches, however, calculate the value of all future benefits the same way (see line F of Table 8 and line A6, column 1, of Table 9).

An Unfunded Actuarial Accrued Liability is computed under the Entry Age Normal Actuarial 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 that remain a constant percentage of payroll each year.

The payments will increase 6.5% each year because 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.

Sources of Actuarial Gains and Losses (Table 10)

The assumptions used in making the calculations using the Entry Age Normal Actuarial Cost Method are based on long-term expectations. Each year the actual experience will deviate from the long-term expectation. The major sources of gain and loss, which have been identified, are:

- A loss from salaries because the average increase was 8.7% instead of the assumed 6.5%.

- A loss from Current Assets because the return was 4.1% instead of the assumed 8%.

- A loss of $1,991,000 (reported on line D5) due to fewer active members terminating than anticipated.

Contribution Sufficiency (Table 11)

This report answers the question of "How adequate are the Statutory Contributions?" by comparing the Statutory Contributions to the Required Contributions.

The Required Contributions, set forth in Chapter 356, consist of:

- Normal Costs based on the Entry Age Normal Actuarial Cost Method
- A Supplemental Contribution for amortizing any Unfunded Actuarial Accrued Liability
- An Allowance for Expenses

Table 11 shows the Fund has a contribution sufficiency since the Statutory Contribution Rate is 13.60% compared to the Required Contribution Rate of 10.37%.

Projected Cash Flow (Table 12)

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.

This projected cash flow assumes that future payrolls increase by 6.5%. This is the only table in the report where 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 1990 is large because it includes those already over age 58 who are assumed to retire a year from the valuation date.

Changes in Actuarial Assumptions

This valuation does not reflect any changes in actuarial assumptions since the prior valuation.

Changes in Plan Provisions

This valuation does not reflect any changes in plan provisions since the prior valuation.

TABLE 1

CORRECTIONAL EMPLOYEES RETIREMENT FUND

ACCOUNTING BALANCE SHEET
(DOLLARS IN THOUSANDS)

July 1, 1988

	MARKET VALUE	COST VALUE
A. ASSETS		
1. Cash, Equivalents, Short-Term Securities	$4,439	$4,439
2. Investments		
a. Fixed Income	10,999	11,269
b. Equity	31,620	27,206
c. Real Estate	4,351	3,639
3. Equity in Minnesota Post-Retirement Investment Fund (MPRIF)	25,435	25,435
4. Other	597	597
B. TOTAL ASSETS	$77,441	$72,585
C. AMOUNTS CURRENTLY PAYABLE	$139	$139
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	$10,965	$10,965
2. Employer Reserves	40,902	36,046
3. MPRIF Reserves	25,435	25,435
4. Non-MPRIF Reserves	0	0
5. Total Assets Available for Benefits	$77,302	$72,446
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	$77,441	$72,585

F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS

1. Cost Value of Assets Available for Benefits (D5)		$72,446
2. Market Value (D5)	$77,302	
3. Cost Value (D5)	72,446	
4. Market Over Cost (F2-F3)	$4,856	
5. 1/3 of Market Over Cost(F4)/3		1,619
6. Actuarial Value of Assets (F1+F5) (Same as "Current Assets")		$74,065

TABLE 2

CORRECTIONAL EMPLOYEES RETIREMENT FUND

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

YEAR ENDING JUNE 30, 1988

	MARKET VALUE	COST VALUE
A. ASSETS AVAILABLE AT BEGINNING OF YEAR	$72,774	$64,845
B. OPERATING REVENUES		
1. Member Contributions	$1,753	$1,753
2. Employer Contributions	3,089	3,089
3. Investment Income	2,689	2,689
4. MPRIF Income	2,861	2,861
5. Net Realized Gain (Loss)	171	171
6. Other	0	0
7. Net Change in Unrealized Gain (Loss)	(3,073)	0
8. Total Revenue	$7,490	$10,563
C. OPERATING EXPENSES		
1. Service Retirements	$2,589	$2,589
2. Disability Benefits	89	89
3. Survivor Benefits	0	0
4. Refunds	196	196
5. Expenses	109	109
6. Other	23	23
7. Total Disbursements	$3,006	$3,006
D. OTHER CHANGES IN RESERVES	44	44
E. ASSETS AVAILABLE AT END OF YEAR	$77,302	$72,446

TABLE 3

CORRECTIONAL EMPLOYEES RETIREMENT FUND

ACTIVE MEMBERS AS OF JUNE 30, 1988

AGE	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
<25	20	37	2						59
25-29	32	125	60	1					218
30-34	17	86	130	39					272
35-39	12	55	87	98	16				268
40-44	8	39	52	61	34	10			204
45-49	3	18	22	35	12	17	5		112
50-54	1	10	13	30	16	13	12	4	99
55-59	1	2	8	6	6	4	2		29
60-64			1	2	1	2			6
65+									0
TOTAL	94	372	375	272	85	46	19	4	1,267

AVERAGE ANNUAL EARNINGS

AGE	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25	13,544	20,217	26,227						18,158
25-29	14,293	21,642	25,597	28,208					21,682
30-34	16,623	23,405	26,536	30,317					25,469
35-39	15,677	23,135	27,121	29,700	32,035				27,027
40-44	20,376	23,743	26,936	30,879	32,076	31,619			28,334
45-49	20,344	24,629	28,839	30,739	32,049	32,442	26,989		29,337
50-54	17,743	26,960	29,057	30,100	32,380	29,640	31,789	31,761	30,101
55-59	17,124	23,624	31,602	31,310	33,841	36,662	28,741		31,456
60-64			27,487	28,720	30,026	17,415			24,964
65+									0
ALL	15,509	22,647	26,908	30,254	32,222	31,185	30,205	31,761	26,106

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
1,458	8,425	10,090	8,229	2,739	1,435	574	127	33,077

TABLE 4

CORRECTIONAL EMPLOYEES RETIREMENT FUND

SERVICE RETIREMENTS AS OF JUNE 30, 1988

	YEARS RETIRED							
AGE	<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50								0
50-54	1							1
55-59	13	39						52
60-64	4	23	54					81
65-69		8	21	58				87
70-74			13	54				67
75-79				40				40
80-84								0
85+								0
TOTAL	18	70	88	152	0	0	0	328

AVERAGE ANNUAL ANNUITY

	YEARS RETIRED							
AGE	<1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50								0
50-54	3,705							3,705
55-59	7,056	8,603						8,216
60-64	4,307	7,917	7,384					7,383
65-69		6,200	6,133	5,462				5,692
70-74			6,671	4,554				4,965
75-79				4,614				4,614
80-84								0
85+								0
ALL	6,259	8,103	6,980	4,916	0	0	0	6,224

TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
113	567	614	747	0	0	0	2,041

TABLE 5

CORRECTIONAL EMPLOYEES RETIREMENT FUND

DISABILITY RETIREMENTS AS OF JUNE 30, 1988

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

AVERAGE ANNUAL BENEFIT

	YEARS DISABLED							
AGE	<1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50			7,287					7,287
50-54		9,745						9,745
55-59								0
60-64			18,265	2,165				10,215
65-69								0
70-74								0
75-79								0
80-84								0
85+								0
TOTAL	0	9,745	12,776	2,165	0	0	0	9,492

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS OF DISABILITY

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
0	29	26	2	0	0	0	57

TABLE 6

CORRECTIONAL EMPLOYEES RETIREMENT FUND

SURVIVORS AS OF JUNE 30, 1988

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

AVERAGE ANNUAL BENEFIT

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50	5,494	8,676						7,085
50-54		9,322						9,322
55-59		7,077						7,077
60-64	2,673							2,673
65-69	1,849		4,742	3,882				3,491
70-74		3,336						3,336
75-79				4,434				4,434
80-84								0
85+								0
ALL	3,339	7,094	4,742	4,158	0	0	0	5,470

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
10	43	5	8	0	0	0	66

TABLE 7

CORRECTIONAL EMPLOYEES RETIREMENT FUND

RECONCILIATION OF MEMBERS

		TERMINATED	
	ACTIVES	DEFERRED RETIREMENT	OTHER NON-VESTED
A. On June 30, 1987	1,232	43	84
B. Additions	119	8	11
C. Deletions:			
1. Service Retirement	(19)	(4)	
2. Disability	0		
3. Death	(1)	0	0
4. Terminated-Deferred	(7)		
5. Terminated-Refund	(42)	0	(8)
6. Terminated-Other Non-vested	(11)		
7. Returned as Active		0	(2)
D. Data Adjustments	(4)	0	(5)
Vested	801		
Non-Vested	466		
E. Total on June 30, 1988	1,267	47	80

	RECIPIENTS		
	RETIREMENT ANNUITANTS	DISABLED	SURVIVORS
A. On June 30, 1987	313	11	9
B. Additions	25	1	3
C. Deletions:			
1. Service Retirement		0	
2. Death	(10)	(6)	0
3. Annuity Expired	0	0	0
4. Returned as Active	0	0	
D. Data Adjustments	0	0	0
E. Total on June 30, 1988	328	6	12

TABLE 8

CORRECTIONAL EMPLOYEES RETIREMENT FUND

ACTUARIAL BALANCE SHEET
(DOLLARS IN THOUSANDS)

JULY 1, 1988

A. CURRENT ASSETS (TABLE 1, F6)			$74,065
B. EXPECTED FUTURE ASSETS			
1. Present Value of Expected Future Statutory Supplemental Contributions			36,278
2. Present Value of Future Normal Costs			32,963
3. Total Expected Future Assets			69,241
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS			$143,306
D. CURRENT BENEFIT OBLIGATIONS	Non-Vested	Vested	Total
1. Benefit Recipients			
a. Retirement Annuities		$23,756	$23,756
b. Disability Benefits		739	739
c. Surviving Spouse and Child Benefits		940	940
2. Deferred Retirements with Future Augmentation		2,629	2,629
3. Former Members without Vested Rights		245	245
4. Active Members			
a. Retirement Annuities	1,210	27,124	28,334
b. Disability Benefits	821	0	821
c. Survivors' Benefits	1,072	0	1,072
d. Deferred Retirements	601	8,645	9,246
e. Refund Liability Due to Death or Withdrawal	0	1,360	1,360
5. Total Current Benefit Obligations	$3,704	$65,438	$69,142
E. EXPECTED FUTURE BENEFIT OBLIGATIONS			$45,275
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS			$114,417
G. CURRENT UNFUNDED ACTUARIAL LIABILITY (D5-A)			($4,923)
H. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F-C)			($28,889)

TABLE 9

CORRECTIONAL EMPLOYEES RETIREMENT FUND

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

JULY 1, 1988

	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	$62,763	$21,229	$41,534
b. Disability Benefits	1,636	663	973
c. Survivors Benefits	2,216	791	1,425
d. Deferred Retirements	17,213	7,252	9,961
e. Refunds Due to Death or Withdrawal	2,280	3,028	(748)
f. Total	$86,108	$32,963	$53,145
2. Deferred Retirements with Future Augmentation	$2,629		$2,629
3. Former Members Without Vested Rights	245		245
4. Annuitants in MPRIF	25,435		25,435
5. Recipients Not in MPRIF	0		0
6. Total	$114,417	$32,963	$81,454

B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)	
1. AAL (A6)	$81,454
2. Current Assets (Table 1, F6)	74,065
3. UAAL (B1-B2)	$7,389
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE	
1. Present Value of Future Payrolls through the Amortization Date of July 1, 2017	$893,544
2. Supplemental Contribution Rate (B3/C1)	0.83%

TABLE 10

CORRECTIONAL EMPLOYEES RETIREMENT FUND

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

YEAR ENDING JUNE 30, 1988

A. UAAL AT BEGINNING OF YEAR	$4,593
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	$3,410
2. Contribution	(4,842)
3. Interest on A, B1, and B2	310
4. Total (B1+B2+B3)	($1,122)
C. EXPECTED UAAL AT END OF YEAR (A+B4)	$3,471
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	$473
2. Investment Return	1,797
3. MPRIF Mortality	(269)
4. Mortality of Other Benefit Recipients	0
5. Other Items	1,917
6. Total	$3,918
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D6)	$7,389
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)	$7,389

TABLE 11

CORRECTIONAL EMPLOYEES RETIREMENT FUND

DETERMINATION OF CONTRIBUTION SUFFICIENCY
(DOLLARS IN THOUSANDS)

JULY 1, 1988

	% OF PAYROLL	$ AMOUNT
A. STATUTORY CONTRIBUTIONS - CHAPTER 352		
1. Employee Contributions	4.90%	$1,902
2. Employer Contributions	8.70%	3,376
3. Total	13.60%	$5,278
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	6.06%	$2,356
b. Disability Benefits	0.19%	72
c. Survivors	0.22%	84
d. Deferred Retirement Benefits	1.95%	756
e. Refunds Due to Death or Withdrawal	0.82%	318
f. Total	9.24%	$3,586
2. Supplemental Contribution Amortization by July 1, 2017 of UAAL of $7,389	0.83%	$322
3. Allowance for Expenses	0.30%	$116
4. Total	10.37%	$4,024
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) (A3-B4)	3.23%	$1,254

Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1988 is $38,807

CORRECTIONAL EMPLOYEES RETIREMENT FUND

PROJECTED CASH FLOW
(DOLLARS IN THOUSANDS)

FISCAL YEAR	STATUTORY CONTRIBUTIONS	TRANSFERS TO MPRIF	OTHER DISBURSEMENTS	INVESTMENT RETURN	NON-MPRIF ASSETS YEAR END
1988					$48,630
1989	$5,278	$571	$450	$4,061	56,948
1990	5,621	3,209	444	4,635	63,551
1991	5,986	742	473	5,275	73,597
1992	6,375	2,228	486	6,034	83,292
1993	6,790	3,921	505	6,758	92,414
1994	7,231	3,799	540	7,509	102,815
1995	7,701	3,151	565	8,385	115,185
1996	8,201	4,335	612	9,345	127,784
1997	8,735	4,256	652	10,376	141,987
1998	9,302	3,558	702	11,561	158,590
1999	9,907	5,135	757	12,848	175,453
2000	10,551	4,578	820	14,242	194,848
2001	11,237	6,146	864	15,757	214,832
2002	11,967	7,904	924	17,312	235,283
2003	12,745	8,448	994	18,955	257,541
2004	13,573	8,492	1,058	20,764	282,328
2005	14,456	13,928	1,134	22,562	304,284
2006	15,395	14,482	1,214	24,331	328,314
2007	16,396	12,450	1,305	26,371	357,326
2008	17,462	16,123	1,401	28,584	385,848
2009	18,597	15,663	1,499	30,925	418,208
2010	19,806	16,647	1,603	33,519	453,283
2011	21,093	22,161	1,714	36,151	486,652
2012	22,464	16,540	1,828	39,096	529,844
2013	23,924	20,143	1,956	42,461	574,130
2014	25,479	18,955	2,082	46,108	624,680
2015	27,135	20,448	2,218	50,153	679,302
2016	28,899	26,956	2,354	54,328	733,219
2017	30,777	24,432	2,497	58,811	795,878
2018	32,778	24,866	2,656	63,880	865,014

TABLE 13

CORRECTIONAL EMPLOYEES 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. 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. (0.30% of payroll)
Return of Contributions:	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.
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.

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 Normal Actuarial 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

	Death		Withdrawal		Disability		Retirement	
Age	Male	Female	Male	Female	Male	Female	Male	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	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

CORRECTIONAL EMPLOYEES RETIREMENT FUND

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. Proportionate Retirement Annuity is available at age 65 and 1 year of Allowable Service.
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 50% or 100% bounce back joint and survivor (option is cancelled if Member is pre-deceased by beneficiary). 15 year certain and life thereafter.

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

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.

TABLE 14
(cont)

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, benefits commence when Member would have been age 55.
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.
Amount	Benefit computed under law in effect at termination.

STATE PATROL RETIREMENT FUND

ACTUARIAL VALUATION REPORT

JULY 1, 1988

THE Wyatt COMPANY

AN INDEPENDENT WORLDWIDE BENEFITS
AND COMPENSATION CONSULTING FIRM

ACTUARIAL SERVICES
COMPENSATION PROGRAMS
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EMPLOYEE BENEFITS
EMPLOYEE COMMUNICATIONS
RISK MANAGEMENT
INSURANCE CONSULTING
HEALTH CARE CONSULTING

December 2, 1988

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, 1988 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 22, 1988.

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

TABLE OF CONTENTS

STATE PATROL RETIREMENT FUND

REPORT HIGHLIGHTS
(DOLLARS IN THOUSANDS)

	07/01/87 VALUATION	07/01/88 VALUATION
A. CONTRIBUTIONS (TABLE 11)		
1. Statutory Contributions - Chapter 352B % of Payroll	27.40%	27.40%
2. Required Contributions - Chapter 356 % of Payroll	23.39%	23.87%
3. Sufficiency (Deficiency) (A1-A2)	4.01%	3.53%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 1)	$136,397	$148,355
b. Current Benefit Obligations (Table 8)	$153,107	$167,349
c. Funding Ratio (a/b)	89.09%	88.65%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 1)	$136,397	$148,355
b. Actuarial Accrued Liability (Table 9)	$160,628	$175,062
c. Funding Ratio (a/b)	84.91%	84.74%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	$246,237	$259,582
b. Current and Expected Future Benefit Obligations	$225,285	$241,433
c. Funding Ratio (a/b)	109.30%	107.52%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	771	740
b. Projected Annual Earnings	$28,583	$29,267
c. Average Annual Earnings (Actual $)	$37,072	$39,550
d. Average Age	40.4	40.6
e. Average Service	13.8	14.0
2. Others		
a. Service Retirements (Table 4)	318	339
b. Disability Retirements (Table 5)	13	13
c. Survivors (Table 6)	99	103
d. Deferred Retirements (Table 7)	16	16
e. Terminated Other Non-vested (Table 7)	8	8
f. Total	454	479

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 decreased from 4.01% in 1987 to 3.53% in 1988. According to this valuation a contribution rate of 23.87% 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 88.65%. The corresponding ratio for the prior year was 89.09%.

- 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 1988 the ratio is 84.74%, which is a decrease from the 1987 value of 84.91%.

- 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.

<u>Asset Information (Tables 1 and 2)</u>

Minnesota Statutes require that the asset value used for actuarial purposes recognize only a third of the unrealized gains and losses. This requirement exists because market values (which include all unrealized gains and losses) are typically volatile and can produce erratic changes in the contribution requirements from year to year.

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

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.

This Fund participates in the MPRIF (i.e. Minnesota Post Retirement Investment Fund). The asset value shown for MPRIF on line A3 is set equal to the MPRIF Reserves reported on line D3 for both market and cost value purposes. This reserve is based on a 5% interest assumption.

Investment performance by SBI (i.e. State Board of Investment) above the 5% level is not shown in the assets but will be added in on January 1, 1989 when benefits will be increased for those annuitants who have been receiving payments for 18 months. Next year's valuation will include the 1989 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, 1988 is provided below:

MPRIF Reserves	$72,739,000
Reserves Plus Excess Earnings	77,600,000
MPRIF Market Value	78,300,000

<u>**Membership Data (Tables 3, 4, 5, 6 and 7)**</u>

Tables 3 through 6 summarize statistical information about 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 except in the case of new hires whose earnings have been annualized.

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.

A reconciliation of members in Table 7 provides a method for tracking what happened to members during the past year.

Actuarial Balance Sheet (Table 8)

An actuarial balance sheet provides a method for evaluating 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. Current and future funding levels are evaluated by comparing the Total Current and Expected Future Assets on line C to the Total Current and Expected Future Benefit Obligations on line F.

The Current Benefit Obligation used to measure current funding levels is calculated in accordance with Statement No. 5 of the Governmental Accounting Standards Board (GASB). Those requirements are:

- For active members - salary and service are projected to retirement to determine benefits for each member and the ratio of credited service to total service establishes the portion of the projected benefit to be used in calculating the current funding level.

- For non-active members - the discounted value of benefits, including augmentation in cases where benefits have not commenced.

GASB Disclosure

The Current Benefit Obligation amounts in Table 8 are required to be disclosed by Statement No. 5 of the 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 July 1, 1988 Pension Benefit Obligation reported in Table 8 is reformatted for GASB reporting purposes in the following table.

Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$81,485,000
Current Employees -	
Accumulated employee contributions including allocated investment income	23,415,000
Employer-financed vested	50,610,000
Employer-financed nonvested	11,839,000
Total Pension Benefit Obligation	$167,349,000

* Estimated

Actuarial Cost Method (Table 9)

The approach used by the State of Minnesota to determine contribution sufficiency is the Entry Age Normal Actuarial 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) illustrates the two techniques 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. Both approaches, however, calculate the value of all future benefits the same way (see line F of Table 8 and line A6, column 1, of Table 9).

An Unfunded Actuarial Accrued Liability is computed under the Entry Age Normal

Actuarial 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 that remain a constant percentage of payroll each year.

The payments will increase 6.5% each year because 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>Sources of Actuarial Gains and Losses (Table 10)</u>

The assumptions used in making the calculations using the Entry Age Normal Actuarial Cost Method are based on long-term expectations. Each year the actual experience will deviate from the long-term expectation. The major sources of gain and loss, which have been identified, are:

- A gain from salaries even though the average increase of 7.2% was higher than the assumed 6.5% increase. This gain occurred because most of the increases above 6.5% were for the younger members whose liabilities are much lower than the liabilities for the older members, who had salary increases under 6.5%.

- A loss from Current Assets because the return was 4.7% instead of the assumed 8%.

Contribution Sufficiency (Table 11)

This report answers the question of "How adequate are the Statutory Contributions?" by comparing the Statutory Contributions to the Required Contributions.

The Required Contributions, set forth in Chapter 356, consist of:

- o Normal Costs based on the Entry Age Normal Actuarial Cost Method
- o A Supplemental Contribution for amortizing any Unfunded Actuarial Accrued Liability
- o An Allowance for Expenses

Table 11 shows the Fund has a contribution sufficiency since the Statutory Contribution Rate is 27.40% compared to the Required Contribution Rate of 23.87%.

Projected Cash Flow (Table 12)

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.

This projected cash flow assumes that future payrolls increase by 6.5%. This is the only table in the report where 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 1990 is large because it includes those already over age 58 who are assumed to retire a year from the valuation date.

Changes in Actuarial Assumptions

This valuation does not reflect any changes in actuarial assumptions since the prior valuation.

Changes in Plan Provisions

This valuation does not reflect any changes in plan provisions since the prior valuation.

TABLE 1

STATE PATROL RETIREMENT FUND

ACCOUNTING BALANCE SHEET
(DOLLARS IN THOUSANDS)

July 1, 1988

	MARKET VALUE	COST VALUE
A. ASSETS		
1. Cash, Equivalents, Short-Term Securities	$4,253	$4,253
2. Investments		
a. Fixed Income	17,726	18,237
b. Equity	50,965	44,724
c. Real Estate	7,012	5,881
3. Equity in Minnesota Post-Retirement Investment Fund (MPRIF)	72,739	72,739
4. Other	477	477
B. TOTAL ASSETS	$153,172	$146,311
C. AMOUNTS CURRENTLY PAYABLE	$243	$243
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	$17,863	$17,863
2. State Reserves	54,881	48,020
3. MPRIF Reserves	72,739	72,739
4. Non-MPRIF Reserves	7,446	7,446
5. Total Assets Available for Benefits	$152,929	$146,068
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	$153,172	$146,311

F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS

1. Cost Value of Assets Available for Benefits (D5)		$146,068
2. Market Value (D5)	$152,929	
3. Cost Value (D5)	146,068	
4. Market Over Cost (F2-F3)	$6,861	
5. 1/3 of Market Over Cost(F4)/3		2,287
6. Actuarial Value of Assets (F1+F5) (Same as "Current Assets")		$148,355

TABLE 2

STATE PATROL RETIREMENT FUND

CHANGES IN ASSETS AVAILABLE FOR BENEFITS
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1988

	MARKET VALUE	COST VALUE
A. ASSETS AVAILABLE AT BEGINNING OF PERIOD	$144,544	$132,323
B. OPERATING REVENUES		
1. Member Contributions	$2,244	$2,244
2. Employer Contributions	4,971	4,971
3. Investment Income	4,636	4,636
4. MPRIF Income	7,682	7,682
5. Net Realized Gain (Loss)	658	658
6. Other (Includes State Appropriation)	62	62
7. Net Change in Unrealized Gain (Loss)	(5,360)	0
8. Total Revenue	$14,893	$20,253
C. OPERATING EXPENSES		
1. Service Retirements	$6,203	$6,203
2. Disability Benefits	46	46
3. Survivor Benefits	14	14
4. Refunds	9	9
5. Expenses	159	159
6. Other	77	77
7. Total Disbursements	$6,508	$6,508
D. OTHER CHANGES IN RESERVES	0	0
E. ASSETS AVAILABLE AT END OF PERIOD	$152,929	$146,068

TABLE 3

STATE PATROL RETIREMENT FUND

ACTIVE MEMBERS AS OF JUNE 30, 1988

	YEARS OF SERVICE								
AGE	≤1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
<25		13							13
25-29		60	21	1					82
30-34	4	35	66	23					128
35-39	2	8	31	57	24				122
40-44		4	13	34	82	25			158
45-49			2	8	38	67	6		121
50-54			1	1	9	24	35	11	81
55-59				1	3	3	9	9	25
60-64				1	1		6		8
65+					1			1	2
TOTAL	6	120	134	126	158	119	56	21	740

AVERAGE ANNUAL EARNINGS

	YEARS OF SERVICE								
AGE	≤1	1-4	5-9	10-14	15-19	20-24	25-29	30+	ALL
<25		26,733							26,733
25-29		28,244	31,942	33,785					29,258
30-34	16,046	28,870	31,803	32,880					30,702
35-39	31,211	28,440	31,384	35,732	37,722				34,467
40-44		28,779	34,003	35,643	36,215	34,919			35,517
45-49			33,619	39,485	37,003	35,872	35,761		36,423
50-54			32,696	38,033	39,306	35,145	36,357	38,478	36,589
55-59				33,680	36,450	36,992	36,548	41,696	38,328
60-64				38,169	40,605		33,596		35,044
65+					51,310			33,793	42,552
ALL	21,101	28,294	31,975	35,432	36,937	35,553	36,028	39,634	34,037

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
127	3,395	4,285	4,464	5,836	4,231	2,018	832	25,188

TABLE 4

STATE PATROL RETIREMENT FUND

SERVICE RETIREMENTS AS OF JUNE 30, 1988

AGE	YEARS RETIRED <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50								0
50-54	4							4
55-59	23	44	1					68
60-64	5	47	53					105
65-69		12	31	27				70
70-74			14	21	13			48
75-79				3	12	10	1	26
80-84				2	2	4	9	17
85+						1		1
TOTAL	32	103	99	53	27	15	10	339

AVERAGE ANNUAL ANNUITY

AGE	YEARS RETIRED <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50								0
50-54	22,336							22,336
55-59	22,397	17,345	23,240					19,140
60-64	19,966	19,627	17,982					18,813
65-69		19,037	19,133	14,647				17,386
70-74			14,129	15,722	8,765			13,374
75-79				13,234	10,725	6,262	6,791	9,147
80-84				13,960	8,596	7,673	6,288	7,788
85+						6,138		6,138
ALL	22,010	18,583	17,851	14,967	9,624	6,630	6,338	16,524

TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
704	1,916	1,767	793	260	99	63	5,602

TABLE 5

STATE PATROL RETIREMENT FUND

DISABILITY RETIREMENTS AS OF JUNE 30, 1988

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

AVERAGE ANNUAL BENEFIT

AGE	YEARS DISABLED <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50		15,125	10,523					12,824
50-54								0
55-59		20,979	13,934	10,496	8,021			12,785
60-64			22,281	11,882	8,542			13,294
65-69				7,467				7,467
70-74								0
75-79								0
80-84								0
85+								0
TOTAL	0	18,052	15,579	10,684	8,282	0	0	12,578

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS OF DISABILITY

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
0	36	47	64	17	0	0	164

TABLE 6

STATE PATROL RETIREMENT FUND

SURVIVORS AS OF JUNE 30, 1988

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50			1	5				6
50-54	1							1
55-59		2	4	5		1		12
60-64	2	1	4	3	1			11
65-69	1	3	3	3	1		1	12
70-74	2		4	3	1	2	1	13
75-79	2	4	3	4	1	3	2	19
80-84	2	1	5	1			4	13
85+			5	2	1	2	6	16
TOTAL	10	11	29	26	5	8	14	103

AVERAGE ANNUAL BENEFIT

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50			3,632	2,505				2,693
50-54	7,048							7,048
55-59		14,106	16,909	7,090		3,508		11,234
60-64	19,102	21,543	13,735	11,034	5,321			13,919
65-69	7,280	11,939	10,167	7,795	8,082		3,643	9,059
70-74	3,557		6,172	5,129	9,328	3,613	3,566	5,178
75-79	3,957	4,451	6,982	7,014	7,311	4,724	3,641	5,447
80-84	4,151	3,685	4,295	3,651			3,607	3,965
85+			3,538	3,639	3,643	4,765	3,646	3,751
ALL	7,586	9,733	8,328	6,109	6,737	4,304	3,628	6,817

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
76	107	241	159	34	34	51	702

TABLE 7

STATE PATROL RETIREMENT FUND

RECONCILIATION OF MEMBERS

	ACTIVES	TERMINATED: DEFERRED RETIREMENT	TERMINATED: OTHER NON-VESTED
A. On June 30, 1987	771	16	8
B. Additions	7	4	0
C. Deletions:			
1. Service Retirement	(32)	(4)	
2. Disability	0	0	
3. Death	(2)	0	0
4. Terminated-Deferred	(3)		
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	614		
Non-Vested	126		
E. Total on June 30, 1988	740	16	8

	RECIPIENTS: RETIREMENT ANNUITANTS	RECIPIENTS: DISABLED	RECIPIENTS: SURVIVORS
A. On June 30, 1987	318	13	99
B. Additions	36	0	10
C. Deletions:			
1. Service Retirement		0	
2. Death	(15)	0	(3)
3. Annuity Expired	0	0	(2)
4. Returned as Active	0	0	
D. Data Adjustments	0	0	(1)
E. Total on June 30, 1988	339	13	103

TABLE 8

STATE PATROL RETIREMENT FUND

ACTUARIAL BALANCE SHEET
(DOLLARS IN THOUSANDS)

JULY 1, 1988

A. CURRENT ASSETS (TABLE 1, F6)			$148,355
B. EXPECTED FUTURE ASSETS			
1. Present Value of Expected Future Statutory Supplemental Contributions			44,856
2. Present Value of Future Normal Costs			66,371
3. Total Expected Future Assets			111,227
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS			$259,582
D. CURRENT BENEFIT OBLIGATIONS	Non-Vested	Vested	Total
1. Benefit Recipients			
a. Retirement Annuities		$67,299	$67,299
b. Disability Benefits		2,424	2,424
c. Surviving Spouse and Child Benefits		10,462	10,462
2. Deferred Retirements with Future Augmentation		1,248	1,248
3. Former Members without Vested Rights		52	52
4. Active Members			
a. Retirement Annuities	1,176	65,972	67,148
b. Disability Benefits	7,419	0	7,419
c. Survivors' Benefits	2,921	0	2,921
d. Deferred Retirements	323	7,938	8,261
e. Refund Liability Due to Death or Withdrawal	0	115	115
5. Total Current Benefit Obligations	$11,839	$155,510	$167,349
E. EXPECTED FUTURE BENEFIT OBLIGATIONS			$74,084
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS			$241,433
G. CURRENT UNFUNDED ACTUARIAL LIABILITY (D5-A)			$18,994
H. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F-C)			($18,149)

TABLE 9

STATE PATROL RETIREMENT FUND

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

JULY 1, 1988

	ACTUARIAL PRESENT VALUE OF PROJECTED BENEFITS	ACTUARIAL PRESENT VALUE OF FUTURE NORMAL COSTS	ACTUARIAL ACCRUED LIABILITY
	(1)	(2)	(3)=(1)-(2)
A. DETERMINATION OF ACTUARIAL ACCRUED LIABILITY (AAL)			
1. Active Members			
a. Retirement Annuities	$127,539	$48,621	$78,918
b. Disability Benefits	12,913	6,524	6,389
c. Survivors Benefits	5,038	2,827	2,211
d. Deferred Retirements	14,267	8,008	6,259
e. Refunds Due to Death or Withdrawal	191	391	(200)
f. Total	$159,948	$66,371	$93,577
2. Deferred Retirements with Future Augmentation	$1,248		$1,248
3. Former Members Without Vested Rights	52		52
4. Annuitants in MPRIF	72,739		72,739
5. Recipients Not in MPRIF	7,446		7,446
6. Total	$241,433	$66,371	$175,062
B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)			
1. AAL (A6)			$175,062
2. Current Assets (Table 1,F6)			148,355
3. UAAL (B1-B2)			$26,707
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE			
1. Present Value of Future Payrolls through the Amortization Date of July 1, 2009			$514,398
2. Supplemental Contribution Rate (B3/C1)			5.19%

TABLE 10

STATE PATROL RETIREMENT FUND

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

YEAR ENDING JUNE 30, 1988

A. UAAL AT BEGINNING OF YEAR	$24,231
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	$4,953
2. Contribution	(7,215)
3. Interest on A, B1, and B2	1,848
4. Total (B1+B2+B3)	($414)
C. EXPECTED UAAL AT END OF YEAR (A+B4)	$23,817
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	($69)
2. Investment Return	2,399
3. MPRIF Mortality	184
4. Mortality of Other Benefit Recipients	26
5. Other Items	350
6. Total	$2,890
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D6)	$26,707
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)	$26,707

TABLE 11

STATE PATROL RETIREMENT FUND

DETERMINATION OF CONTRIBUTION SUFFICIENCY
(DOLLARS IN THOUSANDS)

JULY 1, 1988

	% OF PAYROLL	$ AMOUNT
A. STATUTORY CONTRIBUTIONS - CHAPTER 352B		
1. Employee Contributions	8.50%	$2,488
2. Employer Contributions	18.90%	5,531
3. Total	27.40%	$8,019
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	13.26%	$3,880
b. Disability Benefits	1.79%	524
c. Survivors	0.80%	234
d. Deferred Retirement Benefits	2.13%	624
e. Refunds Due to Death or Withdrawal	0.10%	29
f. Total	18.08%	$5,291
2. Supplemental Contribution Amortization by July 1, 2009 of UAAL of $26,707	5.19%	$1,519
3. Allowance for Expenses	0.60%	$176
4. Total	23.87%	$6,986
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) (A3-B4)	3.53%	$1,033

Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1988 is $29,267

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
1988					$75,616
1989	$8,019	$420	$584	$6,330	88,961
1990	8,540	7,138	1,154	7,127	96,336
1991	9,095	1,737	1,765	7,931	109,860
1992	9,687	5,609	2,407	8,856	120,387
1993	10,316	6,039	3,090	9,678	131,252
1994	10,987	7,027	3,816	10,506	141,902
1995	11,701	6,210	4,578	11,389	154,204
1996	12,462	7,734	5,383	12,310	165,859
1997	13,272	11,282	6,245	13,099	174,703
1998	14,134	12,161	7,138	13,770	183,308
1999	15,053	13,723	8,069	14,395	190,964
2000	16,031	10,596	9,052	15,132	202,479
2001	17,073	18,125	10,089	15,753	207,091
2002	18,183	22,404	11,191	15,951	207,630
2003	19,365	22,705	12,350	15,983	207,923
2004	20,624	23,951	13,566	15,958	206,988
2005	21,964	20,031	14,862	16,042	210,101
2006	23,392	21,649	16,263	16,227	211,808
2007	24,912	25,843	17,743	16,198	209,332
2008	26,532	26,011	19,297	15,996	206,552
2009	28,256	16,568	20,959	16,153	213,434
2010	30,093	20,483	22,730	16,550	216,864
2011	32,049	29,409	24,603	16,471	211,372
2012	34,132	25,187	26,592	16,204	209,929
2013	36,351	29,682	28,662	15,915	203,851

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. (0.60% of payroll)
Return of Contributions:	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:	100% of members are married. Female is three years younger than male. 15% load on spouse benefits for children's benefits.
Social Security:	NA

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 Normal 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 Male	Death Female	Withdrawal Male	Withdrawal Female	Disability Male	Disability Female	Retirement Male	Retirement 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.
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.
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.
DEATH	
Surviving Spouse Benefit	
Eligibility	Member who is active or receiving a disability benefit.

TABLE 14
(cont)

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. 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.
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.
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, 1988

THE Wyatt COMPANY

AN INDEPENDENT WORLDWIDE BENEFITS
AND COMPENSATION CONSULTING FIRM

ACTUARIAL SERVICES
COMPENSATION PROGRAMS
ADMINISTRATIVE SYSTEMS
INTERNATIONAL SERVICES
ORGANIZATION SURVEYS

SUITE 1525
8400 NORMANDALE LAKE BOULEVARD
MINNEAPOLIS, MINNESOTA 55437

(612) 921-8700

EMPLOYEE BENEFITS
EMPLOYEE COMMUNICATIONS
RISK MANAGEMENT
INSURANCE CONSULTING
HEALTH CARE CONSULTING

December 2, 1988

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, 1988 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 22, 1988.

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

TABLE OF CONTENTS

JUDGES RETIREMENT FUND

REPORT HIGHLIGHTS
(DOLLARS IN THOUSANDS)

	07/01/87 VALUATION	07/01/88 VALUATION
A. CONTRIBUTIONS (TABLE 11)		
1. Statutory Contributions - Chapter 490 % of Payroll	3.76%	4.44%
2. Required Contributions - Chapter 356 % of Payroll	25.96%	28.24%
3. Sufficiency (Deficiency) (A1-A2)	-22.20%	-23.80%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 1)	$18,781	$20,760
b. Current Benefit Obligations (Table 8)	$53,677	$59,389
c. Funding Ratio (a/b)	34.99%	34.96%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 1)	$18,781	$20,760
b. Actuarial Accrued Liability (Table 9)	$54,034	$59,708
c. Funding Ratio (a/b)	34.76%	34.77%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	$25,135	$29,089
b. Current and Expected Future Benefit Obligations	$78,446	$88,854
c. Funding Ratio (a/b)	32.04%	32.74%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	238	246
b. Projected Annual Earnings	$15,999	$17,109
c. Average Annual Earnings (Actual $)	$67,221	$69,548
d. Average Age	53.5	53.2
e. Average Service	11.5	11.2
2. Others		
a. Service Retirements (Table 4)	87	93
b. Disability Retirements (Table 5)	5	5
c. Survivors (Table 6)	60	63
d. Deferred Retirements (Table 7)	7	5
e. Terminated Other Non-vested (Table 7)	1	0
f. Total	160	166

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 4.44%. The remaining 23.80% needed to reach the required contribution level of 28.24% 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 34.96%. The corresponding ratio for the prior year was 34.99%.

- 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 1988 the ratio is 34.77%, which is a slight increase from the 1987 value of 34.76%.

- The Projected Benefit Funding Ratio is a measure of the adequacy or deficiency in the contribution level. This year's ratio of 32.74% 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 (Tables 1 and 2)

Minnesota Statutes require that the asset value used for actuarial purposes recognize only a third of the unrealized gains and losses. This requirement exists because market values (which include all unrealized gains and losses) are typically volatile and can produce erratic changes in the contribution requirements from year to year.

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

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.

This Fund participates in the MPRIF (i.e. Minnesota Post Retirement Investment

Fund). The asset value shown for MPRIF on line A3 is set equal to the MPRIF Reserves reported on line D3 for both market and cost value purposes. This reserve is based on a 5% interest assumption.

Investment performance by SBI (i.e. State Board of Investment) above the 5% level is not shown in the assets but will be added in on January 1, 1989 when benefits will be increased for those annuitants who have been receiving payments for 18 months. Next year's valuation will include the 1989 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, 1988 is provided below:

MPRIF Reserves	$17,812,000
Reserves Plus Excess Earnings	19,000,000
MPRIF Market Value	19,100,000

The non-MPRIF Reserves amount of $12,137,000 on line D4 of Table 1 represents the liability for benefits that are paid directly by the Fund.

Membership Data (Tables 3, 4, 5, 6 and 7)

Tables 3 through 6 summarize statistical information about 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 except in the case of new hires whose earnings have been annualized.

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.

A reconciliation of members in Table 7 provides a method for tracking what happened to members during the past year.

Actuarial Balance Sheet (Table 8)

An actuarial balance sheet provides a method for evaluating 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. Current and future funding levels are evaluated by comparing the Total Current and Expected Future Assets on line C to the Total Current and Expected Future Benefit Obligations on line F.

The Current Benefit Obligation used to measure current funding levels is calculated in accordance with Statement No. 5 of the Governmental Accounting Standards Board (GASB). Those requirements are:

- For active members - salary and service are projected to retirement to determine benefits for each member and the ratio of credited service to total service establishes the portion of the projected benefit to be used in calculating the current funding level.

- For non-active members - the discounted value of benefits.

GASB Disclosure

The Current Benefit Obligation amounts in Table 8 are required to be disclosed by Statement No. 5 of the 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 July 1, 1988 Pension Benefit Obligation reported in Table 8 is reformatted for GASB reporting purposes in the following table. The liabilities based on the old benefit provisions are provided for comparison. See page 9 for an explanation of the change in benefits.

	Old Benefits	New Benefits
Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$30,576,000	$30,576,000
Current Employees -		
Accumulated employee contributions including allocated investment income	5,177,000 *	5,177,000 *
Employer-financed vested	13,178,000	16,581,000
Employer-financed nonvested	8,668,000	7,055,000
Total Pension Benefit Obligation	$57,599,000	$59,389,000

* Estimated

Actuarial Cost Method (Table 9)

The approach used by the State of Minnesota to determine contribution sufficiency is the Entry Age Normal Actuarial 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) illustrates the two techniques 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. Both approaches, however, calculate the value of all future benefits the same way (see line F of Table 8 and line A6, column 1, of Table 9).

An Unfunded Actuarial Accrued Liability is computed under the Entry Age Normal Actuarial 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 that remain a constant percentage of payroll each year.

The payments will increase 6.5% each year because 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>Sources of Actuarial Gains and Losses (Table 10)</u>

The assumptions used in making the calculations using the Entry Age Normal Actuarial Cost Method are based on long-term expectations. Each year the actual experience will deviate from the long-term expectation. The major sources of gain and loss, which have been identified, are:

- A gain from salaries because the average increase was less than the expected increase.

- A loss from Current Assets because the return was 5.5% instead of the assumed 8%.

Contribution Sufficiency (Table 11)

This report answers the question of "How adequate are the Statutory Contributions?" by comparing the Statutory Contributions to the Required Contributions.

The Required Contributions, set forth in Chapter 356, consist of:

- Normal Costs based on the Entry Age Normal Actuarial Cost Method

- A Supplemental Contribution for amortizing any Unfunded Actuarial Accrued Liability

- An Allowance for Expenses

Table 11 shows the Fund has a contribution deficiency since the Statutory Contribution Rate is 4.44% compared to the Required Contribution Rate of 28.24%. As noted earlier, Statutory Contributions are required only from members. The State will make the necessary contributions to meet benefit payments.

Projected Cash Flow (Table 12)

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%. This is the only table in the report where 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 1990 is large because it includes those already over age 68 who are assumed to retire a year from the valuation date.

Changes in Actuarial Assumptions

This valuation does not reflect any changes in actuarial assumptions since the prior valuation.

Changes in Plan Provisions

This valuation reflects three changes in plan provisions since the prior valuation. Vesting eligibility for the Basic and Coordinated plans has been reduced from 10 years to 5 years. This change applies to the Deferred Annuity, the Normal Retirement Benefit and the Early Retirement Benefit. In the case of the Coordinated plan, the Social Security Benefit Offset was reduced from 75% to 50% and the employee contribution was increased by .75% of Salary.

	Impact Due to Changes In Plan Provisions
Actuarial Accrued Liability	$1,748,000
Projected Benefit Obligation for GASB No. 5	1,790,000
Normal Cost	1.21%
Supplemental Contribution	0.58%
Required Contribution	1.79%

TABLE 1

JUDGES RETIREMENT FUND

ACCOUNTING BALANCE SHEET
(DOLLARS IN THOUSANDS)

July 1, 1988

	MARKET VALUE	COST VALUE
A. ASSETS		
1. Cash, Equivalents, Short-Term Securities	$198	$198
2. Investments		
a. Fixed Income	882	936
b. Equity	2,008	2,051
c. Real Estate	349	292
3. Equity in Minnesota Post-Retirement Investment Fund (MPRIF)	17,812	17,812
4. Other	20	20
B. TOTAL ASSETS	$21,269	$21,309
C. AMOUNTS CURRENTLY PAYABLE	$536	$536
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	$4,018	$4,018
2. State Reserves	(13,234)	(13,194)
3. MPRIF Reserves	17,812	17,812
4. Non-MPRIF Reserves	12,137	12,137
5. Total Assets Available for Benefits	$20,733	$20,773
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	$21,269	$21,309

F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS

1. Cost Value of Assets Available for Benefits (D5)		$20,773
2. Market Value (D5)	$20,733	
3. Cost Value (D5)	20,773	
4. Market Over Cost (F2-F3)	($40)	
5. 1/3 of Market Over Cost(F4)/3		(13)
6. Actuarial Value of Assets (F1+F5) (Same as "Current Assets")		$20,760

TABLE 2

JUDGES RETIREMENT FUND

CHANGES IN ASSETS AVAILABLE FOR BENEFITS
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1988

	MARKET VALUE	COST VALUE
A. ASSETS AVAILABLE AT BEGINNING OF PERIOD	$18,960	$18,691
B. OPERATING REVENUES		
1. Member Contributions	$565	$565
2. Employer Contributions	2,650	2,650
3. Investment Income	299	299
4. MPRIF Income	1,663	1,663
5. Net Realized Gain (Loss)	18	18
6. Other	56	56
7. Net Change in Unrealized Gain (Loss)	(309)	0
8. Total Revenue	$4,942	$5,251
C. OPERATING EXPENSES		
1. Service Retirements	$2,274	$2,274
2. Disability Benefits	116	116
3. Survivor Benefits	720	720
4. Refunds	6	6
5. Expenses	43	43
6. Other	10	10
7. Total Disbursements	$3,169	$3,169
D. OTHER CHANGES IN RESERVES	0	0
E. ASSETS AVAILABLE AT END OF PERIOD	$20,733	$20,773

TABLE 3

JUDGES RETIREMENT FUND

ACTIVE MEMBERS AS OF JUNE 30, 1988

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									0
35-39	5	9	3						17
40-44	2	23	15	3					43
45-49	1	11	15	9	2				38
50-54	1	7	5	11	8	5			37
55-59	1	4	7	12	7	3	1		35
60-64	1	3	3	9	17	8	7	4	52
65+		3	2	5	5	3	6		24
TOTAL	11	60	50	49	39	19	14	4	246

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									0
35-39	52,027	63,939	63,826						60,416
40-44	62,275	64,322	63,857	64,740					64,094
45-49	57,031	64,372	63,855	63,826	63,827				63,817
50-54	63,463	63,899	63,826	64,219	63,826	63,826			63,947
55-59	62,215	64,512	64,218	63,826	63,826	63,826	63,826		63,937
60-64	62,215	64,741	69,382	64,752	64,498	63,826	64,218	64,600	64,661
65+		67,758	63,827	63,826	67,160	64,740	66,147		65,707
ALL	57,237	64,430	64,232	64,141	64,547	63,971	65,017	64,600	64,030

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
630	3,866	3,212	3,143	2,517	1,215	910	258	15,751

TABLE 4

JUDGES RETIREMENT FUND

SERVICE RETIREMENTS AS OF JUNE 30, 1988

AGE	YEARS RETIRED <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50								0
50-54	1							1
55-59								0
60-64	1	2						3
65-69	3	11	2					16
70-74	3	15	13	2				33
75-79		1	10	6				17
80-84			2	9	2			13
85+				4	5	1		10
TOTAL	8	29	27	21	7	1	0	93

AVERAGE ANNUAL ANNUITY

AGE	YEARS RETIRED <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50								0
50-54	17,189							17,189
55-59								0
60-64	18,976	26,205						23,795
65-69	30,509	20,147	23,215					22,473
70-74	25,950	25,286	32,978	19,007				27,996
75-79		23,082	30,293	19,704				26,131
80-84			9,089	25,935	15,168			21,686
85+				22,425	18,289	28,998		21,014
ALL	25,693	23,324	29,490	22,826	17,397	28,998	0	24,820

TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
206	676	796	479	122	29	0	2,308

TABLE 5

JUDGES RETIREMENT FUND

DISABILITY RETIREMENTS AS OF JUNE 30, 1988

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		1						1
70-74		2	1					3
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						21,266		21,266
65-69		41,847						41,847
70-74		20,676	16,242					19,198
75-79								0
80-84								0
85+								0
TOTAL	0	27,733	16,242	0	0	21,266	0	24,141

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS OF DISABILITY

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
0	84	16	0	0	21	0	121

TABLE 6

JUDGES RETIREMENT FUND

SURVIVORS AS OF JUNE 30, 1988

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50		4						4
50-54								0
55-59		1						1
60-64	1	1	2	4	1			9
65-69	3	1	1		1			6
70-74		4	1	2		1		8
75-79		3	4	3	1	1	1	13
80-84	1	2	3		1		2	9
85+	1	2	3	1		2	4	13
TOTAL	6	18	14	10	4	4	7	63

AVERAGE ANNUAL BENEFIT

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50		18,871						18,871
50-54								0
55-59		14,220						14,220
60-64	17,807	9,908	15,925	8,257	14,499			11,899
65-69	16,839	6,384	20,068		14,499			15,245
70-74		17,192	20,054	12,369		14,499		16,007
75-79		15,696	15,793	10,753	3,921	3,921	6,797	12,089
80-84	12,460	14,382	7,953		14,499		6,570	10,302
85+	10,875	11,721	17,548	15,179		14,500	10,535	13,329
ALL	15,276	15,225	15,118	10,520	11,855	11,855	8,868	13,325

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
92	274	212	105	47	47	62	839

TABLE 7

JUDGES RETIREMENT FUND

RECONCILIATION OF MEMBERS

	ACTIVES	TERMINATED DEFERRED RETIREMENT	TERMINATED OTHER NON-VESTED
A. On June 30, 1987	238	7	1
B. Additions	20	0	0
C. Deletions:			
1. Service Retirement	(8)	(2)	0
2. Disability	0		
3. Death	(3)	0	0
4. Terminated-Deferred	0		
5. Terminated-Refund	0	0	(1)
6. Terminated-Other Non-vested	0		
7. Returned as Active		0	0
D. Data Adjustments	(1)	0	0
Vested	175		
Non-Vested	71		
E. Total on June 30, 1988	246	5	0

	RECIPIENTS RETIREMENT ANNUITANTS	RECIPIENTS DISABLED	RECIPIENTS SURVIVORS
A. On June 30, 1987	87	5	60
B. Additions	11	0	6
C. Deletions:			
1. Service Retirement		0	
2. Death	(5)	0	(3)
3. Annuity Expired	0		0
4. Returned as Active	0	0	
D. Data Adjustments	0	0	0
E. Total on June 30, 1988	93	5	63

TABLE 8

JUDGES RETIREMENT FUND

ACTUARIAL BALANCE SHEET
(DOLLARS IN THOUSANDS)

JULY 1, 1988

A. CURRENT ASSETS (TABLE 1, F6)			$20,760
B. EXPECTED FUTURE ASSETS			
1. Present Value of Expected Future Statutory Supplemental Contributions			0
2. Present Value of Future Normal Costs			8,329
3. Total Expected Future Assets			8,329
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS			$29,089
D. CURRENT BENEFIT OBLIGATIONS	Non-Vested	Vested	Total
1. Benefit Recipients			
a. Retirement Annuities		$20,906	$20,906
b. Disability Benefits		1,257	1,257
c. Surviving Spouse and Child Benefits		7,786	7,786
2. Deferred Retirements		627	627
3. Former Members without Vested Rights		0	0
4. Active Members			
a. Retirement Annuities	1,200	21,628	22,828
b. Disability Benefits	1,741	0	1,741
c. Survivors' Benefits	4,114	0	4,114
d. Deferred Retirements	0	0	0
e. Refund Liability Due to Death or Withdrawal	0	130	130
5. Total Current Benefit Obligations	$7,055	$52,334	$59,389
E. EXPECTED FUTURE BENEFIT OBLIGATIONS			$29,465
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS			$88,854
G. CURRENT UNFUNDED ACTUARIAL LIABILITY (D5-A)			$38,629
H. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F-C)			$59,765

TABLE 9

JUDGES RETIREMENT FUND

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

JULY 1, 1988

	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	$46,730	$21,329	$25,401
b. Disability Benefits	3,540	2,277	1,263
c. Survivors Benefits	7,726	5,379	2,347
d. Deferred Retirements	0	0	0
e. Refunds Due to Death or Withdrawal	282	161	121
f. Total	$58,278	$29,146	$29,132
2. Deferred Retirements	$627		$627
3. Former Members Without Vested Rights	0		0
4. Annuitants in MPRIF	17,812		17,812
5. Recipients Not in MPRIF	12,137		12,137
6. Total	$88,854	$29,146	$59,708

B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)	
1. AAL (A6)	$59,708
2. Current Assets (Table 1,F6)	20,760
3. UAAL (B1-B2)	$38,948
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE	
1. Present Value of Future Payrolls through the Amortization Date of July 1, 2009	$300,707
2. Supplemental Contribution Rate (B3/C1)	12.95%

TABLE 10

JUDGES RETIREMENT FUND

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

YEAR ENDING JUNE 30, 1988

A. UAAL AT BEGINNING OF YEAR	$35,253
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	$2,093
2. Contribution	(3,215)
3. Interest on A, B1, and B2	2,775
4. Total (B1+B2+B3)	$1,653
C. EXPECTED UAAL AT END OF YEAR (A+B4)	$36,906
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	($280)
2. Investment Return	93
3. MPRIF Mortality	456
4. Mortality of Other Benefit Recipients	(239)
5. Other Items	264
6. Total	$294
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D6)	$37,200
F. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO PLAN AMENDMENTS	$1,748
G. CHANGE IN ACTUARIAL ACCRUED LIABILITY DUE TO CHANGES IN ACTUARIAL ASSUMPTIONS	$0
H. UAAL AT END OF YEAR (E+F+G)	$38,948

TABLE 11

JUDGES RETIREMENT FUND

DETERMINATION OF CONTRIBUTION SUFFICIENCY
(DOLLARS IN THOUSANDS)

JULY 1, 1988

	% OF PAYROLL	$ AMOUNT
A. STATUTORY CONTRIBUTIONS - CHAPTER 490		
1. Employee Contributions	4.44%	$759
2. Employer Contributions	0.00%	0
3. Total	4.44%	$759
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	10.86%	$1,859
b. Disability Benefits	1.12%	191
c. Survivors	2.95%	505
d. Deferred Retirement Benefits	0.00%	0
e. Refunds Due to Death or Withdrawal	0.07%	12
f. Total	15.00%	$2,567
2. Supplemental Contribution Amortization by July 1, 2009 of UAAL of $38,948	12.95%	$2,216
3. Allowance for Expenses	0.29%	$50
4. Total	28.24%	$4,833
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) (A3-B4)	-23.80%	($4,074)

Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1988 is $17,109

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
1988					$2,948
1989	$759	$774	$1,328	$182	1,787
1990	767	3,580	1,278	(21)	(2,325)
1991	823	2,411	1,211	(298)	(5,422)
1992	878	3,097	1,154	(569)	(9,364)
1993	939	7,248	1,100	(1,045)	(17,818)
1994	1,003	2,695	1,048	(1,535)	(22,093)
1995	1,079	3,993	994	(1,924)	(27,925)
1996	1,165	4,359	943	(2,399)	(34,461)
1997	1,264	6,282	891	(2,993)	(43,363)
1998	1,360	3,060	843	(3,571)	(49,477)
1999	1,482	5,281	795	(4,142)	(58,213)
2000	1,593	3,810	754	(4,776)	(65,960)
2001	1,731	3,988	713	(5,396)	(74,326)
2002	1,861	1,854	677	(5,973)	(80,969)
2003	2,018	4,485	643	(6,602)	(90,681)
2004	2,205	8,618	613	(7,536)	(105,243)
2005	2,393	7,273	577	(8,638)	(119,338)
2006	2,614	7,439	554	(9,762)	(134,479)
2007	2,864	10,167	529	(11,072)	(153,383)
2008	3,132	9,065	520	(12,529)	(172,365)
2009	3,412	8,788	518	(14,025)	(192,284)
2010	3,738	12,323	522	(15,747)	(217,138)
2011	4,067	9,565	532	(17,612)	(240,780)
2012	4,419	10,064	556	(19,510)	(266,491)
2013	4,834	14,279	574	(21,720)	(298,230)

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 2.5% to current fiscal year, 5% for the next 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:	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 ($838/month for 1988), increasing with salary scale. Covered annual wages: $45,000 Contribution rate: 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 Normal 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

Age	Death Male	Death Female	Withdrawal Male	Withdrawal Female	Disability Male	Disability Female	Retirement Male	Retirement 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 5 years of Allowable Service. <u>(Amended 1988)</u> 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 5 years of Allowable Service. <u>(Amended 1988)</u>
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 50% or 100% bounce back joint and survivor (option is cancelled if Member is pre-deceased by beneficiary).

10 or 15 year certain and life.

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.
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	5 years of Allowable Service. (Amended 1988)
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	1.25% of Salary plus the Social Security tax rate reduced by the Member's Social Security tax. (Amended 1988)
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 5 years of Allowable Service. (Amended 1988) 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 50% of the member's primary Social Security. Maximum benefit of 65% of salary for the 12 months preceding retirement. (Amended 1988)
Early Retirement Benefit	
Eligibility	Age 62 and 5 years of Allowable Service. (Amended 1988)
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 50% or 100% bounce back joint and survivor (option is cancelled if Member is pre-deceased by beneficiary). 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 50% of the Member's primary Social Security or the Normal Retirement Benefit, without reduction for age. <u>(Amended 1988)</u>
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.

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	5 years of Allowable Service. (Amended 1988)
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, 1988

THE *Wyatt* COMPANY

AN INDEPENDENT WORLDWIDE BENEFITS
AND COMPENSATION CONSULTING FIRM

ACTUARIAL SERVICES
COMPENSATION PROGRAMS
ADMINISTRATIVE SYSTEMS
INTERNATIONAL SERVICES
ORGANIZATION SURVEYS

SUITE 1525
8400 NORMANDALE LAKE BOULEVARD
MINNEAPOLIS, MINNESOTA 55437

(612) 921-8700

EMPLOYEE BENEFITS
EMPLOYEE COMMUNICATIONS
RISK MANAGEMENT
INSURANCE CONSULTING
HEALTH CARE CONSULTING

November 22, 1988

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, 1988 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 22, 1988.

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

TABLE OF CONTENTS

LEGISLATORS RETIREMENT FUND

REPORT HIGHLIGHTS
(DOLLARS IN THOUSANDS)

	07/01/87 VALUATION	07/01/88 VALUATION
A. CONTRIBUTIONS (TABLE 11)		
1. Statutory Contributions - Chapter 3A % of Payroll	9.00%	8.96%
2. Required Contributions - Chapter 356 % of Payroll	32.14%	33.58%
3. Sufficiency (Deficiency) (A1-A2)	-23.14%	-24.62%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 1)	$11,158	$11,857
b. Current Benefit Obligations (Table 8)	$21,950	$23,758
c. Funding Ratio (a/b)	50.83%	49.91%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 1)	$11,158	$11,857
b. Actuarial Accrued Liability (Table 9)	$23,083	$24,882
c. Funding Ratio (a/b)	48.34%	47.65%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	$15,526	$16,078
b. Current and Expected Future Benefit Obligations	$31,570	$33,120
c. Funding Ratio (a/b)	49.18%	48.54%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	201	201
b. Projected Annual Earnings	$4,765	$4,932
c. Average Annual Earnings (Actual $)	$23,709	$24,540
d. Average Age	46.9	47.8
e. Average Service	6.6	7.3
2. Others		
a. Service Retirements (Table 4)	124	125
b. Disability Retirements (Table 5)	NA	NA
c. Survivors (Table 6)	42	44
d. Deferred Retirements (Table 7)	100	97
e. Terminated Other Non-vested (Table 7)	17	17
f. Total	283	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 8.96%. This rate is based on a contribution of 9.00% for the first 20 years of service and zero thereafter. The remaining 24.62% needed to reach the required contribution level of 33.58% 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 49.91%. The corresponding ratio for the prior year was 50.83%.

- 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 1988 the ratio is 47.65%, which is a decrease from the 1987 value of 48.34%.

- The Projected Benefit Funding Ratio is a measure of the adequacy or deficiency in the contribution level. This year's ratio of 48.54% 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%.

<u>Asset Information (Tables 1 and 2)</u>

Minnesota Statutes require that the asset value used for actuarial purposes recognize only a third of the unrealized gains and losses. This requirement exists because market values (which include all unrealized gains and losses) are typically volatile and can produce erratic changes in the contribution requirements from year to year.

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

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.

This Fund participates in the MPRIF (i.e. Minnesota Post Retirement Investment Fund). The asset value shown for MPRIF on line A3 is set equal to the MPRIF Reserves reported on line D3 for both market and cost value purposes. This reserve is based on a 5% interest assumption.

Investment performance by SBI (i.e. State Board of Investment) above the 5% level is not shown in the assets but will be added in on January 1, 1989 when benefits will be increased for those annuitants who have been receiving payments for 18 months. Next year's valuation will include the 1989 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, 1988 is provided below:

MPRIF Reserves	$8,496,000
Reserves Plus Excess Earnings	9,070,000
MPRIF Market Value	9,150,000

Membership Data (Tables 3, 4, 6 and 7)

Tables 3 through 6 summarize statistical information about 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.

A reconciliation of members in Table 7 provides a method for tracking what happened to members during the past year.

<u>Actuarial Balance Sheet (Table 8)</u>

An actuarial balance sheet provides a method for evaluating 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. Current and future funding levels are evaluated by comparing the Total Current and Expected Future Assets on line C to the Total Current and Expected Future Benefit Obligations on line F.

The Current Benefit Obligation used to measure current funding levels is calculated in accordance with Statement No. 5 of the Governmental Accounting Standards Board (GASB). Those requirements are:

- o For active members - salary and service are projected to retirement to determine benefits for each member and the ratio of credited service to total service establishes the portion of the projected benefit to be used in calculating the current funding level.

- o For non-active members - the discounted value of benefits, including augmentation in cases where benefits have not commenced.

GASB Disclosure

The Current Benefit Obligation amounts in Table 8 are required to be disclosed by Statement No. 5 of the 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 July 1, 1988 Pension Benefit Obligation reported in Table 8 is reformatted for GASB reporting purposes in the following table.

Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$16,240,000
Current Employees -	
Accumulated employee contributions including allocated investment income	2,949,000 *
Employer-financed vested	3,076,000
Employer-financed nonvested	1,493,000
Total Pension Benefit Obligation	$23,758,000

* Estimated

Actuarial Cost Method (Table 9)

The approach used by the State of Minnesota to determine contribution sufficiency is the Entry Age Normal Actuarial 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) illustrates the two techniques 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. Both approaches, however, calculate the value of all future benefits the same way (see line F of Table 8 and line A6, column 1, of Table 9).

An Unfunded Actuarial Accrued Liability is computed under the Entry Age Normal Actuarial 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 that remain a constant percentage of payroll each year.

The payments will increase 6.5% each year because 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.

Sources of Actuarial Gains and Losses (Table 10)

The assumptions used in making the calculations using the Entry Age Normal Actuarial Cost Method are based on long-term expectations. Each year the actual experience will deviate from the long-term expectation. The major sources of gain and loss, which have been identified, are:

- A gain from salaries because the average increase was less than the expected increase.

- A loss from Current Assets because the return was below the assumed 8%.

Contribution Sufficiency (Table 11)

This report answers the question of "How adequate are the Statutory Contributions?" by comparing the Statutory Contributions to the Required Contributions.

The Required Contributions, set forth in Chapter 356, consist of:

- Normal Costs based on the Entry Age Normal Actuarial Cost Method

- A Supplemental Contribution for amortizing any Unfunded Actuarial Accrued Liability

- An Allowance for Expenses

Table 11 shows the Fund has a contribution deficiency since the Statutory Contribution Rate is 8.96% compared to the Required Contribution Rate of 33.58%. As noted earlier, Statutory Contributions are required only from members. The State will make the necessary contributions to meet benefit payments.

Projected Cash Flow (Table 12)

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%. This is the only table in the report where 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.

Changes in Actuarial Assumptions

This valuation does not reflect any changes in actuarial assumptions since the prior valuation.

Changes in Plan Provisions

This valuation does not reflect any changes in plan provisions since the prior valuation.

TABLE 1

LEGISLATORS RETIREMENT FUND

ACCOUNTING BALANCE SHEET
(DOLLARS IN THOUSANDS)

July 1, 1988

	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)	8,496	8,496
4. Other	3,392	3,392
B. TOTAL ASSETS	$11,888	$11,888
C. AMOUNTS CURRENTLY PAYABLE	$31	$31
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	$3,296	$3,296
2. State Reserves	(3,448)	(3,448)
3. MPRIF Reserves	8,496	8,496
4. Non-MPRIF Reserves	3,513	3,513
5. Total Assets Available for Benefits	$11,857	$11,857
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	$11,888	$11,888

F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS

1. Cost Value of Assets Available for Benefits (D5)		$11,857
2. Market Value (D5)	$11,857	
3. Cost Value (D5)	11,857	
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")		$11,857

TABLE 2

LEGISLATORS RETIREMENT FUND

CHANGES IN ASSETS AVAILABLE FOR BENEFITS
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1988

	MARKET VALUE	COST VALUE
A. ASSETS AVAILABLE AT BEGINNING OF PERIOD	$11,158	$11,158
B. OPERATING REVENUES		
1. Member Contributions	$396	$396
2. Employer Contributions	925	925
3. Investment Income	0	0
4. MPRIF Income	976	976
5. Net Realized Gain (Loss)	0	0
6. Other	0	0
7. Net Change in Unrealized Gain (Loss)	0	0
8. Total Revenue	$2,297	$2,297
C. OPERATING EXPENSES		
1. Service Retirements	$1,019	$1,019
2. Disability Benefits	0	0
3. Survivor Benefits	130	130
4. Refunds	19	19
5. Expenses	31	31
6. Other	2	2
7. Total Disbursements	$1,201	$1,201
D. OTHER CHANGES IN RESERVES	(397)	(397)
E. ASSETS AVAILABLE AT END OF PERIOD	$11,857	$11,857

TABLE 3

LEGISLATORS RETIREMENT FUND

ACTIVE MEMBERS AS OF JUNE 30, 1988

AGE	YEARS OF SERVICE <1	1-4	5-9	10-14	15-19	20-24	25-29	30+	TOTAL
<25		1							1
25-29		4							4
30-34		7	5						12
35-39	2	17	7	5					31
40-44		20	9	9	1				39
45-49		14	9	7	2				32
50-54		12	6	10	1				29
55-59		9	7	7	5				28
60-64		10	1	4	4				19
65+	1	2		1	1		1		6
TOTAL	3	96	44	43	14	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		23,593							23,593
25-29		23,593							23,593
30-34		23,593	23,593						23,593
35-39	23,593	23,593	23,593	23,593					23,593
40-44		23,593	23,593	23,593	23,593				23,593
45-49		23,593	23,593	23,593	23,593				23,593
50-54		23,593	23,593	23,593	23,593				23,593
55-59		23,593	23,593	23,593	23,593				23,593
60-64		23,593	23,593	23,593	23,593				23,593
65+	23,593	23,593		23,593	23,593		23,593		23,593
ALL	23,593	23,593	23,593	23,593	23,593	0	23,593	0	23,593

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
71	2,265	1,038	1,014	330	0	24	0	4,742

TABLE 4

LEGISLATORS RETIREMENT FUND

SERVICE RETIREMENTS AS OF JUNE 30, 1988

AGE	YEARS RETIRED <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50								0
50-54								0
55-59	1							1
60-64	3	23						26
65-69		11	29					40
70-74		2	12	14				28
75-79			2	7	4			13
80-84			1	1	10			12
85+					4	1		5
TOTAL	4	36	44	22	18	1	0	125

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	8,022							8,022
60-64	4,240	6,689						6,406
65-69		9,122	8,483					8,659
70-74		7,496	14,749	7,209				10,461
75-79			7,320	4,911	6,688			5,828
80-84			13,922	15,986	7,020			8,342
85+					8,424	4,921		7,724
ALL	5,186	7,477	10,262	6,876	7,258	4,921	0	8,227

TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
21	269	451	151	131	5	0	1,028

TABLE 6

LEGISLATORS RETIREMENT FUND

SURVIVORS AS OF JUNE 30, 1988

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
<50	1		4	3	1			9
50-54								0
55-59		2			1			3
60-64		1	1	1				3
65-69		3	1		1			5
70-74	1	1	2	3	1	1		9
75-79		4	2	1	1			8
80-84	1	2	2					5
85+				2				2
TOTAL	3	13	12	10	5	1	0	44

AVERAGE ANNUAL BENEFIT

AGE	YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	ALL
<50	16,251		4,371	761	795			4,090
50-54								0
55-59		3,191			2,088			2,823
60-64		1,278	4,876	3,806				3,320
65-69		4,023	2,075		2,256			3,280
70-74	3,632	5,466	5,709	3,557	3,196	1,484		3,985
75-79		2,694	3,868	5,349	2,549			3,301
80-84	2,928	1,893	2,269					2,250
85+				2,115				2,115
ALL	7,604	3,058	4,010	2,634	2,177	1,484	0	3,395

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH <1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
23	40	48	26	11	1	0	149

TABLE 7

LEGISLATORS RETIREMENT FUND

RECONCILIATION OF MEMBERS

	ACTIVES	TERMINATED: DEFERRED RETIREMENT	TERMINATED: OTHER NON-VESTED
A. On June 30, 1987	201	100	17
B. Additions	3	3	0
C. Deletions:			
1. Service Retirement	0	(5)	
2. Disability	0		
3. Death	0	0	0
4. Terminated-Deferred	(3)		
5. Terminated-Refund	0	(1)	0
6. Terminated-Other Non-vested	0		
7. Returned as Active		0	0
D. Data Adjustments	0	0	0
Vested	101		
Non-Vested	100		
E. Total on June 30, 1988	201	97	17

	RECIPIENTS: RETIREMENT ANNUITANTS	DISABLED	SURVIVORS
A. On June 30, 1987	124	NA	42
B. Additions	5		3
C. Deletions:			
1. Service Retirement			
2. Death	(4)		0
3. Annuity Expired	0		(1)
4. Returned as Active	0		
D. Data Adjustments	0		0
E. Total on June 30, 1988	125	NA	44

TABLE 8

LEGISLATORS RETIREMENT FUND

ACTUARIAL BALANCE SHEET
(DOLLARS IN THOUSANDS)

JULY 1, 1988

A. CURRENT ASSETS (TABLE 1, F6)			$11,857
B. EXPECTED FUTURE ASSETS			
1. Present Value of Expected Future Statutory Supplemental Contributions			0
2. Present Value of Future Normal Costs			$4,221
3. Total Expected Future Assets			4,221
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS			$16,078

D. CURRENT BENEFIT OBLIGATIONS	Non-Vested	Vested	Total
1. Benefit Recipients			
a. Retirement Annuities		$10,379	$10,379
b. Disability Benefits		0	0
c. Surviving Spouse and Child Benefits		1,630	1,630
2. Deferred Retirements with Future Augmentation		4,152	4,152
3. Former Members without Vested Rights		79	79
4. Active Members			
a. Retirement Annuities	1,082	5,819	6,901
b. Disability Benefits	0	0	0
c. Survivors' Benefits	386	0	386
d. Deferred Retirements	25	6	31
e. Refund Liability Due to Death or Withdrawal	0	200	200
5. Total Current Benefit Obligations	$1,493	$22,265	$23,758

E. EXPECTED FUTURE BENEFIT OBLIGATIONS	$9,362
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS	$33,120
G. CURRENT UNFUNDED ACTUARIAL LIABILITY (D5-A)	$11,901
H. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F-C)	$17,042

TABLE 9

LEGISLATORS RETIREMENT FUND

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

JULY 1, 1988

	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	$15,686	$7,267	$8,419
b. Disability Benefits	0	0	0
c. Survivors Benefits	826	483	343
d. Deferred Retirements	53	59	(6)
e. Refunds Due to Death or Withdrawal	315	429	(114)
f. Total	$16,880	$8,238	$8,642
2. Deferred Retirements with Future Augmentation	$4,152		$4,152
3. Former Members Without Vested Rights	79		79
4. Annuitants in MPRIF	8,496		8,496
5. Recipients Not in MPRIF	3,513		3,513
6. Total	$33,120	$8,238	$24,882

B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)	
1. AAL (A6)	$24,882
2. Current Assets (Table 1,F6)	11,857
3. UAAL (B1-B2)	$13,025
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE	
1. Present Value of Future Payrolls through the Amortization Date of July 1, 2009	$86,694
2. Supplemental Contribution Rate (B3/C1)	15.02%

TABLE 10

LEGISLATORS RETIREMENT FUND

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

YEAR ENDING JUNE 30, 1988

A. UAAL AT BEGINNING OF YEAR	$11,925
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	$814
2. Contribution	(1,321)
3. Interest on A, B1, and B2	934
4. Total (B1+B2+B3)	$427
C. EXPECTED UAAL AT END OF YEAR (A+B4)	$12,352
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	($84)
2. Investment Return	596
3. MPRIF Mortality	(65)
4. Mortality of Other Benefit Recipients	53
5. Other Items	173
6. Total	$673
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D7)	$13,025
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)	$13,025

TABLE 11

LEGISLATORS RETIREMENT FUND

DETERMINATION OF CONTRIBUTION SUFFICIENCY (DOLLARS IN THOUSANDS)

JULY 1, 1988

	% OF PAYROLL	$ AMOUNT
A. STATUTORY CONTRIBUTIONS - CHAPTER 3A		
1. Employee Contributions	8.96%	$442
2. Employer Contributions	0.00%	0
3. Total	8.96%	$442
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	15.82%	$780
b. Disability Benefits	0.00%	0
c. Survivors	0.85%	42
d. Deferred Retirement Benefits	0.18%	9
e. Refunds Due to Death or Withdrawal	1.01%	50
f. Total	17.86%	$881
2. Supplemental Contribution Amortization by July 1, 2009 of UAAL of $13,025	15.02%	$741
3. Allowance for Expenses	0.70%	$35
4. Total	33.58%	$1,657
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) (A3-B4)	-24.62%	($1,215)

Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1988 is $4,932

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
1988					$3,361
1989	442	$0	$269	$276	3,810
1990	466	1,167	201	269	3,177
1991	496	1,532	304	201	2,038
1992	534	1,050	257	132	1,397
1993	555	887	296	87	856
1994	594	1,615	305	15	(455)
1995	592	1,406	319	(82)	(1,670)
1996	631	839	335	(155)	(2,368)
1997	641	1,936	343	(255)	(4,261)
1998	687	1,003	358	(368)	(5,303)
1999	724	1,614	373	(475)	(7,041)
2000	780	2,314	382	(640)	(9,597)
2001	814	2,622	396	(856)	(12,657)
2002	877	1,869	408	(1,069)	(15,126)
2003	861	1,347	421	(1,246)	(17,279)
2004	929	2,448	431	(1,460)	(20,689)
2005	930	3,981	439	(1,795)	(25,974)
2006	979	2,994	446	(2,176)	(30,611)
2007	1,092	4,429	456	(2,601)	(37,005)
2008	1,170	5,325	455	(3,145)	(44,760)
2009	1,273	2,868	469	(3,663)	(50,487)
2010	1,385	3,711	476	(4,151)	(57,440)
2011	1,471	3,833	474	(4,709)	(64,985)
2012	1,603	6,194	482	(5,402)	(75,460)
2013	1,696	3,038	474	(6,109)	(83,385)

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 2.5% to current fiscal year, 5% for the next 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 - 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. (0.70% of payroll)

Return of Contributions: 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. 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 Normal 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, 1988

THE *Wyatt* COMPANY

AN INDEPENDENT WORLDWIDE BENEFITS
AND COMPENSATION CONSULTING FIRM

ACTUARIAL SERVICES
COMPENSATION PROGRAMS
ADMINISTRATIVE SYSTEMS
INTERNATIONAL SERVICES
ORGANIZATION SURVEYS

SUITE 1525
8400 NORMANDALE LAKE BOULEVARD
MINNEAPOLIS, MINNESOTA 55437

(612) 921-8700

EMPLOYEE BENEFITS
EMPLOYEE COMMUNICATIONS
RISK MANAGEMENT
INSURANCE CONSULTING
HEALTH CARE CONSULTING

November 22, 1988

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, 1988 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 22, 1988.

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

TABLE OF CONTENTS

ELECTIVE STATE OFFICERS RETIREMENT FUND

REPORT HIGHLIGHTS
(DOLLARS IN THOUSANDS)

	07/01/87 VALUATION	07/01/88 VALUATION
A. CONTRIBUTIONS (TABLE 11)		
1. Statutory Contributions - Chapter 352C % of Payroll	9.00%	9.00%
2. Required Contributions - Chapter 356 % of Payroll	37.93%	39.43%
3. Sufficiency (Deficiency) (A1-A2)	-28.93%	-30.43%
B. FUNDING RATIOS		
1. Accrued Benefit Funding Ratio		
a. Current Assets (Table 1)	$246	$281
b. Current Benefit Obligations (Table 8)	$1,619	$1,757
c. Funding Ratio (a/b)	15.19%	15.99%
2. Accrued Liability Funding Ratio		
a. Current Assets (Table 1)	$246	$281
b. Actuarial Accrued Liability (Table 9)	$1,800	$1,929
c. Funding Ratio (a/b)	13.67%	14.57%
3. Projected Benefit Funding Ratio (Table 8)		
a. Current and Expected Future Assets	$482	$499
b. Current and Expected Future Benefit Obligations	$2,210	$2,311
c. Funding Ratio (a/b)	21.81%	21.59%
C. PLAN PARTICIPANTS		
1. Active Members		
a. Number (Table 3)	6	6
b. Projected Annual Earnings	$373	$386
c. Average Annual Earnings (Actual $)	$62,219	$64,399
d. Average Age	49.1	50.1
e. Average Service	7.2	8.2
2. Others		
a. Service Retirements (Table 4)	3	3
b. Disability Retirements (Table 5)	NA	NA
c. Survivors (Table 6)	5	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 30.43% needed to reach the required contribution level of 39.43% 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 15.99%. The corresponding ratio for the prior year was 15.19%.

- 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 1988 the ratio is 14.57%, which is an increase from the 1987 value of 13.67%.

- The Projected Benefit Funding Ratio is a measure of the adequacy or deficiency in the contribution level. This year's ratio of 21.59% 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 (Tables 1 and 2)

Minnesota Statutes require that the asset value used for actuarial purposes recognize only a third of the unrealized gains and losses. This requirement exists because market values (which include all unrealized gains and losses) are typically volatile and can produce erratic changes in the contribution requirements from year to year.

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

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, 4, 6 and 7)

Tables 3 through 6 summarize statistical information about 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.

The reconciliation of members in Table 7 provides a method for tracking what happened to members during the past year.

Actuarial Balance Sheet (Table 8)

An actuarial balance sheet provides a method for evaluating 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. Current and future funding levels are evaluated by comparing the Total Current and Expected Future Assets on line C to the Total Current and Expected Future Benefit Obligations on line F.

The Current Benefit Obligation used to measure current funding levels is calculated in accordance with Statement No. 5 of the Governmental Accounting Standards Board (GASB). Those requirements are:

- For active members - salary and service are projected to retirement to determine benefits for each member and the ratio of credited service to total service establishes the portion of the projected benefit to be used in calculating the current funding level.

- For non-active members - the discounted value of benefits, including augmentation in cases where benefits have not commenced.

GASB Disclosure

The Current Benefit Obligation amounts in Table 8 are required to be disclosed by Statement No. 5 of the 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 July 1, 1988 Pension Benefit Obligation reported in Table 8 is reformatted for GASB reporting purposes in the following table.

Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	$1,004,000
Current Employees -	
Accumulated employee contributions including allocated investment income	242,000 *
Employer-financed vested	417,000
Employer-financed nonvested	94,000
Total Pension Benefit Obligation	$1,757,000

* Estimated

Actuarial Cost Method (Table 9)

The approach used by the State of Minnesota to determine contribution sufficiency is the Entry Age Normal Actuarial 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) illustrates the two techniques 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. Both approaches, however, calculate the value of all future benefits the same way (see line F of Table 8 and line A6, column 1, of Table 9).

An Unfunded Actuarial Accrued Liability is computed under the Entry Age Normal Actuarial 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 that remain a constant percentage of payroll each year.

The payments will increase 6.5% each year because 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.

Sources of Actuarial Gains and Losses (Table 10)

The assumptions used in making the calculations using the Entry Age Normal Actuarial Cost Method are based on long-term expectations. Each year the actual experience will deviate from the long-term expectation. The major sources of gain and loss, which have been identified, are:

- A gain from salaries because the average increase was less than the expected increase.

- A loss from Current Assets because the return was below the assumed 8%.

Contribution Sufficiency (Table 11)

This report answers the question of "How adequate are the Statutory Contributions?" by comparing the Statutory Contributions to the Required Contributions.

The Required Contributions, set forth in Chapter 356, consist of:

- Normal Costs based on the Entry Age Normal Actuarial Cost Method

- A Supplemental Contribution for amortizing any Unfunded Actuarial Accrued Liability

- An Allowance for Expenses

Table 11 shows the Fund has a contribution deficiency since the Statutory Contribution Rate is 9.00% compared to the Required Contribution Rate of 39.43%. As noted earlier, Statutory Contributions are required only from members. The State will make the necessary contributions to meet benefit payments.

Projected Cash Flow (Table 12)

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%. This is the only table in the report where 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.

Changes in Actuarial Assumptions

This valuation does not reflect any changes in actuarial assumptions since the prior valuation.

Changes in Plan Provisions

This valuation does not reflect any changes in plan provisions since the prior valuation.

TABLE 1

ELECTIVE STATE OFFICERS RETIREMENT FUND

ACCOUNTING BALANCE SHEET
(DOLLARS IN THOUSANDS)

July 1, 1988

	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	282	282
B. TOTAL ASSETS	$282	$282
C. AMOUNTS CURRENTLY PAYABLE	$1	$1
D. ASSETS AVAILABLE FOR BENEFITS		
1. Member Reserves	$278	$278
2. State Reserves	(717)	(717)
3. MPRIF Reserves	0	0
4. Non-MPRIF Reserves	720	720
5. Total Assets Available for Benefits	$281	$281
E. TOTAL AMOUNTS CURRENTLY PAYABLE AND ASSETS AVAILABLE FOR BENEFITS	$282	$282

F. DETERMINATION OF ACTUARIAL VALUE OF ASSETS

1. Cost Value of Assets Available for Benefits (D5)		$281
2. Market Value (D5)	$281	
3. Cost Value (D5)	281	
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")		$281

TABLE 2

ELECTIVE STATE OFFICERS RETIREMENT FUND

CHANGES IN ASSETS AVAILABLE FOR BENEFITS
(DOLLARS IN THOUSANDS)

YEAR ENDING JUNE 30, 1988

	MARKET VALUE	COST VALUE
A. ASSETS AVAILABLE AT BEGINNING OF PERIOD	$246	$246
B. OPERATING REVENUES		
1. Member Contributions	$34	$34
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	$166	$166
C. OPERATING EXPENSES		
1. Service Retirements	$55	$55
2. Disability Benefits	0	0
3. Survivor Benefits	43	43
4. Refunds	0	0
5. Expenses	1	1
6. Other	0	0
7. Total Disbursements	$99	$99
D. OTHER CHANGES IN RESERVES	(32)	(32)
E. ASSETS AVAILABLE AT END OF PERIOD	$281	$281

TABLE 3

ELECTIVE STATE OFFICERS RETIREMENT FUND

ACTIVE MEMBERS AS OF JUNE 30, 1988

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									0
35-39									0
40-44			1						1
45-49		1	1						2
50-54			1	1					2
55-59									0
60-64				1					1
65+									0
TOTAL	0	1	3	2	0	0	0	0	6

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									0
35-39									0
40-44			50,767						50,767
45-49		48,027	72,109						60,068
50-54			53,274	48,840					51,057
55-59									0
60-64				92,297					92,297
65+									0
ALL	0	48,027	58,717	70,569	0	0	0	0	60,886

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
0	48	176	141	0	0	0	0	365

TABLE 4

ELECTIVE STATE OFFICERS RETIREMENT FUND

SERVICE RETIREMENTS AS OF JUNE 30, 1988

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			1					1
75-79			1	1				2
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			15,376					15,376
75-79			28,554	12,730				20,642
80-84								0
85+								0
ALL	0	0	21,965	12,730	0	0	0	18,887

TOTAL ANNUAL ANNUITY (IN THOUSANDS) BY YEARS OF RETIREMENT

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
0	0	44	13	0	0	0	57

TABLE 6

ELECTIVE STATE OFFICERS RETIREMENT FUND

SURVIVORS AS OF JUNE 30, 1988

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		2						2
75-79								0
80-84								0
85+					2	1		3
TOTAL	0	2	0	0	2	1	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		7,886						7,886
75-79								0
80-84								0
85+					10,832	6,947		9,537
ALL	0	7,886	0	0	10,832	6,947	0	8,876

TOTAL ANNUAL BENEFIT (IN THOUSANDS) BY YEARS SINCE DEATH

<1	1-4	5-9	10-14	15-19	20-24	25+	TOTAL
0	16	0	0	21	7	0	44

TABLE 7

ELECTIVE STATE OFFICERS RETIREMENT FUND

RECONCILIATION OF MEMBERS

	ACTIVES	TERMINATED DEFERRED RETIREMENT	TERMINATED OTHER NON-VESTED
A. On June 30, 1987	6	5	1
B. Additions	0	0	0
C. Deletions:			
1. Service Retirement	0	0	
2. Disability	0		
3. Death	0	0	0
4. Terminated-Deferred	0		
5. Terminated-Refund	0	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, 1988	6	5	1

	RECIPIENTS RETIREMENT ANNUITANTS	RECIPIENTS DISABLED	RECIPIENTS SURVIVORS
A. On June 30, 1987	3	NA	5
B. Additions	0		0
C. Deletions:			
1. Service Retirement			
2. Death	0		0
3. Annuity Expired	0		0
4. Returned as Active	0		
D. Data Adjustments	0		0
E. Total on June 30, 1988	3	NA	5

TABLE 8

ELECTIVE STATE OFFICERS RETIREMENT FUND

ACTUARIAL BALANCE SHEET
(DOLLARS IN THOUSANDS)

JULY 1, 1988

A. CURRENT ASSETS (TABLE 1, F6)			$281
B. EXPECTED FUTURE ASSETS			
1. Present Value of Expected Future Statutory Supplemental Contributions			0
2. Present Value of Future Normal Costs			218
3. Total Expected Future Assets			$218
C. TOTAL CURRENT AND EXPECTED FUTURE ASSETS			$499
D. CURRENT BENEFIT OBLIGATIONS	Non-Vested	Vested	Total
1. Benefit Recipients			
a. Retirement Annuities		$426	$426
b. Disability Benefits		0	0
c. Surviving Spouse and Child Benefits		294	294
2. Deferred Retirements with Future Augmentation		268	268
3. Former Members without Vested Rights		16	16
4. Active Members			
a. Retirement Annuities	71	622	693
b. Disability Benefits	0	0	0
c. Survivors' Benefits	23	0	23
d. Deferred Retirements	0	0	0
e. Refund Liability Due to Death or Withdrawal	0	37	37
5. Total Current Benefit Obligations	$94	$1,663	$1,757
E. EXPECTED FUTURE BENEFIT OBLIGATIONS			$554
F. TOTAL CURRENT AND EXPECTED FUTURE BENEFIT OBLIGATIONS			$2,311
G. CURRENT UNFUNDED ACTUARIAL LIABILITY (D5-A)			$1,476
H. CURRENT AND FUTURE UNFUNDED ACTUARIAL LIABILITY (F-C)			$1,812

ELECTIVE STATE OFFICERS RETIREMENT FUND

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

JULY 1, 1988

	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	$1,210	$280	$930
b. Disability Benefits	0	0	0
c. Survivors Benefits	37	19	18
d. Deferred Retirements	0	0	0
e. Refunds Due to Death or Withdrawal	60	83	(23)
f. Total	$1,307	$382	$925
2. Deferred Retirements with Future Augmentation	$268		$268
3. Former Members Without Vested Rights	16		16
4. Annuitants in MPRIF	0		0
5. Recipients Not in MPRIF	720		720
6. Total	$2,311	$382	$1,929

B. DETERMINATION OF UNFUNDED ACTUARIAL ACCRUED LIABILITY (UAAL)	
1. AAL (A6)	$1,929
2. Current Assets (Table 1,F6)	281
3. UAAL (B1-B2)	$1,648
C. DETERMINATION OF SUPPLEMENTAL CONTRIBUTION RATE	
1. Present Value of Future Payrolls through the Amortization Date of July 1, 2009	$6,791
2. Supplemental Contribution Rate (B3/C1)	24.27%

TABLE 10

ELECTIVE STATE OFFICERS RETIREMENT FUND

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

YEAR ENDING JUNE 30, 1988

A. UAAL AT BEGINNING OF YEAR	$1,554
B. CHANGE DUE TO INTEREST REQUIREMENTS AND CURRENT RATE OF FUNDING	
1. Normal Cost and Expenses	$57
2. Contribution	(166)
3. Interest on A, B1, and B2	120
4. Total (B1+B2+B3)	$11
C. EXPECTED UAAL AT END OF YEAR (A+B4)	$1,565
D. INCREASE (DECREASE) DUE TO ACTUARIAL LOSSES (GAINS) BECAUSE OF EXPERIENCE DEVIATIONS FROM EXPECTED	
1. Salary Increases	($9)
2. Investment Return	19
3. MPRIF Mortality	0
4. Mortality of Other Benefit Recipients	42
5. Other Items	31
6. Total	$83
E. UAAL AT END OF YEAR BEFORE PLAN AMENDMENTS AND CHANGES IN ACTUARIAL ASSUMPTIONS (C+D7)	$1,648
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)	$1,648

TABLE 11

ELECTIVE STATE OFFICERS RETIREMENT FUND

DETERMINATION OF CONTRIBUTION SUFFICIENCY (DOLLARS IN THOUSANDS)

JULY 1, 1988

	% OF PAYROLL	$ AMOUNT
A. STATUTORY CONTRIBUTIONS - CHAPTER 352C		
1. Employee Contributions	9.00%	$35
2. Employer Contributions	0.00%	0
3. Total	9.00%	$35
B. REQUIRED CONTRIBUTIONS - CHAPTER 356		
1. Normal Cost		
a. Retirement Benefits	10.88%	$42
b. Disability Benefits	0.00%	0
c. Survivors	0.78%	3
d. Deferred Retirement Benefits	0.00%	0
e. Refunds Due to Death or Withdrawal	3.11%	12
f. Total	14.77%	$57
2. Supplemental Contribution Amortization by July 1, 2009 of UAAL of $1,648	24.27%	$94
3. Allowance for Expenses	0.39%	$2
4. Total	39.43%	$153
C. CONTRIBUTION SUFFICIENCY (DEFICIENCY) (A3-B4)	-30.43%	($118)

Note: Projected Annual Payroll for Fiscal Year Beginning on July 1, 1988 is $386

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
1988					$281
1989	$35	$0	$100	$20	236
1990	37	0	95	17	195
1991	39	0	178	10	66
1992	42	0	118	2	(8)
1993	45	0	143	(5)	(111)
1994	48	0	139	(13)	(215)
1995	51	0	130	(20)	(314)
1996	54	0	130	(28)	(418)
1997	58	0	179	(38)	(577)
1998	61	0	208	(52)	(776)
1999	65	0	196	(67)	(974)
2000	70	0	207	(83)	(1,194)
2001	74	0	187	(100)	(1,407)
2002	79	0	176	(116)	(1,620)
2003	84	0	199	(134)	(1,869)
2004	89	0	193	(154)	(2,127)
2005	95	0	217	(175)	(2,424)
2006	101	0	235	(199)	(2,757)
2007	108	0	260	(227)	(3,136)
2008	115	0	225	(255)	(3,501)
2009	123	0	278	(286)	(3,942)
2010	131	0	298	(322)	(4,431)
2011	139	0	320	(362)	(4,974)
2012	148	0	302	(404)	(5,532)
2013	158	0	329	(449)	(6,152)

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 2.5% to current fiscal year, 5% for the next 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 - 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. (0.39% 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 Normal 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.

TABLE 14 (cont)

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.