

REPORT ON AN ACTUARIAL VALUATION OF THE
SOUTH CAROLINA POLICE OFFICERS RETIREMENT SYSTEM
PREPARED AS OF JUNE 30, 1968

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September 18, 1970

State Budget and Control Board
South Carolina Police Officers Retirement System
Columbia, South Carolina

Gentlemen:

I transmit herewith our report on an actuarial valuation of the South Carolina Police Officers Retirement System, prepared as of June 30, 1968.

The valuation was prepared on the basis of an interest assumption of 4-1/2 per cent. The valuation indicates that the System is in a sound actuarial condition and the recommendation is made that the Board give consideration to an improvement in the basic benefits, introducing a minimum pension on disability retirement and providing a survivor's benefit upon death in active service after attainment of age 55 and completion of 20 years of service.

I trust that the report is in satisfactory form for use by the Board.

Respectfully submitted,


Hugh Gillespie

REPORT ON AN ACTUARIAL VALUATION OF THE
SOUTH CAROLINA POLICE OFFICERS RETIREMENT SYSTEM
PREPARED AS OF JUNE 30, 1968

The South Carolina Police Officers Retirement System was established as of July 1, 1962. Membership in the system is open to any police officer of the State or other employer (county, municipality or other political subdivision of the State and any agency or department thereof) that has been admitted to the System. A police officer whose period of active duty during a year is less than 1,600 hours and his compensation for such service is less than \$2,000 per year is not eligible to join. Membership is compulsory with employees who become police officers of the State or other employers after the employer's date of admission to the System. Police officers in service on the employer's date of admission become members as of such date unless they file elections not to become members of the System and execute a waiver of all present and prospective benefits which would otherwise inure to them on account of their participation in the System. Contributions to provide the benefits under the system are made jointly by the members and the employers.

This report presents the results of an actuarial valuation of the System prepared as of June 30, 1968. The report gives first a summary of the benefit and contribution provisions of the System and a statement of the membership as of the valuation date. Next, the valuation balance sheet showing the assets and liabilities of the System is presented, followed by recommendations regarding the contributions payable by the employers. Finally, summaries of the membership data on which calculations were based are shown.

The valuation took into account the amendment to the System effective July 1, 1968, which increased the basic benefit and added a lump sum death benefit.

SUMMARY OF BENEFIT AND CONTRIBUTION PROVISIONS

A summary of the main benefit and contribution provisions of the System as interpreted for the valuation is presented in the following digest. Credited service of a member includes all service as a police officer since he last became a member of the System and also includes, in the case of a member who became such on or before June 30, 1963, remains a member until death or retirement under the System and who immediately prior to his becoming a member was a participant in another fund, service which was credited to him under such other fund.

REGULAR ALLOWANCE PROGRAM

BENEFITS

Service Retirement Allowance

Condition for Allowance

A member may retire on a service retirement allowance upon the attainment of age 55 and the completion of 5 years of credited service.

Amount of Allowance

Upon service retirement a member receives a service retirement allowance which is equal to:

(1) A basic monthly retirement allowance of \$27.50 plus \$6.60 for each completed year of credited service in excess of 5 years, not exceeding 15 years, plus \$3.30 for each completed year of credited service in excess of 20; plus

(2) An additional monthly retirement allowance which is the actuarial equivalent of the member's accumulated additional contributions at retirement.

Early Retirement Allowance

Condition for Allowance

A member who has completed 20 years of credited service may retire on an early retirement allowance.

Amount of Allowance

Upon early retirement a member is entitled to a deferred allowance commencing at age 55 which is equal to:

(1) A basic deferred allowance equal to the basic service retirement allowance he would have received if he had remained in service to age 55 reduced in the proportion which the number of his completed years of credited service at his early retirement date bears to the number he would have had if he had remained in service to age 55; plus

(2) An additional deferred allowance which is the actuarial equivalent of the member's accumulated additional contributions.

If the member has attained age 50 and completed 25 years of credited service at early retirement date, in lieu of such deferred allowance, he may elect to receive a reduced allowance commencing immediately which is the actuarial equivalent of the deferred allowance.

Disability Retirement Allowance

Condition for Allowance

A member who has completed 5 or more years of credited service and is permanently incapacitated for duty, mentally or physically, may retire or be retired on a disability retirement allowance.

Amount of Allowance

Upon disability retirement a member receives a disability retirement allowance computed as a service retirement allowance based on his completed years of credited service and his accumulated additional contributions at disability retirement.

Return of Contributions

Should a member cease to be a police officer except by death or retirement his contributions plus one-half of the accumulated regular interest thereon are returned to him. Should a member die before retirement the amount of his accumulated contributions is paid to his designated beneficiary or estate.

Death Benefit

Upon the death of a member in service a lump sum amount is paid to his designated beneficiary or estate equal to:

(1) The amount of his accumulated basic contributions or \$1,000, whichever is greater; plus

(2) The amount of his accumulated additional contributions.

Upon the death of a retired member who has not elected an option, the excess of his total accumulated contributions at the time his allowance commenced over the sum of the retirement allowance payments made to him is paid to his designated beneficiary or estate.

Pre-Retirement Death Program

Upon the death of a contributing member in service who had completed at least one full year of membership, a death benefit is payable to his designated beneficiary or estate, equal to the annual earnable compensation of the member at the time his death occurs. Such death benefit is payable apart and separate from the payment of the member's accumulated contributions.

Optional Allowances

Until the first payment on account of a retirement allowance becomes normally due, any member may elect to receive his retirement allowance in accordance with one of the following forms, which are computed to be actuarially equivalent:

Option 1. A reduced retirement allowance payable during the retired member's life, with the provision that after his death the reduced allowance will be continued to his designated beneficiary.

Option 2. A reduced retirement allowance payable during the retired member's life, with the provision that after his death one-half of the reduced allowance will be continued to his beneficiary.

CONTRIBUTIONS

By Members

Each member contributes \$16 per month. Each member may make additional contributions at 7% of the portion of his compensation in excess of the amount taxable to him under the Federal Insurance Contributions Act.

By Employers

The contributions by employers are determined on the basis of actuarial valuations of the System. Currently 8.5% of compensation is being paid.

SUPPLEMENTAL ALLOWANCE PROGRAM

BENEFITS

Payment of Supplemental Allowance

Upon the retirement of a member who has participated in the Supplemental Allowance Program, a supplemental allowance is payable equal to:

(1) An allowance which is the actuarial equivalent of the member's accumulated supplemental contributions; plus

(2) An amount equal to the allowance under (1) above. A member may elect to receive his supplemental allowance in one of the optional forms described under the regular allowance program above.

Return of Supplemental Contributions

Should a member cease to be a police officer for reasons other than death or retirement, his aggregate supplemental contributions are returned to him.

Upon the death of a member prior to retirement his accumulated supplemental contributions are paid to his designated beneficiary or estate.

Upon the death of a retired member who has not elected an option, the excess of his accumulated supplemental contributions at the time his allowance commenced over the sum of supplemental allowance payments made to him is paid to his designated beneficiary or estate.

CONTRIBUTIONS

By Members

Each member participating in the Supplemental Allowance Program contributes 6% of his monthly compensation in excess of \$400. Such member may also elect to contribute the amount which would have resulted had he, during each month of his credited service prior to his date of participation, contributed 2% of the portion of his rate of monthly compensation during the month immediately preceding date of participation

in the program and had such contributions been accumulated with interest at 4% per annum.

By Employers

Each participating employer makes supplemental contributions to match those made by its participating members. Any forfeitures of an employer's contributions on account of terminating members are used to reduce the contributions otherwise payable by such employer.

MEMBERSHIP OF THE SYSTEM

ACTIVE MEMBERSHIP

Table I shows the number of active members included in the valuation as of June 30, 1968.

TABLE I

NUMBER OF ACTIVE MEMBERS INCLUDED
IN THE VALUATION
AS OF JUNE 30, 1968

GROUP	:	NUMBER
Men	:	3,911
Women	:	41
Total	:	3,952

RETIRED MEMBERS

Table II shows the number and annual retirement allowances of beneficiaries on the roll as of June 30, 1968. The allowances include the increases effective July 1, 1968.

TABLE II

THE NUMBER AND ANNUAL RETIREMENT ALLOWANCES OF BENEFICIARIES ON THE ROLL AS OF JUNE 30, 1968

GROUP	NUMBER	ANNUAL RETIREMENT ALLOWANCES
Service and Early Retirements:		
Men	280	\$ 367,344
Women	5	6,804
Total	285	\$ 374,148
Disability Retirements:		
Men	28	\$ 25,884
Women		
Total	28	\$ 25,884
Beneficiaries of Deceased Retired Members:		
Men	14	\$ 11,220
Women		
Total	14	\$ 11,220
Grand Total	327	\$ 411,252

VALUATION BALANCE SHEET

The following valuation balance sheet indicates the present and contingent assets and liabilities of the retirement system as of June 30, 1968. The amounts of the present assets shown on the balance sheet were taken from a statement furnished by the Director of the System.

TABLE III
VALUATION BALANCE SHEET
SHOWING THE ASSETS AND LIABILITIES OF THE
SOUTH CAROLINA POLICE OFFICERS RETIREMENT SYSTEM
AS OF JUNE 30, 1968

ASSETS	
Present assets of System creditable to:	
Employee Annuity Savings Fund-Basic	\$ 4,320,373
Employee Annuity Savings Fund-Supplemental	786,701
Employer Annuity Accumulation Fund-Basic	11,292,261
Employer Annuity Accumulation Fund-Supplemental	<u>751,928</u>
Total Present Assets	\$ 17,151,263
Present value of prospective contributions to the Employer Annuity Accumulation Fund-Basic:	
Normal contributions	\$ 9,411,544
Accrued liability contributions	<u>4,815,295</u>
Total Prospective Contributions	<u>14,226,839</u>
Total Assets	<u><u>\$ 31,378,102</u></u>
LIABILITIES	
Present value of benefits on account of which contributions have been accumulated to date in the Employee Annuity Savings Fund-Basic	
	\$ 4,320,373
Present value of benefits on account of which contributions have been accumulated to date in the Employee Annuity Savings Fund-Supplemental	
	786,701
Present value of benefits on account of which contributions have been accumulated to date in the Employer Annuity Accumulation Fund-Supplemental	
	751,928
Present value of benefits payable on account of beneficiaries now drawing allowances from the Employer Annuity Accumulation Fund-Basic	
	4,179,826
Present value of benefits to active members to be paid by contributions of the employers into the Employer Annuity Accumulation Fund-Basic	
	<u>21,339,274</u>
Total Liabilities	<u>\$ 31,378,102</u>

RESULTS OF VALUATION

The valuation balance sheet indicates the following in regard to the funds of the system.

Employee Annuity Savings Fund-Basic

The Employee Annuity Savings Fund-Basic is the fund to which are credited the regular and additional contributions made by members together with interest thereon. When a member retires, the amount of his accumulated contributions is transferred from this fund to the Employer Annuity Accumulation Fund-Basic. The assets credited to the Employer Annuity Savings Fund-Basic on June 30, 1968, which represents the accumulated regular and additional contributions of members to that date, amounted to \$4,320,373. The liabilities of this fund are also shown as \$4,320,373. Future contributions into this fund and benefits payable from such contributions are considered to be of equivalent value and hence are not shown in the balance sheet.

Employee Annuity Savings Fund-Supplemental

The Employee Annuity Savings Fund-Supplemental is the fund to which are credited the supplemental contributions made by members together with interest thereon. When a member retires, the amount of his accumulated contributions is transferred from the Employee Annuity Savings Fund-Supplemental to the Employer Annuity Accumulation Fund-Supplemental and his annuity is paid from the latter fund. The assets credited to the Employee Annuity Savings Fund-Supplemental on June 30, 1968, which represents the accumulated contributions of members to that date, amounted to \$786,701. The liabilities of this fund are also shown as \$786,701. Future contributions into this fund and benefits payable from such contributions are considered to be of equivalent value and hence are not shown in the balance sheet.

Employer Annuity Accumulation Fund-Supplemental

The Employer Annuity Accumulation Fund-Supplemental is the fund to which are credited the supplemental contributions made by employers together with interest thereon. The assets credited to the Employer Annuity

Accumulation Fund-Supplemental on June 30, 1968, which represents the contributions made by employers on behalf of their members to that date, amounted to \$751,928. The liabilities of this fund are also shown as \$751,928. Future contributions into this fund and benefits payable from such contributions are considered to be of equivalent value and hence are not shown in the balance sheet.

Employer Annuity Accumulation Fund-Basic

The Employer Annuity Accumulation Fund-Basic is the fund to which the contributions made by employers are credited and from which are paid all regular benefits on account of retired members and their beneficiaries.

The present assets creditable to the Employer Annuity Accumulation Fund on June 30, 1968, amounted to \$11,292,261. The liabilities on account of active members amounted to \$21,339,274. In addition, the balance sheet indicates liabilities of \$4,179,826 on account of all benefits payable to retired members or their beneficiaries from the Employer Annuity Accumulation Fund-Basic. The total liabilities, therefore, amounted to \$25,519,100. The difference between these liabilities and the present assets credited to this fund is \$14,226,839, which represents the present value of future contributions to be made by the employers.

The normal cost to provide the benefits for the average new entrant into the system was calculated to be \$271.79 per member. Future normal contributions at this rate have a present value of \$9,411,544. If this amount is subtracted from \$14,226,839, the present value of future contributions to be made by employers, \$4,815,295 remains as the present value of the unfunded accrued liability. If this amount were liquidated by level annual payments over a period of 24 years from the valuation date, which is assumed to be the remainder of the period anticipated at the date of establishment of the System, the accrued liability contribution is equal to \$84.06 per member based on the 3,952 members included in the valuation.

The total contribution is therefore equal to \$355.85 per member or to 7.0 per cent of the estimated payroll of \$20,045,888 of the membership.

If the employers were to continue to pay 8.5 per cent of payroll, and assuming a constant payroll, the unfunded accrued liability would be liquidated in about 10 years

from the valuation date. Thereafter only a normal contribution of 5.4 per cent of payroll would be required of the employers to meet the cost of basic benefits.

In addition the employers pay the one year term cost of the pre-retirement death program which is approximately 1 per cent of payroll.

CONCLUSION AND RECOMMENDATIONS

As previously indicated, the results of the valuation show that the System is in a sound actuarial condition with only a relatively small unfunded accrued liability remaining to be liquidated. If employer contributions are continued at 8.5 per cent of payroll (exclusive of the cost of the pre-retirement death benefit), the unfunded accrued liability will probably be liquidated within 10 years, and the employer contribution rate could then be reduced to the normal contribution rate which is about 5.4 per cent of payroll.

Calculations were made to determine the cost of making the following recommended improvements in the System:

1. The basic benefit would be equal to \$30 per month if the member had 5 years of credited service at retirement plus \$7 per month for each year of credited service in excess of 5 years, not exceeding 15 years, plus \$3.50 per month for each year of credited service in excess of 20 years. The change would affect present as well as future retirees.

2. If a member retires on a disability retirement allowance with less than 20 years of credited service his basic allowance would be equal to the allowance based on 20 years of service or to the allowance which would have been payable had the member remained in service to age 55, whichever is less.

3. If a member dies in active service after the attainment of age 55 and completion of 20 years of credited service, an allowance is payable to his designated beneficiary equal to the amount which would have been payable had the member retired at the time of death and named such person as beneficiary under an election of Option 1. This benefit is payable in lieu of the return of the deceased member's accumulated contributions.

Our calculations indicate that if the employer rate is continued at 8.5 per cent of payroll the above improvements may be made if the period for liquidating the unfunded accrued liability is extended to 35 years.

It should be noted that a margin of conservatism would still exist in the employer contribution rate after making the changes previously suggested. This results from the fact that employer contributions are a fixed percentage of payroll, and it has been assumed that the payroll will remain constant in the future. If salaries continue to increase in the future as they have since the establishment of the System, employer contributions will be greater than anticipated. On this basis it will probably be possible to make periodic improvements in the basic benefits in the future and maintain the employer contribution as a fixed percentage of payroll.

As an alternative to the flat benefit approach, with periodic improvements, it would seem desirable to provide benefits based on average compensation over the five years preceding retirement, as under the South Carolina Retirement System. Further consideration will be given to this approach and recommendations made for consideration by the Board.

BASIS FOR THE VALUATION

The valuation of the retirement system was made on the basis of the active service table attached to the June 30, 1967 actuarial report. The 1937 Standard Annuity Table was used as the mortality table for members retired on account of service and beneficiaries of deceased retired members and such table rated ahead five years was used as the mortality table for members retired on account of disability. An interest rate of 4-1/2 per cent was used.

On the basis of information furnished the actuary by the Director of the Retirement System, cards were prepared for each member and beneficiary in the system. Tabulations were then made showing as of June 30, 1968 the number of active members, classified by age and length of service, and the number and monthly retirement allowances of beneficiaries, classified by age. The tabulations are summarized in the following tables.

TABLE 1
THE DISTRIBUTION OF THE NUMBER OF ACTIVE
MEMBERS BY AGE AS OF JUNE 30 1968

AGE	MEN	WOMEN
18	1	
19		1
20	6	
21	13	1
22	48	
23	82	
24	91	
25	109	1
26	113	2
27	103	
28	128	
29	101	
30	83	3
31	89	
32	98	1
33	76	3
34	105	
35	94	
36	68	2
37	87	
38	91	2
39	70	2
40	107	
41	101	1
42	80	1
43	95	6
44	114	3
45	75	
46	92	1
47	91	1
48	118	
49	105	1
50	106	2
51	94	2
52	112	
53	88	
54	99	
55	81	

TABLE 1
THE DISTRIBUTION OF THE NUMBER OF ACTIVE
MEMBERS BY AGE AS OF JUNE 30 1968

CONTINUED

AGE	MEN	WOMEN
56	88	1
57	86	2
58	68	
59	85	1
60	83	1
61	65	
62	48	
63	44	
64	27	
65	30	
66	15	
67	14	
68	11	
69	8	
70	7	
71	3	
72	2	
73	4	
74	3	
75	1	
76	1	
77	1	
78	1	
81	1	
82	1	
TOTAL	3,911	41

TABLE 2
THE DISTRIBUTION OF THE NUMBER OF ACTIVE
MEMBERS BY YEARS OF CREDITED SERVICE
AS OF JUNE 30 1968

YEARS OF SERVICE	MEN	WOMEN
0	300	5
1	547	9
2	404	6
3	323	5
4	192	4
5	230	
6	163	3
7	146	
8	130	
9	66	
10	99	1
11	151	3
12	79	2
13	74	1
14	102	
15	77	
16	75	1
17	64	
18	71	
19	59	1
20	77	
21	87	
22	53	
23	43	
24	19	
25	26	
26	27	
27	44	
28	42	
29	22	
30	27	
31	53	
32	7	
33	5	
34	2	
35	6	

TABLE 2
THE DISTRIBUTION OF THE NUMBER OF ACTIVE
MEMBERS BY YEARS OF CREDITED SERVICE
AS OF JUNE 30 1968

CONTINUED

SERVICE OF YEARS	MEN	WOMEN
36	2	
37	4	
38	4	
40	1	
41	2	
42	1	
43	2	
44	1	
47	1	
49	1	
TOTAL	3,911	41

TABLE 3

THE DISTRIBUTION OF THE NUMBER AND MONTHLY
RETIREMENT ALLOWANCES OF BENEFICIARIES
BY AGE AS OF JUNE 30 1968

SERVICE AND EARLY RETIREMENTS

AGE	MEN		WOMEN	
	NUMBER	AMOUNT	NUMBER	AMOUNT
55	3	\$ 359		
56	6	641		
57	12	1,415		
58	12	1,237	1	\$ 153
59	15	1,418		
60	8	1,005	1	43
61	11	1,167		
62	15	1,316	1	153
63	15	1,545		
64	11	1,075		
65	25	3,212	1	188
66	15	1,508		
67	14	1,458		
68	27	3,234		
69	16	1,666		
70	21	2,051		
71	15	1,822	1	30
72	9	1,093		
73	7	719		
74	3	412		
75	5	431		
76	2	193		
77	3	446		
78	1	28		
79	3	363		
80	3	215		
81	1	209		
83	1	142		
88	1	232		
TOTAL	280	\$ 30,612	5	\$ 567

SUMMARY

NO OPTION	243	\$ 27,288	5	\$ 567
OPTION 1	15	1,218		
OPTION 2	22	2,106		

TABLE 4
 THE DISTRIBUTION OF THE NUMBER AND MONTHLY
 RETIREMENT ALLOWANCES OF BENEFICIARIES
 BY AGE AS OF JUNE 30 1968

DISABILITY RETIREMENTS				
MEN			WOMEN	
AGE	NUMBER	AMOUNT	NUMBER	AMOUNT
32	1	\$ 47		
35	2	123		
36	1	107		
40	1	47		
43	2	173		
44	1	47		
45	1	80		
47	2	91		
48	1	68		
49	1	85		
51	1	39		
53	4	270		
54	1	91		
56	2	198		
57	2	241		
62	1	169		
64	1	140		
67	1	84		
69	2	57		
TOTAL	28	\$ 2,157		

SUMMARY

NO OPTION	21	\$ 1,638
OPTION 1	4	302
OPTION 2	3	217

TABLE 5
 THE DISTRIBUTION OF THE NUMBER AND MONTHLY
 RETIREMENT ALLOWANCES OF BENEFICIARIES
 BY AGE AS OF JUNE 30 1968

BENEFICIARIES OF DECEASED RETIRED MEMBERS

AGE	MEN		WOMEN	
	NUMBER	AMOUNT	NUMBER	AMOUNT
39			1	\$ 70
42			1	29
45			1	68
48			2	149
50			1	98
56			1	62
57			1	49
59			2	71
61			1	88
67			1	62
69			1	64
70			1	125
TOTAL			14	\$ 935