



Office of the Superintendent
of Financial Institutions Canada

Bureau du surintendant
des institutions financières Canada

Ottawa, Canada
K1A 0H2

REPORT ON THE ACTUARIAL EXAMINATION

OF THE

ROYAL CANADIAN MOUNTED POLICE (DEPENDANTS) PENSION FUND

AS AT

MARCH 31, 1988

Canada

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Royal Canadian Mounted Police Pension Continuation Act - Part IV

Report on the Actuarial Examination
of the
Royal Canadian Mounted Police (Dependants) Pension Fund
as at March 31, 1988

I. Introduction and Summary

Pursuant to the provisions of section 56 of the Royal Canadian Mounted Police Pension Continuation Act, we have made an actuarial examination of the Royal Canadian Mounted Police (Dependants) Pension Fund as at March 31, 1988.

Section II of this report presents a summary of the membership data. Section III sets out the financial statements and section IV reconciles the change in the surplus of the Fund between the current and the previous examination of the Fund. Section V includes our recommendation with respect to the distribution of a portion of the surplus as at March 31, 1988. Section VI contains the actuarial opinion as regards the data, the actuarial assumptions and the actuarial methods upon which the examination is based. The actuarial assumptions are described in Appendix 1. Detailed summaries of the valuation results are given in Appendix 2. A summary of the history, provisions of the Plan and previous distributions are given in Appendices 3, 4 and 5, respectively. Mortality rates used for the purpose of determining the actuarial present value of future benefits and contributions are shown in Appendix 6.

The last examination of this Fund was made as of March 31, 1986. No amendments to the Act have been made since that time.

The increases in benefits accruing from surplus distributions revealed at the 1986 examination were 30%, 15% and 15% as of April 1, 1986, 1987 and 1988, respectively. These increases applied to all benefits accrued in respect of which contributions had been made (i.e. the increases did not apply to benefits arising out of surplus distributions). Please refer to Appendix 5 for details regarding the respective T.B. authorizations.

The total increase in benefits accruing from distributions of surplus revealed by previous examinations is 310% of all current and prospective benefits purchased by contributions made or deemed to have been made prior to April 1, 1978*.

Based on the assumptions described in Appendix 1, the total assets, total liabilities and surplus are respectively, as of March 31, 1988, \$16,954,369, \$14,531,496 and \$2,422,873. The liabilities include the present value of benefit increases that were granted as of April 1, 1988.

We recommend that a portion of the surplus be distributed in a manner similar to previous distributions: namely, that benefits purchased by contributions made or deemed to have been made be increased 20% effective April 1, 1989 and another 20% effective April 1, 1990. Implementation of this recommendation would increase the liabilities and decrease the surplus as at March 31, 1988 by approximately \$1.346 million.

This report and the above figures make no explicit provision for benefit increases other than those recommended above. The valuation interest assumption, however, reflects our long term expectation and is much less than the anticipated interest rates for the near and medium term. Interest credits greater than assumed for the purpose of determining the total assets and liabilities together with the surplus remaining after the distribution noted above should be sufficient to provide substantial inflationary protection for the foreseeable future.

* No current or prospective benefits have been purchased by contributions made or deemed to have been made since April 1, 1978.

II. Data and Membership Statistics

The Supply and Services Office attached to the Headquarters of the Royal Canadian Mounted Police maintains records of contributions, amounts of pensions and annuities in course of payment and other details necessary for the administration of Part IV of the Act. These records were examined for consistency and reasonableness both with regard to individual members or survivors and with regard to previous submissions and account data. The data are in our opinion reasonable and appropriate for the purpose of this report.

As shown in the following schedule, during the two years between April 1, 1986 and March 31, 1988, there were 18 deaths and 1 withdrawal among former members of the Force subject to Part IV. During the preceding two-year period, the corresponding statistics were 13 deaths and 10 withdrawals. There have been no new entrants since March 31, 1959. As there are now no contributors paying current service contributions, no additional benefits are being purchased.

Membership Statistics

	Persons Subject to Part IV as at April 1, 1986	Terminations and new entrants during the period April 1, 1986 to March 31, 1988			Persons Subject to Part IV as at March 31, 1988
		With- drawals	Deaths	New Entrants	
Members of the Force (active or retired)	325	1	18	0	306
Widows in receipt of a pension	146	0	8	17	155
Children and students in receipt of an annuity	7	7	0	2	2

III. Financial Statements

An income statement for the period April 1, 1986 to March 31, 1988, a summary of the actuarial present value of future benefits as at March 31, 1988 and the valuation balance sheet as at March 31, 1988 follow. The actuarial present values are calculated according to the bases and assumptions described in Appendix 1. Detailed summaries of the valuation results are given in Appendix 2.

Income Statement
April 1, 1986 to March 31, 1988

Fiscal year ending	1987	1988
Account balance (beginning of year)	\$14,669,062	\$15,705,271
Credits to account		
Contributions	26,038	25,111
Interest	1,641,122	1,724,063
Charges to account		
Surrenders	24,328	--
Annuity payments	606,623	673,825
Account balance (end of year)	\$15,705,271	\$16,780,620

Present Value of Future Benefits
as at March 31, 1988

	<u>Basic</u>	<u>Dividend*</u>	<u>Total</u>
Benefits in course of payment			
Widows	\$ 1,597,847	\$ 4,953,324	\$ 6,551,171
Children	1,492	4,624	<u>6,116</u>
			\$ 6,557,287
Prospective benefits			
Widows	1,935,457	5,999,917	7,935,374
Children	9,472	29,363	<u>38,835</u>
			<u>7,974,209</u>
Total	\$ 3,544,268	\$10,987,228	\$14,531,496

* Includes 15% dividend declared as of April 1, 1988.

Valuation Balance Sheet
as at March 31, 1988

Assets

Balance of account	\$16,780,620
Present value of future instalment contributions	<u>173,749</u>
Total assets	\$16,954,369

Liabilities* and Surplus

Present value of benefits in course of payment	\$ 6,557,287
Present value of prospective death benefits	7,974,209
Reported but not paid death claims	<u>--</u>
Total liabilities	\$14,531,496
Surplus	<u>2,422,873</u>
Total liabilities and surplus	\$16,954,369

* Includes liabilities in respect of dividend declared as of April 1, 1988.

IV. Reconciliation of Surplus

The balance sheet in this report shows a surplus in the Fund of approximately \$2,423,000 which may be reconciled with the surplus of approximately \$2,598,000 as at March 31, 1986 as shown in the preceding report as follows:

	(thousands)
Surplus at March 31, 1986	\$2,598
Interest at 6% per annum	321
Allocation of surplus to dividends authorized by T.B. 805 358	<u>(2,285)</u>
	\$ 634
Experience Gains	
Interest	1,626
Other assumptions (mortality, proportion married at death, withdrawal etc.)	<u>163</u>
Total	<u>1,789</u>
Surplus at March 31, 1988	\$2,423

V. Distribution of Surplus

Subsection (2) of Section 56 of the Act provides that the actuary who conducts the valuation shall make recommendations concerning the disposal of any surplus brought out by the valuation.

We believe that it would be equitable and desirable to distribute a portion of this surplus in a manner similar to the previous distributions listed in Appendix 5.

Specifically we recommend that the following method be used for distributing a portion of the surplus which exists in the Royal Canadian Mounted Police (Dependants) Pension Fund:

- (a) Benefits be increased by 20% effective April 1, 1989 and 20% effective April 1, 1990, such increases to be in addition to but not dependent on the benefits authorized by P.C. 123/1833, P.C. 1955-8/1033, P.C. 1960- 8/367, P.C. 1965-7/2303, T.B. 700054, T.B. 720862, T.B. 737531, T.B. 742727, T.B. 751700, T.B. 767185, T.B. 779418, T.B. 792014, T.B. 801121, and T.B. 805358, and
- (b) The increase described in (a) above, be applicable to pensions and annuities in course of payment on the date of the Order authorizing the increases as well as to prospective pensions and annuities.

It may be noted that the increases recommended above, taken together with the increases effected by the previous distributions of surplus, would provide a total increase of 330% at April 1, 1989 and 350% at April 1, 1990 in current and prospective benefits purchased by contributions made or deemed to have been made. Alternately, it can be shown, or expressed, that the implementation of the recommendation would result in annualized rates of increase in the total of basic and previously declared dividend amounts of 4.88% and 4.65% at April 1 of each of 1989 and 1990, respectively.

The actuarial present value as at March 31, 1988 of the increase in dividends recommended to be granted as of April 1, 1989 and April 1, 1990 is approximately \$1,346,000⁽¹⁾. The balance sheet in this report shows a surplus in the Fund as at March 31, 1988 of approximately \$2,423,000. Approval of our recommendation would reduce the surplus in the Fund to \$1,077,000.

Our ability to predict the mortality experience of former contributors to the plan, their spouses and widows and our ability to determine if observed differences between actual and expected mortality rates are significant is limited as a consequence of the small number of persons exposed to risk and the advanced age of these people. Accordingly, we believe that it is appropriate that the remaining surplus be retained in the Fund for future contingencies.

It is important to note that no explicit provision for benefit increases other than those recommended above are included in the Report. The valuation interest rate⁽²⁾, however, reflects our long term expectation and is much less than the anticipated rate⁽³⁾ at which interest will be credited to the Fund for the near and medium term. As these "excess" interest credits emerge it should be possible to recommend future dividend increases which provide substantial inflation protection.

Based on calculations essentially similar to those used to estimate fund yields developed for purposes of Appendix 1 to the Actuarial Report on the Public Service Superannuation Account⁽⁴⁾ as at December 31, 1983, the interest rates applied to the Fund balance for the fiscal years ending 1989 and 1990 are estimated to be 10.0% and 9.9% per annum, respectively. Consequently, a significant surplus is expected as at March 31, 1990. We recommend that an actuarial examination of the Fund be performed at that date in order to ensure a timely and equitable distribution of the surplus, or a portion thereof, that then exists.

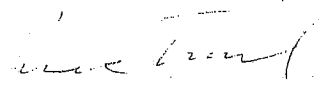
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- (1) This amount varies slightly with the date of the Order authorizing the increases; however, the difference is not material to the recommendation. For the purpose of estimating the actuarial present value the date of the Order is deemed to be March 31, 1988.
 - (2) We have assumed for the purpose of estimating the actuarial present value of contributions and benefits a valuation interest rate of 6% per annum.
 - (3) It is assumed that the rate at which interest will be credited to the Fund is as described in Appendix 1.
 - (4) See page 22 of that Report.

VI. Actuarial Opinion

In my opinion

- (a) the data upon which the calculations have been based are sufficient for the purposes of this report;
- (b) the assumptions used are reasonable and appropriate for the purpose of this report; and
- (c) the methods employed are consistent with sound actuarial principles.

Respectfully submitted



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December 8, 1988

APPENDIX 1

Valuation Bases and Assumptions

The valuation is performed by calculating the actuarial present values, as at March 31, 1988, of the computed prospective benefits and the benefits in course of payment. This was done by applying valuation factors, constructed in accordance with the bases and assumptions described below, to amounts of benefit classified into appropriate divisions.

(a) Interest

With the amendment to subsection 55(3) of the Act in 1975 the rate at which interest has been credited to the Fund has been the same as that used for the various superannuation accounts. This rate is calculated every three months as if the amounts not required for payment of benefits in the combined accounts in each quarter had been invested on a basis similar to that applied under the Canada Pension Plan, i.e., in 20-year bonds having a yield equivalent to the average yield on Government of Canada bonds with 20 or more years to maturity outstanding at that time.

For the quarter ending March 31, 1988, the average rate at which interest was credited was 2.6702%, per quarter. This is equivalent to an annual rate of approximately 11.116%.

We have assumed for the purpose of determining the actuarial present value of benefits and contributions an interest rate of 6.0% per annum.

The 6.0% rate reflects our current estimate of the ultimate interest rate on new money invested on a basis similar to that applied under the Canada Pension Plan. This long term rate is assumed to be composed of an inflation factor of 3.5% per annum and a real rate of return of about 2.5%⁽¹⁾ per annum.

Interest earnings in excess of those based on the 6.0% rate will, in the absence of mortality losses, be available as they emerge to provide for increases in dividends or contingency reserves.

(1) More precisely $(1.060/1.035 - 1) \times 100\%$ or 2.415%. Real average annual rates of return on Canada Long Bonds excluding capital gains and losses were 2.70% for 1961-1985, 1.87% for 1946-1985, 1.55% for 1936-1985 and 2.36% for 1926-1985.

(b) Mortality

- (i) Members and Spouses - The number of members and spouses is too small for a study of mortality experience. However, it is considered that the 1980-82 Canada Life Tables* projected 10 years according to scale D** is reasonably representative of the expected mortality of this group. The mortality rates from this table are shown in Appendix 6.
- (ii) Widows - At March 31, 1988, 155 widows were in receipt of a pension, and only 51 deaths have occurred among widows in receipt of a pension since Part IV was introduced in 1934. It is thus evident that the mortality rates used in the valuation had to be chosen arbitrarily. It is considered that the 1980-82 Canada Life Tables projected 10 years according to scale D is reasonably representative of the expected mortality of this group. The mortality rates from this table are shown in Appendix 6.
- (iii) Children - Because the mortality of children is very low, it was deemed suitable to value children's allowances without taking account of mortality.

(c) Other Assumptions

The average number of eligible children per member according to the member's age at death and the average benefit period for children to age 21, or up to age 25 if not married and in full-time attendance at school or university (having been in such attendance substantially without interruption since he or she attained age 21 or the member died whichever occurred later), are assumed to be the same as adopted for the purposes of the Actuarial Report as at December 31, 1982 of the Royal Canadian Mounted Police Superannuation Account. The total liability in respect of current and prospective benefit payments to children is very small relative to the total liabilities in respect of all benefits payable from the Fund; and consequently any deviation of the experience from that assumed in respect of current and prospective children beneficiaries is not material for the purposes of this examination.

Actual marital status and known ages of members and their spouses were used in estimating the value of prospective benefits to the spouses.

The probability that a member who at March 31, 1988 is married and less than 60 years of age will become a widower and remarry before attaining age 60 is assumed to be zero. As at March 31, 1988 the youngest age of a member is 57 and all members less than age 60 are married. Any deviation of the future experience from that assumed in this paragraph is not material for the purposes of this examination.

* Statistics Canada: Life tables, Canada and the provinces 1980-82.

** Ref.: Transactions of the Society of Actuaries, Vol. XXIII, pp. 583-584

APPENDIX 2

Detailed Valuation Summaries as at March 31, 1988

1. Benefits in Course of Payment

(a) Amounts and values on March 31, 1988 of pensions in course of payment to widows

<u>Age Nearest Birthday</u>	<u>Number of Widows</u>	<u>Basic Pension</u>		<u>Pensions Arising from 310% Dividend</u>	
		<u>Annual Payment</u>	<u>Value</u>	<u>Annual Payment</u>	<u>Value</u>
50-54	3	\$ 3,775.26	\$ 50,866	\$ 11,703.31	\$ 157,683
55-59	10	16,205.30	202,764	50,236.83	628,569
60-64	26	30,428.01	349,986	94,326.83	1,084,956
65-69	31	39,158.39	408,731	121,391.01	1,267,066
70-74	33	35,014.14	313,508	108,543.83	971,873
75-79	29	23,209.47	173,307	71,949.36	537,251
80-84	16	13,036.89	81,450	40,414.36	252,496
85-89	6	3,330.61	15,542	10,324.89	48,182
90-94	1	493.24	1,693	1,529.04	5,248
TOTAL:	155	\$164,651.31	\$1,597,847	\$511,053.46	\$4,953,324

(b) Amounts and values on March 31, 1988 of annuities in course of payment to children

<u>Age Nearest Birthday</u>	<u>Number of Children</u>	<u>Basic Pension</u>		<u>Pensions Arising from 310% Dividend</u>	
		<u>Annual Payment</u>	<u>Value</u>	<u>Annual Payment</u>	<u>Value</u>
20-24	2	\$1,573.92	\$1,492	\$ 4,879.15	\$ 4,624
TOTAL:	2	\$1,573.92	\$1,492	\$ 4,879.15	\$ 4,624

2. Prospective benefits

(a) Amounts and values on March 31, 1988 of pensions accrued to widows

Age Nearest Birthday	Number of Contri- butors	<u>Basic Pension</u>		<u>Pensions Arising from 310% Dividend</u>	
		<u>Annual Payment</u>	<u>Value</u>	<u>Annual Payment</u>	<u>Value</u>
55-59	27	\$ 54,805.35	\$ 182,110	\$ 169,896.59	\$ 564,542
60-64	76	136,448.19	509,756	422,989.39	1,580,244
65-69	86	127,079.76	541,702	393,947.26	1,679,275
70-74	69	93,529.15	432,343	289,940.37	1,340,264
75-79	29	35,379.77	175,097	109,677.29	542,802
80-84	17	16,993.38	84,469	52,679.48	261,850
85-89	2	2,180.81	9,979	6,760.51	30,935
Total	306	\$466,416.41	\$1,935,456	\$1,445,890.89	\$5,999,912

(b) Amounts and values on March 31, 1988 of annuities accrued to children

Age Nearest Birthday	Number of Contri- butors	<u>Basic Pension</u>		<u>Pensions Arising from 310% Dividend</u>	
		<u>Annual Payment</u>	<u>Value</u>	<u>Annual Payment</u>	<u>Value</u>
55-59	27	\$ 27,829.61	\$ 3,579	\$ 86,271.79	\$11,094
60-64	76	65,087.25	4,913	201,770.48	15,229
65-69	86	50,987.01	941	158,059.73	2,917
70-74	69	36,628.54	40	113,548.47	123
75-79	29	12,472.51		38,664.78	
80-84	17	5,676.98		17,598.64	
85-89	2	764.40		2,369.64	
TOTAL:	306	\$199,446.30	\$ 9,473	\$618,283.53	\$29,363

APPENDIX 3

History

Prior to 1934, there was no legislative provision for benefits payable to dependants of constables. In that year, the Royal Canadian Mounted Police Act was amended by the addition of Part IV. The provisions of this Part enabled constables to purchase certain survivorship benefits for their dependants by payment of specified contributions. Constables on the Force on October 1, 1934, had the option of becoming contributors under Part IV by election; constables appointed to the Force after that date were required to become contributors as at the date of their appointment. Contributions equal to 5% of pay were required from all contributors, and supplementary contributions on a fixed scale according to age were permitted. All contributions were to be credited to an account in the Consolidated Revenue Fund called the Royal Canadian Mounted Police (Dependants) Pension Fund and all pensions, annuities and other benefits were to be charged against that account.

In 1948, the Act was amended extensively. Three new parts, namely, Parts V, VI and VII were added. For persons appointed to the Force after March 1, 1949, and for members of the Force on that date who elected to become contributors under Part V, the provisions of Part V replaced the pension arrangements formerly provided under Parts II, III and IV. However, constables who were members of the Force on March 1, 1949, and who were not contributors under Part IV on that date, retained their right of election to become subject to Part IV, provided that

- (a) they had continuous service on the Force from October 1, 1934 or before, to the date of such election, and
- (b) they did not elect at any time to become contributors under Part V.

The 1948 amendments also affected Part IV of the Act as respects financial implications. Under Part IV as originally enacted, it was specifically provided that the charge on the Consolidated Revenue Fund should not at any time exceed the available balance in the Royal Canadian Mounted Police (Dependants) Pension Fund. It was also provided that if, as a result of an actuarial valuation, the amount in this Fund were found to be less than the amount required to make adequate provision for prospective benefits, the Governor in Council might decrease the benefits, or any of them, or increase the contributions, as might appear equitable and expedient, so as to re-establish the solvency of the Fund. It is thus apparent that it was originally intended that the Fund should be entirely self-supporting and that there should be no charges to the Treasury other than the expenses of administration and, periodically, interest at 4% on the balance in the Fund. At the time of the 1948 amendments, which established new pension arrangements under Part V and closed Part IV as respects new members of the Force, it was evidently considered that provision should be made for the government to assume responsibility for any deficit that might appear in the

Fund. Accordingly, Part IV was amended to provide that, if a deficit were revealed by an actuarial valuation, the Governor in Council might direct that there be credited to the fund out of any unappropriated moneys in the Consolidated Revenue Fund such amount as might appear equitable and expedient so as to re-establish the solvency of the Fund.

In 1959, two new Acts, namely, the Royal Canadian Mounted Police Superannuation Act and the Royal Canadian Mounted Police Pension Continuation Act were passed to provide for all pension arrangements in respect of the Royal Canadian Mounted Police. The pensions formerly provided for widows and orphans under Part IV of the Royal Canadian Mounted Police Act are now provided for under Part IV of the Royal Canadian Mounted Police Pension Continuation Act.

In 1975, Part IV of the Royal Canadian Mounted Police Pension Continuation Act was amended in two respects. Prior to this amendment, benefits to children of a deceased contributor were payable until age 18 in the case of a son, and to age 21 in the case of a daughter. As a result of the amendment, benefits are now payable to age 21 to both sons and daughters, and are further payable between age 21 and age 25 to a son or daughter who is unmarried and in full-time attendance at a school or university, having been in such attendance substantially without interruption since attaining age 21 or since the contributor died, whichever occurred later.

At the same time subsection 55(3) of the Act, which had provided that interest would be added to the balance in the Fund from time to time at the rate of 4% per annum, was amended to provide that such interest would be calculated at such rate and in such manner as the Governor in Council by regulation prescribed.

APPENDIX 4

Benefits and Contributions

Contributions at the rate of 5% of pay together with supplementary contributions in accordance with the scale set out in present subsection 47(3) of the Act were expected to produce the following benefits:

- (a) a pension for life to a surviving widow equal to 1.5% of the member's final pay multiplied by the number of years of service;
- (b) an annuity, not exceeding 7% of the member's final pay, payable to each surviving child⁽¹⁾ eligible in accordance with the provisions of the Act at that time;
- (c) a lump sum benefit⁽²⁾ in respect of a member not survived by a widow equal to the value⁽³⁾ of a pension to a female life 20 years older than the member at his death, but not exceeding the age of 75 years, the annual amount of the said pension being the same as the widow's pension that would be payable if the member were survived by a widow.

(1) If there is no surviving widow or if the widow dies before the child's annuity ceases, the amount of annuity is doubled.

(2) Ordinarily payable to the dependants and relatives of the member who are, in the opinion of the Minister, best entitled to share the benefit.

(3) Based on the female mortality rates of Rutherford's Annuity Tables and interest at 4% per annum.

When a member becomes subject to Part IV, he may elect to make contributions, either in a lump sum or by equivalent instalments⁽¹⁾, to purchase benefits for his dependants at the levels previously indicated on the basis of his rate of pay at date of election and any period of service countable towards his own pension for which he elects to contribute. In like manner, on promotion to or within the ranks of non-commissioned officers, a member may elect to contribute, either by lump sum or by equivalent instalments⁽¹⁾, an amount⁽²⁾ sufficient to bring the benefits for his dependants up to the indicated levels on the basis of his rate of pay in this new rank and the whole period of service for which he has previously contributed.

On election to become subject to Part I of the Royal Canadian Mounted Police Superannuation Act, or on termination of service as a constable either by promotion to commissioned rank or by discharge from the Force, a member may leave his contributions in the Fund and may continue to pay any instalments of contributions payable in respect of an election to contribute for prior service or upon promotion. Under such circumstances, the member and his dependants continue to be eligible for the benefits purchased by his contributions. However, if a member withdraws his contributions on election to become subject to Part I or on termination of service as a constable, or at any time thereafter, his rights in the Fund and those of his dependants thereupon cease.

Some limitations⁽³⁾ on the level of benefits have been noted earlier in this appendix. There are other limitations, namely,

-
- (1) Based on the mortality rates of the Canadian Men Table, CM(5), and interest at 4% per annum.
 - (2) The member may elect to pay some portion of this amount, the benefits purchased thereby being dependent on the amount of the contribution paid.
 - (3) Subsection (1) of section 57 provides that if the Fund is substantially in excess of the amount required to make adequate provision for the prospective payments to be made out of it, the Governor in Council may by order increase the benefits provided under Part IV, or any of them, in such manner as may appear equitable and expedient. It is evident, therefore, that the described limitations become inapplicable for accrued benefits when a distribution of surplus in the form of an increase in benefits takes place.

- (a) if the age of a member at the date of his death exceeds the then age of his widow by more than 20 years, the pension to his widow is reduced in the proportion of the value* of a life annuity to a female of an age twenty years less than the age of such member at the date of his death to the value* of an equal life annuity to a female of an age equal to the actual age of the widow at that date,
- (b) if a member marries after age 60, the value* of the pension to his widow may not exceed the lump sum that would be payable if he were not survived by a widow,
- (c) if a member marries before age 60 after termination of service and dies within five years after such marriage, the value* of the pension to his widow may not exceed the lump sum benefit that would be payable if he were not survived by a widow unless, within the said five years, he satisfies the Commissioner that he is in sound health, and
- (d) the total of the pension to the widow and of the annuities to the children of a member may not exceed 70% of his final rate of pay and allowances.

* The values of the female life annuities, noted in (a) above, and the value of the widow's pension, noted in (b) and (c) above, are based on the female mortality rates of Rutherford's Annuity Tables and interest at 4% per annum.

APPENDIX 5

Previous Surplus Distributions

Commencing with the valuation in 1949, sufficient surplus was revealed by each valuation for the actuary to consider it advisable to recommend that some of it be distributed by way of an increase in benefits.

The recommendations and their implementation have been as follows:

<u>Valuation as at March 31</u>	<u>Recommendation as an increase in basic current and prospective benefits purchased by contributors</u>	<u>Implementation</u>
1949	5% of benefits accrued prior to April 1, 1949	PC 123/1833 dated April 12, 1951
1954	additional 5% of benefits accrued prior to April 1, 1949, plus 10% of benefits accrued between April 1, 1949 and March 31, 1954,	PC 1955-8/1033 dated July 7, 1955
1959	10% of benefits accrued between April 1, 1954 and March 31, 1959	PC 1960-8/367 March 24, 1960
1964	additional 5% of benefits accrued prior to April 1, 1959, plus 15% of benefits accrued between April 1, 1959 and March 31, 1964	PC 1965-7/2303 December 29, 1965
1969	additional 15% of benefits accrued prior to April 1, 1964, plus 30% of benefits accrued between April 1, 1964 and March 31, 1969	T.B. 700054 dated October 1, 1970
1972	additional 10% of benefits accrued prior to April 1, 1969, plus 40% of benefits accrued between April 1, 1969 and March 31, 1972	T.B. 720862 dated July 12, 1973
1974	additional 10% of benefits accrued prior to April 1, 1972, plus 50% of benefits accrued between April 1, 1972 and March 31, 1974	T.B. 737531 dated July 10, 1975
1976 (Interim)	additional 50% of benefits accrued prior to April 1, 1974, plus 100% of benefits accrued between April 1, 1974 and March 31, 1976	T.B. 742727 dated April 15, 1976
1976 (Final)	additional 20% of benefits accrued prior to April 1, 1976	T.B. 751700 dated August 24, 1977
1978	additional 30% of benefits accrued prior to April 1, 1976 plus 150% of benefits accrued between April 1, 1976 and March 31, 1978	T.B. 767185 dated November 1, 1979

<u>Valuation as at March 31</u>	<u>Recommendation as an increase in basic current and prospective benefits purchased by contributors</u>	<u>Implementation</u>
1980	additional 30% of accrued benefits	T.B. 779418 dated October 8, 1981
1982	additional 20% of accrued benefits	T.B. 792014 dated February 2, 1984
1984	additional 35% of accrued benefits retroactive to January 1, 1984 and an additional 15% of accrued benefits retroactive to January 1, 1985.	T.B. 801121 dated February 20, 1986
1987	additional 30% of accrued benefits retroactive to April 1, 1986, an additional 15% of accrued benefits retroactive to April 1, 1987, and an additional 15% of accrued benefits effective as of April 1, 1988	T.B. 805358 dated April 30, 1987

It may be noted that for purposes of increases in benefits arising from distributions of surplus as at and from the March 31, 1980 valuation, "accrued benefits" means all current and prospective benefits purchased by contributions made or deemed to have been made prior to April 1, 1978. No current or prospective benefits have been purchased by contributions made or deemed to have been made since that date.

APPENDIX 6

Rates of Mortality for Members and Widows

<u>Age</u>	<u>Members</u>	<u>Widows</u>	<u>Age</u>	<u>Members</u>	<u>Widows</u>
45	.00349	.00184	85	.12865	.08406
46	.00388	.00203	86	.13886	.09317
47	.00431	.00222	87	.14988	.10317
48	.00480	.00245	88	.16145	.11397
49	.00532	.00270	89	.17375	.12562
50	.00588	.00297	90	.18680	.13818
51	.00651	.00326	91	.20047	.15165
52	.00719	.00357*	92	.21510	.16627
53	.00794	.00390	93	.22109	.17198
54	.00875	.00425	94	.21822	.16866
55	.00961	.00464	95	.22081	.17105
56	.01056	.00504	96	.24346	.19495
57	.01161	.00551*	97	.30049	.25473
58	.01274	.00599	98	.41247	.37345
59	.01395	.00649	99	.56942	.54102
60	.01525*	.00706✓	100	.74275	.72398
61	.01669	.00767	101	.90141	.88798
62	.01828	.00840*	102	1.00000	1.00000
63	.02004	.00921			
64	.02193	.01007			
65	.02398	.01104			
66	.02623	.01211			
67	.02865	.01332			
68	.03123	.01463			
69	.03397	.01602			
70	.03694	.01755✓			
71	.04018	.01932			
72	.04382	.02136			
73	.04780	.02359			
74	.05204	.02604			
75	.05663	.02875			
76	.06164	.03186			
77	.06714	.03552			
78	.07308	.03963			
79	.07943	.04418			
80	.08623	.04924			
81	.09361	.05487			
82	.10150	.06118			
83	.11003	.06808			
84	.11906	.07572			