Office of the Superintendent of Financial Institutions
Bureau du surintendant des institutions financières

Pension Plan for the Royal Canadian Mounted Police

Actuarial Report

(including cost certificate)

as at 31 December 1992

Canada

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Ottawa, Canada
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13 October 1994

The Honourable Arthur C. Eggleton, P.C., M.P.
President of the Treasury Board
Ottawa, Canada
K1A 0R5

Dear Minister:

Pursuant to section 6 of the *Public Pensions Reporting Act*, I am pleased to submit my report on the actuarial review, as at 31 December 1992, of the pension plan established under the *Royal Canadian Mounted Police Superannuation Act*.

Yours sincerely,

Bernard Dussault

Bernard Dussault
Chief Actuary

Canada

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I- Introduction

Pursuant to the *Public Pensions Reporting Act* (PPRA), I have made an actuarial review as at 31 December 1992 of the pension plan established under the *Royal Canadian Mounted Police Superannuation Act* (RCMPSA). The previous review had been made as at 31 December 1989. The date of the next periodical review contemplated by the PPRA is 31 December 1995.

The provisions of the plan deemed to apply for purposes of this report are described in Appendix 1 and take into account those that were effective at the valuation date. Among the developments having taken place since the previous review, those materially affecting the plan valuation are described below.

A- The salary freeze which applies for four years in respect of economic increases and over two years in respect of seniority increases.

B- *Bill C-55*, which received Royal Assent on 29 September 1992, amended certain *Acts* relating to pensions, including the RCMPSA, and also enacted the *Special Retirement Arrangements Act* and the *Pension Benefits Division Act*.

1. ***Special Retirement Arrangements Act* (SRAA)**
The SRAA had not yet come into force by the valuation date. Its main purpose is to allow the Governor in Council to establish Retirement Compensation Arrangements (RCAs) in order to provide for the normal accrual of pensions in respect of the portion of employment earnings that will be removed from the RCMPSA for compliance with the *Income Tax Act* (see also item 3d below).

2. ***Pension Benefits Division Act* (PBDA)**
The PBDA had not yet come into force by the valuation date. The purpose of the PBDA is to provide, under certain plans including the RCMPSA, for a division, upon marital (including common-law) breakdown, of pension benefits accrued during the spousal cohabitation. This provision is meant to be cost neutral.

3. **Amendments to the RCMPSA**
The main amendments to the RCMPSA as a result of *Bill C-55* are described below, of which only those described under "(a) Financing of the Plan" had come into force by the valuation date.

(a) **Financing of the Plan**
The financing provisions of the underlying legislation are deemed to have come into force on 1 April 1991. The financing amendments can be broken down as follows:

- **Supplementary Benefits**
The RCMPSA-related portion of the Supplementary Retirement Benefits Account (for inflation adjustments) was combined with the RCMPS Account. All supplementary benefits (inflation adjustments) are now paid from the RCMPS Account.

- **Government Contributions**
  The amended legislation provides for the full funding of existing pension obligations and those to accrue in the future. If an actuarial unfunded liability results as at any valuation date in respect of all benefits then accrued, the RCMPS Account must then be credited annually with such amounts that in the opinion of the President of the Treasury Board will, over a period not exceeding 15 years, fully amortize that unfunded liability. In respect of future pension benefits accruing during any given year following a valuation date, the government must credit such contributions during that year which, together with the yearly employees' contributions and subsequent investment earnings thereupon, are adequate in the opinion of the President of the Treasury Board to meet the full actuarial cost of the underlying pension obligations.
- **Interest**
  The amount of investment earnings credited to the RCMPS Account may not be less than the amount computed using the interest rate determined in accordance with the formula described in item B-2 of Appendix 1.

(b) Optional Survivor Benefit
The amended legislation allows plan members to provide survivor benefits in respect of spousal relationships established over age 60 while retired, at a cost to be actuarially determined. This provision is meant to be cost neutral, the full cost being borne by the pensioner electing the option through an adjustment being made to his/her own pension. The effective date of this piece of legislation is 6 May 1994.

(c) Leave Without Pay
Employees may now elect not to contribute in respect of leave without pay periods in excess of three months. They may also elect later on to contribute in respect of such periods. The effective date of this amendment has not yet been determined.

(d) Compliance with the *Income Tax Act*
Under the amended legislation, the RCMPSA regulations will prescribe yearly the maximum salary rate above which the RCMPSA will not apply for purposes of current pensionable service (see also item 1 above). The effective date of this amendment has not yet been determined. Other provisions of the RCMPSA may be amended by regulation for the purposes of conforming with any provision of *Section 147.1* of the *Income Tax Act* and Part LXXXV of the Income Tax Regulations, as they read on 15 January 1992.

II- Data

A- Overview

1. Active Contributors

There were 18,731 active contributors at the end of 1992, of whom 87% are male. The average age at the last birthday of active contributors was 38.1 years and the average pensionable service was 14.5 completed years. The average annual salary was $51,589 and the aggregate annual payroll was $966.3 million.

Regular members comprise 89% of all active contributors; the remaining 11% are civilian members. Tables 3D, 3E, 3F and 3G of Appendix 3 show detailed information by sex on the age, years of pensionable service and average salary of regular members and civilian members.

2. Pensioners

There were 4,830 pensioners at the end of 1992, of whom 97% are male. The average age at the last birthday of pensioners was 57.0 years; at date of retirement, it was 48.6 years. The average annual pension was $25,274 and the aggregate annual pension payments were $122.1 million. All pensions were in course of payment as at 31 December 1992 except for 14 cases that are deferred to age 60.

Retired regular members comprise 91% of all pensioners and the remaining 9% are retired civilian members. Tables 3H, 3I and 3J of Appendix 3 show detailed information by sex on the benefits in course of payment to retired regular members and civilian members.

3. Eligible Survivors

There were 637 surviving spouses at the end of 1992, of whom 99% are female. The average age last birthday of surviving spouses was 60.7 years; at date of death of the member, it was 52.0 years. The average annual spouse allowance was $7,969 and the aggregate annual spouse allowance payments were $5.1 million. Table 3K of Appendix 3 shows detailed information on the benefits in course of payment to eligible survivors, including children and students.

B- Source of Valuation Data

The Classification and Compensation Branch of the Royal Canadian Mounted Police provided relevant valuation input data on active contributors while the RCMP Services Section of Public Works and Government Services Canada did so in respect of retired contributors and survivors. In accordance with *Section 8* of the *Public Pensions Reporting Act*, the Comptroller General of Canada provided a certification of the assets of the plan for purposes of this valuation.

C- Validation of Valuation Data

The principal validation tests applied to the valuation input data are as follows:

- reconciling of the membership with that published in the previous valuation report (see tables 3A, 3B and 3C of Appendix 3);
- comparing the membership with that published in the Report on the Administration of the RCMP Superannuation Account for the year ending 31 March 1993, taking into account the status changes occurring in the three months following the valuation date;
- checking that the salary of an active contributor was within a certain range and reasonable in comparison with the salary of that contributor in the previous valuation report;
- verifying that the pensionable service of an active contributor was reasonable in relation to the attained age; and
- comparing the initial pension of each contributor retiring in 1990-92 with the expected pension based on the 31 December 1989 valuation data, taking into account any changes arising from service after 31 December 1989.

Based on the omissions and discrepancies identified by these and other tests, adjustments to the basic data, considered appropriate after consulting with the data providers, were made.

D- Acknowledgements

The co-operation and able assistance received from the Classification and Compensation Branch, the RCMP Services Section, and the Comptroller General of Canada deserve to be acknowledged.

III- Methods

A- Assets

The RCMPS Account corresponds to the excess, accumulated with interest, of past contributions to the Plan over past benefit payments. These assets are shown at their book value, as opposed to market value, because the balance in the RCMPS Account is exclusively constituted of notional government securities that are held until maturity.

B- Normal Costs

The projected accrued benefit or projected unit credit actuarial cost method was used to compute normal costs in respect of active contributors. Under this method, the normal cost computed in respect of a given year corresponds to the present value of all future benefits accrued in respect of that year's pensionable service. Consistent with this cost method, salaries are projected up to retirement using the assumed annual increases in average salaries (including general economic increases as well as those arising from seniority and promotion).

C- Liabilities

- **Active Contributors**
  Consistent with the projected unit credit actuarial cost method employed to estimate normal costs, the plan's liabilities as at the valuation date correspond to the present value of all future benefits accrued in respect of all prior years' pensionable service.

- **Pensioners, Survivors and Former Contributors Entitled to a Deferred Annuity**
  Consistent with actuarial practice and standards, the plan's liabilities as at the valuation date correspond to the present value of all future benefits.

IV- Assumptions

A- Basic Economic Assumptions

The following basic economic assumptions are required for valuation purposes in respect of each year following the valuation date:

- the year's average new money interest rate applicable to 20-year federal bonds purchased during the year;
- the year's increase in the Consumer Price Index (CPI);
- the year's increase in the Industrial Aggregate of average weekly earnings; and
- the year's increase in contributors' average annual salary (exclusive of seniority and promotional increases).

To determine these assumptions, analyses were made of short- (10-year), medium- (25-year) and long-term (50-year) experiences, of the current state and outlook of the economy, as well as of available economic forecasts like those included in the 1994 federal budget and those made by the Conference Board. Three main conclusions were reached as a result of these analyses:

1. High current real rates of return (i.e., the excess of new money interest rates over annual increases in the CPI) on long-term investments are expected to return eventually to 3% per annum.

2. Low current annual increases in the CPI will rise gradually to eventually reach an ultimate level of 3%.

3. Low current real annual increases in average earnings (productivity gains, i.e., the difference between annual increases in salary rates and annual increases in the CPI), will rise gradually to eventually reach an ultimate level of 1%. The assumed annual increase in contributors' average annual salary would normally, for any year, be the same as the assumed increase in the Industrial Aggregate of average weekly earnings. However, it was adjusted in the short term to reflect the remaining four years of salary freeze imposed on government employees. This includes the two-year general economic salary freeze contemplated in the February 1994 budget.

Each of these conclusions differs somewhat from those underlying the ultimate (i.e., after year 2000) values assumed for the previous valuation. The differences, together with the rationale therefor, are as follows:

a) The assumed ultimate real rate of return on investments was changed from 2.5% to 3% per annum. The former proves to be somewhat low relative to the average experience of the last 25 years and the current outlook for the Canadian economy (globalization of markets, size of the public debt, etc.).

b) The assumed ultimate level of inflation was changed from 3.3% to 3% per annum. Inflation was fairly stable at levels of 4% to 5% in the 1983-1991 period, but dropped below 2% in 1992 and 1993. With the prospects of stable moderate inflation from now on, it appeared appropriate to reduce the long-term expectations by three-tenths of a percentage point at this time.

c) The assumed ultimate productivity rate was changed from 1.2% to 1.0% per annum. In the latest actuarial reports on the RCMPSA and some other public pension plans, consideration was given to assuming 1% instead of 1.2% for productivity. The 1% assumption has already been used in the three most recent reports on public pension plans. It has indeed become appropriate to now recognize fully this lower level which happens to correspond to the experience averaged over the last 25 years.

B- Margins Against Adverse Fluctuations

Actuarial valuations prepared for private employers' pension plans normally include safety margins. This is generally done mainly to ensure that in case of a plan wind-up there would be at that time, taking into account possible future fluctuations in economic and demographic factors, sufficient funds for the payment of all future benefits accrued as at the wind-up date. Such rationale does not appear to apply to the RCMPSA because the plan sponsor is the Canadian government.

However, a secondary objective of a margin consists of ensuring as much as possible that any eventual difference between assets and liabilities will be positive rather than negative, and therefore that any required financing adjustments will be in respect of a surplus rather than a deficit. The need for a moderate margin remains therefore valid, but an important change was made for this report in the approach used to compute the margin.

In previous reports, the margin corresponded to a reduction of 1% in the yearly projected fund yield provided it would not fall below 6%. For this report, the margin corresponds to an increase of a quarter of a percentage point of the pension indexing factor (see section C below) derived for 1996 and subsequent years. The adjustments to the annual pension indexing factor for margin purposes commence only three years after the valuation date because this factor is already known for 1993 and 1994, and could be reasonably well estimated for 1995 when this report was finalized.

The rationale behind the new approach for computing the margin is that fluctuations in the CPI, in comparison to the three other basic assumptions, are the ones having, at the time of a fluctuation, the largest immediate impact on both the plan's cash flows and liabilities.

As may be seen in Appendix 4 (reconciliation of the surplus and normal cost), the new approach for the margin entails, *ceteris paribus*, a material reduction in the liabilities and in the normal cost.

C- Derived Economic Assumptions

The following assumptions were derived from the basic economic assumptions:

1. **Yearly Fund Yields**

   Such yields are required for the computation of present values of benefits involved in the determination of the plan's liabilities. The average investment rate of return on the RCMPS Account was computed for each future year by deeming that the assets held on 31 December 1992 in the Public Service, the Royal Canadian Mounted Police and the Canadian Forces Superannuation Accounts would, through a buy-and-hold strategy, continue to accumulate an asset portfolio consisting entirely of 20-year federal bonds. It was assumed that no further contributions would be made after 31 December 1992. It was also assumed that any year's cash flow (i.e., the excess of investment earnings over benefit payments) would be invested at the assumed new money rates.

2. **Year's Increase in the CPP Year's Maximum Pensionable Earnings (YMPE)**

   The YMPE is involved in the valuation process by virtue of the integration of the RCMPSA with the Canada Pension Plan (CPP). The assumed increase in the YMPE for a given year was derived, in accordance with the *CPP Act*, to correspond to the increase in the assumed Industrial Aggregate of average weekly earnings over the two consecutive 12-month periods ending 30 June of the previous year.

3. **Year's Increase in the Pension Indexing Factor.**

   The year's pension indexing factor is involved in the valuation process by virtue of its role in the pension inflation adjustments. It was derived by applying the Benefit Index formula, described in Appendix 1, which relates to (assumed) CPI increases over successive 12-month periods ending with September.

D- Administration Expenses

No provision was made regarding the expenses incurred for the administration of the plan in computing its liabilities and normal costs because the RCMPSA is administered by the government with no related charge applied to the RCMPS Account.

E- Summary of Basic and Derived Economic Assumptions

	Interest		Inflation		Employment Earnings		
Year	New Money Interest (%)	Projected Fund Yield (%)	CPI Increase (%)	Pension Indexing* (%)	Industrial Aggregate (%)	YMPE Increase (%)	Contributors' avrg. Salary Increase** (%)
1993	8.2***	10.7***	1.8***	2.1***	1.6***	3.7***	3.0***
1994	8.1	10.6	0.8	1.9***	2.0	3.0***	0.0
1995	8.0	10.4	1.7	1.1	2.7	1.8	0.0
1996	7.8	10.3	2.0	1.5	3.0	2.4	0.0
1997	7.5	10.1	2.3	1.9	3.3	2.9	0.0
1998	7.0	9.9	2.7	2.2	3.7	3.2	3.5
1999	6.5	9.7	3.0	2.6	4.0	3.5	3.7
2000	6.0	9.4	3.0	2.9	4.0	3.9	4.0
2001	6.0	9.1	3.0	3.0	4.0	4.0	4.0
2002	6.0	8.7	3.0	3.0	4.0	4.0	4.0
2003	6.0	8.4	3.0	3.0	4.0	4.0	4.0
2004	6.0	8.2	3.0	3.0	4.0	4.0	4.0
2005	6.0	7.9	3.0	3.0	4.0	4.0	4.0
2006	6.0	7.7	3.0	3.0	4.0	4.0	4.0
2007	6.0	7.5	3.0	3.0	4.0	4.0	4.0
2008	6.0	7.4	3.0	3.0	4.0	4.0	4.0
2009	6.0	7.2	3.0	3.0	4.0	4.0	4.0
2010	6.0	7.0	3.0	3.0	4.0	4.0	4.0
2011	6.0	6.7	3.0	3.0	4.0	4.0	4.0
2012	6.0	6.5	3.0	3.0	4.0	4.0	4.0
2013	6.0	6.4	3.0	3.0	4.0	4.0	4.0
2014	6.0	6.3	3.0	3.0	4.0	4.0	4.0
2015	6.0	6.2	3.0	3.0	4.0	4.0	4.0
2016	6.0	6.2	3.0	3.0	4.0	4.0	4.0
2017	6.0	6.1	3.0	3.0	4.0	4.0	4.0
2018+	6.0	6.0	3.0	3.0	4.0	4.0	4.0

* Exclusive of the increment, in respect of the margin, of 0.25% for 1996 and later years.

** Exclusive of seniority and promotional increases.

*** These figures reflect actual experience.

F- Demographic Assumptions

1. New Members

To estimate the normal costs shown in the cost certificate (section V), assumptions were made as to the number, sex, age, and initial salary of future new plan members. It was assumed that the number, sex and type of new members would be such that the population of each subgroup of active contributors rises annually in accordance with the 1990-92 experience, as follows:

Male regular members	0%
Female regular members	6%
Male civilian members	1%
Female civilian members	4%

For each sex, the age distribution of the future new members was based on that of the actual new members in the 1990-92 period.

2. Active Contributors

Table 2A of Appendix 2 shows the assumed seniority and promotional increases to salary for an active contributor. Tables 2B to 2F show, respectively, the assumed rates of decrement arising from nonvested terminations (entitlement to a return of contributions with interest rather than to an annuity or an allowance), pensionable disabilities (member becomes a "disability pensioner" entitled to an immediate disability pension), pensionable retirements (member becomes a "retirement pensioner" entitled to an immediate or deferred retirement pension), and mortality for the year 1993.

Although the seniority and promotional increases in the previous valuation were sex-based, the assumption adopted for this report varies only by type of member and duration of service. The assumption for regular members is largely equal to the previous male assumption except at durations 30 and over, where it is substantially lower. The assumption for civilian members at the first three durations is much lower than in the previous valuation. No adjustment was made for the two-year seniority freeze, its effect being deemed minimal.

For this valuation, rates of nonvested termination, determined separately for regular members and civilian members, are assumed to vary by sex. These assumed rates are substantially the same as the sex-distinct combined rates in the previous valuation except at durations 21 and over, where they are now zero. Moreover the decrement is no longer applied to civilian members beyond age 50 with at least five years of pensionable service.

The rates of pensionable disability assumed for this report are much the same as those of the previous valuation; however, the rates are no longer deemed to apply to members for whom the sum of age (minimum 55 years) and years of pensionable service is at least 85.

The unisex rates of pensionable retirement assumed for this report vary not only by age, as for the previous report, but also by years of pensionable service and type of member. In aggregate, the rates assumed for regular members (table 2D of Appendix 2) are approximately 5% lower than the rates assumed for male members in the previous report. However, the rates assumed for most civilian members (table 2E of Appendix 2) under age 59 are generally much lower than the corresponding age-based rates in the previous valuation.

The rates of mortality deemed applicable to male regular members in 1993 are those projected for that year in the previous valuation; however, the female rates are marginally lower than under the previous valuation. For active civilian members, the male rates are as much as 50% higher than the previous rates, while the female rates are generally 20% higher. Mortality rates beyond 1993 are obtained by applying the longevity improvement factors shown in table 2G of Appendix 2 to the rates assumed for that year. The improvement factors are practically the same as those used in the previous valuation.

3. **Pensioners**
Just as for active contributors, tables 2F and 2G of Appendix 2 define the mortality basis for pensioners. The regular member mortality rates are either unchanged from the previous valuation (for male pensioners) or marginally lower (for female pensioners), whereas the civilian member rates are approximately 20% higher. As for the previous report, it was assumed that a disability pensioner would experience the same mortality as a retirement pensioner.

4. **Surviving Spouses**
Tables 2H and 2I of Appendix 2 show the proportion of members assumed to leave, upon death, a spouse eligible for a survivor pension under the plan. The probability of a male member up to age 60 leaving a widow is approximately 5% less than was assumed in the previous valuation; at many of the higher ages, the decrease is close to 15%. The probability of a female pensioner leaving a widower is approximately double the previous assumption.

Tables 2H and 2I of Appendix 2 also show the assumed age difference between the surviving spouse and the deceased member. For male pensioners aged 70 to 90, the age difference of the widow reflects the expectation that she will be one or two years older than assumed in the previous valuation. Similarly for female pensioners of all ages, it was assumed that the widower would be somewhat older than under the previous report.

The mortality rates deemed applicable to surviving spouses in 1993 (table 2F of Appendix 2) are significantly higher than the corresponding rates assumed for that year in the previous valuation. The increase is at least 50% up to age 70, and approximately 25% at the higher ages. Assumed longevity improvement factors were applied to obtain mortality rates applicable beyond 1993, as described for active contributor mortality.

5. **Surviving Children and Eligible Students**
It was assumed that the number of children and eligible students surviving a member would be in accordance with tables 2H and 2I of Appendix 2, which also show the average age of those survivors. To determine the value of pensions in payment to children and eligible students, the rates of pension termination were assumed to be zero if age 17 had not yet been attained, and 15% per annum thereafter until expiry of the benefit on the twenty-fifth birthday. All of these assumptions are materially the same as in the previous valuation.

G- Other Assumptions

1. Election of Options

Experience data indicate that a regular member, voluntarily retiring with 10 to 20 years of service in the Force while under the applicable retirement age, usually elects a return of contributions rather than a deferred annuity; it was assumed that this would always occur. The same assumption was made in respect of civilian members voluntarily retiring before reaching age 50. However, it was assumed that civilian members voluntarily retiring at or beyond age 50 would, if eligible, elect an annual allowance or an immediate annuity.

2. Use of Average Salaries

For valuation purposes, individual member data were grouped into sex-age-service cells. For each cell, the projected average salary at retirement exceeds the projected average YMPE. To the extent that this would not have been true if the data had not been so aggregated, the amount of CPP offset at age 65 was overstated. However, this overstatement is negligible because only a handful of active members (all civilians) had sufficiently low salaries at the end of 1992.

3. Retirement Age of Regular Members

For simplicity, it was assumed that all regular members at least 56 years old could *retire because of age* as defined in Appendix 1. In practice, this is true only for ranks up to corporal who joined the Force before July 1988; all other regular members retire at a higher age, ranging from age 57 to age 60. This simple assumption overstates the liabilities and the normal cost in respect of only a small proportion of regular members, namely those who joined the Force at ages 33 and over; the resulting financial effect thereof is quite minor.

4. Maximum Age of Active Contributors

It was assumed that all active contributors would leave service by their sixty-fifth birthday. With respect to the five active contributors (all civilian members) already at least 65 years of age, it was assumed that their retirement would occur immediately after 31 December 1992.

5. Minimum Death Benefit

This valuation takes into account the minimum death benefit, described in Note 12 of Appendix 1, only in respect of deaths occurring before retirement. The resulting understatement of accrued liability and normal cost is negligible because relatively few pensioners die in the early years of retirement without leaving an eligible survivor.

6. CPP Offset for Disability Pensioners

It was assumed that future disability pensioners would not be entitled to a CPP disability pension. In contrast, all current disability pensioners under age 65 were taken to be in receipt of a CPP disability pension.

7. Nature of Decrements

It was assumed that all decrements (e.g., disability, termination) were permanent and that therefore no subsequent re-entry would occur.

V- Valuation Results

A- Valuation Balance Sheet

The following balance sheet was prepared using the valuation methods described in section III, the assumptions described in section IV and the experience data described in section II.

<u>Assets</u>		<u>Millions of dollars</u>
Balance in RCMP Superannuation Account		5,340.7
Future contributions and government credits* in respect of elected prior service		20.2
Total Assets		5,360.9
<u>Liabilities</u>		
For prospective benefits to and in respect of active contributors		
• **Regular members**	2,395.3	
• Civilian members	182.6	
		2,577.9
For benefits to persons entitled to a periodic income		
• **Regular members**		
Retirement pensioners	1,327.6	
Disability pensioners	48.1	
Surviving spouses	53.0	
Surviving children and students	1.3	
		1,430.0
• **Civilian members**		
Retirement pensioners	66.1	
Disability pensioners	7.2	
Surviving spouses	5.0	
Surviving children and students	0.1	
		78.4
Total Liabilities		4,086.3
<u>Surplus</u>		1,274.6

* Government credits in each future year assumed to be 221% of future contributions by members, which is the multiple for 1995 in accordance with the cost certificate in this section.

B- Cost Certificate

The normal costs and the assets and liabilities of the plan were computed using the valuation methods described in section III, the assumptions described in section IV and the experience data described in section II. Emerging experience, differing from the corresponding assumptions, will result in gains or losses which will be revealed in future reports.

1. Normal Costs

Normal costs were computed using the relevant assumed new money interest rates (deemed to apply for 20 years and replaced by the assumed ultimate rate thereafter), as opposed to the projected fund yields reduced by 1%, minimum 6%, used in the previous report. The plan provisions upon which the normal costs were based do not take into account those provisions of *Bill C-55* that had not yet come into force by the valuation date. The normal costs are expressed below as a percentage of the pensionable payroll which corresponds to the sum of all salaries paid during the year to current contributors with no more than 35 years of pensionable service.

Year	Type of Member	Normal cost (%)	Employees' portion (%)	Government's portion %
1993	Regular	17.30	6.03	11.27
	Civilian	14.16	5.85	8.31
	Combined	**16.97**	**6.02**	**10.95**
1994	Regular	18.23	5.99	12.24
	Civilian	14.95	5.78	9.17
	Combined	**17.89**	**5.96**	**11.93**
1995	Regular	19.20	5.90	13.30
	Civilian	15.78	5.70	10.08
	Combined	**18.83**	**5.87**	**12.96**

The above table shows increases for 1994 and 1995 in the aggregate normal cost as well as in the government's portion of that cost. This gradual increase in the normal cost mainly reflects a partial transition from the current to the ultimate economic assumptions. On the other hand, the employees' portion of the normal cost decreases for 1994 and 1995. This results from the integration of the RCMPSA contributions with the CPP (described in Appendix 1). The CPP employees' contributions offset corresponds to the actual amount of contributions to CPP. As the CPP contribution rate started to increase in 1987 and is expected to continue to increase each year until about 2030, the employees' portion of the RCMPSA normal cost decreases yearly as the CPP offset increases.

2. Assets and Liabilities

The total liabilities for the plan are estimated at $4.09 billion as at 31 December 1992. The assets of $5.36 billion as at the same date therefore exceed the liabilities, corresponding to a surplus of $1.27 billion.

C- Sensitivity of Estimates to Variations in Economic Assumptions

The supplementary results shown below provide an indication of the degree to which the results shown in the Cost Certificate depend on some of its basic assumptions. The differences between the results below and those shown in the Cost Certificate above can also serve as the basis for deriving a reasonable approximation of the projected effect of larger or smaller changes in the value specified by one or more of the key assumptions. However, one must bear in mind that any such calculation does not take into account either the extent to which the effect of changing a given assumption may not be strictly linear, or the interaction effect that may come into play when more than one assumption is changed.

1. **Constant, as Opposed to Streamed, Economic Assumptions**

   The 1993 normal cost of 16.97% of pensionable payroll takes into account, among other things, that the 1993 new money interest rate of 8.2%, deemed to apply for 20 years, is higher than the ultimate level of 6% assumed for the rest of the projection period. If new money interest rates and other economic factors were deemed constant at their otherwise assumed ultimate value (i.e., 6% for interest, 4% for annual increase in average salaries, and 3% for inflation) throughout the projection period, the resulting normal cost for 1993 would be 27.83% instead of 16.97% of pensionable payroll.

2. **Productivity (Real Rate of Increase in Average Salaries)**

   If the productivity gains assumed for the 1993 normal cost of 16.97% were reduced by 0.5% from 1998 onward, then the 1993 normal cost would decrease by 0.49% of pensionable payroll from 16.97% to 16.48%.

3. **Margin Against Adverse Fluctuations**

   If the 0.25% marginal increase deemed to apply after 1995 to the assumed pension indexing factors were removed, the 1993 normal cost of 16.97% would decline by 0.52% of pensionable payroll to 16.45%, and the liabilities would decrease by about 2.8%.

4. **Interest Rate**

   (a) **Yield *versus* New Money**

   If the projected fund yields were used instead of the assumed new money interest rates, the 1993 normal cost would be 1.54% less, i.e., 15.43% instead of 16.97% of pensionable payroll.

   (b) **Investment Policy**

   The 1993 normal cost of 16.97% is based on a deemed investment policy of buying and holding 20-year government bonds. If the deemed investments also included a significant equity component, it would be appropriate to assume higher real rates of return. As a measure of sensitivity, an increment of one percentage point in the real interest rate would decrease the 1993 normal cost by 3.60% of pensionable payroll from 16.97% to 13.37%.

VI- Conclusions

A- Surplus

In comparison with the previous report, the financial results of this report rest, among other things, on a major change in the approach used for the computation of margins against adverse fluctuations. This change entails a sizeable reduction in the total liabilities for the plan, which found itself with a large surplus as at 31 December 1992. Considering the unusual increase in the surplus since the last valuation and my opinion that

- the liabilities computed in respect of all benefits accrued by 31 December 1992 include a reasonable margin against adverse fluctuations, and

- the normal costs computed for 1993, 1994 and 1995 make adequate provision for the full funding of benefits projected to accrue during those years,

it would be appropriate to take measures now to reduce the RCMPSA surplus over time. The methodology for achieving this surplus reduction could require, *inter alia*, actuarial advice, the provision of which is not among the objectives of this statutory actuarial report.

B- Actuarial Standards

In my opinion, considering that this report was prepared pursuant to the *Public Pensions Reporting Act*,

- the valuation input data on which it is based are sufficient and reliable;
- the assumptions that have been used are, in aggregate, appropriate;
- the methods employed are appropriate;
- the value of the plan assets would be greater than the liabilities if the plan were to be wound up at the valuation date; and
- this report has been prepared, and my opinion given, in accordance with accepted actuarial practice, and particularly with the Canadian Institute of Actuaries' standard of practice for the valuation of pension plans.

Bernard Dussault

Bernard Dussault, B.Sc., F.S.A., F.C.I.A.
Chief Actuary

Ottawa, Canada
13 October 1994

APPENDIX 1

Summary of Provisions, in Force as at 31 December 1992, of the Pension Plan Established under the *Royal Canadian Mounted Police Superannuation Act*

A- Membership

Membership in the plan is compulsory for all members of the Royal Canadian Mounted Police (the *Force*), regardless of length of service. Members of the Force who transferred to the Canadian Security Intelligence Service when it was established in 1984 could elect to remain in the plan; of those who did so, most were still active plan members as at 31 December 1992.

B- Credits and Charges to the RCMP Superannuation Account

1. Contributions

All members' and government's contributions are credited to the RCMPS Account.

(a) Members

Until they complete 35 years of pensionable service, active members make required contributions to the Account equal to 7.5% of salary minus their contributions to the Canada Pension Plan (CPP); thereafter they contribute 1% of salary. Members may elect to contribute in respect of a period of prior service, as described in Note 1 of section D of this Appendix.

(b) Credits by Government

The government credits the Account with amounts in respect of current and prior pensionable service. In addition, it makes special credits as required.

- **Current Service**
  The government determines its normal monthly credit to the Account as that amount, which when combined with the member contributions in respect of current service, is sufficient to cover the cost, as estimated by the President of the Treasury Board, of all future benefits that have accrued in respect of that month. The government credits averaged 169% of member contributions during the 1990-92 intervaluation period.
- **Elected Prior Service**
  The government credits to the Account in respect of elected prior service are analogous to those already described in respect of current service.
- **Special Credits**
  If an unfunded actuarial liability is identified through a triennial statutory actuarial report, the RCMPS Account is to be credited with such annual amounts that in the opinion of the President of the Treasury Board will fully amortize this deficit over a period not exceeding 15 years.

2. Interest

The interest rate applying to net cash flows (contributions minus benefits) to the RCMPS Account is revised every three months on the basis applying to the Canada Pension Plan, i.e., the applicable rate corresponds to the average rate on outstanding Canada Government bonds with 20 or more years to maturity. Investment earnings are credited to the RCMPS Account.

3. Payment of Benefits

All benefit payments pursuant to the plan are charged to the RCMPS Account.

C- Summary Description of Benefits

Entitlement to benefits depends on either service in the Force or pensionable service, both of which are defined in Note 1 of section D below. The explanatory notes referred to in this summary description are given in section D of this Appendix.

1. Regular Members

Type of Termination	Under 10 Years of Service in the Force*	10 or More Years of Service in the Force
Retirement because of age (Note 2)	Greater of: return of contributions (Note 3), or cash termination allowance (Note 4)	Immediate annuity (Note 5)
Compulsory retirement to promote economy or efficiency in the Force	Return of contributions	• If less than 20 years: choice of return of contributions, deferred annuity (Note 6), or reduced immediate annuity (Note 7) • If 20 or more years: immediate annuity
Compulsory retirement because of misconduct	At the discretion of the Treasury Board (Note 8)	At the discretion of the Treasury Board (Note 8)
Voluntary retirement	Return of contributions	• If less than 20 years: choice of return of contributions, or deferred annuity • If 20 to exactly 24 years: annual allowance (Note 9) • If more than exactly 24 years: immediate annuity
	Under 10 Years of Pensionable Service	10 or More Years of Pensionable Service
Compulsory retirement because of disability	Greater of: return of contributions, or cash termination allowance	Immediate annuity

* A contributor who holds a rank in the Force must have 10 or more years of pensionable service to qualify for a benefit other than a return of contributions.

2. Civilian Members

Type of Termination	Under Five Years of Pensionable Service	Five or More Years of Pensionable Service
Retirement because of age (Note 2)	Return of contributions	Immediate annuity
Compulsory retirement because of disability	Greater of: return of contributions, or cash termination allowance	Immediate annuity
Compulsory retirement because of misconduct	Return of contributions	At the discretion of the Treasury Board (Note 8)
Voluntary retirement	Return of contributions	• If 35 or more years of service in the Force: immediate annuity • If 30 or more years at age 55 or older: immediate annuity • Otherwise: choice of return of contributions, deferred annuity, or annual allowance (Note 10)

3. Benefits Paid after the Death of an Active Contributor

Type of Termination	Under Five Years of Pensionable Service	Five or More Years of Pensionable Service
Death leaving neither spouse (Note 13) nor eligible children under age 25 (Note 11)	Return of contributions to nominated beneficiary, otherwise to estate	Greater of: return of contributions, or five times the annuity to which contributor would have been entitled (Note 12)
Death leaving spouse and/or eligible children under age 25	Greater of: return of contributions, or one month's pay for each year of pensionable service	Annual allowance to surviving spouse and/or children (Note 13)

4. Benefits Paid after the Death of a Pensioner

Type of Termination	Benefit
Death leaving neither spouse nor eligible children under age 25	Minimum benefit (Note 12)
Death leaving spouse and/or eligible children under age 25	Annual allowance (Note 13)

5. Indexation

The plan provides benefit adjustments related to increases in the cost of living for pensioners and their surviving spouses and children satisfying at least one of the following criteria:

- retirement pensioner at least 60 years old;
- retirement pensioner at least 55 years old if the sum of years of pensionable service and age is at least 85 years;
- disability pensioner; or
- survivor.

The Benefit Index in respect of a calendar year is the Benefit Index for the preceding year multiplied by the ratio of the average of the Consumer Price Index for the twelve-month period ending on 30 September of that preceding year to the average for the corresponding period one year earlier. Prior to 1985, there were some deviations from the current Benefit Index formula.

The supplementary benefit is equal to the initial amount of the annuity or annual allowance to which the person is entitled multiplied by the excess, over one, of the ratio of the Benefit Index for the year of payment to the Benefit Index for the deemed date on which the person to whom or in respect of whose service the pension is payable ceased to be employed. If the actual date of cessation of employment is after 21 June 1982, then the deemed date is the first day of the next following calendar month; otherwise, it is the first day of January immediately preceding the actual date of cessation.

D- Explanatory Notes

Note 1: Service

(a) Service in the Force

Service in the Force normally means any period during which an individual is required to make contributions to the RCMP Superannuation Account; however, it also includes any period of service either as a special constable before the *Act* came into force or as a member of a provincial or municipal police force taken over by the Force.

(b) Pensionable Service

The pensionable service of a contributor includes any period of service in the Force (see previous paragraph) for which he or she has contributed or has elected to contribute. It also includes other periods of prior service other than in the Force, for which he or she has elected to contribute in accordance with the provisions of the *Act*.

Note 2: Retirement Because of Age

Retirement because of age normally means ceasing to be a regular member of the Force on or after reaching age 60, provided the contributor is not being retired because of disability or misconduct. However, regular members who joined the Force before July 1988 may elect to retain the prescribed retirement ages (56 for ranks up to corporal, 57 for sergeants, and 58 for staff sergeants and majors) in effect at that time.

Note 3: Return of Contributions

Return of contributions means the payment of an amount equal to the accumulated current and prior service contributions paid or transferred by the contributor into the RCMP Superannuation Account. Interest is credited at the rate of 4% per annum each 31 December on the accumulated contributions with interest as at the prior 31 December.

Note 4: Cash Termination Allowance

Cash termination allowance means an amount equal to one month's salary, at the rate authorized to be paid to the contributor at the date of termination, multiplied by the number of years of pensionable service to the credit of the contributor, minus the total reduction in contributions to the RCMP Superannuation Account as a result of the integration of the plan with the Canada Pension Plan.

Note 5: Immediate Annuity

Immediate annuity means an annuity that becomes payable immediately upon becoming entitled thereto. All annuities are normally payable in equal monthly instalments in arrears until the end of the month in which the contributor dies. The annual amount of *basic annuity* is equal to 2% of the highest value resulting from averaging any series of six consecutive annual pensionable earnings, multiplied by the number of years of pensionable service not exceeding 35. For a contributor who has reached age 65 or is entitled to a disability pension under the Canada Pension Plan, the amount of the annuity is reduced by 0.7% of the average annual salary, not exceeding the *Average Maximum Pensionable Earnings*, used in determining the amount of the annuity, multiplied by the number of years of pensionable service after 1965 or after attaining age 18, whichever is later, but not exceeding 35 years. *Average Maximum Pensionable Earnings* is the average of the Year's Maximum Pensionable Earnings, as defined in the Canada Pension Plan, over the contributor's last three years of service.

Note 6: Deferred Annuity

Deferred annuity means an annuity that becomes payable upon attainment of age 60. The annual payment is determined as for an immediate annuity. If a deferred annuitant under age 60 becomes disabled, the deferred annuity becomes an immediate annuity. If a former contributor under age 60 ceases to be entitled to a disability pension, he or she becomes entitled to a deferred annuity or, at his or her option, to an annual allowance (Notes 9 and 10) that is the actuarial equivalent of the deferred annuity.

Note 7: Reduced Immediate Annuity

Reduced immediate annuity means an immediate annuity where the annual amount of annuity determined as described in Note 5 is reduced until age 65 by 5% for each full year, not exceeding six, by which the period of service in the Force is less than 20 years. This type of annuity may be chosen by a contributor who holds a rank in the Force with 10 but less than 20 years of service in the Force

- if he or she is compulsorily retired prior to normal retirement age on account of a reduction in the Force, or
- at the discretion of the Treasury Board, if he or she is compulsorily retired to promote economy or efficiency.

Note 8: Retirement Because of Misconduct

Upon compulsory retirement because of misconduct, the contributor is entitled either to a return of contributions or to such greater benefit as may be specified by the Treasury Board but not exceeding the benefit to which he or she would have been entitled under any other plan provision.

Note 9: Annual Allowance for Regular Members

Annual allowance means, for a regular member, an immediate annuity reduced by 5% for each full year by which

- the period of service in the Force is less than 25 years, or
- age at retirement is less than the applicable retirement age,

whichever is the lesser.

Note 10: Annual Allowance for Civilian Members

Annual allowance means, for a civilian member, an annuity payable immediately or when the contributor attains age 50, if later. The amount of the allowance is equal to the amount of the deferred annuity to which the contributor is entitled, reduced by 5% of such annuity multiplied by a factor equal to 60 minus the age when the allowance becomes payable. However, if the contributor is at least 50 years of age and has at least 25 years of pensionable service, then the factor is reduced to the greater of

- 55 minus the age, and
- 30 minus the number of years of pensionable service.

The Treasury Board can waive all or part of the reduction for certain older members. Age and service are expressed to the nearest one-tenth of a year. If a former contributor entitled to an annual allowance commencing at age 50 becomes disabled before then, the entitlement changes to an immediate annuity. If the former contributor later ceases to be entitled to a disability pension and has not reached age 60, then the immediate annuity reverts to an annual allowance or, at the option of the former contributor, becomes a deferred annuity that is the actuarial equivalent of the annual allowance.

Note 11: Eligible Children
Eligible children under 25 includes all children of the contributor who are under age 18, and any child of the contributor who is age 18 or over but under 25, in full-time attendance at a school or university, having been in such attendance substantially without interruption since he or she reached age 18 or the contributor died, whichever occurred later.

Note 12: Minimum Death Benefit
If an active contributor or a pensioner dies without leaving an eligible survivor, there is paid a lump sum equal to the greater of the return of contributions and five times the *basic annuity* (note 5) to which the contributor would have been, or the pensioner was entitled, at the time of death, less all amounts (excluding indexation adjustments) already paid to the pensioner.

The same formula is used to determine the lump sum payable upon the death of an eligible survivor, except that all amounts (excluding indexation adjustments) already paid to the survivor are also subtracted.

Note 13: Annual Allowance for Survivors
Annual allowance means, for the surviving spouse and children of an active or former contributor, an annuity that becomes payable immediately upon the death of the contributor. The amount of the allowance is determined with reference to a basic allowance and is ordinarily payable in equal monthly instalments.

The basic allowance is equal to 1% of the highest value resulting from averaging any series of six consecutive annual pensionable earnings, multiplied by the number of years of pensionable service not exceeding 35. The surviving spouse of a contributor or pensioner is entitled to the basic allowance except if:

- the contributor dies within one year of marriage unless the Treasury Board is satisfied that the contributor's health at the time of the marriage justified an expectation of surviving for at least one year:
- the pensioner marries after age 60, unless after marriage the pensioner becomes an active contributor again; or
- the pensioner is female and retired before 20 December 1975.

The annual allowance for an eligible child is equal to 20% of the basic allowance, subject to a reduction if there are more than four eligible children in the same family. The annuity otherwise payable to an eligible child is doubled if the child is an orphan.

APPENDIX 2

Sample Demographic Assumptions

Table 2A

Assumed Seniority and Promotional Increases
(expressed as a percentage of annual salary)

Pensionable Service*	Regular Members** (%)	Civilian Members (%)
0	23.5	5.0
1	12.3	4.5
2	6.6	3.9
3	1.8	3.4
4	1.1	3.0
5	1.0	2.6
6	.8	2.3
7	.6	2.1
8	.4	1.9
9	.5	1.7
10	.5	1.6
11	.7	1.5
12	.8	1.4
13	.9	1.3
14	1.1	1.2
15	1.0	1.1
16	1.1	1.0
17	1.1	1.0
18	1.1	1.0
19	1.3	1.0
20	1.1	1.0
21	1.1	.9
22	1.1	.9
23	1.0	.9
24	1.1	.9
25	1.0	.9
26	.9	.8
27	.9	.8
28	.9	.8
29	1.0	.7
30	.9	.7
31	.9	.7
32	.9	.7
33	.9	.7
34	1.0	.8
35+	.8	.8

* Expressed in completed years.

** Includes 0.1% attributable to service allowance increases every fifth anniversary of engagement.

Table 2B

Assumed Rates of Nonvested Termination*

Pensionable Service**	Regular Members***		Civilian Members****	
	Male	Female	Male	Female
0	.040	.072	.040	.086
1	.028	.052	.027	.060
2	.025	.044	.025	.048
3	.024	.043	.023	.047
4	.023	.040	.022	.045
5	.021	.036	.021	.041
6	.015	.031	.016	.035
7	.012	.026	.013	.030
8	.010	.025	.011	.028
9	.009	.024	.009	.027
10	.008	.023	.008	.026
11	.007	.021	.007	.024
12	.006	.019	.006	.022
13	.005	.016	.006	.018
14	.004	.012	.005	.014
15	.003	.009	.003	.010
16	.002	.006	.002	.007
17	.002	.004	.002	.005
18	.001	.003	.001	.003
19	.001	.002	.001	.002
20	.001	.001	.001	.002
21	-	.001	-	.001

* Decrement includes all non-mortality terminations resulting in lump sum payments.
** Expressed in completed years.
*** Rates at durations ten and over do not apply from age 56 onward.
**** Rates at durations five and over do not apply from age 50 onward.

Table 2C

Assumed Rates* of Pensionable Disability

Age Last Birthday	Male	Female
28	.0001	.0001
29	.0001	.0003
30	.0001	.0005
31	.0002	.0009
32	.0003	.0012
33	.0004	.0016
34	.0005	.0019
35	.0006	.0023
36	.0007	.0026
37	.0007	.0029
38	.0008	.0033
39	.0009	.0036
40	.0010	.0039
41	.0011	.0043
42	.0013	.0047
43	.0015	.0051
44	.0017	.0055
45	.0020	.0059
46	.0023	.0062
47	.0027	.0066
48	.0031	.0069
49	.0036	.0073
50	.0041	.0076
51	.0047	.0083
52	.0054	.0091
53	.0063	.0099
54	.0072	.0108
55	.0083	.0118
56	.0094	.0130
57	.0106	.0144
58	.0120	.0159
59	.0136	.0176

* Rates apply if at least ten years of pensionable service are completed (five years, if a civilian member), but not if the sum of age (minimum 55) and number of years of pensionable service is at least 85.

Table 2D

Assumed Rates of Pensionable Retirement for Regular Members

Age Last Birthday	Completed Years of Pensionable Service 9-18	19	20-22	23	24-28	29-33	34	35+
37	-	.003	-	-	-	-	-	-
38	-	.006	.004	-	-	-	-	-
39	-	.014	.009	-	-	-	-	-
40	-	.022	.015	-	-	-	-	-
41	-	.028	.018	.041	-	-	-	-
42	-	.033	.020	.047	.045	-	-	-
43	-	.039	.025	.055	.054	-	-	-
44	-	.042	.027	.060	.056	-	-	-
45	-	.043	.027	.063	.057	-	-	-
46	-	.046	.029	.068	.059	-	-	-
47	-	.049	.032	.073	.061	.063	-	-
48	-	.051	.032	.074	.066	.064	-	-
49	-	.054	.034	.080	.072	.069	-	-
50	-	.057	.037	.085	.079	.072	-	-
51	-	.063	.040	.096	.088	.085	-	-
52	-	.076	.049	.117	.108	.101	.192	-
53	-	.105	.066	.161	.149	.136	.264	.185
54	-	.153	.100	.236	.219	.198	.386	.277
55	.080	.186	.121	.288	.267	.241	.472	.335
56	.010	.193	.121	.293	.277	.244	.486	.341
57	.020	.182	.112	.283	.262	.231	.470	.335
58	.030	.177	.110	.269	.254	.224	.453	.321
59+	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Table 2E

Assumed Rates of Pensionable Retirement for Civilian Members

Age Last Birthday	Completed Years of Pensionable Service 4-8	9-13	14-18	19-23	24-28	29-33	34	35+
49	.004	.008	.012	.012	.008	.029	-	-
50	.004	.008	.012	.012	.008	.029	-	-
51	.004	.008	.012	.012	.010	.044	-	-
52	.004	.008	.012	.012	.012	.058	.085	-
53	.004	.008	.012	.012	.012	.070	.085	.100
54	.019	.038	.056	.056	.056	.234	.510	.750
55	.019	.038	.056	.056	.056	.091	.298	.500
56	.019	.038	.056	.056	.056	.183	.340	.500
57	.019	.038	.056	.056	.056	.274	.383	.500
58	.019	.038	.056	.056	.056	.365	.425	.500
59	.258	.258	.258	.258	.644	.644	.644	.644
60	.172	.172	.172	.172	.430	.430	.430	.430
61	.086	.086	.086	.086	.215	.215	.215	.215
62	.086	.086	.086	.086	.215	.215	.215	.215
63	.215	.215	.215	.215	.537	.537	.537	.537
64	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Table 2F

Assumed Rates of Mortality for 1993

Age Last Birthday	Regular Members*		Civilian Members*		Surviving Spouses	
	Male	Female	Male	Female	Male	Female
20	.0004	.0002	.0004	.0002	.0013	.0004
25	.0005	.0002	.0005	.0003	.0013	.0004
30	.0006	.0003	.0007	.0004	.0013	.0005
35	.0007	.0004	.0009	.0005	.0014	.0006
40	.0010	.0005	.0014	.0007	.0018	.0010
45	.0016	.0007	.0024	.0011	.0028	.0017
50	.0028	.0011	.0042	.0018	.0048	.0029
55	.0046	.0019	.0066	.0027	.0083	.0045
60	.0073	.0033	.0100	.0046	.0134	.0069
65	.0134	.0059	.0172	.0076	.0214	.0108
70	.0233	.0110	.0300	.0135	.0336	.0171
75	.0387	.0205	.0488	.0261	.0520	.0284
80	.0680	.0362	.0809	.0463	.0796	.0476
85	.1044	.0635	.1255	.0758	.1222	.0825
90	.1470	.1031	.1828	.1229	.1847	.1400
95	.2172	.1705	.2594	.2033	.2746	.2297
100	.3747	.3207	.4200	.3591	.4357	.3884
105	.6464	.6032	.6800	.6343	.6912	.6569
109	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

* Rates apply equally to active contributors and to all retired contributors regardless of disability status.

Table 2G

Assumed Improvements in Longevity

Age Last Birthday	Annual % Reduction in 1993 Assumed Mortality rates Male	Female
20	.10	.50
25	.10	.50
30	.50	.75
35	.75	1.25
40	1.00	1.75
45	1.50	1.75
50	1.50	1.50
55	1.30	1.50
60	1.30	1.50
65	1.30	1.50
70	1.25	1.50
75	1.25	1.45
80	1.20	1.45
85	.90	1.05
90	.55	.70
95	.10	.30

Table 2H

Assumptions for Survivor Benefits in respect of Male Members

Age Last Birthday at Death	Proportion Married at death	Age difference between spouses*	Eligible Children	
			Number	Average Age
20	.15	0	.03	1
25	.40	(1)	.27	2
30	.67	(1)	1.40	3
35	.81	(2)	1.92	7
40	.86	(2)	1.94	11
45	.88	(2)	1.81	15
50	.89	(2)	1.19	18
55	.90	(2)	.48	20
60	.90	(3)	.21	21
65	.86	(3)	.07	22
70	.80	(3)	.04	23
75	.74	(3)	.02	24
80	.66	(3)	-	-
85	.56	(4)	-	-
90	.41	(4)	-	-
95	.25	(4)	-	-
100	.10	(6)	-	-
105	.03	(10)	-	-
109	.01	(14)	-	-

* Age of widow less age of member, both at death of member.

Table 2I

Assumptions for Survivor Benefits in respect of Female Members

Age Last Birthday at Death	Proportion Married at death	Age difference between spouses*	Eligible Children	
			Number	Average Age
20	.14	1	.01	1
25	.35	1	.12	2
30	.48	2	.76	3
35	.52	2	1.09	7
40	.52	2	1.15	11
45	.52	2	1.01	15
50	.51	3	.61	19
55	.50	3	.24	21
60	.47	3	.06	23
65	.42	3	.02	24
70	.35	3	-	-
75	.28	2	-	-
80	.20	2	-	-
85	.12	2	-	-
90	.05	1	-	-
95	.02	(1)	-	-

* Age of widow less age of member, both at death of member.

APPENDIX 3

Summaries of Data

Table 3A

Reconciliation of Membership

The following table, derived from the experience data, shows pertinent statistics concerning active contributors, retired contributors (includes both retirement pensioners and disability pensioners) and survivors during the years 1990 to 1992. Tables 3B and 3C below show further details on reconciliations by sex and type, of the active and retired contributors.

	Active Contributors	Retirement Pensioners	Disability Pensioners	Surviving Spouses	Eligible Surviving Children
At 31 December 1989	18,325	3,777	199	517	271*
Data corrections	(157)	(40)	(6)	20	
New members	2,176	-	-	-	
Re-engagements	73	(3)	-	-	
Nonvested terminations	(612)	-	-	-	
Pensionable disabilities	(70)	-	70	-	
Pensionable retirements	(965)	965	-	-	
Deaths	(39)	(121)	(8)	(29)	
Emerging survivors	-	-	-	129	
Transfers to other plans	-	(3)	-	-	
At 31 December 1992	18,731	4,575	255	637	255*

* The available data were insufficient to allow the reconciliation of the change in the population of eligible surviving children.

Table 3B

Detailed Reconciliation of Active Contributors

	Regular Members		Civilian Members	
	Male	Female	Male	Female
At 31 December 1989	14,978	1,314	1,187	846
Data corrections	(95)	(24)	(13)	(25)
New members	1,416	380	163	217
Re-engagements	44	13	2	14
Nonvested terminations	(357)	(134)	(35)	(86)
Pensionable disabilities	(48)	(6)	(8)	(8)
Pensionable retirements	(862)	(1)	(73)	(29)
Deaths	(30)	(2)	(6)	(1)
At 31 December 1992	15,046	1,540	1,217	928

Table 3C

Detailed Reconciliation of Pensioners

A- Retirement Pensioners

	Former Regular Members		Former Civilian Members	
	Male	Female	Male	Female
At 31 December 1989	3,475	1	200	101
Data corrections	(27)	-	(7)	(6)
Re-engagements	(3)	-	-	-
New pensioners	862	1	73	29
Deaths	(101)	-	(16)	(4)
Transfers to other plans	(3)	-	-	-
At 31 December 1992	4,203	2	250	120

B- Disability Pensioners

	Former Regular Members		Former Civilian Members	
	Male	Female	Male	Female
At 31 December 1989	151	5	23	20
Data corrections	(4)	-	(2)	-
New pensioners	48	6	8	8
Deaths	(5)	-	(3)	-
At 31 December 1992	190	11	26	28

Table 3D

Male Regular Members as at 31 December 1992

Number of Contributors
and
Average Current Salary

Age Last Birthday	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	All Years of Service
	Completed Years of Pensionable Service								
to 24	378	6	-	-	-	-	-	-	384
	$40,700	48,600	-	-	-	-	-	-	$40,800
25-29	1,135	601	33	-	-	-	-	-	1,769
	$44,700	48,800	49,300	-	-	-	-	-	$46,200
30-34	415	705	1,366	41	-	-	-	-	2,527
	$45,400	49,000	49,600	50,500	-	-	-	-	$48,800
35-39	101	215	1,048	1,903	113	-	-	-	3,380
	$46,200	49,000	49,900	52,200	54,800	-	-	-	$51,200
40-44	34	93	214	1,070	2,070	152	-	-	3,633
	$46,600	48,600	49,500	52,500	56,500	59,300	-	-	$54,700
45-49	13	65	54	229	512	1,310	60	-	2,243
	$46,800	47,900	49,500	51,400	56,700	61,700	67,300	-	$58,900
50-54	2	27	25	62	34	182	535	38	905
	$39,200	47,200	46,100	50,300	54,300	61,500	67,500	74,100	$63,600
55-59	1	6	18	27	7	9	60	75	203
	$49,000	46,400	49,800	48,100	53,200	51,600	68,100	74,800	$64,300
60-64	-	-	-	-	-	-	1	1	2
	-	-	-	-	-	-	52,100	68,000	$60,100
All Ages	2,079	1,718	2,758	3,332	2,736	1,653	656	114	15,046
	$44,200	48,800	49,700	52,200	56,400	61,400	67,500	74,500	$52,900

Average age last birthday: 38.5 years
Average pensionable service: 15.6 completed years

Table 3E

Female Regular Members as at 31 December 1992

Number of Contributors and Average Current Salary

Age Last Birthday	Completed Years of Pensionable Service 0-4	5-9	10-14	15-19	20-24	25-29	All Years of Service
to 24	160	5	-	-	-	-	165
	$40,100	48,400	-	-	-	-	$40,400
25-29	297	228	6	-	-	-	531
	$44,500	49,000	48,600	-	-	-	$46,500
30-34	63	192	180	9	-	-	444
	$44,800	48,900	49,100	48,200	-	-	$48,400
35-39	25	40	101	109	2	-	277
	$43,300	48,500	49,000	50,000	40,400	-	$48,700
40-44	5	12	23	41	9	2	92
	$46,000	48,400	49,100	51,400	51,300	49,300	$50,100
45-49	4	2	2	17	2	1	28
	$43,600	49,100	49,200	50,800	49,200	51,900	$49,500
50-54	-	-	-	1	1	-	2
	-	-	-	43,500	49,200	-	$46,400
55-59	-	-	1	-	-	-	1
	-	-	41,000	-	-	-	$41,000
All Ages	554	479	313	177	14	3	1,540
	$43,200	48,900	49,000	50,300	49,300	50,200	$47,000

Average age last birthday: 31.0 years
Average pensionable service: 7.1 completed years

Table 3F

Male Civilian Members as at 31 December 1992

Number of Contributors and Average Current Pay

Age Last Birthday	Completed Years of Pensionable Service 0-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	All Years of Service
to 24	17	1	-	-	-	-	-	-	18
	$35,100	31,200	-	-	-	-	-	-	$34,900
25-29	69	26	3	-	-	-	-	-	98
	$39,600	42,200	41,600	-	-	-	-	-	$40,400
30-34	52	72	49	-	-	-	-	-	173
	$40,600	48,000	45,200	-	-	-	-	-	$45,000
35-39	21	47	92	62	6	-	-	-	228
	$47,400	48,700	50,400	50,100	43,200	-	-	-	$49,500
40-44	14	22	34	79	63	5	-	-	217
	$48,700	45,000	49,700	53,700	53,300	47,000	-	-	$51,600
45-49	18	12	25	47	65	36	7	-	210
	$52,400	44,600	54,000	51,000	56,200	48,400	52,100	-	$52,300
50-54	9	15	28	23	18	22	29	4	148
	$41,900	43,200	43,600	50,600	59,500	54,600	49,600	54,700	$49,600
55-59	4	8	21	25	9	8	7	3	85
	$55,900	51,900	42,500	47,700	60,800	57,200	59,000	50,700	$50,500
60-64	2	2	7	11	11	-	1	2	36
	$32,000	42,600	48,800	45,900	51,000	-	57,100	56,000	$47,900
65+	-	-	1	-	2	-	1	-	4
	-	-	35,200	-	43,200	-	36,900	-	$39,600
All Ages	206	205	260	247	174	71	45	9	1,217
	$42,400	46,600	48,100	51,000	54,800	51,200	51,300	53,700	$48,800

Average age last birthday: 41.9 years
Average pensionable service: 13.6 completed years

Table 3G

Female Civilian Members as at 31 December 1992

Number of Contributors and Average Current Pay

Age Last Birthday	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	All Years of Service
	Completed Years of Pensionable Service								
to 24	28 $33,000	2 33,200	- -	- -	- -	- -	- -	- -	30 $33,000
25-29	86 $37,000	28 37,500	- -	- -	- -	- -	- -	- -	114 $37,100
30-34	59 $39,600	49 43,700	66 40,000	5 38,100	- -	- -	- -	- -	179 $40,800
35-39	40 $36,000	29 44,100	88 44,900	59 44,500	2 37,400	- -	- -	- -	218 $43,000
40-44	24 $36,300	25 41,300	35 41,400	54 45,700	33 46,700	9 43,300	- -	- -	180 $43,100
45-49	16 $38,500	17 38,700	18 42,400	15 42,700	16 52,600	17 46,900	- -	- -	99 $43,600
50-54	6 $46,500	4 40,000	15 41,200	15 41,500	9 43,700	5 46,500	2 43,700	2 51,100	58 $43,000
55-59	- -	2 38,700	7 40,500	7 39,900	10 49,600	8 44,700	2 46,300	- -	36 $44,100
60-64	2 $50,500	- -	2 38,600	2 41,700	5 37,600	2 49,800	- -	- -	13 $42,200
65+	- -	- -	- -	- -	1 39,800	- -	- -	- -	1 $39,800
All Ages	261 $37,400	156 41,400	231 42,300	157 44,000	76 47,000	41 45,800	4 45,000	2 51,100	928 $41,600

Average age last birthday: 38.4 years
Average pensionable service: 10.7 completed years

Table 3H

Retired Male Regular Members as at 31 December 1992

Age Last Birthday	Retirement Pensioners Number	Retirement Pensioners Yearly Amounts* Average ($)	Retirement Pensioners Yearly Amounts* Total ($)	Disability Pensioners Number	Disability Pensioners Yearly Amounts* Average ($)	Disability Pensioners Yearly Amounts* Total ($)
35-39	1	14,000	14,000	11	9,300	102,000
40-44	148	18,000	2,664,000	19	11,900	226,000
45-49	540	22,600	12,204,000	37	15,300	566,000
50-54	1,022	26,500	27,083,000	33	20,900	690,000
55-59	1,165	29,700	34,601,000	35	24,700	865,000
60-64	920	28,300	26,036,000	29	16,500	479,000
65-69	197	22,400	4,413,000	12	17,600	211,000
70-74	97	24,900	2,415,000	8	14,500	116,000
75-79	60	18,900	1,134,000	5	15,100	76,000
80-84	40	18,600	744,000	-	-	-
85-89	12	18,100	217,000	-	-	-
90-94	1	11,000	11,000	1	14,000	14,000
All Ages	4,203	26,537	111,536,000	190	17,594	3,345,000

Average age last birthday
At 31 December 1992: 56.4 years
At retirement: 47.9 years

Average age last birthday
At 31 December 1992: 54.4 years
At disability: 45.4 years

* The yearly amounts of pension shown above were determined taking into account

- the benefit reductions due to CPP offsets (effective at age 65 or, if earlier, upon commencement of a CPP disability pension), and
- the 1 January 1993 indexation increase on both immediate and deferred annuities.

Table 3I

Retired Male Civilian Members as at 31 December 1992

Age Last Birthday	Retirement Pensioners Number	Retirement Pensioners Yearly Amounts* Average ($)	Retirement Pensioners Yearly Amounts* Total ($)	Disability Pensioners Number	Disability Pensioners Yearly Amounts* Average ($)	Disability Pensioners Yearly Amounts* Total ($)
40-44	1	16,000	16,000	-	-	-
45-49	-	-	-	1	12,000	12,000
50-54	7	18,800	132,000	2	12,800	26,000
55-59	41	26,800	1,099,000	8	15,600	125,000
60-64	77	20,900	1,609,000	8	12,000	96,000
65-69	65	14,400	936,000	3	8,100	24,000
70-74	38	15,400	585,000	3	11,100	33,000
75-79	17	14,700	250,000	-	-	-
80-84	2	16,800	34,000	1	5,000	5,000
85-89	2	11,400	23,000	-	-	-
All Ages	250	18,734	4,684,000	26	12,369	321,000

Average age last birthday
At 31 December 1992: 64.9 years
At retirement: 58.6 years

Average age last birthday
At 31 December 1992: 61.6 years
At disability: 53.7 years

* The yearly amounts of pension shown above were determined taking into account
- the benefit reductions due to CPP offsets (effective at age 65 or, if earlier, upon commencement of a CPP disability pension), and
- the 1 January 1993 indexation increase on both immediate and deferred annuities.

Table 3J

Retired Female Members* as at 31 December 1992

Age Last Birthday	Retirement Pensioners Number	Retirement Pensioners Yearly Amounts** Average ($)	Retirement Pensioners Yearly Amounts** Total ($)	Disability Pensioners Number	Disability Pensioners Yearly Amounts** Average ($)	Disability Pensioners Yearly Amounts** Total ($)
30-34	-	-	-	1	2,000	2,000
35-39	-	-	-	7	7,600	53,000
40-44	-	-	-	8	8,500	68,000
45-49	2	16,600	33,000	2	9,300	19,000
50-54	8	12,800	102,000	5	6,600	33,000
55-59	20	19,400	388,000	5	13,500	68,000
60-64	23	18,900	435,000	7	6,400	45,000
65-69	32	12,500	400,000	1	15,000	15,000
70-74	23	13,600	313,000	3	11,900	36,000
75-79	9	11,700	105,000	-	-	-
80-84	4	14,500	58,000	-	-	-
85-89	1	15,000	15,000	-	-	-
All Ages	122	15,161	1,849,000	39	8,678	339,000

Average age last birthday
At 31 December 1992: 65.3 years
At retirement: 58.5 years

Average age last birthday
At 31 December 1992: 50.9 years
At disability: 45.6 years

* All female pensioners are former civilian members, except for 2 retirement pensioners and 11 disability pensioners who are former regular members.

** The yearly amounts of pension shown above were determined taking into account
- the benefit reductions due to CPP offsets (effective at age 65 or, if earlier, upon commencement of a CPP disability pension), and
- the 1 January 1993 indexation increase on both immediate and deferred annuities.

Table 3K

Eligible Survivors as at 31 December 1992

Age Last Birthday	Number	Yearly Amounts* Average ($)	Total ($)
30-34	8	2,500	20,000
35-39	30	4,300	129,000
40-44	53	6,500	345,000
45-49	50	6,900	345,000
50-54	69	8,800	607,000
55-59	104	9,900	1,030,000
60-64	84	9,000	756,000
65-69	62	8,600	533,000
70-74	52	8,000	416,000
75-79	59	7,500	443,000
80-84	48	7,400	355,000
85-89	14	5,300	74,000
90-94	4	6,300	25,000
Widow(er)s**	**637**	**7,969**	**5,078,000**
Children	**255**	**1,287**	**333,000**

Average age last birthday of spouses
At 31 December 1992: 60.7 years
At death of member: 52.0 years

* Amounts reflect accrued indexation to and including 1 January 1993.

** All but eight are widows.

APPENDIX 4

Reconciliation of Surplus and Normal Cost

The table below shows the main factors reconciling the overall change in the difference between assets and liabilities, and in the normal cost, between the last valuation date (31 December 1989) and this one. Figures in brackets indicate negative amounts. Main items of this table are explained in the following pages.

	Surplus ($ millions)		Normal Cost (% of pensionable payroll)	
At 31 December 1989		118.1		18.60 (for 1990)
Interest on initial surplus		38.9		-
Expected normal cost change		-		2.87
Data corrections		(96.9)		-
Partial realization of margin		140.7		-
Cost/contributions difference		(80.4)		-
Indexation payments charged to the CRF		18.2		-
Experience gains (losses)				
General salary increases	(137.3)		0.06	
Seniority and promotion increases	27.7		-	
Pension indexation	25.0		-	
YMPE increases	21.3		(0.14)	
New members	-		0.22	
Minor items	(10.2)		0.07	
Miscellaneous	(5.4)		-	
Subtotal		(78.9)		0.21
Change in margin		551.4		(2.75)
Revision of valuation assumptions				
General salary increases	330.8		(2.60)	
Pension indexation	247.1		(0.77)	
Interest rates	(117.5)		2.02	
Seniority and promotion increases	83.6		(0.42)	
Proportion married at death	76.8		(0.28)	
Mortality	45.7		(0.16)	
Pensionable retirement	(23.9)		0.16	
Widow(er) age	21.9		(0.08)	
Minor items	(27.5)		0.26	
Subtotal		637.0		(1.87)
Refinements of valuation procedures		26.5		(0.09)
At 31 December 1992		1,274.6		16.97 (for 1993)

Explanations of the Above Reconciliation

A- Expected Normal Cost Change
The gradual increase in the normal cost from 1990 to 1993 as under the previous report mainly reflects a partial transition from the current to the ultimate economic assumptions and, to a minor degree, the expected changes in the demographic characteristics of the active contributors.

B- Data Corrections
The assets shown in the previous valuation erroneously included an accrued quarterly interest credit of $91.0 million. Similarly the liability included $18.1 million in respect of a number of former plan members who no longer had a benefit entitlement. With interest to 31 December 1992, the net effect of these corrections was a $96.9 million decrease in the surplus.

C- Partial Realization of Margin
The previous valuation assumed annual interest rates included a deduction of 1% from the projected fund yields for the years up to 2011. The partial realization of this margin for the 1990-92 period created a surplus of $140.7 million.

D- Margin Against Adverse Fluctuations
The change in the calculation of the margin from a reduction of the relevant projected fund yields by one percentage point (but not below the ultimate yield of 6%), to an increase of a quarter of a percentage point of the pension indexing factors, resulted in a surplus increase of $551.4 million and in a normal cost reduction of 2.75% of pensionable payroll.

E- Cost/Contributions Difference
The surplus decreased by $80.4 million because the actual government contributions in the 1990-92 period were less than those corresponding to the government portion of the normal cost shown in the previous report cost certificate.

F- Indexation Payments Charged to the Consolidated Revenue Fund
Until 31 March 1991 the Consolidated Revenue Fund (CRF) bore the cost of indexation payments made to or in respect of a member after the exhaustion of that member's account in the Supplementary Retirement Benefits (SRB) Account; this created $18.2 million of surplus. Effective 1 April 1991, *Bill C-55* folded the relevant portion of the SRB Account into the RCMP Superannuation Account and charged all indexation payments to it.

G- General Salary Increases
Except for 1991, the general salary increase experience for 1990 to 1992 was as expected in the previous valuation. For 1991, the regular members received an unforeseen 4.2% increase that decreased surplus by $137.3 million. The assumed general salary increases for the years after 1993 are now lower than in the previous valuation. No general salary increases at all are assumed from 1994 to 1997 inclusive; moreover, the ultimate rate of increase is only 4% per annum - a decrease of 0.5% per annum. The revision of the general salary increase assumption caused the surplus to rise by $330.8 million and the normal cost to fall by 2.60% of pensionable payroll.

H- Seniority and Promotion Increases

The 1990-92 seniority and promotion increases for long-service members were only one-third of expected, creating a gain of $27.7 million. The related assumption was revised to differentiate by type of member rather than by sex as for the previous report. The revised assumption ignores the two-year freeze imposed on seniority increases by the February 1994 budget because this freeze is expected to have only a minor effect on the pension of future retirees. The revision increased the surplus by $83.6 million and decreased the normal cost by 0.42% of pensionable payroll.

I- Pension Indexation

The pension indexation experience was largely as expected except for the actual 1 January 1993 increase being only 2.1% instead of 4.0%. Consequently, the surplus has risen by $25.0 million. The revised assumption, exclusive of the margin, is lower than the previous assumption; the decrease is greatest in the early years and ultimately levels off at 0.3% per annum. The revision has caused the surplus to increase by $247.1 million and the normal cost to decrease by 0.77% of pensionable payroll.

J- Interest Rates

The rates of interest credited to the notional 20-year bond portfolio in 1990-1992 fell just short of the corresponding projected fund yields in the previous valuation; consequently, the experience loss ($7.6 million) was almost negligible. The actual rates were approximately 1% per annum higher than the 1990-92 valuation interest rates; however, this excess return was a partial realization of the margin, as discussed in paragraph C above. The revised valuation interest assumption averages 0.2% per annum lower than the projected fund yields of the previous valuation, except from the year 2015 onward, where it is 0.2% per annum higher. As a result, the surplus has decreased by $117.5 million. The normal cost has increased by 2.02% of pensionable payroll because the actual 8.2% new money interest rate for 1993, applicable for 20 years, upon which it is based, is significantly lower than the average projected fund yields used for the previous valuation.

K- Proportion Married at Death

Based on the previous assumption, the 168 member deaths recorded during the 1990-1992 period should have yielded 149 widow(er)s. Only 129 widow(er)s actually emerged, increasing the surplus by $3.0 million. For male members, the revised proportion married is approximately equal to the experience during the intervaluation period. For female members, the revised proportion married was based largely on a study of the marital status of 595 active contributors. Adopting the revised assumption increased the surplus by $76.8 million and decreased the normal cost by 0.28% of pensionable payroll.

L- Mortality

A minor mortality gain of $2.6 million emerged during the 1990-1992 period. For regular members, the previous mortality assumption was essentially retained. However, it was deemed necessary to develop new mortality assumptions for civilian members and for widow(er)s, based respectively on the mortality assumptions for non-disabled former contributors and for widow(er)s in the 1989 actuarial valuation of the pension plan established under the PSSA. These changes caused the surplus to rise by $45.7 million and the normal cost to fall by 0.16% of pensionable payroll.