

# Actuarial Report

---

on the

## PENSION PLAN FOR THE CANADIAN FORCES

As at 31 March 2000



Office of the Superintendent  
of Financial Institutions

Office of the Chief Actuary

Bureau du surintendant  
des institutions financières

Bureau de l'actuaire en chef

Canada

To obtain a copy of this report, please contact:  
Office of the Chief Actuary  
Office of the Superintendent of Financial Institutions  
12<sup>th</sup> Floor, Kent Square Building  
255 Albert Street  
Ottawa, Ontario  
K1A 0H2

Facsimile: (613) 990-9900  
E-mail address: [oca-bac@osfi-bsif.gc.ca](mailto:oca-bac@osfi-bsif.gc.ca)

An electronic version of this report is available  
on our Web site: [www.osfi-bsif.gc.ca](http://www.osfi-bsif.gc.ca)

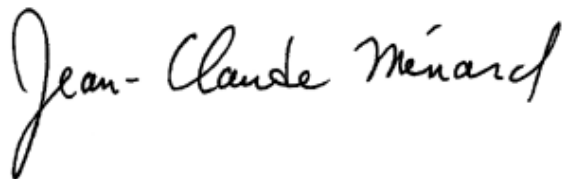
15 June 2001

The Honourable Lucienne Robillard, 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 the report on the actuarial review as at 31 March 2000 of the pension plan established under the *Canadian Forces Superannuation Act*.

Yours sincerely,

A handwritten signature in black ink that reads "Jean-Claude Ménard". The signature is written in a cursive style with a large initial 'J' and a long, sweeping underline.

Jean-Claude Ménard, F.S.A., F.C.I.A.  
Chief Actuary  
Public Sector Insurance and Pension Programs



## TABLE OF CONTENTS

	<u>Page</u>
I - Executive Summary .....	7
A - Purpose of this Actuarial Report .....	7
B - Scope of the Report .....	7
C - Main Findings .....	7
II - Financial Position of the Plan.....	9
A - Balance Sheet as at 31 March 2000 .....	9
B - Cost Certificate.....	10
C - Sensitivity of Normal Costs to Variations in Key Assumptions .....	12
III - Reconciliation of Results with Previous Report.....	13
A - Explanations of the Reconciliation .....	14
IV - Actuarial Opinion and Peer Review .....	16
APPENDICES .....	17
Appendix 1 - Developments Occurring Before 31 March 2000 .....	17
Appendix 2 - Summary of Plan Provisions .....	19
Appendix 3 - Plan Assets .....	32
Appendix 4 - Membership Data .....	38
Appendix 5 - Methodology .....	53
Appendix 6 - Economic Assumptions.....	56
Appendix 7 - Demographic Assumptions .....	60
Appendix 8 - Detailed Reconciliation of Results with Previous Report.....	76
Appendix 9 - Acknowledgements .....	78



## **I - Executive Summary**

### **A - Purpose of this Actuarial Report**

This actuarial report on the pension plan established under the *Canadian Forces Superannuation Act* (CFSA) was made as at 31 March 2000 pursuant to the *Public Pensions Reporting Act* (PPRA). The previous review was made as at 31 March 1997. The date of the next periodic review contemplated by the PPRA is 31 March 2003.

In accordance with accepted actuarial practice, the main purpose of this actuarial report is to show realistic estimates of:

- the balance sheet of the pension plan as at the valuation date, i.e. its assets, its liabilities, and the surplus or deficit as at that date;
- the annual amount to amortise over a period of years any surplus or deficit revealed as at the valuation date, and
- the plan's projected cost for each of the next three plan years<sup>1</sup> following the valuation date.

### **B - Scope of the Report**

The previous valuation report was based on the plan provisions as they stood after the enactment of Bill C-55 on 29 September 1992. There were no further changes to the plan provisions until Bill C-71 and Bill C-78 were enacted on 17 June 1999 and 14 September 1999, respectively. The significant plan changes resulting from these two bills are fully described in Appendix 1 page 17.

### **C - Main Findings**

- As at 31 March 2000, the plan had a surplus of \$15.4 billion resulting from the difference between the assets of \$48.5 billion and the liabilities of \$33.1 billion.
- The surplus could be amortised in 15 equal annual instalments of \$1.9 billion beginning on 30 September 2001.
- The surplus could also be partially amortised in 15 equal annual instalments of \$1.7 billion beginning on 30 September 2001. Under this scenario, the surplus remaining at the end of 15 years is equal to 10% of the liabilities.
- The estimated normal cost of plan year 2001 is 22.27% of pensionable payroll<sup>2</sup> that is \$648 million.

---

<sup>1</sup> Any reference to a given plan year in this report should be taken as the 12-month period ending 31 March of the given year.

<sup>2</sup> As defined on page 24.

- The normal cost for plan year 2003 is estimated to decrease marginally to 21.95% of pensionable payroll. Further marginal decreases are expected in subsequent years as the demographic profile of the Canadian Forces changes.



## II - Financial Position of the Plan

### A - Balance Sheet as at 31 March 2000

The balance sheet was prepared using the assets described in Appendix 3, the data described in Appendix 4, the methodology described in Appendix 5, and the assumptions described in Appendices 6 and 7.

<u>Assets</u>	<u>\$ million</u>
Balance in Canadian Forces Superannuation Account	48,410.2
Present value of future contributions in respect of elected prior service	<u>60.8</u>
<b>Total Assets</b>	<b>48,471.0</b>
<u>Liabilities</u>	
For benefits accrued to, and in respect of contributors	10,684.3
For benefits payable to, and in respect of:	
- Retirement pensioners	20,042.4
- Disability pensioners	414.8
- Surviving spouses	1,758.6
- Surviving children	<u>6.6</u>
	22,222.4
Administrative expenses to be charged to the Canadian Forces Superannuation Account	<u>144.5</u>
<b>Total Liabilities</b>	<b>33,051.2</b>
<u>Surplus</u>	<b>15,419.8</b>

## B - Cost Certificate

The normal costs, assets and liabilities were computed using the assets described in Appendix 3, the data described in Appendix 4, the methodology described in Appendix 5, and the assumptions described in Appendices 6 and 7. Emerging experience, differing from the corresponding assumptions, will result in gains or losses to be revealed in subsequent reports.

### 1 - Normal Costs

Plan year 2001 is the first year in which member and government contributions will be credited to the Canadian Forces Pension Fund and for which benefits accrued will be paid from the Fund. The normal cost for plan year 2001 reflects the projected yields on the new Fund shown on page 59.

The following normal costs are expressed as a percentage of the projected pensionable payroll as well as a dollar amount in each given plan year.

<u>Plan Year</u>	<u>Percentage of Pensionable Payroll</u>	<u>Millions of Dollars</u>
2001	22.27	648.1
2002	21.92	650.3
2003	21.95	665.9
2004	21.93	682.5
2005	21.82	698.4
2006	21.67	714.4
2007	21.50	730.7
2008	21.32	747.9
2009	21.13	766.6
2010	20.96	787.0
2011	20.77	808.9
2012	20.61	833.3
2013	20.47	860.7
2014	20.37	892.2
2015	20.28	926.4

The use of the actual Fund rate of return<sup>1</sup> (approximately 0%) over the first nine months of operation causes the plan year 2001 normal cost as a percentage of pensionable payroll to be marginally higher than in subsequent plan years. Further marginal decreases are expected in subsequent years as the demographic profile of the Canadian Forces changes.

---

<sup>1</sup> The projected annual yield on the Fund for plan year 2001 is 1.52% as shown on page 59.

## 2 - Allocation of Normal Costs

The foregoing normal costs are borne jointly by the contributors and the government. Contributors make required contributions in accordance with a prescribed formula (see page 19), with the government covering the balance of the normal cost.

<u>Allocation of Normal Cost as Percentage of Pensionable Payroll</u>			
<u>Plan Year</u>	<u>Government (G)</u>	<u>Members (M)</u>	<u>Ratio (G/M)</u>
2001	17.34	4.93	3.52
2002	16.97	4.95	3.43
2003	16.98	4.97	3.42

The above table shows the allocation of the normal cost expressed as a percentage of pensionable payroll, as well as the ratio of the cost borne by the government to that borne by the contributors. The allocation of normal costs between the government and members is shown only to plan year 2003 because member contribution rates are known with certainty only to 31 December 2003.

## 3 - Summary Balance Sheet

As at 31 March 2000 the assets of the plan were \$48.5 billion and the total liabilities are estimated at \$33.1 billion, leaving a surplus of \$15.4 billion. If this surplus were to be amortised over 15 years it would involve annual instalments of approximately \$1.9 billion beginning on 30 September 2001.

If this surplus were to be partially amortised over 15 years such that the surplus remaining at the end of 15 years equals 10% of the liabilities, it would involve annual instalments of approximately \$1.7 billion beginning on 30 September 2001.

### C - Sensitivity of Normal Costs to Variations in Key Assumptions

The table below shows the change on the plan year 2001 normal costs if key economic assumptions are increased or decreased by one percentage point per annum. The increase or decrease of 1% in the economic assumption starts in plan year 2001.

Revised economic assumptions	Ultimate Investment Yield %	Ultimate Level of Inflation %	Ultimate Average Earnings Increases <sup>1</sup> %	Change in plan year 2001 normal costs (from current basis) %	Revised normal cost for plan year 2001 %
Current basis	<b>7.25</b>	<b>3.0</b>	<b>4.0</b>	N/A	22.27
Investment Yield	<b>8.25</b>	unch. <sup>2</sup>	unch.	(4.17)	18.10
	<b>6.25</b>	unch.	unch.	5.66	27.93
Level of Inflation	unch.	<b>4.0</b>	unch.	2.85	25.12
	unch.	<b>2.0</b>	unch.	(2.23)	20.04
Average Earnings	unch.	unch.	<b>5.0</b>	1.56	23.83
	unch.	unch.	<b>3.0</b>	(1.38)	20.89
Level of Inflation and Average Earnings	unch.	<b>4.0</b>	<b>5.0</b>	4.61	26.88
	unch.	<b>2.0</b>	<b>3.0</b>	(3.47)	18.80
Investment Yield and Level of Inflation	<b>6.25</b>	<b>2.0</b>	<b>3.0</b>	0.88	23.15

The previous estimates indicate the degree to which the valuation results shown in the Cost Certificate depend on some of the key assumptions. The differences between these estimates and those shown in the Cost Certificate (page 10) can also serve as a basis for approximating the effect of other numerical variations in a key assumption, to the extent that such effects are indeed linear.

- 1 Assumed increases apply to both Canadian Forces average pensionable earnings and YMPE from plan year 2001 onward and to maximum pension earnings from 1 January 2005 onward.
- 2 The abbreviation 'unch.' indicates that the value remains unchanged at the level of the current basis assumption.

### III - Reconciliation of Results with Previous Report

This section describes the various factors reconciling the surplus and normal cost of this valuation with the corresponding items of the previous valuation. Figures in brackets indicate negative amounts. The main items in the table below are explained in the following pages.

	Surplus in millions of dollars	Surplus as a percentage of liabilities as at 31 March 2000	Normal Cost as a percentage of pensionable payroll
<b>(as at 31 March 1997)</b>	<b>11,569</b>	<b>35.0</b>	
<b>(for plan year 1998)</b>			<b>21.28</b>
Data corrections and refinements	(125)	(0.4)	(0.07)
Interest on surplus and above adjustments	2,366	7.2	
Expected normal cost change			1.70
Cost/contribution differences	(54)	(0.2)	
Experience gains and losses <sup>1</sup>	(17)	(0.1)	0.07
Changes in assumptions, methodology and Plan Provisions <sup>1</sup>	449	1.4	0.10
<b>(as at 31 March 1999)</b>	<b>14,187</b>	<b>42.9</b>	
Interest on surplus	1,318	4.0	
Expected normal cost change			0.29
Effect of projection of population	42	0.0	
Changes in assumptions and Plan Provisions as at 31 March 2000 <sup>1</sup>	(230)	(0.7)	(0.05)
New Account yield	102	0.3	(0.09)
<b>(as at 31 March 2000)</b>	<b>15,420</b>	<b>46.7</b>	
Change from Account yield to Fund yield			(1.53)
Estimated Fund yield for plan year 2001			0.57
<b>(for plan year 2001)</b>			<b>22.27</b>

<sup>1</sup> Detailed summaries are shown in Appendix 8, page 76.

## **A - Explanations of the Reconciliation**

### **1 - Data Corrections and Refinements**

The correction of errors (such as coding of status and pension amounts) in the 1996 data resulted in a decrease in the surplus of \$125 million.

### **2 - Interest on Surplus and Adjustments (plan year 1998 and 1999)**

The surplus earned interest totalling \$2,366 million for plan year 1998 and 1999 (includes item 1 above).

### **3 - Expected Normal Cost Change**

The increase of 1.70% of pensionable payroll in the normal cost for plan year 1998 and plan year 1999 projected in the previous report mainly reflects a partial transition from current to ultimate economic assumptions.

### **4 - Cost/Contributions Difference**

A decrease in the surplus of \$54 million resulted from the actual government contributions in plan years 1998 and 1999 being less than the government portion of the normal cost shown in the previous report cost certificate. This amount includes interest accumulation on that difference to 31 March 1999.

### **5 - Experience Gains and Losses**

The financial analysis of these items shown in Appendix 8 page 76, resulted in a decrease of \$17 million in the surplus as at 31 March 1999.

### **6 - Effect of Changes in Assumptions, Methodology and Plan Provisions**

The financial analysis of these items shown in Appendix 8 page 76, resulted in an increase of \$449 million in the surplus as at 31 March 2000. Bill C-71 modifications to the *Canadian Forces Superannuation Act* accounted for a total reduction of \$314 million in surplus and an increase in the normal cost of 0.55% of pensionable payroll.

### **7 - Interest on Surplus and Adjustments (plan year 2000)**

The surplus additionally earned interest totalling \$1,318 million for the projected plan year 2000 (include items 4, 5 and 6 above).

### **8 - Expected Normal Cost Change (plan year 2000)**

The increase of 0.29% of pensionable payroll in the normal cost for plan year 2000 mainly reflects a partial transition from current to ultimate economic assumptions.

## **9 - Financial Effect of Projection of Population**

The financial effect of the projection of the population as well as the difference between the expected versus the actual assets for plan year 2000 caused an increase in surplus totalling \$42 million.

## **10 -Changes in Assumptions and Plan Provisions as at 31 March 2000**

The financial analysis of these items shown in Appendix 8 page 76, resulted in a decrease of \$230 million in the surplus as at 31 March 2000. Among the major items effecting the reduction, the introduction of administrative expenses imputed to the Account reduces the surplus by \$145 million and having the Government matching employees' prior service contributions further reduces the surplus by \$94 million.

## **11 -New Account Yield**

As described in Appendix 5-D page 54, the yield on the Account is determined by an iterative process involving the actual investment earnings on the combined existing assets of the three Accounts as at the valuation date, the assumed future new money interest rates, and all future expected benefits payable in respect of all pension entitlements accrued up to 31 March 2000. On 31 March 2001, in accordance with the *Public Service Superannuation Act* and the *Royal Canadian Mounted Police Superannuation Act*, the account surpluses were reduced to a level equivalent to ten percent of the liabilities. This produces a slight increase in the future expected yield on the combined accounts. Consequently, the new yield has the effect of increasing the surplus in the Canadian Forces Superannuation Account by \$102 million as well as decreasing the normal cost as a percentage of pensionable payroll by 0.09%.

## **12 -Change from the Account Yield to the Fund Yield**

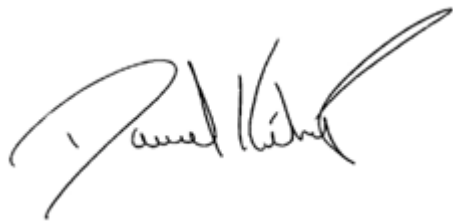
Beginning in plan year 2001, future service accrual will now be funded through the Canadian Forces Pension Fund. The effect on the normal cost of moving from the Account yield to the Fund yield is a decrease of 1.53% of pensionable payroll.

#### IV - Actuarial Opinion and Peer Review

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

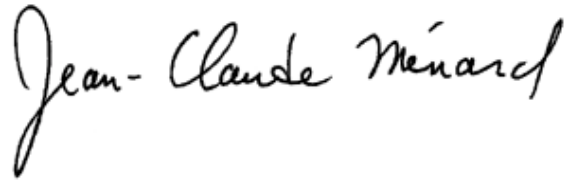
- the valuation input data on which it is based are sufficient and reliable;
- the assumptions that have been used are, in aggregate, appropriate;
- the methodology employed is appropriate; and
- the value of assets exceeds the wind-up liabilities at the valuation date.

This report has been prepared, and our opinions given, in accordance with accepted actuarial practice, and particularly with the Canadian Institute of Actuaries' Standard of Practice for the Valuation of Pension Plans.



---

Daniel Hébert  
Principal Actuary  
Office of the Chief Actuary  
Fellow of the Canadian Institute of Actuaries  
Fellow of the Society of Actuaries



---

Jean-Claude Ménard  
Chief Actuary  
Office of the Chief Actuary  
Fellow of the Canadian Institute of Actuaries  
Fellow of the Society of Actuaries

#### Peer Review

I have reviewed this report, and believe that the actuarial assumptions are appropriate for the purposes of the valuation and the methods used are appropriate for the purposes of the valuation. In my opinion, the report has been prepared, and the actuaries' opinions given, in accordance with accepted actuarial practice.



---

Elliot Trottier  
Principal Actuary  
Office of the Chief Actuary  
Fellow of the Canadian Institute of Actuaries  
Fellow of the Society of Actuaries

Ottawa, Canada  
15 June 2001



## APPENDICES

### Appendix 1 - Developments Occurring Before 31 March 2000

The following important developments occurred before the valuation date of 31 March 2000 and were appropriately taken into account (unless noted otherwise) in the determination of both the accrued liabilities and the normal costs.

#### 1. Bill C-71

Bill C-71, which received Royal Assent on 17 June 1999, includes the following provisions:

- (a) For members terminating their employment on or after that date, benefits will be based on the highest average annual pensionable earnings over any consecutive five years; previously this was over six years.
- (b) For members whose pensions had not been reduced by that date, the reduction in pension plan benefits at age 65 (earlier if the plan member becomes entitled to Canada Pension Plan disability benefits) will be based on the five-year average of the Year's Maximum Pensionable Earnings (YMPE) rather than a three-year average.

#### 2. Bill C-78

Bill C-78, which received Royal Assent on 14 September 1999, includes the following provisions:

##### (a) Employee contribution rate changes

For calendar years 2000 to 2003 inclusive, employee contribution rates for both the Public Service Superannuation Act and the Canadian Forces Superannuation Act are 4% of salary up to the YMPE and 7.5% of salary above. Thereafter, the Canadian Forces Superannuation Act employee contributions rates cannot exceed the corresponding Public Service Superannuation Act rates that Treasury Board can set as necessary subject to two limitations. The first is that no single contribution rate increase will exceed 0.4% of salary in any given year, and the second is that rates will not increase past the point where employees are paying 40% of the current Public Service Superannuation Act current service costs.

##### (b) Canadian Forces Pension Fund

Beginning on 1 April 2000, employer and employee contributions to the Canadian Forces Superannuation Act pension plan will no longer be credited to the Superannuation Account. Rather, they will be deposited in the newly created Canadian Forces Pension Fund to be invested in the financial markets.

For investment purposes, the amended legislation includes a provision to establish the Public Sector Pension Investment Board (PSPIB). The PSPIB will operate at arm's length from the Government and plan members. The PSPIB will be responsible for investing employer and employee contributions in the financial markets with a view to achieving maximum rates of return without undue risk.

(c) Superannuation Account Surpluses

The amended legislation gives the government the authority to debit the current surplus from the Canadian Forces Superannuation Account in instalments over a period of up to 15 years. The legislation also allows maintaining a surplus equal to 10% of the liabilities at the end of the period.

(d) Canadian Forces Pension Fund Surpluses

The amended legislation gives Treasury Board the authority to deal with any surpluses in the new Canadian Forces Pension Fund as they occur, either by reducing employee and/or employer contributions or by withdrawing amounts from the Fund.

(e) Pension Deficits

The Government will continue to assume sole responsibility for deficits in the Canadian Forces Superannuation Account and the Canadian Forces Pension Fund.

(f) Administrative Expenses

Effective 1 April 2000, expenses attributable to program management and delivery will be charged to the Account and the Fund in proportion to plan members' service acquired before and after that date.

(g) Beneficiary Changes

The amended plan permits payment of survivor benefits to a same-sex survivor as if that person were an opposite-sex partner in a common-law relationship. Until such experience develops the effect on the liability and the normal cost is assumed to be minimal. Consequently no adjustments were made to the liabilities and normal cost.

(h) Credited Interest Rates on Return of Contribution

Under the amended plan the interest rate on return of contribution will be credited quarterly at the rate of return earned by the Canadian Forces Pension Fund. A minimum of 0% will be used whenever the Canadian Forces Pension Fund earns a negative return over a specific year.

(i) The Bill includes authorities for Treasury Board to amend the *Canadian Forces Superannuation Act* to provide for improved vesting and portability arrangements. However, no regulations have been set yet and these benefits are not taken into account in this valuation.

## **Appendix 2 - Summary of Plan Provisions**

Pensions for members of the Canadian Forces (the *regular force*) were provided under the *Defence Services Pension Act* until the *Defence Services Pension Continuation Act* and the *Canadian Forces Superannuation Act (CFSA)* were enacted in 1959. The current provisions of the pension plan established under the CFSA are summarized in this Appendix. However, the Act shall prevail if there is a discrepancy between it and this summary.

### **A- Membership**

Membership in the plan is compulsory for all active members of the Canadian Forces. It includes the forces known before 1 February 1968 as the regular forces of the Canadian Forces and the forces known before 1 February 1968 as the Royal Canadian Navy, the Canadian Army Active Force, the Permanent Active Militia, the Permanent Militia Corps, the permanent staff of the Militia, the Royal Canadian Air Force (Regular) and the permanent Active Air Force.

### **B- Contributions**

#### **1. Members**

During the first 35 years of pensionable service, contributors make required contributions as follows:

- for calendar years 2000 to 2003 inclusive, 4% of pensionable earnings up to the YMPE and 7.5% of salary above; and
- from calendar year 2004, at rates not exceeding the corresponding Public Service Superannuation Act rates set by Treasury Board. The Public Service Superannuation Act rates are subject to the limitations that no single contribution rate increase will exceed 0.4% of salary in any given year and that rates will not increase past the point where employees are paying 40% of the Public Service Superannuation Act current service costs.

After 35 years of pensionable service, contributors make required contributions as follows:

- for calendar years 2000 to 2003 inclusive, 1% of pensionable earnings; and
- from calendar year 2004, at rates not exceeding the corresponding Public Service Superannuation Act rates set by Treasury Board.

If eligible, a contributor may elect to contribute for prior service.

## **2. Government**

### **(a) Current Service**

The Government determines its normal monthly contribution as that amount, which when combined with the required contributions by contributors in respect of current service, is sufficient to cover the cost of all future benefits that have accrued in respect of pensionable service during that month. This cost is estimated by the President of the Treasury Board in consultation with the Minister of National Defence and is based on actuarial advice.

### **(b) 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, except that from 1 April 2000 the Government will match member contributions made to the Account for prior service elections.

### **(c) Surpluses**

Bill C-78, which received Royal Assent on 14 September 1999, gives the government the authority to:

- debit surpluses from the Canadian Forces (CF) Superannuation Account in instalments over a period of up to 15 years; and,
- deal with any surpluses in the new CF Pension Fund as they occur, either by reducing employee and/or employer contributions or by withdrawing amounts from the Fund.

### **(d) Unfunded Liability**

If an unfunded actuarial liability is identified through a triennial statutory actuarial report, the CF Superannuation Account and/or the CF Pension Fund are to be credited with such annual amounts that in the opinion of the President of the Treasury Board will fully amortise these deficits over a period not exceeding 15 years.

## C- Summary Description of Benefits

The pension plan established under the *Canadian Forces Superannuation Act* mainly aims at providing an employment earnings-related lifetime retirement pension to the eligible members of the Canadian Forces. The plan also provides benefits to members in case of disability and to the spouse and children in case of death.

Subject to its integration with the pensions paid by the Canada Pension Plan, the initial rate of retirement pension is equal to 2% of the highest average of annual pensionable earnings over any period of five<sup>1</sup> consecutive years, multiplied by the number of years of pensionable service not exceeding 35. The pension is indexed annually with the Consumer Price Index and may be payable at the earliest of age 55 as defined in Note 2 page 24. Entitlement to benefits depends on either service in the Force or pensionable service, as defined below in Notes 3 and 4 page 25.

The explanatory notes referred to in the following summary description are given in section D starting on page 24.

### 1. Contributors<sup>2</sup>

Type of Termination	Service in the Regular Force (Note 3)	Benefit
Retirement because of age (Note 7)	3 years or less	Return of contributions (Note 8)
	More than 3 but less than 10 years	Return of contributions or cash termination allowance (Note 9), whichever is the greater
	10 years or more	Immediate annuity (Note 10)
Retirement on completion of short engagement (an officer contributor other than a subordinate officer who has not reached retirement age and is not serving on an intermediate engagement or for an indefinite period of service) (Note 5)	Less than 10 years	Return of contributions (Note 8)
	At least 10 but less than 20 years	At option of contributor (1) return of contributions; or (2) deferred annuity (Note 11)
	20 years or more	See “Retirement for reasons other than those previously mentioned”

1 If the number of years of pensionable service is less than five, then the average is over the entire period of pensionable service.

2 Pursuant to the CFSA, contributors include persons no longer required to contribute to the CFS Account.

<b>Type of Termination</b>	<b>Service in the Regular Force (Note 3)</b>	<b>Benefit</b>
Retirement during an indefinite period of service after having completed an intermediate engagement and prior to reaching retirement age, for reasons other than disability or misconduct, or to promote economy or efficiency	Any length	Immediate annuity to which contributor was entitled upon completion of intermediate engagement increased to such extent as prescribed by regulation <sup>1</sup> (Note 12)
Retirement on completion of intermediate engagement (a contributor who has not reached retirement age and is not serving for an indefinite period of service) (Note 6)	20 years or more (by definition in CFS Regulations)	Immediate annuity (Note 10)
Compulsory retirement because of disability <sup>2</sup>	Less than 10 years	Return of contributions or cash termination allowance, whichever is greater
	10 years or more	Immediate annuity
Compulsory retirement to promote economy or efficiency	3 years or less	Return of contributions
	More than 3 but less than 10 years	Return of contributions or cash termination allowance, whichever is greater
	At least 10 but less than 20 years	At option of contributor (1) return of contributions; or (2) deferred annuity; or (3) with consent of the Minister of National Defence, an immediate reduced annuity (Note 13)
	20 years or more	Immediate annuity

- 1 The CFSA limits the annuity to the immediate annuity to which the contributor would be entitled if retiring because of age or disability, and the formula in the CFS Regulations (note 13) always produces less than the maximum.
- 2 Any condition rendering a member of the regular force mentally or physically unfit to perform his or her duties. A member is discharged under Q. R. & O. 15.01 Article 3B when he or she is unable to perform the duties of his or her own occupation. A member is discharged under Q.R. & O. 15.01 Article 3A when he or she is unable to perform any occupation.

Type of Termination	Service in the Regular Force <i>(Note 3)</i>	Benefit
Compulsory retirement because of misconduct, as defined in the CFSA	Less than 10 years	Return of contributions
	10 years or more	Return of contributions or, with consent of Treasury Board, the whole or any part specified by Treasury Board of the annuity to which the contributor would have been entitled at the time of his or her retirement if <i>retired for other reasons (Note 14)</i>
Retirement for reasons other than those previously mentioned	Less than 10 years	Return of contributions
	At least 10 but Less than 20 years	At option of contributor: return of contributions; or deferred annuity
	At least 20 but Less than 25 years	Immediate reduced annuity
	25 years or more	Officer contributor - immediate reduced annuity <i>(Note 13)</i> ; Other than officer contributor: - immediate annuity <i>(Note 10)</i>

## 2. Benefits in Case of Death of a Contributor

Status at Death	Service in the Regular Force <i>(Note 3)</i>	Benefit
Leaving no eligible spouse or children under 25 <i>(Notes 15 and 16)</i>	Less than 10 years	Return of contributions or cash termination allowance, whichever is greater
	10 years or more	Five times the annual amount of retirement pension to which the contributor would have been entitled at the date of death
Leaving eligible spouse and/or children under 25	Less than 5 years	Return of contributions or an amount equal to one month's earnings of the deceased contributor for each year of credited pensionable service, whichever is the greater
	5 years or more	Annual allowance <i>(Note 17)</i>

### 3. Benefits in Case of Death of a Pensioner

Status at Death	Benefit
Leaving no eligible spouse or children under 25	Minimum death benefit ( <i>Note 18</i> )
Leaving eligible spouse and/or children under 25	Annual allowance ( <i>Note 17</i> )

## D- Explanatory Notes

### 1. Pensionable Earnings

Pensionable earnings means the salary at the annual rate prescribed by the regulations made pursuant to the *National Defence Act* together with the allowances representing medical-dental care costs prescribed by the Canadian Forces Superannuation Regulations to a contributor, subject for tax purposes to a prescribed yearly maximum after April 1995. The maximum is \$99,600 for the 2001 calendar year.

Pensionable payroll means the aggregate pensionable earnings of all contributors with less than 35 years of pensionable service.

### 2. Indexation

#### (a) Level of Indexation Adjustments

All immediate and deferred annuities (pensions and allowances) are adjusted every January to the extent warranted by the increase, as at 30 September of the previous year, in the 12-month average Consumer Price Index. If the indicated adjustment is negative, annuities are not decreased for that year; however, the next following adjustment is diminished accordingly.

#### (b) First Indexation Adjustment

Indexation adjustments accrue from the end of the month in which employment terminates. The first annual adjustment following termination of employment is prorated accordingly.

#### (c) Commencement of Indexation Payments

The indexation portion of a retirement, disability or survivor pension normally starts being paid when the pension is put into pay. However, regarding a retirement pension, the pensioner must be at least 55 years old provided also the sum of age and pensionable service is at least 85; otherwise the retirement pensioner must be at least 60 years old.



### **3. Service in the Regular Force**

For most purposes of the CFSA, “service in the regular force” means service in the regular force of the Canadian Forces or its predecessors excluding any service for which a contributor was paid a return of contributions or lump sum payment under the CFSA that he or she did not elect to repay on subsequent enrolment.

### **4. Pensionable Service**

Pensionable service includes any period of service in the regular force in respect of which a contributor either (1) made contributions that remain in the Account or Fund or (2) elected to contribute. It also includes any period of prior service for which a contributor was paid a return of contributions or lump sum payment under the CFSA that he or she did elect to repay on subsequent enrolment.

### **5. Short Engagement**

Short engagement means a period of service of a member of the regular force as an officer, other than as a subordinate officer, of such duration shorter than an intermediate engagement as is prescribed by regulation. The regulations prescribe a period of at least nine years for a short engagement in respect of commissioned officers.

### **6. Intermediate Engagement**

Intermediate engagement means a period of service of a member of the regular force of such duration as is prescribed by regulation. A period of service of at least 20 years of total continuous service plus any additional time necessary to reach age 40 has been prescribed as an intermediate engagement for all members.

### **7. Retirement Because of Age**

Retirement because of age means ceasing to be a member of the regular force at or after the prescribed retirement age for any reason other than disability, misconduct or death. A retirement age of 55 applies for all members serving under the career programs adopted in 1975.

For those members enrolled prior to the introduction of the 1975 programs and not subject to their provisions, the previous rules for retirement age continue to apply. These rules, effective 1 February 1968, applicable to contributors who enrolled on or after that date, or to those serving on that date that elected to be subject to such rules, are shown in the table on the next page.

	<u>Pre-1975 Retirement Age</u>		
	<u>General Service</u>	<u>Specialist Service</u>	<u>Commissioned From Rank</u>
Brigadier-General and above	55	60	55
Colonel	55	58	55
Lieutenant-Colonel	51	55	50
Major	47	55	50
Captain and Lieutenant	45	50	50
Others Ranks above Corporal	50		
Corporal and below	44		

---

For those contributors serving on 1 February 1968 who did not elect to have these rules apply to them, the retirement age is as in the table above but varies slightly by rank and by branch of the Forces.

For those contributors to whom the above rules would normally apply, the regulations also prescribe, for purposes of compulsory retirement under certain conditions or voluntary retirement, that the retirement age will be deemed to have been reached only upon completion of the following periods of full-time paid service in any of Her Majesty's Forces, if the resulting date of retirement is earlier.

	<u>Years of Service</u>
Colonel and above	30
Officers below Colonel	28
Other Ranks above Corporal	30
Corporal and below	25

---

## 8. 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 Account and/or into the Fund. Interest is credited at the quarterly Fund rate each quarter on the accumulated contributions with interest as at the end of the previous quarter.

## 9. Cash Termination Allowance

Cash termination allowance means the payment of an amount equal to one month's employment earnings at the rate authorized to be paid to the contributor at date of termination multiplied by the number of years of pensionable service to the credit of the contributor minus the total reduction in employee contributions to the CFS Account by virtue of the integration of the plan with the CPP.

## 10. Immediate Annuity

Immediate annuity means an unreduced pension that becomes payable immediately upon a pensionable retirement or a pensionable disability. The annual amount is equal to 2% of the highest average of annual pensionable earnings (calculated without reference to the yearly maximum described in Note 1) of the contributor over any period of five<sup>1</sup> consecutive years, multiplied by the number of years of pensionable service not exceeding 35. However, if such highest five-year earnings average exceeds the yearly maximum prescribed for the calendar year in which service is terminated, then the annual amount is reduced by 2% of such excess, multiplied by the number of years of pensionable service after April 1995.

When a pensioner attains age 65 or becomes entitled to a disability pension from the CPP, the annual amount of pension is reduced by 0.7% of the indexed CPP annual pensionable earnings<sup>2</sup> (or, if lesser, the indexed five-year average earnings on which the immediate annuity is based), multiplied by the years of CPP pensionable service<sup>3</sup>.

Annuities are payable in equal monthly instalments in arrears until the end of the month in which the pensioner dies or when the disability pensioner recovers from disability. Upon the death of the pensioner, either a survivor allowance (Note 17) or a minimum death benefit (Note 18) may be payable.

## 11. Deferred Annuity

Deferred annuity means an annuity that normally becomes payable to a retirement pensioner when he/she reaches age 60. The annual payment is determined like that of an immediate annuity (see note 10 above) but is adjusted to reflect the indexation (see page 24) from date of termination to the commencement of annuity payments.

When a contributor entitled to a deferred annuity becomes disabled before reaching age 60, the contributor ceases to be entitled to that deferred annuity and becomes entitled to an immediate annuity.

When a contributor, being entitled while still under age 60 to an immediate annuity in respect of a disability, recovers from that disability, the disability annuity payments are terminated and the contributor becomes entitled to a deferred annuity.

- 
- 1 If the number of years of pensionable service is less than five, then the average is over the entire period of pensionable service.
  - 2 Indexed CPP annual pensionable earnings means the average of the YMPE, as defined in the CPP, over the last five years of pensionable service, increased by indexation proportionate to that accrued in respect of the immediate annuity.
  - 3 Years of CPP pensionable service, means the number of years of pensionable service after 1965 or after attaining age 18, whichever is later, but not exceeding 35.

## **12. Annuity Payable upon Retirement During an Indefinite Period of Service**

For a contributor who has not reached retirement age and ceases to be a member of the regular force while on an indefinite period of service after completing an intermediate engagement for any reason other than disability, misconduct, or to promote economy or efficiency, Canadian Forces Superannuation Regulations prescribe an annuity that is equal to the greater of:

- (a) an immediate annuity based on the pensionable service to the date of completion of the intermediate engagement only and the highest five-year earnings average at date of retirement, and
- (b) an immediate annuity based upon the total pensionable service to the date of retirement and the highest five-year employment earnings average at that date reduced by 5% of such amount of annuity for each full year by which:
  - in the case of an officer, the age at the date of retirement is less than the retirement age applicable to the contributor's rank; or
  - in the case of a contributor other than an officer, the age at the date of retirement is less than the retirement age applicable to the contributor's rank or the period of service in the regular force is less than 25 years, whichever is the lesser.

## **13. Immediate Reduced Annuity**

Immediate reduced annuity means an immediate annuity for which the annual amount of the annuity as determined in note 10 is reduced as stated below.

With the consent of the Minister of National Defence, a contributor who is required to terminate to promote economy or efficiency and has between 10 and 20 years of service in the regular force may choose an immediate annuity reduced, until attainment of age 65 but not thereafter, by 5% for each full year not exceeding six by which:

- (a) the period of service in the regular force is less than 20 years; or
- (b) the age of the contributor at the time of retirement is less than the retirement age applicable to the contributor's rank,

whichever is the lesser.

A contributor who, not having reached retirement age, ceases to be a member of the regular force for any reason other than disability, misconduct, or to promote economy or efficiency, or while on an indefinite period of service is entitled

- (a) as an officer having served in the regular force for 20 years or more, to an immediate annuity reduced by 5% for each full year by which his or her age at the time of retirement is less than the retirement age applicable to his or her rank, or

(b) as other than an officer having served in the regular force for 20 years or more but less than 25 years, to an immediate annuity reduced by 5% for each full year by which:

- the period of service in the regular force is less than 25 years, or
- the age at the time of retirement is less than the retirement age applicable to the contributor's rank,

whichever is the lesser.

When a pensioner in receipt of an immediate reduced annuity becomes disabled before reaching age 60, the pensioner ceases to be entitled to that immediate reduced annuity and becomes entitled to an immediate annuity adjusted in accordance with regulations to take into account the amount of any immediate reduced annuity which the pensioner may have received prior to becoming disabled.

#### **14. Compulsory Retirement Because of Misconduct**

In the case of compulsory retirement because of misconduct, the contributor is entitled to:

- (a) a return of contributions, or
- (b) having served in the regular force for 10 or more years, with the consent of the Treasury Board, the whole or any part specified by the Treasury Board of any annuity to which the contributor would have been entitled if the contributor had retired for other reasons (excluding disability, completion of short or intermediate engagement, misconduct and to promote economy or efficiency) at the same date. However, in no case shall the actuarial present value of any reduced benefit (based by Regulation on the Canadian Life Table (1941) and an interest rate of 4%) be less than the return of contributions.

#### **15. Eligible Surviving Spouse**

Eligible surviving spouse means the surviving spouse of a contributor or pensioner except if:

- (a) the contributor or pensioner died within one year of marriage unless the Minister of National Defence is satisfied that the contributor's health at the time of the marriage justified an expectation of surviving for at least one year; or

- (b) the pensioner married at age 60 or over, unless after such marriage the pensioner either:
- became a contributor again (in such cases, common-law unions are accepted), or
  - made an optional survivor benefit election within 12 months following marriage to accept a reduced pension so that the new spouse would be eligible for a survivor benefit. This reduction is reversed if and when the new spouse predeceases the pensioner or the spousal union is terminated for reason other than death; or
- (c) the pensioner is a female who retired before 20 December 1975 and did not make an optional survivor benefit election within the one-year period ending 6 May 1995.

## **16. Eligible Surviving Children**

Eligible surviving children includes all children of the contributor or pensioner who are under age 18, and any child of the contributor or pensioner 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 or pensioner died, whichever occurred later.

## **17. Annual Allowance for Eligible Survivors**

Annual allowance means, for the eligible surviving spouse and children of a contributor or pensioner, an annuity that becomes payable immediately upon the death of that individual. The amount of the allowance is determined with reference to a basic allowance equal to 1% of the highest average of annual pensionable earnings of the contributor over five consecutive years, multiplied by the number of years of pensionable service not exceeding 35. If such highest five-year earnings average exceeds the yearly maximum prescribed for the calendar year in which service is terminated, then the annual amount is reduced by 2% of such excess, multiplied by the number of years of pensionable service after April 1995.

The annual allowance for a spouse is equal to the basic allowance unless the spouse became eligible as a result of an optional survivor benefit election, in which case it is equal to the percentage of the basic allowance specified by the pensioner making the election.

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

Annual allowances are not integrated with the CPP and are payable in equal monthly instalments in arrears until the end of the month in which the survivor dies or otherwise loses eligibility. If applicable, a residual benefit (Note 18) is payable to the estate upon

the death of the last survivor.

### **18. Minimum Death Benefit**

If upon the death of a contributor there is no person to whom an allowance provided under the terms of the CFSA may be paid, or if the persons to whom such allowances may be paid die or cease to be entitled thereto and no other amount may be paid to them, there is paid to the estate of the contributor:

- (a) if the contributor was not a member of the regular force upon or after 20 December 1975, any amount by which the amount of return of contributions exceeds the aggregate of all amounts paid to those persons and to the contributor;
- (b) if the contributor was a member of the regular force upon or after 20 December 1975, an amount similar to the above except that the return of contributions is taken as at least equal to five times the basic annuity to which the contributor was or would have been entitled at the time of his or her death; or
- (c) if the contributor was retired and entitled to an immediate annuity from which a deduction had been made as a result of integration with the CPP, the amount payable in (a) or (b) above cannot be less than the amount by which the cash termination allowance (see Note 9 above) exceeds the aggregate of all amounts already paid to those persons and to the contributor.

### **19. Division of Pension in Case of Spousal Union Breakdown**

In accordance with the *Pension Benefits Division Act*, upon the breakdown of a spousal union (including common-law), a lump sum can be transferred by court order or by mutual consent from the plan assets to the credit of the former spouse of a contributor or pensioner. As at the transfer date, the maximum transferable amount is half the value of the retirement pension accrued by the contributor or pensioner during the period of cohabitation. If the member's benefits are not vested, the maximum transferable amount corresponds to half the member's contributions made during the period subject to division, accumulated with interest at the rate applicable on a refund of contributions. The benefits of the contributor or pensioner are then reduced accordingly.

### **Appendix 3 - Plan Assets**

#### **A- Canadian Forces Superannuation Account**

Until 31 March 2000, the plan was entirely financed through the Canadian Forces Superannuation Account, which forms part of the Accounts of Canada. The Account is:

- credited with all prior service contributions made for elections made prior to 1 April 2000 or leave without pay contributions for periods before 1 April 2000 but remitted after that date;
- charged with the benefit payments made in respect of service earned under the Account; and,
- credited with investment earnings as though net cash flows were invested quarterly in 20-year Government of Canada bonds issued at prescribed interest rates and held to maturity. No formal debt instrument is issued to the Account by the Government in recognition of the amounts therein. Investment earnings are credited every three months to the Account on the basis of the actual average yield for the same period on the combined Superannuation Accounts of the Public Service, Canadian Forces and Royal Canadian Mounted Police pension plans.

#### **B- Canadian Forces Pension Fund**

Beginning on 1 April 2000, Government and member contributions (except for prior service elections made prior to 1 April 2000) to the pension plan were no longer credited to the Canadian Forces (CF) Superannuation Account. Rather, they are deposited in a newly created CF Pension Fund to be invested in the financial markets with a view to achieving maximum rates of return without undue risk. The new Fund is charged with the benefit payments and administrative expenses in respect of service since 1 April 2000.



## 1. Reconciliation of Balances in the Canadian Forces Superannuation Account

(in millions of dollars)				
<b>Account balance as at 31 March 1997</b>				39,746.8
Plan year	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>1998-2000</u>
Public Accounts opening balance	39,746.8	42,486.7	45,322.4	39,746.8
<b>INCOME</b>				
Employee contributions	138.8	136.7	144.2	419.7
Employer contributions	402.6	396.0	562.4	1,361.0
Transfers from other pension funds	5.5	5.1	4.7	15.3
Investment earnings	<u>3,907.8</u>	<u>4,049.7</u>	<u>4,167.3</u>	<u>12,124.8</u>
Subtotal	4,454.7	4,587.5	4,878.6	13,920.8
<b>EXPENDITURES</b>				
Annuities	1,642.7	1,725.0	1,731.0	5,098.7
Pension division	40.5	23.1	37.4	101.0
Returns of contributions	31.1	3.5	21.4	56.0
Transfers to other pension funds	<u>0.7</u>	<u>0.3</u>	<u>1.0</u>	<u>2.0</u>
Subtotal	1,715.0	1,751.9	1,790.8	5,257.7
Public Accounts closing balance	42,486.7	45,322.4	48,410.2	48,410.2
<b>Account balance as at 31 March 2000</b>				48,410.2

The above table shows the reconciliation of the assets in the Canadian Forces Superannuation Account between the last valuation date and the current valuation date. Since the last valuation, the Account balance has grown by \$8.7 billion (a 22% increase) to reach \$48.4 billion as at 31 March 2000. The net growth in the Account balance is to a large extent the result of interest credits made.

## 2. Rates of Return

The following rates of return on the Account by plan year were calculated using the foregoing entries. These results differ somewhat from those shown in the actuarial reports as at 31 March 1999 on the Public Service and Royal Canadian Mounted Police pension plans even though the quarterly yields used to compute actual investment earnings are identical for all three plans. The main reasons for this discrepancy are that:

- (a) the uniform quarterly yields are applied only to the opening balance of the Accounts, thereby ignoring the cash flows during the quarter, and
- (b) the results below were computed assuming a uniform distribution of cash flows during the plan year by imputing to them one-half year of interest.

<u>Plan Year</u>	<u>Return</u>
1998	9.98%
1999	9.67%
2000	9.31%

### **3. Sources of Asset Data**

The Account entries shown in the table of the previous page were taken from the Public Accounts of Canada. In accordance with section 8 of the *Public Pensions Reporting Act*, the Office of the Comptroller General of Canada provided a certification of the assets of the plan as at 31 March 2000.

### **4. Account Projections**

The following table shows a projection of the Account over 16 years commencing 1 April 2000. This projection is based on the assumption that the surplus will be withdrawn in equal instalments over 15 fiscal years beginning on 30 September 2001.

**Account Projection with no Surplus at the End of 16 Years**  
(\$ billion)

Plan Year	Beginning Account Balance	Beginning Net Liabilities <sup>1</sup>	Beginning Surplus	Account Payments	Investment Earnings	Instalment Payments
2001	48.41	32.74	15.67	1.81	4.28	0.00
2002	50.88	33.80	17.08	1.87	4.28	1.89
2003	51.40	34.81	16.59	1.92	4.19	1.89
2004	51.77	35.75	16.02	1.98	4.12	1.89
2005	52.02	36.65	15.37	2.03	4.01	1.89
2006	52.11	37.48	14.63	2.08	3.89	1.89
2007	52.02	38.23	13.79	2.13	3.77	1.89
2008	51.77	38.91	12.86	2.18	3.66	1.89
2009	51.36	39.51	11.85	2.23	3.52	1.89
2010	50.75	40.04	10.71	2.27	3.38	1.89
2011	49.97	40.47	9.50	2.32	3.23	1.89
2012	48.99	40.81	8.18	2.36	2.99	1.89
2013	47.72	40.98	6.74	2.40	2.83	1.89
2014	46.26	41.04	5.22	2.44	2.68	1.89
2015	44.61	41.02	3.59	2.48	2.52	1.89
2016	42.75	40.91	1.84	2.52	2.35	1.89
2017	40.69	40.69	0.00			

<sup>1</sup> The net liabilities are the plan liabilities net of the present value of future contributions in respect of elected prior service. The plan year 2001 beginning net liabilities differ from those shown in the balance sheet page 9. These liabilities have been determined using new derived yields based on the assumption that the surplus will be withdrawn as described.

The following table is similar to the first except that the surplus remaining at the end of 16 years is equal to 10% of the liabilities.

**Account Projection**  
**With Surplus Equal to 10% of Liabilities at the End of 16 Years**  
(\$ billion)

Plan Year	Beginning Account Balance	Beginning Net Liabilities <sup>1</sup>	Beginning Surplus	Account Payments	Investment Earnings	Instalment Payments
2001	48.41	32.79	15.62	1.81	4.28	0.00
2002	50.88	33.86	17.02	1.87	4.29	1.73
2003	51.57	34.87	16.70	1.92	4.21	1.73
2004	52.14	35.82	16.32	1.98	4.15	1.73
2005	52.58	36.72	15.86	2.03	4.05	1.73
2006	52.88	37.55	15.33	2.08	3.94	1.73
2007	53.01	38.29	14.72	2.13	3.84	1.73
2008	53.00	38.97	14.03	2.18	3.74	1.73
2009	52.83	39.57	13.26	2.23	3.62	1.73
2010	52.50	40.08	12.42	2.27	3.50	1.73
2011	52.00	40.51	11.49	2.32	3.36	1.73
2012	51.32	40.84	10.48	2.36	3.13	1.73
2013	50.36	41.00	9.36	2.40	2.99	1.73
2014	49.23	41.06	8.17	2.44	2.86	1.73
2015	47.92	41.03	6.89	2.48	2.72	1.73
2016	46.43	40.92	5.51	2.52	2.57	1.73
2017	44.76	40.69	4.07			

---

<sup>1</sup> The net liabilities are the plan liabilities net of the present value of future contributions in respect of elected prior service. The plan year 2001 beginning net liabilities differ from those shown in the balance sheet page 9. These liabilities have been determined using new derived yields based on the assumption that the surplus will be withdrawn as described.

**Account Projection**  
**With Surplus Equal to 10% of Liabilities as at 31 March 2002**  
(\$ billion)

Plan Year	Beginning Account Balance	Beginning Net Liabilities <sup>1</sup>	Beginning Surplus	Account Payments	Investment Earnings	Instalment Payment
2001	48.41	32.84	15.57	1.81	4.28	0.00
2002	50.88	33.91	16.97	1.87	4.36	14.95
2003	38.42	34.93	3.49	1.92	3.16	0.00
2004	39.66	35.87	3.79	1.98	3.18	0.00
2005	40.86	36.77	4.09	2.03	3.18	0.00
2006	42.01	37.60	4.41	2.08	3.16	0.00
2007	43.09	38.35	4.74	2.13	3.15	0.00
2008	44.11	39.02	5.09	2.18	3.14	0.00
2009	45.07	39.62	5.45	2.23	3.12	0.00
2010	45.96	40.13	5.83	2.27	3.10	0.00
2011	46.79	40.55	6.24	2.32	3.06	0.00
2012	47.53	40.88	6.65	2.36	2.94	0.00
2013	48.11	41.04	7.07	2.40	2.90	0.00
2014	48.61	41.10	7.51	2.44	2.87	0.00
2015	49.04	41.07	7.97	2.48	2.83	0.00
2016	49.39	40.96	8.43	2.52	2.78	0.00
2017	49.65	40.73	8.92			

<sup>1</sup> The net liabilities are the plan liabilities net of the present value of future contributions in respect of elected prior service. The plan year 2001 beginning net liabilities differ from those shown in the balance sheet page 9. These liabilities have been determined using new derived yields based on the assumption that the surplus will be withdrawn as described.

## **Appendix 4 - Membership Data**

### **A- Sources of Membership Data**

The individual data in respect of contributors, pensioners, and eligible survivors were provided by the Department of National Defence as at 31 March 1999, and are shown in the summaries of data in this Appendix.

### **B- Validation of Membership Data**

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

- reconciling the membership data with the data used in the previous valuation report (see tables 4A, 4B and 4C, starting on page 39);
- comparing the membership with that published in the Report on the Administration of the Canadian Forces Superannuation Account for the year ending 31 March 1999;
- checking that the salary of a contributor is within a certain range reasonably consistent with the salary of that contributor in the previous valuation report;
- verifying that the pensionable service of a contributor is reasonably consistent with the attained age; and
- comparing the initial pension of each contributor retiring during the period with the expected pension based on the 31 March 1999 valuation data, taking into account any changes arising from service after 31 March 1996.

Based on the omissions and discrepancies identified by these and other tests, appropriate adjustments were made to the basic data after consulting with the Department of National Defence who provided them.

## C- Reconciliation of Membership Data

The following tables, derived from the basic data, shows pertinent statistics concerning contributors, pensioners, and survivors during the period from April 1996 to March 1999 inclusive.

**Table 4A**  
**Reconciliation of Contributors**

	Male			Female			Total
	Officers	Other Ranks	Total	Officers	Other Ranks	Total	
Contributors as at 31 March 1996	12,938	46,256	59,194	1,594	5,570	7,164	66,358
Data corrections <sup>1</sup>	296	(295)	1	37	(26)	11	12
New entrants <sup>2</sup>	1,270	6,017	7,287	376	807	1,183	8,470
Terminations							
Annuity benefits							
Death	(20)	(71)	(91)	(1)	(3)	(4)	(95)
Disabled 3A	(9)	(52)	(61)	(3)	(16)	(19)	(80)
Disabled 3B	(96)	(1,018)	(1,114)	(17)	(161)	(178)	(1,292)
Other <sup>3</sup>	(1,811)	(5,195)	(7,006)	(127)	(646)	(773)	(7,779)
Subtotal	(1,936)	(6,336)	(8,272)	(148)	(826)	(974)	(9,246)
Lump sum benefit							
Death	(6)	(34)	(40)	(1)	(3)	(4)	(44)
Disabled 3A	-	(11)	(11)	(1)	(4)	(5)	(16)
Disabled 3B	(39)	(186)	(225)	(17)	(42)	(59)	(284)
Other <sup>3</sup>	(1,155)	(3,719)	(4,874)	(256)	(577)	(833)	(5,707)
Subtotal	(1,200)	(3,950)	(5,150)	(275)	(626)	(901)	(6,051)
Total terminations	(3,136)	(10,286)	(13,422)	(423)	(1,452)	(1,875)	(15,297)
Contributors as at 31 March 1999	11,368	41,692	53,060	1,584	4,899	6,483	59,543

1 On this line, contributors who had other rank status on 31 March 1996 and who attained officer status between April 1996 and March 1999 are shown as officers rather than other ranks.

2 Excludes 1,416 contributors, entitled to a lump sum, who were released from the Forces during their year of entry.

3 Compulsory retirements because of age, promotion of economy or efficiency, misconduct, and all retirements for other reasons.

**Table 4B**

**Reconciliation of Pensioners**

	Male			Female			Total
	Officers	Other Ranks	Total	Officers	Other Ranks	Total	
<b>Retirement Pensioners<sup>1</sup></b>							
Entitled as at 31 March 1996	15,857	52,051	67,908	432	1,014	1,446	69,354
Data corrections	43	159	202	2	(2)	-	202
New entitlements	(1,811)	(5,195)	(7,006)	(127)	(646)	(773)	(7,779)
Terminations							
Deaths	(1,056)	(3,197)	(4,253)	(21)	(9)	(30)	(4,283)
Other <sup>2</sup>	(33)	(94)	(127)	(2)	(5)	(7)	(134)
Subtotal	(1,089)	(3,291)	(4,380)	(23)	(14)	(37)	(4,417)
Entitled as at 31 March 1999	16,622	54,114	70,736	538	1,644	2,182	72,918
<b>Disability Pensioners (3A)</b>							
Entitled as at 31 March 1996	287	3,923	4,210	15	28	43	4,253
Data corrections	6	36	42	-	1	1	43
New entitlements	9	52	61	3	16	19	80
Deaths	(38)	(454)	(492)	-	(1)	(1)	(493)
Entitled as at 31 March 1999	264	3,557	3,821	18	44	62	3,883
<b>Disability Pensioners (3B)</b>							
Entitled as at 31 March 1996	126	2,162	2,288	14	147	161	2,449
Data corrections	3	18	21	-	2	2	23
New entitlements	96	1,018	1,114	17	161	178	1,292
Terminations							
Deaths	(3)	(72)	(75)	(1)	(1)	(2)	(77)
Other <sup>2</sup>	-	(1)	(1)	-	-	-	(1)
Subtotal	(3)	(73)	(76)	(1)	(1)	(2)	(78)
Entitled as at 31 March 1999	222	3,125	3,347	30	309	339	3,686

1 Includes 81 former contributors as at 31 March 1999 whose pension benefits are deferred to age 60.

2 Includes re-enrolments in the regular force and transfers to other superannuation plans.



**Table 4C**

**Reconciliation of Survivors**

	<u>Widows</u>	<u>Widowers</u>	<u>Total</u>	<u>Children Under 18</u>	<u>Students (18 to 24)</u>	<u>Total</u>
Entitled as at 31 March 1996	16,741	27	16,768	602	444	1,046
Data corrections	236	3	239	(280)	64	(216)
New entitlements	3,417	10	3,427	163	23	186
Terminations	(1,514)	(1)	(1,515)	(4)	(8)	(12)
Entitled as at 31 March 1999	18,880	39	18,919	481	523	1,004

**Table 4D**

**Male Officers as at 31 March 1999  
Number of Contributors and  
Average Annual Earnings<sup>1</sup>**

Age Last Birthday	Completed Years of Pensionable Service								All Years of Service
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	
15-19	289 \$12,261	- -	- -	- -	- -	- -	- -	- -	289 \$12,261
20-24	744 \$17,450	300 \$32,962	- -	- -	- -	- -	- -	- -	1,044 \$21,907
25-29	265 \$30,250	945 \$47,779	274 \$52,202	- -	- -	- -	- -	- -	1,484 \$45,465
30-34	99 \$37,305	465 \$56,932	1,159 \$56,462	331 \$60,799	- -	- -	- -	- -	2,054 \$56,344
35-39	52 \$48,256	115 \$57,325	737 \$60,306	1,487 \$63,661	320 \$66,310	- -	- -	- -	2,711 \$62,498
40-44	30 \$56,647	25 \$60,475	119 \$64,623	493 \$68,134	891 \$69,142	234 \$71,923	- -	- -	1,792 \$68,597
45-49	10 \$50,235	11 \$65,373	20 \$65,863	53 \$69,447	252 \$70,563	678 \$72,669	151 \$76,796	- -	1,175 \$72,227
50-54	4 \$74,769	9 \$71,877	10 \$65,380	22 \$74,544	49 \$78,863	153 \$73,312	472 \$75,668	69 \$78,663	788 \$75,462
55-59	- -	- -	1 \$61,920	- -	3 \$74,988	2 \$130,861	8 \$80,849	17 \$80,913	31 \$82,933
All Ages	1,493 \$22,268	1,870 \$48,654	2,320 \$57,720	2,386 \$64,417	1,515 \$69,106	1,067 \$72,706	631 \$76,004	86 \$79,108	11,368 \$57,079

Average age last birthday: 35.8 years

Average pensionable service last anniversary: 14.9 years

Annualised pensionable payroll: \$648,874,855

**PBDA Information**

Average		Annual Reduction		CPP Reduction		
Number	Age	Service	Without Indexation	With Indexation	Without Indexation	With Indexation
100	44.1	23.3	\$739,296	\$792,692	\$150,856	\$161,681

<sup>1</sup> Earnings are pensionable earnings as defined in Note 1 of Appendix 2-D except that they are not adjusted in respect of the maximum level of earnings prescribed for income tax purposes and are also not limited to 35 years of service.

**Table 4E**

**Male Other Ranks as at 31 March 1999  
Number of Contributors and  
Average Annual Earnings<sup>1</sup>**

Age Last Birthday	Completed Years of Pensionable Service								All Years of Service
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	
15-19	382 \$22,596	- -	- -	- -	- -	- -	- -	- -	382 \$22,596
20-24	3,399 \$27,370	237 \$37,864	- -	- -	- -	- -	- -	- -	3,636 \$28,054
25-29	2,124 \$30,922	3,947 \$38,446	1,038 \$39,637	- -	- -	- -	- -	- -	7,109 \$36,372
30-34	523 \$33,220	1,665 \$38,613	6,764 \$40,152	1,193 \$41,655	- -	- -	- -	- -	10,145 \$39,719
35-39	185 \$33,410	265 \$38,738	2,410 \$40,439	7,674 \$42,249	1,530 \$44,414	- -	- -	- -	12,064 \$41,949
40-44	39 \$35,792	31 \$39,524	93 \$40,655	1,214 \$42,445	3,307 \$45,870	658 \$49,042	- -	- -	5,342 \$45,281
45-49	10 \$32,140	12 \$37,786	10 \$41,642	51 \$43,396	395 \$46,006	1,377 \$49,573	316 \$52,197	- -	2,171 \$48,979
50-54	1 \$38,988	4 \$48,642	2 \$53,568	5 \$41,335	12 \$47,149	98 \$49,200	648 \$52,137	69 \$53,963	839 \$51,780
55-59	- -	- -	- -	- -	- -	- -	- -	4 \$58,656	4 \$58,656
All Ages	6,663 \$28,914	6,161 \$38,492	10,317 \$40,176	10,137 \$42,208	5,244 \$45,459	2,133 \$49,392	964 \$52,157	73 \$54,220	41,692 \$40,059

Average age last birthday: 34.0 years

Average pensionable service last anniversary: 13.4 years

Annualised pensionable payroll: \$1,670,129,688

**PBDA Information**

Average		Annual Reduction		CPP Reduction		
Number	Age	Service	Without Indexation	With Indexation	Without Indexation	With Indexation
482	39.4	19.4	\$1,914,213	\$2,045,805	\$587,269	\$627,607

<sup>1</sup> Earnings are pensionable earnings as defined in Note 1 of Appendix 2-D except that they are not adjusted in respect of the maximum level of earnings prescribed for income tax purposes and are also not limited to 35 years of service.

**Table 4F**

**Female Officers as at 31 March 1999  
Number of Contributors and  
Average Annual Earnings<sup>1</sup>**

Age Last Birthday	Completed Years of Pensionable Service								All Years of Service
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	
15-19	115	-	-	-	-	-	-	-	115
	\$11,992	-	-	-	-	-	-	-	\$11,992
20-24	203	101	-	-	-	-	-	-	304
	\$15,691	\$34,622	-	-	-	-	-	-	\$21,981
25-29	56	186	42	-	-	-	-	-	284
	\$32,075	\$46,074	\$51,284	-	-	-	-	-	\$44,084
30-34	28	80	164	31	-	-	-	-	303
	\$40,720	\$58,694	\$56,483	\$59,173	-	-	-	-	\$55,886
35-39	12	23	89	124	12	-	-	-	260
	\$46,199	\$58,397	\$60,592	\$61,681	\$60,118	-	-	-	\$60,231
40-44	9	11	26	75	53	7	-	-	181
	\$48,127	\$56,884	\$63,818	\$64,973	\$63,857	\$71,409	-	-	\$63,400
45-49	3	2	3	23	39	27	-	-	97
	\$49,680	\$63,192	\$60,784	\$66,837	\$67,563	\$69,770	-	-	\$67,152
50-54	2	2	1	3	11	13	4	-	36
	\$58,752	\$81,324	\$59,916	\$78,544	\$66,174	\$69,999	\$73,510	-	\$69,657
55-59	-	-	1	-	2	-	1	-	4
	-	-	\$67,752	-	\$66,474	-	\$142,400	-	\$85,775
All Ages	428	405	326	256	117	47	5	-	1,584
	\$20,455	\$46,963	\$57,605	\$63,003	\$64,971	\$70,077	\$87,288	-	\$46,726

Average age last birthday: 31.5 years

Average pensionable service last anniversary: 9.9 years

Annualised pensionable payroll: \$74,014,285

**PBDA Information**

Average		Annual Reduction		CPP Reduction		
Number	Age	Service	Without Indexation	With Indexation	Without Indexation	With Indexation
1	41.0	16.0	\$2,831	\$3,013	\$633	\$673

<sup>1</sup> Earnings are pensionable earnings as defined in Note 1 of Appendix 2-D except that they are not adjusted in respect of the maximum level of earnings prescribed for income tax purposes and are also not limited to 35 years of service.

**Table 4G**

**Female Other Ranks as at 31 March 1999  
Number of Contributors and  
Average Annual Earnings<sup>1</sup>**

Age Last Birthday	Completed Years of Pensionable Service								All Years of Service
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	
15-19	50	-	-	-	-	-	-	-	50
	\$22,359	-	-	-	-	-	-	-	\$22,359
20-24	310	18	-	-	-	-	-	-	328
	\$26,477	\$38,212	-	-	-	-	-	-	\$27,121
25-29	203	503	127	-	-	-	-	-	833
	\$30,502	\$38,289	\$39,041	-	-	-	-	-	\$36,506
30-34	104	298	753	137	-	-	-	-	1,292
	\$32,516	\$38,357	\$39,525	\$41,064	-	-	-	-	\$38,855
35-39	61	86	358	928	121	-	-	-	1,554
	\$33,994	\$37,894	\$39,604	\$41,527	\$43,623	-	-	-	\$40,750
40-44	13	28	38	216	330	24	-	-	649
	\$33,947	\$38,156	\$39,757	\$41,429	\$44,391	\$47,046	-	-	\$42,754
45-49	3	5	11	13	62	73	2	-	169
	\$34,708	\$37,853	\$38,948	\$40,861	\$44,549	\$47,841	\$55,242	-	\$45,077
50-54	-	-	-	4	3	8	9	-	24
	-	-	-	\$41,412	\$43,260	\$46,577	\$49,260	-	\$46,308
All Ages	744	938	1,287	1,298	516	105	11	-	4,899
	\$28,923	\$38,267	\$39,501	\$41,454	\$44,223	\$47,563	\$50,348	-	\$38,870

Average age last birthday: 33.9 years

Average pensionable service last anniversary: 12.3 years

Annualised pensionable payroll: \$190,425,684

**PBDA Information**

Number	Average		Annual Reduction		CPP Reduction	
	Age	Service	Without Indexation	With Indexation	Without Indexation	With Indexation
5	39.2	17.8	\$19,675	\$20,247	\$6,265	\$6,447

<sup>1</sup> Earnings are pensionable earnings as defined in Note 1 of Appendix 2-D except that they are not adjusted in respect of the maximum level of earnings prescribed for income tax purposes and are also not limited to 35 years of service.

**Table 4H**

**Retirement Pensioners as at 31 March 1999**

Age Last Birthday	Number			Annual Pension <sup>1</sup>	
	Male	Female	Total	Without Indexation	With Indexation
25-29	2	1	3	\$16,965	-
30-34	339	86	425	\$2,889,643	-
35-39	1,863	405	2,268	\$24,439,016	-
40-44	4,648	661	5,309	\$84,339,986	-
45-49	4,808	345	5,153	\$99,251,974	-
50-54	7,897	216	8,113	\$176,136,505	-
55-59	10,366	146	10,512	\$52,589,480	\$188,475,322
60-64	11,388	90	11,478	-	\$260,883,457
65-69	11,051	75	11,126	-	\$210,264,193
70-74	7,939	59	7,998	-	\$151,848,218
75-79	6,680	33	6,713	-	\$135,228,050
80-84	2,975	48	3,023	-	\$55,855,132
85-89	683	13	696	-	\$12,009,675
90-94	93	4	97	-	\$1,275,573
95-99	3	-	3	-	\$21,997
100 Up	1	-	1	-	\$5,277
All Ages	70,736	2,182	72,918	\$439,663,569	\$1,015,866,894

**Average age last birthday**

At 31 March 1999: 61.0 years

At retirement: 45.5 years

Average annual pension: \$19,961

<sup>1</sup> Amounts of pension take into account the integration of the CFSA with the CPP.

**Table 4I**

**Retirement Pensioners as at 31 March 1999  
Reduction in Annual Pension due to  
Pension Benefit Division Act**

Age Last Birthday	Number			Annual Pension <sup>1</sup>	
	Male	Female	Total	Without Indexation	With Indexation
30-34	1	-	1	\$2,087	-
35-39	40	1	41	\$118,920	-
40-44	154	1	155	\$706,499	-
45-49	171	1	172	\$1,046,119	-
50-54	260	-	260	\$1,852,460	-
55-59	250	1	251	\$426,499	\$7,484
60-64	160	-	160	-	\$9,973
65-69	84	-	84	-	\$9,921
70-74	28	-	28	-	\$10,299
75-79	6	-	6	-	\$9,282
80-84	2	-	2	-	\$5,901
All Ages	1,156	4	1,160	\$4,152,584	\$4,663,458

**Average age last birthday**

At 31 March 1999: 53.5 years

At retirement: 44.7 years

Average annual reduction: \$7,600

<sup>1</sup> Amounts of pension take into account the integration of the CFSA with the CPP.

**Table 4J**

**Disability (3A) Pensioners as at 31 March 1999**

Age Last Birthday	Number			Annual Pension <sup>1</sup> With Indexation
	Male	Female	Total	
30-34	10	2	12	\$80,407
35-39	37	12	49	\$371,066
40-44	58	14	72	\$698,733
45-49	40	10	50	\$501,985
50-54	151	8	159	\$1,259,828
55-59	377	-	377	\$3,305,275
60-64	657	4	661	\$6,092,918
65-69	1,025	5	1,030	\$10,095,509
70-74	784	3	787	\$8,405,996
75-79	521	3	524	\$6,393,246
80-84	139	-	139	\$1,729,406
85-89	20	1	21	\$248,866
90-94	<u>2</u>	<u>-</u>	<u>2</u>	<u>\$15,908</u>
All Ages	3,821	62	3,883	\$39,199,143

**Average age last birthday**

At 31 March 1999: 66.4 years

At retirement: 39.2 years

Average annual pension: \$10,095

---

<sup>1</sup> Amounts of pension take into account the integration of the CFSA with the CPP.



**Table 4K**

**Disability (3A) Pensioners as at 31 March 1999**  
**Reduction in Annual Pension due to**  
***Pension Benefit Division Act***

Age Last <u>Birthday</u>	<u>Number</u>			Annual Pension <sup>1</sup> <u>With Indexation</u>
	<u>Male</u>	<u>Female</u>	<u>Total</u>	
40-44	1	-	1	\$5,341
45-49	-	-	-	-
50-54	-	-	-	-
55-59	5	-	5	\$5,394
60-64	3	-	3	\$4,992
65-69	7	-	7	\$4,228
70-74	<u>3</u>	<u>-</u>	<u>3</u>	<u>\$6,260</u>
All Ages	19	-	19	\$95,663

**Average age last birthday**

At 31 March 1999: 63.1 years

At retirement: 39.4 years

Average annual reduction: \$5,035

---

<sup>1</sup> Amounts of pension take into account the integration of the CFSA with the CPP.

**Table 4L**

**Disability (3B) Pensioners as at 31 March 1999**

Age Last Birthday	Number			Annual Pension <sup>1</sup>	
	Male	Female	Total	Without Indexation	With Indexation
25-29	4	3	7	-	\$52,718
30-34	137	23	160	-	\$1,410,984
35-39	557	117	674	\$272,373	\$7,190,698
40-44	608	113	721	\$821,282	\$9,074,569
45-49	538	52	590	\$1,370,264	\$8,033,670
50-54	613	26	639	\$2,619,883	\$9,613,819
55-59	515	2	517	\$2,228,146	\$7,741,575
60-64	282	3	285	-	\$6,216,886
65-69	84	-	84	-	\$1,644,765
70-74	8	-	8	-	\$202,186
75-79	-	-	-	-	-
80-84	1	-	1	-	\$14,462
All Ages	3,347	339	3,686	\$7,311,948	\$51,196,332

**Average age last birthday**

At 31 March 1999: 47.4 years

At retirement: 40.3 years

Average annual pension: \$15,873

<sup>1</sup> Amounts of pension take into account the integration of the CFSA with the CPP.

**Table 4M**

**Disability (3B) Pensioners as at 31 March 1999**  
**Reduction in Annual Pension due to**  
***Pension Benefit Division Act***

Age Last <u>Birthday</u>	Number			Annual Pension <sup>1</sup>	
	<u>Male</u>	<u>Female</u>	<u>Total</u>	<u>Without Indexation</u>	<u>With Indexation</u>
30-34	3	-	3	-	\$1,574
35-39	21	-	21	-	\$3,740
40-44	13	-	13	-	\$4,951
45-49	10	-	10	-	\$5,810
50-54	13	-	13	\$14,925	\$5,776
55-59	10	-	10	\$8,674	\$6,741
60-64	<u>4</u>	<u>-</u>	<u>4</u>	<u>-</u>	<u>\$9,363</u>
All Ages	74	-	74	\$23,599	\$385,693

**Average age last birthday**

At 31 March 1999: 45.6 years

At retirement: 40.4 years

Average annual reduction: \$5,531

<sup>1</sup> Amounts of pension take into account the integration of the CFSA with the CPP.

**Table 4N**

**Surviving Spouses as at 31 March 1999**

<u>Age Last Birthday</u>	<u>Number</u>	<u>Annual Allowance</u> <sup>1</sup>
24-29	1	\$3,932
25-29	12	\$41,022
30-34	65	\$265,194
35-39	135	\$705,326
40-44	205	\$1,337,486
45-49	317	\$2,524,040
50-54	639	\$5,730,688
55-59	1,232	\$10,955,331
60-64	2,132	\$18,133,417
65-69	2,977	\$24,731,050
70-74	3,866	\$33,135,952
75-79	4,260	\$36,671,726
80-84	2,183	\$18,168,415
85-89	723	\$5,630,036
90-94	145	\$991,349
95-99	<u>27</u>	<u>\$149,324</u>
All Ages	18,919	\$159,174,288

**Average age last birthday**

At 31 March 1999: 70.3 years

At death of member: 58.3 years

Average annual allowance: \$8,413

---

<sup>1</sup> 39 of the surviving spouses are widowers.

## **Appendix 5 - Methodology**

### **A- Assets**

The assets of the plan consist essentially of the recorded balance in the Canadian Forces Superannuation Account, which forms part of the Accounts of Canada. These assets are shown at the book value of the underlying notional bond portfolio described on page 32. For consistency, both the normal costs for plan year 2001 and the liabilities are determined using the projected yields, described in Appendix 6, that fully reflect the earning power of the assets. If a market value approach had been taken, the resulting higher asset value would have been largely offset by the higher liabilities attributable to discounting at market new money interest rates, which were lower than the projected yields assumed for this valuation.

The only other plan asset consists of the discounted value of future member contributions, and government credits in respect of prior service elections. There are two changes in methodology from the previous valuation, as follows.

- A discount rate of 6.0% per annum is used. The rate previously used was the projected yield on the Account.
- All future government credits were previously assumed to be 373% of member contributions. In this valuation, the government is assumed to match member contributions.

### **B- Normal Costs**

The projected accrued benefit actuarial cost method (also known as the projected unit credit method) was used to compute normal costs. Under this method, the normal cost computed in respect of a given year corresponds to the value, discounted in accordance with the projected yields described in section D below and shown on page 59, of all future benefits considered to accrue in respect of that year's service. Consistent with this cost method, pensionable earnings are projected up to retirement using the assumed annual increases in average pensionable earnings (including seniority and promotional increases). The method used for projecting future employment earnings in excess of the prescribed yearly maximum pensionable earnings is described in section C-2 below.

### **C- Liabilities**

#### **1. Contributors**

Consistent with the projected accrued benefit actuarial cost method employed to estimate normal costs, the plan's liabilities in respect of contributors as at the valuation date correspond to the value, discounted in accordance with the projected yields on the Account described in D below and shown on page 59, of all future benefits accrued as at that date in respect of all previous years' service.

## 2. Salary Cap for Active Contributors

A yearly maximum salary cap is now prescribed for *Canadian Forces Superannuation Act* purposes and this salary cap will limit benefits earned from May 1995 onward. The formula for calculating the prescribed yearly salary cap is:

$$\left( \frac{\mathbf{A} - (.013 \times \mathbf{B})}{.02} \right) + \mathbf{B} \quad ; \text{ rounded to the next highest } \$100$$

where **A** is the defined benefit maximum as per the *Income Tax Act* (currently fixed at \$1,722.22 until 2005, and then increasing in line with the Industrial Aggregate),

and **B** is the Year's Maximum Pensionable Earnings for the CPP.

For calendar year 2001, the prescribed yearly salary cap is \$99,600, which is obtained as

$$\left( \frac{\$1,722.22 - (.013 \times \$38,300)}{.02} \right) + \$38,300$$

The cost effect of the salary cap is applied as an offset to the liabilities and normal costs calculated.

## 3. Pensioners and Survivors

Consistent with accepted actuarial practice and standards, the plan's liabilities as at the valuation date in respect of pensioners (including deferred annuitants) and survivors correspond to the value, using the projected yields described in section D below and shown on page 59, of all future benefits.

### D- Projected Yields

The projected yields (shown on page 59) assumed in computing the present value of benefits involved in estimating the liabilities specified in sections B and C above are the projected annual yields on the combined book value of the Superannuation Accounts of the pension plans established under the *Public Service, Canadian Forces, and RCMP Superannuation Acts*. The normal costs are based on the expected Fund yields shown on page 59.

The projected Account yields were determined by an iterative process involving the actual investment earnings on the combined existing assets of the three Accounts as at the valuation date, the assumed future new money interest rates (also shown on page 59), and all future expected benefits payable in respect of all pension entitlements accrued up to 31 March 2000.

Because interest is neither charged nor credited to any cash flow during a quarter, we have made a further minor adjustment of both 0.03% per annum up to and including plan year 2015 and 0.04% per annum thereafter to the projected yields on the Account. Note that the column entitled “Yield Projected on Account” in the table of page 59 includes this adjustment. This is a change in methodology from the previous report.

In the previous report, the Account yields were determined using the open-group approach, meaning that all expected future contributions (including those of future new entrants) to the plans were taken into account. As a result of the new pension Fund commencing 1 April 2000, the open-group approach is no longer appropriate.

#### **E- Membership Data**

For valuation purposes, individual data on each member were used.

The member data shown in Appendix 4 on page 38 were provided as at 31 March 1999, which is one year earlier than the valuation date of this report. These data were accordingly projected to the 31 March 2000 valuation date using the demographic assumptions of the current valuation and the actual economic experience (1.5% indexation increase for pensioners and general pay increases of 11.7% and 6.9% for Officers and Other Ranks respectively) for the relevant one-year projection period.

## Appendix 6 - Economic Assumptions

### A- Key Economic Assumptions

The following key economic assumptions are required for valuation purposes:

#### 1. Level of Inflation

Given the prospects of stable, moderate inflation for the foreseeable future and the average Canadian experience over the last 75<sup>1</sup> years (3.16% per annum), the ultimate level of inflation was assumed at 3% per annum. Current lower levels of inflation were assumed to trend to 3% per annum over a fifteen-year select period.

#### 2. Real Increases in Average Earnings

The ultimate productivity rate (i.e. real increase in average employment earnings in excess of inflation) was assumed at 1% per annum. This assumed rate lies about midway between the average Canadian experience of the past 25<sup>1</sup> years (0.32% per annum) and 75<sup>1</sup> years (1.48% per annum). Low current real increases in average earnings were assumed to rise gradually over a fifteen-year select period to reach an ultimate level of 1% per annum.

#### 3. Real Rate of Return on Long-Term Government of Canada Bonds

The ultimate real rate of return on long-term Government of Canada bonds was assumed at 3% per annum based on the average experience of the last 75<sup>1</sup> years (2.65% per annum).

#### 4. Real Rate of Return on the Canadian Forces Pension Fund

On the basis of the Fund holding a diversified mixture of assets, the real return on the Fund was assumed at 4.25% per annum. This real rate was derived on the basis of the average experience over 25<sup>1</sup> years for diversified portfolios of Canadian pension plans (7.01% per annum) and current real rate of return assumptions used in actuarial reports of other Canadian pension plans.

---

1 For the period ending December 1999, according to the Canadian Institute of Actuaries Report on Canadian Economic Statistics 1924-1999. All figures are geometric averages, which are slightly smaller than the corresponding arithmetic averages. For example, the 75-year average inflation rate of 3.16% would be 3.25% if calculated arithmetically.



Note that all of the real rates of return referred to in this report are actually real-return differentials, i.e., the difference between the effective annual rate of return on investments and the rate of increase in prices. This differs from the technical definition of the real rate of return, which, in the case of the ultimate Fund assumption, would be

$$\left( \frac{1.0725}{1.03} \right) - 1 = 4.126\% \text{ rather than } 4.25\%.$$

Period of Years Ending 1999	25	50	75
Level of Inflation	5.02%	4.16%	3.16%
Real <sup>1</sup> Increases in Average Earnings	0.32%	1.45%	1.48%
Real <sup>1</sup> Return on Long-Term Canada Bonds	5.33%	2.24%	2.65%
Average Real <sup>1</sup> Return on Diversified Portfolios	7.01%	4.65% <sup>2</sup>	N/A

## B- Derived Economic Assumptions

The following assumptions were derived from the key economic assumptions:

### 1. Projected Yields on the Canadian Forces Superannuation Account

These yields are required for the computation of present values of benefits to determine the plan's liabilities. The methodology used to determine the projected yields on the Account is described on page 54.

### 2. Projected Yields on the Canadian Forces Pension Fund

These yields are required for the computation of present values of benefits to determine the plan's normal costs and they are derived from the assumed future level of inflation and the real return on the Fund. The assumed yield of 6.25% per annum for fiscal year 2002 is expected to increase gradually to 7.25% per annum by fiscal year 2015.

### 3. Increase in the Year's Maximum Pensionable Earnings (YMPE)

The YMPE is involved in the valuation process because the plan is integrated with the Canada Pension Plan. The assumed increase in the YMPE for a given year was derived, in accordance with the *Canada Pension Plan Act*, to correspond to the increase in the assumed Industrial Aggregate of Average Weekly Earnings over successive 12-month periods ending on 30 June.

<sup>1</sup> These real rates are calculated after the level of inflation is removed geometrically.

<sup>2</sup> Averaged over the last 40 years.

#### **4. Increase in 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 indexation formula described on page 24, which relates to the assumed Consumer Price Index increases over successive 12-month periods ending on 30 September.

#### **C- Margin Against Adverse Fluctuations**

The economic assumptions used in this valuation contain a measure of prudence, as is the norm for other pension plans in Canada.

## D- Summary of Key and Derived Economic Assumptions

Plan Year	Inflation		Increase in Employment Earnings			Interest		
	CPI Increase	Pension Indexing <sup>2</sup>	Industrial Aggregate	YMPE	Average Pensionable Earnings <sup>3</sup>	Interest on New Money	Yield <sup>1</sup> Projected on Account	Yield Projected on Fund
	%	%	%	%	%	%	%	%
2001 <sup>4</sup>	<b>2.71</b>	<b>2.5</b>	<b>2.6</b>	<b>1.9</b>	<b>4.60/6.50</b>	<b>5.2</b>	9.01	1.52
2002	2.0	2.0	2.1	2.1	2.5	5.0	8.72	6.25
2003	2.0	2.0	2.2	2.2	2.6	5.0	8.41	6.25
2004	2.0	2.0	2.3	2.3	2.6	5.0	8.19	6.25
2005	2.0	2.0	2.4	2.4	2.7	5.0	7.92	6.25
2006	2.0	2.0	2.5	2.5	2.8	5.0	7.65	6.25
2007	2.1	2.1	2.7	2.7	2.9	5.1	7.42	6.35
2008	2.2	2.2	2.9	2.9	3.0	5.2	7.23	6.45
2009	2.3	2.3	3.1	3.1	3.2	5.3	7.02	6.55
2010	2.4	2.4	3.3	3.3	3.3	5.4	6.82	6.65
2011	2.5	2.5	3.5	3.5	3.5	5.5	6.62	6.75
2012	2.6	2.6	3.6	3.6	3.6	5.6	6.28	6.85
2013	2.7	2.7	3.7	3.7	3.7	5.7	6.11	6.95
2014	2.8	2.8	3.8	3.8	3.8	5.8	5.99	7.05
2015	2.9	2.9	3.9	3.9	3.9	5.9	5.88	7.15
2016	3.0	3.0	4.0	4.0	4.0	6.0	5.75	7.25
2017	3.0	3.0	4.0	4.0	4.0	6.0	5.66	7.25
2018	3.0	3.0	4.0	4.0	4.0	6.0	5.60	7.25
2019	3.0	3.0	4.0	4.0	4.0	6.0	5.61	7.25
2020	3.0	3.0	4.0	4.0	4.0	6.0	5.63	7.25
2021	3.0	3.0	4.0	4.0	4.0	6.0	5.63	7.25
2022	3.0	3.0	4.0	4.0	4.0	6.0	5.65	7.25
2023	3.0	3.0	4.0	4.0	4.0	6.0	5.68	7.25
2024	3.0	3.0	4.0	4.0	4.0	6.0	5.71	7.25
2025	3.0	3.0	4.0	4.0	4.0	6.0	5.76	7.25
2026	3.0	3.0	4.0	4.0	4.0	6.0	5.80	7.25
2027	3.0	3.0	4.0	4.0	4.0	6.0	5.84	7.25
2028	3.0	3.0	4.0	4.0	4.0	6.0	5.88	7.25
2029	3.0	3.0	4.0	4.0	4.0	6.0	5.92	7.25
2030	3.0	3.0	4.0	4.0	4.0	6.0	5.95	7.25
2031	3.0	3.0	4.0	4.0	4.0	6.0	5.97	7.25
2032	3.0	3.0	4.0	4.0	4.0	6.0	6.00	7.25
2033	3.0	3.0	4.0	4.0	4.0	6.0	6.02	7.25
2034	3.0	3.0	4.0	4.0	4.0	6.0	6.03	7.25
2035	3.0	3.0	4.0	4.0	4.0	6.0	6.04	7.25
2036	3.0	3.0	4.0	4.0	4.0	6.0	6.04	7.25

1 Includes the adjustment described in section 5-D on page 55.

2 Assumed to be effective as at 1 January.

3 Assumed to be effective as at 1 April and exclusive of seniority and promotional increases.

4 Bold figures denote actual experience.

## Appendix 7 - Demographic Assumptions

### A- Termination of Service

Except where otherwise noted, all demographic assumptions were determined from the plan's own experience as was done in the past. Where applicable, assumptions of the previous valuation were updated to reflect the available valuation experience of April 1996 to March 1999. Assumptions related to causes of termination of service are described in the following table:

Termination Cause	Rate Basis	Comments	Table
Terminations (withdrawals or retirement), Other than for Disability, with less than 20 Years of Service	Service, Rank, Sex	Giving partial credibility to the experience data of the 1998 and 1999 plan years, (the experience data for plan year 1997 was excluded as it was deemed to fall under the Force reduction plan) the rates were modified from the previous valuation as follows:	7B
		Male Officers - 25% increase	
		Male Other Ranks - 18% increase	
		Female Officers - 10% increase	
		Female Other Ranks - 7% increase	
Pensionable termination with 20 or more years of service	Service, Rank	Giving partial credibility to the experience data of the 1998 and 1999 plan years, (the experience data for plan year 1997 was excluded as it was deemed to fall under the Force reduction plan) the rates were modified from the previous valuation as follows:	7D
		Officers - 7% increase	
		Other Ranks - 3% increase	
Disability	Occupation Age, Rank, Sex	In 1991, the disability benefit provisions were made the same irrespective of the type of disability releases, either 3A (any occupation) or 3B (own occupation). Since it is expected that the mortality experience of 3B disabled pensioner be similar to healthy pensioner, we recognized for the first time that disability incidence differs between the 3A and 3B causes of release.	7F
		Overall, the new incidence rates are marginally higher than in the previous valuation	
Mortality	Age, Rank, Sex, Year	Rates deemed applicable at the contributor ages are generally close to those projected in the previous valuation. For the first time, different mortality rates were assumed between male Officers and Other Ranks	7G
		Longevity improvements were based on a 24-year select period with an ultimate longevity improvement of 0.5% at all ages below age 101.	7I

**B- Assumptions related to benefits**

Benefit	Related Assumptions	Rate Basis	Comments	Table
<b>Pension</b>	Mortality	Age, Rank, Sex, Year	On the basis of the plan's experience, the rates assumed in the previous valuation for 1996 were maintained but projected three years to account for longevity improvements from 1996 to 1999. Furthermore, a 50% ceiling rate was established up to age 114 and the table was closed at age 115.	7G
			Longevity improvements as mortality in service.	7I
	Proportion of contributors with 10 to 19 years of service electing an immediate annuity	Service, Rank	Giving partial credibility to the experience data of the 1998 and 1999 plan years, the proportions were set at approximately 80% greater than the proportions assumed in the previous report for both Officers and Other Ranks.	7C
	Reduction factors applicable to immediate annuity for Contributors terminating with 20 or more years of service	Service, Rank	Giving partial credibility to the experience of the 1998 and 1999 plan years, the reductions factors were modified from the previous valuation as follows:  Officers - slightly smaller reduction factors  Other Ranks - factors are 2% smaller on average	7E
<b>Disability pension</b>	Disabled life mortality (3A release)	Age, Rank Sex, Year	On the basis of the plan's experience, the rates assumed in the previous valuation for 1996 were maintained but projected three years to account for longevity improvements from 1996 to 1999. For the first time, the same mortality rates were assumed for female Officers and Other Ranks. Additionally, the mortality rates from age 75 slowly grade to the healthy pensioner mortality over a period of 15 years.	7H
			Longevity improvements as mortality in service.	7I
			Canada Pension Plan/ Disability benefit payable immediately.	
	Disabled life mortality (3B release)	Age, Rank Sex, Year	These members have been released under cause 3B, and are unable to perform the duties of their own occupations. The mortality assumption for these pensioners is set equal to the mortality assumption of healthy pensioners.	7G
		Longevity improvements as mortality in service.	7I	
		Canada Pension Plan/ Disability benefit deferred to age 65.		

<b>Benefit</b>	<b>Related Assumptions</b>	<b>Rate Basis</b>	<b>Comments</b>	<b>Table</b>	
<b>Surviving Spouse Annual Allowance</b>	Probability that a member will have an eligible surviving spouse at death	Member's Age, Sex	Giving partial credibility to experience data of the 1997, 1998 and 1999 plan years, both male and female probabilities were unchanged from the previous report.  This benefit is being extended to same-sex couples. However, the probabilities were not revised in this report.	7J	
	Average age of spouse at death of member	Member's Age, Sex	Giving partial credibility to the experience data of the 1997, 1998 and 1999 plan years, the average age of a male's spouse was modified slightly whereas the average age of a female's spouse was unchanged from the previous report.		
	Spouse mortality	Member's Age, Sex, Year	Widow	Widow mortality has been understated in previous years. Giving partial credibility to the experience data of the 1997, 1998 and 1999 plan years, the revised rates were increased by 20%.	7G
			Widower	On the basis of the plan's experience, the rates assumed in the previous valuation for 1996 were maintained but projected three years to account for longevity improvements from 1996 to 1999.	
			Longevity improvements as mortality in service.	7I	
<b>Surviving children Annual allowance</b>	Average number of children at death of member	Member's Age, Sex	No change in rates from the previous valuation.	7K	
	Average age of children at death of member	Member's Age, Sex	No change in rates from the previous valuation.		
	Proportion of children remaining eligible for allowances over age 17	Age of Child	These proportions have been changed to those reported in the actuarial report as at 31 March 1999 on the pension plan for the Public Service of Canada	7L	

## **C- Other Demographic Assumptions**

Considering their negligible effect on liabilities and normal costs, the following rates were assumed to be zero:

- disability incidence rates for non-disabled pensioners; and
- recovery rates for disabled pensioners.

### **1. Seniority and Promotional Salary Increases**

Based on the experience for plan years 1997 to 1999, the rates of both Officers and Other Ranks were revised. The rates for Officers and other Ranks are respectively 6% and 8% lower than the previous ones. For the first time membership data included historical annual salary information that indicated a substantial increase in salary of Officers at around duration four. Most Officers are paid a fairly low annual salary while attending school and upon graduation salaries are increased significantly as these Officers become fulltime members of the Canadian Forces.

### **2. New Members**

It was assumed that the distribution of new members by age, sex and initial salary rate would be the same as that of members with less than one year of service at the valuation date. The number of new entrants was assumed to be equal to the year's number of terminations.

## **D- Other Assumptions**

### **1. Pension Benefits Division/Optional Survivor Benefit / Leave Without Pay**

Pension benefits divisions have almost no effect on the valuation results because the plan liabilities are reduced on average by roughly the amount paid to the credit of the former spouse. Consequently, no future pension benefits divisions were assumed in estimating normal costs and liabilities. However, past pension benefits divisions were fully reflected in liabilities.

Two other provisions, namely the optional survivor benefit and the suspension of membership while on leave without pay, were also treated like pension benefits divisions for the same reason.

### **2. Minimum Death Benefit**

This valuation does not take into account the minimum death benefit, described in Note 18 of page 31, in respect of deaths occurring after retirement. The resulting understatement of accrued liability and normal cost is not material because a majority of the relatively few pensioners who die in the early years of retirement do leave an eligible survivor.

### 3. Maximum Pensionable Earnings (MPE) and Survivor Benefits

The tax-related MPE limit of \$99,600 prescribed for the 2001 calendar year was assumed to rise very slowly until 1 January 2005, and to rise thereafter in accordance with the assumed increase in the Industrial Aggregate of Average Weekly Earnings, as prescribed under the current legislation.

In accordance with the *Income Tax Act*, the survivor benefits have been limited to  $\frac{2}{3}$  of the member's reduced pension. This has the financial effect of reducing the liabilities and the normal cost. The excess is now payable from the Retirement Compensation Arrangements Account.

### 4. Administrative Expenses

From 1 April 2000 administrative expenses are to be charged to the plan. It is estimated that expenses will be 0.3% of pensionable payroll and that in the first plan year the Account will be charged with 99% of the total expenses. The percentage charged to the Account is expected to decrease by an annual factor of

<u>Plan Years</u>	<u>Percentage</u>
2001 to 2010	2 %
2011 to 2020	4 %
2021 to 2030	5 %
2031 to 2040	6 %
2041 to 2050	7 %
2051 onward	8 %

The future expenses expected to be charged to the Account have been capitalised<sup>1</sup> and shown as a liability on the balance sheet, whereas the expenses to the Fund have been added to the normal cost for the year being expensed.

### 5. Funding of Elected Prior Service

The annual government credit to the Account in respect of prior service elections are assumed to be 100% of the corresponding contribution made by the contributors making the elections.

### 6. Outstanding Terminations

Payments owing to former contributors as at 31 March 2000 were ignored in this valuation. The consequent understatement of liability is negligible because there were very few such cases and the average amounts owing were modest.

---

<sup>1</sup> At 6% per annum.



**Table 7A**

**Assumed Annual Seniority and Promotional Salary Increases**

<u>Service</u> <sup>1</sup>	<u>Officer</u>	<u>Other Rank</u>	<u>Service</u> <sup>1</sup>	<u>Officer</u>	<u>Other Rank</u>
	(%)	(%)		(%)	(%)
0	4.0	17.4	20	1.2	1.1
1	6.2	15.6	21	1.2	1.1
2	13.6	13.3	22	1.1	1.1
3	52.3	10.5	23	1.0	1.1
4	19.4	7.7	24	0.9	1.1
5	11.7	5.4	25	0.9	1.0
6	7.9	3.7	26	0.8	1.0
7	5.9	2.6	27	0.7	1.0
8	4.9	2.0	28	0.7	1.0
9	4.2	1.5	29	0.6	0.9
10	3.7	1.2	30	0.5	0.9
11	3.3	1.0	31	0.5	0.9
12	2.9	0.9	32	0.5	0.8
13	2.5	0.9	33	0.5	0.8
14	2.2	0.9	34	0.5	0.8
15	2.0	1.0	35	0.5	0.7
16	1.8	1.0	36	0.5	0.6
17	1.6	1.1	37	0.5	0.5
18	1.5	1.1	38	0.5	0.4
19	1.3	1.1	39+	0.0	0.0

<sup>1</sup> Expressed in completed years calculated at the beginning of the plan year.

**Table 7B**

**Assumed Annual Rates of Termination for Contributors  
With Less Than 19 Years of Service<sup>1</sup>  
(per 1,000 people)**

<u>Service<sup>2</sup></u>	<u>Officers</u>		<u>Other Ranks</u>	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
0	59	94	42	56
1	52	73	54	60
2	46	57	119	81
3	40	50	87	90
4	35	51	70	87
5	35	61	60	82
6	41	76	54	75
7	53	89	46	67
8	64	93	35	61
9	64	88	33	60
10	54	78	32	58
11	46	68	27	47
12	39	53	23	37
13	32	41	16	31
14	26	31	14	26
15	22	26	13	20
16	20	20	11	15
17	17	18	11	13
18	13	17	11	13

---

1 Effectively 19 years of service plus one day.

2 Expressed in completed years calculated at the beginning of the plan year.

**Table 7C**

**Assumed Proportions of Contributors  
With 10 to 19 Years of Service,  
Electing an Immediate Reduced Annuity  
(per 1,000 people)**

<u>Service</u> <sup>1</sup>	<u>Officers</u>	<u>Other Ranks</u>
9	30	13
10	42	23
11	57	37
12	77	57
13	106	86
14	147	128
15	210	189
16	307	281
17	455	424
18	675	648
19	1,000	1,000

---

<sup>1</sup> Expressed in completed years calculated at the beginning of the plan year.

**Table 7D**

**Assumed Rates of Termination for Contributors  
With 19 or More Years of Service<sup>1</sup>  
(per 1,000 people)**

<u>Service</u> <sup>2</sup>	<u>Officers</u>	<u>Other Ranks</u>
19	92	87
20	75	94
21	73	75
22	71	66
23	63	99
24	53	130
25	57	117
26	77	106
27	97	111
28	101	120
29	105	162
30	110	178
31	125	189
32	150	209
33	196	243
34	267	320
35	335	416
36	386	518
37	417	626
38+	427	626

---

1 Effectively 19 years of service plus one day.

2 Expressed in completed years calculated at the beginning of the plan year.

**Table 7E**

**Assumed Reduction Factors Applying to  
Immediate Annuities for Retiring Contributors  
(With 19 or More Years of Service<sup>1</sup>)**

<u>Service</u> <sup>2</sup>	<u>Officers</u> (%)	<u>Other Ranks</u> (%)
19	96.2	93.4
20	96.5	96.4
21	95.3	96.8
22	94.0	96.7
23	92.7	96.9
24	92.9	99.1
25	93.5	99.8
26	96.0	100.0
27+	100.0	100.0

---

1 Effectively 19 years of service plus one day.

2 Expressed in completed years calculated at the beginning of the plan year.

**Table 7F**  
**Assumed Rates of Termination due to Disability (per 1,000 people)**

Age <sup>1</sup>	Any Occupation <sup>2</sup>		Own Occupation <sup>3</sup>		
	Male	Female	Male Officers	Male Other Ranks	Female Officers / Other Ranks
17	0.4	0.4	2.0	2.3	3.9
18	0.4	0.4	2.4	2.5	4.1
19	0.4	0.4	2.7	2.6	4.4
20	0.4	0.4	3.0	2.8	4.7
21	0.4	0.4	3.2	3.0	5.0
22	0.3	0.4	3.3	3.1	5.2
23	0.3	0.5	3.4	3.3	5.4
24	0.3	0.6	3.3	3.6	5.6
25	0.3	0.7	2.8	4.0	5.8
26	0.2	0.8	2.4	4.6	6.0
27	0.2	1.0	1.9	5.2	6.3
28	0.2	1.1	1.6	5.9	6.7
29	0.2	1.2	1.4	6.7	7.1
30	0.2	1.3	1.3	7.7	7.7
31	0.2	1.3	1.3	8.6	8.2
32	0.3	1.4	1.3	9.5	8.9
33	0.3	1.5	1.3	10.2	9.5
34	0.4	1.6	1.4	10.7	10.0
35	0.4	1.7	1.4	10.8	10.5
36	0.5	1.8	1.4	10.6	10.9
37	0.6	2.0	1.4	10.2	11.3
38	0.6	2.1	1.4	9.9	11.8
39	0.6	2.3	1.5	9.8	12.2
40	0.6	2.5	1.6	9.7	12.6
41	0.6	2.7	1.7	9.6	12.9
42	0.6	2.9	1.8	9.4	13.1
43	0.6	3.1	2.1	9.3	13.3
44	0.6	3.3	2.4	9.1	13.5
45	0.6	3.6	2.7	9.0	13.7
46	0.6	3.8	3.1	9.1	13.9
47	0.7	4.1	3.5	9.3	14.2
48	0.8	4.4	3.8	9.6	14.5
49	1.0	4.7	4.1	10.0	14.9
50	1.2	5.0	4.4	10.5	15.2
51	1.4	5.4	4.6	11.0	15.6
52	1.6	5.7	4.9	11.5	16.0
53	1.9	6.1	5.1	12.0	16.3
54	2.2	6.4	5.3	12.6	16.7
55	2.6	6.8	5.6	13.1	17.0
56	2.9	7.1	5.8	13.6	17.4
57	3.3	7.5	6.0	14.2	17.7
58	3.8	7.9	6.2	14.7	18.1
59	4.2	8.2	6.5	15.3	18.5

1 Expressed in completed years calculated at the beginning of the plan year.

2 Any occupation is defined as severe disability and it is assumed to be permanent with no recovery possible.

3 The requirement of "combat readiness" under the Forces may render a member unable to fulfill the requirement of his own occupation. Disability is assumed to be permanent with no recovery possible.

**Table 7G**

**Sample of Assumed Mortality Rates for Plan Year 2001  
(per 1,000 people)**

<u>Age</u> <sup>1</sup>	<u>Active Contributors, Healthy and Disability (3B) Pensioners</u>					
	<u>Male</u>		<u>Female</u>		<u>Surviving Spouses</u>	
	<u>Officers</u>	<u>Other Ranks</u>	<u>Officers / Other Ranks</u>		<u>Male</u>	<u>Female</u>
20	0.5	0.6	0.3		1.1	0.3
25	0.5	0.6	0.3		1.3	0.4
30	0.6	0.9	0.4		1.2	0.5
35	0.8	1.2	0.5		1.3	0.7
40	1.1	2.0	0.7		1.7	0.9
45	1.6	2.4	1.0		2.5	1.7
50	2.8	3.9	1.3		4.0	2.6
55	4.5	6.9	2.3		6.9	4.9
60	8.0	11.3	4.6		11.5	6.7
65	13.4	18.7	8.9		18.6	12.1
70	19.9	30.8	14.0		29.1	18.5
75	36.1	47.9	22.8		45.4	25.1
80	62.0	71.2	39.8		71.7	45.7
85	98.9	105.2	68.9		112.0	73.0
90	150.4	158.2	120.6		171.8	107.7
95	222.9	230.5	194.5		258.3	177.6
100	316.8	323.3	291.1		344.6	320.6
105	495.7	495.7	415.2		500.0	500.0
110	500.0	500.0	492.4		500.0	500.0
115	1,000.0	1,000.0	1,000.0		1,000.0	1,000.0

<sup>1</sup> Expressed in completed years calculated at the beginning of the plan year.

**Table 7H**

**Assumed Mortality Rates for Plan Year 2001  
in Respect of Disability (3A) Pensioners  
(per 1,000 people)**

<u>Age</u> <sup>1</sup>	<u>Male</u>		<u>Female</u>
	<u>Officers</u>	<u>Other Ranks</u>	<u>Officers / Other Ranks</u>
20	0.8	1.2	0.5
25	0.8	1.2	0.5
30	0.8	2.7	0.6
35	1.0	4.6	0.8
40	1.3	6.4	1.2
45	3.2	7.7	2.0
50	8.4	9.2	3.3
55	14.3	13.0	5.3
60	19.9	19.9	8.5
65	26.6	30.0	13.1
70	35.9	48.3	20.9
75	52.7	71.3	34.2
80	77.0	86.7	53.2
85	111.7	112.6	84.8
90	150.4	158.2	134.0
95	222.9	230.5	194.5
100	316.8	323.3	291.1
105	495.7	495.7	415.2
110	500.0	500.0	492.4
115	1,000.0	1,000.0	1,000.0

---

<sup>1</sup> Expressed in completed years calculated at the beginning of the plan year.



**Table 7I**  
**Assumed Improvements in Longevity After Plan Year 2001**

<u>Age</u> <sup>2</sup>	<u>Annual % of Mortality Reduction</u> <sup>1</sup>			
	<u>Male</u>		<u>Female</u>	
	<u>2002</u>	<u>2026+</u>	<u>2002</u>	<u>2026+</u>
20	2.42	0.50	1.46	0.50
25	1.46	0.50	1.22	0.50
30	0.50	0.50	0.98	0.50
35	0.26	0.50	1.22	0.50
40	0.98	0.50	1.22	0.50
45	1.94	0.50	1.46	0.50
50	2.42	0.50	1.22	0.50
55	2.18	0.50	0.98	0.50
60	2.18	0.50	0.98	0.50
65	1.94	0.50	1.22	0.50
70	1.94	0.50	1.46	0.50
75	1.70	0.50	1.22	0.50
80	1.22	0.50	1.22	0.50
85	0.98	0.50	0.98	0.50
90	0.74	0.50	0.74	0.50
95	0.50	0.50	0.50	0.50
100	0.26	0.50	0.26	0.50
105+	0.00	0.00	0.00	0.00

1 Mortality improvement is based on a 24-year select period with an ultimate annual mortality improvement of 0.5% at all ages. During the select period, the annual mortality reduction is linearly interpolated between 2002 and 2026.  
2 Expressed in completed years calculated at the beginning of the plan year.

**Table 7J**

**Assumed Probability<sup>1</sup> a Member will have an  
Eligible Surviving Spouse<sup>2</sup> at Death (per 1,000 people) and  
Assumed Average Age Difference Between Spouses**

Age <sup>3</sup> of Deceased Member	Sex of Deceased Member			
	Male		Female	
	Number	Age Difference <sup>4</sup> Between Spouses	Number	Age Difference <sup>4</sup> Between Spouses
20	306	0	140	1
25	610	(1)	350	1
30	786	(1)	480	1
35	887	(1)	520	2
40	923	(2)	520	3
45	893	(2)	520	2
50	866	(2)	510	3
55	846	(2)	500	3
60	843	(3)	470	3
65	817	(3)	420	2
70	775	(3)	360	0
75	715	(3)	290	1
80	614	(4)	210	(1)
85	406	(5)	130	(3)
90	328	(6)	70	(4)
95	186	(7)	30	(6)
100	72	(9)	10	(6)

1 Does not apply if the deceased member was a contributor with less than five years of pensionable service.

2 Assumed to be of the opposite sex.

3 Expressed in completed years calculated at the beginning of the plan year.

4 Age of widow(er) less age of member, both at the beginning of the plan year.

**Table 7K**

**Assumed Average Number (per 1,000 people)  
and Average Age of Children  
at Death of Participant**

Age of Member <sup>1</sup> at Death	Average Number of Children (according to sex of member)		Average Age <sup>1</sup> of Children (according to sex of member)	
	Male	Female	Male	Female
20	72	2	0	1
25	271	438	2	1
30	670	702	5	5
35	925	794	8	10
40	1,020	726	11	13
45	927	538	14	16
50	665	311	16	17
55	358	129	17	18
60	136	28	18	19
65	36	0	19	0
70	11	0	21	0
75	6	0	23	0
80	0	0	0	0

**Table 7L**

**Assumed Proportions of Children  
Remaining Eligible (on account of school attendance) for Allowances  
Throughout the Following Year ( per 1,000 children)**

Age <sup>1</sup>	Proportion
under 17	1000
17 to 23	840
24 and over	0

<sup>1</sup> Expressed in completed years calculated at the beginning of the plan year.

## Appendix 8 - Detailed Reconciliation of Results with Previous Report

The following table represents detailed reconciliation of the effect on the Account surplus and on the normal cost of item 'Experience gains and losses' shown on page 13. The table on the next page represents detailed reconciliation of the effect on the Account surplus and on the normal cost of item 'Change in assumptions, methodology and plan provisions' shown on page 13.

	Surplus in millions of dollars	Normal Cost as a percentage of pensionable payroll
<b>Experience gains and losses</b>		
<b>Economic</b>		
Investment earnings	(23.4)	
Economic salary increases	(372.8)	0.05
Promotional salary increases	149.1	
Wage increase rates (YMPE/MPE)	(16.5)	0.04
Pension indexing rates	269.9	
<b>Demographic</b>		
New members	4.6	
Active mortality rates	(1.5)	
Active termination with less than 20 years of service	95.3	
Active termination due to disability	(13.6)	
Active termination with 20 or more years of service	(25.5)	
Proportion electing a reduced annuity	(43.1)	
Percentage reduction in annuity upon retirement	(31.5)	
Healthy pensioner mortality rates	(47.3)	
Disabled pensioner mortality rates	1.5	
Widow(er) mortality rates	20.6	
Probability that a members will be married at death	27.5	
Age difference of spouse at death	3.1	
Miscellaneous	(13.6)	(0.02)
<b>Total</b>	<b>(17.2)</b>	<b>0.07</b>

	Surplus in millions of dollars	Normal Cost as a percentage of pensionable payroll
<b>Changes in assumptions, methodology and plan provisions</b>		
<b>Economic</b>		
Promotional salary scale	46.2	(0.13)
Select period changes for economic salary increases, pension indexing rates, and wage increase rates (YMPE/MPE)	1,312.4	(1.24)
Account yield	(800.6)	0.99
<b>Demographic</b>		
Active mortality rates	12.5	(0.03)
Active termination with less than 20 years of service	59.9	(0.28)
Active termination with 20 or more years of service	21.7	(0.05)
Active disability rates	(72.6)	0.22
Proportion electing a reduced annuity	(22.6)	0.09
Percentage reduction in annuity upon retirement	(54.1)	0.16
Healthy pensioner mortality rates	0.5	
Disabled pensioner mortality rates	8.8	
Widow(er) mortality	155.7	(0.05)
Longevity improvement factors	159.2	(0.28)
Age difference of spouse at death	(7.4)	
Child assumptions	(1.5)	
<b>Methodology and Plan Provisions</b>		
Introduce new disability rates (3A and 3B)	(15.5)	0.05
Bill C-71	(314.3)	0.55
Add indexing for disabled 3B to data	(63.8)	
Exclude annual service allowance from data	24.3	0.10
<b>Total</b>	<b>448.8</b>	<b>0.10</b>
<b>Assumption and Plan Provisions changes as at 31 March 2000</b>		
Limit survivor benefits due to Income Tax Act	9.7	(0.07)
Credit fund yield on contributions	(1.6)	0.02
Government future contributions for prior service	(93.6)	
Bill C-78 (employee contribution rate)	0.0	
Capitalise administration expenses	(144.5)	
<b>Total</b>	<b>(230.0)</b>	<b>(0.05)</b>

## **Appendix 9 - Acknowledgements**

The Office of the Comptroller General of Canada provided a certification of the assets of the plan as at 31 March 2000.

The Department of National Defence provided relevant valuation input data on contributors, pensioners and survivors. Public Works and Government Services Canada also provided additional information in respect of pensioners and survivors.

The co-operation and able assistance received from the above-mentioned data providers deserve to be acknowledged.

John Kmetc, A.S.A. played a major role in the preparation of this report.